ELEVENTH BIENNIAL REPORT

20 YEARS PROGRESS

WASHINGTON STATE GAME COMMISSION

ELEVENTH BIENNIAL REPORT

OF THE

WASHINGTON STATE GAME COMMISSION

April 1, 1951 to March 31, 1953

WASHINGTON STATE GAME COMMISSION

Department of Game

Walt Failor, Chairman.....Aberdeen
Dr. W. R. Bernard.....Cheney
Edson Dow.....Wenatchee
James A. Loudon.....Yakima
Richard S. Seward.....Seattle
Claude C. Snider.....Vancouver

John A. Biggs.....Director of Game
Carl N. Crouse.....Assistant Director

STATE PRINTING PLANT OLYMPIA, WASHINGTON

LETTER OF TRANSMITTAL

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

Dear Sir:

On behalf of the members of the State Game Commission we herewith submit to you the eleventh biennial report of the Washington State Game Commission embracing the period April 1, 1951 to March 31, 1953.

This biennial report is, we believe, particularly a significant and noteworthy one, for the reason that it marks the completion of twenty years of state game control. The report represents twenty years of continued and material progress, of a type which has resulted in the establishment in the State of Washington of one of the nation's outstanding wildlife management organizations.

In the building of this organization both present and past Game Commissions and individual Game Commissioners have contributed tirelessly and unselfishly of their time and thinking. That their efforts have been crowned with success is, we believe, best demonstrated by the fact that today nearly 500,000 people are enjoying finer hunting and fishing than did less than 150,000 people twenty years ago. Neither has this progress been achieved at the expense or depletion of our wildlife resources. Instead, it can be safely said that there is more wildlife in the State of Washington today than at any time in its history.

Through the efforts of these men and the material aid of conscientious and loyal employees of the Department of Game, plus the support of sound thinking and progressive sportsmen's organizations, hunting and fishing have assumed their proper places as the greatest and most actively participated in recreational assets of the State. The permanency of these assets has now been established, and can be enjoyed not only by today's citizens of the State, but also by countless future generations.

Respectfully submitted,

WASHINGTON STATE GAME COMMISSION
WALT FAILOR, *Chairman*
DR. W. R. BERNARD
EDSON DOW
J. A. LOUDON
RICHARD S. SEWARD
CLAUDE C. SNIDER

WASHINGTON'S WILDLIFE RESOURCES

Twenty-one years ago, the Washington State Game Department was only a name . . . a title written on a voter's ballot. From that election in 1932 evolved the State Game Department as we know it today. From an Initiative Number to a functioning branch of our state government, it has gained in a comparatively short time the respect of every conservation agency in the nation.

There have been changes through the years. Experience and research, coupled with some ruthless lessons supplied by Mother Nature, have shown that the methods of resource management must progress or the resource will suffer the consequences. In any enterprise, be it public or private, progress is invariably followed by expansion. Twenty-year old "conservation miracles" are today being performed as commonplace practice and the expansion is only a direct reflection of the many new problems in the conservation programs administered by the Department. As the population trends of Washington began to correspond to the agricultural and industrial development of our state, and as the sports of hunting and fishing became more and more popular among the increasing residents, the expansion of the Department was inevitable.

From a means of livelihood to a recreation and an industry—that is the tale of Washington's wildlife resource.

The modern game management program is designed for today . . . and tomorrow. No longer is there a place for **conservation** or **preservation.** Applicable during the early 1900's and rightfully recognized as being the seed from which modern scientific game management has grown, **conservation** and **preservation** programs in their attempts to "save" or stockpile our renewable resources have proved to be completely inadequate. Since game, like our forests, is a renewable resource, it must be understood that allowing a complete, properly controlled harvest of each year's crop is the only means of maintaining a perennial supply of game. With the concentrated demands made on our wildlife by the multitude of sportsmen, who have increased from a comparatively meager 130,000 in 1933 to over a half million people in 1953, it is inconceivable that a "savings program" would be at all workable or practical. Supported almost entirely by hunting and fishing license revenues, the Department's programs in fisheries and game management are pointed toward the perpetual management and harvest of our wildlife. During the 20 years of state control over our game and fisheries resource, there has been a large percentage of the money expended in that period diverted into the construction of permanent installations and the acquisition of public access areas for both hunters and fishermen. The total replaceable value of these capital facilities represents a fifteen million dollar investment in hunting and fishing. However, management, production and maintenance are only parts of a complete game and fisheries program.

Major Programs

One of the major problems facing the state today is making game and game fish available to the hunting and fishing public. Instituted in 1949 as part of the overall game picture was the Farmer-Sportsman Relations program. Pioneering a project that seemed to be the only answer to free public hunting, Washington, through the cooperation of landowners, the sportsmen and Game Department, has opened more than 700,000 acres to public hunting.

The program has been designed to create a greater respect for the landholder's property and at the same time maintain public entry to private land. Coupled with the Farmer-Sportsman activities is the Pheasant Habitat Development program whereby the Department lends an assist in developing farm lands for the benefit of game and agriculture in return for the owner's promise to open up a good portion of his land to public hunting. Together these two programs will open more than one million acres of land, previously closed, for hunters' use. In addition, there are over 187,000 acres of Game Department owned and controlled land making up a network of game ranges located in the strategic game areas of the state. These lands, of course, are opened to public hunting and are maintained in perpetuity for the production and management of our wildlife as well as a means of providing free public hunting in Washington.

The fisherman is getting further opportunities for pursuing his favorite pastime too. Public fishing areas and the lake rehabilitation program are working hand in hand toward this end. Washington again is the leader in reclaiming fishing waters through use of the chemical rotenone and bringing them back to their original productive capacity. More than 15,000 acres of water have been rehabilitated in this fashion and replanted with fighting trout. Before a lake is given the treatment ridding it of scrap fish, the Department sees to it that the public has access to the water. Access areas have been obtained on 138 lakes and streams, and most of them have been developed complete with parking, boat launching and sanitary facilities, giving fishermen the right of way to the state's waters.

These are but a few of the developments designed to give fishermen and hunters a break. Someone not included in the cast of 400,000 that uses these improved hunting and fishing facilities might ask, "What do these improvements mean to the people of the state of Washington in general?"

Besides the obvious assets to Washington's outdoorsmen and the attraction they make for tourists, there are just as direct influences on the economy of the Evergreen state which, however, are not quite so readily observed.

Prof. Robert F. Wallace of Washington State College in his **Economic Aspects of Wildlife Resources in Washington** calls our wildlife a multi-million dollar industry, $80 million to be exact. Broken down further, Professor Wallace says that the average fisherman spends $125 a year; the big game hunter, $88; the upland bird hunter, $74; the waterfowl enthusiast, $64, with another $54 being spent per sportsman for general purchases. Since the hunting and fishing license accounts for no more than $2.50 to $10.50 per person, where does the rest of the sportsman's expenditure go? The proprietor of the sporting goods store, the gun manufacturer, the shoe salesman and every person who has anything to do with outfitting the hunter and fisherman for his many trips a year gets a portion. In addition, the resort owner gets his fair share as does the guide, the manager of the motel, etc. It is difficult to estimate how many persons get in on this exchange of $80 million as it funnels its way from the sportsman into other channels.

It is easy to see, however, the importance of wildlife resources to the people of the state—esthetically as an attraction to all citizens and the tourist trade; materially as millions of dollars are expended on its enjoyment and as the fish and game make their way to the sportsman's table, and finally, and most important, recreationwise as 25 per cent of the state's population find relaxation on a hunting or fishing trip. They forget their troubles as they enjoy their wildlife heritage—a recreation, a livelihood and an industry all rolled up into one.

Washington State Game Commission, March 1953. Left to right: Richard S. Seward; James A. Loudon; Edson Dow; Walt Failor, chairman; Claude C. Snider, and Dr. W. R. Bernard.

COMMISSION

An appraisal of the work of the Game Department in its first score years of existence would not be complete without mention of the men whose judgment, perspective and toil have guided its progress—the State Game Commission.

This 6-man body has been composed of businessmen, lawyers, doctors, dentists, farmers—persons who, though their professions and ideas varied greatly, had but one common purpose in mind—perpetuation, propagation and protection of Washington's wildlife resources.

With their views as different as the conflicting interests of the persons whom they represented—those west of the Cascades speaking on behalf of the industrial cities of Western Washington and those in the eastern portion seeing to it that the farmers on the agricultural side of the mountains were getting their voice heard—the Commission could have become a springboard for sectionalism. However those who served forgot their local interests and instead worked for the common good of the state as a whole. Where agricultural and industrial interests clashed, they ironed out their differences, compromised and took the path that was the best for Washington.

Governor Clarence D. Martin, upon whose shoulders fell the job of selecting Washington's first 6-man state board, told the first game commission as it convened for the first time on January 21, 1933: "You have accepted a position that has as much power and authority as almost any position here. The legislation and the entire enforcement of the game laws are in your hands, and it is going to require much unselfishness to the cause. In selecting a Game Commission, it wasn't easy for me. I think it has been the most difficult selection to make because of the interest in this particular thing—so many unselfishly offering their service to this cause. But I tried to select a Commission that would be geographically placed and understood the interests of Initiative Measure 62, and believed in the cause of Measure 62."

Since then 24 men have served on the Game Commission and all have kept the aims of this initiative in mind. The results of their labors are shown throughout this book.

The Game Commission as set down in Initiative 62 is appointed by the Governor. Two members are named every two years for terms of six years. Three are chosen from the west side of the state and three from the east side with the Cascades as the dividing line. On the original commission in 1933, two members were named for 2 years, two for 4 years and two for 6 years to put the appointments on a staggered basis.

