

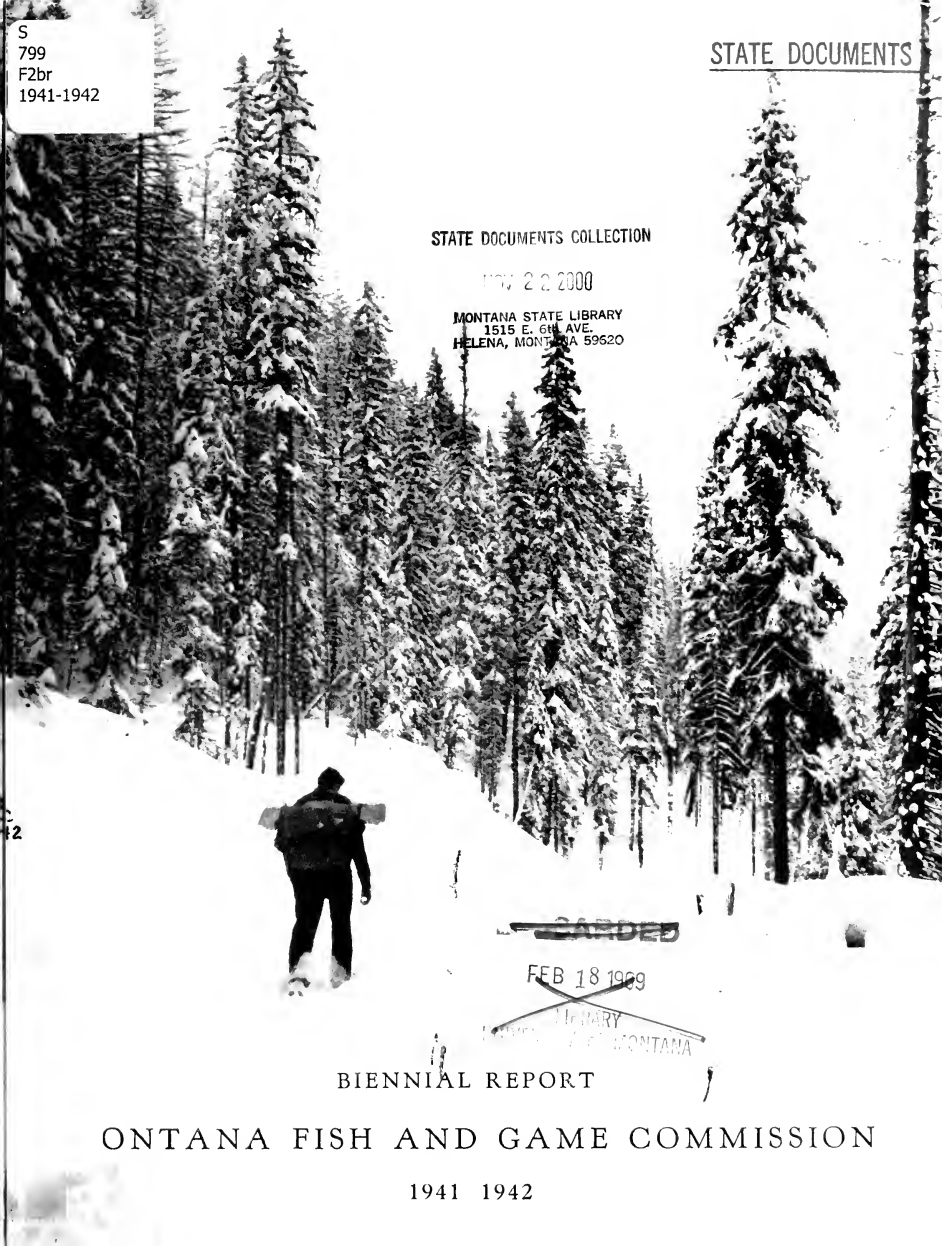
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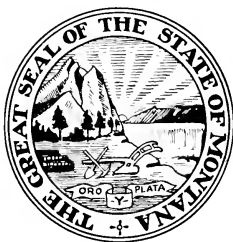
ONTANA FISH AND GAME COMMISSION

1941 1942

MONTANA FISH AND GAME COMMISSION

Biennial Report

1941-1942



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State of Montana
FISH AND GAME COMMISSION
HELENA, MONTANA

December 1, 1942

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J. B. McFARLAND
STATE FISH AND GAME WARDEN, HELENA

ELMER G. PHILLIPS
Supt. STATE FISHERIES, HELENA

To His Excellency,
Sam C. Ford,
Governor of the State of Montana,
Helena, Montana.

Dear Governor Ford:

Transmitted herewith is the Montana Fish and Game Department's progress, activity and financial report for the biennial period from July 1, 1940 to June 30, 1942, including such suggested statutory changes as will make for the better management of game, fish and fur bearers.

In preparing this report of the accomplishments in this division of state government, we have endeavored to bring you a rather complete picture of Montana's Wildlife Resources and the program by which we are striving to manage them.

It is with a deep sense of gratitude for your intense interest in the welfare of Montana's natural resources and more particularly its fish and game, that the ensuing pages have been prepared and are herewith,

Respectfully submitted,

MONTANA FISH and GAME COMMISSION

J. B. McFarland
Secretary

J. W. Bevert
Chairman



Governor Sam C. Ford



E. G. VEDOVA
Roundup



ELMER JOHNSON
Glasgow



J. W. SEVERY, Chairman
Missoula



A. C. GRANDE
Lenep



WM. CARPENTER
Butte

Policy of the State Fish and Game Commission

1. State Sovereignty

To maintain the sovereign rights of the state of Montana in administration and control, propagation and conservation of its wildlife.

2. Scientific Management of Wildlife

1. Improvement in the management of our wildlife resources rests not only upon the maintenance of the present number of fish and game population but also upon an increase in the population of the key species. Such a program should rest upon a foundation of investigational work since very little is known concerning the actual life histories and the influence of environment factors upon our wildlife species.

As a general policy, we feel that the personnel of the State Fish and Game Department should come to recognize the scientific point of view and as rapidly as possible become acquainted with some of the methods of routine investigation. It is our hope that projects dealing with fish, game birds, game animals and fur-bearers will be set up as rapidly as possible with the end in view of improving the management program.

2. Since the effectiveness of any organization cannot be raised above the level of the capacity of the personnel it is necessary that we institute the following program:

- A. Course of the training for personnel:
 - a. Principles of scientific wildlife management.
 - b. Law enforcement.

- c. Education of the public.
- d. Cooperation with University and the State College in this educational program.

- B. Periodic reports of activities of the Fish and Game Department to be sent to all of its field personnel to promote closer cooperation of the entire department.

3. Cooperation

Effective management necessitates cooperation of the fish and game department with federal and other state agencies whose spheres of activity would enable them to contribute to the improvement of wildlife conditions within the state.

4. Investigation

To institute an investigation program in order to obtain basic data essential to scientific wildlife management.

5. Education of the Public

To keep the public advised of the various game management projects and to explain the necessity of such projects.

6. Active Participation of Sportsmen's Organizations

To encourage and foster desirable projects which can be carried out by sportsmen's organizations in their respective areas in order to assist in conservation and propagation of our wildlife. Adequate leadership to be supplied from the personnel of the fish and game department for these projects.



ROBERT F. COONEY,
Coordinator
Restoration Division



J. S. McFARLAND,
State Fish and Game Warden



Elmer G. Phillips,
Superintendent of Fisheries Division

Fish and Game Personnel

J. S. McFarland, State Fish and Game Warden

Office Staff

W. H. Voorhies	Deputy Game Warden	Ann Crimmins	Clerk
W. J. Everin	Chief Clerk	Elsie Johnson	Secretary
Doris Cunningham	Secretary	Carol McCauley	Cashier

Regular Deputy Game Wardens

Lester Barton	Butte	Bruce Neal	Augusta
John F. Burke	Livingston	O. J. Nollar	Havre
L. C. Clark	Bozeman	Charles R. Price	Dillon
John Cook	U. S. Army	Len J. Rensch	Miles City
W. J. Dorrington	Conrad	A. D. Roushar	Roundup
Ray Ellingwood	Libby	Herman C. Sailor	Absarokee
Kenneth O. Fallang	White Sulphur Springs	Gene Sherman	Lewistown
W. A. Hill	Cascade	Raleigh Shields	Polson
Wm. Ray Kohls	Ennis	Dale T. Shook	Billings
E. M. Krost	Sidney	Frank Starina	Missoula
Robert Lambeth	U. S. Air Force	Jack Thompson	Townsend
Curtis Lindsay	U. S. Navy	Charles Tudor	Kalispell
Frank Marshall	Plains	Waldo Vangness	U. S. Army
		Clarence Willey	U. S. Marines

Special Deputy Game Wardens

Don Brown	Harlowton	P. W. Nelson	Livingston
Harry Cosner	Malta	Ben Wahle	U. S. Army
Chas. Higgins	Browning	Don Wright	U. S. Coast Guard
Harry N. Morgan	Ovando		

GAME FARMS

Foremen

V. W. Bailey	Fort Peck	J. R. Wells	Billings
J. F. Hendricks		Warm Springs	

WILDLIFE RESTORATION DIVISION

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J. A. Parsell
Big Game Leader

P. L. Wright
Game Bird Leader

Jan Berry, Secretary
A. A. O'Claire*
Fur Leader

Fieldmen

Wm. Bergeson
Bob Brink*
Robert Casebeer*
Faye M. Couey
Ray Gibler

Robert Hiatt
Geo. Hollibaugh
Clyde Howard
H. J. LaCasse

W. H. Marshall
Lloyd McDowell
O. Marshall Moy
Wm. E. Schultz*

Julius K. Stinson*
Burke Thompson*
W. Ken Thompson
B. F. Vosburgh

*In Armed Forces.

FISHERIES DIVISION

Elmer G. Phillips, Superintendent

Isabelle Harrington, Secretary

Hatcheries and Personnel

Anaconda:

A. G. Stubblefield Foreman
Fred Beal Ass't Foreman

Big Timber:

Leo Gilroy Foreman
Ross Snyder Ass't Foreman
Forest Keller U. S. Army
Ed Furnish U. S. Army

Emigrant:

George Miller Foreman
Fred Billman Ass't foreman

Great Falls:

Melvin Larson Foreman
J. M. Colley Ass't Foreman

Hamilton:

Eli Melton Foreman
S. A. Hamann Ass't Foreman
Bill Thompson U. S. Army
Lester Newman U. S. Army

Lewistown:

Iver Hoglund Foreman
Leo LaTray Ass't Foreman

Libby:

George Ripley Foreman
J. R. Jorgenson Ass't Foreman

Somers:

J. P. Sheehan Foreman
Frank Marcoe Ass't Foreman

Polson:

A. E. Tangen Foreman
J. P. Campbell U. S. Navy

West Yellowstone:

S. S. Drew Foreman

IN MEMORIAM

Fred E. Pilling died December 10, 1941, at St. James Hospital in Butte, Montana. He was born September 6, 1871 in Richland Center, Wisconsin.

The deceased had been employed as a Deputy Game Warden in Montana since 1913. During that time, in addition to performing his regular duties, he was very instrumental in creating the Maiden Rock Fish Hatchery and Game Farm, transplanting elk and fish into his district, and served as Vice-President of the Butte Anglers' Club for many years previous to 1930.

He is survived by his wife, Elizabeth V. Pilling, two sons, Fred E. Pilling and John C. Pilling, two brothers and one sister.

Fred E. Pilling leaves a record of faithful, honest and conscientious public service. He stood high in the estimation of his fellows in the service and was respected by his fellow sportsmen generally and it is with sorrow and profound regret that this record is made of his untimely death.

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Foreword

Montana presents a charming variety of topography, climate and wildlife species. Snow-capped mountain ranges give way to rolling, fertile plains and picturesque river breaks as one travels eastward across the state. This natural heritage is enjoyed not only by all Montanans, but is increasingly appreciated by guests from out of the state.

The Fish and Game Commission is charged with the responsibility of the development and maintenance of the wildlife resources in harmony with the carrying capacity of the environment, as well as other important land uses. This is no easy task. A great deal of work has been done in the past, but much is yet to do.

One point is very clear—no matter how curtailed the personnel of the Department or its facilities, there is an obligation that will not be broken. Wildlife must be so managed that when the boys who are fighting for us return, they will be able to again enjoy the pleasures and the solace of the out-of-doors and the wild things that are so much a part of it. We can certainly do no less.

The report of the Department for the past biennium follows. It attempts to summarize the activities of the Department during this period, and at the same time to present some of the problems which arise in managing wildlife under a multiple land use program. It is a picture of the past with hints as to the picture of the future. It is dedicated to a better understanding of fish and game problems by the citizenry of the state.



Game Problems, Yesterday and Today

Montana has a wildlife heritage which has few duplications anywhere else in the world.

We must depend upon the journals and diaries of early explorers for a picture of conditions as they existed in the early eighteen hundreds. It is almost impossible for us to visualize the abundance and variety of game that inhabited the plains and river bottoms of eastern and central Montana. These included vast herds of buffalo, elk, deer, and antelope. Mountain sheep, an animal that we now associate with the crags of the mountain ranges, were reported as plentiful in the breaks along the Missouri river and its tributaries. Even the grizzly bear was encountered as far east as the present boundary between Montana and North Dakota.

This picture of vast abundance was changed but little during the period of the explorer and trapper. These men depended upon game, but killed only what they needed for food and clothing.

The gold strikes of the early 60's brought in a flood of prospectors. Game within the proximity of the mining camps became an important source of food. Wholesale slaughter did not take place, however, until the overthrow of Indian tribes in eastern Montana following the Custer Campaign in 1876. The slaughter of big game animals that then took place holds a unique place in the history of wildlife destruction. In 1880 the

northern buffalo herd was estimated at a million head. In four years these animals were all but exterminated, killed for their hides and tongues. The other big game species were vastly depleted. Remnants, however, managed to survive by adapting themselves to the more severe climate of the mountain ranges.

By the turn of the century the wildlife resources of Montana presented a sorry picture. The buffalo had disappeared as a wild animal many years before. A few scattered bands of elk still remained in the high mountains. Deer were rapidly diminishing in areas where they had formerly been abundant. Mountain sheep had for the most part disappeared from the river breaks. Antelope were reduced to but a fraction of their former numbers, and the more valuable fur bearers were becoming extremely rare. With the increasing evidence of scarcity came the realization that the wildlife resources of the state were not inexhaustible. The first Board of Game and Fish Commissioners was established by legislative enactment to take effect March 14, 1895. Seasons and bag limits were set; they were, however, extremely liberal. The big game season was from September 1 to January 1, and the limit for each hunter was eight deer, eight mountain sheep, eight mountain goats, and eight antelope. The upland bird season was from August 15 to January 1 with no limit on the number of grouse that might be taken. The season on waterfowl ran from August 15 to May 1, and also in this case there was no limit to the number a hunter might take.

On April 1, 1901, the first state game warden, W. F. Scott, was appointed and a fish and game department organized. The law enforcement personnel was limited to eight deputy wardens.

A great many problems have presented themselves since the pioneer days of the Department almost half a century ago. Important industries have developed. Ranching, farming, lumbering and mining all play a significant role in the land economy of the state today. Just where wildlife fits into this complicated pattern is not always easy to determine. It has become increasingly apparent, therefore, that a fund of accurate, well

The American bison. The millions of yesterday have faded into the twilight of obscurity.

Photo by Kenneth Roehen



founded information is essential as groundwork upon which to base the management of this important resource. In a state the size of Montana, with its wide variety of big game, game birds and fur bearers, the collection of this fundamental information presents a difficult problem. A lack of finances has been a serious handicap to this work in the past. Fortunately the passage by the Legislative Assembly of 1941 of an assent to the provisions of the Federal Aid in Wildlife Restoration Act made funds available for setting up within the Department adequate facilities for the collection of this basic data.

It has been encouraging to note that several of the big game species which had reached a serious low by the early 1900's are now building up to substantial numbers. These increases have of necessity brought about important problems in game management. There are now areas within the state in which concentrations of game ani-

mals are leading to undesirable heavy use of critical winter ranges on public lands and even, in some cases, damage to natural or cultivated crops on privately owned lands. There are, on the other hand, desirable ranges which are as yet decidedly understocked by game animals. It may be seen, therefore, that the Department in its work is confronted with two distinct types of problems—those of scarcity requiring a program of propagation, and conversely, those of abundance necessitating adequate control measures.

The fact that we are engaged in a war which is taxing our national resources and man power to the utmost has added a more critical aspect to the present problems. The demand for increased production of agricultural products of all kinds places a responsibility upon the Commission to manage wildlife so that unnecessary damage to agricultural production will be avoided.

(Continued on page 95)

ACTIVITIES OF THE COMMISSIONERS

During the past biennium the Montana Fish and Game Commission was confronted with an additional responsibility beyond those of the regular duties of fixing policy, passing regulations, and supervising the administration of the wildlife resources of the state. This was necessitated when the 1941 Legislative Assembly assented to the provisions of the Federal Wildlife Restoration Act. Upon the Fish and Game Commission rested the obligation of wisely expending the funds allocated to the state under the provisions of this act. The time devoted to the planning of desirable projects, and then following the development of those plans, has materially increased the responsibilities of the commissioners.

The creation of commission districts in the state by the 1941 Legislative Assembly seems to be a wise provision of the law. Each commissioner is coming to know in detail the various problems which arise in administering fish and game within his home district. This gives the commission a clear picture of the wildlife resource and the problems connected with its management throughout the state as a whole.

The commissioners have, insofar as possible, made field trips into critical big game areas of the state. During the summer of 1941 two commissioners and the State Fish and Game Warden made an extended inspection trip through the South Fork of the Flathead River area. Later in the summer one commissioner went as a member of a party on a trip through the Absaroka Plateau in an effort to gain a better picture of the relationships between recreation, wildlife and domestic stock in that area.

In the summer of 1942 three commissioners and the State Fish and Game Warden made an inspection trip through the Sun River drainage and over the Continental Divide into both the South Fork and North Fork drainages of the Flathead River, studying management problems connected with both big game and fur bearers in those areas.

During the same summer three commissioners and the State Fish and Game Warden attended the twenty-first annual meeting of the Western Association of the Fish and Game Commissioners held at Jackson Hole, Wyoming. This was an especially valuable trip since these representatives of the Department had an opportunity to discuss and understand problems of law enforcement as well as the management of wildlife in the various western states.

With the above duties the Commission has found it necessary to meet every month, except one, in order to properly handle the affairs of the Fish and Game Department. The monthly meetings last from one to three days. As all members of the Commission are engaged in either business or a profession, their time, so freely given, has nevertheless entailed personal sacrifice. If their combined efforts lead to better distribution and utilization of the wildlife resources of the state of Montana, if improved fishing, hunting and trapping results, they will have been rewarded for the time and effort devoted to their work.

An inspection trip on the North Fork of the Sun River elk ranges.





Deputy Game Warden patrol—Absaroka Wilderness Area, June, 1942. At Crevice Creek-Hellroaring pass.

Deputy Game Wardens

In the spring of 1941 a Law Enforcement school was held for all the deputy game wardens at Helena. The personnel of the Attorney General's office cooperated with the department in interpreting the proper enforcement of the statutes governing the fish and game laws.

In February, 1942, the department held a short course for the deputies at Montana State College. Authorities in various fields dealing with wildlife, from the State College, Montana State University, Federal Bureau of Investigation, U. S. Fish and Wildlife Service, U. S. Public Health Service at Hamilton, the Montana Veterinary Research Laboratory, and our own department cooperated to make this course one of exceptional interest to the game wardens. Beyond doubt each man received valuable training that will be useful to him in his field work. It was the intention of the commission to hold a short course annually and follow each school with correspondence work; however, the armed services have called so many of our men that it was decided to discontinue this for the duration.

Deputy Game Wardens have a very difficult assignment in carrying out the provisions of the state fish and game laws. Each man should be qualified in the many fields of fish and game management and law enforcement. He should be capable of recognizing the environmental conditions affecting each wildlife species. He has to be familiar with the streams and lake in his dis-

trict and be conversant with proper planting methods and requirements for each body of water.

To qualify for this position a man must be physically fit, mentally alert, and willing to learn. His work is progressive, and factors which will apply to a given situation one season may not the next. Recently state colleges and universities have been graduating students whose major course of study has equipped them for wildlife work. However, since these courses do not teach methods of law enforcement, there is much for the graduate to learn. Anyone entering the game warden's field has to be imbued with a spirit to conserve the state's wildlife resources if he is to be successful. When a man enters the service, he leaves behind him many of the freedoms he might enjoy in other lines of endeavor.

He is subject to call day and night.

He must in the best interests of his duty often be out in all kinds of weather and for days at a time under the most trying conditions.

He can not indulge in political activities.

He must be capable of treating the public in a courteous manner.

He must not only be adept at his outside activities, but also must be able to execute his field findings into writing for use in the Helena office.

He is subject to transfer of his headquarters at any time and to any place in the state.

One point should be clearly defined and understood in this report: The duties of a deputy

game warden are so varied and complex that it is necessary for one entering the service to surrender many of his interests in other fields of endeavor and concentrate on the position he has chosen as his life's vocation.

The requirements by the department are so stringent that a deputy should be paid a salary consistent with his efforts, and after reaching a certain age or serving a given number of years he should be retired with a pension. Only by this means can the state hope to employ the caliber of men necessary to adequately carry out the conservation, restoration and propagation of our wildlife resources.

Applicants for deputy state game warden positions are now required to take a written exam-

ination which covers the various fields of wildlife with which a man must be familiar if he is to become an asset to the department. The examination is divided into the following classifications: Big Game, Birds, Fur Bearers, Fisheries, Law Enforcement, and General. Qualifications resting upon past experience and personality traits are considered, along with the grade obtained in the examination, in evaluating a man's possible worth to the department. Successful candidates will be placed upon an eligibility list. As the need arises, men will be chosen from this list as special deputy game wardens. These men will be required to serve a probationary period. Vacancies as they occur from time to time on the regular deputy force will be filled from this group.

Predatory Animal Control

The Fish and Game Department has continued in its effort to keep Montana's predatory animals under control during the last biennium.

By complying with Section 3685.5 of the Montana Codes, this department, through the cooperation of the Livestock Commission, has paid \$7,500 each year from the Fish and Game Fund as bounties in the amount of \$2.00 each for coyotes taken during April, May and June.

In addition to this, the Commission on December 17, 1940, set aside \$10,000 which was paid out of the Fish and Game Fund by February 16, 1941, at the rate of \$2.00 as bounty for each coyote taken during that time. There were numerous other coyotes killed at that time but the \$10,000.00 fund was exhausted before all the bounty claims were presented.

The Department is continuing to pay a year around bounty of \$25.00 on each mountain lion killed and \$2.00 on bobcat. During the past two years, bounty claims for 17 lions and eight bobcats have been honored.

It is felt that the present fur market is sufficiently high to encourage the taking of coyotes and that any additional bounty expense would be uncalled for. The fact is recognized that a few predatory animals are an asset to our game birds and animals in that they help maintain a vigor-

ous breeding population by killing the weak and wounded game.

In addition to the predatory animal trappers working under the Fish and Wildlife Service, the Fish and Game Department hired a few coyote trappers for short periods of time to better control certain small game areas in which the coyotes had become too numerous for the safety of our game.

The Mountain Sheep has become the number one problem big game animal in the west.



New Equipment

Equipment plays an important role in the administration of the wildlife resources of the state. This has become very apparent with the recent drastic curtailment of manpower which has thrown an increasingly heavy load upon each member of the remaining personnel. The following short summary does not deal with equipment such as trucks and hatchery facilities, which have been built up through the years, but rather with more recent purchases which have been found helpful in carrying out the work of the department.

Ten head of saddle and pack stock have been secured to facilitate the inspection of the back country game ranges. The personnel of the department and the Commission members rode a total distance of 21,213 miles from July 1, 1941 to October 15, 1942, on such work. This did not include the saddle horse trips made by the Deputy Game Wardens in carrying out their routine duties.

Two motor boats and two canoes were purchased and put into use to aid in patrolling the lakes and rivers of the state and in carrying out the various phases of the fisheries work.

Six Eliason motor snow toboggans were secured during the winter of 1941-42. Two are being used on the North Fork of the Flathead fur management area, and the others on the various big game ranges of the state. This machine, with a top speed of 27 miles an hour, enables the field crews to cover much ground in a short period of time. The toboggan has a seating capacity for three persons. Trips which would require five days on snowshoes may now be traveled in half a day. Many of the roads in the mountainous portions of the state that have previously been inac-

cessible during the winter months may now be quite readily traveled for necessary investigative work.

The fish and game departments of several of the neighboring Western states have found important uses for airplanes in carrying out the work entrusted to them. Counting of big game, particularly elk and antelope, from the air has proved to be far more satisfactory in many areas than similar work by ground crews. Herding antelope into traps, for transplanting purposes, by airplane has become an established practice in three states. Law enforcement patrols by air, particularly during the winter months, have proved to be decidedly effective. The distribution of salt on the more remote winter game ranges, as carried out in Montana last spring on the Sun River and Flathead units, has advantages over distribution by pack string.

Planting of fish by plane is still in the experimental stages, but even now shows very definite promise, particularly in the planting of the more inaccessible mountain lakes. Also, the placement of fertilizer in barren lakes at high elevations in order to build up their carrying capacity for fish is another important activity that may be carried on to advantage by plane. An additional important project here in Montana made possible by the use of an airplane would be the taking of spawn from Big Salmon Lake in the South Fork of the Flathead. This lake presents one of the most potentially ideal spawn taking waters for Native and Dolly Varden trout that may be found anywhere in the West. All of the spawn necessary for the entire state hatchery program for these two species of trout could be secured from this lake. At the present time the spawn is taken from a number of small scattered stations. As Big Salmon Lake is accessible only by many miles of pack trail, the transporting of eggs from this lake to the nearest road by any means other than airplane would be impractical.

It is hoped that after the war, when no doubt the use of the state's recreational resources will increase far beyond any volume yet attained, the airplane will find its place among the various types of equipment used by the department.

The Motor toboggan has been a decided aid in necessary winter investigative work.





Beaver Management

The trapping of beaver was the first enterprise conducted by the whites in the Northwest. It followed almost immediately the first exploration of the territory. The Golden Age of beaver trapping was between 1810 and 1840. By the latter date the cream had been taken, and the streams and rivers had been trapped to their headquarters. There followed a long period of scarcity. Since about 1900, however, aided by more adequate protection the beaver staged a very desirable comeback. They have now become sufficiently numerous to present an important management problem.

Under our state laws beaver are protected throughout the entire year. However, where they are doing actual and material damage the landowner may apply for a permit to trap them. After applying for the permit, the damage must be inspected by a deputy game warden who recommends how many beaver may be taken by the landowner. This has become one of the most abused statutes in the state at the present time, mainly because it has outlived its usefulness. Incepted during a period when beaver were practically extinct, it served an important purpose until today, when beaver have increased until they represent an important fur resource which should be harvested annually not only where they are doing damage, but in those places where they are endangering their future food supply. As with other animals, the population should be governed by the food supply.

This valuable fur bearer has served an important place in the economy of our state. During the drought years he has aided in the conservation of our waters and made it possible for hay crops to be produced on what otherwise would have been barren fields. Since much of his habitat

is found in the mountains and foothills, his dams tend to control the run-off and thereby regulate the flow of our streams. There are many places along irrigation canals and orchards where beaver are a nuisance, and in these places they are either trapped under a permit or transplanted.

In the spring of 1941 it came to the attention of some of the State officials that there was considerable illicit traffic in beaver pelts in the State of Montana. Since under the terms of the Lacey Act furs leaving the State of Montana illegally were also the concern of the Federal government, a cooperative plan was developed by Governor Ford, Kenneth Roehen of the U. S. Fish and Wildlife Service, and J. S. McFarland. Later, Attorney General Bonner was called in to coordinate the activities of his office with the general plan. The basic investigative work was done by Kenneth Roehen and James Gerow of the Fish and Wildlife Service. The State Fish and Game Warden and some of the deputies cooperated in this work when requested to do so by the federal agents.

Despite an attempt to keep the plans and the workers secret as far as the State was concerned, there apparently was a leak or two resulting in increased awareness on the part of some of those suspected of dealing in hot furs; however, a considerable number of arrests were made resulting in convictions, and it is hoped that the trapping and selling of beaver pelts in the State is under closer enforcement than in the past. Following is a recapitulation of the fur operations investigation:

A typical beaver dam, pond and lodge. Headwaters Wood Creek, Sun River.





Sportsmen assisting in the liberation of Ringnecked Pheasants.

During the investigation, it was decisively proved that the present beaver laws are inadequate, and that control of this valuable resource requires better management than is now possible. Therefore, we recommend that the trapping of all beaver be handled by the state and that the pelts be sold by the state; after such sale, that one-third of the gross proceeds be returned to the landowner on whose lands the beaver were taken, one-third be set aside for the expenses involved in the trapping, and the remaining one-third go into the Fish and Game Department Fund in lieu of the ten dollar application fee and the fifty-cent metal tag now in use.

Game Farms

Our game farms produce Chinese pheasants and a few Chukars.

It has been the practice until recently for the Billings and Warm Springs game farms to operate under one superintendent. With the development of a third game farm at Fort Peck, the Commission felt that greater efficiency of production and planting would result if the State Game Warden were made directly responsible for the management of the three farms. Accordingly, the office of Superintendent of Game Farms was abolished, and responsibility for running each farm was vested in a foreman.

In 1941 ground was leased from the U. S. War Department at Fort Peck for the establishment of a new game farm. Barracks were purchased and changed into brooder houses. The most modern equipment was purchased. The electric brooder system was installed, thus eliminating the use of brood hens. V. W. Bailey, formerly superintendent of the Idaho Bird Farm at Jerome, was employed to build and operate this new unit. When completed, this farm will be capable of producing 20 to 25 thousand Chinese pheasants annually. The cost of construction has been comparatively low.

In speaking of game farms one must bear in mind that the most useful function of a plant is the production of birds for restocking areas. It

STATEMENT OF INCOME AND DISBURSEMENTS

Connected with Fur Operations Investigation For Year 1941-1942

RECEIPTS

Sale of furs confiscated	\$6,063.00
Fines assessed by Courts	3,850.00
Total Receipts	\$9,913.00

EXPENDITURES

Cost of furs purchased by undercover agents	\$2,745.00
Court costs deducted from fines, or paid by State Department	154.18
Miscellaneous expenses: Telephone, telegrams, gas, photographing evidence, transcript of court records for evidence, postal registrations, etc.	127.70
Cold storage rental, Helena	40.50
Total Expenditures	\$3,067.38
Net Return to Department	\$6,845.62

is impossible and impractical to artificially propagate birds for the hunters' direct use. It is rather the natural reproduction by these liberated farm birds and other field reared birds living in a favorable environment that provides for the hunters' pleasure.

Relatively few Chukars have been liberated in this state, and to date these plants have not

been particularly successful. In other states thousands of these birds have been liberated; however, reports have not been favorable. Montana is still experimenting with these birds, and in the future they will be given every possible chance to adapt themselves to our environmental conditions with a sincere hope that they will fill a space in our hunters' need.

Cooperation

No department of state government could possibly have had more cooperation than the Fish and Game Department has enjoyed during the past two years.

Following is a list of those organizations which have been especially helpful. This does not include those branches of state government which by statute give the department so much help as a matter of routine day by day.

All sportsmen's organizations
U. S. National Forest Service
State Forestry Service

U. S. Soil Conservation Service
U. S. Taylor Grazing Service
Dude Ranchers' Association
Associations of Guides and Packers
Farmers and ranchers
U. S. Fish and Wildlife Service
U. S. Army Engineers
Montana Livestock Sanitary Board
Montana State College
Montana State University
State Board of Education
U. S. Public Health Service
Anaconda Copper Mining Company

Packing fingerling trout into the back country. Much appreciated cooperation on the part of sportsmen, dude ranchers, guides and packers, and Forest Service personnel has aided this program materially.



Game Preserves

To the men who, in the early days of game conservation, were instrumental in the creation of game preserves can go much of the credit for the present abundance of wildlife in Montana. Game preserves are now, as in the past, an indispensable tool in the management of all forms of wildlife. There must always be sanctuaries where the wild creatures can find peace and protection from the guns of hunters.

It is well to remember, however, that these preserves are tools, and as tools they may eventually wear out. This term as applied to a game preserve refers to the depletion of the forage or the failure of the sanctuary to properly stock surrounding huntable areas. Under such conditions a preserve is benefiting neither the game supposed to be protected or the sportsmen.

The study of big game has brought out a number of important facts concerning their management. One, that there is an uneven distribution of game animals over all available game range and two, that the fullest use is not being made of all available ranges and, three, that several of the present game preserves are contributing materially to this improper distribution although they originally served a very useful purpose in building up a game herd.

Several of our game preserves have already outlived their useful functions and have been or should be abandoned. Examples of these would be the Deer Lodge and Halfway Lake bird preserves, and the Beaverhead game preserve, which were abandoned during 1942.

In other areas certain preserves should be replaced by other closed areas more favorably



located, and perhaps rotated at intervals of time. By a flexible system of rotated closed areas, the following benefits may be derived:

1. A better distribution of game animals over all available range.
2. A diversified use of the range.
3. More game can be produced without serious injury to any particular portions of the range.
4. It will minimize the chance for serious parasitic infection and the spread of contagious diseases.
5. It will aid the department to direct hunting into the areas where hunting is needed.
6. Game animals will always have the necessary protected areas into which to retreat when the hunting pressure becomes too great.

