

Oregon State GAME COMMISSION BULLETIN

Vol. II

PORTLAND, OREGON, MARCH, 1947

No. 2

Rocky Mountain Elk

By NILS N. NILSSON, Senior Biologist Northern Game District

In the early part of the twentieth century a report of even a small herd of deer or elk in eastern Oregon would have made headline news. Previous to this period elk roamed throughout many parts of Oregon in large numbers. Market hunting for their hides, teeth and as a source of food, plus widespread slaughter at all seasons of the year, eventually reduced the elk until extreme restoration measures were necessary to bring them back to normal abundance.

In an account published by the Oregon State Game Department in 1912 it is reported that elk, "although formerly abundant in many sections of our state, have diminished in number until at the present time there are but a few scattered bands in the more remote mountainous sections." Through action of the Game Department, cooperating Federal agencies, Elk Lodges and various private citizens, fifteen elk were introduced into Wallowa county from Jackson Hole, Wyoming, in the spring of 1912, to supplement the remnant herds and to aid in building back elk numbers.

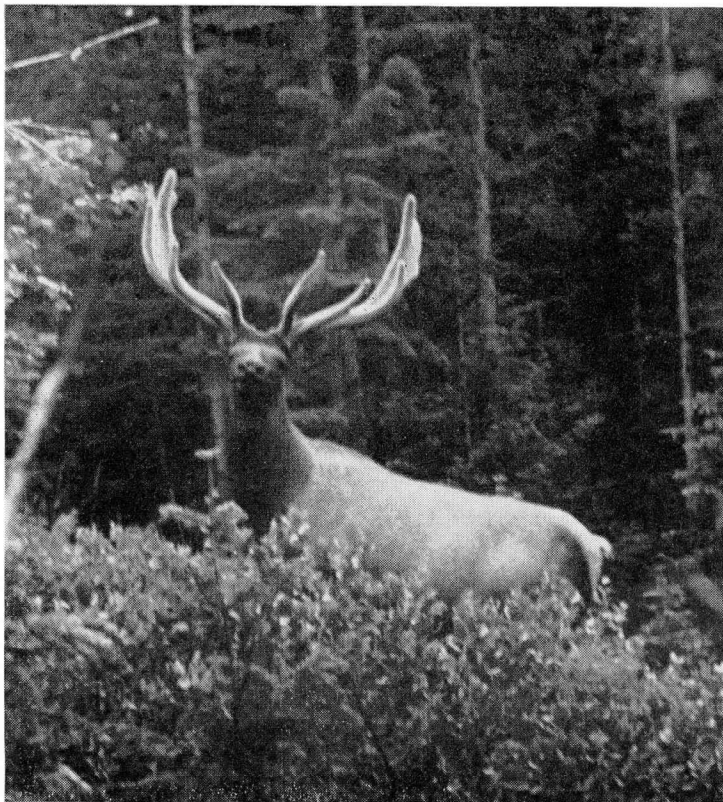
Although the introduction of fifteen Wyoming elk into Wallowa county was not the total solution to bringing back the elk, it had much to do with stimulating interest in conservation and afforded a nucleus of breeding stock in Wallowa county. Subsequent small introductions into other parts of the state and complete protection for a period of 21 years afforded this species an opportunity to reestablish itself in suitable habitat.

With a few additional small herds of elk released at other points, the season was closed and the Fish and Game Commission, together with the sportsmen, sat back to await what was to come "naturally". Complete protection was afforded the species until 1933, during which time elk had built up in numbers and reestablished themselves on many ranges on which they had been absent for years.

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Commissioner Reappointed

R. D. McClallen of Enterprise was reappointed February 25 for another five-year term on the Oregon State Game Commission. Mr. McClallen has served as a member of the Commission since 1942.



"Elk encountered by Nilsson in Wallowa county."

"Care and Diseases of Trout" By Dr. Davis in Third Edition

The third edition of "Care and Diseases of Trout" by Dr. H. S. Davis, now Technical Consultant for the Oregon State Game Commission, has just been published by the Government Printing Office, Washington, D. C. The abstract of the publication summarizes the contents as follows:

"This is the third and most extensive revision of 'Care and Diseases of Trout'. Care of trout at the hatchery, including the care of ponds and raceways, is treated at some length. This is followed by a general discussion of trout foods and methods of feeding, special attention being paid to the use of dry products for supplementing fresh meat in the diet. Some consideration is given to the improvement of brood stock and its practical value.

"A general discussion of parasites and diseases of trout, and their control, is followed by a detailed account of each disease, including the characteristic symptoms, etiology, pathology, and methods of control. The figures include drawings and photomicrographs of the more important organisms that cause trout diseases and their effects on the tissues."

After 23 years of service, Dr. Davis retired from active duty with the U. S. Fish and Wildlife Service in July, 1945. Shortly thereafter he joined the staff of the Oregon State Game Commission, assisting on disease and nutrition problems in the Commission's hatcheries. He has provided much help in the solution of disease problems and in the development of proper diets for raising healthy fish.

Dr. Davis was born in New York state and did his undergraduate work at Westlyan University in Connecticut and took his Ph. D. degree at Harvard. He first studied salmon and trout at Washington State College at Pullman, Washington, where he instructed in zoology from 1901 to 1906. He taught histology

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The Supervisor's Column

In 1940 the Pittman-Robertson Bill (Federal Aid to Wildlife Restoration) was passed in Congress. This bill placed a tax on arms and ammunition and the funds so accumulated are appropriated by Congress and allocated to the various states for game restoration but such funds may not be used for benefit of fisheries. The allocation of funds is based on the area and the number of hunting license holders in each state.