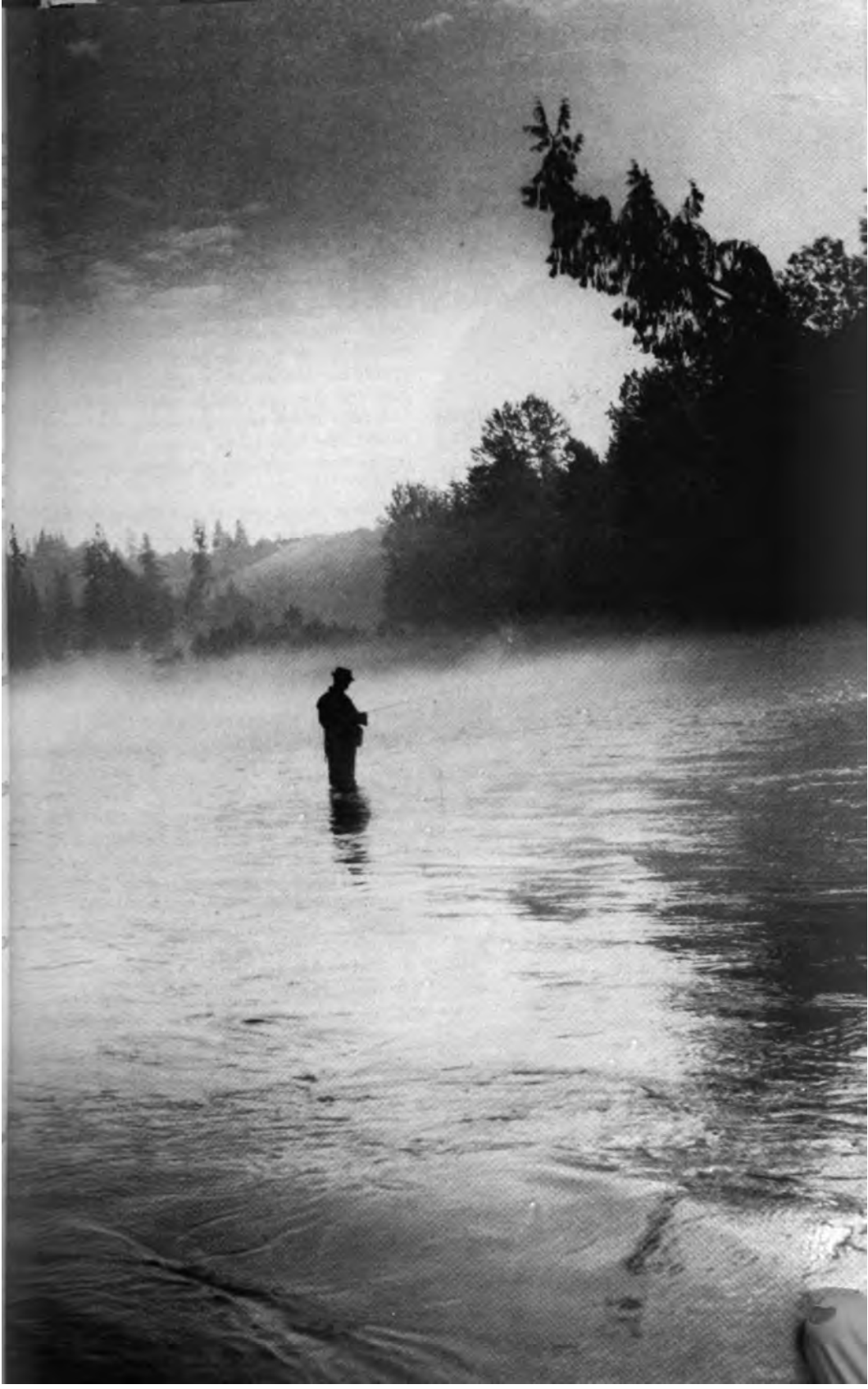
Upon the Commission's shoulders falls the responsibility of setting seasons, passing regulations governing the type of gear and ammunition that can be used and all points connected with the management of the state's wildlife resources. The Commission acts upon the recommendation of Department's field personnel and the suggestions of the residents of the state. The man in the street is allowed his say on the game program through open hearings held at various intervals. The Commission must also appoint the Director of Game, the head administrative officer of the Department.

The Commissioners' only reimbursement for many hours of work and the complaints and abuse heaped upon them by dissatisfied groups and individuals is their expenses incurred while in attendance at their regular meetings.

The chart below gives the names, time of service and occupations of the 24 men who served on the Commission in its first 20 years.

STATE GAME COMMISSIONERS

Name	*Term*	*Occupation*
Arthur C. Basel Greenbank.....	1943-1946	Retired businessman
Virgil B. Bennington, Walla Walla..	1933-1953	Businessman
L. Glenn Davis, Seattle.....	1933-1937	Banker
Samuel Gjerde, Oroville.....	1945-1951	Gunsmith
E. D. Hand, Longview.....	1945-1947	Druggist
Capt. H. D. Hinckley, Seattle.....	1933-1937	Retired Naval Officer
Thomas A. E. Lally, Spokane.....	1933-1945	Attorney
Harry LeGear, Port Angeles.....	1937-1940	Insuranceman
Stephen J. Morrissey, Seattle.....	1947-1953	Attorney
Marcus Nalley, Tacoma.....	1946-1949	Businessman
Dr. H. C. Nickelsen, Tacoma.....	1937-1941	Optometrist
Lou Ovenden, Manson.....	1937-1943	Orchardist
Ben M. Paris, Seattle.....	1933	Sporting Goods Dealer
Harold A. Pebbles, Olympia.....	1947-1951	Attorney
C. A. Peterson, North Bend.....	1941-1947	Farmer
C. A. Stapleton, Omak.....	1933-1937	Orchardist
Dr. J. S. Thomas, Seattle.....	1940-1943	Doctor
Wm. A. Thompson, Vancouver.....	1933-1935	Businessman
Present Commission		
Walt Failor, Chairman; Aberdeen..	1949 to date	Sporting Goods Dealer
Dr. W. R. Bernard, Cheney.....	1951 to date	Dentist
Edson Dow, Wenatchee.....	1953 to date	Attorney
James A. Loudon, Yakima.....	1943 to date	Businessman
Richard S. Seward, Seattle.....	1953 to date	Businessman
Claude C. Snider, Vancouver.....	1935-1945; 1951 to date	Attorney



FISHERY MANAGEMENT

Fisheries management in the state of Washington during the past two decades has been the result of a series of evolutionary steps—some of them never before attempted in the nation. Lake rehabilitation, the rearing of steelhead and many of the other parts of today's program were virtually unheard of in the United States in 1933.

At that time it was becoming apparent to game administrators that the basic fundamentals of merely producing trout in the hatcheries for planting to fulfill the immediate wants of fishermen and the enforcement of laws regulating the take of fish were not enough. Something new had to be done to meet the demands of increasing hordes of fishermen.

Since some of these changes had never been tried, intrepid daring was needed to get them underway. Game administrators were taking a calculated risk in putting them into operation and would feel the wrath of the public if these innovations failed. Only time would determine whether their bold ventures were purposeful or foolhardy.

Now that the testing period has passed, Washington has taken its place as one of the leading states in the nation in the development of its fisheries management program. This success could not have been effected without the courageous and farsighted moves of game administrators.

Early Efforts

The fisherman of the '30's was basically a stream angler, not primarily by choice but rather by necessity as the lowland lakes were not producing the species of fish that he sought. During the summer months, hardy fishermen moved into the higher altitude lakes making rather spectacular catches but because of their remoteness and the short time they were fishable, these waters could satisfy the wants of only a limited few. The readily accessible lowland lakes were over populated with a variety of spiny-rayed fish. Sportsmen of this period, just like those of today, preferred to fish for trout so these waters were not absorbing their fair share of fishing pressure.

Fishing intensity on the streams was so great that it was impossible for them to provide adequate fishing for everyone. At this time, artificial propagation was the only tool that could be offered to supplement nature's load. Lakes and streams received heavy plants of hatchery trout but, due to the physical characteristics of these waters, this program proved unsound. Introduced or planted trout in the lowland lakes were unable to compete with resident spiny rays found in these waters. Stream plants were relatively unsuccessful due to the stream's limited carrying capacity. Coastal rivers presented especially serious problems since they were low in food content and were already supporting a maximum population of migratory fish. Planted fish not taken by fishermen during the summer months were literally wasted. The introduction of these planted trout placed them in direct competition for survi-

val with migratory species, creating not only a loss of hatchery fish but also of those native to the stream. It was physically impossible to produce fishing on resident trout without seriously affecting the supply of migratory fish.

Marking experiments showed that young 2-year old steelhead, averaging 7½ inches in length, made up the largest take of small trout in the early spring. If these fish were allowed to find their way into salt water, they would return in two years as eight pounders. Steelhead and cutthroat fishing was rapidly gaining in popularity with the residents of Western Washington and had to be recognized in the over-all fisheries program. To obtain the maximum benefit from Washington's waters, it was necessary to devise some program that would alleviate the pressure on the streams and transfer the sportsmen to the large number of relatively unused lowland lakes. The first step taken to promote their management was the splitting of the lowland lake and stream seasons with the latter opening a month later to allow a large percentage of these fish to escape to the seas. Since trout fishermen outnumbered those interested in adult steelhead, there was considerable public resistance to this separation. To ease the situation, lowland lakes offered the principal solution.

Lake Rehabilitation

Lowland lakes had an apparent advantage over streams—their high nutritive content made hatchery plantings more successful. Statistics proved that hatchery fish planted in lakes had improved growth over like numbers of fish planted in streams. In the face of these figures, emphasis was shifted to the planting of lakes.

