NIAL REPORT 1950-52

MONTANA

FISH & GAME COMMISSION

STATE OF MONTANA

BIENNIAL REPORT

OF THE

FISH AND GAME COMMISSION

FOR

MAY 1, 1950 — APRIL 30, 1952

Published By The
MONTANA FISH AND GAME DEPARTMENT
Helena, Montana

FOREWORD

Montana is one of the few states that can boast of wilderness areas, abundant wildlife resources, and other of the primitive wonders of early day America. These wild resources in their pristine setting have a very real value in the economy of the state and its recreational industry. Wildlife has value, if properly managed, in the balance of nature and thus also has an effect on agriculture. However, its greatest value is an intangible one that has to do with the physical, mental and spiritual well-being of busy people in a rushing world.

Wildife resources belong to all Montanans, and all are entitled to equal shares of any dividends derived from these resources. It is the responsibility of the Montana Fish and Game Department as charged by law to manage wildlife resources for the benefit of all present and future generations.

This report is a review of progress during the past two years in the development, propagation, utilization and conservation of Montana fish and game and contains a summary of changes during the 50 years of the department's existence.

To the Honorable John W. Bonner,
Governor of Montana

Dear Governor Bonner:

In accordance with law we herewith submit the Biennial Report of the Montana Fish and Game Commission for the period May 1, 1950 through April 30, 1952.

Respectfully submitted,

MONTANA STATE FISH AND GAME COMMISSION

EDWARD M. BOYES, Chairman,
THOMAS S. MORGAN,
WALTER BANKA,
WILLIAM T. SWEET,
MANSON H. BAILEY, JR.,
R. H. LAMBETH,
State Fish and Game Warden

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A Half Century of Fish and Game Conservation

50 Years of Progress

Fifty years of operation as a functional part of the state's government were completed by the Montana Fish and Game Department during the past biennium. In these five decades one can trace tremendous changes in the status of wildlife in the state. At one time Montanans depended on wild game for food and clothing. This dependence gradually decreased as agriculture developed until today the fish and game resource is one that fulfills a different but very real need of people living under modern strains, healthful recreation and relaxation. Man is essentially an outdoor animal, and wildlife gives him an opportunity to be out of doors.

Actually the demand for more hunting and fishing has increased at almost unbelievable rates. In 1901 less than 5,000 people purchased hunting or fishing licenses. Fifty years later, in 1951, this ever growing group of hunters and fishermen had increased to more than 200,000. Nearly one out of every three men, women and children in the state purchase a hunting or fishing license.

Paralleling this increase has been the advancement in equipment and methods of taking game. High velocity rifles; telescope sights, spinning rods, more and better ammunition and lures all have made the hunter and angler potentially more effective in putting game in the bag and fish in the creel. Add to these more leisure time and faster transportation and it can be seen that the pressure on wildlife is many times greater than at any previous period in the state's history.

Yet in spite of the great increase in sportsmen demand it is safe to say that more game was taken during the past biennium than in any other two-year period in the history of the state.

What better measure of a successful game management program can be had than the amount of fish and game taken by the participating sportsmen? This game management program is one that has grown each year to meet the demand. Facilities and equipment have been enlarged and modernized. More and better trained personnel have been added to the department staff. The Fish and Game Department has moved forward during its 50 years of existence. It has met the challenge of civilization against wildlife and at least for the present is maintaining adequate game populations to meet the needs and demands of Montana sportsmen.

Trends today in business, science and industry are toward improved methods, resulting from research. In game management scientific treatment of problems is a necessity. Long past are the times when

hit and miss methods would do—for today mistakes can be costly. Although game management as a science is new, it is and must remain the basis for wise utilization. Emotion and selfish desires have no place in handling natural resources.

Like any organization the Fish and Game Department is no better than its personnel. In recent years constantly higher standards have been instituted and more permanent tenure has been assured competent employees.

Competitive examination is now the basis of selecting men for the division of law enforcement. This examination, which is given at several locations within the state, is a test of knowledge in the field of wildlife as well as measurement of general intelligence. At least a high school education is required of all applicants, and successful applicants are interviewed and then assigned a period of specialized training with an experienced officer before being placed in the field for a year of probationary employment.

Biologists and other technical employees are selected from applicants having a college degree in wildlife or related subjects. These men must have completed the requirements as set forth by accredited colleges and universities . In addition practical field experience is now considered a part of the pre-employment training.

As an indication of the complex organization which is now the

Montana Fish and Game Department one can compare the change in classification of employees in the past 50 years.

In 1901 a staff of 6 to 8 comprised the department's personnel. Today 160 to 200 employees are required to perform the multiple services given by a modern department of conservation.

Essentially the Fish and Game Department is a field organization, and the major portion of its personnel devote full time to field activities

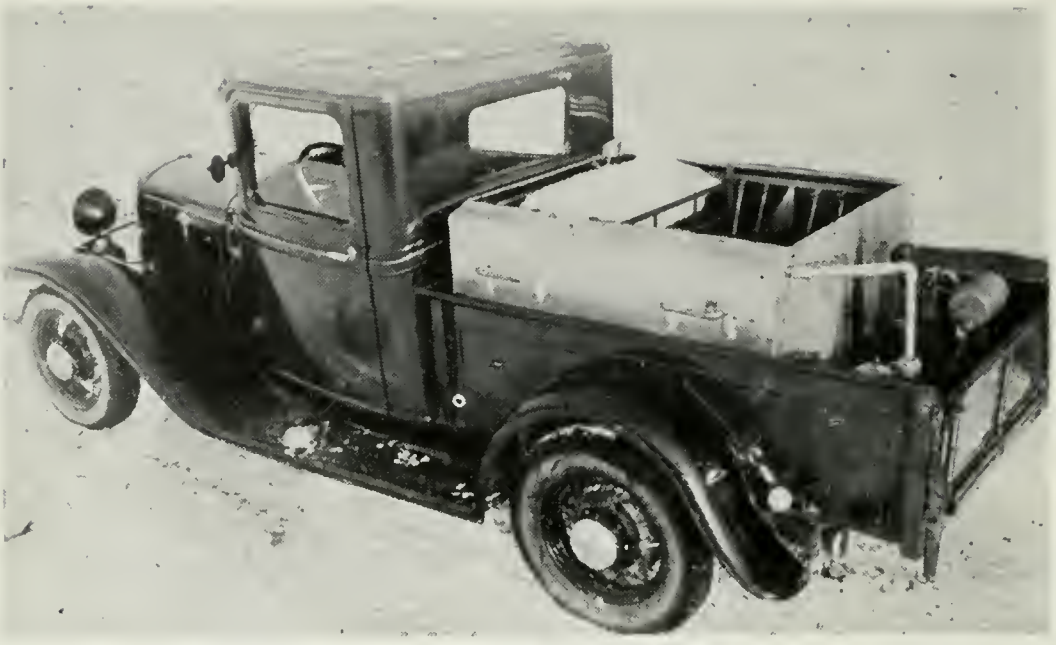
Five district warden supervisors and 45 game wardens are assigned the manifold jobs of the modern game law enforcement officer.

Twenty-two biologists work on problems of game management in big game, upland game birds, waterfowl and fur bearers. An additional ten direct research toward solving the problems of the fisheries division.

Special service personnel include a lawyer, engineer, shop specialists, photographic technician, warehousemen, acountants, information and education staff, ,stenographers and clerical assistants.

Today the Fish and Game Department represents nearly a two million-dollar plant and it administers a vital hunting and fishing business that brings into Montana an estimated $25,000,000 annually.

Progress is obvious in this past biennium as well as in the past five



decades. More progress must be anticipated if the problems of providing hunting and fishing to an ever larger number of people are to be met. In the following pages the accomplishments of each division of the Fish and Game Department will be considered.

ADMINISTRATION

With an income of nearly one and one-quarter million dollars, and a capital evaluation of $1,700,000, the Fish and Game Department is definitely in the category of a substantial business. Wise expenditure of this money must be directed toward maintaining and improving wildlife resources for the people of Montana, and the responsibility and power for this expenditure as set forth in the laws of Montana are given to the Fash and Game Commission.

A five-man commission, meeting two days each month, sets up the basic policies and regulations of the department. The State Game Warden, who is the executive director, is appointed by the Commission. It is his responsibility to put these policies into action and to supervise the activities of the department. The State Game Warden's assistant is the Chief Deputy, who acts in a supervisory capacity under the direction of the State Warden.

Department finances are all obtained either from the sale of licenses or from moneys made available to each state from a tax collected from sportsmen who buy fishing tackle, arms and ammunition. In other words the Department of Fish and Game is financed entirely by the people who participate in the sports of hunting and fishing.

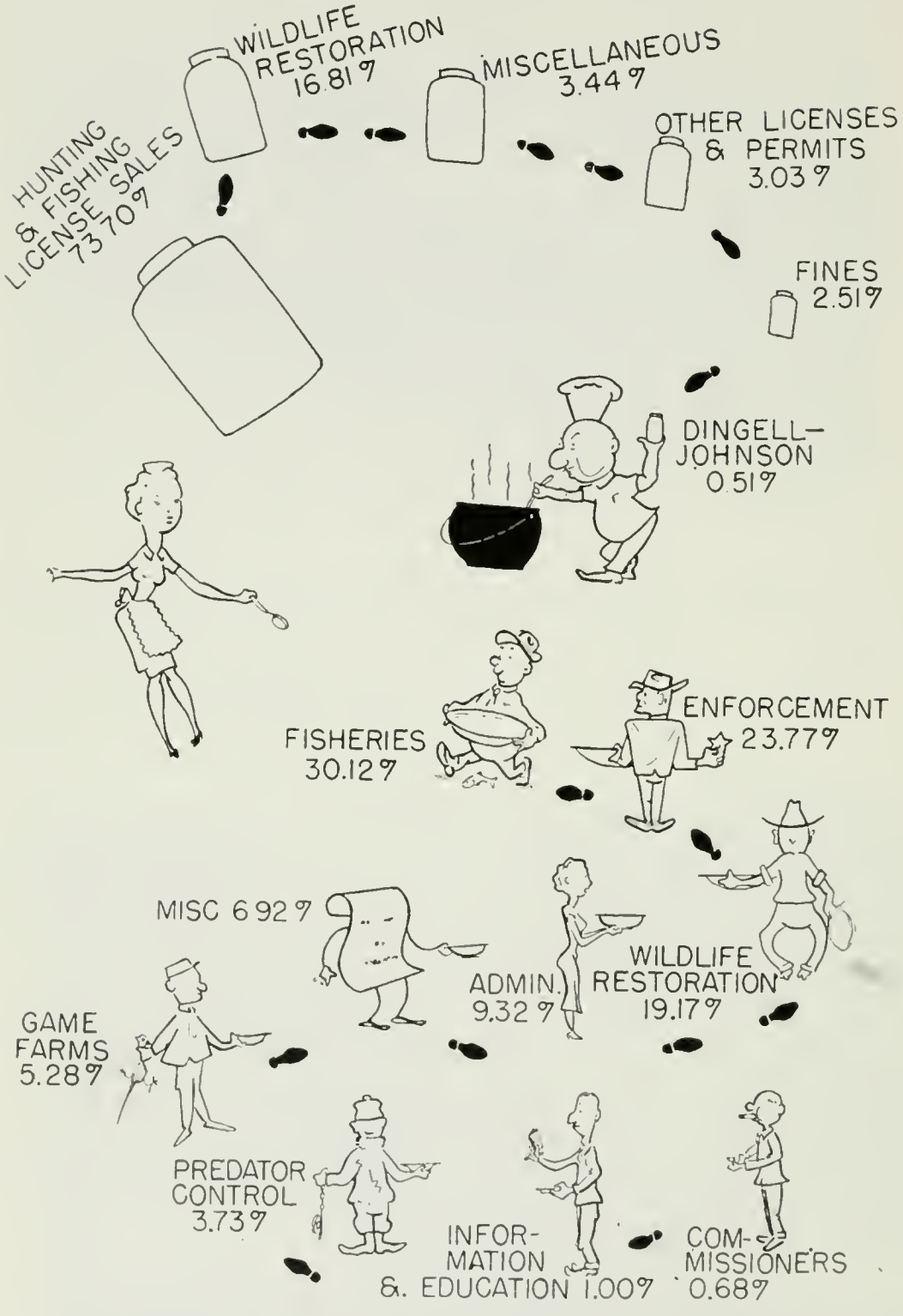
Services put out by the Fish and Game Department are of more general benefit. For example, predator control benefits the stockman, and the wildlife is enjoyed by many who do not hunt or fish, such as photographers, tourists, and nature hobbyists.

Licenses form the backbone of department finance. These are distributed to 475 bonded dealers over the state of Montana. A rather complex system of bookkeeping and accounting is required to keep necessary records of the department. Seven persons handle the financial records and reports of the department.

License sales continue to climb year after year. In our last biennial report we were almost certain that the saturation point had been reached in selling resident hunting and fishing licenses in Montana. This observation was based upon an analysis of the total number of resident bird and fishing licenses sold to the total number of residents in Montana which at the time was estimated to be 591,000 persons. The increase during the past two years over the preceding two-year period has amounted to 5.9 per cent.