Now, however, Mr. Robertson has introduced in Congress H.R. 7104, purpose of which is to tax fishing tackle and equipment to set up a similar fund for fisheries work. If this bill is passed, it will provide material help for the fisheries program throughout the country.

Since inauguration of the Federal Aid to Wildlife Restoration program, which is administered by the Fish and Wildlife Service, Oregon has received the following appropriations:

Fiscal Year	Amount
1940	\$30,281.25
1941	49,519.26
1942	56,415.32
1943	25,186.89
1944	20,667.36
1945	18,342.60
1946	21,374.70
1947	55,360.81

While all the funds derived from this tax are earmarked for wildlife restoration work, it has not been the policy of Congress so far to appropriate all the funds available, thereby accumulating a backlog of around \$15,000,000. While the present request before Congress for next year's appropriation is only for \$2,500,000 (Oregon's share would be \$54,195.98), there is a movement on foot to have the appropriation doubled. Oregon could use the increased funds to good advantage in furthering projects already started. Land for the Summer Lake management area was purchased with these funds but much development work remains to be done. Another management area is being acquired at Camas Swale in Lane county and funds are needed for land acquisition and eventual development of the area. Under this program, Oregon has also carried on various research projects, such as those on sage grouse, deer, elk, pheasants, antelope and game damage control.

If in any state, hunting and angling license fees are diverted and used for any other purpose than the administration of the state fish and game departments and their operations, such state automatically becomes ineligible to participate in the provisions of the present Federal Aid program. A similar clause has been inserted in the new bill H.R. 7104. Therefore, most states are jealously guarding against the appropriation of their fish and game funds for other purposes.

February Meeting of the Game Commission

The regular monthly meeting of the Game Commission was held February 15 at the Portland office.

The following business was considered.

Purchase was authorized from Beulah L. David of approximately three acres of land along Oregon Slough at a cost of \$2,000 per acre to be used as a site for a refrigeration plant for storage and handling of fish food.

Installation of a gas tank and improvement to sidewalk along west side of the headquarters building were authorized.

Membership in the National Conference on Conservation Education and Publicity was approved and payment of the annual dues of \$20 authorized.

The following individuals were added to the recommended list of applicants for membership in the game division of the State Police:

Wm. Lee Allen, Grants Pass
Kenneth C. Robertson, Portland
Donald Benjamin Clark, Astoria
Gail L. Kilgore, Albany
Wm. Frank Davis, Portland
Albert E. Boland, Athena

A uniform plan for a 5-room house was adopted for use in construction of assistants' residences at the hatcheries and game farms. This plan will be used first for the new residence authorized at the Cedar Creek hatchery. Following its completion, two residences were authorized for Klamath Falls hatchery.

The engineering department was instructed to complete plans and specifications for the following projects in the order named: (1) Wizard Falls hatchery; (2) Roaring River hatchery ponds; (3) Diamond Lake hatchery building.

With reference to the annual meeting of the Western Association of State Game and Fish Commissioners to be held in June at Santa Fe, New Mexico, it was decided that members of the Commission and several of the department personnel should attend. In addition to the general program for administrators, special sessions on fisheries and game will be held for technical personnel.

Purchase of nets costing approximately \$1,500 was authorized for use by the lake and stream survey crews and for trash fish control purposes. Authorization was granted also for purchase of a scale projector at \$150.

Four fishery biologists were authorized to attend in April the annual meeting of the Pacific Fishery Biologists at Harrison Hot Springs, Canada.

The Supervisor was instructed to contact members of the Congressional delegation with reference to having land within the Soap Creek demonstration area turned over to the state for research purposes, the land being part of Camp Adair. As other states were reported to

Game District Established

A new game management district was set up last month in the southwest coastal area, which makes the twelfth district established since inauguration early in 1946 of the program through which field management of Oregon's game resources is conducted on a permanent basis by the assignment of field staff personnel to the area.

Headquarters for the new district are at Coquille and senior biologist located there is Leslie Zumwalt, recently returned from service with the army.

The area included within the district extends roughly from Cape Perpetua in the northwest corner of Lane county south to the California line and east to the crest of the coast range, including most of Coos, Curry and western Lane counties.

The eleven other game district headquarters are as follows: Corvallis, Nehalem, Grants Pass, Bend, The Dalles, Lakeview, Burns, John Day, Ontario, La Grande and Pendleton.

Size Limit on Trout?

A constant source of arguments pro and con is the question as to whether or not there should be the minimum length limit on trout as provided by the Commission the past several years. It is the contention of many that anglers ought to keep any trout they catch regardless of size for the reason that once a small fish is hooked, it usually dies when it is released.

Back in 1938, the late Matt Ryckman, who then was superintendent of the Commission's trout hatcheries, decided to find out what happened and had his staff at the Alsea hatchery conduct an experiment.

From one of the holding ponds, 100 steelhead trout, 3 to 8 inches in length, were caught by hook and line. A No. 12 single egg hook was used for catching 73 of the fish and a brown hackle No. 10 hook for the remaining 28. The men were instructed to use the same methods as if they were fishing on a stream. Some of the fish were thrown the full length of the line over the angler's shoulder and all of them were pulled from the water with a severe jerk. The fish were then placed in another holding pond and at the end of two weeks only one had been lost. This fish died within a few minutes after being caught, examination revealing that both gills were torn loose from the mandible. All the others were still in good condition.

have similar projects under way, the suggestion had been made that an omnibus bill be introduced in Congress to take care of all such requests.

Results of 1946 Elk Season

Although the 1946 license sales are still in the process of being audited, it is estimated that approximately 20,000 elk licenses were sold in 1946. However, only 10,108 or approximately one-half of the check-out cards have been received, which leaves approximately 10,000 delinquent elk check-out cards in the state.