As a check on the progress of these releases, catch records were initiated through the cooperation of resort owners and the enforcement division. These reports brought to light the fluctuating returns of the hatchery planted fish. One year, the percentage of planted fish caught by the fisherman might be as high as 80 per cent. The next year, the same water with a plant of equal size would be a disappointment. Success was dependent, it seemed, upon the buffering effect of other fish in the lake. Naturally, the fish in the water the longest were better acclimated to local conditions and had a better chance for survival. Each succeeding plant would find the going a little tougher unless something could be done to eliminate the competition from spiny-rayed fish that was preventing successful production.

Over 80 percent of Washington's accessible lake acreages contained populations of coarse and undesirable species. This figure included only the manageable waters and did not take in the large reservoirs or lakes with uncontrollable inlets or outlets. Much of this water was completely out of production while some would produce although the cost of stocking the necessary amount of large fingerlings was excessive. The majority, however, fell in between and would only provide from poor to fair fishing at best. All produced trout only within the limitations imposed by the other species of fish found in them.

This problem gave birth to the lake rehabilitation program. The basis of the program is the elimination of scrap fish through the use of rotenone, a toxicant found in the roots of the derris plant grown in Java and certain South American nations, and the subsequent replanting of the water with the most desirable species. Desirability is based upon the species' power to produce fishing under the conditions faced in the lake and secondly, upon its popularity with fishermen.

Operation Rotenone

The success of any lake rehabilitation program is primarily dependent upon the thoroughness with which a lake is prepared for treatment and on the actual distribution of rotenone to assure complete coverage of all waters containing the undesirable species of fish.

Prior to the rehabilitation of any body of water, it is necessary to make a complete survey to determine the volume of water in the lake. The amount of toxicant required depends upon the type of fish found in the lake. A concentration of one part of five per cent rotenone dust or a comparable product to a million parts of water is generally needed for treating a lake containing carp or catfish. If these two species of fish are not present, the concentration may be reduced to one-half parts per million.

The most desirable time of year for rehabilitation is dependent on the type of lake under consideration. It is generally advisable to rehabilitate a lake when it is at its lowest level, provided that aquatic vegetation is not too abundant. Heavy aquatic plant growth makes the treating of a lake very difficult and reduces the possibilities of a complete kill of fish. In some cases, it is possible to draw a lake down below the majority of the marginal vegetation. It has been found practical to eliminate rank growths of submerged aquatic vegetation for a few weeks before the rehabilitation of a lake. A lake is seldom treated when it has a heavy algae bloom.

Most rehabilitation has been done during the late summer as lakes are at their lowest levels at that time and water temperatures are still relatively high; however, some rehabilitation has been conducted successfully during the early spring and late fall when temperatures are extremely low. While the fish do not react as rapidly, the same effect is obtained since the water remains toxic for a longer time.

Following mixing and sacking, the predetermined amount of rotenone is stockpiled on the shore in each section of the lake. Since the success of the rehabilitation depends on the proper distribution of the toxicant, an experienced member of the fishery management division is assigned to each section. One other person helps out in each boat used in the operation. Any safe row boat with a 5-horsepower outboard motor is ideal for distributing the rotenone.

The person responsible for each section of the water is supplied with a contour map of the section to assist in the proper distribution of the rotenone. Burlap bags of the toxicant are tied to the stern of the boat and towed directly behind the motor which is usually tipped slightly so that the bag of rotenone will be directly in the wash of the propeller.

All sections of the lake are treated simultaneously. Each section is crossed at 30-foot intervals in a checker-board fashion at least twice and often three times. The toxicant is distributed in proportion to water depths, and all of it is applied to the surface of the lake. Lakes that were as much as 160 feet deep have been treated in this fashion. After the rotenone has had time to settle, the lakes are toxic at all levels.

Dense weed areas are sprayed with a mixture of rotenone and water. A gear-type pump powered with a 10-horsepower motor and equipped with a proportioning valve is used in this operation, since it is of a convenient size to be placed in a small row boat. The main water intake for the pump is placed in the lake while the secondary intake for the proportioning valve is placed in a tank containing a liquefied concentrate of rotenone and water. The pump discharges a stream of water for approximately 100 feet. All weed and spring areas are treated with this sprayer. Swampy areas that are too

far from the main lake to be sprayed with this type of a unit are covered with a back-pack type sprayer. Planes have been used to some extent in spreading swamp areas with rotenone dust.

Inlet streams containing undesirable species are treated with rotenone to assure a complete kill and prevent the recontamination of the lake. Dry rotenone dust placed in a coarse mesh burlap bag and hung in a riffle leaches slowly out of the bag into the stream. Approximately six pounds of five per cent rotenone or a comparable product is put in the stream every 24 hours for every cubic foot per second of water until all the fish are killed.

Outlet streams are also checked closely to see if there are swampy areas adjacent to the stream that contain undesirable fish. Fish in the channel are killed some distance downstream by the flow of the toxic water from the lake. If there is any possibility of recontamination of the lake by fish from the outlet stream, a barrier is constructed below the lake to prevent this upstream migration of fish.

There is some variation in the effect of the rotenone on the fish in a lake, depending on the temperatures and depth of the water and the species of fish. Generally, all fish die within five days following rehabilitation. The period of time that it takes the effects of the rotenone to wear off varies from a few days to a few months. Biological tests are made of water samples taken from all levels of the lake to see if it is ready for restocking. As soon as possible, the lake is restocked with game fish selected for that particular body of water.

Progress of the Program

King's Lake, Pend Oreille county, was selected as the first water to get the rotenone treatment in 1940. Once the scrap fish were destroyed and the effects of the chemical had dissipated, the lake was restocked with cutthroat trout. This first operation was a success, but the Department was forced to wait until the end of World War II before it could embark on an extensive program of lake rehabilitation.

Work resumed in 1945 when five lakes were cleared and replanted. Since that time, 163 more waters in all parts of the state have been brought back to a high productive level. Washington now points with pride to 14,477 acres of some of the best trout waters in the state.

The program has allowed Washington to step up its hatchery production. With the competition of scrap fish eliminated, more and smaller trout could be planted with their chances for survival enhanced. These fish could be planted early, leaving hatchery space available for the rearing of larger fish which are more readily adaptable for release in waters not yet cleared of scrap species. Hatchery plantings could be expanded to include other waters previously neglected, since a smaller quantity of fish was needed for production in rehabilitated lakes.

Through rehabilitation, the Department can even control the rate of fish growth in a given lake. Lakes must be planted every year since it is virtually impossible for them to carry over a fishable population of trout from one year to the next. In the first place, they do not have spawning areas and secondly, fishing intensity makes it almost impossible for a fish to get by a year of age. Since lakes vary in their production from a few fish per survey acre to as many as 350 per acre, depending on the amount of food they have available, it is possible for the Department to allocate just enough fish each year to bring about maximum production in a given water.

As rehabilitation developed, interest in fishing showed a corresponding rise. True, this was partly due to the over-all increase in the state's population, but youngsters and women, previously stymied by rigorous fishing conditions, were added to the ranks of fishermen. This renewed interest in fishing and particularly in the lowland lakes resulted in intense use of the first 500 acres of rehabilitated waters, and the pressure was soon felt in diminishing returns. The cry was immediately heard that rehabilitated waters could only provide fishing for the first few weeks of the season, and little credit was given to the increased poundage of fish being produced. Critics were quieted as more waters were brought into full-time production. As techniques improved, larger bodies of water were treated and replanted.

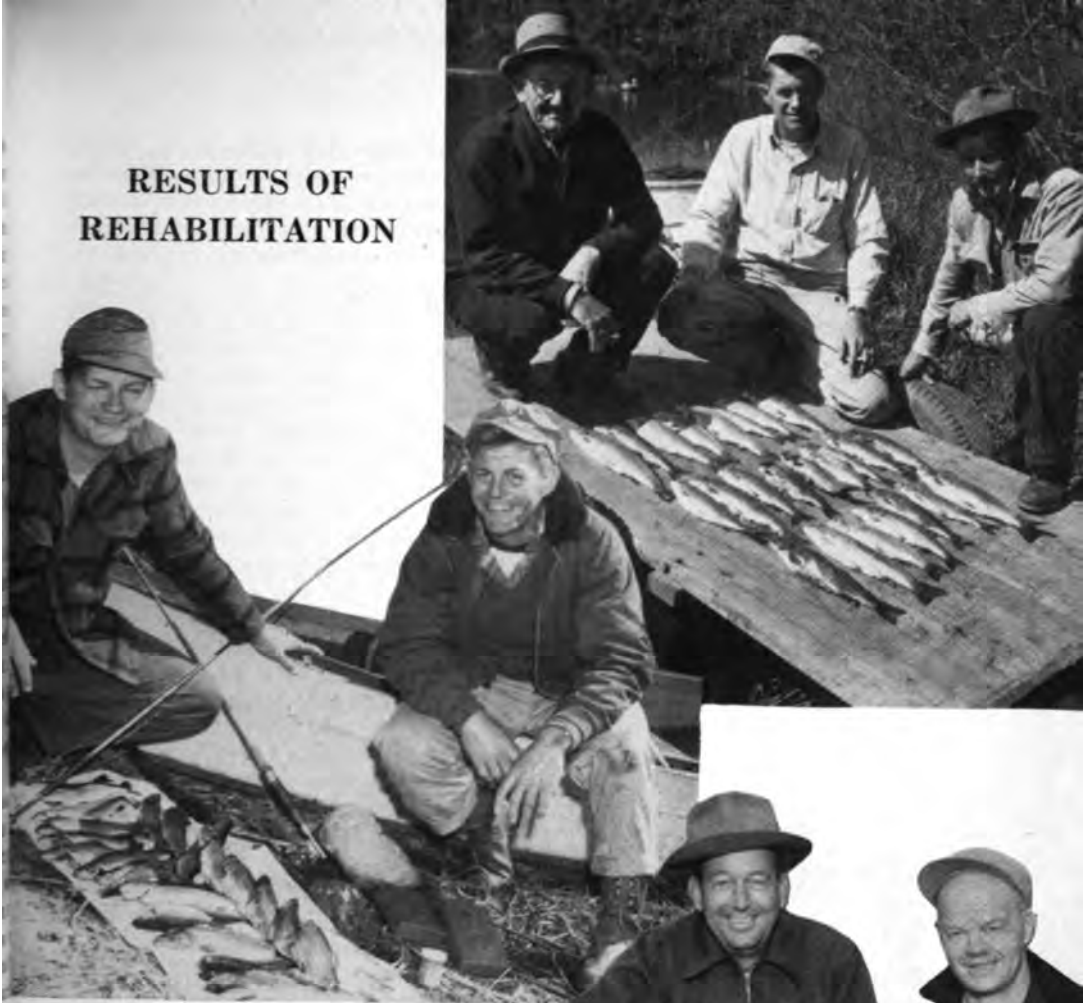
In managing the rehabilitated lakes, the Department planned to allow fishing for six weeks in the spring in order to eliminate the competition of the larger fish before planting the waters in May with small fish averaging two inches in size. Fish grew rapidly in rehabilitated waters and sometimes reached legal size as early as July or August. These fish planted for next year's crop were being taken by fishermen in the late summer months thus creating a double-cropping problem; that is, two crops of fish were taken during the fishing year—the supply of the preceding year and the spring plant.