INCOME AND EXPENDITURE

May 1, 1950 - April 30, 1952

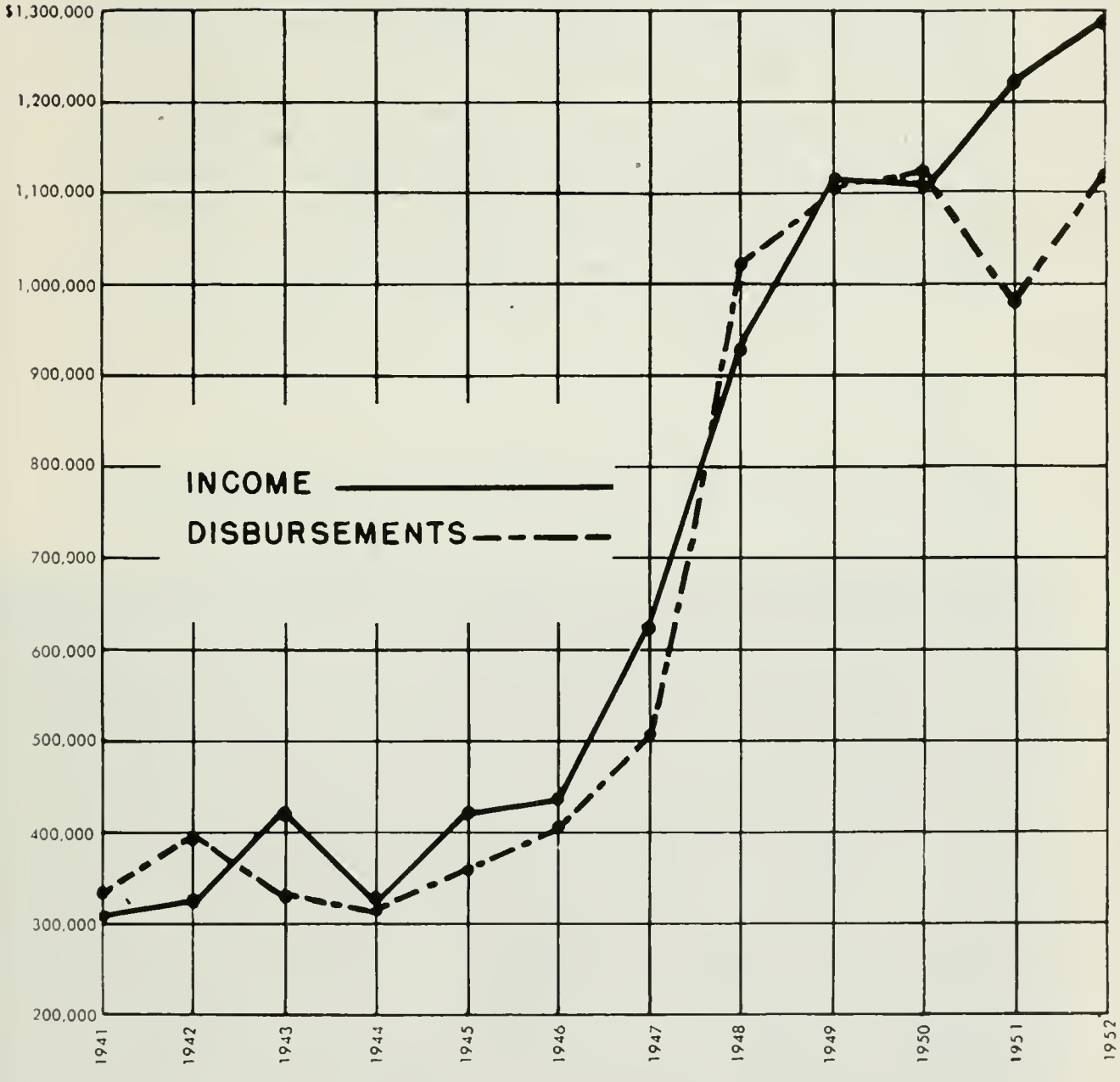


The "chef" above, representing the central office of the Montana Fish and Game Department, carefully measures out the "ingredients" (income from various sources) before "serving" to each division.

STATE OF MONTANA

FISH AND GAME DEPARTMENT

Comparison of income and disbursements from May 1, 1941 through April 30, 1952.



LAW ENFORCEMENT

A long awaited step forward in building up a more efficient conservation force was begun during the past two years by the Commission.

For the first time in the Fish and Game Department's history, recruits for the warden force were chosen from a list of already trained eligibles provided by competitive examinations. This plan of filling vacancies was adopted by the Commission on March 1, 1951. The announcement of the first of examinations was given and in April, approximately 93 applicants took the warden examination. A pre-employment training school was given to those successful in passing the competitive examination and those passing the required subjects at the school were placed on an eligible list from which future recruits are drawn.

In order to keep in step with advancements in law enforcement techniques, the Department has purchased short wave radio telephones for wardens' cars. These units are on a radio frequency which ties our warden force in with other law enforcement agencies such as County Sheriffs, City police and the Highway Patrol. Through this medium of contact, better than ever cooperation between our own field force and other law enforcement agencies is now obtained.

In addition to radio units in wardens' cars, the Department has two radio units in airplanes. We have found that airplanes can be very valuable in locating game concentrations prior to the opening of hunting seasons. Direction of men on the ground into such areas has aided in giving the most efficient patrol of such areas.

When game warden activities taper off during the winter months, they meet in Helena with Division Directors of the Department, representatives of other law enforcement agencies and instructors from Montana State University and State

An intensive conservation course was given to the entire warden force in February 1952. Instructors from the State University at Missoula and the State College at Bozeman conducted the conservation course which is recognized as one of the finest courses given outside of regular higher educational conservation courses. (See cuts below.)

Supervisor district meetings were held periodically in each district to discuss and analyze the operations in each warden's district. Such meetings and training schools are designed to give our employees a working knowledge of methods to give better service to sportsmen.

During the bienium we had an average force of approximately 45 deputy game wardens and five district warden supervisors. We are yet undermanned in the enforcement division in several areas. Additional warden positions will be provided in areas where there is a need to cut down the size of some of the districts which now have a peak load of hunting and fishing activity.

During the past two years a total of 1,415 arrests were made for violation of the Fish and Game laws and rules and regulations of the Commission. Fines imposed for violations of the game laws for the two year period totaled $64,305.00 The average fine imposed by the courts after a conviction for a violation was approximately $45.00. This average fine is $5.00 over the average fine imposed during the preceding biennial period.

College. At this "school" they discuss new techniques and developments in wildlife management, receive additional instruction in operational procedure of the Department, follow practice cases of fish and game law violations to a conclusion and practice in the use of firearms along with their regular training course.

Information and Education

Public interest in hunting and fishing has made apparent the necessity for expanded information and educational facilities. The Department of Fish and Game has recognized that an informed public can supply the support needed to meet new problems in the business of supplying fish for the creel and game in the bag. Thus it is the primary objective of the division of information and education to supply facts and figures concerning the status of fish and game and its management in Montana. It is also believed that pleasure in the outdoors can be increased if the hunter and fisherman are made aware of the habits and values of wild animals.

Daily and weekly news releases providing current information are supplied to all of the wire services, newspapers and radio stations in the state. This material is used extensively and provides one of the best media for news dissemination.

A quarterly magazine, "Montana Wildlife", is published to provide informative and entertaining reading. This publication carries full-length stories of department projects and activities with photographs, drawings and charts to bring to the reader complete details of what is being done in wildlife management. While many states charge for their wildlife magazine, "Montana Wildlife" is sent free to anyone requesting it.

Live wildlife displays were featured at Montana fairs in several counties. These exhibits were most popular, with thousands of visitors stopping to observe and study the wild creatures. Limitation of display animals and personnel made it impossible to fulfill all requests for the display. Most of the animals were obtained through the courtesy of Mr. L. W. Lyons of See 'Em Alive Zoo at Red Lodge and Mr. R. E. Bateman of Wonderland Zoo in Billings.

A series of five-minute radio programs were taped for release over Montana stations. Subjects included fish and game, hunting and fishing regulations and facts concerning Montana wildlife. Plans now include a weekly fifteen-minute program to be released in the near future.

The program schedule for this division includes emphasis upon several subjects. One of these is "hunting safety." An all-out effort is being made to educate hunters in firearms safety. Lectures and articles have been prepared while several thousand phamphlets called "Ten Commandments of Safety" and "Hunter Safety" have been distributed. Posters illustrating dangerous firearms practices were placed at sporting goods dealers, checking stations and other spots frequented by sportsmen. Two films on firearms safety were also available.

Pamphlets and articles on the care of wild game were also distributed during the biennium.

Routine duties include the answering of several thousand letters each year to answer questions of residents and non-residents who request information on hunting and fishing or facts on wildlife. As a service to persons interested in hunting a "Hunting and Fishing Guide"

has been prepared. The division also distributes, free of cost, printed fishing regulations and two-color big game hunting maps.

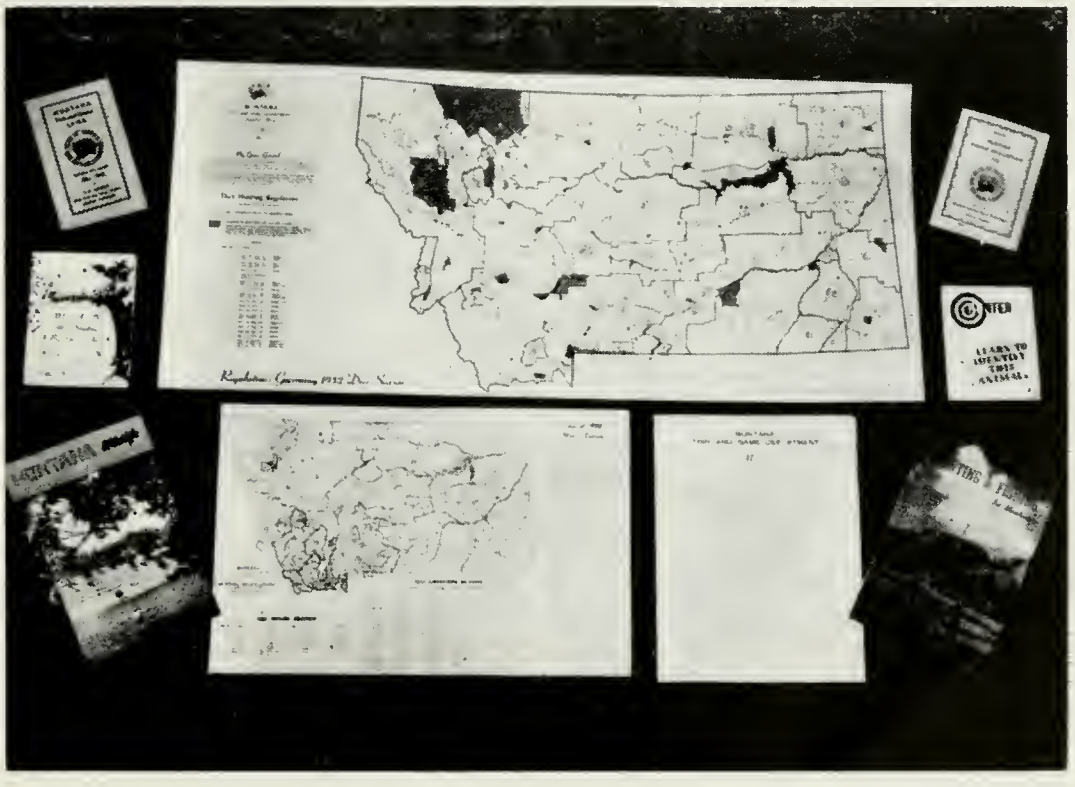
Requests for special articles, photographs and lectures are handled within the limits of department personnel to do so. Members of the department also participate in educational lecture series on adult education and talks to civic and sportsmen clubs. Educational problems of farmer-department-sportsman relationships also fall to this division.

Youth education is progressing and promises to be one of the most important activities of the education division. The department feels that young Montanans are the backbone of the resource conservation movement. Every effort will be made to supply the state's youth with facts concerning the status of wildlife resources.

Initial efforts include teaching assistance at the annual 4-H Conservation Camp and instruction and talks to school groups.

Moving pictures have been acquired and are distributed to schools, sportsmen's clubs and other interested groups.

While education and information are the particular job of this division they are also the responsibility of every department employee. Intra-department communications are aimed toward keeping all department personnel informed so they in turn can report to the people of Montana.



WILDLIFE RESTORATION PROGRAM

INTRODUCTION

At the end of this biennium twelve years of restoration work has been completed in Montana. This program came into being following legislative assent to the Pittman-Robertson Act in the winter of 1941. During the twelve years that have followed, a great deal of wildlife work has been possible through the use of funds thus made available. As the amount allocated each state from the excise tax on sporting arms and ammunition is determined by the size of the state, as well as the number of licenses sold, Montana ranks seventh in the proportion of money received. This money is available for wildlife projects on much the same basis as the Federal Aid to highway programs. That is, the Fish and Game Department pays twenty-five percent of the cost of the projects while the remaining seventy-five percent comes from the Federal Treasury.

Projects are prepared, administered and carried out by state personnel. The Fish and Wildlife Service, acting for the federal government, determines only that the projects are sound and of value to wildlife. All property and equipment acquired under this program belongs to the state.

The scope of the restoration program is wide as it includes necessary investigative activities, wildlife habitat development and acquisition. The work covers big game, upland game birds, waterfowl and furbearers.

The following includes a brief summary of the activities carried on throughout the life of the program with special emphasis on that portion completed during the reported biennium.

BIG GAME

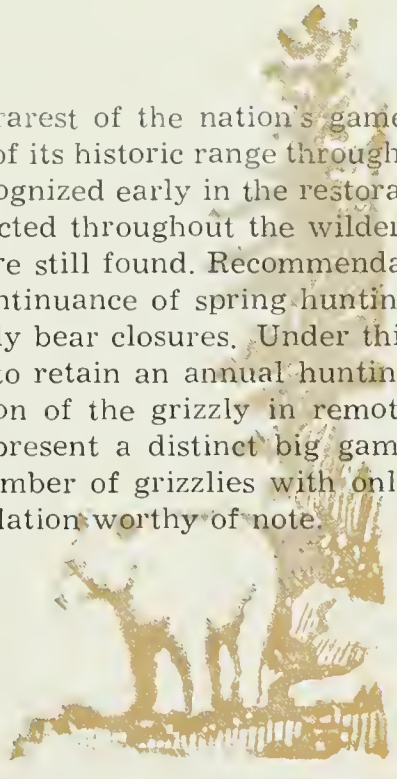
Antelope (Present population—50,600)

During the early years of the restoration program, most of the work consisted of a state-wide census in order to obtain basic information on herd numbers and location. These early aerial counts indicated that numerous desirable areas within the state were almost devoid of this species of big game. An active trapping and transplanting program, therefore, followed. A very successful type of trap was developed. An airplane was used in herding these fleet-footed game animals into the wings of this portable trap. Three thousand four hundred sixty-nine antelope were captured and moved into desirable new locations. In this way 65 additional antelope herds have been developed.