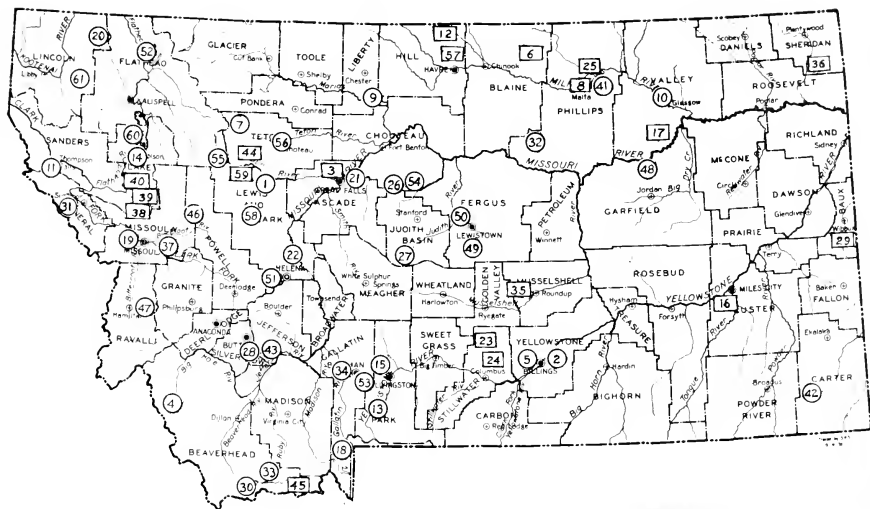
This type of rotation has not as yet been tried in the state, but it is hoped that it may be done in the future.

The benefits to wildlife to be derived from several other preserves may be increased by slightly changing or modifying the boundaries of these preserves. Changed conditions in hunting pressures, forage, and the number of animals have made such alterations necessary. For example, a slight change was made during the summer of 1942 in the boundary of the Gallatin Game Preserve in order to relieve the concentration of elk during the hunting season upon critically needed winter game range.

On the other hand, there are generalized areas where hunting would probably benefit if new preserves or closed areas were established. For example, the Sula Peak Closure was created to take effect prior to the big game season of 1942. It is located in the lower reaches of the East Fork of the Bitterroot river. This closure was created for the purpose of building up the number of big game animals in that area.



MONTANA.



STATE AND FEDERAL GAME REFUGES

- | | | | |
|------------------------------|---------------------|-------------------------------|------------------------|
| 1. Augusta | 16. Fort Keogh | 32. Little Rockies | 47. Skalkaho |
| 2. Ballantine | 17. Fort Peck | 33. Madison Bird | 48. Snow Creek |
| 3. Benton Lake | 18. Gallatin Game | 34. Manhattan | 49. Snowy Mountain |
| 4. Big Hole Basin | 19. Grass Valley | 35. Mason Lake | 50. South Moccasin |
| 5. Billings | 20. Grave Creek | 36. Medicine Lake | 51. State Nursery |
| 6. Black Coulee | 21. Great Falls | 37. Milltown Bird | 52. Stillwater |
| 7. Blackleaf | 22. Green Meadow | 38. National Bison Range | 53. Story |
| 8. Bowdoin Lake | 23. Hailstone Basin | 39. Ninepipe | 54. Sullivan |
| 9. Brinkman | 24. Halfbreed | 40. Pablo | 55. Sun River |
| 10. Cherry Cr. (Valley Co.) | 25. Hewitt Lake | 41. Phillips Co. (Milk River) | 56. Teton Spring Creek |
| 11. Cherry Cr. (Sanders Co.) | 26. Highwood | 42. Piniele | 57. Thibadeau, Lake |
| 12. Creedman Coulee | 27. Judith River | 43. Pipestone-Whitetail | 58. Twin Buttes |
| 13. Emigrant | 28. Lake Avoca | 44. Pishkun | 59. Willow Creek |
| 14. Flathead Bird | 29. Lamesteer | 45. Red Rock | 60. Wild Horse Island |
| 15. Fleshman Creek | 30. Lima Bird | 46. Seeley Lake | 61. Wolf Creek |

- State Game Refuge.
 □ Federal Game Refuge.

Recommendations

Administrative Division:

To permit efficient handling of the large volume of business transacted by the Commission, more office space is needed. At present, we are limited to five small rooms which are occupied daily by 11 employees. Frequently while reports are being compiled, there are seven employees using one room. Property of the department is widely scattered due to inadequate space.

It is hoped that after the war a Fish and Game building will be erected which will provide suitable quarters for the administrative activities, as well as storage facilities for confiscated furs and game. Sufficient room for the proper display of wildlife specimens native to Montana, as well as for an aquarium, should be included in a construction program.

Fisheries Division:

In order to meet future fishing pressure which will undoubtedly prove to be the heaviest in history, it is necessary that our hatcheries be brought up to a much higher plane of efficiency by the addition of refrigeration facilities amply large

to store a year's supply of fish food. Such facilities would permit the fisheries division to purchase in much larger quantities at a considerable saving in cost.

The distribution equipment must also be enlarged and improved to allow more effective distribution with less road travel, as our present units are much too small for present requirements and future stocking policies demand highly improved equipment.

The installation of a plant for processing and canning carp or other rough fish would not only reduce feeding costs at the hatcheries, but would materially aid the waters from which these fish were taken.

The establishment of a research department to assist in developing and improving existing physical equipment such as distribution units and fish screens would lead to the development of better equipment. A research department would also carry out surveys on problem waters to determine factors entering into success or failure of plantings, including a study of the food base, influence of rough and predator fish, etc.



A supreme moment in the life of a disciple of Isaac Walton.

A natural rearing pond program was started in a small way when this country was plunged into a global war. This important program should be materially expanded throughout the state, when peace comes, in order to make possible

the rearing of more large trout to satisfy increased fishing demands.

The construction of a large hatchery and rearing ponds in the Eastern part of the state, designed for the rearing of both trout and warm water species and dedicated to the waters of that region, is highly desirable.

Recommendations for Legislative Action

Any study of the present fish and game statutes will reveal laws which are now out of date. Furthermore, there are statutes whose original intent and meaning is not too clear, and there are others which appear to be in direct conflict with one another. The sportsmen will be benefited and law enforcement made more effective if the fish and game statutes are recodified. Minor changes in some of the present laws, as well as new ones, are needed if our wildlife resources are to be most efficiently managed. Attention is called to the recommendations of the Governor's Reorganization Committee as well as to the files of the State Fish and Game Warden to anyone interested in this matter.

The attention of the legislature and all interested citizens is called to the fact that the maximum salaries which may be paid to the various categories of deputy game wardens are low when the responsibility which the work entails is considered.

Many of the deputy game wardens who have given long service to the sportsmen of the state have already passed what is usually considered retirement age, and others are due to reach that age within the near future. This is a group of men which has loyally served the state for many years on comparatively low salaries. It seems to be the general opinion of sportsmen that these men should not be discharged from the service without some economic stability. A retirement plan is urgently needed for these men which would not only give them the security which they deserve after years of service, but which would also lead to more efficient law enforcement since they could be replaced by younger and more active men.

As the various game species build up, at least in local areas, the problem of removing the

surplus in these areas is made difficult under present statutory provisions. The statutes prohibiting the setting of seasons for antelope and moose should be rescinded. There are areas in the central and eastern sections of Montana where antelope have become very abundant and are in several localities causing a considerable amount of damage to private property holders. Moose have increased in that portion of the Absaroka forest north of Yellowstone Park to the point where, if the herd is not reduced by hunting, it may suffer serious loss during severe winters. It has been found by a recent detailed investigation that there is a decided surplus of bulls which could very well be harvested by hunters under careful regulations. There are local areas in the state where herds of deer or elk have increased to the point where they are destructive to public range or privately owned range property or both. To meet all of the above situations a statute should be passed providing for the use of a limited license so that the surplus from these areas may be removed without jeopardizing the basic breeding stock of the herds.

At the present time there are statutes which allow the Commission or the State Fish and Game Warden to authorize the removal in one way or another of elk, beaver, and muskrat doing damage to property. Such provisions are not made with regard to other wildlife species. The powers of this statute should be broadened to allow the Commission at its discretion to authorize the limited killing of any species causing excessive property damage. Such a statute should provide that animals or parts of animals killed in such manner should be sold at public auction by the State Fish and Game Warden or his deputies, and that the funds derived therefrom should be returned to the state treasurer's office and credited to the funds of the Fish and Game Department.

Fisheries Division

Introduction

This biennium has been one of unusual activity as the problem of maintaining a fishing yield in the face of heavy and growing demands, combined with the handicap of insufficient revenue and the inability to obtain vitally necessary materials and the loss of many of our personnel brought about by a world at war, has required the diligent application of the most efficient methods at our command. Practically every department and phase of the fisheries division has instituted or developed new programs or more efficient procedures that will contribute in no small degree to a more effective fisheries program in the years to come.

Excellent progress was made in the huge problem of fisheries management as related to the future stocking policies of our streams and lakes, and today every hatchery, whether state or federal, is supplied with a definite and closely outlined program. This subject is treated separately under the heading of "A Five Year Fish Distribution and Management Plan for the State of Montana," and we wish to impress upon the reader that the ultimate goal or objective of such a plan is to maintain the largest fish population possible consistent with normal growth and available food supply, and the final assurance that the angler will be well rewarded for his efforts.

Considerable survey work was carried out locating sites for the construction of natural rearing ponds. Several suitable sites have been located and are scheduled for future development. The acceptance of these sites for future development was made only after the most careful investigation and thorough checking of the many factors which are necessary to guarantee their successful operation when constructed.

The constantly rising cost of fish foods for the feeding of small trout in our hatcheries is placing such a burden upon the department that a more efficient and economical method is being sought and the construction of natural rearing ponds promises to aid materially in producing

substantial numbers of fingerling trout. We have profited from our mistakes of the past and now have definite factors which, if all are considered, practically eliminate the chances of failure.

The aforementioned activities are only a few of the many carried on by this department, and in the following pages other phases of the fisheries program will be presented. These activities are being inaugurated or maintained with the sole thought and purpose that this kind of all sports will not diminish but rather increase, and that its thrill can be enjoyed by the ever increasing numbers of fishermen throughout the years ahead.

The economic and recreational value of fishing is assuming greater proportions each year. It is almost impossible to estimate the amount spent by sportsmen in Montana each year on equipment and other items, but it probably totals several million dollars. But who can estimate the recreational value, which undoubtedly is so great and far reaching in its effect that no intelligent conclusion can ever be formulated, and which we know exceeds by far the economic value. The ease with which we may contact the many crystal lakes and tumultuous sparkling streams lying in the depths of vast forests, and cast aside the worries and turmoil of life in close communion with nature, is a rare privilege. The fostering and ripening of loyal friendships and congenial fellowship, the return to our everyday duties refreshed in spirit and body—all these can be considered recreational values on which man cannot place a monetary consideration.

It is, therefore, imperative that we who are representatives of these departments, dedicated to the preservation of this great heritage and natural resource, strive toward the accomplishment of that one ideal which is the perpetuation and rehabilitation of these resources with which the Northwest is so bountifully supplied, and administer them in such a manner as to give an assured and continued benefit to present and future generations.



Species of Game Fish Found in Montana

The game fish found in Montana can be divided into two classes, those native to Montana and those that have been introduced. We will first deal with those that are native to this state, and included in these are cutthroat or black-spotted trout, Dolly Varden, Montana whitefish, and the Montana grayling.

NATIVE

The native cutthroat or black-spotted trout were first mentioned in history when the Lewis and Clark expedition went through Montana. They are a member of the Salmon family and were found in all of the drainage areas of Montana. They spawn in the spring and early summer, seeking the shallow waters of the smaller creeks or lakes where gravel bars are in evidence. These trout vary greatly in the sizes at which they reach maturity, the controlling factors being the size of the body of water they inhabit and the abundance of the food supply. In certain lakes where food is abundant they have been known to reach a weight of 17 pounds, while in many small mountain streams they have reached maturity at 6 or 7 inches and are often spoken of as brook trout under the impression that they are a species different from the larger ones. In gameness they are second only to the rainbow and in feeding habits are similar to most all trout. They are opportunists and when hungry will take anything that promises to be food, even fish of their own species.

DOLLY VARDEN

This interesting member of the charr family is found in the streams and lakes of Montana,

Idaho, Washington, Oregon and California, and northward in coastal streams to the Aleutian Islands. It is found only in the Pacific drainage. It is known under other local names such as the bulltrout and charr. Its size is also governed by environment and specimens only 12 inches long might have the same age maturity as some specimens weighing 30 pounds. In habits it is very voracious, feeding freely upon whatever offers, and is especially fond of minnows. It spawns in the fall of the year from September to November, and for this purpose selects shallow streams with gravel bottoms.

MONTANA WHITEFISH

This popular member of the game fish family is also related to the Salmon family although it does not resemble the trout in exterior appearance. It prefers the clear cold lakes and streams of the mountains, and those living in the lakes remain in comparatively deep water except during the spawning season, which occurs in the late fall or early winter when they run out into the tributary streams seeking suitable gravel bars.

This species attains a length of a foot or more and a weight up to 4 pounds, though the average is considerably less. During the spring and summer they take the fly freely, as well as a baited hook. However, due to the smallness of the mouth, a very small hook must be used.

MONTANA GRAYLING

The grayling conform very closely with the salmon family and there is no species sought for by anglers that surpass the grayling in beauty.

Montana's native trout. Mentioned in Lewis and Clark's journals.



Eastern Brook trout. An interesting species of the charr family which produces excellent fishing.



They display a combination of color equaled by no fish outside the tropics. The Montana grayling was known to occur only in streams emptying into the Missouri river, but due to successful fish cultural activities, it is now found in several streams and lakes on the western slope of the Rockies, and, characteristic of all grayling, it prefers the clear cold streams. The spawning season is in April to June, depending upon water temperatures. The grayling is not a voracious feeder and confines its feeding habits to small forms of aquatic life. Success in angling for this species depends upon the selection of the smallest possible fly hook. The average size of this fish is from one-half to one pound, although specimens weighing over two pounds have been caught.

INTRODUCED SPECIES

Many of our best fishing waters are now stocked with exotic species which in many cases afford wonderful fishing. Included in the list of introduced species are the silver and sockeye salmon, lake or Mackinaw trout, eastern brook and Loch Leven, and last, but not least, the rainbow, which needs no introduction and whose game and fighting qualities are second to none.

The habits of these introduced species are not dissimilar to our native species and correspond to the other members of the Salmon family. The following are some of the record weights: silver and sockeye salmon up to 4½ pounds, rainbow up to 12 pounds, eastern brook up to 17 pounds, Loch Leven or brown trout up to 40 pounds; lake or Mackinaw have been caught up to 80 pounds.

Rainbow trout. Outstanding member of Salmon family introduced into Montana's waters many years ago and well known for its fighting qualities.



Many warm water species have also been introduced and included in this are large and small mouth black bass, perch, sunfish, crappies, bullheads and carp. It was the introduction of these species in trout waters that has created irreparable harm and in many cases has ruined fishing for both species.

FISHING WATERS OF STATE

Our state is indeed fortunate in that we will always have a number of remote areas where natural propagation, supplemented by plantings from our hatcheries, will always insure the ambitious angler a rich reward for his efforts. Those areas which are easy of access will have to depend almost entirely upon heavy plantings from the hatcheries, and most of these plantings should be six-inch and larger fish to maintain proper fishing conditions.

Time and space will not permit even a short description of the many fishing waters within our state, for if the streams which are fishable were totaled, it would probably exceed 34,000 miles, and the many lakes will probably total in excess of 1,550, and to be able to pick from this huge allotment the best fishing waters would indeed be a difficult task. Many waters which at one season of the year are not very productive of results can be outstanding at some other time. Each locality is usually fortunate in possessing a few favored spots where excellent fishing can be had at most any season of the year, and almost every sportsman is always eager and willing to impart this information to a stranger in that locality.

Montana Grayling. Originally found only in Montana, since introduced into many states. Their most striking feature is a large, beautifully colored dorsal fin.



A Five-Year Fish Distribution and Management Plan

With the inception of the first fisheries station in Montana no thought had to be given to the territory to be stocked. The whole State lay with hundreds of individuals willing to receive and distribute the fish being propagated therein. However, it was not long before additional hatcheries were constructed at different points over the State and at the present 11 State hatcheries and three Federal hatcheries are engaged in the rearing of trout and grayling. One warm water station is devoted to rearing the finny rayed species.

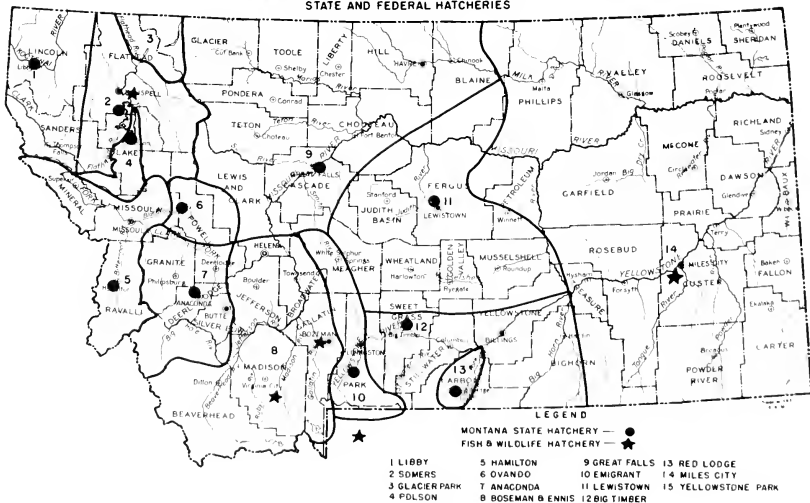
These 14 trout hatcheries under normal operations have an annual output of over 30,000,000 trout of varying sizes and up to the last year these 14 hatcheries were engaged in a distribution program based upon popular demand, pressure from political groups, and the ease with which waters could be contacted. As can be

imagined, the result was anything but satisfactory and resulted in much confusion, duplication of effort and loss of efficiency. It was thought some years ago, when our hatcheries assumed the responsibility of planting, that all our troubles would be over, but it was soon discovered that they had just commenced.

Local pressure groups desiring to stock some favorite spot soon found out that, by various insistent demands, it was very often possible to obtain trout from several hatcheries at once to stock the same body of water. The result was that waters ideally suited to planting very often received no stocking at all and waters not suitable for the species introduced received far more than the waters were capable of supporting. Some of the hatcheries would make a plant of 1 or 1½-inch fish and perhaps the next day, or sometimes within a few hours, the distribution truck from

DISTRICTS NOW ASSIGNED TO FISH HATCHERIES IN MONTANA

MONTANA AREAS OF RESPONSIBILITY IN FISH PLANTING STATE AND FEDERAL HATCHERIES



another hatchery would pull up to the same spot and make a plant of 6-inch trout. This and many other comparable situations were reducing the efficiency of the hatcheries so, recognizing the need for a closer correlation between all interested agencies, the whole fish distribution scheme was critically reviewed during the spring of 1941 by members of the Forest Service, the National Park Service, the Fish and Wildlife Service and the Montana Fish and Game Commission. This review showed that there was need for a closer correlation between the national forest lands and the private outside lands in the matters of jurisdiction of fish distribution.

It was also pointed out, as mentioned before, that there was a definite overlapping of responsibility and duplication of effort among all of the agencies involved. The 11 State hatcheries in Montana had no definite areas of responsibility; neither did the three Federal hatcheries belonging to the Fish and Wildlife Service. As fish distribution was carried on, each State hatchery overlapped its neighbors to a certain extent, and the Federal hatcheries overlapped all of those belonging to the State. The confusion, duplication of effort, excess travel, and all the other ills inherent in a system where a lack of correlation exists were prevalent. Requests for fish by the Forest Service were made to both State and Federal hatcheries. These requests were often duplicated by the local Rod and Gun Clubs. Superintendents of both State and Federal hatcheries often received identical requests for fish planting in the same waters from both the Forest Service and the local Rod and Gun Clubs.

In past years, both State and Federal hatcheries have been subjected to all of the pressures that could be applied, and their function was determined primarily by these pressures. It was almost impossible for them to give real thought to effective fish planting, but rather their efforts necessarily had to be directed toward alleviating the pressures under which they were striving. In consequence, the fisheries' resource in itself was a secondary issue.

In the above mentioned conference it was agreed that:

1. The State Superintendent of Fisheries would act as coordinator of all fish planting activities within the State regardless of whether the fish were produced in the State or Federal hatcheries.

2. The State would be divided into hatchery districts for fish planting.

3. The districts would be determined primarily by the hatchery production and the waters in need of stocking. The divisions would be made on drainage lines without regard to land ownership.

4. Fish planting plans for each district would be developed by the Forest Service and the Fish and Game Commission on a cooperative basis.

The State of Montana was divided into 14 districts. A 15th district was made of Yellowstone National Park, since there is very close cooperation in fish planting activities between Yellowstone Park and the State of Montana. These boundaries were set up tentatively and discussed with each of the hatchery superintendents in order

Taking Lock Leven and Rainbow Trout spawn in the Madison River above Hebgen Lake. Each year sufficient eggs are collected at this station to supply the need of all the hatcheries in Montana for these two species.



to correlate the unit boundaries. After this correlation of unit boundaries, maps were prepared for each of the various units showing their sphere of responsibility.

As soon as the district boundaries were definitely established, the formulation of plans for fish distribution in each of the units was started. In the preparation of these plans, two ideas were dominant:

1. That the State of Montana was large, and consequently it was impossible to make an immediate intensive survey of all of the waters to be stocked. Therefore, it was decided to use as a basis for planting, that information gathered by the Forest Service officials, the hatchery superintendents, the State game wardens, and other similar individuals who have intimate knowledge of the local areas.

2. That hatchery production should be the basis for fish distribution, and that the number produced should be divided as equitably as possible over the entire unit in the waters approved for stocking. In the formulation of these plans, the first step was to eliminate those streams and lakes in which fish planting was not desirable for such reasons as the drying up of the water from natural causes or irrigation, or pollution by mining and other activities of a similar type. Certain lakes were similarly eliminated because of being too shallow, inaccessible, or having extremely limited food supply. After this initial elimination

of streams and lakes in which no planting was recommended, the remaining streams and lakes were then classified, and detailed information was obtained regarding them from individuals having intimate knowledge of the waters. This information was assembled and discussed with all of the interested agencies in the respective units, and the thoughts and ideas of all correlated as nearly as possible, in an attempt to arrive at a basis for determining the stocking program. After this information was assembled, a stocking plan, based on the production capacity of the hatchery and the waters to be stocked, was then outlined. The stocking of the waters, as finally determined, was merely an allocation based on all the knowledge it was possible to obtain as to the respective needs.

It is well realized that such a system is not wholly complete in many respects, but it is felt that this is the first step toward a managed stocking program. Constructive criticisms are solicited, and as suggestions for improvement are received they are incorporated into the stocking plans. Stream survey data will, of course, be included, as well as other pertinent data derived from future studies.

These plans have been discussed with many groups and individuals interested in fish planting in the State of Montana. Almost everyone has been enthusiastic over the use of such a system, since it is realized that it is necessary to have

TOTAL MILEAGE OF STREAMS AND ACREAGE OF LAKES IN DISTRICTS

1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12 and 13

STREAMS	Recommended for Planting		Not Recommended for Planting	
	Mileage entire hatchery districts	Mileage inside national forest boundaries	Mileage entire hatchery districts	Mileage inside national forest boundaries
31 main rivers	2,490	200	917	305
1387 major streams:	13,389	6,648		
4084 minor streams			18,107	7,580
Grand total 5502 streams:	15,879	6,848	19,024	7,885
LAKES	Recommended for Planting		Not Recommended for Planting	
	Average entire hatchery districts	Average inside national forest boundaries	Average entire hatchery districts	Average inside national forest boundaries
294 lakes	207,833*	42,111	66,667	22,643
1695 lakes				
Grand total 1989 lakes:	207,833	42,111	66,667	22,643

* Plus one lake, 129,129 acres.

The above do not include Fort Peck Reservoir with an impounded acreage of 288,000 acres.

some basis for starting a unified program. In every case it was pointed out to these groups that this was certainly not the last word in fisheries management, but that it would form a basis for more intensive study and better developed plans in the future.

In the determining of the production capacity of each hatchery unit, the production of past years was not used as a basis, because heretofore all of the hatcheries had been required to produce a great number of fish. In almost every unit, the production was up to the maximum in numbers and even exceeded what they should have handled in order to care for the fish adequately. In the preparation of these plans the production capacities were determined by the numbers of fish that they should logically produce, based on their trough and pond capacity. In determining these capacities, diagrammatic maps were drawn of the hatchery plants, and then scrutinized carefully to determine (1) the kinds and sizes of fish that they should produce, and (2) the species of fish that were needed in order to adequately stock their territory with desirable kinds.

The hatchery units were evaluated to determine (1) how many 6-inch fish it would be possible and desirable to produce, based on the needs of the territory, (2) how many 3-inch fish were necessary, and (3) how many 1½-inch fish should be produced.

An allocation for each stream and lake to be stocked was then made from the above totals, based on comparative needs. The various species of fish were determined from the contacts that were made with the interested groups and agencies, based on their knowledge of the most desirable species in the different drainages.

Since all studies that have been made in regard to survival show that an increase occurs when large fish are planted, it was the thought of everyone concerned that as many large fish should be produced as possible, consistent with the facilities and funds available.

It was found, in one case, that a hatchery that had been producing on an average of two and one-half million fish annually, of which only approximately 5 per cent had been 3 inches or over, could, by cutting the figures to 1,500,000, produce 40 per cent of the fish 3 inches or over.

It was found also that merely by the formation of these districts and the reduced travel re-

sulting therefrom, combined with the reduced food cost of propagating the large numbers of small fish, a saving of approximately 20 per cent would result, and this saving on car travel and other items could be used for the rearing of the larger fish called for in the program.

The primary fish species that are propagated in the State of Montana are rainbow, cutthroat, Loch Leven, eastern brook, and grayling, in the order named. The majority of the waters of the State of Montana originally were populated with cutthroat trout, but due to the sweeping changes that have been made by man's influence, this



Montana's largest game fish — Mackinaw trout from Whitefish Lake.





Trolling, a popular sport on Flathead Lake.

species is gradually diminishing over much of the State, and has been superseded in many drainages by the rainbow and Loch Leven.

Approximately 40 million fish have been planted annually in the State of Montana, of which rainbow, cutthroat, and Loch Leven have amounted to approximately 10 million each. Eastern brook, grayling, and the species of lesser importance make up the remainder. It is thought that by cutting this total figure to about 30 million, approximately 25 per cent of the larger sizes can be produced.

The final computation of the figures of this planting program also bring out some interesting data in regard to Montana's streams and lakes. It was found that there are 5,502 streams and rivers of all classes, totaling 34,903 miles. Of this

total it was found that 15,879 miles were considered fit for stocking and 19,024 miles were found to be unfit for stocking, due to various factors such as drought, pollution, irrigation, etc. It was also found that Montana has a total of 1,589 lakes, totaling 274,500 acres and of this number 207,833 acres were considered fit for stocking and 66,667 acres were classified as unfit for stocking or needing further investigation. Most of the lakes in this category were those situated at high altitudes and considered inaccessible or inadequately stocked for the available food supply.

It is the belief of all the interested agencies that through this positive management, cooperation, and correlation of effort—the fisheries' resource in the State of Montana should be greatly benefited.

The Blueblack Salmon of Flathead Lake

(*Oncorhynchus nerka*)

The Blueback or Sockeye Salmon is found from the coast of southern Oregon, north to northern Alaska, Kamchatka and Japan. The principal rivers in the United States which it frequents are the Columbia, Quinalt and Skagit, in each of which very heavy runs occur. In the Columbia River this salmon is called the Blueback. In the Frazer it is called the Sockeye, and in Alaska it is known as the Red Salmon or Redfish. This species has established itself in various fresh water lakes where it is physio-

logically landlocked, and appears as localized dwarfed forms sometimes known as the Little Red Fish or Kennerley's Salmon. Among lakes which they are known to inhabit are Altures, Petit, Redfish and Big Payette in Idaho; Wallawa in Oregon; Sammamish, Ozette, American and Chelan in Washington, and many small lakes in British Columbia and Alaska, including the Kootenai and Okanagan lakes.

The Blueback or Sockeye is the most important salmon on the west coast, and by far the most valuable species in Alaska. However, so

reckless is the fishery being prosecuted that it is not difficult to vision its ultimate and fatal depletion.

In the year of 1914 a shipment of Sockeye eggs was received at the Somers Hatchery, located on the west shore of Flathead Lake. A percentage of the hatched Salmon from this shipment found their way into the waters of Flathead Lake and since that time have shown a steady increase. Their presence in the lake was known to very few people for many years, and it was not until the last seven or eight years that the general public became aware that they were inhabiting these waters in such large numbers. The favored spawning areas are located principally on the east shore of the lake, where many of the mountain streams end the last of their tumultuous journey by flowing through large gravel beds rimming the shores. Here the salmon congregate in large numbers to complete their spawning activities, which concludes the life cycle of this species and it is here that the general public congregate in an equally desperate effort to prevent the completion of this cycle. The methods practiced by many bring home with a glaring clarity the procedure that must have been used on our once abundant forms of other animal life, such as the buffalo and the wild pigeon, and which

has relegated them to near or complete extinction. There has been concern expressed by many that the salmon would become too abundant and exclude all other species, but it can safely be predicted that if the present method of capture and take are allowed to continue it will be a matter of relatively few years before the stock is depleted and they will also be mere history, with these same individuals expressing concern as to when they will again return.

However, an important point is the great possibility that now exists to strike a higher and more concentrated balance in all forms of organic and vegetable matter existing in that body of water. These many forms of organic matter, such as the zooplankton crustacea which are the principal food of all young trout fry are directly dependent upon the amount of organic material available, and they can increase only through the introduction of organic matter, and that is exactly the transformation that is taking place in that body of water today. These large number of salmon which spawn each fall, and then through the competition of nature's mission all die, are contributing vast amounts of organic material. A great fertilization program is being carried out at absolutely no cost to any department or agency. (Please turn to page 92).

**Natives and Dolly
Varden trout taken
from Flathead
Lake.**



Fish Screening and Planting

The Fish and Game Department has long realized the necessity for a clearer understanding of the problems confronting us in the relation of irrigation to fishing. In the spring of '41 a research program was started with the main thought in mind of bringing out the effectiveness of existing fish screens and the comparative losses of trout and other fish in these ditches. In view of the limited funds, the survey was confined to the waters of the Yellowstone drainage and, although this area requires further investigation, the findings up to date bring out many pertinent facts and many of the findings can be applied to other irrigation and diversion problems elsewhere in the State.

A total of over 450 irrigation diversions were found to exist on the waters of the Yellowstone drainage alone. In view of such a large number existing on one drainage, it can be safely stated that there are at least 2,000 diversions located on waters throughout the State. It was found that we have installed in the last several years a total of 29 fish screens and of this total only 3 were

still in shape to operate satisfactorily. Most of these installations averaged close to \$800 each and some even more when the items of concrete work, installation, and other incidental expense were taken into consideration. It was also found that the average upkeep and maintenance cost would be approximately \$150 annually. Multiply this figure by 2,000 (the number of ditches in Montana) the annual maintenance load would total \$300,000, which is three times as much as is available for the operations of the Fisheries Division.

What we are faced with is a more practical and economical solution to this huge problem. It cannot be denied that many drainages are in need of such a program, but there are also others where the diversions are so large and numerous that the remaining watershed is left entirely dry, or if any water does remain to flow down the stream the temperatures become too high during the hot summer months for fish life to exist. It would be wise to dedicate such watersheds to agriculture and confine the plantings of trout to waters not so adversely effected and thereby give the sportsmen better fishing in those waters dedicated to recreation.

Many sportsmen's organizations and individuals express the thought that the installation of fish screens throughout the State would end all future propagational worries and an abundance of fishing would be available for everyone. However, there are other factors which must be considered and which in many cases are entirely overlooked. One is the fact that we have large drainages in this State, such as the Flathead and Kootenai where not a single irrigation diversion exists, but a survey will show that fishing has declined just as much in these waters as those having diversions.

This can lead us to only one conclusion, which is that fishing pressures and creel limits have been in excess of our ability to restock and an enlarged propagational program or reduced creel limits must also play their part to bring about better fishing in all waters.

Oregon type fish screen with rotating grills—self-cleaning.



Our New Fishing Waters and Their Future Possibilities

It was not many years ago that the average fisherman was interested only in the western part of the state insofar as the pursuit of his favorite recreation was concerned. In truth much of the eastern portion of our state had little or nothing to offer, and what few streams flowed through these regions were either too warm or muddy for any forms of fish life except a few members of the warm water family, and what few plantings the department carried out were of such species as the sunfish, bream, or catfish and related species.

It was in the early '30s that we began to hear reports of the splendid work being carried out by the Soil Conservation Service and the Reclamation Service, and today, as a result of those activities, many hundreds of reservoirs dot the eastern portion of the state. While it is true that many of these are not suitable for fish life, it has also been proved that a great many do and can afford splendid fishing for species of the warm water variety and in some cases even excellent trout fishing.

There is one body of water recently impounded and still forming which gives promise of exceptional angling possibilities, and that is the Fort Peck Reservoir. When completely filled this impounded area will cover 280,000 acres, an area greater than all of the lakes in the state combined, including Flathead. Within the main reservoir a diversity of fishing can be developed rang-

ing from such species as rainbow, mackinaw and Loch Leven, to crappies and sunfish.

In order to obtain maximum fishing results from the main reservoir, a careful stocking policy will have to be carried out with the thought in mind that the rough fish population must be held to a minimum. In view of the fact that rough fish species will be constantly migrating into the reservoir from the stream above, the stocking program should include the introduction of some species of game fish possessing predatory characteristics which will offer sufficient competition and thus prevent the rough fish from becoming too numerous. The introduction of Mackinaw trout in conjunction with other species would undoubtedly serve the purpose of maintaining a balance of species.

The river below the Fort Peck dam promises to develop into excellent trout waters for a distance of 25 or 30 miles. This outlet water from the reservoir is drawn from the bottom of the lake and is clear and maintains consistently low temperatures, even during the summer months. There is no doubt that with a proper stocking program, sportsmen of eastern Montana will be able to enjoy wonderful trout fishing right at home. However, to carry out a stocking program to adequately take care of such an enormous area will call for the construction of a hatchery and pond culture station capable of producing both trout and warm water species and dedicated to the waters of Eastern Montana.

**Rainbow trout taken from Fresno Lake near Havre.
The largest fish in this group weighed over 5 pounds.**





Lake Wilderness, headwater of Woodhine Creek, Beartooth Mountains. Typical of the beautiful mountain lakes near timberline. Abrupt rocky shoreline provides little natural fish food. Fertilization greatly improves such waters.