Of the 10,108 elk hunters reporting, 3,369 or 33% were successful. The relative success of hunters is indicated by seasons and counties in the accompanying chart.

It is interesting to note that 57% of the hunters reporting hunted in the

"either sex area" and that 55% of the elk harvested were taken in that area in spite of the fact that only approximately one-fifth of the elk in the state were included in the either sex season.

Of the 3,369 elk reported taken, 506 or 15% were killed the first day of the season and 1,698 or 51% were taken during the first week. The average hunting effort required to bag an elk was 12 man days.

Of the 10,108 elk hunters reporting, 6,658 or 66% hunted deer during the 1946 season and of these 3,286 or 50% bagged a deer. These statistics lead to interesting speculation upon numbers of deer harvested in Oregon, when considering the potential 175,000 licensed hunters in the state.

This and That

Predatory birds killed at the Ontario game farm by the employees during the months of November, December and January included 144 crows; 39 magpies; 18 cats; 26 owls and 7 hawks.

* * *

The Fish and Wildlife Service's report for the last quarter of 1946 shows 2,151 predatory animals were taken by the hunters employed under the cooperative control program paid for by federal, state and county funds. The total included 1,987 coyotes, 101 bobcats, 61 bear and 2 mountain lions.

* * *

The dates of the 1947 annual meeting of the Western Association of State Game and Fish Commissioners have been announced as June 4, 5 and 6. The place is Santa Fe, New Mexico.

* * *

Ben Snyder, superintendent of the western Oregon game farms, reports that an experiment is being made this winter with sulphathiazole as a cure for colds in pheasants and chickens. The results from its use in drinking water have been good so far with chickens and further study is being made. The drug has been used before in feed mixtures but it is felt that adding it to drinking water will be more effective since a sick, feverish bird will drink water and still not care for food. Heretofore individual treatments with argyrol were used for colds and gave good results but these required much time and labor. Flock treatment with sulphathiazole in drinking water would be a quick method and much more satisfactory.

* * *

Flying over Crane Creek Mountain last month, while making an aerial survey, Ellis Mason, game biologist in Harney county, and Don Miller, Forest Service biologist, saw two large buck deer, both having a large spread of antlers. Just as they passed over, one of the bucks shook his head and both antlers fell to the ground.

* * *

Nine states and Alaska were represented during the pheasant season in Malheur county last fall. Analysis of the records shows that the hunters checking through the tagging stations came from the following areas (local hunters did not check their birds unless shipping them out of county):

Area	No.	Percent
Western Oregon	1,642	58.18
Eastern Oregon	394	13.95
Washington	345	12.21
Idaho	112	3.96
California	108	3.82
Utah	8	....
Tennessee	4	....
Nevada	3	....
Arizona	2	....
Montana	1	....
Kansas	1	....
Alaska	1	....
Malheur County	203	7.18

1946 ELK SEASONS

County	Hunter Reports	BULLS			COWS	CALVES	TOTAL	Success Ratio	Days Effort Per Animal
		Old	Med.	Spike					
Western Oregon — October 28-November 14 — Bag limit, 1 bull with forked antlers.									
Clatsop	1,010	15	175	..	..	..	190	19%	20
Columbia	26	..	4	..	..	..	4	15%	23
Lincoln	133	3	20	..	..	..	23	17%	17
Lane	119	2	26	..	..	..	28	23%	17
Linn	5	..	....	..	..	..	0	0	0
Deschutes	13	1	1	..	..	..	2	15%	18
Marion	11	3	2	..	..	..	5	45%	5
Clackamas	5	..	1	..	..	..	1	20%	25
Klamath	6	..	....	..	..	..	0	0	..
Sub Total Western Oregon	1,328	24	229	..	..	..	253	19%	19
Northeastern Oregon — October 29-November 20 — 1 bull with antlers.									
Umatilla	1,061	64	224	165	..	..	453	43%	14
(Ukiah)	(127)	..	2	2	25	15	44	35%	..
Union	985	42	168	124	5	1	340	34%	19
Wallowa	617	25	144	108	..	..	277	45%	17
(Troy)	(62)	..	8	..	11	5	24	38%	..
Morrow	147	4	30	18	..	..	52	35%	19
Sub Total N. E. Oregon	2,999	135	576	417	41	21	1,190	39%	16
Either Sex Area — October 29-November 20 — Bag limit, 1 elk.									
Jefferson	2	..	1	..	..	..	1	50%	12
Wheeler	42	1	4	..	5	1	11	26%	5
Crook	47	3	....	..	9	1	13	27%	14
Grant	1,739	60	213	39	291	285	888	51%	6
Harney	165	6	15	..	36	7	70	42%	12
Malheur	157	1	16	6	24	3	50	32%	17
Baker	1,554	37	118	124	302	22	603	39%	5
(Muddy Creek)	(640)	..	13	2	..	..	15	2%	..
(Powder River)	(1,435)	..	83	..	139	59	281	19%	..
Sub Total Either Sex Area	5,781	108	463	171	806	378	1,926	33%	10
GRAND TOTAL	10,108	267	1,268	588	847	399	3,369	33%	12

Summer Lake Hunting Report 1946 Waterfowl Season

Season: October 26, 1946, to December 9, 1946, inclusive. Total length 45 days.

Area: This public shooting ground is composed of 13,265 acres. Of this 7,607 acres were closed as a refuge and 5,658 acres were left open to public shooting.