With the rapid increase in antelope numbers, particularly during the past several years, an increasingly heavy take by hunters has been possible. Antelope hunting, almost unknown in Montana ten years ago, has now become a major big game sport.

Grizzly Bear (Present population—315)

This big bear has become one of the rarest of the nation's game. It has been eliminated entirely from much of its historic range throughout the west. This critical problem was recognized early in the restoration program. A detailed study was conducted throughout the wilderness ranges in the state where grizzlies were still found. Recommendations from this study resulted in the discontinuance of spring hunting and the establishment of a pattern of grizzly bear closures. Under this type of management, it has been possible to retain an annual hunting program and still encourage the restoration of the grizzly in remote back country areas where it is felt to represent a distinct big game asset. Montana holds first place in the number of grizzlies with only Wyoming and Idaho maintaining any population worthy of note.

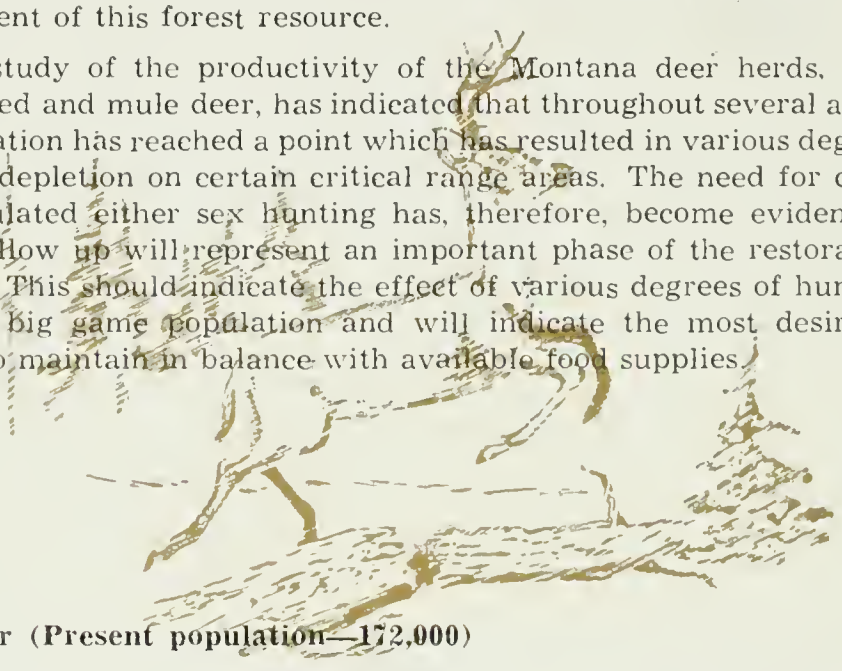


White-tailed Deer (Present population—41,400)

A careful study of the white-tailed deer represented one of the earlier projects. By far the largest numbers of this species were found in the northwestern portion of the state. Areas where these deer might be reintroduced pointed up the need for a trapping and transplanting program. Four hundred twenty-two were moved into new areas, thus producing nine additional herds.

A study of food habits has indicated that yellow pine seedlings may be browsed during severe winters. The intensity of this use is, however, as yet undetermined. A detailed study is, therefore, being carried out at the present time in the Lincoln County area to ascertain the relationship of white-tailed deer use of pine seedlings to the proper management of this forest resource.

A study of the productivity of the Montana deer herds, both white-tailed and mule deer, has indicated that throughout several areas, the population has reached a point which has resulted in various degrees of forage depletion on certain critical range areas. The need for carefully regulated either sex hunting has, therefore, become evident. A careful follow up will represent an important phase of the restoration program. This should indicate the effect of various degrees of hunting upon the big game population and will indicate the most desirable number to maintain in balance with available food supplies.



Mule Deer (Present population—172,000)

Census work has indicated that the mule deer is by far the most abundant game in Montana. Their distribution is almost state-wide. The need for planting of this species was also indicated by this early coverage. The 1,295 mule deer trapped and transplanted were moved into 14 new areas. Their establishment in these locations has been rapid. It has been possible to open several of the planted sites to carefully regulated hunting. A limited take of either sex has been found necessary to keep numbers within the limits of the available winter forage. With both species of deer, the upward trend in population has been particularly noticeable during the past five to six years.

Elk (Total population—45,900)

A careful coverage of each of the major elk herds within the state has brought out the need for various types of management in order that this important game animal might be maintained and developed. One of the most obvious needs was found to consist of more adequate winter range. Approximately twenty thousand acres of foothill-type range was obtained under the restoration program in the Sun River area. The acquisition of this tract has solved one of the most difficult big game problems in the state. Up to three thousand elk are now maintained in this herd with no serious conflicts with other land use.

Work on the Gallatin Canyon range indicated that a lack of winter forage during the more severe winters was seriously handicapping the development of this herd. Six thousand six hundred twenty-eight acres of winter range were purchased. Its development to a maximum of forage will go far toward stabilizing the elk herd in that area.

The coverage of the Blackfoot-Clearwater region during the early years of the program indicated the need for range, particularly during the more severe winters. Fifty-five thousand acres of game range have been obtained. The careful management of this area during the past several years has resulted in a much improved condition. This area is of distinct benefit to elk and also white-tailed and mule deer.

Coverage of the Judith River area also indicated the need for winter game range. In order to meet this need, 2,523 acres have been purchased adjacent to the Forest Boundary on a critical winter range area several miles above Utica. Elk move onto this range from a wide area during the late fall. This range now available for big game is materially aiding in working out the complex livestock-big game problem formerly existing in that area.

Note: By legislative action two years ago, it is now possible for the Fish and Game Commission to pay five cents annually per acre in lieu of taxes for all game range lands acquired.

A detailed forage inventory has been completed for the Gallatin winter range. Similar work is being conducted on the Sun River game range. This information will be valuable in determining the proper number of elk to be carried throughout the winter months on these vital areas insuring an adequate and stable forage supply. It is planned that similar basic information be obtained for all major winter game range areas.

A carefully planned game salting program has been carried out during the past several years. Aerial distribution, particularly in the more remote regions, has become an increasingly important method of distribution. Early spring placement was formerly impossible due to snowed-in trails, particularly at higher elevations. An intensive study of natural licks is also being carried out in conjunction with the over-all salting program.

A cooperative study between the University and the Fish and Game Department regarding the nutritional requirements of elk will aid materially in a better understanding of this important game animal's forage requirements.

Mountain Goats (Present population—4,000)

The limited distribution of this species within the state led to trapping and transplanting work early in the program. Successful introductions of mountain goats have been made in several very desirable mountain ranges formerly completely devoid of this species. The first and most successful plant to date was made in the Crazy Mountain Range north of Big Timber. A recent careful coverage of this area indicates a remarkable rate of increase and an almost complete distribution pattern throughout the area.

Other ranges planted include the Beartooth Plateau in the vicinity of the Cooke City Highway and also in the East Rosebud and Stillwater Canyons, the Spanish Peaks along the Gallatin-Madison divide and the Gates of the Mountains Wild Area between Great Falls and Helena.

Utilization of aircraft has greatly accelerated the speed by which game animals can be trapped and transplanted. Mountain goats can now be carried from their original habitat to a new wilderness area in a matter of hours where formerly such an operation required several days. Wherever possible, collapsible rubber boats are employed between the trap and the waiting airplane. At the end of the flight, trucks transport the animals over he last few remaining miles to the release site.

Moose (Present population—4,060)

Early work with the moose indicated the possibility of a careful hunter harvest. This was first indicated in the Slough Creek-Hellroaring area north of Yellowstone Park where the population consists of approximately sixty percent bulls. During the first several years mature bulls only were taken. However, adequate numbers in the Big Hole and Rock Creek regions permitted a harvest of a limited number of either sex during the past fall.

A careful follow up coverage of moose ranges has indicated that hunting has tended to widen the distribution of this species and has apparently in no way been detrimental to the overall population.

Plans have been worked out for the trapping and transplanting of a small number of moose during the coming winter.

Mountain Sheep (Present population—1,600)

The mountain sheep or bighorn has long been recognized as the number one big game problem animal, not only in Montana but throughout the western states. From an abundance during pioneer times, the numbers have decreased to a remnant of the early population. These numbers have remained almost static for many years.

In recognition of this problem intensive work with mountain sheep has been conducted since the beginning of the program. Trapping and transplanting has been attempted. The 16 bighorns moved to the south edge of the Fort Peck Game Range in eastern Montana five years ago have shown a very desirable rate of increase. These animals were confined in a large pasture until the current year. This was found necessary in order that they might become well established in the area. They have increased to approximately 75 animals and have now been liberated into the surrounding badland area. This was the former range of the Audubon variety of bighorns which became entirely extinct by 1916. The lack of severe winter conditions in this area may well represent a very favorable situation for the rapid increase and expansion of bighorns.

The acquisition of the Sun River Game Range has now allowed the elk to drift freely out into the foothills during the winter months. This has relieved the Sun River mountain sheep from serious competition with elk which was felt to be detrimental to the sheep in the past.

Plans are being made for additional transplanting work. In general, conditions appear increasingly favorable for this important big game species.

UPLAND GAME BIRDS

Ring-necked Pheasants

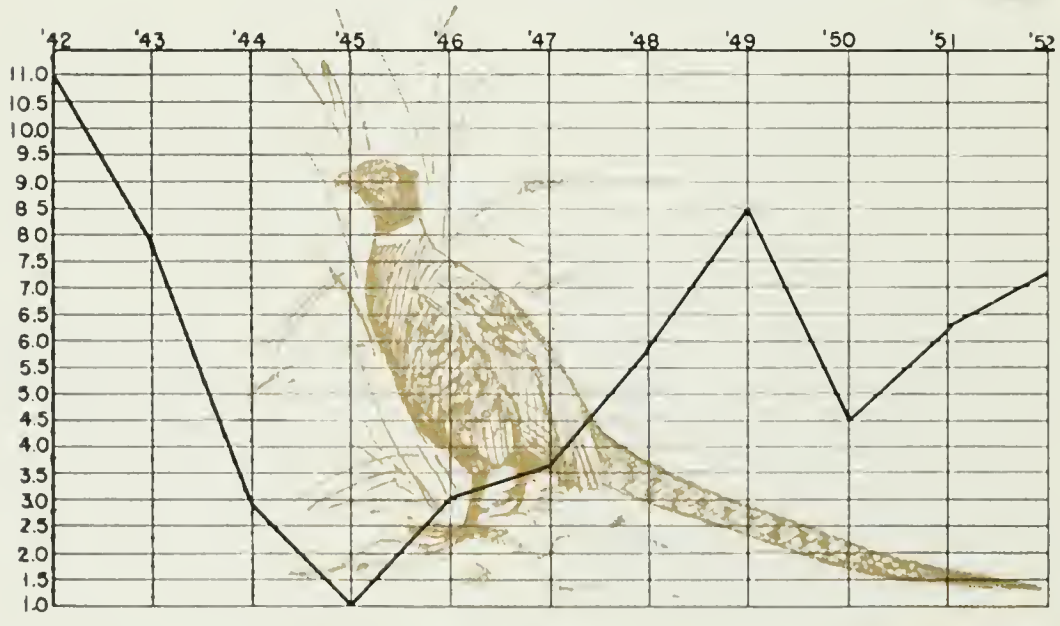
Because the pheasant is restricted very largely to irrigated farm lands within the state, the food habits of this game birds are of particular interest. A study of their food habits was therefore chosen as one of the early restoration projects. This work was conducted in the Yellowstone and Big Horn valleys. Results indicated that the destruction of insect pests and consumption of weed seed offset any harmful effects in the use of agricultural crops. This study further indicated that the consumption of agricultural grains was composed for the most part of waste seed.

The need for additional winter cover has been studied. Although this seems to represent one of the most important limiting factors in several surrounding states, it seems of lesser importance in Montana due to more abundant natural cover and less disastrous winter blizzard conditions. Experimental work, however, is being carried out in the Broadview area where cover plantings are being encouraged on a cooperative basis with local sportsmen and landholders.

An annual population census has been an important phase of the program. Crowing counts during the spring give a reasonably accurate indication of the over wintering population of birds. Roadside checks carried out on a state-wide basis give workable information on the late summer and early fall numbers upon which hunting regulations are based. The accompanying chart indicates that pheasant population has fluctuated from a high in the early 40's to a low in 1946 with a general building-back trend thorughout the past several years.

Survival studies during the past several years have indicated that game farm reared pheasants furnish very small returns to the hunter, particularly in areas where large wild populations thrive. However, they are considered important in the re-establishment of pheasants in seriously depleted areas or in the establishment of this species in newly developed agricultural areas.

FALL PHEASANT POPULATION TRENDS



Hungarian Partridges

The pattern of numbers has followed somewhat that of the pheasant during recent years. This species of game bird appears to be seriously affected by winter conditions. The present trend, however, is upward.

Chukar Partridges

A great deal of interest has been indicated during the past several years in the introduction of this game bird in that it chooses the more arid type of terrain in which to live. It is felt that it may well fill a niche not now filled by any native game species. The restoration work now being carried out in regard to this bird consists of a careful follow-up of recent plants in an effort to determine their success, studies designed to determine better release methods, and investigations to determine desirable future planting sites and areas.

Native Upland Grouse

During the early years of the program,, intensive work was carried out in an effort to determine the population and distribution of the mountain grouse, namely the blue, ruffed and Franklin's or fool hen. A recent follow up on this work has provided much needed information regarding population trends. An increase in number has been observed during the past several years. A definite reaction to cycles in population adds greatly to the difficulty in their management. Studies conducted in experimental management areas have indicated that hunting during periods of population "lows" apparently has no detrimental effect upon either the numbers or distribution of these grouse.

The prairie grouse—both the sharp-tailed and sage grouse (sage hen)—have been followed closely throughout the past several years. Their population trend has also been found cyclic in nature. Sage grouse have indicated a more desirable population level than the sharp-tailed grouse during the past year. Both species have, however, reached a point where carefully managed hunting has been possible.

Sage grouse trapping and transplanting has been found to be a successful method of obtaining a wider distribution of this large species of grouse. This work was carried out under one of the earlier restoration projects in the early 40's but was discontinued due to a downward trend in numbers. It is felt, however, that this work can again be carried out. Areas where plants may most successfully be made lie in the central and western valleys.