Increasing Productivity of Mountain Lakes

This state, like many others having mountainous regions, possesses a great many lakes situated at sub-alpine levels whose beauty and settings are masterpieces from the hand of nature, but whose ability to produce any appreciable numbers of trout are extremely limited due to the lack of sufficient natural food. This lack of natural food is due to the absence of the elements which act as fertilizing agents, namely, the nitrates and phosphates. Usually the terrain surrounding these lakes is composed largely of rock formations which support only meager growths of vegetation and consequently contribute very little fertility.

The introduction of fish foods, such as fresh water shrimp, daphnia, and other forms, will not accomplish the results desired unless the food to support these organisms is present and that food, namely algae, diatoms, etc., cannot thrive unless the water contains sufficient fertility to promote its growth. Hence the need for a greatly expanded program of fertilization, and it is the Commissioners hope that commercial fertilizing materials will again be available in the near future, as well as sufficient personnel to carry to a successful conclusion a program which will be of inestimable benefit to all sportsmen.

Rough Fish Control

It has often been stated that man has been responsible for more harm to fish and game through conscientious endeavor than the man with malicious intent, and this certainly holds true in regard to many of our beautiful lakes in this state.

The misguided introduction of a voracious species of fish into many of our lakes by well meaning individuals has so upset the biological balance of these waters that our game fish have been relegated to almost complete extinction, and any further introduction of trout into these waters is largely a waste of the sportsmen's money. For that reason we have many splendid bodies of water throughout the state which are lying idle and are infested with practically nothing but rough fish such as suckers, carp, squawfish, shiners, sunfish, and other non-game fish.

It would be possible to cite many examples of such introductions which have occurred in the last 10 or 15 years to waters which were famous throughout the entire Northwest for the wonderful rainbow fishing which they afforded. Today, however, they stand almost barren insofar as trout fishing is concerned, but are teeming with millions of suckers, sunfish and shiners which offer such serious competition for the natural food available that the few trout remaining are hard pressed to find sufficient food for their existence. Further introductions of small trout from our hatcheries have been anything but successful.

A FISHERMAN'S PRAYER

Dear Lord, when Gabriel blows his blast
And I come home to rest at last,
Don't measure me for harp and wings,
But let me have instead these things,
Some tackle, and a rod and shiny reel,
A pair of nice dry waders and a creel,
A gushing, frothy, glacial stream,
A quiet lake by which to dream,
An Angel pal with whom to angle
And magic lines that will not tangle
And grant me leave with fingers crossed
To lie about the fish I lost.

However, there is also a bright side to this problem and a method which can be 100 per cent effective in a large majority of these waters, and that is by the use of derris root or rotenone. This substance is obtained from the roots of derris and related plants and imported from China; it is highly toxic to all fish life. When introduced into the waters infested with rough fish, in the proper concentrations, it exterminates all forms of fish life therein. However, it has the advantage of quickly dissipating its powers, and after a comparatively short time the restocking of these waters so treated can commence, and the sportsmen can then be assured that such lakes will again produce maximum trout fishing.

It is to be regretted that this product cannot be obtained at this time due to the fact that it must be imported from the Orient. It is safe to state that in the not too distant future importations will again be resumed. When this time arrives the department hopes to avail itself of sufficient quantities to carry out many successful "tipping over" projects and restore these lakes to their rightful place in the angling world.

Trout waters on Hellroaring Creek.



Wildlife Restoration Division

Introduction

The following report presents a summary of the work carried on by the Wildlife Restoration Division of the Montana Fish and Game Department. The division was formed following the passage by the State Legislature of the Assent to the Federal Aid in Wildlife Restoration Act, in 1941. This act, the result of a concentrated effort by interested individuals and wildlife groups, was passed by Congress in 1937. By it, funds flowing into the federal treasury from a 10 per cent excise tax on sporting arms and ammunition were made available to the states for the purpose of wildlife restoration and development.

The amount apportioned varies with the states and is based upon their size as well as the number of licenses sold in each. For example, the amount apportioned for the fiscal year of 1942 to Montana was \$77,247.05, while in accordance with war time reductions the amount made available for 1943 has been \$34,268.74.

Under the act the federal government reimburses the states for 75 per cent of the cost of all projects. Each of the projects undertaken is originated and planned by the various state fish and game departments, and the personnel to supervise and carry out these projects are chosen by them. The government, acting through the Fish and Wildlife Service, requires only that the projects undertaken are substantial in character and that they conform to the spirit of the act. All equipment, improvements and developments become the property of the state. The scope of the work is broad as it covers all phases of wildlife except fisheries. Thus, in Montana work is now being conducted in connection with the big game, game birds, and fur bearing animals.

According to their objectives, the projects may be classed under the following four general headings:

1. Land Development: Projects under this classification include the improvements of the living conditions or environment for wildlife. They

may include the planting of food and cover as well as the protection of nesting areas, the stabilization of water levels, and similar activities. The fencing of portions of reservoirs and the planting of these protected areas to food and cover for wildlife is an example of this work that is now being carried on.

The restoration of desirable wildlife species is in a sense a phase of development. Examples of this type of project are the trapping and transplanting of big game such as mountain goats and mountain sheep, as well as the trapping and transplanting of various types of game birds such as sage grouse and Chinese pheasants, and also the trapping and transplanting of beaver. In this way game animals, birds and fur bearers are being reintroduced into desirable areas where they once were found or into new areas that provide all the requirements needed by the particular species.

2. Investigations and Surveys: This type of work is being conducted for the purpose of furnishing the Fish and Game Commission with a fund of well grounded information. The surveys undertaken are confined to those that furnish factual information designed to aid in the administration of the wildlife resources of the state. The scope of these field investigations is broad, covering such activities as census work, game range investigation, the determination of the effect of various diseases and parasites, the drain by predators, hunters and winter kill. As this basic information is gained, emphasis will be shifted to more detailed types of investigation.

3. Land Purchase: Under the provisions of the act lands may be purchased when found to be of vital need for the betterment of wildlife. Thus far no land acquisitions have been made. The Department believes that if a purchase is contemplated, it should be carried out only after a thorough study of the economic relations between wildlife and the various other land uses in the area. (Please turn to page 92)



Grizzly Bear Survey

SUN RIVER - FLATHEAD - ABSAROKA UNITS

Introduction:

The grizzly bear is now classed with the rare species of big game. According to a recent nationwide survey conducted by the Fish and Wildlife Service, there are only three states left in which over 10 of these animals are found. Montana is one of the three.

It is recognized that this big bear is distinctly a wilderness type of game animal. To extend the grizzly range into areas of important agricultural activity would not be practical or desirable. Montana is fortunate, however, in possessing a substantial amount of distinctly wilderness type range. It is upon these areas that the Commission hopes to maintain a substantial grizzly bear population. It is further hoped that, under

careful management, a take by hunters of a limited number may be maintained.


With the realization that this valuable game species was dangerously close to extinction over much of its range, the Commission inaugurated a detailed series of investigations.

Procedure:

The three principal grizzly bear ranges in the state have now been covered. On July 1, 1941, a two-man crew began work on the Sun River-Flathead Unit. This comprised a coverage of approximately 2,300,000 acres. Besides the Sun River drainage and the remaining drainages east of the Continental Divide, north to Glacier Park, the work covered the South Fork and the Middle Fork of the Flathead River west of the Continental Divide. The field work on this unit was concluded with the hibernation of the bears in November.

In July, August and September of 1942 a two-man field crew covered approximately 380,000 acres of range in the drainage of the North Fork of the Flathead River, as well as approximately 140,000 acres in the Whitefish Range area. In both cases the work progressed north as far as the Canadian boundary.

During the same period an additional two-man crew was working in the Slough Creek-Hell-roaring area north of Yellowstone Park. The primary objective of this latter crew was to gain information pertaining to moose; however, as much time as possible was spent in working with grizzly bear.



A brown bear cub. Black bear are far more abundant and more widely distributed than the grizzly.

The primary objective of the work was to gain a reasonably accurate census of the grizzly bear inhabiting these important units. All possible information was also required pertaining to feeding habits, annual increase, reaction to closed areas, and property damage.

The impracticability of obtaining a 100 per cent visual census of this species is of course apparent. A system worked out by the Alaskan Game Commission was therefore adopted. This called for the use of tracks to supplement the number of bear actually seen. In order that duplications might be avoided, this method required the measurement of all tracks used. The length (from the end of the toes, not including the claw, to the end of the heel) and the width (across the toes) was recorded. It was found in Alaska, and verified here, that there was sufficient variation in these two measurements for the various tracks used to distinguish one from another in case of doubt. The fact that bear follow trails a great deal in the mountains and also frequent muddy places along the margin of lakes and streams made the task of finding tracks less difficult than it was thought it might be.

Much worthwhile information concerning feeding habits was obtained by observing the bear, finding such evidence as overturned rocks, torn logs, and also dug up areas where roots and bulbs had been obtained. In addition, a field analysis was made of all fecal material found.

Findings:

Census Figures

Area	No. Bear
Sun River-Teton (East of Cont. Divide)	54
Flathead-South Fork, Middle Fork	58
North Fork of Flathead	23
Whitefish Range Unit (Graves Creek Area)	18
Absaroka Primitive Area (Slough Creek-Hellroaring)	10
Total	163

There are no doubt small additional numbers of grizzly bear scattered throughout the upper Gallatin, the headwaters of the Madison, and the Cabinet, Mission and Bitterroot Ranges.

The following is a summary of the observations on food habits of the grizzly obtained on the various units of study:

Early Spring: Search for and use of winter killed animals. Use of first green vegetation, both grasses and weeds.

Middle and late spring: Important use of bulbs and roots. Large areas torn up searching for the bulbs of the dog-toothed violet and the starchy roots of wild parsley (*cogswellia* sp). An increasing use of green vegetation, particularly grasses; the use of the leaves of pines, festucas, bromes, and several species of sedge most noticeable.

Summer: A continued use of the leaves of green grasses. An increasing use of ants, beetles, and other insects as well as their eggs, larvae and young. Much of this type of food is found in and under rotten stumps, logs and under rocks. Torn logs and overturned rocks are unmistakable and rather striking evidence of the presence of bear at this season of the year. Use of wild fruits and berries became increasingly evident during the late summer. The most important of this type of food was the tall huckleberry (*Vaccinium membranaceum*) and the small or low huckleberry (*Vaccinium scoparium*).

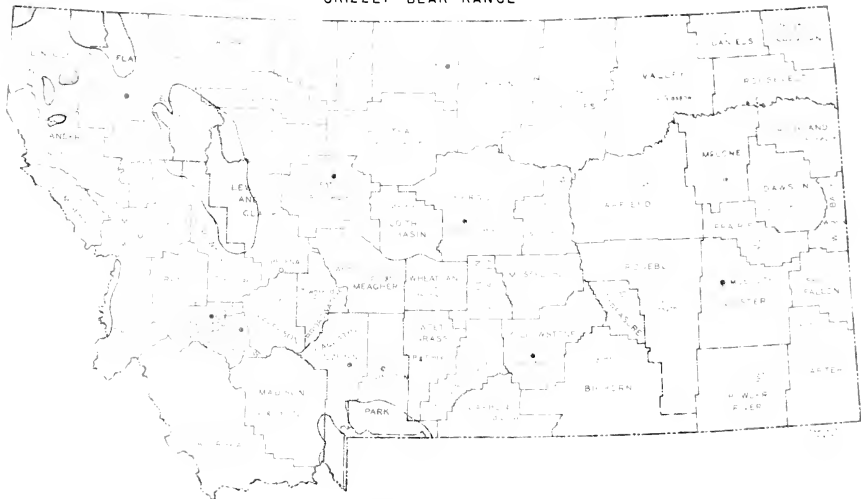
Fall: The use of pine nuts was found to be very important. This use was almost entirely restricted to the nuts of White Barked Pine (*Pinus Albacaulis*). Presumably for this purpose the grizzlies spend a great deal of their time during the fall in the sub-alpine basins, side hills and ridges, at elevations above 6,500 feet where the White Barked Pine is most commonly found. The bear were able to obtain these nuts by digging up squirrel caches.

Use of rodents was noticed at various times during the late spring, summer, and fall. This type of food was not considered of primary importance in the area covered by the study. Occasional use of young call elk has been noted, but is not considered important either to the bear as a source of food, or the elk as a decimation factor.

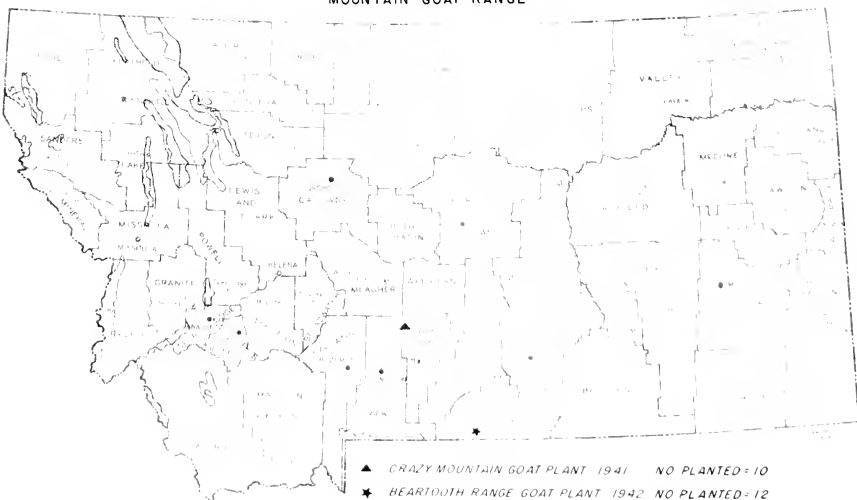
It may be seen from the foregoing summary that the grizzly has been aptly classed as omnivorous, in that the types of food taken are widely varied.

The reaction of this species to the protection of closed areas has been demonstrated in both Yellowstone and Glacier Parks. The effect of a small closure was shown by the larger number of grizzlies found within the Sun River Game Preserve (closed since 1912). The population in-

MONTANA.
GRIZZLY BEAR RANGE



MONTANA.
MOUNTAIN GOAT RANGE





side the Preserve was approximately one grizzly bear to 11 square miles of range, while the average outside was one grizzly to 32 square miles of bear range.

The average annual increase of the species in the areas covered was found to be approximately 15 per cent. The kill by hunters previous to the complete closure in 1942 approximately equalled the rate of increase in the Sun River-Flathead ranges.

Recommendations:

Very careful management of this rare species.

A limited yearly take by hunters controlled by a limited license system. The number taken to be based upon the annual increase.

Mountain Goat Survey

BITTERROOT RANGE UNIT (Progress Report)

Introduction:

The natural range of the mountain goat within the state has apparently changed but little from that of historic times. This species has been found in but three states—Montana, Idaho and Washington. The geographic center of their range is farther north in British Columbia.

The mountain goat is hunted in only two areas within the state, the Flathead and the Bitterroot ranges. The kill has been limited by a short season and the remoteness of the ranges involved.

The Commission has been anxious to ascertain the effect of the present drain by hunters

and other sources upon the goat population within the state. With this purpose in mind the present survey was initiated.

Procedure:

On July 1, 1942, a fieldman was assigned to the Bitterroot goat ranges. The plan for this work called for a complete coverage of the west side of the Bitterroot drainage to the Idaho line between the West Fork of the Bitterroot river and Lolo creek. The coverage has progressed systematically through Tincup creek, Rock creek, Roaring Lion creek, Saw Tooth creek, and Canyon creek.

Findings:

Up to October 15, 102 mountain goats had been observed. They have been widely scattered. It is thought that more favorable census conditions will be found when the goats have concentrated on their winter range.

The work has indicated a satisfactory kid crop. It will be necessary to check throughout the winter in order to determine the percentage of survival. Detailed work on this species in the State of Washington has indicated a high mortality rate among the kids during severe winter conditions. This report further suggests the possibility that mountain goats are monogamous rather than polygamous. As this is an important point in reference to the management of the species, an effort is being made to gain accurate information here in Montana.

The effect of predatory animals has not yet been found to be serious. Their activities may become more pronounced during the winter months.

A detailed report will be submitted following the completion of this work.

SUN RIVER — FLATHEAD UNIT

Information was obtained regarding mountain goats on the Flathead and Sun River ranges, during the grizzly bear surveys conducted in those areas. This work indicated that the mountain goat population in the area open to hunting was holding its own. The neighboring closed areas apparently play an important part in that goats were found to drift into the hunted areas from protected ranges.

Mountain Sheep Survey

SUN RIVER UNIT (Progress Report)

Introduction:

The small number of mountain sheep remaining in the state are apparently little better than holding their own. The reason for this is the number one wildlife problem, not only in Montana but throughout the West. From one of the more abundant big game species of half a century ago, the mountain sheep have dwindled to a small number of isolated groups.

Many theories have been put forth attempting to explain this unsatisfactory condition. In breeding, due to the isolated location of the small bands, an overabundance of rams, and the affect of disease—particularly pneumonia, have been put forth as possible contributing causes. There is also the thought that the activities of civilization have caused the mountain sheep to remain throughout the year in areas of higher elevation and a more severe climate than they were accustomed to on their historic range. Competition for forage with other game species and, in some cases, livestock is another consideration.

To date the riddle has remained unsolved. One band in the West, however, has proved the exception to the rest. The Tarryall herd in Colorado, which is said to have numbered seven head in 1923, now includes over 400. This exception only goes to prove that mountain sheep have the potential possibility of rapid increase if conditions are favorable.

The Sun River herd has been selected for a detailed investigation. This unit is representative of the mountain sheep ranges of the state. It is therefore felt that the result of the investigation in this area may be applied for the development of this species in other parts of the state.

Procedure:

On May 20, 1942, a fieldman was assigned to the Sun River area to carry on detailed in-

vestigations of the mountain sheep and their ranges.

Findings:

All of the sheep seen during the present summer have seemed healthy. The census to date totals 206 animals: 13 rams, 75 ewes, 20 yearlings, 49 lambs, and 49 unclassified. This represents the summer count. Few mature rams were seen on the lower and intermediate portions of the range. Those that were found were in high inaccessible areas. Counts during the breeding season of early December will no doubt show a marked increase in rams.

A desirable number of lambs has been observed during the past summer season with a ewe-lamb ratio of 1 : .83. However, the number of yearlings was comparatively small, indicating the probability of a rather serious loss of lambs during the first winter.

The range conditions have been recorded as excellent. No evidence was found of coyote damage during the summer months. Golden eagles are very common the year around in this area. The possibility of predation from this source is being carefully checked.

The work on this project will be completed on June 30, 1943. A detailed report covering the complete findings will be available at that time.

URAL TWEED MOUNTAIN SHEEP REPORT

A cooperative mountain sheep investigation was carried on during the winter of 1940-1941. The work was conducted on the game ranges between Five Mile and Sutton creeks on the east side of the Kootenai river. This area lies 30 miles north of Libby on the road to Rexford. The Montana Fish & Game Commission and the U. S. Forest Service sponsored this project jointly. Robert Brink conducted the field work and submitted the final report.

Within the winter range of the big horns the mountains rise rather abruptly from the narrow river bottoms. Outcroppings of ledge type rock occur along these steep side hills. The entire area is predominately timbered with larch and fir.

It was found that approximately 100 head of mountain sheep were wintering in the area. There was no evidence which indicated serious deple-

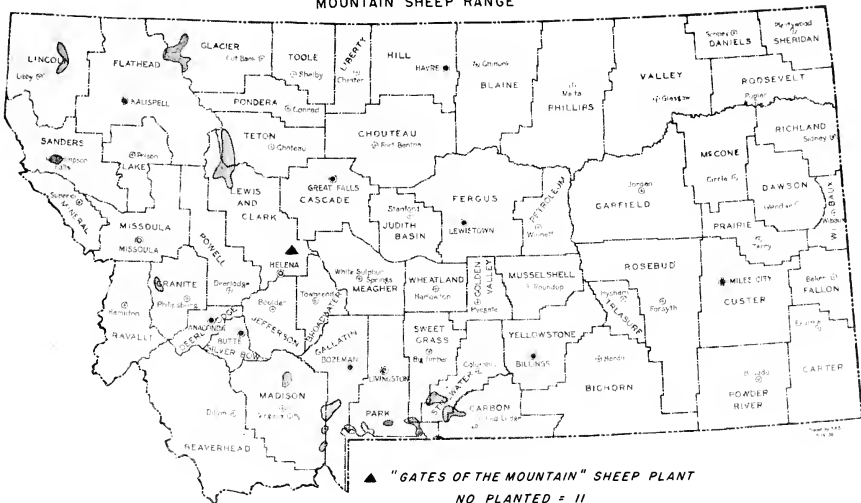
(Please turn to page 93)

A Rocky Mountain Bighorn ram. Photo by J. C. Haberstroh



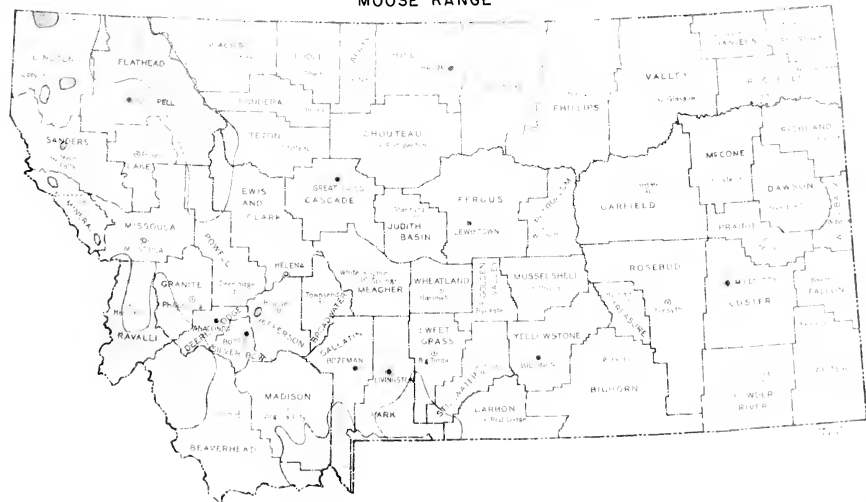
MONTANA.

MOUNTAIN SHEEP RANGE



MONTANA.

MOOSE RANGE





(Top) Bull moose feeding in a high mountain meadow near Lake Abundance.

(Bottom) Meadow at lower elevation. Dead willows indicate heavy winter use.



Hellroaring-Slough Creek Moose Investigation

Moose in Montana are quite widely scattered throughout the mountainous portions of the state. They lack the gregarious habits of the elk and are therefore seldom found in groups numbering more than three or four individuals. The more important moose ranges are located in the Big Hole-

Wise River area, the headwaters of Rock Creek south of Phillipsburg, portions of the Bitterroot range, the North Fork of the Flathead River drainage, and the ranges north and west of Yellowstone Park.

The moose ranges lying north of Yellowstone Park have been designated as the Hellroaring-Slough Creek Unit. The following is a summary or short digest regarding the findings resulting from wildlife investigations that have been carried out within this unit.

Yellowstone National Park has served as a nucleus for the protection of moose and from there they have spread into the Asbaroka Primitive Area, the Gallatin, Tom Miner Basin, and other adjacent ranges. The Slough Creek, Buffalo and Hellroaring drainages, an area of approximately 183,000 acres which lies adjacent to the northern boundary of Yellowstone National Park in the Asbaroka National Forest, contains a heavy population of these comparatively rare animals. During the winter of 1941-42 an extensive survey of this and other areas was made, and throughout the summer of 1942 an intensive study was continued in the Slough Creek-Buffalo-Hellroaring Unit alone.

For years this wilderness tract, with an abundance of natural forage and marshy terrain, was highly desired by moose. About 1925 they began to be seen in large numbers, and by 1935 they had increased to such an extent that the principal forage plant, the willow, was being partially killed in certain of the more heavily used winter range areas.

SUMMARY OF MOOSE CENSUS

Drainage	Male	Yearling		Calves	Total	Add. Est.	GRAND TOTAL		
		Male	Female						
Slough Creek	31	5	20	12	73	54	127		
Buffalo Forks	22	0	13	1	44	11	55		
Hellroaring	35	4	20	8	77	25	102		
	88	9	53	30	194	90	284		
Total Males		97	Total Female		67	Total Young—30		Total Yearlings	23
Sex Ratio: Female		40.25 per cent.		Male: 59.75 per cent:		Per cent of Young: 15.46 per cent.			

Procedure:

Early in June, 1942 a two-man crew started the intensive study making Eagle Creek Cabin near Gardiner, Montana, their headquarters. By using two pack and two saddle horses, they were able to make camp in different parts of the drainages and to work from these progressively. After each day's fieldwork, the route of travel taken during the day and the amount and kind of game seen was plotted on a map. A complete fieldbook was also kept which contained the following data: date and location of moose, elk, deer, bear, and grouse seen; weather and mileage records; forage utilization figures; and the size of all bear tracks measured. A rough analysis of all bear traces was made.

A total of 164 adult (40.25 per cent female and 59.75 per cent male) and 30 calf moose were seen during the summer. This figure does not include duplications. If what was thought to be the same moose was seen on more than one occasion it was not recorded. The identification of individual

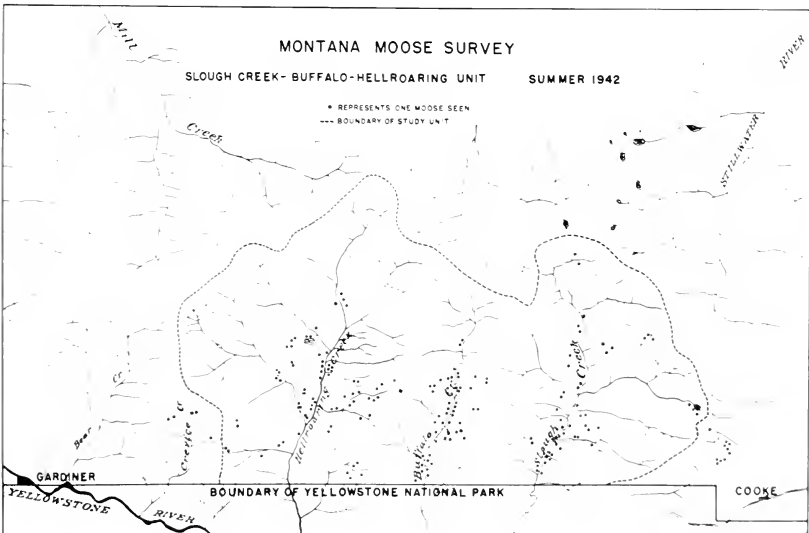
moose was fairly simple due to the wide variation of their physical features such as size and shape of antlers, size and shape of feet, and size and color variation in body form. The calving period in moose extends over a period of approximately one month, and therefore calves vary in size and color during the first three or four months of their lives. This fact helps distinguish one family group from another.

A calf crop of 15.46 per cent was found. This figure indicates that the moose are increasing normally in the area studied.

Recommendations:

Due to the surplus of bulls and the damage being done the main food species, it is recommended that a plan be put into effect which will even up the sex ratio the first year and the following years allow for a harvesting of the annual increase. In order to put the sex ratio on a 50-50 basis, the limited kill of 30 mature bulls is suggested, as shown in the following table:

Please turn to page 92



Flathead Game Management Unit

South Fork and Middle Fork Units Winter 1941-1942

Introduction:

This unit consists of the drainages of the Middle Fork and South Fork of the Flathead River. The lower portion of the Middle Fork drainage is rough, precipitous, and many snowslides occur in this area during the winter months. The upper drainage is rough to rolling, with many windswept ridges. The South Fork drainage rises from an elevation of 3,200 feet at Coram to 5,400 on the low divide at the head of Danaher Creek. The valley floor is from one to two miles wide on an average; however, it narrows to a gorge type at several points. The vegetative cover varies from mature forest to thickets of lodgepole reproduction and brush. This latter type has come in on burned over areas.

The first authentic records of elk in this unit were furnished by Colonel Seevers in 1876. He reported having killed elk near the upper end of the Spotted Bear River. The first record of elk having been killed in any number was recorded in 1911, when 115 elk were taken from this area. No detailed study was made of the Flathead elk herd until after the severe winter of 1931-32. A crew making a trip through the area in the late winter of 1932 reported many elk had winter killed. They found over 500 dead elk while traveling from White River Flat to Cayuse Creek, a distance of less than ten miles. They reported that the remainder of the herd was in very poor condition.

There is no farming or stock grazing within the unit. Logging operations on the lower reaches of the drainage have no apparent effect upon the game or winter ranges. Other than watershed, the primary value of this area lies on its recreational resources, including wildlife.

Procedure:

By November 1, 1941, all necessary outpost camps and main stations had been fully stocked with provisions and equipment. Six men conducted the survey work that was carried on continuously until May 1, 1942. One two-man crew worked the Middle Fork drainage, one crew the lower South Fork, and the third the upper South

Fork. During the six-month period, these men traveled a total of 4,106 miles over winter game ranges, the majority of this travel being on snowshoes. Because of the mild winter, light snows, and lack of heavy game concentrations, the men were required to cover much more country than would be necessary under more severe winter conditions, with elk concentrated on restricted winter range.

The census work indicated the numbers of elk in the South Fork drainage to be 2,870 and in the Middle Fork 750. The survey and classification of 119,000 acres of the 135,000 acres total winter game range rated 11,000 acres as underpopulated, 49,000 acres overpopulated, and 58,500 acres as properly used by game. The condition of the forage on the winter ranges was used as a basis for determining the above information. The heavily used areas indicated a serious amount of damage among such important species as willow, aspen, mountain maple, and even in some cases the conifers, as lodgepole pine and Douglas fir. The elk in the Flathead unit are primarily dependent upon the use of shrubs throughout the winter months, because this damage to this class of forage drastically curtails the carrying capacity of the range.

In order to obtain an appraisal of the important winter ranges in the South Fork and Middle Fork units, areas that were found to be properly utilized were used as guides in estimating the proper number of elk that should be carried on adjacent winter ranges of similar character. All of this information was summarized and the findings indicated the possibility of increasing the numbers in some portions of the range, and the necessity of decreasing in others. The final figures show that for the Middle Fork a safe stocking would be 660 elk. This closely approximated the determined number in the area. In the South Fork it was determined that the available winter forage would support approximately 1,800 to 2,000 head of elk, which indicates a desired decrease of between 800 and 900 head. For the entire Flathead unit it was determined that 2,500 head of elk would be a safe number to maintain. (Please turn to page 95)

FLATHEAD GAME MANAGEMENT UNIT

WATER-PANIC

ELK

UNDERPOPULATED

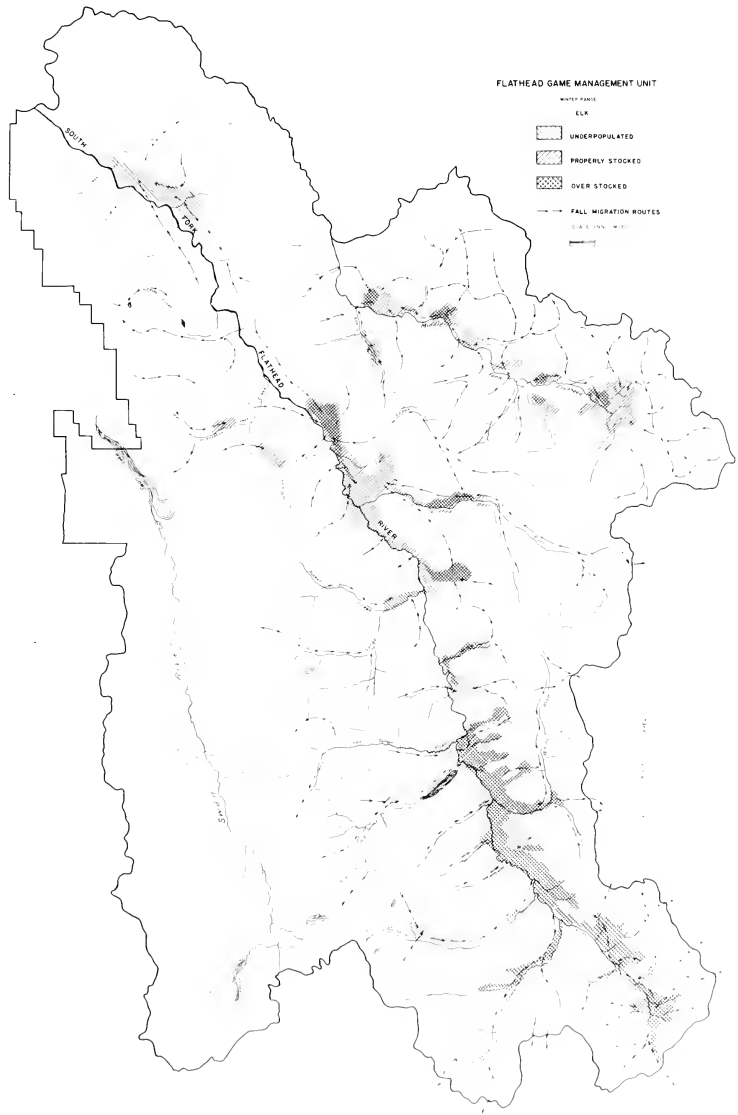
PROPERLY STOCKED

OVER STOCKED

FALL MIGRATION ROUTES

STATE ROAD

RAILROAD



Judith River Management Unit

Introduction:

The Judith River Management Unit, an area of approximately 240,000 acres, was intensively studied during the winter of 1941-42. This region is drained by the Judith River in the Little Belt Mountains. Other parts of the Little Belts, Castle and Crazy Mountains were extensively surveyed to find their relationship with the Judith River Unit.

In 1929 the Judith River Game and Bird Preserve was created. This, along with the buck law, predator control, better law enforcement, and less stock on the National Forest lands, tended to increase the mule deer population until it reached its maximum number in 1939. Due to the topography of the drainage, the deer use a limited area as winter range, part of which is privately owned land.

During 1927-28 eighty-six elk were planted in the game preserve. They had increased to approximately 275 head by 1941, not including the annual hunter harvest. During severe winter weather the elk use a small portion of privately owned land as winter range; however, the present extended season on male elk until February 28 in the Indian Hill area helps hold them on the national forest lands.

The main purpose of the study was to find the extent of damage being done to privately owned lands, and the degree of use of the forage species on the National Forest lands in the heavily populated areas. To accomplish this, an accurate census of both mule deer and elk had to be made, along with monthly inspections to determine the condition of the winter range.