Hunting Permits sold: 5202 (Permit good for one day only)

Number of hunters using area: Resident Hunters.....	2955	
West of Cascades.....	2,106	
East of Cascades.....	706	
Multnomah.....		570
Deschutes.....		562
Lane.....		522
Linn.....		311
Marion.....		211
Clackamas.....		96
Benton.....		94
Polk.....		66
Yamhill.....		44
Klamath.....		42
Douglas.....		41
Lake.....		40
Washington.....		31
Crook.....		25
Lincoln.....		23
Jackson.....		21
Coos.....		19
Columbia.....		17
Jefferson.....		17
Josephine.....		16
Clatsop.....		12
Tillamook.....		10
Hood River.....		8
Gilliam.....		4
Sherman.....		4
Wasco.....		3
Curry.....		2
Umatilla.....		1
TOTAL.....	2,812	
Non-resident Hunters.....	101	3,056

Waterfowl Success Ratio: 2.17 Birds per Man Day

Number of Waterfowl checked out:

DUCKS	1946	1945	1944
Mallard.....	2,932	2,179	1,875
Green Wing Teal.....	1,287	921	1,025
Baldpate.....	1,204	999	899
Pintail.....	1,009	1,339	849
Shoveller.....	479	467	242
Gadwall.....	213	71	0
Redhead.....	80	5	0
Scaup.....	46	33	75
Canvass back.....	33	10	34
Ruddy.....	30	18	0
Buffle head.....	23	29	22
Cinamon Teal.....	15	31	0
Golden eye.....	7	5	0
Wood duck.....	4	3	0
Unclassified.....	1	119	20
Coot.....	171	67	0
TOTAL.....	7,534	6,296	5,041
GEESE	1946	1945	1944
Snow Geese.....	3,452	2,493	1,875
Cackling Goose.....	91	88	135
Canada Goose.....	84	144	119
Lesser Canada Goose.....	8	0	18
White-fronted Goose.....	59	139	170
TOTAL.....	3,694	2,864	2,317
TOTAL WATERFOWL KILL.....	11,226	9,160	7,358
	(45 day season)	(80 day season)	(80 day season)

Hooks and Weights Regulated

The hook and weight regulation previously applying only to fishing in the Rogue and Umpqua rivers is now effective on all waters. Its main purpose is to prevent illegal snagging of salmon. The regulation is as follows:

When fishing with a single hook or hooks larger than $\frac{5}{8}$ of an inch from the point of the single hook or hooks to the shank thereof, or treble or double hooks regardless of size, all sinkers or weights shall be located or fished or have the place of nearest attachment in a position 18 inches or more above, and never below, the hook, measured from the eye thereof, and no weight or sinker shall be used on or attached to the shank or shanks of any of such hooks in any manner.

There shall not be used in any fishing, any treble or double hooks, of which, any one or all thereof are larger than $\frac{3}{4}$ of shank thereof, or treble or double hooks to the shank or shanks thereof and no single hook or hooks larger than one inch from the point of any such hook or hooks to the shank thereof.

The above treble, double or single hook or hooks shall be measured from the point of such hook or hooks to the inside of the shank thereof on a line at right angles at such point or points.

Spiders are not insects. They belong to the Arachnida family, which is composed of mites and scorpions.

The world's largest and smallest animals live in water. These range from one-celled microscopic amoeba to multi-tonned whales. Many terrestrial animals such as frogs, salamanders, and certain insects spend part of their life cycle under water.

Oregon State Game Commission Bulletin

Published Monthly by the

Oregon State Game Commission
1634 S. W. Alder Street—P. O. Box 4136
Portland 8, Oregon

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Rocky Mountain Elk

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Life History

The Rocky Mountain Elk, the species found in eastern Oregon, belongs to the Cervidae family, the genus *Cervus*, and is classified as the species *Cervus canadensis canadensis*. As compared with the Roosevelt elk of western Oregon, it averages slightly smaller, lighter in color, and their antlers are less massive.

The average live weight of a mature bull in prime condition will sometimes reach 850 pounds, while a mature cow in good condition will weigh in the neighborhood of 500 pounds, bull calves approximately 170 pounds and heifer calves 150 pounds by their first Christmas.

Bull calves show no indication of antlers, but in their second year, single tines measuring from eight to 18 inches are grown, and the animal is called a spike. These spikes may be carried as late as the middle of May, and when they are shed new antlers begin growth at once. By the following August this young bull will have from two to four points on his rack. From his third year on to five years the antlers grow generally larger all around, while retaining an average of from four to five points.

Most all bull elk shed their antlers from the period beginning the latter part of February to the middle of April. Growth of new antlers is very rapid until August 1, when full growth is reached. Rubbing and shadow boxing is then begun, so that by September 1 all velvet is shed and the bull is ready to challenge or defend his harem from other bulls.

Spike bulls often do not shed their velvet but carry it through until spring, when their spikes are dropped. Many spike bulls are taken during the hunt-

ing season that have their spikes broken off near the middle. It is believed this is caused by some deterioration or fungus growth in the velvet.

The larger sets of antlers will average about 45-inch spread, 50-inch inside curve and a 9-inch burr.

The elk has two coats of hair, the summer and the winter coat. These are shed during the months of July through August and April through May, respectively. The summer coat is a rusty brown or light bay over the main body, while the head, neck and legs are brownish. The young calves are tawny and thinly spotted with white, turning darker toward

their first winter. The winter coat is light buffy gray over the body, with the tail, rump patch and chin showing white to buffy. The head, neck, breast and legs are dark brown. The winter coat, which continues its growth into November, will average from two inches on the sides and belly to six inches on the neck and shoulders of older bulls.