WATERFOWL

The waterfowl work has been one of the newer fields of activity entered into by the wildlife restoration staff. The first project was a state-wide coverage to determine the amount and location of waterfowl breeding grounds. This was accompanied by both aerial and ground census to further determine the annual production of waterfowl. In this way Montana's contribution to the hunter by locally raised ducks and geese was worked out. The coverage of the breeding grounds has brought out the need for the improvement of several marsh areas with the primary objective of raising the number of locally produced waterfowl and encouraging migrants to linger in the state.

The areas now approved for acquistion and development are Little Muddy Creek near Cascade, Freezout Lake near Fairfield, Chain-O-Lakes near Fresno Reservoir north and west of Havre, Fox Lake near Lambert in Richland County and several others.

Montana affects, and is affected by, two of the major waterfowl flyways, the Pacific and Central. Committees have been formed composed of representatives of the various states and provinces lying within these flyways. Montana has been able to contribute materially to the fund of important information gathered by these Flyway Councils. This information regarding the migration of waterfowl is of extreme importance in setting the waterfowl seasons throughout the nation.

Of particular importance in this regard has been the banding of 20,000 ducks. Returns from these bands are adding much needed information regarding the movements of waterfowl along the two major flyways.

An intensive study of locally raised Canadian geese is being conducted in conjunction with the Wildlife Research Unit at the University. It is expected that the results of this work will lead to the betterment of conditions for this important waterfowl species.

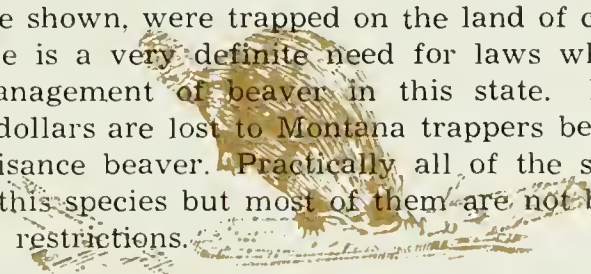
Stock pond reservoirs in Eastern Montana offer some of the better waterfowl breeding grounds in the state but over-grazing by livestock (left) discourages brood production. A continuing program of the Fish and Game Department to provide sufficient vegetative cover (right) will assure future waterfowl harvests.

Montana's Fur-Bearing Animals

Fur-bearing animals of Montana have provided a substantial cash crop since white man first came into the state. In fact it was the lure of beaver pelts that stimulated much of the early exploration, and fur was for many years a common medium of exchange. Trapping today is carried on primarily as part-time activity of ranch boys, timber workers or others whose main occupation gives them free time in the winter. During the 1951 season 1,350 trapper's licenses were issued.

In the 1950-51 season 79,092 pelts were taken by licensed trappers, and these pelts had a cash value of $477,000.

Beaver, which may be legally harvested only in cases where damage can be shown, were trapped on the land of complaining landowners. There is a very definite need for laws which will provide for better management of beaver in this state. Each year many thousands of dollars are lost to Montana trappers because trapping is limited to nuisance beaver. Practically all of the state is now well stocked with this species but most of them are not being utilized because of legal restrictions.



It is believed that fur can be made an even greater business in this state if more effort is directed toward a comprehensive management plan. Toward this end a new fur resources project has been initiated by the Department. Sportsmen and trappers should see direct benefits from a better program of fur bearer management.

Some fur-bearing animals such as beaver affect the habitat of game animals and fish. Others may prey on game animals while still others may act as controls to undesirable species. A balanced program based on biological facts will be tempered to all wildlife species and Montana's economy in general.

ANNUAL YIELD AND VALUE OF 1950-51 FUR CATCH

Species	No. Pelts	Per Cent of Total Pelts	Value	Per Cent of Total Value
Muskrat	53,248	67.3	$ 83,800	17.6
Beaver	12,522	15.8	198,000	41.5
Mink	8,590	10.9	161,500	33.8
Marten	1,462	1.8	29,410	6.2
Weasel	1,632	2.1	1,910	.4
Bobcat	461	.6	940	.2
Coyote	147	.2	190	.04
Skunk	772	1.0	710	.2
Raccoon	195	.2	210	.04
Badger	40	.06	35	.01
Fox	21	.04	45	.01
Lynx	2	.....	25	.....
TOTALS	79,092		$477,000	

FUR RESEARCH PROJECT

During the past year a fur section has been added to the wildlife restoration staff. The chief objective is to gain as much information as possible regarding this resource. This information will form a valuable background for fur bearer management within the state.

Field checks tied in with a questionnaire from trappers have indicated the value of the past year's fur harvest by districts.

Several specific problems are being investigated at this time. One regards the relation of otter to game fish. Another, the effect of large sanctuaries, such as Glacier Park, in repopulating surrounding areas with valuable fur bearers— particularly marten. A third represents a detailed study of beaver in southwestern Montana. Their relationship to game fish and stream flow are interesting sidelights of this overall work, the result of which will be recommendations helpful in the management of this important fur bearer.

PREDATOR CONTROL

Predators might be defined today as those animals that characteristically prey on animals wanted by man for his own use. Under truly wild conditions predators play an important part in keeping what is called the balance of nature. However, when human beings step into the role of the predator by hunting and by cropping surplus animals it sometimes becomes desirable to curtail the predators.

In order to most effectively accomplish predator control, the various agencies and groups interested have formed a Predator Control Board. This is composed of the Montana Fish and Game Department, the U. S. Fish and Wildlife Service, the Wool Growers and the Livestock Association. Each contributes a portion of the cost of controlling predators since benefits are shared equally. Control operations are actually conducted by employees of the Predator Control Division of the U. S. Fish and Wildlife Service and costs are paid from the cooperative fund.

GAME FARMS

It has been shown that planting ring-necked pheasants raised under artificial conditions can be advisable only when the release areas do not have good existing stocks of the species. Where a good breeding stock of birds is in existence, the natural production is adequate to supply the area with all of the birds the area will support. Therefore birds raised at an average cost of $1.50 to $2.00 each must be wisely released. With this in mind the Fish and Game Department has directed its efforts toward stocking birds in areas where (1) no natural stock is present but conditions seem suitable for survival; and (2) weather conditions or natural disaster has reduced the resident population of birds.

The department is also directing more intensive efforts toward developing chukar partridge hunting in the state. However, the program is proceeding cautiously with field biologists studing the results of each attempted transplant. Basic stock for introduction has been raised at Billings and Warm Springs.

Montana game farms are under the direct supervision of the Superintendent of Game Farms, who is also foreman at the Billings Game Farm. Only the most modern and efficient methods of propagation are used. Eggs are obtained from a select breeding stock of pheasants held over each year for this purpose. These are then hatched in thermostatically controlled incubators. Young birds are fed until nine to twelve weeks of age, at which time they are released in the wild.

Game Farm Production

Game Farm	CHINESE PHEASANTS RELEASED		CHUKAR PARTRIDGES RELEASED	
Game Farm	1950-51	1951-52	1950-51	1951-52
Billings	12,328	11,768	668	473
Warm Springs	8,073	10,150	0	200
Fort Peck	12,393	11,805	0	0
Totals	33,462	33,723	668	673

FISHERIES DIVISION

INTRODUCTION

Montana is today one of the last frontiers of trout fishing in the United States. Species found here include the cutthroat, rainbow, brown (loch leven), Mackinaw (lake), the charrs (brook trout and dolly varden) and the grayling. Montana has the only remaining original grayling habitat which still has this species.

Fishing has a definite value not only to Montanans but also to the traveling public. It is estimated that $75,000,000 are contributed to this state by individuals who come to see our parks and scenery and enjoy our out of doors. In 1951 the Montana Fish and Game Department sold 29,175 non-resident fishing licenses. Using a conservative estimate of $30 expended by each visitor for fishing only it can be shown that a minimum of $875,250 is derived by Montana business from this source.

Further calculations indicate that 170,449 resident fishermen spend at least $50 each or a total of $3,552,450 annually. Thus a total of $9,397,700 is spent by Montana sportsmen or visitors for fishing tackle, lodging, meals, gasoline and related costs of a fishing trip.

The Montana Fish and Game Department spends annually $400,000 on all fisheries expenditures. It can readily be seen that the operating costs of maintaining Montana's fishery is in small proportion to the cash return to Montana's economy. The chief value, that of pleasure and recreation, has not been considered, as it can be measured only in the health and welfare of our people.

Montana in a sense is at the crossroads of its fisheries management. We have left the period where isolation and vast untouched areas assured us of adequate fishing regions. We are entering the period now passed through so tragically by eastern states. A stand must be taken soon on the place recreation is to have in our future economy. Problems of pollution, big dams, and other factors disturbing Montana streams must be faced squarely. The industry of fish and game is one of Montana's largest—only sincere, unbiased thinking and planning will keep it so.

The return that is enjoyed by the people in recreation cannot be measured in dollars and cents, however. We must also bear in mind that these same enjoyments and some fishing at one time or another was enjoyed by the eastern states. But their economic development was so fast and without regard to the protection of the natural resources that their recreational resources suffered and were exploited by private interests and closed to the use of the public and is very nearly a thing of the past. We should in our management in Montana consider that we have a natural resource that we are not utilizing to its capacity and we must plan to conserve the streams and lakes so they may be retained as long as possible for future use. In doing so we must adequately provide for the control of pollution both from a

public health standpoint and also from an industrial standpoint. In order for Montana to develop industrially and take advantage of its natural resources such as are available in Montana, adequate legislation is needed both by concerns interested in locating in Montana, and for the protection of the fish and wildlife of the state. Industries and fish and wildlife can work together with proper safeguards formulated for their management. In order to protect the income to the state of the traveling public and by native Montanans these things today should be recognized as a must to be met by honest, sincere, unbiased thinking, and should be forthcoming for the use by industry and fish and game management in the interest of the people of Montana.

Montana's sport fishing resources are looked upon as a national wildlife recreational asset. Because of increased numbers of fishermen, the supply of natural or wild raised trout has dwindled. Our present day management practices are to supplement natural spawning in streams with hatchery-raised trout. Cooperation from all interested in wildlife recreation is necessary to assure success of the program.

FISH HATCHERIES

During the biennium May 1, 1950 to April 30, 1952, the fisheries program has been following the guidance and advice of previous administrators in setting up a program for the State of Montana. Deviations and corrections have been worked out with various sportsmen's organizations in the interest of the people of Montana. The department has maintained during the biennium, eleven trout cultural stations, located at the following strategic places throughout the state: Anaconda, Hamilton, Arlee, Libby, Polson, Somers, Great Falls, Lewistown, Big Timber, Emigrant, and Fromberg in addition to the trout stations, and a combination pike and warm water hatchery at Malta, Montana. The State Department of Fish and Game also contributes to the maintainence and operation of three Federal fish cultural stations located at Miles City, Creston and Ennis, Montana.

The Fish Hatchery planting program in Montana today is an outstanding example of fishery management and cooperation between all agencies and sportsmen. At the time of its inception this program was designed to curtail promiscuous planting of fishes in the entire state and the overlapping of planting by state hatcheries and federal fish hatcheries. Today the hatchery program is still following this procedure and revisions of this program are worked out with the sportsmen's groups in the various hatchery districts in Montana. Under this program a hatchery foreman cannot plant fish unless they are authorized by the program or permission for the planting is obtained from the Helena Office. The Montana Fish and Game Commission has recognized that its moneys to operate come entirely from sportsmen, therefore, it is most unfair to utilize this money for the stocking of private fish ponds that are not open to public fishing.

This program has been adhered to during the biennium, and it

has resulted in several cases, of water being offered for public use to the Fish and Game Department if such water were included in the management program.

Another step forward was made in coordinating the work of the regional biologists in the inspection of streams and lakes in their districts. This information has been used to adjust planting procedures so the optimum in utilization of fish planted may be enjoyed by the fishing public. Species planted have been changed and size of fish have been changed. Recommendations as to numbers and the stocking of virgin high mountain lakes or re-stocking of non-reproductive lakes, have been accomplished under this program. For many years the planting of fish was entirely done by truck or by pack string into the mountain areas. With a newly acquired department airplane several lakes in each hatchery district were planted with cutthroat trout or other species deemed most suitable for the water in question.

During the biennium, an apartment house that would furnish quarters for the help was constructed at the Anaconda Fish Hatchery. At the Arlee station, a supply pipe line was installed to clear up a bacterial infestation that was hampering and curtailing the trout production at that station. At the Hamilton station, in place of the shallow troughs that were furnished by the original John Daly Hatchery, large cement tanks were installed so that we may hold fish to yearling size within the hatchery, thereby getting larger fish for planting.

At the Great Falls Hatchery, a freezing unit for fish food storage was constructed and all the buildings painted. The Lewistown hatchery has not made any changes during the biennium with the exception that a spring was purchased for use in future development.

At the Big Timber Hatchery a small pipe line was installed to better deliver the water to the outside ponds and raceways. At Emigrant Hatchery, there were no improvements made and the operations are being carried on according to the planned program. Recognizing the need for additional fish to be planted in the area surrounding Billings, the Fish and Game Commission formulated a plan for the construction and maintenance of a rearing station at Fromberg, Montana. This station has lived up to expectations and has produced catchable size fish for the area near Billings, Red Lodge, Hardin, Absarokee, and Columbus. The original 10 concrete rearing tanks have been added to by the construction of 9 additional dirt raceways at considerably less cost than the cement tanks and by experiments show they will produce as well as cement structures.

The Libby Hatchery has been improved by the addition of a raceway type tank to utilize additional spring water that is available. The future plans are also to include deep tanks in the hatchery so an operational plan such as is being used at both Arlee and Hamilton may be utilized. Construction of water impoundments in Eastern Montana is affording good warm water fishing and to meet this planting need, the Department has developed a pike hatchery and rearing

facilities near Malta, Montana. In cooperation with the province of Saskatchewan, Canada, Walleye pike and great northern pike eggs were hatched and distributed in water suitable for these species in the eastern half of Montana.