Procedure:

On November 1, 1941, a two-man crew began work on this unit, using the Judith Station as headquarters. Two cabins were stocked with supplies, one on the Middle Fork and one on the Lost Fork of the Judith River. The Judith Unit was then divided into 30 range units, and each was visited for the purpose of inspecting the condition of the range and of making game counts. After this was accomplished each month, an extensive survey was made over other parts of the Little Belts, Castle, and Crazy Mountains.

The crew finished their field work the last of

April after spending approximately six months in the field. They traveled a total of 5,539 miles by car, 1,818 miles by foot, and 240 miles by horse.

Findings:

A census of 1,800 mule deer and 275 elk was made in the Judith River Unit alone. Approximately 63 per cent of the deer were found to be ranging off the National Forest on privately owned lands during the winter months. In the Sapphire Mines area the deer count averaged from 60 to 140 per square mile during this period.

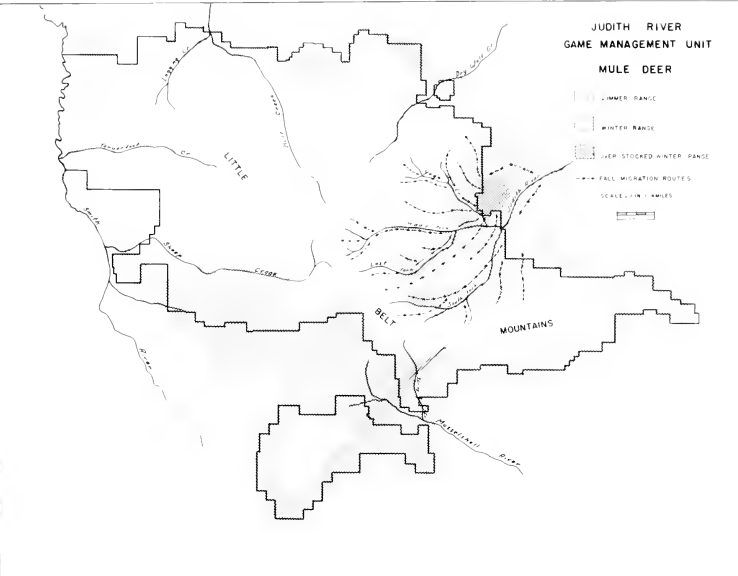
When the range livestock was removed from the National Forest lands October 15, the range was found to have been utilized 45 per cent. The first heavy use of forage by game was noticed on the lower portion of the game preserve. This was due to the congregation of deer and elk within the protected area during the hunting season. Over a period of years abnormal early use of this critical portion of the winter range, coupled with the continued use after the hunting season, has resulted in serious damage to the forage species. Several adjacent range areas were found to be under used by game. Thus the problem was found to be distinctly one of distribution.

Recommendations:

It is recommended that the present boundaries of the Judith River Game and Bird Preserve be shifted so as to eliminate the lower, heavily used portion and enlarge the upper part. This change would prevent the deer and elk from congregating on winter range during the late fall and early winter, and would thus achieve utilization of the more abundant forage at the higher elevations. Revision of the present boundary would also tend to redistribute the game to under populated game areas by changing the migration routes, and would thus enable the winter ranges within the National Forest to support a larger number of game animals than at present, without causing damage to privately owned lands.

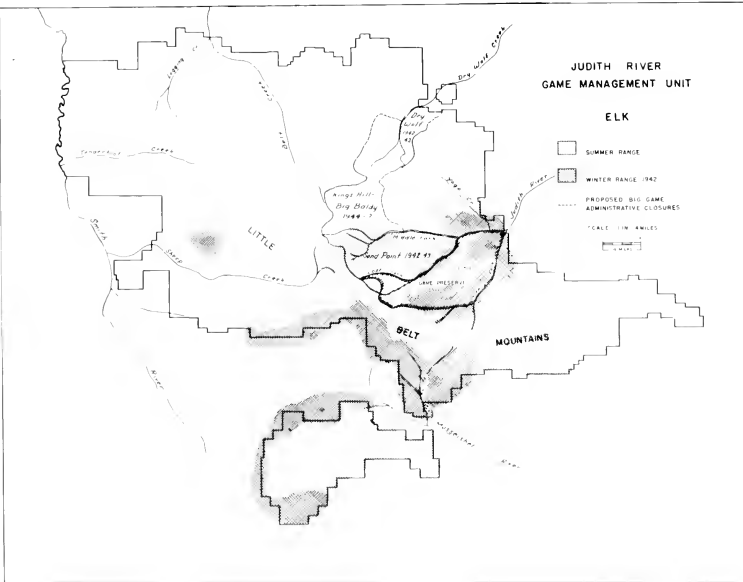
A closed area in a portion of the Dry Wolf Unit, which lies adjacent to the northern boundary of the Judith River Unit, is also recommended. The purpose of this closure would be to increase the big game population in this area which offers an abundance of winter forage. In this way a more desirable distribution of game would be achieved.

JUDITH RIVER
GAME MANAGEMENT UNIT
MULE DEER



JUDITH RIVER
GAME MANAGEMENT UNIT

ELK



Lincoln County Big Game Unit

The unit includes all of Lincoln county. Topography, climate and vegetative cover blend themselves to make this Montana's most ideal deer range. Wildlife, particularly deer, has always been plentiful. This resource has played an important part in the development of the area. The early explorers and trappers, the miners that followed, and eventually the railroad builders all depended on the wildlife for the stocking of their larders. Between 1898 and 1900, deer hides became legal tender, valued at 50c per hide, and as a result there followed a low ebb in the population of deer. Even in the latter depression years the deer of this area played an important part in the economic welfare of the community.

The period between 1911 and 1918 showed a gradual increase in the population of deer. However, it was not until after 1933 that the beginning of a remarkable build-up in their numbers became evident. The creation of the Wolf Creek Game Preserve in 1923, the adoption of

the buck law, and the creation of the Graves Creek Preserve in 1933 and the series of favorable years that have followed have been responsible for the development in this area of the greatest single herd of deer in the state.

The survey conducted by the Fish and Game Department during the winter of 1941-42 disclosed a population of 25,000 deer, 35 elk, and 98 mountain sheep. Grizzly bear and mountain goats are only represented in small numbers and are at the present on the decline, while black bear have been gradually increasing since 1923.

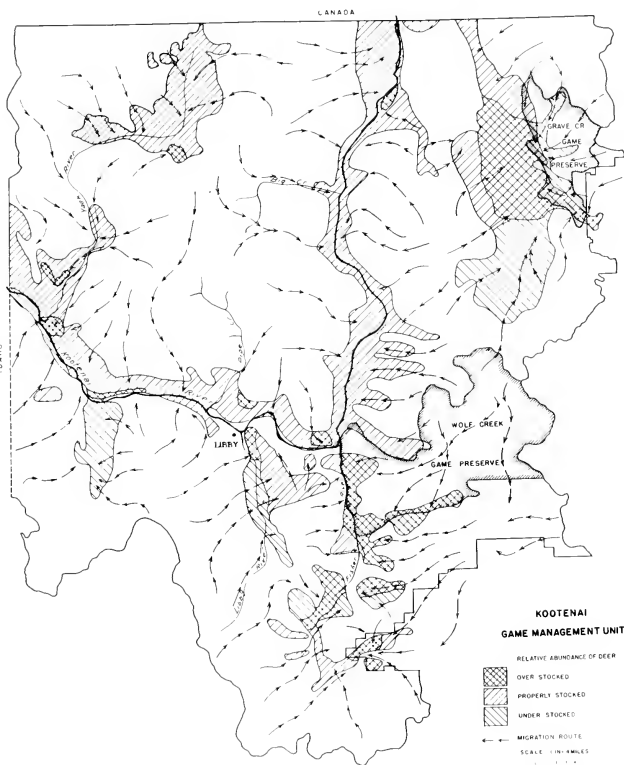
Too little is known of actual hunting pressure in this area, but whatever the losses from legal and illegal hunting, accidental and natural causes, it is known that it does not approach the annual production of deer, as is evidenced by the steady growth over the past few years.

As the amount of available winter range will always control the numbers of game animals that can be maintained within a given area, the efforts of the game studies men were confined to the 416,000 acres of principal winter range within the area. For a four-month period each year there are confined to this winter range 25,000 deer, 35 elk and 98 mountain sheep. Distribution over the whole area, as computed from these figures, indicates one deer for every 16.64 acres of winter range. Unfortunately there is not an even distribution. On the Wolf Creek-Fisher River area there were found 5,500 deer on 41,600 acres, or one deer to every 7.5 acres. A study of range conditions shows that all key species of forage plants, as well as some emergency food species, are being utilized to the point of killing. Similar conditions exist on the winter ranges in the Graves Creek area. The number of deer in these two areas has increased beyond the carrying capacity of the forage. Other units of range, as shown on the map, are either understocked or considered to be properly stocked.

In making recommendations for management of this unit, it is realized that a considerable amount of factual material is still needed. Such management as is recommended at this time will not go beyond that which can be substantiated by the investigative work carried out in the area. The present as well as the future proposed management practices will be directed toward (1)

(Upper) Mule deer fawn of the previous spring.
(Lower) The Franklin's Grouse, or fool hen, is more abundant in Lincoln County than anywhere else in the state.





the relief of the present overstocked portions of the area; (2) to effect a distribution of game animals into understocked areas, and (3) the optimum production of game animals over the entire area consistent with demand for game and the continued vegetative productivity of the ranges.

In order that a more desirable distribution of deer may be obtained in the Wolf Creek area, it is recommended that the boundary of the pre-

serve be shifted to embrace an adjoining understocked unit of comparable size to the north of the present closure.

A detailed salt distribution plan has been developed and is being carried out. The presence of salt on the higher ranges will tend to draw deer from the natural licks located on winter ranges and thus relieve the present prolonged use of these vitally needed areas.



Mountain goat. A fine billy taken in the Bitterroot range.

—Photo by Elkhorn Ranch

Bitterroot Deer and Elk Survey

WINTER OF 1941-1942

The Bitterroot winter big game survey was originally intended to cover all of the mountainous portions of Ravalli County. The unit was bounded by the Rock Creek and Sapphire Ranges on the East and South, and the steep, jagged Bitterroot Range on the West. For convenience in the development of management plans, the area was divided into four units; these may be described as follows:

1. The East Fork Unit. This includes the entire drainage of the East Fork of the Bitterroot River and Rye Creek.
2. The Skalkaho Unit. The ranges lying between Rye Creek and Willow Creek make up this area.
3. The Burnt Creek Unit. This includes the game ranges lying on the west slope of the Sapphire Range between Willow Creek and the county line.
4. Bitterroot Range Unit. The West Fork of the Bitterroot River drainage, as well as the Bit-

terroot Range lying between the valley and the Idaho line, make up this large unit.

It was found that a detailed coverage of the area by a two-man crew would be impossible. As units (1) and (2) presented the most urgent problem, a majority of the time was spent in these two areas. Detailed observations were made of the migration of both deer and elk from their summer to their winter ranges. After the game had settled down on their winter ranges, a coverage was made every two weeks to obtain information concerning numbers of game animals, sex ratios, percentage of young, losses, and winter range conditions. The following is a brief summary of the information obtained from the winter's investigations.

East Fork Unit

(a) The winter range as a whole is not yet seriously overused. However, damage to important browse species by game animals, coupled with increased use of hay stacks and cultivated fields, indicates that the saturation point has been reached.

(b) One of the most important limiting factors to further expansion of the game herds in this area is the fact that the majority of the vital winter range is either privately owned or leased.

(c) The use resulting from the presence of approximately 1,700 deer and 850 elk, in addition to the summer use by domestic livestock on the 23,000 acres of critical winter range, was found to be too heavy for continued productivity.

(d) It was agreed that the range would support a deer herd of 1,250 animals and 650 elk, plus the present use by domestic livestock.

(e) After the game herds have been adjusted to the carrying capacity of the winter range, an annual kill of 120 elk and 200 deer could be maintained.

Skalkaho Unit





(a) It was found that the present number of 675 elk and 575 deer does not overstock the range.

(b) The summer distribution of game, particularly elk, was found to be undesirable. Much of the forage on critical winter ranges was being used during the summer months.

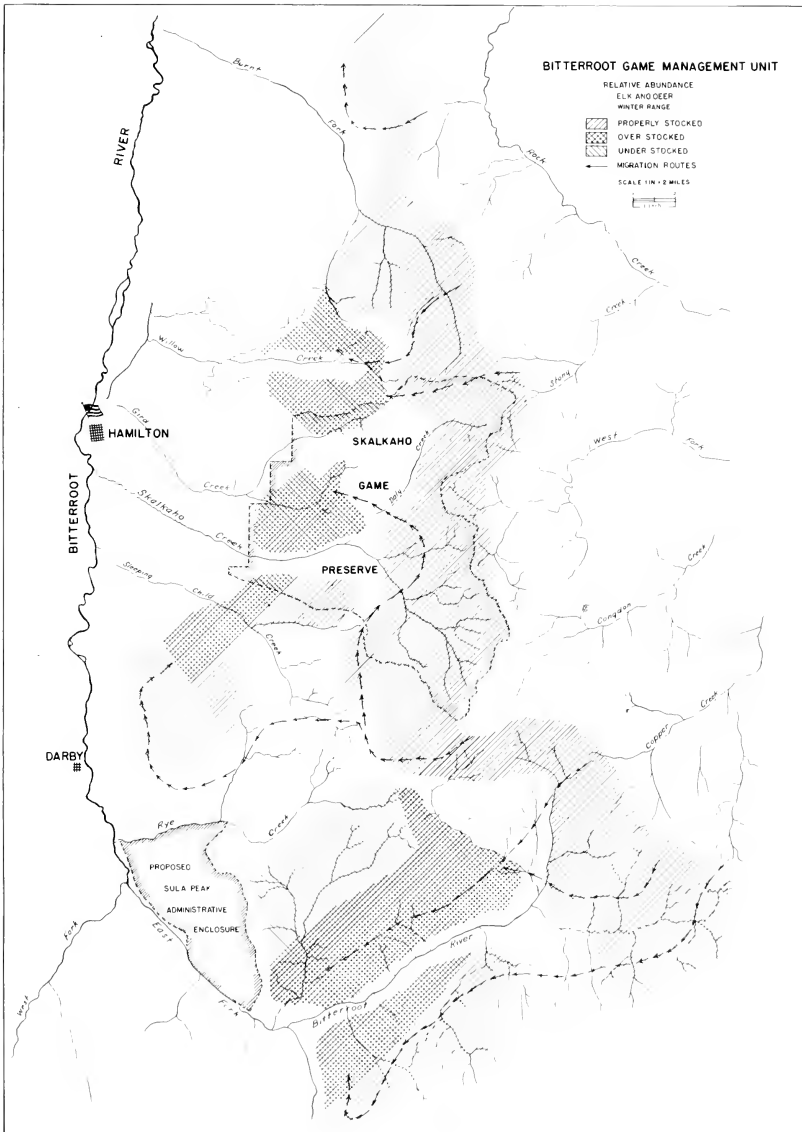
(c) Present use of private lands by elk does not present a serious problem. These ranges are
(Please turn to page 94)

BITTERROOT GAME MANAGEMENT UNIT

RELATIVE ABUNDANCE
ELK AND DEER
WINTER RANGE

-  PROPERLY STOCKED
-  OVER STOCKED
-  UNDER STOCKED
-  MIGRATION ROUTES

SCALE 1 IN = 2 MILES



Fish Creek-Thompson River Unit

WINTER 1941 and 1942

The Fish Creek-Thompson River Game Management Unit lies in western Montana and includes all of the Cabinet and a portion of the Lolo National Forests. The unit boundaries, starting at Missoula, extend south to Lolo, Montana, thence in a westerly direction following Lolo Creek to the Montana-Idaho divide, thence in a north-westerly direction along the State divide to Divide Peak, thence north to Scotchman Peak, thence in a general eastern and southeasterly directly along the Sanders-Lincoln county line to Crystal Lake, thence to Meadow Peak and McGregor Peak, thence in a southeasterly direction along the Indian Reservation line to Grant Creek, thence south to Missoula, point of starting.

The terrain is largely mountainous, consisting of the Bitterroot range, the Couer d'Alene and Cabinet mountains. Timber types are generally yellow pine on the south slopes, Douglas fir on the north slopes, and lodgepole in the bottom areas. The principal browse species are redstem and evergreen *Ceanothus*, serviceberry, mountain maple, and willow. Cheat, bunch grass, and fescue make up the dominant grass coverage, and associated with these low growth forms are kininnick, elk sedge, and Oregon grape.

Climatic conditions are fairly uniform over the area at comparative altitudes, with snow depth ranging from 0 to 12 inches on the south slopes to four feet on the north slopes at the elevations used by big game.

Mule deer on typical winter range in Fish Creek drainage. The Mountain Boim (*Ceanothus velutinus*) which may be seen in the foreground is a very important source of winter browse for deer.

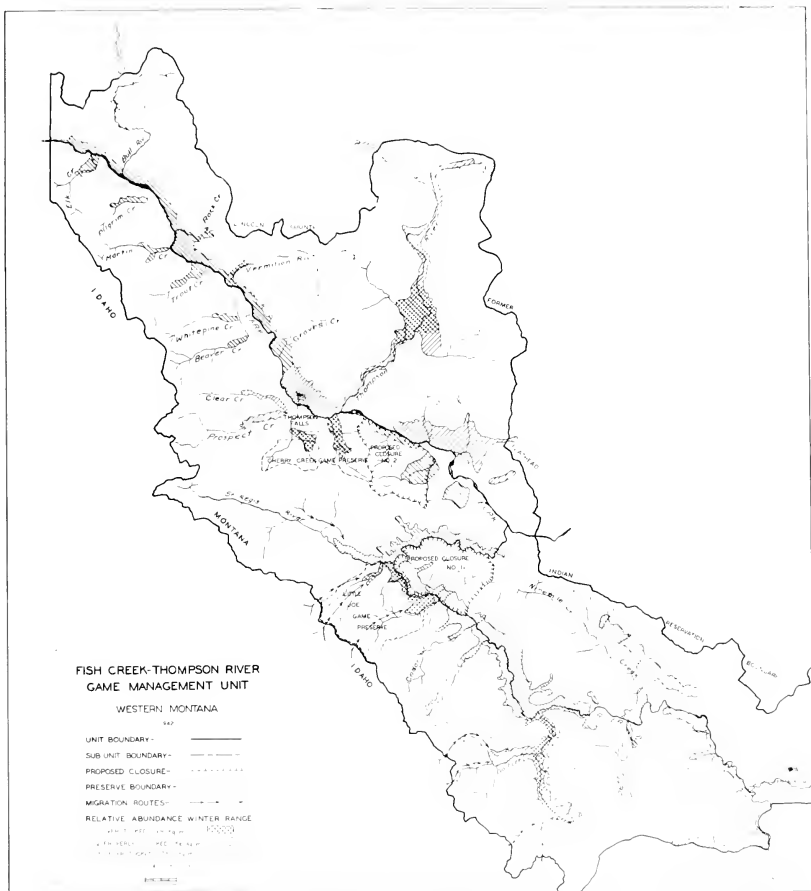
The management unit comprises an area of about 4,000 square miles which is reduced to 480 square miles of usable big game winter range. Of the available winter range, 256 square miles was found to be under used by game, 156 square miles properly used, and 69 square miles heavily used.

The principal game management problem is one of redistribution, the objective being to lessen the use on the heavily used areas and build it up upon the under used sections. It is thought that this may be brought about by carefully controlled hunting, supplemented by proper and adequate salt distribution. Within the entire unit, four areas were found that presented particular problems. These were the Fish Creek, Little Joe, Thompson River, and Cherry Creek winter game ranges.

The **Fish Creek** area was found to have a game population of approximately 1,600 mule deer, 1,200 white tail deer, and 90 elk. The mule deer winter range was found to be adequate and would support up to 1,600 deer. The whitetail range was much more restricted. Due to the lack of this particular type of range, it was felt that to avoid heavy winter losses the number of whitetail deer to be maintained year after year should not greatly exceed 500 head. A salting plan was drawn up and is being put into effect. The presence of adequate amounts of salt upon the summer ranges will tend to draw the game up off the badly needed winter range as quickly as possible in the spring, and hold them in the higher ranges later in the fall.

The most urgent problem found in the study of the **Little Joe Game Preserve** was one of redistributing the present heavy mule deer population in order to build up their numbers in adjoining districts and to prevent further undesirably heavy use of the available winter range. Only 2,500 acres of the total of 65,000 acres were found to be available to the deer during the winter months. The foraging activities of the 2,600 game animals have resulted in damage to the range due to heavy use of browse plants upon exposed sites. It was further indicated that the deer population upon the preserve had not materially increased during the past seven years.





The investigation brought out the point that this heavy use of vitally needed winter forage could be remedied by shifting the boundary of the present game preserve to embrace a neighboring understocked area of comparable size.

The **Thompson River** winter game range consists of the entire drainage of the river from Thompson Lake to the Clark's Fork River. The

principal game species is the whitetail deer; there are only a small number of mule deer and elk in the area. The census work showed that approximately 2,600 whitetail deer were wintering upon a restricted range of not over 12,500 acres. Only a small percentage of this area (approximately 500 acres) produces a substantial amount of important browse plants.

Every effort should be made to conserve forage on the winter range for use during the critical periods. The two natural licks on the Thompson River winter range should be fenced. Deer use these licks heavily in the spring and to a lesser extent during the summer and fall. This use keeps game on the winter ranges when they should be on the adequate summer range. A salting plan has also been worked out to aid in drawing the deer off their winter range. For this reason the plan calls for the plant of salt on the ridges and passes away from the areas used during the winter months.

The present average take by hunters of 200 bucks a year is thought to be adequate.

The use of critical winter range areas by game should be given careful consideration in the formation and correlation of land use plans for this area.

A careful investigation of the **Cherry Creek Game Preserve** indicated that only a small number of areas within its boundary show evidence of heavy use by game. Of the 35,000 acres in the preserve, about 9,600 acres constitute winter range. Past records indicate that for several years the game population has fluctuated but little.

The need for a revised salting plan is evident. In several cases salting in the past had been carried out upon portions of the winter range. The new plan calls for salt placements to be made only on the high summer ranges. This area is quite accessible by mountain roads. If the game population builds up to a point where it becomes injurious to its own food supply, it may be easily controlled by a limited amount of hunting.



A mule deer fawn a few hours old. The pattern of white spots blends harmoniously with the lights and shadows of the forest floor. This, coupled with the fact that these little fellows are almost, if not entirely, odorless, is an important protection from roving predators.

Gallatin Management Unit

Introduction:

The area included in this unit lies on both sides of the upper reaches of the Gallatin River. The principal winter range includes a total of approximately 60,000 acres and extends 20 miles down the Gallatin River from the Yellowstone Park boundary.

Historians differ as to the origin of this elk herd, but the consensus of opinion is that the remnants of elk that survived the early day plains hunter adapted themselves to the mountainous environment.

According to Mr. C. K. Skinner of the Park Service, elk were scarce in Yellowstone Park up to 1890, after which they began to increase in numbers. In 1908 the records indicate that winter storms and deep snows in the park drove large bands of elk into the valleys of the Madison and Gallatin Rivers.

Between 1890 and 1906 the present winter elk range was grazed heavily by range livestock. In 1908 the first area in Montana to be set aside for big game was closed to grazing by the Forest Service. This game range was located on the Bacon Rind, Snowslide and Monument Creeks of this winter area. Heavy stocking continued over other portions of the range, however, until 1917. Since 1917 the numbers have been gradually reduced. The result has been the removal of the serious conflicts on the winter elk ranges.

The principal problem as regards management of elk in this area is primarily one of distribution. That is the prevention of undesirably heavy concentrations on relatively small areas during the winter months. The number of elk that this unit will support year after year is of necessity limited. One of the specific objectives of the winter's investigation was, therefore, the determination of the carrying capacity of these winter ranges.

Procedure:

On November 15, 1941, a two-man crew started the investigative work that was carried on continuously until April 30, 1942. Headquarters was at the Cinnamon Station, which is situated in the approximate center of the winter range area. Field stations at convenient intervals

were stocked early in the fall. The 60,000 acres of winter range was covered twice each month by horse as long as snow depths permitted, after which coverage was made on foot with the aid of snowshoes or skis.

Findings:

The attached map shows the extent of the average winter range. By the appropriate symbols are shown areas of heavy use, under use, and those ranges that are considered to be properly stocked with game animals. A survey to eliminate portions of the winter range that were found to be nonusable because of barren rock, heavily drifted snow, cliffs, or other reasons, resulted in a reduction of the available range on an average winter to 41,830 acres.

The Key Area—Key Species method was used in determining the desirable carrying capacity of the winter elk range. By this method the use made of the most important forage plants on typical portions of the various units of the winter range was used as an index to the number of elk the area as a whole would support throughout the critical winter months. In this way it was determined that the Gallatin unit would support approximately 2,000 elk.

The census for 1941-42 placed the total number in this herd at approximately 2,500 head. From 875 identified animals of breeding age a sex ratio of one bull to 6.4 cows was determined. Of the total herd, 57.3 per cent were cows (including yearlings), 19.3 per cent were bulls, and 23.4 per cent were calves. This year's study indicates an increase of 620 animals over the number determined in the area the previous year.

The dates of migration from the summer range in the park to the Gallatin winter range appear primarily controlled by weather conditions. During the average year it has been found to begin during the latter part of September. By October elk have been observed in migratory herds in the park area from Daily Creek to the headwaters of the Gallatin River. Their travel to the winter ranges follows well established migration routes. The presence of hunters along the boundary of the Gallatin Game Preserve has acted as a check to this natural drift. This has

in the past created a concentration of 1,000 to 1,500 elk on the vital winter ranges of the Tepee and Daily Creeks, preventing a normal distribution and utilization of the ranges of the lower country. The attached map shows this area of heavy use. On the upper Gallatin, in the vicinity of Tepee Creek, there is marked evidence of over-utilization of forage by elk during winter months. In this area most of the Key-Species have been used very heavily, and some to the point of killing. Early stages of erosion are evident on the west and south exposures of the hills in the lower Tepee, Daily and Black Butte Creeks.

Conservation Committee for the Upper Gallatin Water Shed

In February, 1932, a group of men interested in this particular game problem, and representing the Montana State College at Bozeman, Bozeman Chamber of Commerce, Forest Service, National Park Service, Sportsmen's Organization, Dude Ranches, State Game Department, Stockmen and the Northern Pacific Railroad, were called together by Fred B. Williams, president of the Bozeman Rod and Gun Club, to correlate the sev-

eral uses being made of the winter range of the Gallatin elk herd. Out of this group there emanated the Conservation Committee of the Upper Gallatin Watershed. (When it was created, the Junior Chamber of Commerce was also included in the group.)

The members of this committee have traveled on horseback twice each year over the principal winter elk ranges. As a result of these inspection trips, a definite set of recommendations has been drawn up and submitted to the Fish and Game Commission. The aid and cooperation given by this group has been greatly appreciated.

Recommendations:

(1) That the number of elk using this winter range should be maintained at approximately 2,000 head.

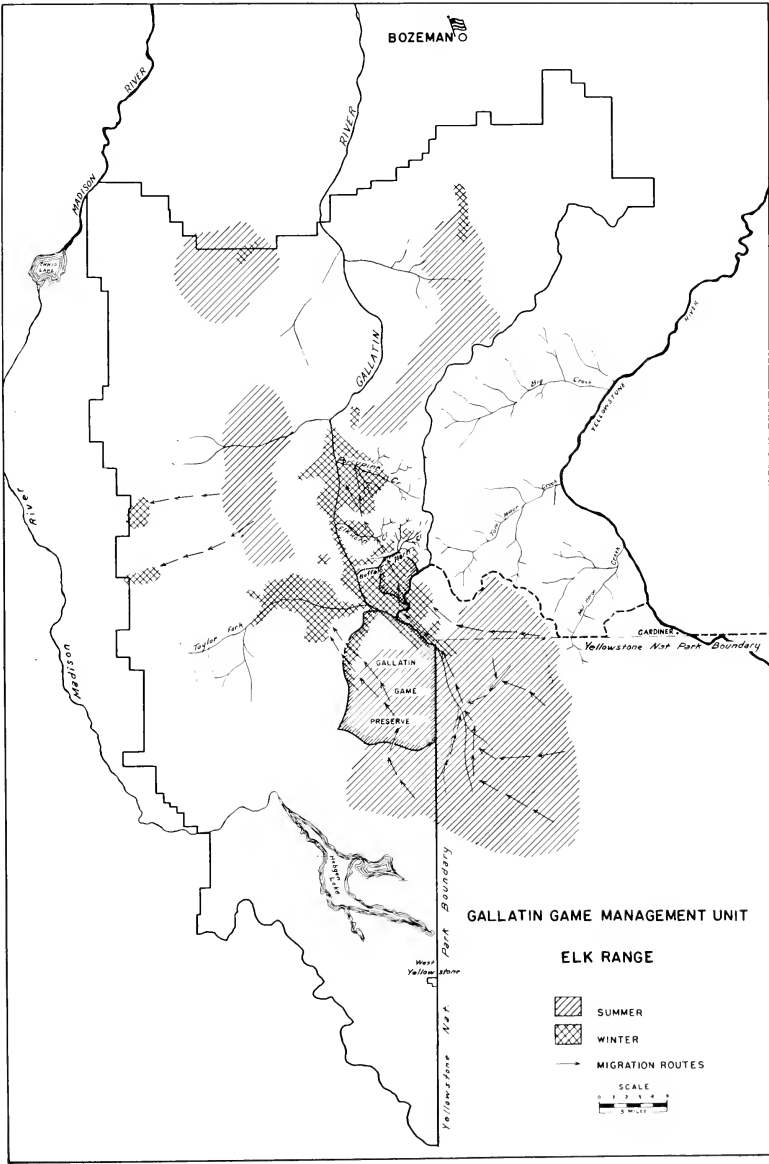
(2) That the Squaw Creek Checking Station should be maintained in order that accurate data may be kept on the kill by hunters. It is further recommended that an annual field check be made during the most desirable winter period.

(Please turn to page 95)



This yearling mule deer buck seems very proud of his first antlers. The single spikes as shown in this picture are rather rare in this species in Montana. Small two-point heads are far more common for the first set.

BOZEMAN



GALLATIN GAME MANAGEMENT UNIT

ELK RANGE

-  SUMMER
-  WINTER
-  MIGRATION ROUTES



Sun River Game Range Area

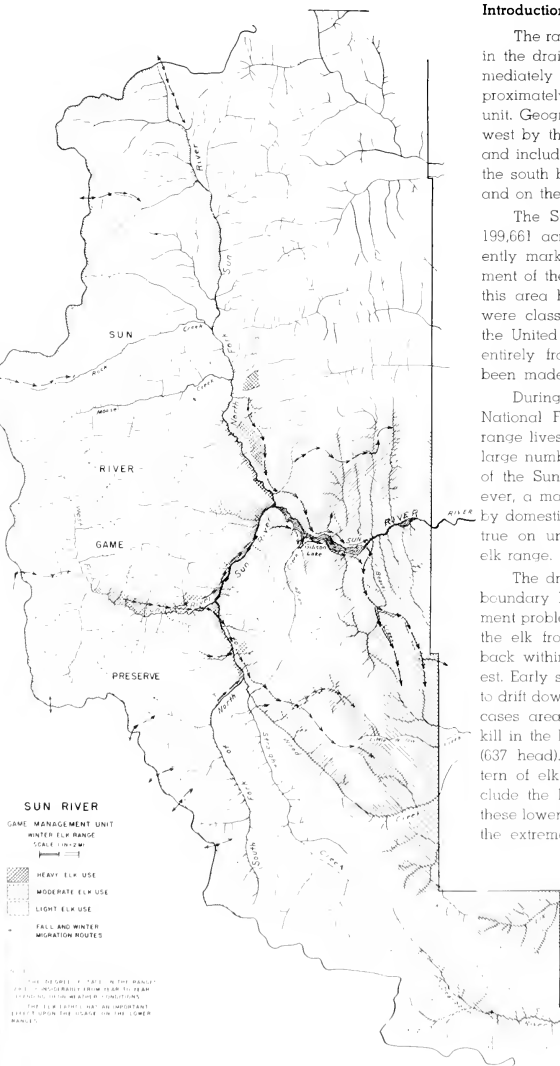
Introduction:

The range of the Sun River elk herd lies within the drainage of the upper Sun River and immediately adjacent drainages. An area of approximately 600,000 acres is included within this unit. Geographically, the area is bounded on the west by the Continental Divide, on the north by and including the drainage of the Teton river, on the south by the drainage of the Dearborn river, and on the east the prairies.

The Sun River Game Preserve, comprising 199,661 acres, was created in 1913. This apparently marked an important step in the development of the present elk herd. By 1920 the elk in this area had increased so markedly that they were classed with the more important herds in the United States. The Sun River elk developed entirely from native stock. A plant has never been made in the area.

During the period prior to the creation of the National Forests and for some time thereafter, range livestock, both cattle and sheep, grazed in large numbers over the more accessible portions of the Sun River ranges. There has been, however, a marked reduction in the use of this area by domestic livestock. This has been particularly true on units found to be important as winter elk range.

The drift of elk into areas outside the Forest boundary has presented an important management problem for a number of years. Prior to 1925 the elk from the Sun River herd wintered well back within the boundaries of the National Forest. Early severe fall storms that year caused elk to drift down onto lower ranges, reaching in some cases areas outside the Forest. The first heavy kill in the history of the herd took place that fall (637 head). During subsequent winters the pattern of elk migration definitely expanded to include the lower and foothill ranges. The use of these lower ranges by elk reached its peak during the extremely severe winter of 1929-30.



Control measures were inaugurated soon after the drift to outside ranges set in. This consisted of actual patrol work. The men engaged traveled on horseback, on snowshoes and on foot. The objective has been to keep the main body of the elk herd within the Forest boundary during the winter months.

The success of the patrol work has increased markedly throughout the years. A lack of man power was a definite handicap until the winter of 1938-39. The work that winter marked the beginning of an intensive patrol. This type of work has been carried on each winter since that time with a marked degree of success.