The obvious answer would be the closing of the lake once the season's crop has been taken by the sportsmen to avoid the harvest of the fish planted for next year's production. However, the problem is finding its own solution in an expanded rehabilitation program making more bodies of water available to the fishing public and eliminating the heavy concentration on a few selective lakes. This already has been borne out in Stevens and Okanogan counties and should hold true in the rest of the state. So that the efforts of rehabilitation will not be wasted, screening devices and barriers have been constructed to keep scrap fish from reentering rehabilitated waters and to keep trout from escaping. Even with all of the precautionary measures taken, 15 per cent of Washington's rehabilitated lakes have been recontaminated with scrap species by fishermen who have deliberately or unwittingly brought them back from nearby waters.

Spawn Taking Stations

One value of the lake rehabilitation program which is sometimes overlooked is the creation of broodstock lakes, providing the Game Department with sources of cutthroat trout eggs which are the basis of artificial propagation of this species. It has been impossible to develop strains of cutthroat trout that can be held at fish hatcheries in the same manner as rainbow eggs therefore it was necessary to find another means for obtaining cutthroat broodstock. King's Lake, the first rehabilitated water, was planted with cutthroat soon after its treatment and has since produced a million or more cutthroat annually. This station was the turning point in the dire future forecast for cutthroat species in northeastern Washington. Instead of becoming extinct as predicted, cutthroat plantings have increased throughout the area. Blue Lake,

RESULTS OF REHABILITATION



The development of fishing on readily accessible lakes has created many hours of relaxation for increasing numbers of Washington's sportsmen.

Catches like these are the rule on most of Washington's waters.

Okanogan county, has become an even more productive cutthroat egg taking station, turning out more than two million cutthroat eggs each year since its rehabilitation in 1949. In the future, the program will be expanded to include Western Washington. A small lake in Mason county has already been purchased and will be used for this purpose after its rehabilitation.

Evaluation of Rehabilitation

In spite of the success of the lake rehabilitation program in rejuvenating Washington's waters, there are still those who oppose it. Owners of property along rehabilitated waters resent the invasion to their privacy which is a direct result of the increased numbers of fishermen. Fishermen interested in warm water species also have complained that too many lakes are being used solely for the benefit of trout. However, it is the Game Department's first obligation to produce the maximum amount of fish in the waters of the state and promote those programs that provide the greatest benefit to the largest number of people. Those who oppose lake rehabilitation are definitely in the minority, and every effort has been made to create a fisheries management program that takes into consideration the specific interests of all concerned. Fishermen in Washington prefer trout to spiny rays at a ratio of 17 to 1. The inherent characteristics of Washington's 600,000 acres of lowland lakes will permit only a small percentage of them to be rehabilitated and if the Department is to provide the fishing demanded by the public today, it must bring as many of these waters as possible into trout production.

A close survey of Washington's waters has shown that the majority of them are basically adapted for trout production; however, when statistics have indicated that a water is capable of supporting warm water species of fish, it has been rehabilitated for this specific purpose. Lake Kahlotus, Franklin county, is one of the major waters rehabilitated and turned over to bass and crappie. In 1951, Lake Killarney, a small lake in King county, was treated and also restocked with different varieties of bass. In addition, three small lakes created by the Equalizing Reservoir in the Columbia Basin area, have been cleared of scrap fish and stocked with bass and sunfish. The principal drawback in building up bass fishing is their slow rate of growth. Checks will continue to be made on those lakes set aside exclusively for bass to determine their growth ratio in comparison with that of other kinds of fish.

The value of the rehabilitation program is readily seen by a quick glance at the record. Here are but a few of the results. Before rehabilitation, Liberty Lake produced an average of 5,000 game fish a year. After being cleared of scrap fish, returns showed an annual catch of over 300,000 fish. Bay Lake, Pierce county, 117 acres, has been in production since 1950 and has put out at least 30,000 pounds of fish each year during that span. This compares to a meager thousand pounds of small perch in the years before rehabilitation.

It is the same story on practically all of the 169 waters which have felt the effects of the march of science. Scientific progress does not stand still so more lakes will get the shot of adrenalin they need to take their place in providing hours of recreation and relaxation for Washington residents and tourists.

LAKES REHABILITATED AS OF MARCH 31, 1953

YEAR	NUMBER			ACRES		
	New	Re-Treated	Total	New	Re-Treated	Total
1940	1	.....	1	45	.....	45
1945	5	.....	5	122.4	.....	122.4
1946	24	.....	24	719.6	.....	719.6
1947	27	.....	27	1,156.3	.....	1,156.3
1948	13	.....	13	1,049.7	.....	1,049.7
1949	22	5	27	2,032.2	151.1	2,183.3
1950	26	5	31	2,829.5	159.7	2,989.2
1951	23	3	26	3,123	224.2	3,347.2
1952	28	6	34	3,408.35	455.14	3,863.49
TOTAL	169	19	188	14,477.05	990.14	15,467.19

The Promise of High Lakes

With increasing populations, the only waters of the state which hold true to the story book concept of fishing are the out-of-the-way high mountain lakes, a challenge to hardier fishermen. These are the only spots left where a man can fish with comparative ease, free of the cares of civilization.

If more fishermen would find their way to these places, the Department's fisheries program would get a boost through the dispersement of fishing intensity now concentrated so heavily on the lowland lakes. Although not utilized to their fullest extent by fishermen, these highland waters have not been forgotten by the Game Department. In the last three years especially, the Department has expanded plantings in these areas through the use of the airplane.

Although the plane has made it possible to increase the number of high lakes planted, it was with somewhat of a nostalgic twinge that the Department retired its mule pack train in 1948. The mule train is part of the romantic, though somewhat difficult, past of the Department which has been forced to give way to scientific progress.

High mountain lakes are still somewhat of a mystery. Their exact total is not known, but it is believed that they outnumber the lowland lakes and that their potential has barely been scratched. Coupled with the lowland waters which are yet to be reclaimed by rehabilitation, they give Washington a bright hope for the future.

Public Fishing Areas

The efforts of the fishery management division would be virtually wasted if the fishermen of the state did not have the right of way to the state's waters. Before the inauguration of the Department's public access area program in 1947, there was fear that the "Open West" was doomed to fall under an avalanche of "No Trespassing" signs which were appearing all over the state.

Fishermen were faced with the prospect of either paying their way to their favorite fishing spot or not fishing at all. Sportsmen and the Game Department saw the danger signs ahead—what good were all of the advancements in fisheries management, if the persons for whom they were intended could not reap the benefits?

With the aid of sportsmen, county commissioners and the state land office, the Department took the only course open—the public fishing area program. The program consists of the acquisition and development of public

High lakes are becoming favorite spots for Washington's anglers. The airplane has replaced the picturesque mule team in supplying fish for these waters.

access areas to make certain that the fish produced and planted in Washington's waters will be harvested by the people of the state to whom they belong.

When the program was started in 1947, the Department had only 17 such areas under its control. Today there are 138. Of these, 125 are on lakes and the remainder on streams. During the 1951 to 1953 biennium, access was obtained on 45 lakes and 3 streams and 42 of these were developed.

Approximately 70 per cent of the areas have been obtained through donations of resort owners, public spirited individuals and through platting regulations put into effect by County Planning Commissions or Boards of County Commissioners. The latter provide that any person subdividing waterfront property make a portion of it available to the public under control of the Game Department to assure the continued public access to the waters involved.