DISTRIBUTION

The fish distribution in Montana follows along with the planting program. Small units operated by each hatchery carry the major portion of the distribution load. However, for use in Montana 2 large two-ton distribution units are detailed to various hatcheries to aid in their distribution program. These units have a capacity of from 350 to 600 pounds of live fish per load and are kept in first class condition at all times so no fish losses may result during transit. The distribution of fish starts in the spring of the year after the ice breaks up, and continues through September. Fish distribution as to numbers, species and hatcheries will be found on a separate page in the biennial report.

Fisheries Restoration Section

INTRODUCTION

Another milestone in the Fish and Game Department was passed this biennium when, on July 1, 1951, the first funds from the Federal Aid in Fish Restoration Act of 1950, commonly known as the Dingell-Johnson Act became available to the Fisheries Division. This act channels federal excise taxes derived from the sale of fishing tackle back to the states to set up fisheries conservation programs. Many sportsmen and citizens alike believe that fish stocking from hatcheries is the answer to all fisheries problems, but, unfortunately, the answer is not as simple as this. Fish, being a product of their environment, prosper and fail directly as environmental factors present are favorable or are not favorable. While the Fisheries Division delved into the problems of productive fishery management prior to July 1, 1951, the added federal funds have enabled the Department to expand its efforts.

The various projects undertaken during the biennium are briefly described under the following headings:

RANCH FISH POND STUDY

Many landowners as well as sportsmen have indicated an interest in the management of small ponds for production of sport fish; therefore, in cooperation with the Montana State College Agricultural Experiment Station, the Fish and Game Department has during this biennium completed the first phase in a ranch fish pond study. This study has the widest state interest of any of the Department's fishery studies since it concerns the larger portion of the state's land area. This initial phase dealt mainly with the physical aspects of a pond suited for sport fish. A bulletin[1] which has been prepared and printed, dealing with the construction and management of Montana's ranch fish ponds, is available free of charge from the Fish and Game Department or the Montana State Experiment Station.

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[1] Brown, C.J.D., and Nels A. Thoreson.
1951. Ranch fish ponds in Montana, their construction and management. Mont. State College Ag. Exp. Sta., Bull. No. 480, 30 pp .

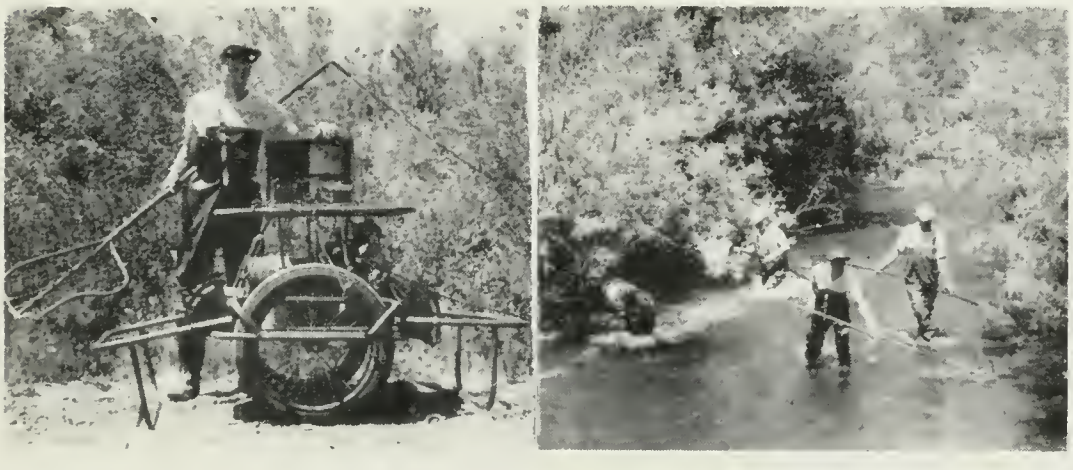
PRICKLEY PEAR CREEK STUDY

It is realized that the zeal of Montana's fishermen to see ever increasing numbers of fish harvested from the state's waters is similar to the zeal of ranchers throughout the state to crop from their lands as large a yield of wheat, hay, or cattle as is possible. It is realized too, however, that the ability of water to produce its crop of fish is limited just as is the ability of land to produce its agricultural crops. Little is known in Montana of the size of its fish populations, of the yields that may be expected from its fish crops, or of the need for "seeding" the streams with hatchery trout. Knowing these needs for information to guide fishery management, the Fish and Game Commission authorized a trout study on Prickley Pear Creek near Wolf Creek, Montana, which study has been completed during the present biennium.

It has been of fundamental importance to Montana fishery managers to learn that Prickley Pear Creek, considered a "fished-out" stream by most anglers, actually contained a fine resident fish population. During the fishing season for all three years the natural increase in both numbers and weight of fish was either equal to or greater than the catch by the fishermen so that the trout population either increased in size during the fishing season or remained relatively stable.

During 1951 there were 2,516 anglers who fished the 15.5 miles of stream embraced by the study section. These caught 2,335 pounds of trout and whitefish, (151 pounds per mile) during the season. The anglers averaged 0.71 fish per man-hour of fishing—0.96 fish per hour when flies were used as a lure and 0.46 fish per hour when some form of bait was used.

Marked fingerling, hatchery-reared rainbow trout were planted in the stream in the fall and marked legal size, hatchery-reared rainbow trout were planted in the stream in the spring.



Biologists, wearing waders for protection, send an electric current through the electrode to temporarily stun the fish population in a carefully measured census area of Prickley Pear Creek (right.) The Department owns and operates three electric shockers like the one shown at left.

Fish are easily caught after they have been "shocked" and are placed in wire holding baskets to be counted, weighed, measured and tagged (left) to determine growth rates, migration patterns and other data used in scientific fisheries management practices. This shocking method in no way harms fish and they resume normal activity within a few minutes. Final sep in the shocking operation is cleaning the nets (right).

Creel census showed that 38 per cent of the legal plant of rainbows was caught by anglers while only two per cent of the fingerling plant was caught; however, 93 per cent of the fish caught were wild fish from natural reproduction. Considering the hatchery-reared fish returned to the creel on a monetary basis, each fingerling trout caught cost the Fish and Game Department $1.43 per fish while each legal planted trout cost $0.35. Since 3,000 fingerling and 1,000 legal rainbow trout were planted in the 15.5 miles of stream each year, by noting that these, at considerable cost to the department, contributed only 7 per cent to the catch, it is seen that wise management points to more concentrated efforts on the stream environment itself to insure high, natural production of fish.

IRRIGATION DIVERSION STUDY

As early as 1893 the State Legislature showed concern in their legislative enactments over the loss of fish in irrigation diversions. Since that time various statements of fish loss have appeared in the Department's biennial reports. This problem is and has been a real one, but to date no clear cut answer has been provided to the problem. In Montana, fish screens of varying types have been placed in the canals. None, from Montana's viewpoint, has been completely satisfactory, and all are expensive, not only to install, but especially to maintain.

During the past biennium the Fish and Game Commission took a forward step in authorizing a complete evaluation of the irrigation diversion problem. The study was undertaken cooperatively with the Montana State College Agricultural Experiment Station, and in order to limit activities for the initial phase of the work so that real results might be had, the study was confined to the irrigation diversions of the Gallatin Valley. Briefly the findings and recommendations are as follows:

1. It has been demonstrated conclusively that fish losses to any one canal in the Gallatin Valley are small enough so that conventional type fish screens cannot be installed and maintained economically.
2. If water flows into canals are shut off by a predesigned method, a large proportion of the fish in the canals can be brought back to the river.
3. By altering the picture of cover, that is of overhanging brush, cutbanks, and pools in the canals, fish may be brought back into the river much more readily.
4. The greater proportion of fish enter canals with the initial flush of water into these canals in the spring. It is recommended that, where possible, irrigation headgate structures should be flushed each spring prior to running water down the canal proper by diverting water from the canal through a by-pass structure and bypass canal back to the river. This will shift the fish population from the headgate structure to a point in the river further downstream.
5. It is clear that unless the problem of providing or insuring adequate stream flows is faced objectively, no amount of effort to keep fish out of irrigation canals will succeed.

GRAYLING STUDY

The grayling, once abundant in Montana and Michigan and other portions of North America, has suffered more from the encroachment of man than any other fresh water game fish. As man has extended himself and his cultural and economic system throughout the nation, the grayling has retired from its indigenous haunts. While the Arctic subspecies are common in Canada and Alaska, the subspecies found in the United States has receded until Montana has the only stocks in the nation with any degree of magnitude and stability.

But even in Montana the grayling is not secure. Michigan, while realizing that its grayling stocks were receding in abundance, felt a

few years back that it could maintain the species in certain areas. That species is now extinct in Michigan. History tells that the grayling was once found in great abundance throughout most all of the Missouri River Drainage in Montana above the Great Falls. Only rare reports are now received of occurrences in this area save from certain headwater streams in Beaverhead County, particularly in Red Rock Creek and the upper part of the Big Hole River. The grayling is still found in certain lakes of Beaverhead, Madison, and Gallatin Counties, and this fish has been introduced successfully into other lakes outside its original range.

The Montana Fish and Game Commission, realizing the need for prompt action to insure the perpetuation of this Montana native fish authorized an investigation of the status of the grayling, with special effort to be given to the upper Beaverhead River system. As a result of the initial work, the Commission designated the Red Rock Creek Drainage above the Lima Dam as a grayling sanctuary. It is planned that harvest of the grayling in this area by anglers will continue, and that special effort will be made to discourage all exotic fishes in this area and give all possible encouragement to the grayling. Work is being done cooperatively with the Montana State College Agricultural Experiment Station. The Commission also expresses its appreciation to the U. S. Fish and Wildlife Service which has extended so much help in the work through the Red Rock Nation Migratory Waterfowl Refuge.

One of the major factors affecting the grayling within the sanctuary has been that induced by the beaver. Beaver have been so complete, so thorough, in their dam construction, that the barriers they constructed have denied the grayling access to their normally accustomed spawning areas. Beaver dam removal has been undertaken, and as a result, grayling runs have been observed in tributaries far up to the head of Red Rock Creek. Dam removal is not yet well underway, but even when the dams have all been removed, the problem will not be solved. A check must be maintained on the size of the beaver population itself or barriers to migrating grayling will quickly be reconstructed.

The grayling is Montana's native fish. It is a fine game fish, and one worth saving.

FISH RESTORATION DISTRICTS

Montana has been divided into six districts or units as illustrated by the accompanying map. These districts were designed for greater economy and efficiency of work so that every portion of the state may have its individual fishery problems given needed attention. It is planned that a trained biologist will be stationed in each area. To date Districts 1, 4, and 6 are operative. These men are responsible for the fishery resources within their districts. By constant observation and study, these men will know their waters and their needs.

MONTANA.

Of the Six Montana fisheries restoration districts shown above, Districts One, Four and Six are now in operation.

They will outline sound and substantial planting programs; will execute needed restoration measures such as habitat improvement, rough fish control, creation of new fishing waters, and acquisition and development of fishing areas for public use; and will formulate adequate and needed regulations.

Two noteworthy examples of work done by the district biologists will be given, the first entailed a local problem of a rearing pond and the second a local problem on a popular stream.

Smith Lake is an artificial body of water in Flathead County, and prior to any developmental work, the lake bed was marshy with a slow moving stream passing through. In 1931 the Works Progress Administration financed the building of a dam and a wooden gate. The purpose of the impoundment was for the rearing of trout. In 1948 the Montana Fish and Game Department replaced the wooden structure with one of concrete and built a concrete structure above the pond in order to divert the inlet stream around the lake. The size of the impoundment is 15.7 acres and the deepest part is eight feet.

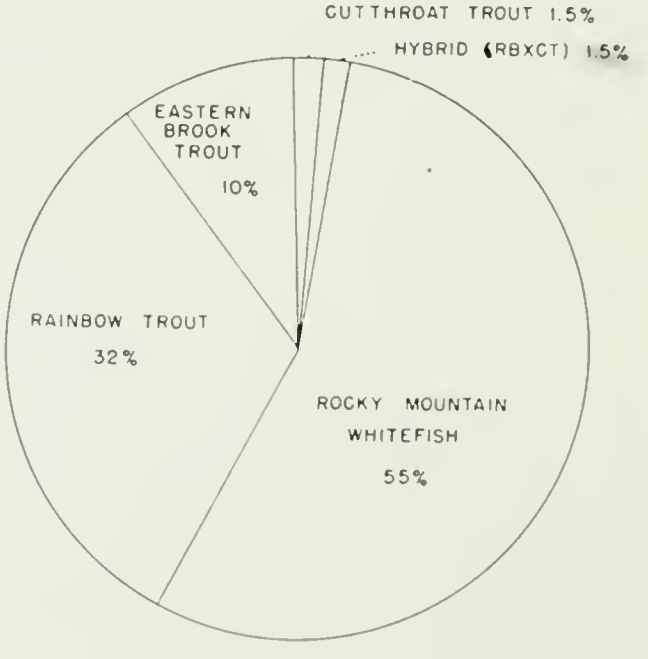
The usual procedure of releasing the fish is to open the gate and flush the fish down a stream one mile into Whitefish Lake. When the pond is drained, the planks are replaced, the lake is filled with water, and fry cutthroat trout are again planted.

A total of 1,707 cuttroat trout and four eastern brook trout were taken out of the pond in 1951. Thirty thousand cutthroat trout and no eastern brook trout had been planted in 1950. The average length of the 1,707 fish were 6.0 inches with a range of 2.8 to 9.2 inches. Their total weight was 143.94 pounds.