Procedure:

Last winter's big game work on the Sun River area extended from November, 1941, to April, 1942. The two fieldmen made their headquarters at Hannan Station on the lower Sun River Canyon. Other field stations were used as stop-over camps on the regular trips throughout the winter game ranges. During the winter the crew traveled approximately 1,140 miles on foot and snowshoes and 724 miles on horseback. The winter ranges were covered once each month.

A detailed record was kept concerning each day's observations. This included census figures, range conditions, feeding habits, and movements or migrations of game animals, as well as information pertaining to disease and parasites and other information considered important phases of the life history of the Sun River elk herd.

Findings:

Weather conditions on the Sun River game range during the past winter apparently varied in no important respect from normal. The movement of elk beyond the Forest boundary was very light. The State elk patrol was successful in checking this drift.

The most heavily used winter elk range was found in the lower West Fork of the Sun River within the Game Preserve boundary. Heavy use occurs during late fall in this area. The elk are held back by hunters along the lower margin of the closed area, and at the same time are pushed down out of higher ranges by deepening snows. Elk use this area very heavily during the spring and early summer. The large natural lick near the mouth of the West Fork tends to hold large numbers of elk on these lower ranges when they should be drifting onto the high summer ranges.

Limited areas on the North Fork of the Sun River range receive heavy elk use during the spring months. This type of usage is confined to the most exposed slopes, as well as areas within the proximity of natural licks.

(Top) Looking south along the Chinese Wall from Larch Hill Pass. This escarpment extends for many miles along the Continental Divide between the Sun River and Flathead. It is 700 to 1,000 feet in height. Elk are able to cross at only a few high passes, and these are blocked by deep drifts during the winter months. (Middle) A migrating herd of elk on one of the high passes. (Bottom) Loading 50-pound blocks of game salt at Augusta in preparation for distribution by airplane.



Census work carried on during the past season indicates that between 2,500 and 2,600 elk wintered in the Sun River area. The age class distribution, as based upon positively identified animals, showed that 27 per cent were calves of the previous season. This figure indicates a high rate of increase for the herd.

Two distinct phases of migration have been found to occur in connection with the Sun River elk herd:

1. Migrations from one portion of the Sun River drainage to another. These movements are motivated by a desire for forage. During the winter months, distinct routes are followed as the elk move from the deep snow of the high ranges onto areas where food is more available.

2. Migrations in and out of the Sun River proper. The past year's work, as well as previous surveys and observations, have pointed toward a relationship between the Sun River and Flathead elk herds. Use by elk of the passes along the Continental Divide was first noticed in 1917. The volume of this movement has apparently increased markedly since that time. It appears that the early hunting season throughout the headwaters of the South Fork of the Flathead has been an important factor in causing a movement of elk into the Sun River during the early fall. Observations further indicate that the majority of the elk that move into this Sun River, winter there. It is thought that this movement of elk from the Flathead has been an important factor in maintaining the number of elk on the Sun River ranges.

Work in the field, both during the fall and spring, has shown that the most important elk passes along the Continental Divide are the following:

1. Indian Creek-Molly Creek Pass.
2. Larch Hill-White River Pass.
3. Lick Creek-Hart Creek Pass.

An analysis of the number of elk killed by hunters for each season since 1910 indicates that weather has been the most important single factor in determining the volume of kill. Severe fall storms have tended to move the elk out of the more remote ranges into areas where they may be reached by hunters. Checking station records covering the past 11 years are listed in the following tabulation:

Elk Killed by Man in Sun River Area In Last 11 Years

Year	Kill	Year	Kill
1932.....	642	1937.....	505
1933.....	200	1938.....	1,000
1934.....	187	1939.....	200
1935.....	266	1940.....	600
1936.....	200	1941.....	1,100
		1942.....	1,108

Recommendations:

(a) The number of elk in the Sun River herd should be maintained at between 2,000 and 2,500 head. This is based upon the estimated carrying capacity of the available winter range within the National Forest boundary.

(b) The problems of heavy vegetative use in the Sun River area are local in character and due primarily to faulty distribution. Every effort should therefore be made to achieve the proper distribution of the elk herd.

The placement of salt on game ranges has been found to be an important factor in drawing elk into desired areas. An intensive salting program has been developed for the Sun River. The salt plan calls for placement in strategic areas at intermediate and high elevations. The following objectives were kept in mind when the plan was drawn up:

All salt should be placed above the winter ranges. In this way, elk would be drawn up off important winter ranges as soon as possible in the spring of the year and kept off until late in the fall. As a result the maximum amount of forage would be reserved on ranges available to the elk during the critical winter period. The developed plan also takes into consideration the relief of heavy concentrations about natural licks. It has been found that salt, properly placed and available during the spring and early summer months, has the desired effect of attracting elk away from natural licks.

In the light of the above described objectives it is recommended that the intensive salting program inaugurated three years ago be continued.

A field check was made during the past summer to determine the results of the distribution of 11,700 pounds of salt by airplane on June 18, 1942. The salt visited during this check indicated that

(Please turn to page 96)

Big Game Surveys, Winter 1942-1943

SWAN VALLEY UNIT

Large portions of the Swan Valley have been logged off at various intervals in the past. Much of the cut over area now supports a heavy growth of willow, as well as conifer reproduction. The abundance of browse species has no doubt been responsible for a rapid increase in the numbers of whitetail deer in the area. Much important information is needed in regard to the actual numbers of deer now inhabiting the area, the effect of predators, carrying capacity of the available winter ranges, as well as other important facts pertaining to the well being of the game animals in the area.

BIG BLACKFOOT UNIT

The work in this area will be conducted on the drainages of the Big Blackfoot and Clearwater Rivers. As with the Swan unit, this is primarily a deep snow country. Winter ranges are of necessity restricted. Willow and other important browse species make up an important share of the critical winter forage. The principal big game species is the whitetail deer, although mule deer and elk are also found within the unit. There appears to be an interesting relationship between portions of this range and the Danaher range on the upper South Fork. An interchange of elk has been noted. The same type of information is necessary as that described under the discussion of the Swan Valley unit.

Comparatively little has been known up to this time concerning game conditions on both of these big game ranges. A fund of reliable information is therefore essential in developing the wildlife resources on both these units.



MADISON VALLEY UNIT

The two man crew assigned to this unit will cover not only the Madison but also the Gravelly, Ruby and Tobacco Root ranges. The present information pertaining to game conditions in this area is very inadequate. It is particularly important to determine the affect the kill of doe deer, allowed upon a portion of this unit, has had upon the distribution, numbers and sex ratio of game in that area. This kill was found necessary as a control measure in preventing damage to private property that had resulted from concentrations of mule deer on several restricted ranges. The past open season on both sexes in the area resulted in a kill of 255 deer, of which 115 were bucks and 140 does.

Small numbers of elk, mountain sheep and moose also inhabit the area.

Snow blowing from the crest of Sawtooth Mountain, Lower Sun River Canyon. On many winter game ranges strong winds play an important part in moving the snow from exposed side hills and ridge tops, thus creating vitally needed feeding areas.



Eastern Montana Big Game Survey

A decided lack of information exists concerning the possibilities of big game development on the eastern half of the state.

In order that this type of work might be carried on wisely and with due regard to other land uses, a man was assigned to the area in the fall of 1942. His job has been to inspect the ranges upon which either deer or antelope or both may be developed in substantial numbers. Plans for the trapping of deer from overcrowded ranges in the western portion of the state, and the transplanting of these animals upon desirable ranges in eastern Montana, is an important phase of the work being outlined. The possibility of reintroducing mountain sheep in the breaks along the Yellowstone and Missouri is also being investigated.

Strategic locations for closed areas are being mapped out. It is felt that a pattern of carefully selected sanctuaries will aid materially in the development of the big game resources on that vast area.


Antelope Survey

During the summer of 1941 six men made a systematic coverage of all counties where antelope are now found. This survey was incidental to the regular upland game bird investigation, but since in their work it was necessary to cover all of the areas in which antelope are found, the men were instructed to obtain the numbers of antelope and map their present range. The data was recorded progressively as the work advanced through the counties. The map included in this report indicates their present range. Counties in which the heaviest concentrations of antelope were found during the summer of 1941 were: Carter, Stillwater, Powder River, Choteau, Musselshell, Hill, Golden Valley, Wheatland, Custer and Cartfield.



Time did not permit intensive studies relative to their life history, sex ratio, per cent of young, condition of range, or conflict with other uses of the lands. The result of the survey, however, does indicate that Montana now has approximately 14,000 antelope which are distributed throughout the eastern and central section of the state.

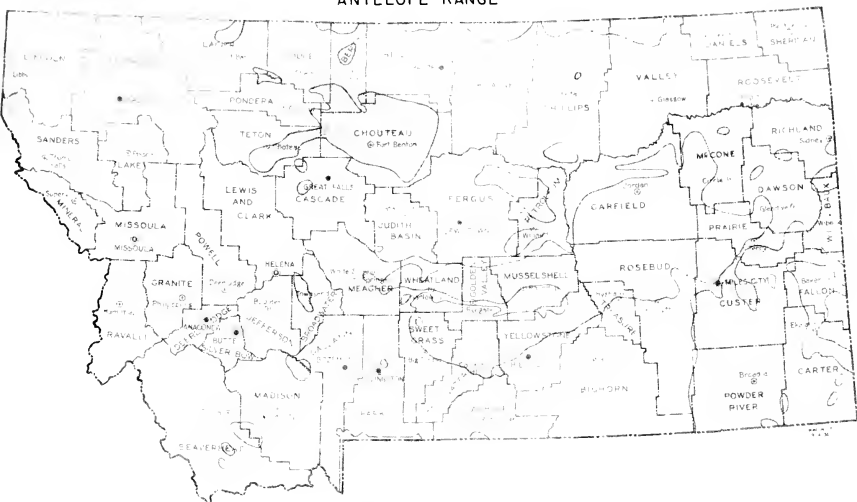
Under ideal conditions and complete protection, antelope will increase approximately 25 per cent annually; that is, antelope possess the highest potential rate of increase of any of our big game species. A general open season would prove fatal to numerous small herds. The only safe way of harvesting the surpluses from desired areas would be to permit only a given number to be taken from certain carefully designated localities. Because of the limiting factors controlling the maximum numbers of antelope that can be raised, and the comparative ease with which this species may be killed by hunters, it is doubtful if it will ever be possible to harvest a crop of antelope in any other way. The limited license system has worked out very satisfactorily in the hunting of antelope in neighboring western states.



The antelope has increased rapidly throughout many portions of eastern and central Montana.

Photo by Bob Fletcher

MONTANA.
ANTELOPE RANGE



MONTANA.
ELK RANGE



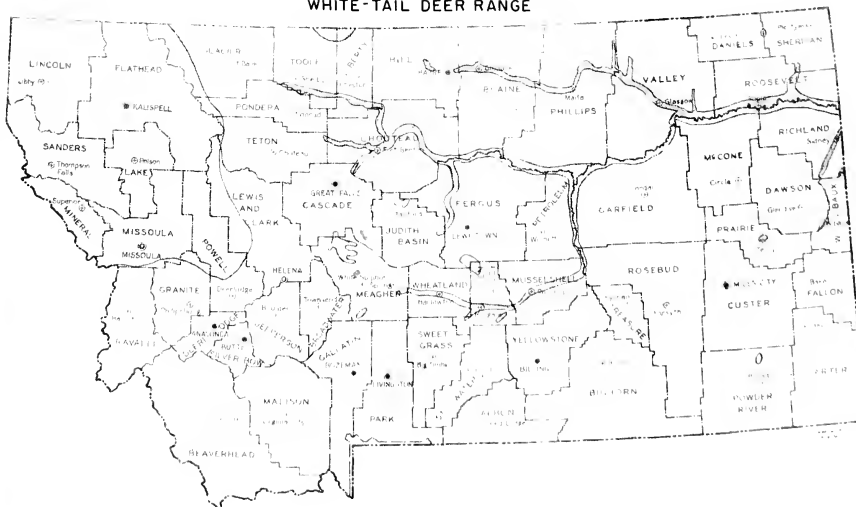
MONTANA.

MULE DEER RANGE



MONTANA.

WHITE-TAIL DEER RANGE



Big Game Development

The introduction of game animals into desirable new ranges and also their reestablishment in areas where they were once found are important phases of wildlife development work.

The planting of elk has been an established practice in several states, including Montana, for many years. There are very few remaining areas, however, where these animals may be introduced without serious conflict with other land uses. Interest has for that reason shifted to the planting of other game species such as mountain goats, mountain sheep, deer, and antelope.

Trapping and Transplanting Mountain Goats and Mountain Sheep

The present, as well as the historic, mountain goat range is quite limited in Montana. It is found along the Continental Divide and on several of the higher ranges to the West. There are a number of areas located in the mountainous portions of central Montana which present apparently ideal goat range but upon which no mountain goats are found. It is desirable, therefore, to introduce goats into these ranges.

A mountain goat nanny and her kid of the previous spring, the Deep Creek pen.



The picture has been different with the mountain sheep. They were at one time abundant over a large per cent of the mountainous portion of the state and also out along the breaks of the Missouri and its tributaries. Due to excessive hunting, the bands were greatly depleted in the early 1900's. The majority of the remainder have dwindled during the intervening years until now they are represented by only a scattering of small isolated bands.

The transplanting of mountain sheep into ranges where they were once abundant is a logical step toward the ultimate reestablishment of this species. This program also calls for the interchange of several rams. It is hoped in this way to introduce new blood among these small isolated bands and thus to determine whether inbreeding may be a factor in holding down the mountain sheep population.

Procedure:

In trapping both mountain goats and mountain sheep, a woven wire pen was used. This was forty-five feet long, twenty-five feet wide, and eleven feet high. The pen was baited with common stock salt. A gate was used which could be tripped 300 yards away from the trap.

The capturing pen for mountain goats was located in the main Rocky Mountain range west of Choteau. The first attempt to trap and transplant was made in April, 1940. The Fish and Game Department was reimbursed for half the expense of this project by the Big Timber Rod and Gun Club. Ten goats were captured and transplanted to the Sweetgrass Canyon of the Crazy Mountains in Sweetgrass county. There

is no record of goats having previously inhabited this rather isolated range; the topography and vegetative composition, however, appear ideal for this species. Two additional yearling billys were moved to the small herd in the Benchmark area.

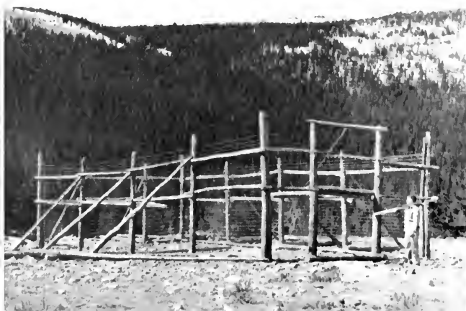
MOUNTAIN GOATS PLANTED IN THE CRAZY MOUNTAIN AREA

Tag No.	Date Planted	Sex	Age	Weight	Where Placed
	4-14-41	Male	3 yrs.		Sweetgrass Canyon Crazy Mountains
	4-14-41	Male	1 yr.		" "
	4-14-41	Female	4 yrs.		" "
	4-14-41	Female	3 yrs.		" "
29201	4-24-41	Female	4 yrs.	141	" "
29202	4-24-41	Female	1 yr.	47	" "
29203	4-27-41	Male	1 yr.	55	Benchmark Area Sun River
29204	4-27-41	Male	1 yr.	60	" "
29205	4-24-41	Female	4 yrs.	104	Sweetgrass Canyon Crazy Mountains
29206	4-24-41	Female	2 yrs.	68	" "
29207	4-24-41	Male	3 yrs.	112	" "
29208	4-24-41	Male	2 yrs.	90	" "

During the spring of 1942 twelve mountain goats were captured in the same pen. They were transported to the Beartooth Mountains and released near the mouth of the Lake Fork of Rock Creek just west of the Red Lodge-Cook City highway. Topography is similar to the ranges along the Continental Divide where goats are now found. Elevations run from 4,500 feet in the foothills up to 12,850 feet on Granite Peak, the highest mountain in the state. It is thought that the long distances separating the Beartooth Range from the areas in which mountain goats are found have prevented a natural drift.

The following tabulation lists the information concerning the Beartooth plant:

A mountain goat capturing pen located on a high bench within the Deep Creek drainage west of Choteau.



The first catch, a mature billy, two nannies and a 10-month old kid.



**MOUNTAIN GOATS PLANTED IN
BEARTOOTH RANGE**

Tag No.	Trap	Date Trapped	Date Liberated	Sex	Age	Wt.
8	West of Chateau	3-31-42	4-10-42	Female	1 yr.	48
9	"	3-31-42	4-10-42	Male	3 yrs.	170
10	"	3-31-42	4-10-42	Female	6-8 yrs.	144
11	"	4-8-42	4-10-42	Male	2 yrs.	128
12	"	4-8-42	4-10-42	Female	4 yrs.	152
14	"	4-25-42	4-27-42	Female	2 yrs.	48
15	"	4-25-42	4-27-42	Female	1 yr.	37
16	"	4-25-42	4-27-42	Female	2 yrs.	49
17	"	4-25-42	4-27-42	Female	2 yrs.	52
19	"	4-25-42	4-27-42	Female	5-6 yrs.	122
20	"	5-1-42	4-2-42	Male	1 yr.	42
22	"	5-1-42	4-2-42	Female	3 yrs.	158

Mountain Sheep

Up to the present time there have been 11 mountain sheep placed in the Gates of the Mountains area on the Missouri river. Five were captured and released during the spring of 1942, and the remaining six this fall. These mountain sheep were taken from the Sun River herd.

**MOUNTAIN SHEEP PLANTED IN GATES OF
THE MOUNTAINS AREA**

Tag No.	Trap	Date Trapped	Date Liberated	Sex	Age
1	Sun River	3-18-42	5-18-42	Female	3 yrs.
2	"	3-21-42	5-18-42	Female	3 yrs.
3	"	4-15-42	5-18-42	Female	2 yrs.
5	"	4-15-42	5-18-42	Female	2 yrs.
6	"	4-15-42	5-18-42	Female	1 yr.
7	"	10-26-42	10-27-42	Male	2 yrs.
8	"	10-26-42	10-27-42	Female	1 yr.
9	"	11-17-42	11-18-42	Female	2 yrs.
10	"	11-17-42	11-18-42	Female	2 yrs.
11	"	11-17-42	11-18-42	Male	1 yr.
12	"	11-17-42	11-18-42	Female	2 yrs.

Deep snows in the vicinity of the trap during the spring of 1942 necessitated packing goats on horseback in specially designed crates.



Mountain sheep were abundant on the Gates of the Mountains range during pioneer times. Heavy hunting depleted their numbers. The last report of this band was during the severe winter of 1919-20.

Transfer of Rams

On November 27, 1942, a three-year-old ram captured in the Sun River Canyon area was transported to the Gallatin Canyon and liberated. The ram was released on the west side of the river at the mouth of Deer Creek in close proximity to the mountain sheep of the Gallatin Canyon band. This was in accordance with a program involving the eventual exchange of several rams between the Sun River, Gallatin and Libby herds in an effort either to prove or disprove the theory of inbreeding as it may be affecting the natural increase of this species, which is now represented by small isolated groups.

On December 27, 1942, this ram (as identified by a tag in the ear) was seen with 22 other mountain sheep on the west side of the Gallatin river approximately one mile above the mouth of Deer Creek.

A five-year-old ram was captured in the Gallatin Canyon at the mouth of the West Fork and on December 27, 1942, was transported to the Sun River Canyon where he was released at the mouth of Hannan Gulch in the proximity of other mountain sheep.

The eleven mountain sheep planted in the Gates of the Mountain area were captured in pens similar to those used for goats.



Fur Section

The restoration and increase of the fur resources of the state is an essential part of any broad wildlife program. The depletion of the valuable fur species is not a new problem. Trappers followed quickly on the heels of the explorers in the West; by 1850 the cream of the fur crop had been taken. Since that time it has become increasingly difficult to make a reasonable livelihood from this activity. The majority of the furs now taken are secured by trappers who use this merely as a seasonal occupation during slack periods of their regular work. There has been little incentive to trap only the yearly increase, thereby to leave sufficient breeding stock to as-

sure a sustained yield. The fur harvest of the more valuable species has therefore fluctuated markedly; years of heavy take have been of necessity followed by periods of scarcity and closed seasons.

It is clearly evident that a resource as potentially important to the economic welfare of the state should be handled upon as sound and orderly a basis as possible. It is realized that a great deal of fundamental information is necessary as an aid in restoring and maintaining the numbers of fur-bearing animals at a maximum; in regard to their food supply and the other uses of the land. In an effort to obtain this information,

The following record of observations were recorded by Fieldmen White and Hellenga from the Red Meadow Station area. This is a typical example of the field records kept by the crews.

Date	No. Marten	Foods	Drainage	Timber type	Elev.	Exp.	Weather
Dec— 1	1	rabbit, squirrel, mice	Red Meadow	Spr., Bal.	5500	NE	
7	1	rabbit, squirrel	Red Meadow	Spr.	4500	S	cldy-mild
21	1	rabbit, squirrel	Hay Creek	Spr., Bal.	6000	E	clear-cold
Jan— 1	1	rabbit, squirrel	Whitefish Creek	Spr.	4200	SW	-20°
7	1	rabbit	Whitefish Creek	Spr., Bal., LP	5700	NE	-20°
8	4	rabbit, squirrel	Hay Creek	Spr., Fir	4400	S	-10°
15	1	rabbit, squirrel	Swade Creek	Spr., Wh P., Bal	4100	SW	-10°
16	1	rabbit, squirrel	W. Fork Whit. C'	Fir, Loh.	5200	E	-20°
17	2	rabbit, squirrel	E. Fork Whit. C'	Spr., Bal.	52-5500	N	-20°
19	3	rabbit, squirrel	Red Meadow C'	Spr., Bal.	49-5400	S	0°-clr
20	2	rabbit, squirrel	Hay Creek	Spr., Fir, Bal	57-6000	N	-10°
23	2	rabbit, squirrel	So. Fk. Shorty	Spr., Bal., Alp.	60-5700	N	0°-fog
27	2	rabbit, squirrel	Stillwater	Spr., Bal., Alp.	6000	W&N	25°
28	1	rabbit, squirrel	Whitefish Creek	Spr., Bal., Alp.	5800	S	10°
29	3	rabbit, squirrel	Shorty-Stillwater	Spr., Bal., Alp.	6400	N	5°
31	4	mice, squirrel	White & Deep	Spr., Bal., Alp.	60-6500	E&W	0°-ch
Feb— 6	1	rabbit, squirrel	Red Meadow C.	Spr., Bal., Fir	5100	E	20°
9	2	rabbit, squirrel	S. F. Shorty	Spr., Bal., Alp.	66-6500	N	10°
13	2	rabbit, squirrel	Stillwater	Spr., Bal., Alp.	4500	S	0°
14	2	rabbit, squirrel	Deep Creek	Spr., Bal., Alp.	55-5200	S	20°
19	3	rabbit, squirrel	Hay Creek	Spr., Bal., Alp.	48-5200	S&N	0°
21	2	rabbit, squirrel	Red Meadow C.	Spr., Bal., Fir	50-5400	E	-5°
25	3	rabbit, squirrel	Red Meadow C'	Spr., Bal., Alp.	52-5700	SE	5°
27	2	rabbit, squirrel	Hay Creek	Spr., Bal., Alp.	55-6000	E&W	10°
Mar— 6	1	rabbit, squirrel	Hay Creek	Spr., Bal., Alp.	6000	S	5°
7	1	rabbit, squirrel	Hay Creek	Spr., Bal., Alp.	6000	W	15°
12	1	rabbit, squirrel	Whitefish Creek	Spr., Bal.	6000	NE	20°
13	1	rabbit, squirrel	Stillwater R.	Spr., Bal., Alp.	6000	S	25°
17	3	rabbit, squirrel	Wigwam Creek	Spr., Bal., Alp.	49-6400	NE	20°
18	1	rabbit, squirrel	Wigwam Creek	Spr., Bal.	46-4900	NE	0°
23	1	rabbit, squirrel	Whitefish Creek	Spr., Bal.	5000	W	25°
24	2	rabbit, squirrel	Red Meadow C.	Spr., Bal., Alp.	41-5200	E	15°

Total 61 marten tracks
 Total 10 lynx tracks
 Total 4 fox tracks
 Total 8 mink tracks
 Total 3 wolverine
 Total 5 beaver

Total 5 moose
 Total 2 Rocky Mt. Goat
 Total 35 Whitetail Deer
 Total 39 Mule Deer
 Total 225 Ruffed Grouse
 Total 116 Blue Grouse
 Total 14 Franklin Grouse



The pine marten, often called the American Sable, Montana's most valuable fur bearing animal.

the Fish and Game Commission has instituted a Fur Survey Project.

FUR SURVEY PROJECT

Introduction:

The area selected for intensive fur survey lies within and immediately adjacent to the drainage of the North Fork of the Flathead River. It is bounded by Glacier Park on the east, the Canadian border on the north, and the Great Northern Railroad track on the west (see map). This area is predominately timbered and presents a variety of types. Most important, however, are the heavy stands of spruce and alpine fir growing at intermediate and higher elevations, and the dense growth of lodgepole pine coming in on the sites of old burns. The terrain is steep to rolling, but lacks the precipitous nature of the adjacent ranges

within the boundary of the Park. The principal fur species found in this region is the pine marten. The Canadian lynx, beaver, mink, bobcat, otter, fox and wolverine are also represented. The area selected presents a typical fur management unit which, throughout the years, has become comparatively unproductive due to heavy trapping.

The objective of the work is, therefore, the building up of the various valuable fur species to the maximum capacity of the range then to allow the trapping not to exceed the yearly increase. It is further planned to apply the information obtained in this unit to others with the eventual objective of building the entire state up to its maximum production of fur. The establishment of a system of individual trapper units will be an important phase of this work.

Procedure:

For convenience the entire area was divided into three units, with a two-man crew assigned to each (see map). Field work for the season of 1941-42 began on November 10, 1941, and ended April 30, 1942. During this coverage 23 headquarters and field, or stop-over, stations were used. Travel on the trails and cross-country was accomplished by the use of snowshoes; motor toboggans were used to travel between stations and by the project leader during inspection trips. This relatively new type of winter travel was found to be very satisfactory. The use of the toboggans made possible a far more complete coverage than would otherwise have been secured.

The following objectives were set up as a guide to the field work:

1. To secure a census by species of the fur bearing animals in the area, this to be accomplished by supplementing the numbers actually

seen by those definitely determined by an analysis of the tracks.

2. To record all possible information pertaining to the feeding habits of the marten, as well as the other fur bearing species.

3. Information secured pertaining to the day-by-day cruising radius of each species. In this way the average size of the home range required for each will be obtained.

4. All possible information secured in regard to the rate of increase which may be expected for each of the fur bearers studied.

5. Information obtained regarding the compatibility existing between individuals in each species, and also between the species. In this way the population densities that may be expected under existing conditions of food and cover may be determined.

Findings:

The first winter's census work indicated the following number of fur bearers to be inhabiting the area:

90 pine marten	157 beaver
18 Canadian lynx	20 mink
3 otter	4 wolverines
6 fox	1 bobcat

Information pertaining to the rate of increase of the various species will be obtained from the second season's work (winter 1942-43). It is thought that this data may be applied in similar areas throughout the state.

It was found that the marten during the winter months preferred the denser types of timber. These appear most typically on north and east exposures and along the creek bottoms. Recorded information pertaining to the location of the marten tracks is as follows: 81 per cent in dense spruce timber, 8 per cent in lodgepole pine timber, 7 per cent in Douglas fir timber, and 4 per cent in open parks within the sub-alpine zone. It was found last year that whenever possible martens avoid natural openings and burned off areas. Martens were noted as ranging the lower elevations (3,500-4,500 feet) during the early months of the winter. They change their field of activity, however, to the slopes, ridge tops, and high benches at elevations ranging between five and six thousand feet during January and February. They then return to the lower ranges used during the earlier portions of the winter. Rather

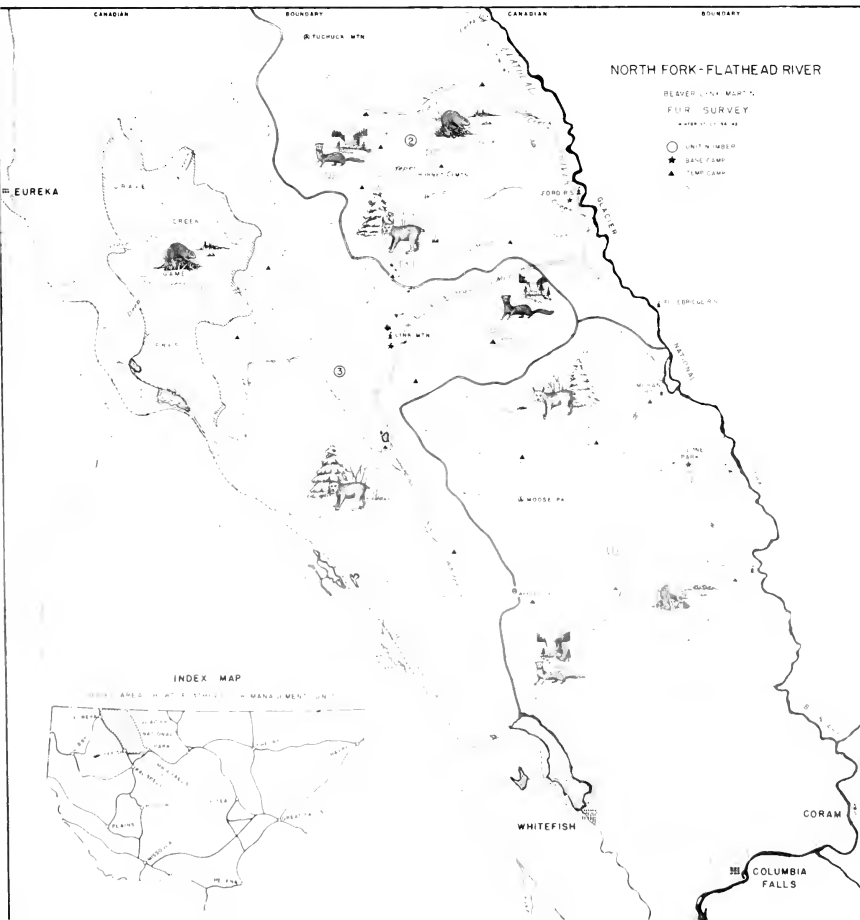
(top)—Motor toboggan in use on fur survey, North Fork of the Flathead. (bottom)—Overnight camp near the crest of the Whitfish Range.



unseasonable rains and wet snows occurred during the early winter of 1941-42. It is thought that this somewhat unusual climatic condition may have effected the habits of the marten during that period. This will be thoroughly checked during the present winter.

The principal winter foods of the marten were found to be snowshoe rabbits, squirrels, mice and grouse, in the order listed. The use of carrion was also noted. The included tabulation represents

a sample of the data which was kept on the foods and feeding habits of the marten during the first season's work. These observations were made in the Red Meadow area. Records of each of the three crews show that red squirrels and snowshoe rabbits were plentiful and generally well distributed over the entire study area. In some localities grouse were plentiful, but they were not found to be so well distributed as the other species: (Please turn to page 93).



Live Trapping and Transplanting Beaver

Introduction:

Beaver living in close proximity to man may become a nuisance. Their ponds may flood valuable agricultural lands, irrigation ditches are often dammed, and valuable shade trees may be cut down. On the other hand, beaver in the mountains and other remote areas are distinctly beneficial. Their ponds and dams tend to control the spring runoff; violent fluctuations in stream flow are thus prevented. Sediment is settled out of the water, slowly building up fertile mountain meadows. The water table is raised along the streams, thus encouraging a luxuriant growth of sedges, grasses and browse. These areas, in turn, become an important part of the range for big game or livestock.

The environment for fish has in many streams been improved by the activities of beaver. The ponds, dispersed throughout the length of shallow, rapid streams, form badly needed hiding and resting places. Important fish foods flourish in many of these ponds.

Live trapping and transplanting of beaver, from areas where they have become nuisances into those where they will be beneficial, has become an important phase of wildlife work.

Procedure:

The live traps used in this work resemble somewhat a large suitcase made of heavy woven wire. They are hinged at the back so that in setting they are opened almost flat. One side is placed against the side of the pond or stream; this portion of the trap is camouflaged with willow twigs. The other side is submerged in several inches of water. The beaver, attracted by scent from beaver castor, swims over the submerged portion of the trap. The animal comes in contact with a trigger that trips the trap. The side closing quickly scoops the beaver up out of the water, confining him in a snug wire pen. From the traps the beaver are placed in transporting crates and taken to their new homes in the more remote areas. The last part of their journey is often made by pack string.

The trapping and transplanting of live beaver has been carried on in Montana and other states for several years. The first attempt in this state, however, to carry on the work on a larger scale followed the establishment of a project during the spring of 1941. During July three two-man crews were sent into the field; each crew was equipped with a camp outfit, a pickup truck, and live traps. On August 1 it was deemed advisable to dispense with the third crew. The most satisfactory period for live trapping was found to

Camouflaging the trap with leaves and willow twigs. The other half of the trap is under water.



A beaver snugly caught in one of the live traps.



be during late July and throughout the months of August and September.

The crews were routed in accordance with information gathered concerning the areas in which beaver were doing actual damage. The transplanting was done in areas in which a survey had indicated the need for beaver. The field work

SEASON OF 1941

County Trapped	No. Beaver Taken	County Planted	No. Beaver Planted
Lewis & Clark	28	Broadwater	27
		Lewis & Clark	1
Meagher	22	Meagher	12
		Sweet Grass	10
Hill	10	ChoctEAU	10
Teton	2	Teton	2
Fergus	6	Fergus	6
Lincoln	2	Lincoln	2
Valley	3	Valley	3
Cascade	8	Teton	8
Silver Bow	14	Jefferson	14
Deaverhead	62	Madison	15
		Jefferson	16
		Silver Bow	7
		Beaverhead	24
Flathead	11	Flathead	11
TOTAL	168		168

was discontinued the first season in the last week in September. One two-man crew worked during the last of July, all of August, and the first half of September in 1942.