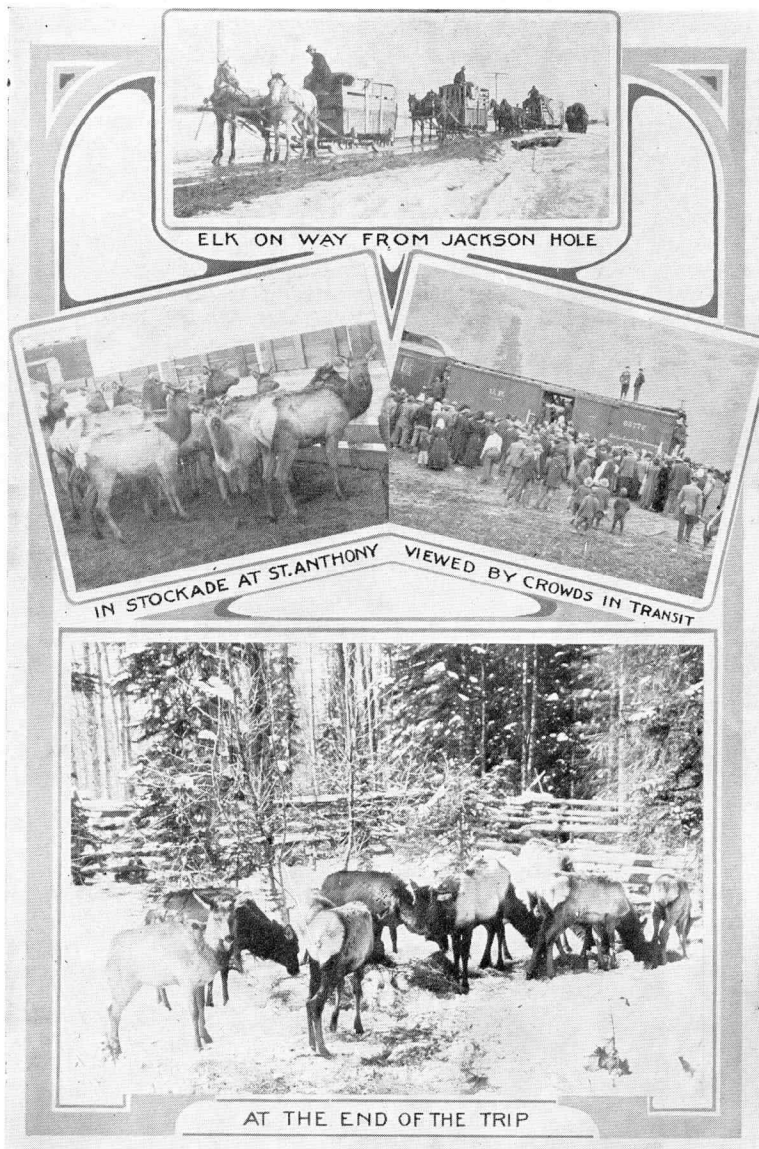
In observations made in eastern Oregon, bugling does not begin on a certain date throughout the entire region. In a particular area the first bugle has been heard about August 15 in three successive seasons, while in another area bugling does not begin until about the first of September.

By the first week in September bulls begin collecting their harems, which average near six cows. The highest number I have observed in eastern Oregon has been sixteen, including four yearlings and three calves.

There is considerable fighting among herd bulls and unattached bulls but seldom to death. Cows and calves stand bunched together watching, cows indifferent and calves slightly interested.

Most of the cows are bred between September 15 and October 15. That some breeding takes place earlier was brought out by an observation of an elk cow calving on April 7 during the past year (1946), which makes the breeding date somewhere near August 15. The gestation period is approximately eight and a half months, 249 to 262 days. Yearling cows do not breed. Practically all calving takes place from May 15 to June 15. Single calves are the general rule, with twin calves being rare. The young are usually born in open spots with no protection. They are moved in one hour to more inconspicuous spots near timber.

In branding young calves no case of the mother attempting to molest the per-



ELK ON WAY FROM JACKSON HOLE

IN STOCKADE AT ST. ANTHONY VIEWED BY CROWDS IN TRANSIT

AT THE END OF THE TRIP

"Pictures taken in 1912 of elk brought to Wallowa county from Wyoming."

The Chesterfield of birds is the great blue heron. To his middle claw is attached a small comb, with which to preen his feathers.

Old groundhog holes make the best shelters for rabbits during the wintertime for they show relatively little variation in temperature.

The grebe is a bird contortionist. It lifts its legs out of the water, shakes the moisture from them, then folds them over the back, under its wings.

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Rocky Mountain Elk

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son handling the calf has been experienced. In all cases the cow will "bark" and trot off, watching banding operations from a distance of a few hundred yards.

No spectacular migrations occur in eastern Oregon, with most of the elk traveling only a few miles from summer to winter ranges. After the breeding season, and the snowstorms that soon follow, the elk drift downward as the weather forces them to their winter ranges, which include only a small fraction of the area available for their use during the summer months. As the animals concentrate on these small winter ranges, herds of from 50 to 500 animals may be observed. Many of the older bulls at this time segregate themselves in small groups from these main herds. As the snow recedes in the spring the elk follow the green grass back to their mountainous summer ranges.

The elk is essentially a grazing animal of the mountains, meadows and plains and prefers the forage that grows on open rangeland. They prefer the high grassy ridges and numerous parks but do not go high into the granites found in parts of eastern Oregon, as do the mule deer.

Feeding and pasture habits of elk are similar to domestic cattle. They have two general feeding periods, daylight and evening hours. In between these periods they lie in the shade and ruminate. Grasses, when available, make up the larger part of the elk diet. In early spring and summer months most all weeds are readily eaten by the elk. In winter, when bunch grasses, elk sedge and other grasses are available under the snow, the elk will, like wild horses, paw away the snow to get to the grasses. Browse plants, such as mountain mahogany, willow, juniper, bitter brush, ocean spray, huckleberry and vine maple, are readily eaten where found on winter ranges.