The purpose of the work was to make a monetary evaluation of the rearing pond to guide future management policies. Only one year's observations are represented in the figures below. Two more years observations will be added to these before the project is completed. The following are the resulting figures:

30,000 fry at $12.50 pr thousand (Cost obtained from Somers Fisheries Station Foreman)	$375.00
Law Enforcement (Pond is closed to fishing)	22.00
Cost of operation (8 man days)	68.80
Transportation (400 miles at 7¢)	28.00
Expected return on investment (5% of $5,960 which is cost of dam to the Department)	298.00
Cost of one year's operation	$791.80
Value of fish produced (143.94 pounds at $1.25 per pound, the cost to raise a pound of fish in the Somers fish hatchery	179.90
Net yearly loss	$611.90

The second project mentioned above which was one of the many accomplished by the district biologists was a fish population survey of Sheep Creek in Meagher County. It is a popular fishing stream parallel for some distance by U. S. Highway 89. Fishing success has declined during the past years, and it was evident that the stream needed a new management plan. A census of the fish population was made by the district fishery man. It was found as is illustrated in the accompanying graph that the Rocky Mountain whitefish constituted 55 per cent of the legal game fish population. This stream is closed to winter fishing when whitefish are normally harvested, so these game fish available to sportsmen who fish the stream constitute only 45 per cent of the legal fish in the stream. Thus, with the increase



Percent of each species of all legal-sized (7" and longer) game fish found in randomly selected sections of Sheep Creek, Meagher County, Montana, 1951.

of the whitefish population, it is obvious why fishing success for trout has declined. Information is thus provided from which fishery managers may design a new and effective plan for this stream.

CONTINUING FISHERIES CENSUS

During the biennium as in the past one, a program of fisheries census has been continuing in an effort to catalogue the state's waters for fishery management use.

The program has two parts, creel census and direct stream and lake census. The latter census is done largely by the district biologists, but every opportunity for gathering such information is accepted by all members of the Fish Restoration Section.

The Fish and Game Commission gratefully acknowledges the help given the Department in this program by the Zoology and Entomology Department of the Montana State College. Without the provision they have made for allowing the Department office and laboratory space, specialized equipment, and consultation with staff members, the Continuing Fisheries Census particularly as relates to age and growth of fishes, could not have advanced to the stage of high value it has now reached.

Through the Statewide Creel Census phase of this program, information of fish catches is obtained at a minimum cost to the Department. The catch data is analyzed from punch cards and is used by fishery managers in outlining hatchery planting programs, in keeping a check on trends of fishing success, and in outlining the species distributions. The greater part of the information is gathered by the Department's game wardens as they go about their regular duties of enforcement. As will be noted, other sources, however, contribute their worthwhile share.

Creel checks by game wardens, guides, and outfitters covered 8,451 anglers during the 1951 fishing season. These fished 29,847 hours to catch 33,495 fish for an average catch of 1.1 fish per man hour and 4.0 fish per man day.

One hundred and fifty-five **Fishermen's Logs** were returned to the Department after the 1951 fishing season, representing 2,133 fishing trips and 7,852 hours of fishing. These anglers took 13,066 fish for an average catch of 1.7 fish per man hour and 6.1 fish per man day.

During the 1951 regular open season, catch records were received from 399 trout streams, seven non-trout streams, 122 trout lakes, and eight non-trout lakes.

DISEASE AND NUTRITION STUDY

Recognizing that stocking fish in Montana streams is one of the major undertakings of the Fish and Game Department, a project was set up under the Dingell-Johnson program to study nutritional problems and disease problems of the trout hatcheries in Montana. Fish planting, whether for initial stocking in virgin lakes, or for other substantial purposes, should be done with fish that are raised to withstand the rigors of introduction into wild waters. Discussions with

different fisheries managers disclosed that, to obtain the highest return of sportsmen's money, every effort should be made to produce and use for stocking, healthy conditioned fish.

During the biennium, a disease and nutrition project was instituted and the biologist detailed to this project was sent to the University of Washington for two months by the Fish and Game Commission to obtain a library on research work pertaining to these two problems. After returning to Montana the biologist has worked with several hatcheries, but particularly the Arlee hatchery, to diagnose disease problems and to prescribe control measures that will enable the hatchery installations to carry on in their districts the raising and distribution of fishes.

Problems continually arising in the feeding of fishes and in the diets and nutritional problems will be worked out as the need arises in each particular installation.

Statistics

STATE FISH AND GAME DEPARTMENT
STATEMENT OF INCOME
May 1, 1950—April 30, 1951

Hunting and Fishing Licenses and Shipping Permits:

Resident Bird and Fish	159,284	@	$ 3.00	$477,852.00	
Resident Big Game	87,261	@	2.00	174,522.00	
Non-Resident 3-Day Fishing	23,664	@	2.50	59,160.00	
Non-Resident Rishing	3,741	@	10.00	37,410.00	
Non-Resident Bird	124	@	25.00	3,100.00	
Non-Resident Big Game	897	@	100.00	89,700.00	
Shipping Permits	4,124	@	.60	2,474.40	
Special Moose Permits	76	@	25.00	1,900.00	
Special Antelope Permits	8,345	@	5.00	41,725.00	
Special Elk Licenses	245	@	1.00	245.00	
Special Deer Licenses	1,513	@	5.00	7,565.00	
				$ 895,653.40	
Less Dealers' Fees				27,472.90	
Net Income from Sale of 1950 Licenses					$ 868,180.50
1949 Accounts Paid During Above Period					4,510.60
Less Refund on Cash Receipt No. 3529—June, 1950—H Wilson					.50
Total Income from Hunting and Fishing License Sales					$ 872,690.60

Licenses and Permits Other Than Above:

General Trappers' Licenses	934	@	$ 10.00	$ 9,340.00	
Land Owner Trappers' Licenses	490	@	1.00	490.00	
Beaver Tags	11,447	@	.50	5,723.50	
Beaver Trapping Permits	1,487			19,367.00	
Guides' and Outfitters Licenses	119	@	5.00	595.00	
Resident Fur Dealers' Licenses	52	@	10.00	520.00	
Taxidermist Licenses	12	@	15.00	180.00	
Certificates of Identification	822	@	.50	411.00	
Fur Dealer Agents' Licenses	22	@	10.00	220.00	
Non-Resident Fur Dealers' Licenses	2	@	50.00	100.00	
Minnow Seining Permits	12	@	10.00	120.00	
Rough Fish Seining Permit	1	@	50.00	50.00	
Alien Gun Permit	1	@	25.00	25.00	
Outfitters' Licenses	140	@	10.00	1,400.00	
					$ 38,541.50

Miscellaneous Revenue:

Fines	$ 28,213.40	
Confiscations—Sale of Fish and Meats	5,647.21	
Other Revenue	6,157.27	
Confiscations—Sale of Hides and Furs	8,427.35	
Royalty on Beaver Sold	7.50	
Extra Beaver Granted on Beaver Permits	167.00	
		$ 48,619.73
TOTAL OF ABOVE		$ 959,851.83
Wildlife Restoration Income by Federal Reimbursement		268,664.02
TOTAL INCOME TO DEPARTMENT, MAY 1 1950-APRIL 30, 1951		$ 1,228,515.85

STATE FISH AND GAME DEPARTMENT
STATEMENT OF INCOME
May 1, 1951—April 30, 1952

Hunting and Fishing Licenses and Shipping Permits:

Resident Bird and Fish	170,449	@	$ 3.00	$ 511,347.00	
Resident Big Game	100,740	@	2.00	201,480.00	
Non-Resident 3-Day Fishing	24,790	@	2.50	61,975.00	
Non-Resident Fishing	4,385	@	10.00	43,850.00	
Non-Resident Bird	216	@	25.00	5,400.00	
Non-Resident Big Game	1,245	@	100.00	124,500.00	
Shipping Permits	5,239	@	.60	3,143.40	
Special Moose Permits	105	@	25.00	2,625.00	
Special Antelope Permits	9,272	@	5.00	46,360.00	
Special Elk Licenses	357	@	1.00	357.00	
Special Deer Licenses	1,254	@	5.00	6,270.00	
				$ 1,007,307.40	
Less Dealers' Fees				30,256.70	
Net Income from Sale of 1951 Licenses					$ 977,050.70
1950 Accounts Paid During Above Period					5,478.00
Total Income From Hunting and Fishing License Sales					$ 982,528.70

Licenses and Permits Other Than Above:

General Trappers' Licenses	890	@	$ 10.00	$ 8,900.00	
Land Owner Trappers' Licenses	460	@	1.00	460.00	
Beaver Tags	12,582	@	.50	6,291.00	
Beaver Trapping Permits	1,427			18,625.00	
Guides' and Outfitters Licenses	163	@	10.00	1,630.00	
Resident Fur Dealers Licenses	50	@	10.00	500.00	
Taxidermist Licenses	11	@	15.00	165.00	
Certificate of Identification	876	@	.50	438.00	
Fur Dealer Agent Licenses	26	@	10.00	260.00	
Non-Resident Fur Dealer Licenses	3	@	50.00	150.00	
Minnow Seining Permits	15	@	10.00	150.00	
Rough Fish Seining Permits	1	@	50.00	50.00	
Alien Gun Permit	1	@	25.00	25.00	
					$ 37,644.00

Miscellaneous Revenue:

Fines	$ 35,091.61	
Confiscations—Sale of Fish and Meats	6,755.14	
Other Revenue	59,299.19	
Royalty on Beaver Sold	8.00	
Extra Beaver Granted on Beaver Permits	164.00	
Sale of Elk Study	1.00	
		$ 101,318.94
TOTAL OF ABOVE		$ 1,121,491.64
Wildlife Restoration Income by Federal Reimbursement		154,533.84
Dingell-Johnson Income by Federal Reimbursement		12,737.33
TOTAL INCOME TO DEPARTMENT MAY 1, 1951—APRIL 30, 1952		$ 1,288,762.81

RECAPITULATION OF DISBURSEMENTS
May 1, 1950—April 30, 1951

COMMISSIONERS			$ 7,268.92
ADMINISTRATION			88,608.01
PUBLIC INFORMATION AND EDUCATION			8,393.47
PREDATOR CONTROL			46,096.04
MISCELLANEOUS:			
Game Damage Expense		$ 8,951.38	
Shop and Warehouse		21,826.75	
Printing Licenses—Maps		18,291.35	
Refunds		232.90	
University Research Unit		3,915.99	
Appropriation to Purchasing Department		3,937.50	
Other Field Projects		1,699.07	
Insurance—Automobile-Buildings		881.86	
TOTAL MISCELLANEOUS			$ 59,736.80
ENFORCEMENT			229,264.12
FISHERIES DIVISION:			
Hatcheries:			
Anaconda	$ 29,899.66		
Arlee	24,885.02		
Big Timber	16,218.64		
Bluewater	12,988.71		
Emigrant	16,747.70		
Great Falls	29,539.27		
Hamilton	13,871.43		
Lewistown	26,303.14		
Libby	13,943.31		
McNeil	5,409.28		
Ovando	827.33		
Polson	5,560.78		
Somers	13,564.37		
Creston, Ennis, Miles City (Fed.)	13,834.54		
Spawning Stations		$ 4,686.66	
Other Field Projects		49,805.41	
TOTAL FISHERIES DIVISION			$ 278,085.25
GAME FARMS:			
Billings		$ 18,392.76	
Fort Peck		19,913.87	
Warm Springs		15,948.76	
Moiese			
TOTAL GAME FARMS			$ 54,255.39
WILDLIFE RESTORATION DIVISION			214,166.28
TOTAL EXPENDITURES DURING FISCAL YEAR			985,874.28

RECAPITULATION OF DISBURSEMENTS
May 1, 1951—April 30, 1952

COMMISSIONERS			$ 6,918.11
ADMINISTRATION			106,526.26
PUBLIC INFORMATION AND EDUCATION			14,634.49
PREDATOR CONTROL			31,965.82
MISCELLANEOUS:			
Game Damage Expense		$ 12,910.51	
Shop and Warehouse		36,904.37	
Printing Licenses—Maps		13,178.86	
Refunds		229.43	
University Research Unit		7,047.52	
Appropriation to Purchasing Department		2,669.94	
Other Field Projects		2,580.65	
Insurance—Automobiles-Buildings		7,645.78	
TOTAL MISCELLANEOUS			$ 83,167.06
ENFORCEMENT			268,251.91
FISHERIES DIVISION:			
Hatcheries:			
Anaconda	$ 49,559.86		
Arlee	40,938.03		
Big Timber	12,856.27		
Bluewater	14,730.72		
Emigrant	16,251.47		
Great Falls	35,148.14		
Hamilton	11,315.77		
Lewistown	23,437.46		
Libby	23,675.16		
McNeil	12,828.92		
Ovando	8,112.30		
Polson	5,652.99		
Somers	13,701.64		
Creston, Ennis, Miles City (Fed)	14,432.65		
Spawning Stations		$ 5,625.90	
Other Field Projects		16,503.15	
Federal Aid Program		37,617.70	
TOTAL FISHERIES DIVISION			$ 352,222.00
GAME FARMS:			
Billings		$ 17,174.96	
Fort Peck		23,997.38	
Warm Springs		14,355.18	
Moiese		687.01	
TOTAL GAME FARMS			$ 56,214.53
WILDLIFE RESTORATION FEDERAL AID			186,972.89
TOTAL EXPENDITURES DURING FISCAL YEAR			$ 1,106,873.07

DETAIL OF EXPENDITURES

For Fiscal Years Ending April 30, 1951 and April 30, 1952

	APRIL 1951	APRIL 1952
COMMISSIONERS		
Per Diem and Expense	$ 7,268.92	$ 6,918.11
ADMINISTRATION		
Operation	83,410.15	101,164.37
Capital Expenditures	4,349.12	4,662.21
Repairs and Replacements	848.74	699.68
TOTAL	$ 88,608.01	$ 106,526.26
PUBLIC RELATIONS		
Operation	$ 6,983.47	$ 10,652.80
Capital Expenditures	1,387.30	2,677.15
Repairs and Replacements	22.70	1,304.54
TOTAL	$ 8,393.47	$ 14,634.49
PREDATOR CONTROL		
Aid to Federal Control Program	$ 42,748.17	$ 28,797.69
Bounties Paid	3,347.87	3,168.13
TOTAL	$ 46,096.04	$ 31,965.82
MOIESE EXPERIMENTAL FARM		
Operation		$ 444.51
Capital Expenditures		210.00
Repair and Replacement		32.50
TOTAL		$ 687.01
MISCELLANEOUS ACCOUNTS		
Game Damage—Salaries and Expense	$ 8,755.22	$ 12,910.51
Shop and Warehouse	8,202.52	26,225.60
Printing Licenses and Permits	18,291.35	13,178.86
Refunds	232.90	229.43
Feed and Salt (For Game Animals)		6.84
Fairs and Expositions	619.60	836.81
Surveys, Plans, Assessments, Water Use, Lease of Lands	630.56	672.27
Checking Stations	645.07	1,064.73
Insurance—Automobile, Buildings, Equipment	881.86	7,645.78
TOTAL	$ 38,259.08	$ 62,770.83
UNIVERSITY RESEARCH UNIT		
Operation	$ 3,683.20	$ 5,758.97
Capital Expenditures	179.00	1,278.10
Repair and Replacement	53.79	10.45
TOTAL	$ 3,915.99	$ 7,047.52
ENFORCEMENT		
Operation	$ 219,267.04	$ 252,188.15
Capital Expenditures	6,990.78	12,772.44
Repairs and Replacements	3,006.30	3,291.32
TOTAL	$ 229,264.12	$ 268,251.91