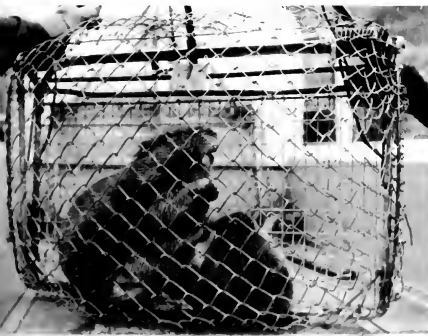
The local Deputy Game Wardens very materially aided the work of the crews in their respective districts. The following tabulation indicates the counties from which beaver were taken and those in which they were planted during the past two seasons' work.

(Please turn to page 96).

SEASON OF 1942

County Trapped	No. Beaver Taken	County Planted	No. Beaver Planted
Silverbow	20	Jefferson	14
		Deer Lodge	6
Deer Lodge	1	Jefferson	1
Madison	4	Jefferson	4
Petroleum	5	Judith Basin	5
Fergus	3	Judith Basin	3
Jefferson	9	Broadwater	9
Lewis & Clark	15	Broadwater	15
Powell	8	Broadwater	8
Broadwater	2	Broadwater	2
Granite	1	Flathead	1
Flathead	23	Flathead	23
TOTAL	91		91

Female Beaver and 5-month-old kit.



A beaver liberated near the edge of a mountain stream.



Upland Game Bird Section

Game Bird Survey

Because there has been a pressing need for detailed information pertaining to Montana upland game birds, the Fish and Game Department was anxious that a state wide survey be undertaken in order to determine the relative abundance of the various species throughout the state. Pertinent facts about life histories of our game birds were to be uncovered in order to facilitate sound management of these species.

The study was instigated in June, 1941, and a systematic coverage of the eastern Montana counties was undertaken. A leader and six crew men were assigned to the study. Each crew spent several days in a county in obtaining information from all available sources on the distribution and abundance of the various birds. At the end of the summer most of the eastern and central Montana counties had been studied. The results of the summer's work were compiled and organized during the winter months. Maps were prepared showing the range of each species in each county. Birds were classified as being (1) common to abundant, or (2) uncommon to rare. By talking with informed residents of the regions information was gathered on population trends.

The summer season of 1942 saw the necessity of completing the county by county survey. Also it was thought reasonable to go back for more intensive study into some of the areas shown by the previous summer to be of particular interest. In addition to obtaining specific information on the habitat preferences of the birds, a great deal of further information was recorded. An example of the method of recording information is given in figure 1. Areas were studied intensively in Sheridan, Fallon, Garfield, Toole and Meagher counties, and less intensive studies were made in Carter, Glacier, and Phillips counties. The results will be discussed under each species.

In the nine remaining counties in western Montana grouse were to be studied. Most of the

areas of good grouse habitat lie within the National Forest in these regions. At least 100 miles per county, and usually much more than that, were covered by foot over forest trails in order to obtain the desired information on the abundance of grouse.

Detailed records of all observations were kept by the crew members. The specific results of our studies on the grouse will be discussed under the individual species.

SHARP-TAILED GROUSE

(*Pediocetes phasianellus*)

This grouse is also called the Pintail Grouse and, erroneously, the Prairie Chicken. Figure 2 indicates the range and the relative abundance of the sharptail in Montana. Two rather distinct habitats are occupied by this bird in eastern and central Montana. Over the major portion of the range the vegetative formation of the habitat is comprised of wheat fields, both growing wheat and the previous year's stubble, grassland, and more or less extensive areas of shrubby cover including choke cherry, snowberry, rose, and sage. Intensively cultivated areas sown chiefly to wheat do not support sharptails in any numbers. The most abundant populations occur where only a half section or less is sown to wheat, the remainder supporting native vegetation.

A restricted area in extreme northeastern Montana shows the second type of habitat. This region, approximately 22 sections of land in Sheridan county, is characterized by low rolling sandhills. A more dense population of grouse was found here than in any other area studied. The central portion of this area is entirely devoid of grain and supports only grasses, shrubs, and weeds. Snowberry, wild rose, and chokecherry were the most important shrubby species. The patches of brush, often over 100 feet in diameter, were scattered throughout the area with areas



Blue Grouse on her nest.

of grass interspersed. It is felt that the scattering of the brush patches is a most important aspect of this habitat. The fruits of the chokecherry, snowberry, and rose are all known to be used extensively by sharptails during the winter months.

In several of the central counties the ranges lack some of the features indicated above as being essential to an ideal habitat; thus the birds are less abundant. It will require considerable work in the future to determine the effect of hunting on sharptail populations. It is significant, however, to note that the areas which maintain the largest sharptail populations are remote from large cities or towns.

In many cases we found that the information recorded lend itself to statistical calculation.

To illustrate the results of this statistical study we have included figure 3. This graph analyses the results of all the flushings of sharptail grouse observed during the summer of 1942, based on over 400 observations. cursory examination of the table will show that the birds flushed at greater distances from the observers during September than they did during the summer months. The statistical treatment substantiates this fact. The reader may feel that such a fact is of little importance in a study of grouse. We feel, on the other hand, that the accumulation of many such facts will soon give us a scientific understanding of the birds we are studying and such will allow more intelligent management of the species in question.

SAGE GROUSE
(*Centrocercus urophasianus*)

Also called Sage Hen

The range of the sage grouse in Montana is indicated in figure 4. It was found that this species occupies many regions which are not extensively sage brush areas. In fact, over one-half of all sage grouse observed occurred in abandoned fields where stubble, timothy, and weeds, especially oyster plant and mustard, were most common. Only one-fourth of the birds were observed in areas dominated by sage. These observations were made during the summer months and it is not our belief that sage grouse remain year around in these areas without sage. Six per cent of the birds observed were seen in cultivated grain fields. This use of abandoned and cultivated fields is most important because it has been felt in the past that man's disturbance of the original native vegetation would see the disappearance of this grouse from the regions and possibly their complete extinction.

Our study has shown that the sage grouse is much more closely restricted to the proximity of water than is the sharptail. Since the sage grouse were observed an average of less than one-half mile from water, and the average distance from water for sharptails was about three-fourths of a mile, it is likely that sage grouse drink regularly whereas we have seen no evidence to indicate that sharptails need to drink at all. It would seem, then, that in considering areas for transplanting of sage grouse the availability of water must be considered.

RICHARDSON'S BLUE GROUSE
(*Dendragopus obscurus richardsoni*)

This is usually called the Blue Grouse. The range of this grouse in Montana is quite extensive in the mountainous regions (figure 5). Most of the range lies west of the Continental Divide. It is well known that these grouse nest at quite low elevations and gradually move up the mountain sides during the summer months. The studies in the western counties during the summer of

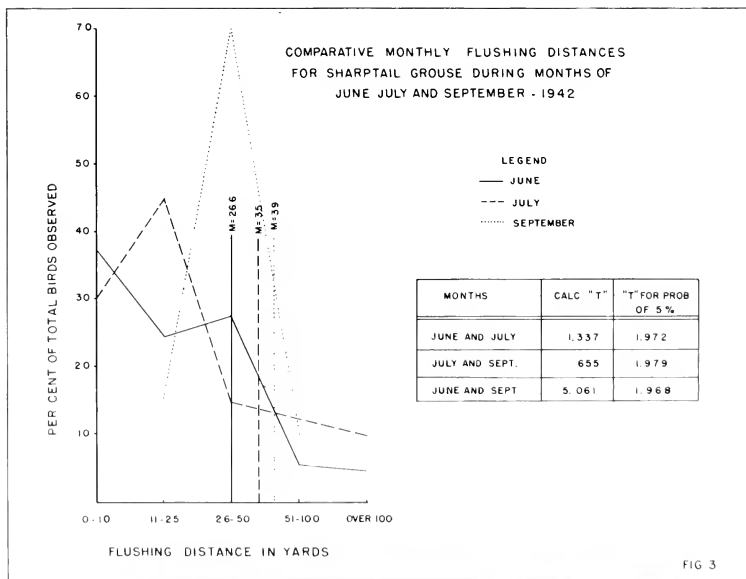
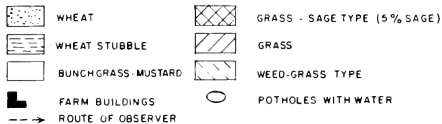
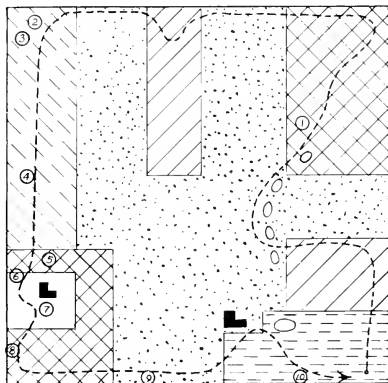


FIG 3

NORTHERN FALLON COUNTY
SECTION 4, T 8 N., R 58 E.

OBSERVER = P.L. WRIGHT
DATE = JUNE 18, 1942
TIME = 10:30 = 2:00



REF. NO	SPECIES	NO BIRDS	FLUSHING	DISTANCE	PROXIMITY TO WATER	COVER
			FRONT	SIDE		
1	HUNGARIAN	1 ADULT	10 YDS.	10 YDS.	100 YDS.	GRASS TYPE
2	SAGE GROUSE	"	5 YDS.	—	50 YDS.	GRASS-WEED TYPE
3	C.PHEASANT	1 AD., B YG.	40 & 5 Resp.	—	"	"
4	SHARPTAIL	1 ADULT	10 YDS.	10 YDS.	300 YDS.	"
5	"	"	25 YDS.	5 YDS.	"	"
6	"	"	"	"	200 YDS.	"
7	"	"	3 YDS.	—	100 YDS.	BUNCHGRASS & MUSTARD
8	"	"	20 YDS.	—	"	EDGE OF ROAD
9	"	"	50 YDS.	—	200 YDS.	TALL GRASS AT ROAD EDGE
10	HUNGARIAN	"	—	30 YDS.	"	EDGE WHEAT STUBBLE

REMARKS — NO BRUSHY COVER ON THIS SECTION, BUT DENSE SAGE LINED CREEK IN NEXT SECTION NORTH.

FIG 1

142 clearly indicate this habit. During this ascent up the mountains, which takes place mostly during July and August, the birds are more apt to be seen on the south faces of the mountains than elsewhere. By September most of the grouse are to be found on or near the ridge tops. As would be expected, Blue Grouse during the summer months were found more commonly in vegetative types with huckleberries than any other type of forest.

During July we found Blue Grouse considerably closer to drinking places than we did during the later summer, leading us to suspect that these birds do not require drinking water during late summer when they are able to feed on huckleberries.

GREY RUFFED GROUSE
(*Bonasa umbellus umbelloides*)

This specie is often known as the Ruffed Grouse, Willow Grouse, Native Pheasant, or Brush Pheasant. Although it occupies much of the same general regions as does the Blue Grouse (figure 6), this grouse is found at lower elevations. Virtually all of the ruffed grouse observed were

seen between 3,000 and 5,000 feet. Furthermore, ruffed grouse are found closely associated with wet places. The average distance from water of all the ruffed grouse seen was only 113 yards. Whether this choice of habitat so close to streams is due to the fact that the birds need to drink frequently we cannot say. We feel that it is more likely a preference for the type of vegetation found in the bottom land.

FRANKLIN'S GROUSE
(*Canachites franklini*)

Almost always called Fool Hen

This bird formerly occurred over a much wider range (figure 7). In most parts of its range it is seen very rarely. Only in Lincoln County or in some of the primitive areas can it be considered at all common. This grouse is found over a wide altitudinal range from about 3,000 to over 7,000 feet. Since so few Franklin's grouse were seen, we are unable to characterize its habitat, although it seemed to be associated with spruce and lodgepole types. It is usually found close to water.

MONTANA.
SHARPTAIL GROUSE RANGE

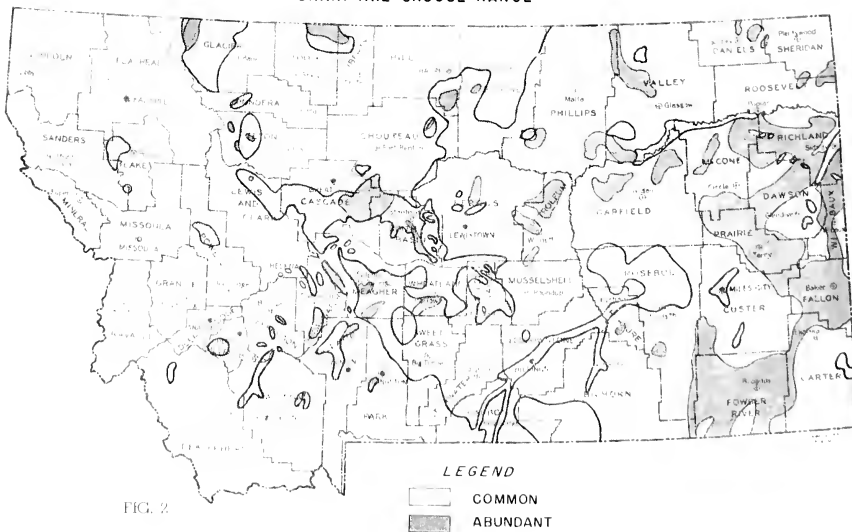
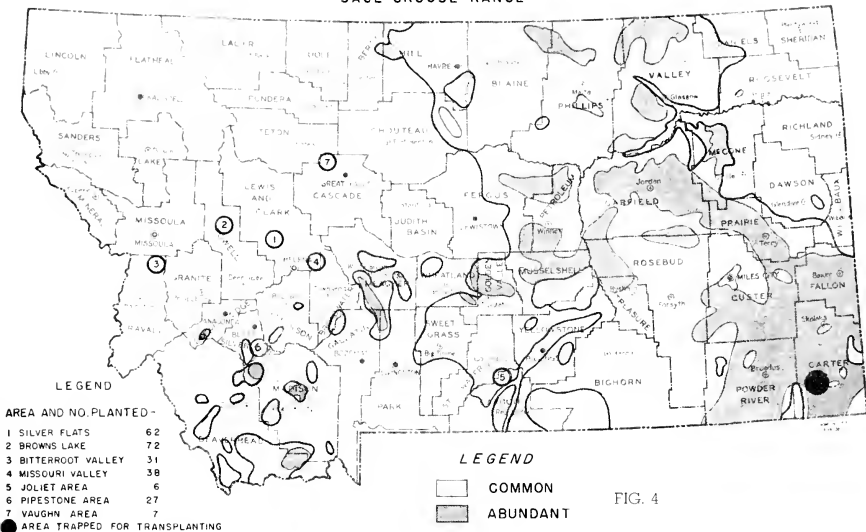
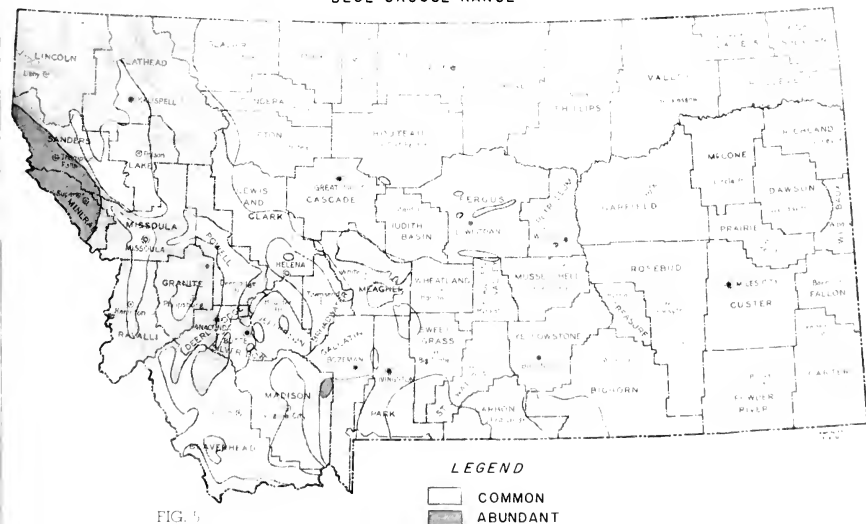


FIG. 2.

MONTANA.
SAGE GROUSE RANGE



MONTANA.
BLUE GROUSE RANGE



MONTANA

RUFFED GROUSE RANGE

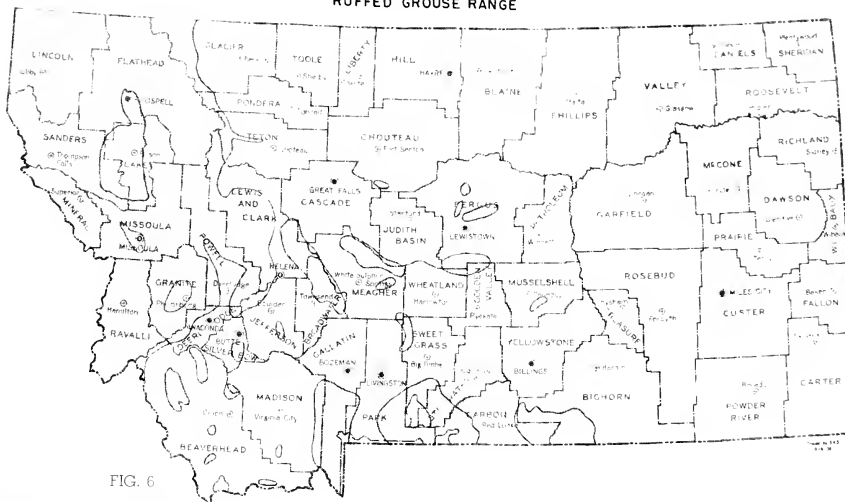


FIG. 6

MONTANA

FRANKLIN GROUSE RANGE

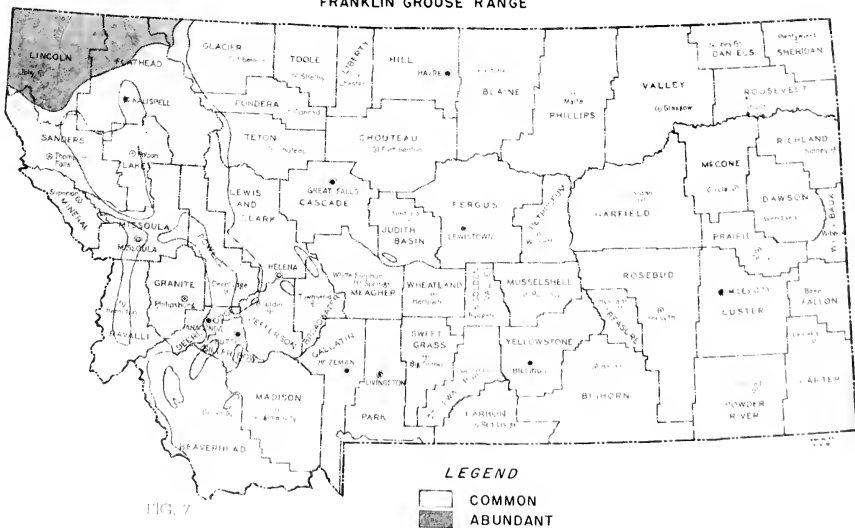


FIG. 7

HUNGARIAN PARTRIDGE

(*Perdix perdix perdix*)

Often called European Partridge or, incorrectly, Hungarian Pheasant. Figure 8 shows the range of this species to be the most extensive of any species in Montana. Typical "hun" habitat varies considerably over the state. In eastern Montana the birds are found in the same general habitat occupied by sharptails or sage grouse. In central Montana it is the only game bird to live in any numbers in intensively cultivated wheat growing areas. In western Montana, aside from inhabiting the cultivated irrigated regions, it lives in sage brush stands and is the only game bird to live commonly in dry cheat grass covered hills. Most of the broods of young birds were seen relatively close to water though some birds were found several miles from water.

RING-NECKED PHEASANT

(*Phasianus colchicus torquatus*)

Often called Chinese Pheasant or China Pheasant

The range of this species (figure 9) is seen to be closely associated with river valleys or irrigated regions. Even though the range map shows this bird inhabiting only rather narrow strips along the rivers, the abundance of the bird in the areas it does inhabit probably makes it Montana's most abundant game bird. Good pheasant habitat includes grain fields, irrigation ditches, streams or pools, patches of thick brush, thick feed covered fields, and mild enough winters to enable the birds to obtain sufficient food during these months. It is the hope of the Fish and Game Department to establish strains which have more Mongolian pheasant blood than Chinese pheasant blood. If they are successful in doing this it may be possible to obtain stable permanent pheasant populations in many areas where they will not live at present. It may be noted by referring to the accompanying map how closely the present range of Chinese pheasants follows the irrigated valleys.

Poulation Trends of All Species:

It is well known that the grouse of the eastern and midwestern states undergo cyclic periods of great scarcity followed by periods of recovery. It is not known whether our grouse tend to follow this 10 or 12 year cycle, but further studies of our grouse populations will bring this out. We



(above)—White-tail Ptarmigan. Winter plumage. Continental Divide between Sun River and Flathead. (below)—Female Franklin's Grouse or Fool Hen.

do know that all of the native grouse of Montana reached unprecedented "lows" in their number some 10 or 15 years ago. Until several years' work has accumulated accurate records on the abundance of birds, we shall have to rely largely on the observations of reliable people who have lived in the regions in question for many years for figures on trends.

There is little doubt that sharptails have increased greatly during the past few years in eastern Montana. Some eastern Montana residents go so far as to say they are as abundant now as they have ever been. In the central counties the recovery is progressing at a slower pace, and west of the divide the sharptail seems to be nearly extinct with little hope of recovery. We

MONTANA.
HUNGARIAN PARTRIDGE RANGE

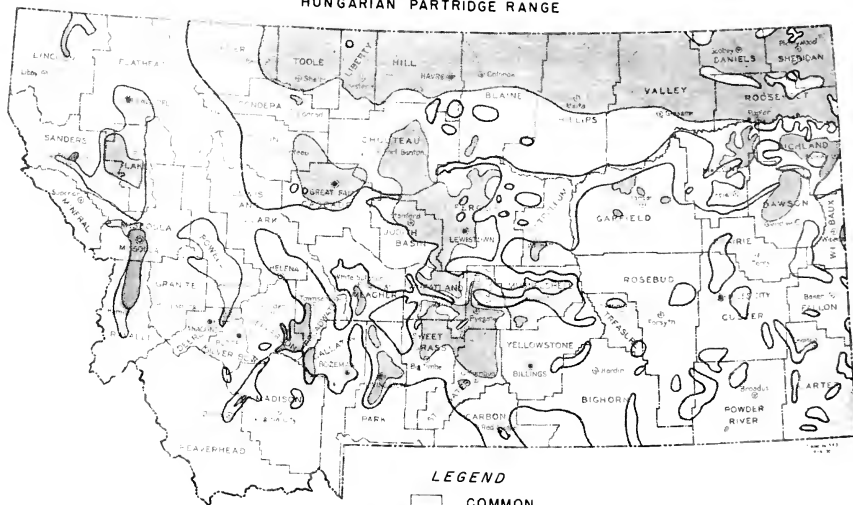


FIG. 8

LEGEND

- COMMON
■ ABUNDANT

MONTANA.
CHINESE PHEASANT RANGE

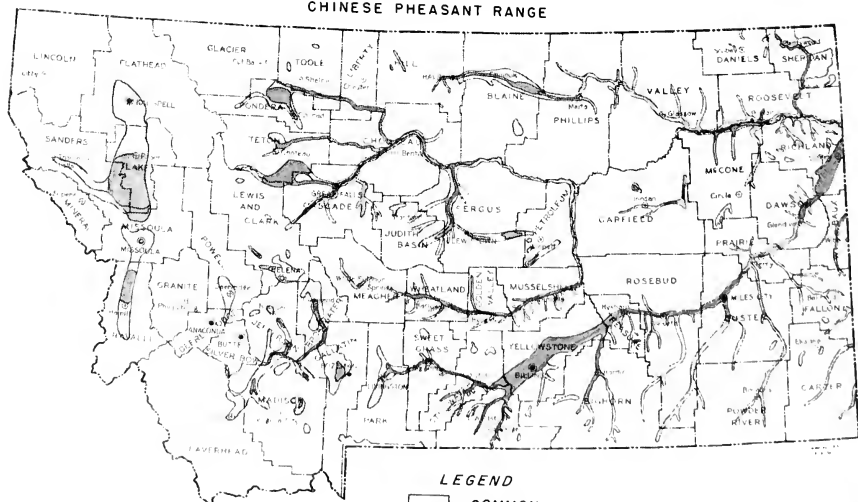


FIG. 9

LEGEND

- COMMON
■ ABUNDANT

feel that the failure of recovery of the sharptail in western Montana is due almost entirely to the degeneration of its habitat. Much of the area formerly occupied by sharptails in western Montana is now covered with cheat grass which cannot possibly support the birds.

The sage grouse is recovering its numbers in many parts of the state, though in most areas its recovery is slower than that of the sharptail. We shall point out later why this is so. Many regions of the state seem to show the bird remaining stationary and there are many areas where the birds became extinct during the drought and have not yet returned.

Blue grouse in general are becoming more common, though the rate of increase is not rapid. Ruffed grouse are apparently making more rapid recovery of their numbers, while Franklin's grouse apparently are steadily becoming rarer.

Brood County Studies:

In any study on game birds it is of paramount importance to determine the rate of increase. This is best done by counting the numbers of young in the broods of the various species. Accordingly, whenever a brood of young birds

was encountered, special effort was made to count the number. The results of our brood count figures of 1942 are summarized as follows:

SPECIES	Number of complete broods counted	Range in number of young	Ave. No. of young
Sage Grouse	28	4-10	5.9
Sharptail	8	3-14	9.4
Blue Grouse	83	1-9	2.9
Ruffed Grouse	22	1-5	3.1
Franklin's Grouse	22	1-6	3.5
Hungarian Partridge	32	1-19	7.7
Chinese Pheasant	22	1-10	5.8

These figures need some explanation. It is well known that the number of young birds in a brood gradually decreases during the summer due to predators, disease, and accidents. Therefore the number of young per brood in any species would be much higher during June than it would during August. It is necessary, then, for us to indicate when our counts were taken. All of the sharptail broods were taken from very young birds before they had been greatly reduced by natural causes. Our counts on sage grouse were (Please turn to page 96)

MONTANA. PTARMIGAN RANGE

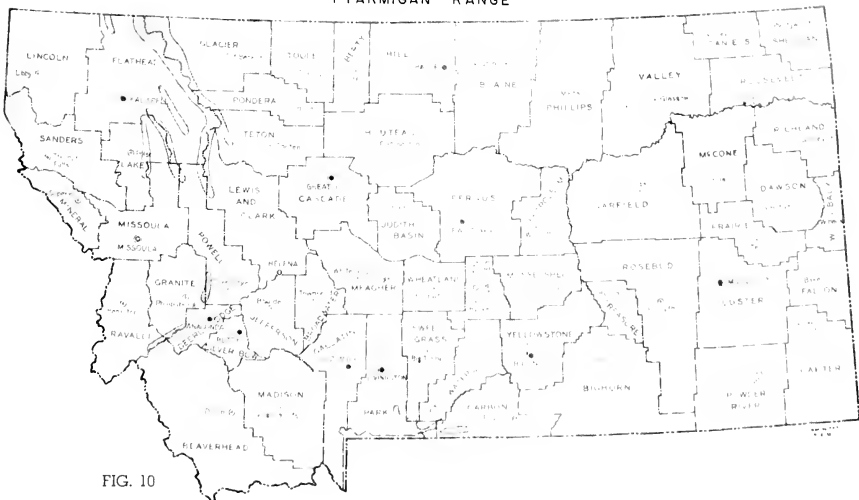


FIG. 10

Sage Grouse (Sage Hen) Trapping and Transplanting

Introduction:

The sage hens are now found throughout the greater part of eastern Montana where the habitat is suitable. A lack of the sage types apparently accounts for their absence in the northeast corner of the state. Reference to the map, which shows the distribution of these big grouse, illustrates this general distribution in the east and also the isolated, spotty pattern of their occurrence within the western half of the state. This is due partly to the presence of high mountain ranges, which the sage hens never inhabited. However, there are numerous sagebrush covered areas within and adjacent to the intermountain valleys where sage hens were once abundant. Their disappearance was apparently due to a combination of factors. Heavy and rather indiscriminate killing by hunters was no doubt one of the most important. A series of dry years also had a detrimental effect. Disease and parasites may have played a part. At any rate, large areas are now found in the western half of Montana where sage hens were once plentiful but are today totally absent.

In an effort to reestablish this native game bird to ranges it had once inhabited, the Fish and Game Commission undertook a trapping and transplanting program.

Procedure:

The trapping and transplanting of sage hens had been carried on by several neighboring states. The methods worked out by the Wyoming Game and Fish Commission were adopted here in Montana.

The method in brief consists of the use of a winged trap and a truck or car to drive the birds. The trap was built in two sections, each 20 feet long. The front section was made of chicken wire and the rear section of fish netting. When placed end to end this formed a trap 40 feet long, 6 feet wide, and three feet high. Two wings approximately 200 feet long were constructed of fish netting; these were two feet high. When the trap had been set up, the wings were placed out from the front forming a wide V.

The trapping was carried on in the vicinity of the Roy Williams ranch on Box Elder Creek in



Sage hens in their new home.

Carter County. The actual field work started on September 20, 1942. It would have been advantageous to start field work earlier, but it was delayed due to difficulties in obtaining personnel. The work continued until November 6, by which time the weather had become decidedly adverse.

A total of 242 birds was trapped in 29 successful drives, or an average of a little over eight birds per drive. Nineteen was the largest number taken in one drive. The birds were placed in shipping crates, taken by truck to Miles City, and then shipped by rail to the points of distribution. From the station they were taken to the various areas into which they were liberated.

The following tabulation indicates the number of birds thus far liberated. It is hoped that the program may be continued for several seasons in order that all of the desirable areas may be stocked.

SAGE HEN PLANTINGS

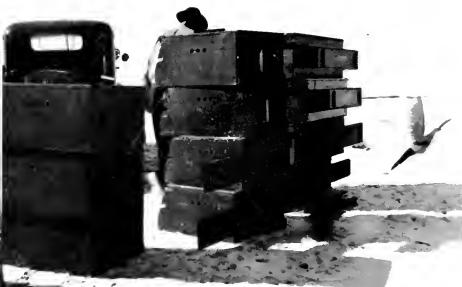
Area Name	County	No. of Grouse Planted
1. Silver Flats	Lewis & Clark	62
2. Browns Lake	Powell	72
3. Bitterroot Valley	Ravalli	31
4. Missouri Valley	Lewis & Clark	38
5. Joliet Area	Carbon	6
6. Moose Creek	Silver Bow	20
7. Rochester Basin	Madison	6
8. Vaughn Area	Cascade	7
Total		242

A brief outline is given describing the actual capturing work. The crew consisted of two men. Soon after sunup the men drove out into the sage covered areas in a pickup truck. When a flock of sage hens was sighted, they were approached. If it was apparent that they would drive, the men then drove off 200-300 yards and put up the trap and the wings. This took approximately half an hour. They would then get into the truck again, circle the flock and slowly start driving them toward the pen. The compound gear was used as it



(from top to bottom)—1. Putting up the pen. 2. The wings complete the job. 3. Taking sage hens off the train at Helena. 4. Birds released at Brown's Lake near Ovando.

(top)—Male ringnecked pheasant in trap. (middle)—
Releasing trapped birds in under-stocked area in Hill
County. (bottom)—Six sharptailed grouse caught in a
pheasant trap. These birds were released in the Flat-
head Valley.



was not desirable to hurry the birds. It was very important to know where each member of the flock was at all times, as one might be momentarily overlooked and, if approached too closely, would fly. It was found that when one bird flew, invariably the entire flock would follow. Bunches of over 20 birds were found difficult to handle. During the last part of the work a flock numbering approximately 700 birds was found. An effort was made to cut away smaller numbers from such large flocks.

The birds were driven carefully into the wings and then into the trap. From the chicken wire section they were carefully driven into the fish net portion of the trap. One of the crew would then crawl in and capture the birds. They were handed out under the netting to the man on the outside who would put a band on the leg and place the birds in the shipping crates. Six to seven were placed in a single crate.

It was found that a flock would drive well into the wind but would fly if an attempt were made to drive them with it. They drove well uphill but very poorly downhill. There were many other interesting characteristics which were discovered during the work. This experience will be highly valuable in carrying on any future trapping and transplanting program.

CHINESE PHEASANT TRAPPING AND TRANSPLANTING

A limited program of live trapping and transplanting of Chinese pheasants was carried on during the winter of 1941 and 1942. This work was conducted in heavy pheasant concentrations in Yellowstone County. An experimental phase of the project was developed in Gallatin County.

During January and early February approximately 250 birds were trapped. They were liberated in Lewis and Clark and Hill counties. The trapping was accomplished by the use of small woven wire traps baited with wheat and corn.

The introduction of these wild birds has been found to be a very satisfactory method of building up the numbers in desired areas. The removal of a limited number of birds from locations of heavy concentration is beneficial as it lessens the possibility of damage to agricultural crops.

Wildlife Habitat and Water Facilities Development



There are three principal limiting factors in the natural propagation of any type of wildlife. These are food, water, and cover. The program being worked out under this project, therefore, includes the improvement of water, food and cover. This is being carried out on a state-wide basis.

Typical of the work being carried on is the fencing of the upper portions of existing reservoirs and the planting of food and cover within these enclosed areas. In this way nests and young birds are protected from the trampling of livestock. It has also been found that vegetation at the upper end of reservoirs aids materially in de-silting the water that flows in, thus lengthening the life of these reservoirs. In all cases where this work is being carried on, sufficient shore line is being left unenclosed to accommodate the needs of livestock.