Problems of Elk Management

To better understand the various problems which are now involved in the management of elk one has only to look back a few decades to when some of these conditions that now contribute to making problems were nonexistent.

Prior to settlement of our valleys and foothills, deer and elk often summered in the foothills and lower mountain slopes and drifted to the valleys for winter, particularly when winters were severe and deep snows covered their feed higher up. When these same fertile valleys and foothills were developed into farms and ranches, and cattle and sheep were introduced to harvest the abundance of range forage by man, the deer and elk were forced to use higher and smaller areas for their winter ranges.

In these early days of "free-for-all" grazing it was believed that the ranges had unlimited carrying capacity, and no

thought was given to the conservation of the forage resources on a permanent business basis or for future generations. It was during this hectic period that most of our ranges were excessively grazed and received damage from which many have not recovered.

In open winters, the increasing elk herds preferred wintering on the lower zones of their summer ranges. The appearance of elk in the low valleys during the last few years is due primarily to two reasons, which are as follows:

1. Excessive grazing has eliminated many of the preferred forage species, making it impossible for elk to find sufficient feed above the lower foothills during the winter months.

2. Many small elk and deer herds have found, after coming down on winter ranges adjacent to farms and ranches, the "ideal habitat". So lush have they found these surroundings that a "sort" of "squatter's rights" have been taken up by many of them. This means that the calves and fawns are born and reared in and around fields and pastures. This results in "local herds" that do not migrate to higher elevations during the summer months, thus causing varying degrees of damage to field crops, as well as the breaking of fences and irrigation ditches. This, of course, is a continuous source of irritation to the farmer and stockman.

One would presume that elk and deer damage would ebb and flow according to the severity of the winter; that is, the deeper the snow, the more visits to haystacks. As records will show, this presumption is true, but it does not reveal the additional fact that the acquired taste developed for alfalfa hay in such winters is not forgotten by the elk or deer.

During the winter of 1944-45 very little snow fell throughout the mountains and the deer and elk were scattered over most of their summer ranges. All south slopes were barren of snow, making for an easy winter on big game. In spite of this, deer and elk damage occurred in various sections. These night marauders can be classified as "repeaters", and are animals which have an acquired taste for alfalfa hay, and, barring accidents, return each winter — with one or more friends!

All the ranchers in northeastern Oregon show a keen interest in wildlife of all kinds, and there is an evident desire on their part for wildlife to be accorded its proper place in the use of all ranges, both public and private.

Many hunters, interested solely in wildlife, have the erroneous belief that it is impractical for livestock and big game to graze on the same areas. Few ranchers and livestock producers are found in eastern Oregon who do not contend that it is entirely practical to graze big game and domestic livestock on the same ranges in **reasonable numbers**, and it is only when livestock or game numbers are allowed to increase beyond the

carrying capacity of the range that trouble develops.

Ranchers have often been wrongfully accused of being enemies of wildlife. With but few exceptions this does not ring true for they were among the first to advocate a policy for the protection of wildlife.

Winter Feeding

Many well meaning and misinformed sportsmen clamored for permanent feeding stations during the elk damage experienced in parts of eastern Oregon during the winter of 1945-1946.

In the severest of winters, when deep snows cover all available food for long periods, it is necessary sometimes to feed for a few weeks to carry deer or elk through, but, as a permanent practice, it should be avoided at all costs.

If results of permanent feeding of game were satisfactory such procedure would in some ways be justified. A few of our sister states have found that feeding of big game is unsound in practice, and detrimental to the range and health of the animals. In addition, it is a good way to spend the sportsmen's money without justification.

Utah has been conducting experimental feeding for several winters and has found that if there is no natural browse to supplement the emergency feeding, a high mortality can be expected; also that such feeding stations concentrate the deer or elk just like the old method of permanent bedding grounds so widely used in early sheep grazing history, with the result that considerable range surrounding concentrations are depleted of all available forage.

Many sportsmen always think of the feeding of elk in Jackson Hole, Wyoming, as a success. If the facts of this federal project are studied and taken as conclusive, there will be less enthusiasm wasted on such a plan. Those in charge of this "WPA" for elk have cause to dread each winter when the feeding of hay is begun. Artificial feeding of big game is expensive and ineffective.

Cooperative Studies

Cooperative range studies by the United States Forest Service and the Oregon State Game Commission were begun two years ago. These studies are being conducted on preferred species of range plants which are palatable to both game and livestock, with the object of obtaining information which will tell whether the plants are being used properly or being grazed excessively by livestock or big game.

To better illustrate this study, let us take the browse plant mountain mahogany, which is palatable to both livestock and big game. Also let us assume that mahogany can withstand the loss of 40 per cent of its annual growth and still maintain itself in vigorous condition. If cattle and sheep utilize 30 per cent of the annual growth and the game 10 per cent the plant is being properly used. If the combined utilization exceeds 40 per

(Continued on Page 7)

Rocky Mountain Elk

(Continued from Page 6)

cents for many years, depletion of the forage resource can be anticipated.

In short, it is much safer to carry a surplus of grasses and browse plants instead of an over surplus of livestock or big-game animals. When the animals become too numerous for the available forage throughout the summer or winter ranges they not only do permanent damage to the ranges but the animals decline in weight and vigor, due to malnutrition.

Preferred Ranges

Studies and surveys conducted by the Game Commission during the last three years indicate that elk have spread over some watersheds which are better suited for deer ranges than elk ranges. With these findings, management has begun to reduce and keep at low numbers the elk herds throughout these preferred deer ranges. In watersheds where habitat conditions are more suitable for elk, management plans will make every effort to maintain a maximum number of high quality breeding animals.