DETAIL OF EXPENDITURES (Continued)

	APRIL 1951	APRIL 1952
FISHERIES—GENERAL		
Operation	$ 5,047.95	$ 6,974.90
Capital Expenditures	1,959.36	950.28
Repairs and Replacements	400.56	384.47
TOTAL	$ 7,407.87	$ 8,309.65
HATCHERY—ANACONDA		
Operation	$ 28,988.22	$ 27,494.29
Capital Expenditures	175.18	20,222.88
Repairs and Replacements	736.26	1,842.69
TOTAL	$ 29,899.66	$ 49,559.86
HATCHERY—ARLEE		
Operation	$ 23,539.41	$ 21,325.14
Capital Expenditures	172.18	13,957.33
Repairs and Replacements	1,173.43	5,655.56
TOTAL	$ 24,885.02	$ 40,938.03
HATCHERY—BIG TIMBER		
Operation	$ 14,659.91	$ 12,021.92
Capital Expenditures	326.84	127.91
Repairs and Replacements	1,231.89	706.44
TOTAL	$ 16,218.64	$ 12,856.27
HATCHERY—BLUEWATER SPRINGS		
Operation	$ 10,595.83	$ 12,322.92
Capital Expenditures	316.87	289.92
Repairs and Replacements	2,076.01	2,117.88
TOTAL	$ 12,988.71	$ 14,730.72
HATCHERY—CRESTON (Federal)		
Operation	$ 5,004.23	$ 5,015.40
TOTAL	$ 5,004.23	$ 5,015.40
HATCHERY—EMIGRANT		
Operation	$ 15,919.50	$ 13,856.55
Capital Expenditures	491.44	1,802.56
Repairs and Replacements	336.76	592.36
TOTAL	$ 16,747.70	$ 16,251.47
HATCHERY—ENNIS (Federal)		
Operation	$ 4,870.32	$ 4,658.03
Capital Expenditures	32.85	54.60
Repairs and Replacements	130.74	373.32
TOTAL	$ 5,033.91	$ 5,085.95
HATCHERY—GREAT FALLS		
Operation	$ 26,936.91	$ 30,468.10
Capital Expenditures	190.01	3,520.83
Repairs and Replacements	2,412.35	1,159.21
TOTAL	$ 29,539.27	$ 35,148.14

DETAIL OF EXPENDITURES (Continued)

	APRIL 1951	APRIL 1952
HATCHERY—HAMILTON		
Operation	$ 9,563.85	$ 10,076.60
Capital Expenditures	77.77	495.04
Repairs and Replacements	4,229.81	744.13
TOTAL	$ 13,871.43	$ 11,315.77
HATCHERY—LEWISTOWN		
Operation	$ 24,833.95	$ 20,614.14
Capital Expenditures	20.82	2,030.33
Repairs and Replacements	1,448.37	792.99
TOTAL	$ 26,303.14	$ 23,437.46
HATCHERY—LIBBY		
Operation	$ 12,565.70	$ 16,517.84
Capital Expenditures	353.36	4,059.48
Repairs and Replacements	1,024.25	3,097.84
TOTAL	$ 13,943.31	$ 23,675.16
HATCHERY—McNEIL		
Operation	$ 4,736.31	$ 7,648.66
Capital Expenditures	303.06	4,048.76
Repairs and Replacements	369.91	1,131.50
TOTAL	$ 5,409.28	$ 12,828.92
HATCHERY—MILES CITY (Federal)		
Operation	$ 3,796.40	$ 4,064.31
Capital Expenditures		266.99
TOTAL	$ 3,796.40	$ 4,331.30
HATCHERY—OVANDO		
Operation	$	$ 4,964.41
Capital Expenditures	827.33	1,552.33
Repairs and Replacements		1,595.56
TOTAL	$ 827.33	$ 8,112.30
HATCHERY—POLSON		
Operation	$ 4,256.65	$ 5,139.16
Capital Expenditures	940.78	129.00
Repairs and Replacements	363.35	334.83
TOTAL	$ 5,560.78	$ 5,652.99
HATCHERY—SOMERS		
Operation	$ 11,735.65	$ 11,695.65
Capital Expenditures	274.68	331.16
Repairs and Replacements	1,534.06	1,674.83
TOTAL	$ 13,564.37	$ 13,701.64
SPAWNING STATIONS		
Operation	$ 4,648.51	$ 5,070.36
Capital Expenditures	13.15	
Repairs and Replacements	25.00	555.54
TOTAL	$ 4,686.66	$ 5,625.90

DETAIL OF EXPENDITURES (Continued)

	APRIL 1951	APRIL 1952
OTHER FIELD PROJECTS		
Operation	$ 14,882.16	$ 4,504.90
Capital Expenditures	324.78	2,834.70
Repairs and Replacements	395.53	853.90
TOTAL	$ 15,602.47	$ 8,193.50
FISHERIES RESTORATION		
Operation	NONE	$ 26,940.02
Capital Expenditures		10,256.79
Repairs and Replacements		420.89
TOTAL	$	$ 37,617.70
FISHERIES RESEARCH		
Operation	$ 23,749.06	$ 7,515.74
Capital Expenditures	2,421.87	2,026.52
Repairs and Replacement	624.14	291.61
TOTAL	$ 26,795.07	$ 9,833.87
GAME FARM—BILLINGS		
Operation	$ 15,665.10	$ 16,037.87
Capital Expenditures	1,753.99	1,081.65
Repairs and Replacements	973.67	55.44
TOTAL	$ 18,392.76	$ 17,174.96
GAME FARM—FORT PECK		
Operation	$ 16,155.16	$ 17,877.56
Capital Expenditures	250.71	2,168.42
Repairs and Replacement	3,508.00	3,951.40
TOTAL	$ 19,913.87	$ 23,997.38
GAME FARM—WARM SPRINGS		
Operation	$ 14,914.22	$ 13,264.37
Capital Expenditures	486.94	409.33
Repairs and Replacements	547.60	681.48
TOTAL	$ 15,948.76	$ 14,355.18
WILDLIFE RESTORATON DIVISION		
Operation	$ 157,993.92	$ 144,541.04
Capital Expenditures	49,218.44	34,509.94
Repairs and Replacements	6,953.92	7,921.91
TOTAL	$ 214,166.28	$ 186,972.89
WAREHOUSE STORES	$ 13,624.23	$ 10,678.77
MONTANA STATE PURCHASING DEPARTMENT	$ 3,937.50	$ 2,669.94
TOTAL EXPENDITURES	$ 985,874.28	$ 1,106,873.07

RECAPITULATION OF FUNDS
May 1, 1950 to April 30, 1951
and
May 1, 1951 to April 30, 1952

Balance Forward April 30, 1950		$ 220,390.79
Income May 1, 1950—April 30, 1951		1,228,515.85
Funds Available During Period 1950-51	$ 1,448,906.64	
Disbursements During Period 1950-51	985,874.28	
Balance April 30, 1951		$ 463,032.36
Income May 1, 1951—April 30, 1952		1,288,762.81
Funds Available During Period 1951-52	$ 1,751,795.17	
Disbursements During Period 1951-52	1,106,873.07	
Balance April 30, 1952		$ 644,922.10

FISH AND GAME VIOLATIONS
By Counties

	May 1, 1950 to April 30, 1951	May 1, 1951 to April 30, 1952
Beaverhead	39	29
Big Horn	11	12
Blaine	.....	3
Broadwater	20	6
Carbon	8	31
Carter	2	3
Cascade	13	20
Chouteau	7	3
Custer	9	8
Daniels	.....	.....
Dawson	5	.....
Deer Lodge	21	27
Fallon	.....	4
Fergus	8	4
Flathead	42	61
Gallatin	37	33
Garfield	1	.....
Glacier	5	1
Golden Valley	4	4
Granite	6	19
Hill	2	2
Jefferson	8	10
Judith Basin	9	2
Lake	10	17
Lewis and Clark	19	32
Liberty	.....	1
Lincoln	20	21
Madison	49	25
McCone	6	1
Meagher	10	4
Mineral	18	28
Missoula	28	30
Musselshell	6	4
Park	54	66
Petroleum	.....	.....
Phillips	8	5
Pondera	8	13
Powder River	4	9
Powell	8	12
Prairie	1	.....
Ravalli	15	12
Richland	5	8
Roosevelt	...	19
Rosebud	15	5
Sanders	16	21
Sheridan	2	6
Silver Bow	9	6
Stillwater	26	23
Sweet Grass	4	9
Teton	21	33
Toole	4	3
Treasure	4	2
Valley	14	8
Wheatland	10	6
Wibaux	.....	.....
Yellowstone	23	30
TOTALS	674	741

FISH AND GAME LAW VIOLATIONS
Classified as Follows

	May 1, 1950 to April 30, 1951	May 1, 1951 to April 30, 1952
Fishing Violations (All Types)	276	237
Big Game Hunting (All Types)	290	335
Trapping	18	14
Improper Licenses	33	52
Game Bird (All Types)	57	103
TOTALS	674	741

1950 LICENSE SALES BY COUNTIES
May 1, 1950 to April 30, 1951

County	Resident Bird and Fish	Resident Big Game	Tourist Fishing	Non-Resident Fishing	Non-Resident Bird	Non-Resident Big Game	Special Permits	Totals
Beaverhead	2,913	1,812	2,525	240	4	56		7,550
Big Horn	1,517	688	120	55	3	.....		2,383
Blaine	978	362	17	.....	.....	.....		1,357
Broadwater	1,127	799	69	9	1	3		2,008
Carbon	2,811	1,485	295	53	.....	.....		4,644
Carter	452	399	8	.....	.....	.....		859
Cascade	14,522	7,060	374	91	3	43		22,093
Chouteau	1,653	928	42	2	.....	.....		2,625
Custer	2,358	1,285	56	15	.....	4		3,718
Daniels	460	170	1	.....	.....	.....		631
Dawson	1,708	842	26	8	.....	2		2,586
Deer Lodge	3,900	1,862	468	47	.....	5		6,282
Fallon	630	402	5	5	.....	1		1,043
Fergus	5,296	4,039	278	33	.....	17		9,663
Flathead	12,022	6,965	1,581	303	7	39		20,917
Gallatin	7,566	4,044	6,706	868	10	138		19,332
Garfield	398	297	14	2	.....	.....		711
Glacier	2,016	596	190	31	2	23		2,858
Golden Valley	388	275	22	.....	.....	.....		685
Granite	1,093	702	99	16	.....	3		1,913
Hill	3,021	896	49	14	1	9		3,990
Jefferson	1,185	816	125	22	.....	5		2,153
Judith Basin	1,063	866	48	4	.....	9		1,990
Lake	4,051	1,660	1,037	115	11	5		6,879
Lewis and Clark	7,662	4,878	554	115	3	129		13,341
Liberty	355	86	6	1	.....	.....		448
Lincoln	3,379	2,319	1,142	159	3	11		7,013
Madison	2,374	1,440	1,619	157	7	30		5,627
McCone	450	187	13	.....	.....	.....		650
Meagher	984	771	98	16	.....	10		1,879
Mineral	1,011	727	644	410	5	12		2,809
Missoula	10,315	5,857	981	205	19	107		17,484
Musselshell	1,658	1,066	132	8	.....	.....		2,864
Park	4,408	3,028	607	94	.....	97		8,234
Petroleum	278	213	1	1	.....	.....		493
Phillips	1,216	846	14	1	1	.....		2,078
Pondera	2,329	927	90	16	1	2		3,365
Powder River	559	449	11	5	.....	.....		1,024
Powell	1,851	1,271	167	35	.....	23		3,347
Prairie	330	170	9	3	.....	.....		512
Ravalli	4,047	2,433	648	83	1	26		7,238
Richland	1,497	699	10	2	6	.....		2,214
Roosevelt	1,839	812	49	7	5	1		2,713
Rosebud	1,075	763	20	8	.....	.....		1,866
Sanders	2,490	1,761	809	123	9	11		5,203
Sheridan	1,059	406	6	2	10	5		1,488
Silver Bow	11,068	4,894	536	72	1	13		16,584
Stillwater	1,992	1,307	215	40	.....	6		3,560
Sweet Grass	1,373	998	195	45	.....	3		2,614
Teton	2,088	1,123	78	8	.....	16		3,313
Toole	1,561	485	53	9	.....	.....		2,108
Treasure	208	179	3	.....	.....	.....		390
Valley	2,728	859	230	27	1	2		3,847
Wheatland	1,390	1,028	105	21	2	7		2,553
Wibaux	273	169	14	5	.....	.....		461
Yellowstone	12,309	5,860	450	130	8	24		18,781
Special Moose							76	76
Special Antelope							8,345	8,345
Special Elk							245	245
Special Deer							1,513	1,513
Totals	159,284	87,261	23,664	3,741	124	897	10,179	285,150