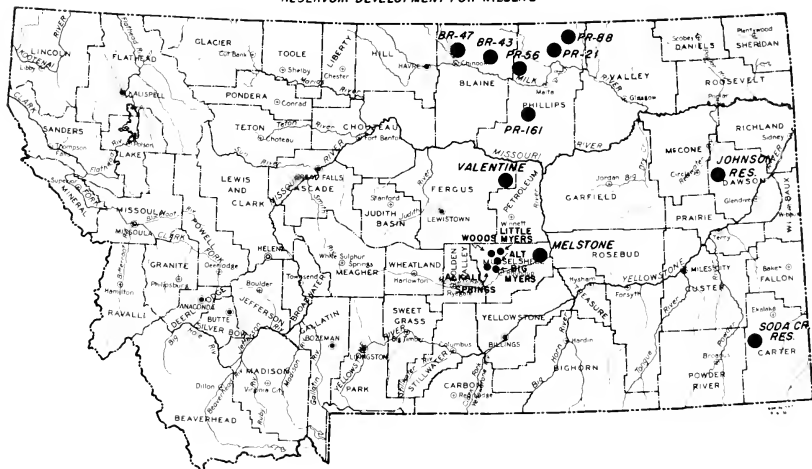
The shrubs being planted are species that not only supply cover and protection, but also furnish food. Examples of these are: Caragana, Russian olive, wild rose, chokecherry, buffalo berry, and wild plum. Shore line plants are important as they improve the nesting sites and also add to the feed supply. Smart weed, millet, and crested wheat grass are the more important plants being used for this purpose. The plants that grow out in the water are classed as aquatics. They are of particular importance as sources of food for waterfowl, and also afford nesting places for several species. The more important aquatic plants being developed under this program are prairie and hardstem bullrush, duck potato, wild celery, and several types of pond weed. Twenty thousand shrubs are being secured through the Soil Conservation Service at no cost to the Fish and Game Commission.

Melstone Reservoir in Musselshell County. The wildlife development area is shown just beyond the fence. The planting of shore line and aquatic vegetation will greatly improve this reservoir for wildlife.



MONTANA.

RESERVOIR DEVELOPMENT FOR WILDLIFE



PRESENT LIST OF DEVELOPMENTS

No.	Name of Development	Type of Development	County
1	Melstone Reservoir	Fencing & planting wildlife area	Musselshell
2	Alkali Springs	Spring improvement	Musselshell
3	Alt Reservoir	Fencing & planting wildlife area	Musselshell
4	Woods Reservoir	Fencing & planting wildlife area	Musselshell
5	Little Meyers	Fencing & planting wildlife area	Musselshell
6	Big Myers	Fencing & planting wildlife area	Musselshell
7	Valentine Reservoir	Fencing & planting wildlife area	Fergus
8	Anderson Reservoir (56)	Fencing & planting wildlife area	Phillips
9	PR-21 Reservoir	Fencing & planting wildlife area	Phillips
10	PR-88 Reservoir	Fencing & planting wildlife area	Phillips
11	BR-47 Reservoir	Fencing & planting wildlife area	Blaine
12	BR-43 Reservoir	Fencing & planting wildlife area	Blaine
13	Soda Creek Reservoir	Fencing & planting wildlife area	Carter
14	Johnson Reservoir	Fencing & planting wildlife area	Dawson
15	PR-161 Reservoir	Fencing & planting wildlife area	Phillips

The included map shows the location of the above listed developments.

Advantage is being taken of reservoirs already constructed by the Soil Conservation Service and the Montana Water Board. By a cooperative agreement, desirably located reservoirs are being turned over to the Fish and Game Commission for the development of the wildlife habitat upon each. Aid has also been given in the furtherance of this program by the Grazing Service.

During the coming season it is planned to broaden the scope of the work to include the fencing of several 1-10 acre plots for the development

of food and cover for upland game birds. These plots will be carefully located and will act as key feeding areas during severe winter periods.

To date wildlife areas have been fenced upon 14 reservoirs. In addition, one vitally needed spring has been developed and the source fenced. Planting has been completed on one of the reservoirs. Freezing weather prevented a continuation of this phase of the work. The planting will be completed as quickly as weather conditions will allow during the coming spring.

(top)—Anderson Reservoir (56) in Phillips County. (middle)—Canada geese. The wariest of Montana's waterfowl. (bottom)—Valentine Reservoir, Fergus County. These are typical examples of reservoirs upon which wildlife areas are being developed.



THE BLUEBACK SALMON OF FLATHEAD LAKE

(Continued from page 31)

Certain states and the Dominion of Canada have expended large sums in an effort to fertilize a few of their barren lakes to obtain better fishing. Many carloads of fish oval and other organic matter were transported from the coast and introduced in these waters. Then followed the introduction of various organisms and vegetation. When these had reproduced sufficiently young trout fry were planted, and these waters now afford excellent fishing. Previous to this time they had been stocked for years with trout fry totaling millions, with absolutely no results, as these young fish starved to death as fast as they were introduced, due to the absence of sufficient food suitable for young trout.

A condition quite similar to this has existed in Flathead, Whitefish and MacDonalD lakes. The type and quantity of food suitable for the propagation of young trout is relatively scarce, and until such time as organic conditions improve to permit a denser concentration of this food, the most ambitious stocking program will not achieve the results desired.

Investigation has revealed that the young salmon is principally a plankton feeder and does not interfere seriously with the food of young trout. In fact the young Sockeye are readily eaten and preferred by the large trout inhabiting that body of water.

The meat of the adult or near-adult salmon is oily, highly colored, and of a superior flavor. On the coast the Sockeye Salmon is preferred by all canners and commands the highest price.

During the summer months these salmon present a most beautiful appearance, and many are caught in Flathead lake by bait fishing and trolling, although it is very seldom that they are recognized as this species. They are usually classed as silver salmon or native trout.

Another condition we wish to clarify is the misunderstanding that has existed in the minds of many who contend that these salmon are a menace to the spawning habits of the Native and Rainbow trout that exists in these waters. The Sockeye species spawn in the fall or early winter, the large majority having completed the de-

position of ova during the months of October, November and December, whereas the rainbow and native trout spawn in the months of March April and May. This precludes any possibility of competition between these species on the spawning beds.

A few years ago a portion of Flathead river known as Foy's bend was closed to fishing by an order of the Commission, as large numbers of small trout locally known as "Bluebacks" or natives were rearing in that vicinity, and of the hundreds of sportsmen who had made large catches of these fish, none ever realized that approximately 90 per cent were the Sockeye Salmon species.

The Montana Fish and Game Commission or any other conservation agency will never have sufficient funds to carry on a fertilization program in such a vast body of water as Flathead lake, and in our estimation the appearance of these salmon is solving one of the most difficult biological problems with which we are confronted, and the only concern is that they might not be able to complete this biological cycle before their extermination.

WILDLIFE RESTORATION DIVISION

(Continued from page 36)

4. Coordination: A project has been set up for the purpose of summarizing and integrating the data obtained by the various branches of the Restoration Division. In this way the necessary information is prepared and presented to the Fish and Game Commission and the State Game Warden. A further responsibility is the keeping of a systematic cost accounting system and in addition, a record of equipment purchased and its accountability, as well as the preparation and submission of reports required by the Fish and Wildlife Service.

Reports of the progress of the various projects undertaken by the Division are included in the following pages.

The reports are brief, having been taken from detailed field records which are on file in the Fish and Game Department office. These are available for more intensive review.

HELLROARING - SLOUGH CREEK MOOSE INVESTIGATION

(Continued from page 45)

POSSIBLE KILL BY DRAINAGES

Drainage	Present Number		Desired Full Kill
	Males	Females	
Hellroaring Cr.	39	28	11
Buffalo Forks	22	14	8
Slough Creek	36	25	11
Total Kill			30

The recommended kill is believed conservative as it is based on the total number of 194 moose actually seen during the summer's work, and not on the estimated number of 284, which would give a kill of 54.

During the following years the kill should be based upon one half of the yearlings in the herd, as it is thought the age class is a better indication of the annual increase than the calves, as they have survived the most critical period of their lives. This method of harvest would hold the size of the moose herd at the maximum carrying capacity of the area.

The question of transplanting or removing by driving the surplus of mature bulls has been discussed and given thorough consideration. Due to past experience in other parts of the country, and the inaccessibility of the overstocked area, this method does not appear feasible.

The harvesting of these moose can only be accomplished by the limited license method, and should be put under rigid control to guarantee that only the desired sex and age class would be taken. This would require legislative action.

It is felt that the area warrants additional inspection carried on during the critical winter period; therefore, two trips have been planned for the winter of 1942-43. In this way the data obtained from the past winter's work will be checked and additional information obtained.

MOUNTAIN SHEEP SURVEY

(Continued from page 42)

tion of the band by parasites or disease. Poaching had apparently played a part in holding the band down in the past but was not serious at the

time the investigation was conducted. Very interesting data was secured in connection with the feeding habits of the sheep. Various species of grass made up their principal winter diet. It was determined that the winter range would support up to 300 head of mountain sheep.

MADISON COUNTY MOUNTAIN SHEEP STUDY

A report compiled by Richard Alsop of the Madison Valley Rod & Gun Club was submitted to the Fish and Game Commission in 1941. The report was cumulative, including observations made since the winter of 1935-36. The author stated that much of the material had been obtained in cooperation with the Gallatin National Forest.

Three distinct groups of mountain sheep were found in Madison county. These were in the following areas:

1. Tobacco Root Mountains, west of Potosi Hot Springs.
2. Indian Creek, in the Madison Range.
3. Moose and Squaw Creeks in the Madison Range.

The estimated total of these three bands was given as 60 head. It was definitely determined that there had been no material increase during the period of the study. No extensive seasonal migration was noted. It is felt that the ranges involved will carry a substantially larger number of mountain sheep. Poaching was not found to be a serious factor in holding down the numbers. No evidence of disease or parasites was found.

Both the Ural-Tweed and the Madison reports contain a great deal of worthwhile information pertaining to the mountain sheep in the two regions. This will be incorporated into the statewide management plan for this important species of big game.

FUR SECTION — INTRODUCTION

(Continued from page 73)

Trapping observations indicate that marten confine their operations to a home range. Following the trails of individual marten has shown that the cruising radius is limited to 12 or 15 miles going from one creek basin to another, using cer-

tain passes and always returning to the place from whence they came.

Only one instance was recorded where martens came from Glacier Park into the area being studied. No instances were recorded where they migrated in from Canada. This is probably due to the continuous burned off area on either side of the International Boundary at this point.

Martens were found in the Wigwam Drainage, and it is altogether probable that an interchange between Canada and the U. S. takes place in that area because of the continued green timber types.

Conclusions:

A fund of basic information was gained during the past winter's work. Additional data will, however, be needed to complete several phases of the survey. Particular emphasis will be placed upon the development of additional information pertaining to the migratory habits of the important fur bearers and how their numbers in a given area are affected by fluctuations in the population of important food species such as snowshoe rabbits and pine squirrels.

In addition, information will be gained concerning the compatibility between members of the same species and between species; in that way the maximum possible population of fur bearers on the area will be determined, and, by comparison, the volume that may be produced in other mountainous areas throughout the state.

The data will be checked in connection with the most desirable method of taking a substantial fur crop year after year without damage to the breeding stock. In this connection, the possibility of developing a trapper unit system upon public lands, somewhat like that now used successfully in Canada, will be investigated. The chief advantage of this system is the assurance of an orderly take of fur. The trapper working upon each particular unit will take only the annual increase each year with the assurance that no one else will come in and deplete the remaining animals. In this way the violent fluctuations in number of the more valuable fur bearers throughout the years would be eliminated and trapping as an occupation would be placed upon a more reliable basis.

BITTERROOT DEER AND ELK SURVEY

(Continued from page 52)

used moderately by sheep. A quantity of the coarser grass types are left after the herds have grazed over the area.

Recommended:

1. Maintain the game herds in the East Fork area at approximately 1,250 deer and 650 elk.
2. Place adequate amounts of salt well back on the Skalkaho unit. This will tend to draw the elk back onto the higher summer range, thus saving the lower ranges for the critical winter months.
3. A closure was recommended in the Medicine Tree area north and east of the lower reaches of the East Fork of the Bitterroot. This area includes approximately 33 sections (see map). The protection afforded by the closed area would tend to draw game animals out of the heavily utilized ranges; it would also act as a stepping-stone in the distribution of game to nearby understocked ranges.

4. Inaugurate an extended season in the East Fork area during the fall of 1942. This would aid in balancing the numbers of game animals with the available winter range, and would also accelerate the drift into the above described closed area.

Progress to Date:

1. The recommended extended season to December 15 in the East Fork area was put in effect during the fall of 1942.
2. An adequate amount of salt was distributed during the past spring on the high summer ranges in the East Fork and Skalkaho areas. Checks during the past summer indicate that a more desirable distribution of elk has been effected.
3. The recommended closure in the Medicine Tree area on the lower East Fork was created and has thus been in effect throughout the 1942 hunting season. A detailed inspection of the area will be made during the present winter to determine its effect on game distribution.
4. A detailed investigation of mountain goats is being carried on at the present time in the Bitterroot Range. Important information is being gathered relative to other species of big game in the area as well.

FLATHEAD GAME MANAGEMENT UNIT

(Continued from page 46)

The sex ratio among the elk, as established from positively identified animals, was 52 per cent cows, 24 per cent calves, and 24 per cent bulls. This would indicate an approximate increase in the herd, at its present number, of 900 head.

A detailed discussion of the apparent interchange or migration of elk between the Flathead and Sun River ranges is included in the Sun River report.

Recommendations:

(1) It is recommended that the number of elk maintained in the Flathead approximate the carrying capacity of the winter ranges, which has been determined at 2,500 head. It is hoped that in this way the productivity of the range may be maintained and that any future waste from a heavy winter kill, such as that which occurred in 1931-32, may be avoided.

(2) It is also recommended that salt be distributed in accordance with the developed plan. This salting is designed to hold elk off winter ranges as long as possible, and to assist in distributing game from overpopulated areas to areas that are under stocked.

(3) That the reseeding of overused ranges be continued, if the present seeding program proves successful.

(4) That, because of their apparent inter-relationship, the Flathead and Sun River herds should be considered as one management unit.

GALLATIN MANAGEMENT UNIT

(Continued from page 58)

In this way necessary information will be obtained concerning the herd and the ranges upon which it depends.

(3) That a change be made in the boundary of the Gallatin Game Preserve in the Tepee-Buffalo Horn area. This change, as shown on the accompanying map, would protect the natural migration route to the fall ranges, thereby averting a forced concentration of game animals in the Tepee and Daily Creek drainages.

(4) That a series of well placed quadrats be located for the purpose of carrying on a progressive study of critical winter ranges. In this way accurate information may be obtained concerning the density and volume of important forage species. This important data may be used as an index to the condition of the range. It is suggested that this detailed investigative work be carried on by the School of Wildlife Management at the State College in Bozeman.

(5) That salt should be placed annually in accordance with the developed salting plan for the area.

Results to Date:

The Commission, during its April, 1942, meeting made the recommended change in the Game Preserve boundary.

The 1942 hunting season has clearly demonstrated the betterment in game distribution, as well as hunting conditions, resulting from the change.

GAME PROBLEMS, YESTERDAY AND TODAY

(Continued from page 11)

As the population of any species builds up to the maximum food and cover available for that species in a given area, it becomes necessary to treat it as any other crop—a crop which must be harvested if it is not to be lost through starvation. A corollary of this is the fact that if the annual crop is not removed, deterioration of vegetation and soil occurs and eventually leads to a reduced carrying capacity for that species. The problem of management is also complicated by a conflict between the various economic interests which are found within a state as large as Montana. The economic stability of many communities in the state rests upon agricultural activities. There is, however, a place for wildlife in this set up, and the relative utilization of feed and forage by wildlife and domestic stock will vary with the pattern of economic life in different communities.

If the Department is able to obtain the necessary personnel and travel facilities, it should be possible during the war emergency to increase the population of the various species in those areas

where the habitat is favorable and where there are under-populations. With proper management it should be possible to enter the post-war period with more and better fishing and hunting than Montana has had since the pioneer days.

SUN RIVER GAME RANGE AREA

(Continued from page 62)

elk were using it heavily. It is thought that a better distribution of elk is being achieved by this carefully planned salting program.

(c) It is recommended that a further check be made to gain additional information on the extent of the interchange of elk between the Flat-head and Sun River ranges, this work to be carried out during the fall and spring of the year.

It is recommended that every effort be made to minimize the use of the large natural licks on important winter ranges. Fencing of these licks may be necessary to achieve this objective.

TRAPPING AND TRANSPLANTING OF BEAVER

(Continued from page 75)

It was possible for the crew during the past summer to check several representative areas in which beaver had been planted the previous season. In all cases the beaver were found to have established themselves.

Detailed figures on expenditures indicated that during the first season the total cost per beaver planted was \$12.11, and for the second season it was \$11.32.

The long distances between trapping and liberating sites has been an important factor in raising the cost per beaver in this program. In a state as large as Montana this presents a difficult problem to overcome. It is felt, however, that the experience gained during the past two seasons, plus a more complete fund of information concerning the localities where this work may most economically be carried on, will substantially reduce the cost of any future work of this kind.

UPLAND GAME BIRD SURVEY

(Continued from page 85)

made on the average a little later than the sharptail. Most of the counts on the other species were made later in the summer. For these reasons the figures on sharptail broods show a higher average than do those of the "hun," yet we know that if the figures were entirely comparable, the number of young per brood of "huns" would be considerably larger than in the sharptail.

It is easy to see, however, that the rate of reproduction of the sharptail is greater than that of the sage hen. This accounts, we believe, for the fact that the sharptail has recovered so much better than the sage grouse. We have no figures from former years to compare with our brood counts on the mountain type grouse, so we cannot tell whether they are typical of an average season or not. However, local residents tell us that the wet cold spring was very destructive to young grouse and that brood counts taken in normal years would be much higher than our 1942 figures. It is hoped that we will have opportunity to take similar counts in the future for comparison.

In the pheasant areas we encountered the belief that many hen pheasants commonly and regularly produce two or even three broods of young per year. When the untrained observer travels through a pheasant breeding area during late summer, he sees young birds ranging from those the size of a meadowlark to those nearly full grown. He naturally believes that these two general sizes of young birds were produced by the same hens. It is well known that nearly 50 per cent of all pheasants' first nesting attempts are unsuccessful. These hens which have had their nests destroyed by predators, stock, or man, will almost invariably nest again in their effort to produce young. When very small young birds are seen in late summer it is believed these may represent the results of a third attempt to bring off young. This persistent effort of pheasants to produce young undoubtedly results in a much more rapid rate of increase than is found in native grouse, which do not so readily re-nest, and is one of the most important reasons why pheas-

ants are capable of withstanding the heavy hunting pressure they annually take.

Densities of Populations:

Obtaining exact figures on the number of game birds per acre or per section is one of the most difficult aspects of any upland game bird study. In many cases such figures are impossible to obtain by any present known method. This is especially true of the mountain grouse. Great effort has been made to record the data in such a way as to allow comparative recounts of the birds in successive years. For example, we cannot tell how many Blue Grouse there are in Mineral County, but we can by rewalking the same forest trails at the same time next year obtain figures which will conclusively show whether the birds are 10 per cent or 20 per cent more or less abundant than they were in 1942. Such information is of great value to the Commission in establishing open seasons and bag limits. Using our data books of 1942, it will be possible in future years accurately to check the changes in population of all species of upland game birds in the following counties: Sheridan, Fallon, Carter, Garfield, Toole, Glacier, Meagher, Lincoln, Flathead, Sanders, Mineral, Missoula, Ravalli, Powell, Granite and Lake.

There is little doubt that pheasants reach greater densities (birds per acre) than any of our other game birds. Sharptail grouse in some of the extreme eastern counties are certainly next in order, with sage grouse in a few areas following closely behind. Although Hungarian Partridges are found over a much greater area than any other species, we have not found them to be as abundant in any one place as the above mentioned species. The mountain grouse, blue, ruffed,

and franking, are much scarcer even in their areas of greatest concentration than the four species mentioned above.

A detailed census of the heavy pheasant population in the region of Billings was scheduled prior to the opening of the special open season in September, but continued rainy weather forced us to cancel our plans. Figures from the Flathead Valley where the birds are thought to be less abundant than in the Yellowstone Valley clearly show that the population there is much higher than in most of the pheasant areas of the midwestern and eastern states.

Future Work:

The original plan of determining the status of each species of upland game birds in each county has been accomplished. Future work which is urgently needed should better tell us the reasons for some of our findings. In view of recent complaints lodged by farmers of damage to crops by pheasants, detailed studies of the food habits of this bird should be made in several regions of the state. Such studies will involve examination of crop and gizzard contents of birds at a time when they are reportedly doing damage. It is most important in our understanding of the native species to assign men to a full time study on a year around basis in special regions. Only in this way can we really come to understand all of the factors operating against the proper recovery of grouse in many counties.

A census check will be made of the pheasant population in the Billings area early in January, 1943. The result of this work will be particularly important as it will indicate the effect of the past hunting season upon numbers of birds and also upon the sex ratio.



SOMETHING TO THINK ABOUT!

To permit an increase of any wild bird or animal over and above the available food supply is to destroy that bird or animal just as surely as by overshooting.

By—David M. Newell,
Editor-in-Chief, Field & Stream

Statistical Section

ASSETS AND LIABILITIES OF THE
FISH AND GAME DEPARTMENT

JUNE 30, 1941

Assets

Land and Land Improvements	\$ 46,137.17
Buildings and Attached Fixtures	200,419.79
Machinery and Appliances	42,769.69
Hand Tools and Petty Equipment	3,441.92
Furniture and Fixtures	15,134.22
Library and Reference Books	15.00
Scientific Apparatus	118.60
Fish Traps and Holding Pens	2,150.00
Livestock	75.00
Rearing Ponds and Pipe Lines	71,139.24

Balance in Fish and Game Fund	\$381,400.63
Revolving Fund	76,600.65
1941 Accounts Receivable	100.00
1942 Accounts Receivable	266,563.50
1943 Accounts Receivable	151.00

Liabilities

Commissions Dealers' Fees	266,714.50
Disbursements and Appropriations	13,910.80
	330,680.04
1941 Accounts Receivable	\$1,099,305.62

ASSETS AND LIABILITIES OF THE
FISH AND GAME DEPARTMENT

JUNE 30, 1942

Assets

Land and Land Improvements	\$ 48,797.17
Buildings and Attached Fixtures	206,205.12
Machinery and Appliances	62,267.37
Hand Tools and Petty Equipment	7,743.70
Furniture and Fixtures	14,563.36
Library and Reference Books	15.00
Scientific Apparatus	2,146.55
Livestock	710.00
Ponds and Pipe Lines	66,586.74
Stores and new supplies	4,057.53

Balance in Fish and Game Fund	\$ 413,062.54
Revolving Fund	23,709.00
Fur Purchase Fund	100.00
Receivables Due	3,000.00
	2,770.00

Liabilities

Commissions Dealers' Fees	266,714.50
Disbursements and Appropriations	13,910.80
	330,680.04
1941 Accounts Receivable	\$1,099,305.62
1942 Accounts Receivable	273,328.00
1943 Accounts Receivable	4,081.50

Liabilities

Commissions Dealers' Fees	277,409.50
Disbursements and Appropriations	15,207.30
Fish and Game Fund	400,903.87
Disbursements Deducted from P. R. Fd.	\$1,184,363.44

Total Assets

\$1,184,363.44

Liabilities

Surplus	\$ 563,908.97
1942 License Revenue	332,025.40
1941 License Revenue	233,463.00
1940 License Revenue	151.00
Other Licenses and Permits	24,138.00
Miscellaneous Revenue	30,679.19

\$1,184,363.44

FISH AND GAME DEPARTMENT RECEIPTS FOR YEAR
JULY 1, 1940 TO JUNE 30, 1941

Hunting and Fishing Licenses and Shipping Permits:

Res. Bird and Fish	83,876	¢	\$ 2,00	\$187,752.00
Res. Big Game	38,913	¢	1,00	38,913.00
Res. Sportswan	115	¢	5,00	575.00
Non-Res. Fishing	1,475	¢	5,00	7,375.00
Non-Res. 10 Day Fishing	6,531	¢	2,50	16,327.50
Non-Res. Bird	125	¢	10,00	1,250.00
Non-Res. Big Game	338	¢	30,00	11,640.00
Allen Bird	3	¢	30,00	90.00
Allen Fishing	56	¢	10,00	560.00
Shipping Permits	3,365	¢	.50	1,682.50

Less Dealers' Fees	\$266,172.50
Delinquent Accounts	13,810.80
	148.10
	\$292,361.70

Other Licenses and Permits:

Beaver Tags	17,716	¢	\$.50	\$ 8,858.00
Trappers' Licenses	908	¢	10,00	9,080.00
Trapper-Land Owner	813	¢	1,00	813.00
Beaver Permits	1,682	¢	10,00	10,820.00
Guides' Licenses	119	¢	10,00	1,190.00
Taxidermist Licenses	6	¢	15,00	90.00
Soining Licenses	2	¢	5,00	10.00
Res. Fur Dealers	322	¢	1,00	322.00
Fur Dealer Agent	11	¢	10,00	110.00
Non-Res. Fur Dealer	11	¢	25,00	275.00
Cert. of Identification	527	¢	.50	263.50

\$ 31,811.50

Miscellaneous Revenue:

Fines	\$ 10,466.71
Confiscation Sale Furs	3,817.62
Confiscation Sale Guns, Rods, etc.	567.00
Confiscation Sale Fish & Meats	1,063.58
Game Farm Sale of Brood Hens	1,411.88
Sale of Elk Study	2.50
Refunds	330.80
Other Revenue	650.11
Sale of Furs State Trappers	1,222.00
Royalty on Fish Sold	72.61

\$ 22,355.81

Total Income

\$306,887.12

FISH AND GAME DEPARTMENT RECEIPTS FOR YEAR
JULY 1, 1941 TO JUNE 30, 1942

Hunting and Fishing Licenses and Shipping Permits:

Res. Bird and Fish	98,554	¢	\$ 2,00	\$197,108.00
Res. Big Game	46,487	¢	1,00	46,487.00
Res. Sportswan	76	¢	5,00	380.00
Non-Res. Fishing	1,482	¢	5,00	7,460.00
Non-Res. 10 Day Fishing	7,184	¢	2,50	17,960.00
Non-Res. Bird	219	¢	10,00	2,190.00
Non-Res. Big Game	452	¢	30,00	14,190.00
Allen Bird	2	¢	30,00	60.00
Allen Fishing	55	¢	10,00	550.00
Shipping Permits	2,892	¢	.50	1,446.00

Less Dealers' Fees	\$288,071.00
Delinquent Accounts	15,116.70
	139.50
	\$272,951.20

Other Licenses and Permits:

Beaver Tags	11,181	¢	.50	\$ 5,580.50
Trappers' Licenses	449	¢	10,00	4,490.00
Trapper-Land Owner	560	¢	1,00	560.00
Beaver Permits	1,078	¢	10,00	10,780.00
Guides' Licenses	128	¢	10,00	1,280.00
Taxidermist Licenses	10	¢	15,00	150.00
Soining Licenses	1	¢	5,00	5.00
Resident Fur Dealers	528	¢	1,00	528.00
Fur Dealer Agent	13	¢	10,00	130.00
Non-Res. Fur Dealer	14	¢	25,00	350.00
Cert. of Identification	543	¢	.50	271.50

\$ 24,135.00

Miscellaneous Revenue:

Fines	\$ 16,194.11
Confiscation Sale Furs	3,068.00
Confiscation Sale Guns, Rods, etc.	708.10
Confiscation Sale Fish & Meats	2,191.88
Game Farm Sale of brood hens	1,219.75
Sale of Elk Study	2.00
Refunds	613.28
Other Revenue	228.15
Sale of Furs State Trappers	1,094.40

\$ 30,890.87

Minus returned check

210.70

Total Income

\$327,908.77

DETAIL OF EXPENDITURES OF FISH AND GAME DEPARTMENT
Year Ending June 30, 1941

ADMINISTRATION:

Operation

Salaries: Game Warden	\$ 3,740.00
Chief Clerk	2,812.50
Office Employees	7,043.02
Supt. of Fisheries	3,445.76
Others	1,635.57
Game Manager	1,893.38
Postage	1,222.75
Stationary, Record Books and Blanks	517.27
Sundry Office Expense	461.96
Telephone and Telegraph	843.57
Freight, Express and Drayage	169.47
Office Rent—Capitol Building	1,200.00
Auto Travel—Game Warden	495.76
Other Travel	361.72
Auto Travel—Chief Clerk	160.89
Other Travel	78.85
Auto Travel—Superintendent of Fisheries	331.70
Other Travel	424.30
Travel of Others	54.10
Auto Travel—Game Manager	462.39
Other Travel	188.75
Printing Publications	210.75
Printing Licenses	4,425.98
Official Bonds	480.00
Advertising and Notices	2,535.50
Rent and Lease of Land	84.50
Industrial Accident Insurance	3,213.23
Association Dues	75.00
Legal Costs	1,260.18
Expense of Fairs	446.63
Insurance on Autos	75.19
Maps and Surveys	3,034.66
Board of Prisoners	740.38
Other Field Expenses	3,722.93
Auditing Expense	226.00
General Supplies and Expense	167.87
Total Operation	\$ 48,242.51

Capital

Land and Land Improvement	7.00
Machinery, Appliances and Trailers	894.51
Furniture and Fixtures	186.71

1,088.22

Repairs and Replacements

Machinery and Appliances

253.81

Commissioners Expense

Per Diem	\$ 1,745.00
Travel	2,254.48

Total Commissioners Expense

\$ 3,999.48

DETAIL OF EXPENDITURES OF FISH AND GAME DEPARTMENT — (Continued)

Year Ending June 30, 1941

Miscellaneous

Salaries: Trappers and Hunters	130.00	
Others	2,091.18	
Bird Food and Salt	1,065.10	
Poison and Traps	40.00	
Bounty Expense	16,941.00	
Miscellaneous	1,791.43	
Total Miscellaneous		\$ 22,058.71

Stream Survey

Salary	100.00	
Travel	23.50	
		123.50

Deputies

Salaries: Regulars	39,187.74	
Specials	18,653.45	
Special Field Work	2,405.89	
Miscellaneous Expense	1,495.74	
Subsistence	3,715.03	
Transportation	25,321.51	
Shells	10.00	
Total Operation		90,789.36

Capital

Boats and Motors	64.89	

 Total Administration \$166,220.48

CHECKING STATION:

Operation

Salaries and Wages	\$ 1,528.69	
Office Supplies and Expenses	50.04	
Travel	28.19	
Auto and Truck Expense	36.24	
Heat, Light and Water	42.88	
Subsistence	40.86	
Hardware and Sundry Supplies	36.29	
Insurance	1.09	
Miscellaneous	161.43	
Total Operation		1,925.71

Capital

Land and Land Improvements	33.55	
Buildings and Attached Fixtures	843.58	
Furniture and Fixtures	26.00	
Total Capital		903.13

 Total Checking Station \$ 2,828.84

DETAIL OF EXPENDITURES OF FISH AND GAME DEPARTMENT — (Continued)

Year Ending June 30, 1941

GAME FARM—Warm Springs:

Operation

Salaries and Wages	\$ 9,388.35	
Office Supplies and Expense	96.49	
Travel	326.20	
Auto and Truck Expense	483.38	
Heat, Light and Water	385.76	
Bird Food	2,772.17	
Hardware and Sundry Supplies	105.36	
Insurance	17.93	
Distribution of Birds	121.85	
Miscellaneous	37.56	
	<hr/>	
Total Operation		\$ 13,735.08

Capital

Land and Land Improvement	\$ 10.75	
Buildings and Attached Fixtures	1,870.23	
Hand Tools and Petty Equipment	27.24	
Autos and Trucks	603.70	
	<hr/>	
Total Capital		\$ 2,511.92

Repairs and Replacements

Buildings and Attached Fixtures	\$ 6.20	
Autos and Trucks	239.87	
Breeding Stock	1,284.00	
	<hr/>	
Total Repairs and Replacements		\$ 1,530.07

Total Game Farm—Warm Springs.	<hr/>	\$ 17,777.07
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GAME FARM—Billings:

Operation

Salaries and Wages	\$ 7,113.95	
Office Supplies and Expense	67.55	
Travel	6.53	
Auto and Truck Expense	393.70	
Heat, Light and Water	301.54	
Bird Food	2,681.92	
Hardware and Sundry Supplies	83.53	
Insurance	17.93	
Distribution of Birds	166.08	
Miscellaneous	68.23	
	<hr/>	
Total Operation		\$ 10,900.96

Capital

Land and Land Improvement	\$ 61.60	
Buildings and Attached Fixtures	9,183.00	
Hand Tools and Petty Equipment	88.92	
	<hr/>	
Total Capital		\$ 9,333.52

DETAIL OF EXPENDITURES OF FISH AND GAME DEPARTMENT — (Continued)

Year Ending June 30, 1941

Repairs and Replacements

Buildings and Attached Fixtures	\$ 64.52	
Hand Tools and Petty Equipment	18.70	
Autos and Trucks	39.70	
Breeding Stock	1,148.00	
Total Repairs and Replacements		\$ 1,270.92
Total Game Farm Billings		\$ 21,505.40

WILDLIFE RESTORATION ACT:

Administration:

Operation

Salaries	\$ 303.93	
Office Supplies and Expense	12.16	
Travel	8.10	
Total Operation		\$ 324.19

Research

Salaries	\$ 475.00	
Office Supplies	1.12	
Travel	59.90	
Total Research		\$ 536.02

Beaver Development

Salaries	\$ 225.00	
Travel	25.40	
Auto and Truck Expense	4.25	
Total Beaver Development		\$ 254.65

Total Wildlife Restoration \$ 1,148.87

FISH HATCHERIES:

Operation

Salaries and Wages	\$ 46,722.05	
Office Supplies and Expense	1,928.74	
Travel	879.96	
Auto and Truck Expense	6,021.17	
Heat, Light and Water	1,941.45	
Fish Foods	14,088.36	
Rents	33.40	
Subsistence	501.09	
Hardware and Sundries	1,255.54	
Hatchery Supplies	813.35	
Distribution of Fish	46.33	
Insurance	419.28	
Miscellaneous	42.89	
Total Operation		\$ 74,093.04

DETAIL OF EXPENDITURES OF FISH AND GAME DEPARTMENT — (Continued)

Year Ending June 30, 1941

Capital

Land and Land Improvement	\$ 1,981.36	
Buildings and Attached Fixtures	22,078.00	
Machinery and Appliances	331.85	
Hand Tools and Petty Equipment	192.52	
Furniture and Fixtures	119.04	
Auto and Truck Expense	4,428.68	
Scientific Apparatus	3,473.11	
Fish Traps	195.96	
Mechanical Fish Screens	3,671.86	
Fish Tanks	152.53	
Rearing Ponds	1,746.65	
	<hr/>	
Total Capital		\$ 38,371.56