Good range management and the maintenance of deer and elk herds within and under the safe limits of the carrying capacities of winter ranges is one of the main assurances that Oregon Sportsmen can rely upon for the continuance of their big-game hunting.

Trout Liberations

In Watershed No. 2

Name of Stream	No. and Species
Abiqua Creek	9,300 rb.
Baker Creek	560 rb.
Big Fall Creek	39,560 rb.
Butte Creek	11,850 rb.
Blue River	93,150 rb.
Bilyeu Creek	1,350 rb.
Breitenbush River	36,295 rb.
Camp Creek	19,400 rb.
Crabtree Creek	15,320 rb.
Deer Creek	12,000 rb.
Dairy Creek, E. Fk.	9,000 ct.
Frank Brice Creek	16,300 rb.
French Creek	7,500 rb.
Gales Creek	7,672 ct.
Gates Creek	81,920 rb.
Goose Creek	15,750 rb.
Hamilton Creek	4,400 rb.
Hills Creek	72,448 rb.
Horse Creek	85,280 rb.
Humbug Creek	7,700 rb.
Innis Creek	2,100 rb.
Laying Creek	16,300 rb.
Little Fall Creek	27,648 rb.
Luckiamute River	1,175 ct.
Marten Creek	39,400 rb.
Mary's River	12,000 rb.
Marion Creek	20,000 rb.
McKenzie River	350,370 rb.
McKenzie River, S. Fk.	101,460 rb.
McKenzie River, E. Fk.	4,900 rb.
Mill Creek	38,664 rb.
Milk Creek	5,000 rb.
Mohawk Creek	17,500 rb.

Molalla River	44,323 rb.
Mosby Creek	20,000 rb.
Quartzville Creek	45,900 rb.
Rickreall Creek	10,500 rb.
Roaring River	3,200 rb.
Salmon Creek	101,716 rb.
Salt Creek	76,381 rb.
Santiam River, N. Fk.	121,130 rb.
Santiam River, M. Fk.	4,400 rb.
Santiam River, S. Fk.	66,350 rb.
Santiam River, Lit. N. Fk.	50,680 rb.
Thomas River	15,360 rb.
Tualatin River	7,680 ct.
Wiley Creek	13,148 rb.
Wiley Creek, Little	5,440 rb.
Willamette River, M. Fk.	202,600 rb.
Willamina River	11,700 rb.
Winberry Creek	34,560 rb.

Total Fish Liberated
in Streams 2,018,340

Name of Lake	No. and Species
Benson Lake	11,840 rb.
Betty Lake	10,400 rb.
Big Lake	18,875 e.b.
Birthday Lake	5,670 rb.
Breitenbush Lake	10,101 rb.
Burnt Top Lake	9,990 rb.
Clear Lake (McKenzie)	32,400 ct.
Clear Lake (McKenzie)	51,240 rb.
Clear Lake (Clackamas)	10,700 rb.
Cervus Lake	6,080 rb.
Corner Lake	21,090 rb.
Dumbell Lake	5,180 rb.
Eddaleo, Upper	10,080 rb.
Edna Lake	1,950 rb.
Elbow Lake	5,510 rb.
Emma Lake	3,230 rb.
Ernie Lake	3,800 rb.
Gander Lake	10,450 rb.
Harvey Lake	14,820 rb.
Helen Lake	5,700 rb.
Horsefly Lake	1,920 rb.
Indian Prairie Lake	10,800 rb.
Island Lake No. 2	5,180 rb.
Island Lake No. 3, Upper	5,244 rb.
Island Lake No. 3, Lower	5,244 rb.
Junction Lake	8,000 rb.
Kidney Lake	20,000 rb.
Kiwa Lake	10,140 rb.
Linton Lake	11,100 rb.
Long Lake	10,080 rb.
Mac Lake	15,000 rb.
Marion Lake	14,700 ct.
Marion Lake	29,540 rb.
McFarland Lake	10,800 rb.
Marylin Lake, Lower	3,192 rb.
Marylin Lake, Upper	3,192 rb.
Melis Lake	9,082 rb.
Mud Lake	15,450 rb.
Midnight Lake	10,640 rb.
Nash Lake	15,000 rb.
Opal Lake	4,890 rb.
Otter Lake	15,210 rb.
Pamelia Lake	9,800 ct.
Pine Lake	8,360 rb.
Quinn Lake, Upper	4,800 rb.
Quinn Lake, Lower	4,800 rb.
Rainbow Lake	6,541 rb.
Red Butte Lake	4,531 rb.
Rigdon Lake, Upper	20,520 rb.
Rigdon Lake, Lower	13,680 rb.
Rockpile Lake	11,520 rb.
Round Lake	14,820 rb.

Salmon Lake	14,820 rb.
Scott Lake	17,750 rb.
Separation Lake	11,100 rb.
Spring Lake	4,810 rb.
Shadow Lake	7,680 rb.
Swan Lake	5,700 rb.
Sunset Lake	4,030 rb.
Teto Lake	4,531 rb.
Torrey Lake	10,080 rb.
Timpanogas Lake, Lower	29,340 rb.
Verde Lake	3,800 rb.
Wahanna Lake	29,640 rb.
Williams Lake	5,700 rb.
Wishbone Lake	3,800 rb.
Unnamed Lake No. 1	4,000 rb.
Unnamed Lake No. 3	4,000 rb.
Unnamed Lake No. 3	4,000 rb.
Unnamed Lake No. 4	300 rb.
Unnamed Lake No. 5	2,000 rb.
Unnamed Lake No. 6	4,000 rb.