1951 LICENSE SALE BY COUNTIES
May 1, 1951 to April 30, 1952

County	Resident Bird and Fish	Resident Big Game	Tourist Fishing	Non-Resident Fishing	Non-Resident Bird	Non-Resident Big Game	Special Permits	Totals
Beaverhead	3,037	1,789	2,498	254	4	46		7,628
Big Horn	1,551	911	109	29	5	6		2,611
Blaine	1,143	554	16	2	1	.....		1,716
Broadwater	1,141	899	60	5	.....	.....		2,105
Carbon	2,887	1,667	284	48	.....	4		4,890
Carter	587	520	4	1	.....	.....		1,112
Cascade	16,184	8,428	460	88	13	88		25,261
Chouteau	1,701	942	42	3	.....	.....		2,688
Custer	2,654	1,863	27	11	.....	8		4,563
Daniels	545	313	2	.....	.....	.....		860
Dawson	1,913	1,122	25	12	3	1		3,076
Deer Lodge	4,002	1,902	566	57	.....	11		6,538
Fallon	766	608	10	3	1	.....		1,388
Fergus	5,633	4,541	278	39	.....	15		10,506
Flathead	12,300	7,955	1,801	323	10	76		22,965
Gallatin	7,672	4,682	6,623	1,050	6	202		20,235
Garfield	442	360	16	3	.....	.....		821
Glacier	2,071	573	185	25	2	21		2,877
Golden Valley	397	312	24	1	.....	.....		734
Granite	1,149	787	116	15	.....	16		2,083
Hill	3,191	1,121	74	17	.....	11		4,414
Jefferson	1,255	883	105	10	.....	11		2,264
Judith Basin	1,090	902	63	10	.....	3		2,068
Lake	4,262	1,779	1,333	170	22	11		7,577
Lewis and Clark	8,448	5,583	518	79	5	139		14,772
Liberty	340	81	2	1	.....	.....		424
Lincoln	4,118	2,812	1,114	156	2	4		8,206
Madison	2,333	1,519	1,593	170	7	39		5,661
McCone	499	300	13	.....	.....	.....		812
Meagher	1,076	793	96	19	.....	4		1,988
Mineral	1,101	887	673	623	20	16		3,320
Missoula	10,749	6,218	1,202	219	31	129		18,548
Musselshell	1,672	1,201	95	7	1	4		2,980
Park	4,591	3,477	652	147	.....	110		8,977
Petroleum	329	283	3	.....	.....	.....		615
Phillips	1,335	964	19	1	3	.....		2,322
Pondera	2,417	988	90	11	1	3		3,510
Powder River	618	514	7	3	.....	.....		1,142
Powell	2,075	1,519	207	33	1	32		3,867
Prairie	385	270	9	3	.....	.....		667
Ravalli	4,103	2,576	821	115	4	63		7,682
Richland	1,748	1,107	8	2	18	9		2,892
Roosevelt	2,034	1,117	33	14	3	4		3,205
Rosebud	1,265	1,121	8	8	1	.....		2,402
Sanders	2,780	2,016	845	150	11	15		5,817
Sheridan	1,114	647	5	1	13	1		1,781
Silver Bow	11,783	5,384	686	119	1	35		18,008
Stillwater	2,023	1,342	168	36	.....	8		3,577
Sweet Grass	1,404	1,093	222	45	.....	8		2,772
Toole	1,638	568	30	17	2	.....		2,255
Teton	2,127	1,185	80	17	7	23		3,439
Treasure	240	192	1	.....	.....	.....		433
Valley	2,778	954	217	28	3	3		3,983
Wheatland	1,489	1,116	135	31	5	11		2,787
Wibaux	312	212	15	9	.....	.....		548
Yellowstone	13,452	7,288	502	145	11	55		21,453
Special Moose							105	105
Special Antelope							9,272	9,272
Special Elk							357	357
Special Deer							1,254	1,254
Totals	170,449	100,740	24,790	4,385	216	1,245	10,988	312,813

FISH PLANTED FROM SOMERS HATCHERY
May 1, 1950 through April 30, 1951

Species	Number	Size
Black Spotted	686,240	1½
	190,385	2
	35,640	4
Rainbow	1,080	4
Sockeye Salmon	977,200	Fry
	238,130	1½
Mackinaw	42,000	2
TOTAL	2,170,675	

May 1, 1951 through April 30, 1952

Species	Number	Size
Black Spotted	87,408	Fry
	29,000	Ad Fry
	954,640	1
	20,968	1½
	126.334	2
	33,600	3
	55,065	4
	480	Adult
Sockeye Salmon	2,187,337	Fry
	120,000	1½
Silver Salmon	18,000	2
Mackinaw	34,200	1½
Grayling	1,700,000	Fry
TOTAL	7,537,707	

FISH PLANTED FROM EMIGRANT HATCHERY
May 1, 1950 through April 30, 1951

Species	Number	Size
Black Spotted	476,000	1
	3,360	3½
Rainbow	151,600	1½
	40 000	2
	117,090	3½
Brook Trout	69,000	2
Loch Leven	201,000	1½
TOTAL	1,058,050	

May 1, 1951 through April 30, 1952

Species	Number	Size
Black Spotted	175,000	1
	62,000	1¼
	12.050	1½
	38.400	3½
Rainbow	7,800	Fry
	48,700	1½
	39,400	4
	77,500	5
Brook	63.100	2
	4,950	4
Loch Leven	142,450	2
	23,400	5
TOTAL	794,750	

FISH PLANTED FROM LIBBY HATCHERY
May 1, 1950 through April 30, 1951

Species	Number	Size
Black Spotted	6,280	2
Brook	850	6
	150	Adult
Sockeye	368,000	Fry
TOTAL	375,280	

May 1, 1951 through April 30, 1952

Species	Number	Size
Black Spotted	208,404	Fry
	135,000	Ad Fry
	236,000	1
	106,900	1½
	27,250	2-3
	543	2½
Rainbow	5,000	Fry
	60,000	1
	1,500	2
	18,000	2-4
	3,840	5½
	500	Adult
Brook	3,870	6½
	2,905	Adult
Sockeye	40,000	Fry
Silver Salmon	5,460	3
Grayling	390,000	Fry
TOTAL	1,245,172	

FISH PLANTED FROM POLSON HATCHERY
May 1, 1950 through April 30, 1951

Species	Number	Size
Black Spotted	278,700	2
Rainbow	266,800	2
Sockeye	1,376,000	Fry
TOTAL	1,921,500	

May 1, 1951 through April 30, 1952

Species	Number	Size
Black Spotted	548,300	1
Sockeye	1,583,400	Fry
TOTAL	2,131,700	

FISH PLANTED FROM LEWISTOWN HATCHERY

May 1, 1950 through April 30, 1951

Species	Number	Size
Black Spotted	32,250	1½
Rainbow	76,671	1
	62,780	1½
	5,926	2
	1,260	3
	66,470	5
	3,960	5½
	45,674	6
	35,668	7
	4,160	Adult
Brook	6,371	1
	4,639	3
	2,880	4½
	3,520	5
	4,060	5½
Sockeye	2,700	4
Loch Leven	25,880	1
	38,560	1½
	16,920	2
	3,100	4
TOTAL	443,449	

May 1, 1951 through April 30, 1952

Species	Number	Size
Black Spotted	101,172	1
	2,830	7
Rainbow	92,664	1
	20,572	1½
	6,557	2
	10,860	3
	75,686	6
	65,474	7
Brook	13,515	1
	30,787	2
	4,180	4
Sockeye	39,280	1½
	5,430	3
Loch Leven	25,638	1
	87,496	2
	118,820	3
	22,000	4
TOTAL	722,961	

FISH PLANTED FROM GREAT FALLS HATCHERY
May 1, 1950 through April 30, 1951

Species	Number	Size
Black Spotted	177,800	1
Brook	17,000	2½
	1,000	3
	111,700	3½
Loch Leven	79,000	2½
Rainbow	36,000	Ad Fry
	51,200	1
	30,000	1½
	55.200	4
	114,110	5
	39.800	5½
	33,220	6
	5,200	7
	7,200	8
Grayling	200,000	Fry
Walleye	750.000	Fry
TOTAL	1,708,430	

May 1, 1951 through April 30, 1952

Species	Number	Size
Black Spotted	102,800	1
	60,850	1½
Brook	5,625	2
	3,000	3
	23,040	3½
	8,400	4
	44,000	4½
Loch Leven	79,400	2
Rainbow	141,520	1½
	9,000	2
	2,000	3
	23,640	5
	6 360	6
	50,240	7
	47.730	8
	33,600	A
Silver Salmon	7,200	3
TOTAL	648,405	

FISH PLANTED FROM BLUEWATER HATCHERY
May 1, 1950 through April 30, 1951

Species	Number	Size
Rainbow	5,000	3½
	39,500	5
	3,052	5½
TOTAL	47,552	

May 1, 1951 through April 30, 1952

Species	Number	Size
Black Spotted	31,900	5½
	210	7½
Rainbow	17,068	4
	117,490	4½
	31,442	5
	20,033	6
	810	6½
TOTAL	218,953	

FISH PLANTED FROM ARLEE HATCHERY
May 1, 1950 through April 30, 1951

Species	Number	Size
Black Spotted	15,000	Ad Fry
	251,309	1
	420,344	1½
Rainbow	1,500	1
	214,962	1½
	21,360	2
	130	Adult
Brook	26,800	2
	9,398	Adult
Loch Leven	62,154	1½
TOTAL	1,022,957	

May 1, 1951 through April 30, 1952

Species	Number	Size
Black Spotted	738,695	Ad Fry
	29,750	4
Rainbow	228,826	Ad Fry
	36,084	1½
	13,680	5½
	462	6
	16,812	6½
	15,819	7
	5,811	Adult
Brook	5,695	6½
	1,600	Adult
Loch Leven	32,940	1½
TOTAL	1,126,174	

FISH PLANTED FROM MILES CITY (Federal-State Cooperative) HATCHERY
May 1, 1950 through April 30, 1951

Species	Number	Size
Walleye	2,568,000	Fry
Great Northern	2,000	Fry
Bass	50	Ad Fry
	20,799	2
	43,205	4
Crappie	24,827	2
Bullhead	26,010	3
Bluegill	50	Adult
TOTAL	2,684,932	

May 1, 1951 through April 30, 1952

Species	Number	Size
Walleye	1,800,000	Fry
	2,600	3
Great Northern	781,000	Fry
Bass, Large Mouth	78,000	Fry
	57,005	4
Bluegill	3,926	1
TOTAL	2,722,531	

FISH PLANTED FROM BIG TIMBER HATCHERY

May 1, 1950 through April 30, 1951

Species	Number	Size
Black Spotted	106,820	EE
	144,616	1¼
	10,000	2½
Rainbow	25,186	EE
	242,048	1¼
	126,000	2½
	17,250	2¾
	18,500	3
Brook	136,000	2
	15,800	3½
	2,400	4
Loch Leven	97,632	1¼
	142,400	1½
	64,000	1¾
	27,090	4
	21,120	5
TOTAL	1,196,862	

May 1, 1951 through April 30, 1952

Species	Number	Size
Black Spotted	89,548	1½
Rainbow	306,816	1½
	46,750	3
Brook	61,500	3
Loch Leven	96,000	1¼
	29,760	3½
	85,890	4
Sockeye	243,760	Fry
TOTAL	960,024	

FISH PLANTED FROM HAMILTON HATCHERY

May 1, 1950 through April 30, 1951

Species	Number	Size
Black Spotted	23,150	3
Rainbow	87,324	3½
Silver Salmon	35,300	2
Loch Leven	124,460	1½
TOTAL	270,234	

May 1, 1951 through April 30, 1952

Species	Number	Size
Black Spotted	40,000	Fry
	80,700	1
	273,474	3
	10,000	4
Rainbow	48,700	3½
Silver Salmon	17,680	3
Loch Leven	85,170	1½
TOTAL	555,724	

FISH PLANTED FROM ANACONDA HATCHERY

May 1, 1950 through April 30, 1951

Species	Number	Size
Black Spotted	300,340	1
	45,287	3
	4,500	3½
	262,372	4
Rainbow	99,325	Ad Fry
	2,560	1½
	3,000	3
	21,186	4½
	123,766	5
	6,130	5½
	106,353	6
	8,652	6½
	21,877	7
	1,500	8
Grayling	4,700,000	Fry
	3,550	6
Brook	880	2
	1,208	5½
	10,164	6
Silver Salmon	12,000	3
Loch Leven	97,920	1½
	3,850	5½
	2,100	6
TOTAL	5,838,520	

May 1, 1951 through April 30, 1952

Species	Number	Size
Black Spotted	337,320	1
	15,360	1½
	15,271	5
	21,957	6
Rainbow	68,560	1½
	122,990	4
	21,508	5
	1,237	6
	17,282	7
Grayling	3,370,000	Fry
	2,800	5
	5,544	6
Brook	3,060	5
	15,153	6
	540	7
	500	8
Silver Salmon	67,625	3
Loch Leven	88,600	1½
	16,340	4
	500	6
TOTAL	4,192,146	

FISH PLANTED FROM CRESTON (Federal-State Coperative) HATCHERY

May 1, 1950 through April 30, 1951

Species	Number	Size
Black Spotted	1,483,350	1
	198,000	1½
	120,520	3
	102,880	4
	94,664	5
	2,688	6½
	5,270	7
	4,048	9
Rainbow	24,960	2
	32,688	3
	23,360	4
	1,080	6
	447	12
	5,182	7
	3,300	8
Brook	62,576	3
	17,256	4
	468	12
	3,248	7
	5,234	8
Dolly Varden	59,410	3
Mackinaw	23,516	4
TOTAL	2,274,145	

May 1, 1951 through April 30, 1952

Species	Number	Size
Black Spotted	1,392,000	Adult
	267,840	1
	223,935	1½
	113,552	3
	68,331	4
	29,875	5
	959	6
Rainbow	107,952	Adult
	220	1½
	45,000	2
	17,940	2
	12,640	3
	1,492	4
	1,680	6
	698	7
Brook	5,064	9
Dolly Varden	14,542	7
	5,226	4
Mackinaw	20,390	8
	4,599	4
TOTAL	2,333,935	7

FISH PLANTED FROM McNEIL HATCHERY

May 1, 1950 through April 30, 1951

Species	Number	Size
Walleye Pike	3,325,000	not known
Large Mouth Bass	5,650	not known
TOTAL	3,330,650	

May 1, 1951 through April 30, 1952

Species	Number	Size
Walleye Pike	4,382,000	not known
Northern Pike	368,650	not known
Large Mouth Bass	9,450	not known
TOTAL	4,760,100	

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