DEVELOPED PUBLIC FISHING AREAS

(Areas Developed Prior to April 1, 1953)

Lakes:

No.	*County*	*Name of Lake*	*Fiscal Year Developed*
1	Adams	Cow*	1952
2	Adams	Sprague*	1952
3	Chelan	Black*	1952
4	Clark	Lackamas	1950
5	Cowlitz	Horseshoe*	1950
6	Ferry	Curlew	1949
7	Franklin	Kahlotus	1951
8	Island	Deer	1950
9	Island	Goss	1950
10	Island	Lone	1950
11	King	Alice	1948
12	King	Ames	1951
13	King	Beaver	1952
14	King	Boren	1948
15	King	Dolloff	1948
16	King	Geneva	1948
17	King	Killarney	1948
18	King	Lake 12	1951
19	King	Meridian	1951
20	King	North	1952
21	King	Sawyer	1951
22	King	Shady	1948
23	King	Spring (Otter)	1950
24	King	Walker	1951
25	King	Wilderness	1952
26	Kitsap	Buck*	1952
27	Kitsap	Horseshoe	1950
28	Kitsap	Kitsap	1952
29	Kitsap	Mission	1950
30	Kitsap	Tiger	1950
31	Kitsap	Wildcat	1948
32	Lewis	Carlisle (Onalaska)	1950
33	Mason	Cady*	1951
34	Mason	Devereaux	1948
35	Mason	Haven	1949
36	Mason	Island	1951
37	Mason	Lost	1951
38	Mason	Mason	1951

DEVELOPED PUBLIC FISHING AREAS—Continued

(Areas Developed Prior to April 1, 1953)

Lakes:

No.	*County*	*Name of Lake*	*Fiscal Year Developed*
39	Mason	Nahwatzel	1950
40	Mason	Panther	1949
41	Mason	Phillips	1951
42	Mason	Spencer	1947
43	Mason	Tee	1949
44	Mason	Twin	1951
45	Mason	Wooten	1947
46	Okanogan	Davis	1951
47	Okanogan	Fish	1950
48	Okanogan	Pearrygin	1951
49	Okanogan	Spectacle	1950
50	Okanogan	Twin, Big	1951
51	Okanogan	Twin, Little	1951
52	Pacific	Island	1952
53	Pacific	Loomis	1952
54	Pend Oreille	Davis	1950
55	Pierce	Bay	1948
56	Pierce	Bonney	1948
57	Pierce	Clear	1951
58	Pierce	Crescent	1949
59	Pierce	Tanwax	1949
60	Skagit	Big	1952
61	Skagit	Clear	1949
62	Skagit	Hart	1950
63	Skagit	Lake 16	1950
64	Skagit	Vogler	1950
65	Snohomish	Bosworth	1949
66	Snohomish	Chain	1948
67	Snohomish	Crabapple	1952
68	Snohomish	Echo	1952
69	Snohomish	Flowing	1948
70	Snohomish	Loma	1951
71	Snohomish	Martha (Warm Beach)	1950
72	Snohomish	Martha	1952
73	Snohomish	Riley	1950
74	Snohomish	Roesiger	1951
75	Snohomish	Serene*	1951
76	Snohomish	Storm	1948
77	Spokane	Liberty	1952
78	Stevens	Cedar	1952
79	Stevens	Deep	1950
80	Thurston	Hicks	1952
81	Thurston	Lawrence	1950
82	Thurston	Long	1952
83	Thurston	Offut	1952
84	Thurston	Summit	1948
85	Thurston	Ward	1950
86	Whatcom	Cain	1949
87	Whatcom	Silver	1952
88	Whatcom	Terrell	1949
89	Whatcom	Toad	1949
90	Yakima	Bumping*	1952
91	Yakima	Wenas	1950
Streams:			
1	Cowlitz	Toutle	1951
2	Klickitat	Klickitat-Area 1	1949
3	Klickitat	Klickitat-Area 2	1949
4	Spokane	Deadman's Creek (Juvenile Area)	1950

* Indicates area usable—development incomplete

The Department's 138 public access areas are used by thousands of sportsmen during the fishing seasons.

Development of Public Fishing Areas

Development work on public fishing areas is, and of necessity must be, closely coordinated with fisheries management since it assures the harvest of the crop that is produced by the over-all fisheries management program. It consists of construction of an access road to the water's edge, a boat launching area, and parking and sanitary facilities. Commercial concessions are not granted on these areas nor are they developed as camp or picnic grounds since the Department is not in competition with resort owners nor is it in the business of supplying park facilities. It is instead utilizing the license holder's money to make the fish in Washington's waters available for harvest.

Other activities on land management for fish during the biennium included the processing of approximately 30 easements or agreements to permit flooding of lands where necessary for impoundments, the installation of screens to prevent passage of undesirable fish along streams into rehabilitated lakes and to retain fish in stocked lakes and the acquisition of land on which to build water control structures.

TWENTY YEARS OF HATCHERY OPERATIONS

In 1933, sixteen hatcheries, seven eyeing stations used only for trout egg incubation and several rearing ponds were turned over to the newly organized State Game Commission for operation. Today only ten of these original properties are still operated and all except two have been rebuilt and modernized. Some of the structures were rebuilt because of deterioration from age but, more significantly, reconstruction and replacement manifest changes required to keep pace with a progressive fisheries program. The need for fingerling rearing ponds was recognized early and led to the construction of hacheries with extensive rearing facilities. Eighteen of the twenty-four hatcheries now operated have fingerling rearing ponds.

A comparison of the number of trout planted 20 years ago with today's production would be misleading. The records indicate that fish were planted in greater numbers in 1933 than in 1953 but fortunately the degree of survival has been so improved that the number of game fish creeled annually has increased immeasurably. In 1933, less than one-half of one per cent of the total number of fish raised were of legal size; whereas, nearly one-third of the trout now liberated are six inches or over in length.

The first year's operation of the hatchery division cost the Game Department $70,774.06. Today's hatchery expenditures are almost 10 times greater yet the cost per pound of fish raised has been greatly reduced ($1.38 a pound in 1947*; $.80 a pound in 1953), and the total production in weight of fish liberated is 30 times greater (303,950 pounds in 1947*; 750,000 pounds in 1953).

*No records on poundage prior to 1947.

The new and the old in Washington fish hatcheries. The Walla Walla hatchery (above) was typical of the installations turned over to the State Game Department in 1933. Today, hatcheries complete with modern equipment look more like the 1953 version of the Puyallup hatchery (below).

Diet and Disease

Early attempts to rear large fingerling trout soon demonstrated the need for more complete information on trout nutrition and control of fish diseases. The University of Washington's School of Fisheries was contacted and studies on these problems were promptly established. Information obtained from numerous diet experiments carried on in 1933 and 1934 by Dr. Lauren R. Donaldson at the University is still applied in setting up modern diets in the hatcheries.

Among other things, early diet studies proved that beef liver alone was inadequate for raising fingerling trout. Experimental use of spawned-out salmon carcasses, salmon viscera and other commercial fisheries waste products soon proved the superiority of diets containing these elements. They also helped to improve the growth rate of fingerlings which became an important consideration in the expanded rearing program. The value of fish meals as a growth stimulus received careful attention and for a time made up a major portion of trout diets. Careful observation of the results produced by various diets eventually established the need for balanced feeding. Today a wide variety of products make up the hatchery diet.

In discussing hatchery feed, it is interesting to note that the search for a good diet has resulted in not only an improved feed but also one with a lower unit cost. The cost of a pound of feed in 1934 was 10.5 cents; in 1952, the average cost was 7 cents, and this in spite of a substantial change in dollar value.

The control of fish diseases, other than nutritional, proved to be a more difficult problem. Treatments prescribed often destroyed as many fish as the disease itself. Certain pernicious epidemics were uncontrollable and, occasionally, the entire lots of fish either succumbed or were destroyed. The same diseases and many others are troublesome today but research has provided sulfa drugs, antibiotics and other germicides which give effective control.

Today, the University of Washington, wtih its excellent laboratory facilities, is the center of fish disease work for several governmental agencies in the artificial propagation of fish. The Game Department, through funds supplied by the federal government under the Dingell-Johnson fisheries aid bill, has set up a project to study further the bacterial diseases of trout.

GAME FISH LIBERATED

SPECIES	April 1, 1951 to March 31, 1952		April 1, 1952 to March 31, 1953		TOTAL	
	Number	Pounds	Number	Pounds	Number	Pounds
Cutthroat	2,168,353	30,893	3,017,354	20,604	5,185,707	51,497
Eastern Brook	3,079,905	9,042	2,335,488	3,453	5,415,393	12,495
Rainbow	12,817,326	661,806	16,018,104	652,751	28,835,430	1,314,557
Silvers	22,608,860	5,767	15,678,195	3,920	38,287,061	9,687
Steelhead	605,463	63,023	1,148,052	89,397	1,753,515	153,020
Miscellaneous Trout	3,871	395	603,937	22,885	607,808	23,280
Total	41,283,984	770,926	38,801,130	793,610	80,085,114	1,564,536

STATE TROUT HATCHERIES
Fish Feed Data

Year	Poundage Feed	Cost of Feed	Cost per Pound
1933	100,000	$9,330.00	$.093
1934	119,467	10,700.00	.105
1935	206,172	14,200.00	.07
1936	417,741	20,000.00	.05
1937	297,299	13,800.00	.045
1938	422,083	15,600.00	.038
1939	328,000	12,200.00	.04
1940	525,505	19,815.00	.038
1941	585,427	22,723.00	.039
1942	811,882	39,014.41	.048
1943	952,487	59,704.96	.063
1944	1,139,201	64,141.82	.0563
1945	1,398,986	67,220.22	.0483
1946	1,594,483	128,948.74	.08
1947	2,298,877	129,372.63	.056
1948	2,623,203	157,526.05	.06
1949	2,627,087	157,840.26	.06
1950	3,414,448	195,330.14	.057
1951	3,135,621	202,027.13	.064
1952	3,092,352	217,314.48	.07

Egg Production

During the early years of operation, trout eggs for the hatcheries were obtained almost entirely from wild fish. The resulting fry and fingerling were difficult to rear, and growth rates were slow. Fingerling reared from eggs purchased from commercial trout breeders exhibited the ability to grow as much as twice as fast as wild fish. In addition, the domesticated trout were much more resistant to disease and generally could be handled much more easily from a fish cultural standpoint. Consequently, rainbow and cutthroat broodstock were established at several hatcheries to provide a reliable source of the highest quality eggs. For many years, rainbow eggs were also purchased from commercial dealers to supplement the Department's own supply. A careful cost analysis, however, pointed out the economy of producing eggs at Department hatcheries and so today sufficient rainbow broodstock are maintained to supply all egg requirements.