Repairs and Replacements

Land and Land Improvements	\$ 345.35	
Buildings and Attached Fixtures	5,044.73	
Machinery and Appliances	267.94	
Hand Tools and Petty Equipment	116.41	
Furniture and Fixtures	154.60	
Autos and Trucks	1,337.68	
Fish Traps	65.50	
Mechanical Fish Screens	252.85	
Fish Tanks	24.33	
Rearing Ponds	124.03	
Egg Cases	1.20	
Boats and Motors	33.57	
	<hr/>	
Total Repairs and Replacements		\$ 7,768.19
		<hr/>
Total Hatcheries		\$120,833.39
		<hr/>
Total Expenditures		\$330,680.04

DETAIL OF EXPENDITURES OF FISH AND GAME DEPARTMENT

Year Ending June 30, 1942

ADMINISTRATION:

Operation

Salaries: Game Warden	\$ 3,600.00	
Chief Clerk	2,700.00	
Office Employees	8,457.83	
Supt. of Fisheries	3,300.00	
Others	2,174.70	
Game Manager		
Postage	1,229.19	
Stationery, Record Books and Blanks	1,622.87	
Sundry Office Expense	549.04	
Telephone and Telegraph	1,131.32	
Freight, Express and Drayage	325.18	
Office Rent, Capitol Building	1,500.00	
Auto Travel—Game Warden	576.12	
Other Travel—Game Warden	554.17	
Auto Travel—Chief Clerk	35.74	
Other Travel—Chief Clerk	3.45	
Auto Travel—Supt. of Fisheries	484.87	
Other Travel—Supt. of Fisheries	953.61	
Travel of Others	42.11	
Printing Publications	1,475.51	
Printing Licenses	3,997.05	
Official Bonds	409.03	
Advertising and Notices	777.15	
Rent and Lease of Land	562.62	
Industrial Accident Insurance	3,856.06	
Association Dues	50.00	
Legal Costs	247.53	
Expense of Fairs	31.22	
Insurance on Autos	106.08	
Maps and Surveys	3,001.80	
Board of Prisoners	455.10	
Other Field Expense	338.65	
Auditing Expense	131.33	
General Supplies and Expense	4,198.83	
Total Operation		\$ 48,878.14

Capital

Land and Land Improvement	\$ 26.47	
Machinery, Appliances and Horse Trailers	1,182.34	
Furniture and Fixtures	172.86	
Buildings and Attached Fixtures	32.98	
Scientific Apparatus	294.75	
Total Capital		\$ 1,709.40

Repairs and Replacements

Machinery and Appliances	\$ 106.82	
Furniture and Fixtures	10.95	
Total Repairs and Replacements		\$ 217.77

DETAIL OF EXPENDITURES OF FISH AND GAME DEPARTMENT — (Continued)
Year Ending June 30, 1942

Commissioners' Expense

Per Diem of Commissioners	\$ 1,555.00	
Travel	1,792.08	
General Supplies and Expenses	19.76	
	<hr/>	
Total Commissioners' Expense		\$ 3,366.84

Miscellaneous

Salaries: Hunters and Trappers	\$ 2,805.00	
Others	1,955.59	
Bird Food and Salt	1,474.06	
Poison and Traps	61.40	
Bounty Expense	1,734.00	
Miscellaneous	1,820.69	
Bounties	5,293.00	
	<hr/>	
Total Miscellaneous		\$ 15,143.74

Stream Survey

Salaries	\$ 1,100.00	
Travel	962.86	
Miscellaneous Expense	39.90	
	<hr/>	
Total Stream Survey		\$ 2,102.76

Deputies

Salaries: Regular Deputies	\$ 44,067.08	
Special Deputies	18,093.66	
Special Field Work	1,260.70	
Miscellaneous Expense	1,673.56	
Subsistence	4,144.39	
Transportation	23,534.23	
Shells	7.95	
Uniforms	495.95	
	<hr/>	
Total Operation		\$ 93,277.52

Capital

Boats and Motors	\$ 227.09	
	<hr/>	
Total Capital		\$ 227.09
Total Administration		\$ 164,917.22

CHECKING STATION:

Operation

Salaries and Wages	\$ 1,472.94	
Office Supplies and Expense	19.22	
Travel	16.49	
Auto and Truck Expense	13.10	
Heat, Light and Water	80.10	
Subsistence	436.36	
Hardware and Sundry Supplies	2.66	
Miscellaneous	249.09	
	<hr/>	
Total Operation		\$ 2,289.96

DETAIL OF EXPENDITURES OF FISH AND GAME DEPARTMENT — (Continued)

Year Ending June 30, 1942

Capital			
Buildings and Attached Fixtures	\$	50.00	
Machinery and Appliances		7.50	
Total Capital			\$ 57.50
Repairs and Replacements			
Buildings and Attached Fixtures	\$	9.32	
Total Repairs and Replacements			\$ 9.32
Total Checking Station			\$ 2,356.78
GAME FARM—Warm Springs:			
Operation			
Salaries and Wages	\$	2,308.20	
Office Supplies and Expense		105.58	
Travel		86.55	
Auto and Truck Expense		484.38	
Heat, Light and Water		528.51	
Bird Food		4,055.82	
Hardware and Sundry Supplies		17.90	
Insurance		15.87	
Distribution of Game Birds		58.91	
Miscellaneous		28.75	
Subsistence		7.70	
Total Operation			\$ 13,698.17
Capital			
Land and Land Improvement	\$	14.51	
Buildings and Attached Fixtures		256.00	
Total Capital			\$ 270.51
Repairs and Replacements			
Buildings and Attached Fixtures	\$	33.01	
Autos and Trucks		56.60	
Breeding Stock		1,759.00	
Land and Land Improvements		15.95	
Machinery, Appliances and Autos		5.60	
Total Repairs and Replacements			\$ 1,870.16
Total Game Farm—Warm Springs			\$ 15,836.84
GAME FARM—Fort Peck:			
Operation			
Salaries	\$	6,800.38	
Office Supplies and Expenses		301.23	
Travel		10.60	
Autos and Trucks		602.40	
Heat, Light and Water		136.39	
Bird Food		1,776.46	
Hardware and Sundry Supplies		185.80	
Miscellaneous		265.10	
Total Operation			\$ 10,078.36

DETAIL OF EXPENDITURES OF FISH AND GAME DEPARTMENT — (Continued)

Year Ending June 30, 1942

Capital

Land and Land Improvements	\$ 305.67	
Buildings and Attached Fixtures	5,875.64	
Machinery, Appliances and Autos	3,542.50	
Hand Tools and Petty Equipment	74.04	
Furniture and Fixtures	79.33	
	<hr/>	
Total Capital		\$ 9,877.18

Repairs and Replacements

Land and Land Improvements	\$ 31.85	
Buildings and Attached Fixtures	77.61	
Autos and Trucks	7.80	
	<hr/>	
Total Repairs and Replacements		\$ 117.26

Total Game Farm—Fort Peck \$ 20,072.80

GAME FARM—Billings:

Operation

Salaries and Wages	\$ 6,583.06	
Office Supplies and Expense	66.06	
Travel	45.80	
Auto and Truck Expense	368.31	
Heat, Light and Water	411.77	
Bird Food	2,654.21	
Hardware and Sundry Supplies	31.37	
Insurance	15.87	
Distribution of Fish	49.02	
Miscellaneous	37.90	
	<hr/>	
Total Operation		\$ 10,263.37

Capital

Buildings and Attached Fixtures	\$ 244.42	
Hand Tools and Petty Equipment	6.34	
Machinery, Appliances and Autos	126.80	
	<hr/>	
Total Capital		\$ 377.56

Repairs and Replacements

Buildings and Attached Fixtures	\$ 22.07	
Hand Tools and Petty Equipment	1.00	
Autos and Trucks	46.13	
Breeding Stock	1,639.00	
Land and Land Improvements	7.50	
Machinery, Appliances and Autos	7.50	
	<hr/>	
Total Repairs and Replacements		\$ 1,723.20

Total Game Farm Billings \$ 12,364.13

DETAIL OF EXPENDITURES OF FISH AND GAME DEPARTMENT — (Continued)

Year Ending June 30, 1942

WILDLIFE RESTORATION:

Administration:

Operation

Salaries	\$ 4,143.96	
Office Supplies and Expense	654.92	
Travel	549.65	
Automobiles and Trucks	496.96	
Rent	375.00	
Insurance and Compensation	30.04	
Miscellaneous	18.00	
Total Operation		\$ 6,268.53

Capital

Machinery and Appliances	\$ 194.52	
Hand Tools and Petty Equipment	48.36	
Furniture and Fixtures	578.84	
Autos and Trucks	3.54	
Scientific Apparatus	174.97	
Maps—Surveys and Plans	23.00	
Total Capital		\$ 1,023.23

Repairs and Replacements

Machinery and Appliances	\$ 9.50	
Furniture and Fixtures	11.15	
Autos and Trucks	932.09	
Total Repairs and Replacements		\$ 952.74

Total Administration \$ 8,244.50

RESEARCH:

Operation

Salaries	\$ 38,858.28	
Office Supplies and Expenses	567.70	
Travel	6,003.70	
Automobiles and Trucks	2,004.11	
Heat	807.43	
Rent	1.25	
Subsistence	3,097.76	
Hardware and Sundry Supplies	91.76	
Insurance and Compensation	117.37	
Field Supplies	256.38	
Films	47.64	
Miscellaneous	214.89	
Total Operation		\$ 50,080.77

DETAIL OF EXPENDITURES OF FISH AND GAME DEPARTMENT — (Continued)

Year Ending June 30, 1942

Capital

Land and Land Improvements	\$ 32.00	
Machinery and Appliances	134.56	
Hand Tools and Petty Equipment	2,108.56	
Furniture and Fixtures	15.50	
Autos and Trucks	6,083.38	
Snowmobiles and Toboggans	3,721.47	
Horses	541.73	
Scientific Apparatus	732.18	
Maps, Surveys and Plans	224.43	
	<hr/>	
Total Capital		\$ 13,593.81

Repairs and Replacements

Machinery and Appliances . . . . .	.75	
Hand Tools and Petty Equipment	6.55	
Autos and Trucks	295.36	
Snowmobiles and Toboggans	204.19	
Horses	26.75	
Scientific Apparatus	3.17	
	<hr/>	
Total Repairs and Replacements		\$ 536.77

Total Research \$ 66,198.85

DEVELOPMENT—Beaver:

Operation

Salaries	\$ 2,964.70	
Office Supplies and Expense	76.46	
Travel	113.05	
Autos and Truck Expense	305.41	
Subsistence	208.58	
Hardware and Sundry Supplies . . . . .	.80	
Insurance and Compensation	59.31	
Field Supplies	1.63	
Miscellaneous	25.72	
	<hr/>	
Total Operation		\$ 3,755.66

Capital

Machinery and Appliances	\$ 24.56	
Hand Tools and Petty Equipment	2,261.43	
Autos and Trucks	804.18	
Scientific Apparatus	1.00	
	<hr/>	
Total Capital		\$ 3,091.17

Repairs and Replacements

Hand Tools and Petty Equipment	\$ 5.95	
Snowmobiles and Toboggans	5.60	
	<hr/>	
Total Repairs and Replacements		\$ 11.55

Total Development Beaver \$ 6,858.38

DETAIL OF EXPENDITURES OF FISH AND GAME DEPARTMENT — (Continued)

Year Ending June 30, 1942

RESTOCKING PROJECT:

Operation

Salaries	\$ 2,067.71	
Office Supplies and Expenses	36.06	
Travel	644.09	
Autos and Trucks	428.86	
Subsistence	51.97	
Hardware and Sundry Supplies	251.69	
Field Supplies	131.00	
Miscellaneous	72.31	
	<hr/>	
Total Operation		\$ 3,683.69

Capital

Buildings and Attached Fixtures	\$ 164.28	
Machinery and Appliances	309.49	
Hand Tools and Petty Equipment	32.78	
Maps, Surveys and Plans	8.55	
	<hr/>	
Total Capital		\$ 515.10

Repairs and Replacements

Autos and Trucks	\$ 54.69	
Snowmobiles and Toboggans	9.48	
	<hr/>	
Total Repairs and Replacements		\$ 64.17

Total Restocking Project		<hr/>	\$ 4,262.96
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POSTING OF PRESERVES:

Operation

Salaries	\$ 25.98	
Travel	31.90	
Autos and Trucks	.94	
Field Supplies	8.83	
	<hr/>	
Total Operation		\$ 67.65

Capital

Hand Tools and Petty Equipment	\$ 58.01	
	<hr/>	
Total Capital		\$ 58.01

Total Posting of Preserves		<hr/>	\$ 125.66
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WATER FACILITIES:

Operation

Salaries	\$ 404.62	
Office Supplies and Expenses	1,287.56	
Travel	140.35	
Autos and Trucks	10.65	
Subsistence	13.18	
Hardware and Sundry Supplies	39.94	
Field Supplies	.74	
	<hr/>	
Total Operation		\$ 1,897.04

DETAIL OF EXPENDITURES OF FISH AND GAME DEPARTMENT — (Continued)

Year Ending June 30, 1942

Capital

Land and Land Improvements	\$ 3,357.78	
Machinery and Appliances	10.00	
Hand Tools and Petty Equipment	61.06	
		<hr/>
Total Capital		\$ 3,428.84

Repairs and Replacements

Autos and Trucks	\$ 48.67	
		<hr/>
Total Repairs and Replacements		\$ 48.67
		<hr/>
Total Water Facilities		\$ 5,374.55

FISH HATCHERIES:

Operation

Salaries and Wages	\$ 49,980.80	
Office Supplies and Expense	1,889.72	
Travel	837.56	
Auto and Truck Expense	6,813.63	
Heat, Light and Water	2,157.70	
Fish Food	17,152.29	
Rents	44.00	
Subsistence	959.51	
Hardware and Sundries	637.55	
Hatchery Supplies	615.06	
Distribution of Fish	33.62	
Insurance	337.21	
Miscellaneous	38.64	
		<hr/>
Total Operation		\$ 81,497.29

Capital

Land and Land Improvements	\$ 670.60	
Buildings and Attached Fixtures	885.48	
Machinery and Appliances	294.68	
Hand Tools and Petty Equipment	95.45	
Furniture and Fixtures	35.38	
Automobiles and Trucks	1,452.21	
Scientific Apparatus	4.50	
Fish Traps	240.81	
Mechanical Fish Screens	1,696.90	
Fish Tanks	80.00	
Rearing Ponds	2,701.40	
Maps - Surveys and Plans	3.50	
		<hr/>
Total Capital		\$ 8,160.91

DETAIL OF EXPENDITURES OF FISH AND GAME DEPARTMENT — (Continued)

Year Ending June 30, 1942

Repairs and Replacements

Land and Land Improvements	\$ 19.95	
Buildings and Attached Fixtures	1,123.38	
Machinery and Appliances	150.28	
Hand Tools and Petty Equipment	80.14	
Furniture and Fixtures	13.35	
Automobiles and Trucks	1,461.10	
Fish Traps	123.10	
Mechanical Fish Screens	406.67	
Fish Tanks	107.99	
Rearing Ponds	49.47	
Boats and Motors	93.26	
Scientific Apparatus	2.25	
		<hr/>
Total Repairs and Replacements		\$ 3,630.94
		<hr/>
Total Hatcheries		\$ 93,289.14
		<hr/>
GRAND TOTAL		\$399,903.87

RECAPITULATION OF FISH AND GAME FUND

Balance Fish and Game Fund July 1, 1940	\$100,393.27	
Income for year ending June 30, 1941	306,887.42	
		<hr/>
Funds Available	\$407,280.69	
Expenditures for year	330,680.04	
		<hr/>
Balance in Fund June 30, 1941	\$ 76,600.65	
Income for year ending June 30, 1942	327,908.77	
		<hr/>
Funds available	\$404,509.42	
Expenditures for the year	379,800.42	
		<hr/>
Balance	\$ 24,709.00	
Less appropriation to Purchasing Agent	1,000.00	
		<hr/>
Balance in Fish and Game Fund June 30, 1942		\$ 23,709.00
		<hr/>
Federal P. R. Fish and Game Fund:		
Income for year ending June 30, 1942	\$ 32,348.73	
Expenditures for year	20,103.45	
		<hr/>
Balance in P. R. Fund June 30, 1942		\$ 12,245.28
		<hr/>
Total Funds on Hand		\$ 35,954.26
Vouchered and due from U. S. Government P. R.		37,495.95
		<hr/>
Total Funds on Hand and Due		\$ 73,450.23

LICENSE SALES BY COUNTIES — July 1, 1940 to June 30, 1941

	Resident Bird & Fish	Resident Big Game	Resident Sportsmans	Non-Resident Fishing	Non-Resident Fishing	Non-Resident Big Game	Non-Resident Big Game	Allen Fishing	Totals
Beaverhead	2,104	1,004	2	96	477	4			3,685
Big Horn	1,628	173	1	6	24				1,211
Blaine	704	178		2					881
Broadwater	743	480		3					1,288
Carbon	2,927	807	5	21	117	2		2	3,233
Carter	45	2							47
Cascade	7,754	3,213	16	16	141	6	28	5	11,179
Chouteau	889	233							1,124
Custer	793	44	2		7	1	4		851
Danels	236	16							252
Dawson	669	60			6		1		736
Deer Lodge	2,713	1,037	6	11	83		4	3	3,857
Fallon	123	8							131
Fergus	2,795	1,784	2	5	74		10		4,668
Flathead	5,952	3,117	4	60	418	5	26	5	9,587
Gallatin	4,632	2,234	3	240	1,871	11	50	7	9,048
Garfield									
Grant	1,956	337		5	27		6		1,641
Glacier	372	332			2				316
Golden Valley	474	456	1	3	39		1		1,471
Granite	1,634	143			6	1	1	2	1,787
Hill	925	555		2	27				1,509
Jefferson	665	524	2	1	19		1	1	1,213
Judith Basin	2,645	861	1	26	260	5			3,802
Lake	4,957	3,183	15	16	278	6	61	3	8,552
Lewis and Clark	204	27			1				232
Liberty	2,305	1,345		19	187	1	9	1	3,867
Lincoln	2,813	958		63	251	2	12		3,069
Madison	68	13							81
McCone	884	500		6	94				1,474
Meagher	791	426		82	155		1		1,402
Mineral	5,057	2,792	6	183	293	20	44	2	8,287
Missoula	1,053	41	2		13				1,108
Musselshell	2,948	1,527	8	35	131	4	31	5	4,689
Park									
Pembina									
Phillips	832	152	4	1	6				994
Pondera	1,107	340			5		3		1,456
Powell	1,611	764		18	58	1	20	1	2,473
Prairie	52	3							55
Ravalli	2,782	1,534	1	18	149		14		4,498
Richland	555	47			2				607
Roosevelt	772	52	2	3	4				845
Rosebud	315	15			3				336
Sanders	1,849	1,052	1	45	291		7	2	3,218
Sheridan	126	7							136
Silver Bow	8,011	2,647	10	15	152		12	9	10,978
Sitka	1,368	542		36	182		8		2,135
Spearhead	1,989	587	1	15	113		1		1,707
Teton Grass	1,052	504		2	25		7		1,580
Teton									
Toole	658	182	6	2	4				852
Treasure									
Valley	1,566	63			9				1,638
Wheatland	571	507	4	3	19		1		1,108
Wilcox	91	5			3				102
Yellowstone	7,580	1,360	8	263	1,633		11	6	9,158
Yuma				67	238		12		313
Washington					133		5		265
Total	93,876	38,943	115	1,475	6,534	128	388	56	141,515

*Non-Resident Bird Total includes 3 Allen Bird (Lewis & Clark).

LICENSE SALES BY COUNTIES — July 1, 1941 to June 30, 1942

	Resident Bird & Fish	Resident Big Game	Resident Sportsmans Fishing	Non-Resident Sportsmans Fishing	Non-Resident Bird	Non-Resident Big Game	Alien Fishing	Totals
Beaverhead	2,277	1,127	3	66	558	2	7	4,040
Big Horn	1,108	234	1	6	27	15	4	1,396
Blaine	560	153	...	...	...	...	...	714
Broadwater	1,026	505	...	4	16	2	...	1,551
Carbon	2,139	690	1	10	144	...	2	2,883
Cartere	452	...	...	...	...	...	...	499
Chouteau	7,934	3,734	1	43	195	9	20	11,941
Custer	906	281	1	1	1,174	...	...	1,959
Daniels	232	72	1	3	3	3	...	255
Dawson	372	91	...	...	7	...	...	470
Deer Lodge	3,333	1,323	4	9	89	2	1	4,761
Fallon	167	28	...	...	...	1	...	196
Fergus	3,336	2,256	3	11	91	...	...	5,704
Flathead	5,455	3,939	4	63	437	2	36	9,942
Gallatin	4,949	2,742	1	...	1,902	22	62	10,018
Garfield	37	28	...	...	...	...	...	65
Glacier	1,534	484	...	3	46	7	...	2,074
Golden Valley	203	136	...	3	...	...	...	342
Granite	522	514	...	8	22	6	...	1,072
Hill	2,587	189	2	5	10	1	5	3,089
Jefferson	475	577	...	4	50	...	...	1,046
Judith Basin	541	481	1	...	1,949	...	...	3,000
Landreth	2,888	1,493	3	31	209	1	1	4,205
Lewis and Clark	1,687	3,167	17	46	285	11 ^e	68	8,257
Liberty	184	50	...	...	...	...	...	234
Lincoln	1,738	1,618	...	21	198	...	8	3,584
Madison	1,768	1,119	2	70	251	...	8	3,218
McCone	83	20	...	...	...	...	...	103
Meagher	749	586	1	2	26	...	...	1,364
Mineral	780	488	...	43	199	5	3	1,518
Missoula	5,795	3,020	4	54	334	31	67	9,308
Musselshell	876	476	1	2	5	...	...	1,360
Park	3,064	2,177	6	46	221	1	46	5,566
Petroleum	689	111	2	2	7	...	...	812
Pondera	1,252	435	...	2	14	6	...	1,709
Powder River	...	...	...	...	...	...	...	...
Powell	1,424	1,073	...	16	88	32	...	2,633
Pratt	1,626	1,6	...	...	...	...	...	...
Richmond	2,802	1,872	1	18	172	22	...	4,887
Roosevelt	628	44	1	...	683	...	1	1,133
Rosebud	737	108	...	2	2	6	...	853
Sanders	523	54	...	...	...	...	...	577
Sheridan	1,500	1,179	...	55	464	4	...	3,293
Silver Bow	494	37	...	18	...	...	...	549
Stillwater	9,328	3,156	9	16	168	5	8	12,700
Sweet Grass	1,412	737	1	21	82	5	10	2,258
Teton	1,150	768	...	26	128	2	5	2,082
Teton	1,087	676	...	4	13	7	...	1,759
Toole	1,031	217	2	3	7	2	...	1,262
Treasure Valley	1,501	72	...	...	...	...	...	1,597
Wheatland	839	644	...	12	...	...	...	1,519
Yellowstone	148	6	...	3	23	5	4	155
Yellowstone	7,850	1,908	4	32	159	15	20	9,990
Washington	...	...	...	...	361	287	40	691
Washington	...	...	...	...	111	9	...	155
Totals	98,551	46,487	76	1,492	7,184	219	481	154,518

*Non-Resident Bird Total includes 2 Alien Bird (Lewis & Clark).

VIOLATIONS BY COUNTIES

	July 1, 1940 to June 30, 1941	July 1, 1941 to June 30, 1942		July 1, 1940 to June 30, 1941	July 1, 1941 to June 30, 1942
	Beaverhead	13		26	Meagher	8	11
Big Horn	12	2	Mineral	12	6
Blaine	1	3	Missoula	17	37
Broadwater	3	4	Musselshell	4	3
Carbon	16	8	Park	5	1
Carter	-	-	Petroleum	5	1
Cascade	15	19	Phillips	2	4
Chouteau	3	3	Pondera	25	13
Custer	-	4	Powder River	1	-
Daniels	-	-	Powell	7	4
Dawson	2	7	Prairie	-	-
Deer Lodge	40	21	Ravalli	9	35
Fallon	-	-	Richland	2	9
Fergus	22	20	Roosevelt	5	2
Flathead	25	45	Rosebud	1	1
Gallatin	20	27	Sanders	25	21
Garfield	-	-	Sheridan	-	3
Glacier	6	12	Silver Bow	5	8
Golden Valley	1	-	Stillwater	7	16
Granite	2	9	Sweet Grass	5	2
Hill	1	2	Teton	6	9
Jefferson	7	7	Toole	1	-
Judith Basin	8	4	Treasure	3	-
Lake	80	92	Valley	2	1
Lewis and Clark	31	21	Wheatland	5	6
Liberty	-	1	Wibaux	-	5
Lincoln	25	44	Yellowstone	17	11
Madison	19	21			
McCone	-	-	Totals	529	641

STATEMENT OF FURS SHIPPED OUT OF STATE

July 1, 1940 to June 30, 1941

Muskrats	117,839
Silver Fox	2,737
Red Fox	180
Cross Fox	32
Blue Fox	240
Mink	8,544
Marten	2,379
Beaver	17,717

July 1, 1941 to June 30, 1942

Muskrats	70,039
Fox	1,830
Mink	4,413
Raccoon	329
Beaver	11,161

Above figures include ranch raised furs.

FISH AND GAME LAW VIOLATIONS

	July 1, 1940 to June 30, 1941	July 1, 1941 to June 30, 1942
Fishing without a license	73	74
Fishing in closed waters	29	42
Fishing during closed season	15	21
Possession of more than 5 fish under 7 inches	11	4
Possession of and fishing with salmon eggs	8	8
Illegal possession of seines, net or spear	4	3
Possession of over limit of game fish	32	52
Selling game fish or game animals	..	3
Fishing with more than one rod and line	7	9
Fishing with set line	8	11
Fishing before or after hours	6	31
Pollution of streams	1	1
Swearing to false affidavit to secure license	5	5
Hunting and killing game animals during closed season	33	37
Possession of and fishing with minnows	..	1
Illegal possession of moose	3	5
Illegal possession of antelope	2	..
Illegal possession of deer or elk	35	31
Failing to tag deer or elk properly	8	14
Destroying evidence of sex of deer	3	3
Killing or possessing cub bears	..	4
Possession of or selling bear	..	4
Operating game farm without a license	..	2
Hunting big game without wearing red	..	5
Hunting without a license	9	7
Alien in possession of firearms	3	1
Carrying firearms or hunting on game preserves	16	18
Refusing to show license	..	1
Killing game birds from an automobile, highway or motor boat	30	30
Killing game birds during closed season	58	53
Possession of over limit of game birds	4	4
Possession of Chinese pheasant hen	24	6
Hunting game birds without a plug in gun	10	27
Hunting game birds or game animals before or after hours	21	23
Hunting ducks without proper license	2	1
Trapping during closed season	5	15
Trapping without a license	19	13
Illegal possession of furs	6	11
Shipping furs without a permit	6	4
Illegal possession of beaver hides	28	10
Guiding without a license	1	3
Lending license to another	1	7
Altering license	2	..
Failure to keep a record of fur transactions	1	11
Misdemeanor	..	6
Buying furs without proper license	..	4
Selling untagged beaver hides	..	16
Totals	529	641

GAME FISH EGGS COLLECTED AT STATE SPAWNING STATIONS AND ACQUIRED THROUGH COOPERATIVE AGREEMENTS
 JULY 1, 1940 to JUNE 30, 1941

	Natives	Rainbow	Grayling	Eastern Brook	Loch Leven	Sockeye Salmon	TOTALS
Georgetown Lake	2,057,252		1,501,440				3,558,692
Lake Ronan		386,168					386,168
Rogers Lake			455,680				455,680
Hiebgen Lake		8,122,900			8,496,980		16,619,880
Ashley Lake	2,750,664					4,659,040	2,750,664
Flathead Lake							4,659,040
Aldrich Lake	1,095,678			4,156,971			1,095,678
Alvord Lake				2,118,172			4,156,971
Kilbrennan Lake							2,118,172
Lake Agnes		538,488	4,295,648				4,295,648
Bitterroot Lake	937,757						538,488
Cooperative U. S. Fisheries	6,841,351	9,027,556	6,252,768	6,275,143	8,496,980	4,659,040	937,757
							41,552,838

GAME FISH EGGS COLLECTED AT STATE SPAWNING STATIONS AND ACQUIRED THROUGH COOPERATIVE AGREEMENTS
 JULY 1, 1941 to JUNE 30, 1942

	Natives	Rainbow	Grayling	Eastern Brook	Loch Leven	Sockeye Salmon	Whitefish	TOTALS
Georgetown Lake	1,905,408	1,006,434	561,792					2,467,200
Lake Ronan								1,006,434
Rogers Lake		3,806,294		7,443,450				12,429,232
Hiebgen Lake	2,767,760					4,439,472		2,767,760
Ashley Lake								4,439,472
Flathead Lake								921,360
Aldrich Lake	921,360							3,946,748
Alvord Lake				3,946,748				3,946,748
Kilbrennan Lake				1,442,644				1,442,644
Lake Agnes		4,454,208						4,454,208
Bitterroot Lake	488,928							488,928
Willow Creek	3,217,608							3,217,608
Corp. U. S. Fisheries	1,700,990							1,700,990
	7,295,518	8,519,264	5,016,000	5,389,352	7,443,450	4,439,472	1,179,488	39,282,584

**FISH DISTRIBUTION BY HATCHERIES FOR FISCAL YEAR
JULY 1, 1940 to JUNE 30, 1941**

Station	Natives	Rainbow	Grayling	Brook	Loch Leven	Sockeye Salmon	Silver Salmon	TOTALS
*Anacanda	1,148,780	1,103,620	3,916,950	143,800	951,080			7,286,418
*Big Timber	924,000	1,019,500		201,200	745,000		23,800	2,923,500
*Hamilton	1,088,860	760,600		160,000		3,230		2,089,290
Emigrant	986,390	498,308	3,000	231,400	481,076		24,450	2,224,624
Great Falls	450,000	1,187,500		306,000	339,000	180,000	38,500	2,501,000
Lewisstown	378,800	689,330		273,260				1,341,390
*Libby	472,936	155,340		862,930		273,000	67,000	1,918,206
Ovando	386,427	298,500						684,927
Polson	469,940	821,174				1,006,000	51,000	2,348,114
Red Lodge		386,706		57,500				444,206
*Somers	1,099,100	924,400		180,000		1,598,000	97,000	3,954,500
*Miles City								303,297
	7,405,233	7,844,978	3,919,950	2,416,090	2,516,156	3,060,230	376,350	28,019,472

*Anacanda total includes:
 23,800 Albino Brook Trout,
 1,103,620 Rainbow Trout,
 2,000 Albino Brook Trout,
 2,000 Albino Brook Trout,
 27,000 Mackinaw Trout,
 23,382 Bass, 26,910 Sunfish, 14,451 Crappies, 238,451 Catfish.

**FISH DISTRIBUTION BY HATCHERIES FOR FISCAL YEAR
JULY 1, 1941 to JUNE 30, 1942**

Station	Natives	Rainbow	Grayling	Brook	Loch Leven	Sockeye Salmon	Whitefish	TOTALS
*Anacanda	784,996	827,660	573,500	12,960	197,206			2,379,672
*Big Timber	490,074	319,080		91,400	286,000			1,186,554
Hamilton	870,100	1,148,345	50,160	199,940	237,476			2,506,021
Emigrant	785,423	305,282		9,000	604,000			1,703,705
Great Falls	449,000	1,584,100		69,300	150,000			2,252,400
Lewisstown	333,500	590,025		171,700	60,000			1,155,225
*Libby	209,114	141,700		128,436				479,250
Ovando		452,056						452,056
Polson	671,600	1,139,308				653,000		2,463,908
Red Lodge		297,122		16,800				313,922
*Somers	1,037,850	665,000		48,500		799,000	500,000	3,070,350
Havre		95,300		80,000				175,300
*Miles City								298,780
	5,611,657	7,564,978	623,660	828,036	1,534,682	1,452,000	500,000	18,437,143

*Anacanda total includes:
 3,350 Albino Brook Trout,
 29,000 Bass, 25,000 Sunfish, 14,230 Crappies, 237,281 Catfish.

**PHEASANT LIBERATION
1941 - 1942**

	Year 1941	Year 1942		Year 1941	Year 1942
Beaverhead	500	925	Meagher	300	500
Big Horn	250	150	Mineral	...	150
Blaine	400	200	Missoula	600	800
Broadwater	490	200	Musselshell	1,190	1,000
Carter	300	700	Park	700	1,000
Cascade	1,705	900	Petroleum	844	500
Chouteau	400	400	Phillips	400	280
Custer	600	600	Pondera	400	900
Daniels	500	500	Powder River	350	1,239
Dawson	1,000	975	Powell	400	800
Deer Lodge	500	431	Prairie	400	500
Fallon	500	700	Ravalli	500	1,550
Fergus	1,100	700	Richland	...	250
Flathead	1,323	1,434	Roosevelt	500	1,800
Gallatin	600	850	Rosebud	200	100
Garfield	500	500	Sanders	500	600
Glacier	400	300	Sheridan	800	500
Golden Valley	841	1,025	Silver Bow	700	450
Granite	400	750	Stillwater	630	750
Hill	450	500	Sweet Grass	600	700
Jefferson	250	900	Teton	450	800
Judith Basin	450	500	Toole	450	700
Lake	500	500	Valley	1,000	990
Lewis and Clark	910	1,230	Wheatland	500	970
Liberty	250	500	Wibaux	600	500
Lincoln	75	100	Yellowstone	...	200
Madison	600	1,046			
McCone	800	800	Totals	29,608	36,845

PHEASANTS LIBERATED BY GAME FARMS

	1941	1942
Warm Springs Game Farm	15,298	13,466
Billings Game Farm	14,310	15,309
Fort Peck Game Farm		8,070
Liberation Totals	29,608	36,845
Billings Game Farm Transferred to Fort Peck Game Farm	235	
Warm Springs Game Farm Transferred to Fort Peck Game Farm	95	
Held over for next year Fort Peck Game Farm		1,500
Totals	29,938	38,345

CHUKAR PARTRIDGES

	1942
Billings Game Farm Liberated	41 Yellowstone Co.
Billings Game Farm Transferred to Fort Peck Game Farm	50
Total Raised	91



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