Total Fish Liberated
in Lakes 753,965

Total for All Waters 2,772,305

rb.—Rainbow
e.b.—Eastern Brook
ct.—Cutthroat

Tillamook Deer Investigation

During the middle of February, Game Commission biologists were investigating a loss of blacktail deer on the East Fork of the Trask River where the carcasses of 23 deer were found.

Areas of last winter's loss in the Wilson and Nehalem River watershed also had been thoroughly investigated during the winter months but no losses had appeared so far; in fact all deer and elk observed in these areas appeared to be in excellent condition for this time of year.

The area on the East Fork of the Trask River had a high concentration of deer and is within that section of the 1939 Tillamook Burn where an abundance of forage exists. Preliminary examination of the carcasses indicated that the losses occurred during a period of heavy storms and snow the last of January and early February. No recent losses were noted. However, continued work on the problem is being conducted by department personnel.

March Hunting and Fishing Calendar

Species	Season
Bear	Open entire year
Cougar, Wolves and other Predators	Open entire year
Salmon and Steelhead over 20"	Open entire year
Jack Salmon under 20"	Open entire year
Spiny-rayed Fish	Open entire year

Note: Exceptions listed in official synopsis of hunting and angling regulations.

Oregon State Game Commission Bulletin

1634 S. W. ALDER STREET
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"Care and Diseases of Trout" By Dr. Davis in Third Edition

(Continued From Page 1)

in the University of Florida from 1907 to 1922, after which he joined the staff of the former U. S. Bureau of Fisheries, working full time on disease and nutrition problems. Part of his work with that agency was to take over one of their fish cultural stations that had always had trouble with disease and in which it was claimed it was almost impossible to raise healthy fish. Dr. Davis used modern methods and diets with the result that healthy fish were raised there and good success was had with the operation. He also started the Leetown Experimental Fisheries Station in West Virginia and it today is one of the leading centers of disease and nutrition work in the United States.

Dr. Davis has traveled widely over the country, giving assistance on fish cultural and management problems, and his "Care and Diseases of Trout" has rightly been called "the fish hatchery-men's Bible".

Crow Rookeries Blasted

Early in the morning of February 1 a blast set off electrically from the mainland dynamited the crow rookeries on an island in the Snake River and resulted in the killing of several thousand crows. Members of the Malheur Game League and local Game Commission employees cooperated in carrying out the project.

Sample counts indicated there were about 5,000 dead birds on the island plus an unknown number that may have been blown into the water and drifted away during the dark hours. In addition to the birds killed directly by the blast, several hundred cripples and stunned birds that relit on the island were clubbed to death.

About 900 sticks of dynamite and 3,000 feet of prima-cord were used in the project. A suspension line of rope and wire over 350 feet long was used to span the water to the mainland.

The ptarmigan is a bird of camouflage. During the summer, it is brownish-grey. In early winter its feathers are dappled with brown and white, and in the winter all the brown feathers are replaced by white. In the wintertime, it also sports "snow shoes," stiff white feathers edging its toes. These are molted with the approach of summer.

1946 ANNUAL REPORT

DEPARTMENT OF STATE POLICE GAME CODE

	Warn.	Arrests	Acq.	Sent.	Fines
Angling (closed season	10	40	1	.24	\$ 907.40
(prohibited areas, hours, or methods ..	33	309	6	.10	7,280.60
Defective fishway	1	..	..	..	100.00
Disguising (sex of deer	9	2	..	.08	130.00
(species or kind of bird	1	..	..	..	25.00
Exceeding bag limit	1	109	..	.16	2,743.90
Failure to register trapping location	4	..	..	..	52.00
Failure to tag properly or at all	10	94	1	.98	3,639.80
False application for license	5	..	..	..	125.00
Hunting (closed season	4	111	6	2.09	5,540.50
(prohibited areas, hours or methods ..	31	375	22	1.70	11,796.65
(prohibited animals	36	2	1.21	..	2,025.80
Interfering with or resisting an officer on duty ..	1	..	..	..	..
Lending hunting license	5	..	..	..	195.50
Molesting game animals, birds	3	..	..	..	25.00
(alien gun	1	..	..	..	25.00
(angling	66	192	7	.16	4,386.15
(guide	2	..	..	..	150.00
No license (hatchery	1	..	..	..	25.00
(hunting	41	107	11	.55	2,208.40
(non-resident	1	74	..	.17	1,673.00
(trapping	6	8	..	.23	175.00
Permitting dog to run deer	1	..	..	..	25.00
(game animal	162	4	6.00	..	10,960.06
Possession (game bird	63	1	.62	..	1,857.50
(game fish	63	6	.03	..	1,353.50
Possession of firearm in game refuge	1	..	..	..	25.00
Sale game animal, bird, fish	2	..	..	..	268.05
Shooting from railroad right-of-way	1	..	..	..	25.00
Stream pollution	1	3	1	..	1.00
(closed season	8	2	..	..	175.00
Trapping (prohibited areas, or methods	6	..	..	..	194.00
(with unbranded traps	2	4	..	..	100.00
Trespassing	4	..	..	..	20.00
Trespassing on fishway	4	..	..	..	70.00
Unlawfully disturbing traps	2	1	..	..	25.00
Using license of another	3	..	..	.08	150.00
Wanton waste of game	17	1	..	..	430.00
TOTALS	206	1832	74	14.40	\$58,908.81

Fees collected	\$12.00
8.67 years suspended	
\$10,140.20 remitted	
(angling	21,927
(fur dealer	4
(guide	29
(hunting	14,744
(scientific purpose	2
(trapping	181
Predatory animals killed	25
Searches (with warrant	40
(without warrant	2979
Seizures (game animal	29
(game bird	5
(game fish	20