Development of rainbow broodstock was no problem, but results with cutthroat were not nearly so successful. Commercial breeders had not developed improved strains of this species and broodstock developed from wild fish retained original characteristics of slow growth, poor egg fertility and low resistance to disease even through several generations of selective breeding. Fortunately, however, broodstock lakes were successfully established for cutthroat. Twin Lakes in Chelan county served as a source of cutthroat eggs for many years under county control. In 1940, Kings Lake in Pend Oreille county was rehabilitated and set aside for cutthroat egg production as was Blue Lake in the Sinlahekin Game Range in 1949. Cutthroat broodstock are still held at one hatchery and at the University of Washington where efforts to develop an improved strain of this species will continue.

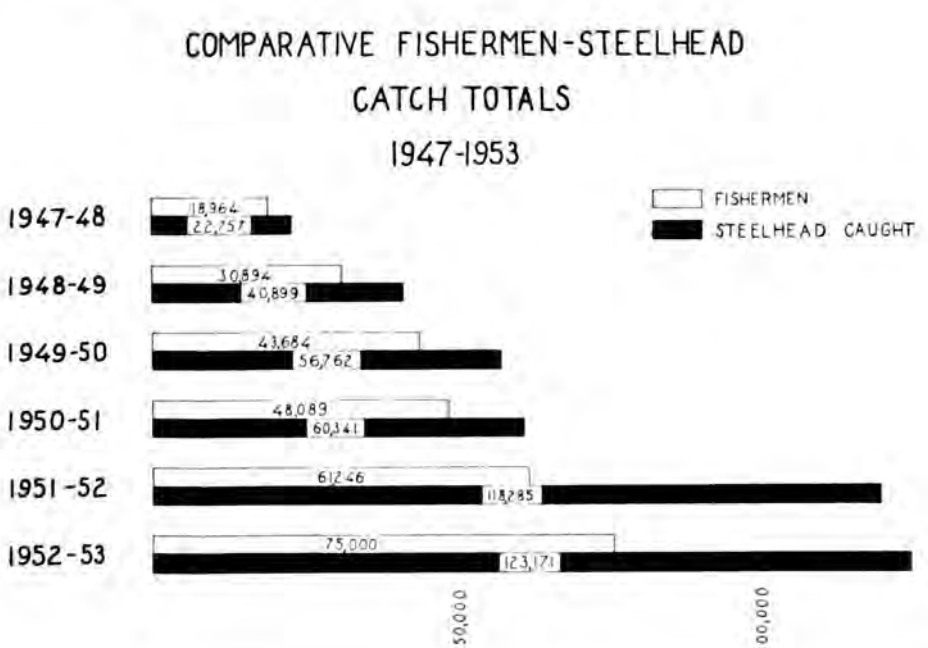
Two successful steelheaders with the results of their day's fishing on the Green River.

Steelhead Progress

Steelhead have been a major success story in hatchery operations. Until recent years, the steelhead program was in a sense an orphan. Adult steelhead were readily trapped at racks or weirs operated by the State Fisheries Department. Steelhead eggs were obtained in large numbers and the resulting fry conveniently returned to parent streams. Records show that several million steelhead were planted each year but sports fishing showed no correlation with hatchery releases.

The construction of the Puyallup Hatchery in 1948 made possible the conversion of the South Tacoma Hatchery to a steelhead rearing station without interfering with the established trout fishing program in the area. South Tacoma with warm spring water offered the best opportunity to rear young steelhead to seaward migrant size. Returns from the release of marked steelhead fingerling definitely established that satisfactory returns of adult steelhead were received only from the release of young fish of migrant size—six to eight inches in length.

The success of this program is demonstrated by the remarkable increase in the number of winter steelhead creeled. In the 1947-48 season, an estimated 22,757 steelhead were caught. The estimated catch for the 1951-52 season was 118,285 fish. Increase in the steelhead egg take from Chambers Creek near the South Tacoma hatchery from 65,000 in 1946 to 2,000,000 in 1952 perhaps even more clearly demonstrates the success of planting large migrant steelhead. It is interesting to note further that in 10 years the total weight of steelhead planted from hatcheries jumped from 6,300 pounds to 63,000 pounds annually.



Summary

Constant improvement in fish cultural activities of the hatcheries has been a singularly important factor in the progress outlined. Most important of all, however, has been the coordination of hatchery production with a well-rounded fisheries management program. Proper utilization of the hatchery product is as important as the quality of the product developed by the hatchery. Trained fisheries biologists are now supervising the hatchery program. They are writing the specifications for the product desired and following through to insure the proper and fullest use of all fish raised. The enthusiastic participation by hundreds of thousands of fishermen on the opening day of fishing season is ample testimony of the success of the coordinated fisheries program.

LAKE AND STREAM IMPROVEMENT

The term **lake and stream improvement** covers many phases of fish management. Probably in the purest sense, the term would embrace only work performed to improve natural environment or habitat. This would include the laddering or blasting of falls to provide additional spawning and rearing areas. It might take in the consolidation of split channels to provide a sufficient flow through a section of a river to enable fish to pass, or it might consist of the removal of natural barriers, such as log jams, or the opening of mouths of tributary streams so as to assure a satisfactory entrance for fish. For convenience, fisheries workers usually include **artificial aids to fish life** as part of the definition of Lake and Stream Improvement. Many of these aids actually are not improvements but are in reality corrections or compensations for conditions created by man. Under this category are included such things as fish screens, barriers to block the entrance of rough fish to certain waters, pollution abatement, fish passage facilities, etc. The list is long and covers many activities.

Prior to 1930, there was little done in the way of stream improvement. True, there were some fish ladders built, but they were crude in design and in many instances inadequate in capacities. This was due to a lack of knowledge of hydraulics as related to the behavior and biology of fish. A few mechanical fish screens had been installed, but their numbers were pitifully inadequate as compared with the number of unscreened diversions. Electric fish screens were installed in a few ditches but were abandoned after they gave disappointing results.

However, in the early '30's important advancements were being made in engineering and hydraulic fields pertaining to fishery problems, and stream improvement began to shape up as an important practical aspect of fisheries management. Major ditches in irrigated areas were equipped with revolving screens. These were practically self-cleaning and required a minimum of care and upkeep. The majority of these installations were placed in the Walla Walla area, the Yakima valley, the Kittitas valley, Chelan county, Okanogan county, and the Sequim-Dungeness area. The practicability of these screens is adequately demonstrated by the fact that after approximately twenty years of operation, many of the original installations continue to give satisfactory service. Test trapping periodically has illustrated the effectiveness of the screens. It is noteworthy that since the installation of the screens, migratory fish, particularly chinook (king) salmon and steelhead trout, have made substantial comebacks. At the present time, more than 200 mechanical

A typical fish screen constructed to prevent fish from being lost in an irrigation project.

fish screens are being operated throughout the state to keep fish from entering irrigation and power canals. New units are being installed yearly as funds permit.

In the middle and late '30's, fishery literature began to devote a great deal of space to the installation of artificial devices in streams and lakes to produce more suitable habitat for fish. This work consisted largely of building wing dams, check dams and other devices in stream beds. Brush shelters and various submerged installations were placed in lakes to provide shelter, feeding and spawning areas for warm water species. In Washington, this type of improvement was found impractical. The state's streams are not stable enough to permit the installation of structures of a permanent nature without running into excessive costs. However, a number of brush shelters were installed on several lakes on an experimental basis. Observations and periodic samplings failed to disclose any material benefits to either the fish or the fisherman. By the end of the '30's, the state began to push harder on a program to remove obsolete dams and other barriers to migratory fish. This work proceeded as fast as funds and legalities would permit.

Pollution and Stream Diversion

The problems involved in pollution control resolve themselves into two basic categories. They are (1) prevention of new industrial pollution and (2) the correction of pre-existing pollution problems. Particular advancements in this field have been made in the past few years since the establishment of the Pollution Control Commission.

Two things were accomplished during the war years that were of major importance in stream improvement work. In 1942, the Department of Game entered into a cooperative agreement with the Department of Fisheries and the U. S. Geological Survey for a comprehensive study of low flows of small streams. The principal value of this study is to determine the potential and variable table of Washington's water supply. The program has continued since 1942 and the information compiled has been of the greatest possible value in making recommendations to the State Department of Conservation and Development relative to water right applications. Minimum flow requirements have been set up on critical streams thereby preserving sufficient water to maintain fish life during critical periods.

In 1943, the State Legislature passed a law which provided in effect that in the event any person, firm, corporation, or governmental agency desired to divert, change the channel, or disturb the bed of any stream or lake in any manner, they must first have the written approval of the Director of Game and the Director of Fisheries. This has enabled the Department to check over all water right applications and projects affecting Washington's lakes and streams and see to it that the welfare of the fisheries resources is duly considered. The Game Department and the Fisheries Department have met with proponents of such projects when a fisheries problem has arisen in order to explain the situation and mutually work out a program by which the necessary work could be accomplished.

Since the end of World War II, the state had a terrific growth both in population and industry. This has resulted in many fishery problems. Poor logging practices have created problems of erosion, flash floods, and reduced summer flows. The need for large blocks of power to meet industrial requirements has resulted in the construction of large dams and has presented problems in passing both mature and immature fish safely around the structures. To offset the damaging conditions mentioned above, fisheries agencies have intensified their activities in many fields. Hatchery production has been stepped up, stream clearance projects undertaken, and research has been centered on problems relating to the safe escapement of migratory fish going over or ascending dams.

Continued research coupled with more and improved artificial aids to fish life, the artificial rearing program, and the control of water diversions has enabled Washington to maintain and, in many areas, even increase our fisheries resource.

Black-tailed buck deer.

EVALUATION OF GAME MANAGEMENT

The Past — The Present — The Future

Since the State of Washington was given control of our wildlife resources back in 1932, many changes and advancements have taken place—changes that have created one of the nation's most highly respected wildlife management agencies; advancements that have allowed Washington to become a richly endowed game state.

The game management practices of twenty or more years ago were sound, logical approaches to the problems of that era. The early recognition of the importance of a properly managed wildlife resource given by the men who first instigated our game laws is largely responsible for the relatively abundant supply of game today.

In order to view objectively the progress made in wildlife management, it is necessary to understand that the programs of the Department are by necessity evolutionary—changing every season in order to adapt to the ever-advancing agricultural and industrial developments; changing every season in order to correlate themselves to and satisfactorily serve the increasing number of sportsmen. Because of the diversified needs created by the increasing population and the intensive agricultural and industrial practices, careful scientific management and knowledge gleaned through scientific and practical research have become the means today of producing and perpetuating our wildlife resource.

The Past

Before 1932, game management was largely a matter of trial and error. Emphasis was placed on hunting restrictions and artificial propagation to rebuild the supply of game. Many game reserves or closed areas were established since the general opinion at that time held that hunting pressure was the key factor in the reduction of game species. The older theories on game (specifically deer and elk) populations assumed that each species was in a state of delicate balance where losses just equaled reproduction and that a small additional loss or slightly increased harvest would send entire herds plummeting toward extinction. Such theories were the basis of all wildlife management. Although the management practices of yesterday would be completely ineffective today, it should be remembered that they were the best known methods then obtainable.

The first game laws were passed by the Territorial Legislature in 1853. They were concerned primarily with the restriction of market hunting and the commercialization of wildlife. From then until 1925, the restrictions on hunting were increased with such innovations as "closed seasons," reductions in bag limits and license requirements. There were also transplantings of native wildlife species and introductions of new varieties of game birds made during this period. Some of the native mountain quail were transplanted by personnel of the Hudson's Bay Company prior to 1850. Pheasants from China were imported and planted in Washington by Judge Denny in 1883, and the popular Hungarian partridge and California valley quail made their appearance in Washington soon after the turn of the century.

Shortly after the state accepted control of its wildlife resource, steps were taken to unearth valuable information (heretofore relatively ignored) concerning accurate population records, range carrying capacities, browse conditions, and reproduction factors. In 1935, an intensive scientific research program was inaugurated and has grown in Washington within the past eighteen years.

The Present

Before we consider the present or future programs, let us reflect a moment on the general subject of game management. What is the goal of any game program? Is it to have **more** game? Is it to **produce** more game? Or is it to **harvest** more game? This question must be answered if we are to guide our present and future management programs. Can we say that Washington has a successful program if we produce a large grouse population and then allow them to die without being harvested? Certainly it is obvious that all other renewable natural resources are managed for maximum harvest, and game is no exception. The success of a game management program is measured by the game in the hunter's bag and fish in the angler's creel.

Legislation and game regulations today are being pointed, directly or indirectly, toward the three cardinal points of modern game management: Productivity, carrying capacity, and harvest. Anyone will agree that a population cannot increase forever. There is a limit somewhere. We commonly hear people say that there **is** a carrying capacity, but that our game populations never **approach** that level. It is considered to be a theoretical, far-distant goal or objective. Yet, there are many reliable studies showing that game animals **have** reached that level in many areas (some as far back as 1940) and, in some cases, almost eliminated themselves by destroying their own food supply. Research throughout the past eighteen years has shown us the way to accomplish our objective in game management (to allow the

largest possible harvest by hunters) and still maintain stable big game herds that are in keeping with the available food supply. The fruits of this research can be shown by comparative game kill figures over the past two decades. In 1935 less than 5,000 deer were killed in the entire state of Washington, while deer kills for the past four years have averaged close to 60,000 annually. Elk kills have increased from 275 in 1935 to an average of better than 5,000 in recent years. Although hunting pressure has increased tremendously, the harvest of game has kept pace with the result that the success per individual hunter has held constant or actually increased.

The Future

The big question in the mind of the hunting public today, and necessarily a question that must be answered each and every year by the modern game agency, is: "How can we be sure that our wildlife resource will be here for future generations to enjoy as much as we have enjoyed it?"

There is every indication that the future will be a bright one—that Washington's game resources can support even heavier harvests and that even in view of limited range, game populations will continually produce hunting opportunities for Washington sportsmen. Naturally, as in all things, we must be content to wait and see what lies in store. Obviously, we cannot solve a problem that has as yet never presented itself. However, it is possible to plan, adapt, revise, and **advance** our programs with the changes and revisions the future will undoubtedly bring. It was previously said that Washington's game program was evolutionary. Perhaps thirty or forty years from now it will be revolutionary—a plan so new and completely different from what we presently know, and have known, that it will probably be a difficult thing for the public to accept. And yet, the basic quality within each of us—the sincere belief that our rich game heritage belongs to everyone in Washington, future residents as well as our generation—should at the same time make us realize that the game programs of the past and the present have all been preparing for the always approaching future.

Comparative Game Figures

In 1949, the game management division initiated a game survey based on a questionnaire sent to one per cent of the state's license holders. By comparing the results of this survey with the statistics compiled from punchcards, accurate information on game kills and sportsmen's participation is obtained. The figures below are based on questionnaire returns.

HUNTERS

	1949	*1950*	*1951*	*1952*
Hunted	277,754	247,280	270,300	287,100
Did not hunt	122,831	120,010	120,400	112,500
Hunted Upland Birds	149,047	122,760	142,437	160,400
Hunted Waterfowl	87,462	87,340	86,400	92,700
Hunted Game Animals	209,502	198,880	185,670	223,100
Hunted Deer	203,400	189,310	174,600	211,500
Hunted Elk	49,607	55,770	54,810	43,000

GAME KILL

	1949	1950	1951	1952
Pheasants	432,338	311,190	350,206	378,259
Hungarian Partridge	82,829	42,680	36,540	74,400
Chukar Partridge	44,861	7,480	16,740	63,100
Pigeons	94,468	90,640	84,780	127,800
Quail	320,581	136,400	144,450	176,300
Grouse	61,133	55,110	110,970	177,200
Sage Hen			2,430	3,900
Ducks	634,947	805,090	845,010	818,000
Geese	34,691	30,140	46,440	53,800
Deer	65,314	62,040	31,380	60,380
Elk	9,831	11,880	6,852	2,846
Bear	5,198	6,270	7,650	8,000
Rabbit		89,540	135,990	216,300

LAND MANAGEMENT AND GAME

No state really reaches the peak of perfection in wildlife management, nor does it climb above problems which frequently encompass game agencies. Step by step, the Game Commission must keep pace with changing conditions which challenge the future of game species.

Early concepts of game programs called for the division of the remaining supply of wildlife resources as equitably as possible among the population as a whole. This was accomplished solely through law enforcement and the control of non-human predators. These formative years gave the Department of Game experiences which have led to the present program and will direct the channels of future advancement.

It soon became evident that game was a crop produced by the lands and waters of Washington and that therefore game and land management were inseparable. The present day art of growing and harvesting Washington's wildlife species developed from the combined efforts of these two programs.

A game crop, like wheat or watermelon, depends on the soil and water resources of the land for its production. To properly manage and produce this crop, the game manager of today must gear his program to the changed and ever-changing economy and ecology of the state. Attempts to stimulate "what used to be" can only lead to failure. Old management policies which have proved effective must be retained and modernized and all available new tools employed. Game crops differ significantly from other crops since, by tradition and law, they are not the property of any one individual but the joint possession of all of the people.

The state must not only carry on specific management programs on lands obtained solely for game use but must assist and stimulate the individuals toward land-use practices which benefit both the land owner and game. These objectives are being achieved through agreements with private owners, whereby the Department performs game habitat development work in return for the owner's promise to open a substantial part of his lands to hunting and through the outright purchase of land where the needs of the game species involved require it.

Land management activities of the Game Department are varied and extend from the simple acquisition of a building site to the planning of a windbreak on a cooperative basis with a landowner. In between are the development of pheasant habitat, the acquisition and development of hunting and fishing areas and the purchase and development of big game ranges.

Land management, like all the functions of the Department, is directed toward the common goal of producing a more abundant wildlife harvest on a sustained basis for the people of Washington.

ACQUISITION PROJECTS

(To April 1, 1953)

Name	*Acres Owned and Controlled*	*County*	*Type of Project*
Sinlahekin	11,399.20	Okanogan	**Big Game Range (Deer, also game birds)
Oak Creek	55,699.35	Yakima	**Big Game Range (elk, prin., also deer)
Squaw Creek	8,772.96	Kittitas	Big Game Range (Antelope)
W. T. Wooten....	11,234.80	Col.-Gar.	**Big Game Range (elk, prin., also deer)
Methow	10,082.47	Okanogan	**Big Game Range (Deer)
Sherman Creek...	6,581.12	Ferry	**Big Game Range (Deer)
Klickitat	2,587.37	Klickitat	**Big Game Range (Deer)
Olympic	578.45	Grays Harbor	**Big Game Range (Deer and Elk)
Colockum	31,755.81	Kittitas and Chelan	**Big Game Range (Elk)
Tjossem Mill Pond	30.10	Kittitas	Waterfowl
Sunnyside	1,399.53	Yakima	**Waterfowl (also upland game birds)
Lake Terrell	1,038.55	Whatcom	**Waterfowl (also upland game birds)
Skagit Flats	2,292.05	Skagit	**Waterfowl
Shillapoo	337.00*	Clark	**Waterfowl
West Potholes ...	80.00	Grant	**Waterfowl
Tidelands	104.68	Mason	**Waterfowl
Potholes Reservoir	38,880.00	Grant	**Waterfowl
Winchester Wasteway	1,905.00	Grant	**Waterfowl
Long Lake Reservoir	2,950.00	Grant	**Waterfowl
Tidelands	28.75 mi.	Skagit and Snohomish	**Waterfowl
McNary	.15	Walla Walla	**Waterfowl

*Plus 5.25 miles of tidelands.
**Denotes Public shooting area.

THE BIG GAME HERDS OF WASHINGTON

The background of Washington's big game herds—the different species, boundaries of their habitat, and the number of animals in the state—seems to be a continual point of interest for every enthusiastic Washington hunter. Deer, elk, black bear, mountain goat, and the antelope all inhabit our Evergreen State. Some are native to our country; others have been imported to create an additional huntable species. The combined populations of these various big game animals have provided over the years a tremendous recreational benefit to the people of the state. It is interesting to note some of the problems encountered in the management of these herds and compare the population trends of each species.

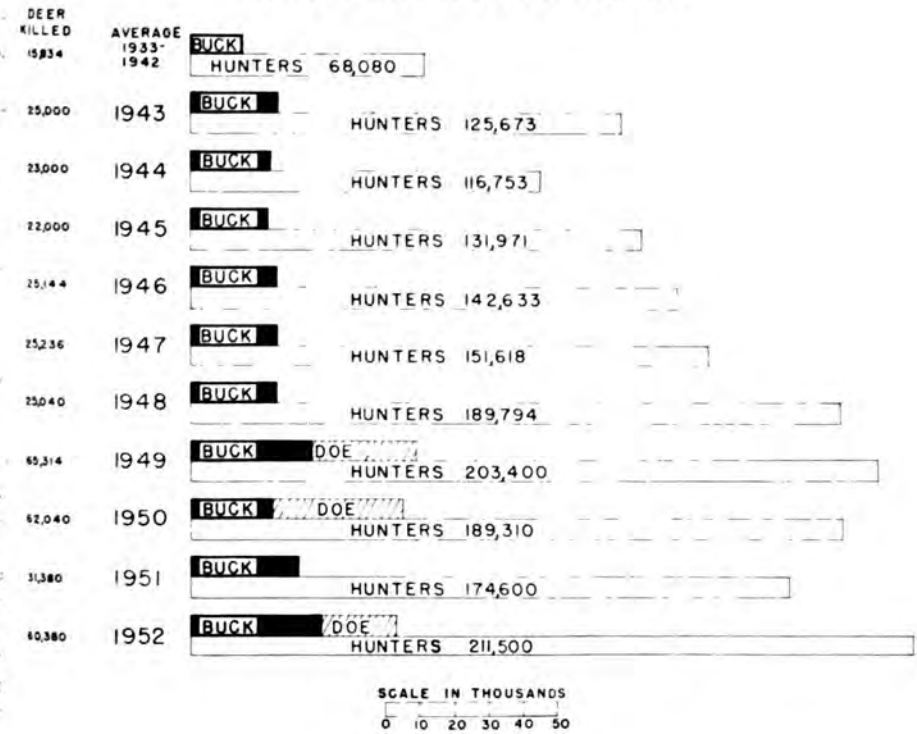
Three Species of Deer

The deer population of Washington includes the mule deer of the mountainous areas of eastern Washington; black-tailed deer, found throughout western Washington and the Columbia River gorge; and the white-tailed deer native to the northeast section of the state. They are without question the most important of Washington's huntable wildlife resource. Their habitat is regarded as the sub-climax type, or areas that are still approaching their final stages of vegetative growth. For example, here in Western Washington, the climax type of range is the coniferous or "Fir Forests." Sub-climax ranges are created in two ways: fires and logging practices. The staple browse species for the lowland black-tailed deer found in the sub-climax type habitat of Western Washington are huckleberry, cedar, and salal. In Eastern Washington, the main diet consists of bitterbrush, snowbrush or laurel, and red stem ceanothus. An interesting sidelight is the fact that the mule deer of Central and Eastern Washington often migrate over fifty miles from mountain summer range to lowland winter range, while the Western Washington black-tail live most of their lives on less than a section of land. The white-tail of northeastern Washington vary in their living habits. Some are local; some are migratory.

By the very nature of their geographical distribution, plus the complexity created by the overlapping and coincidental elk and domestic livestock ranges, the answer to the game managers' problem must be multi-purpose and complete. Comparative deer kill figures of past hunting seasons clearly show that the harvest of the herd's increase (regardless of their sex) must be maintained. That the deer herds have to correlate their numbers to the available food supply in face of the competition for that food supply created by domestic livestock and other wild game living on the same range. For example, in the first hunting season of this biennium (1951) the liberal hunting regulations of the 1949 and 1950 antlerless deer seasons were discarded, and a 16-year-old "buck law" season was re-established. In 1949 and in 1950, the combined deer take totaled over 125,000 animals, with the kill ratio of bucks and does almost equal. The harvest of more than 60,000 deer in a single season (more than twice the harvest of any **two** "buck law" seasons in the past 20 years) was too revolutionary for the people to grasp; hence, the reinstatement of a buck only season in 1951. Sportsmen's groups and concerned individuals feared that the either sex seasons of 1949 and 1950 had seriously damaged Washington's herds.

Mule deer, the largest of Washington's deer species, make excellent prizes for Washington hunters.

COMPARATIVE HUNTERS' SUCCESS



However, such fears were quickly removed when it was learned that more than 30,000 bucks had been taken during the 1951 season—an increased harvest of more than 5,000 additional bucks as compared to all but one of the 16 previous "buck law" seasons. It can only be concluded, then, that the "extra" 30 or more thousand deer that were **not** harvested in 1951 were wasted just as surely as they were wasted in the years 1940-1948—lost to the hunters of Washington simply because their range could not carry the reproduction of the herd through the critical winter months. The main thing to consider is the jeopardy in which future herds are placed when the present populations are allowed to destroy their own food supply. If we can keep our ranges on a sound, scientifically managed, productive basis now, we can be assured of a stable, harvestable supply of deer in the future.

DEER KILLS FOR 1951 AND 1952 SEASONS

	1951	*1952*
Adams	..	..
Asotin	386	775
Benton	..	..
Chelan	2,375	2,567
Clallam	676	1,800
Clark	433	1,113
Columbia	255	696
Cowlitz	906	1,696
Douglas	501	896
Ferry	784	1,871
Franklin	..	..
Garfield	201	266
Grant	110	153
Grays Harbor	1,617	4,360
Island	901	737
Jefferson	229	648
King	732	2,497
Kitsap	206	731
Kittitas	768	1,177
Klickitat	789	1,275
Lewis	1,897	3,025
Lincoln	288	455
Mason	793	1,726
Okanogan	3,302	5,865
Pacific	1,385	3,224
Pend Oreille	817	2,297
Pierce	2,223	2,346
San Juan	187	380
Skagit	440	1,430
Skamania	342	1,196
Snohomish	681	1,567
Spokane	1,523	2,603
Stevens	2,230	6,453
Thurston	1,392	1,638
Wahkiakum	365	936
Walla Walla	98	300
Whatcom	1,092	995
Whitman	..	93
Yakima	456	593
	31,380	60,380

Elk

The largest member of the deer family native to the Evergreen State is Washington's Roosevelt elk. Originally ranging over most of the western part of Washington, they are still plentiful in the Olympic Peninsula area, Pacific and Wahkiakum counties, the Mount St. Helens area in Cowlitz and Skamania counties with small scattered herds in Skagit and Whatcom counties.

A second species, the Rocky Mountain elk, was introduced into Eastern Washington. The importation of these animals from Gardiner, Montana, and subsequent plantings in the Blue Mountains of southeastern Washington, Yakima and Kittitas counties, were made by county game commissioners during the period from 1912 to 1925. Today, there are approximately 30,000 elk that roam the state, 60 per cent of them in Western Washington and 40 per cent in Eastern Washington. A herd of this size is capable of producing an annual hunters' harvest of some 5,000 animals.

Elk range in large herds and are more like cattle since they feed extensively on grasses and sedges. However, the elk diet depends entirely on the flora of the habitat in which they live. On over-grazed ranges, they will turn to browse for their main food supply, using such shrubs and trees as cedar, salal, huckleberry, maple, dogwood, aspen, pine, willow and at least two species of sage. The elk of Eastern Washington are more compatible with a climax type range of bunch grass. Although their high summer range in secluded mountain areas generally carry an abundant food supply, the critical wintering ranges of the lowland areas is the determining factor in population densities. The climax type bunchgrass of the lowlands is either heavily overbrowsed or completely unavailable because of the snow. It is at this time that they must compete with the deer herds for nourishment from such plants

as serviceberry, laurel, bitterbrush and red stem ceanothus. This is particularly true of the Yakima herd.

The problem then resolves around the same determining factor of deer herd populations—habitat or range capacity. Because of the large concentrations of these animals (as many as 250 to 300 elk in a wintering herd), the danger of range destruction and the subsequent reduction of future herds is always present. In direct relation to this danger is the possibility of disease and parasitic infestation, usually a by-product of malnutrition. These pitfalls in wildlife management can be avoided in two ways: (1) create more available winter range and (2) harvest the annual increase of the herd, thereby maintaining a balance between the present herd and the present food supply.

During the past biennium, some 32,000 additional acres of elk range were acquired in the area known as the Colockum in Kittitas county. Throughout Washington, there is a network of strategically located big game ranges that have been acquired and maintained solely for the management of big game. Over 117,000 acres are devoted to elk and play a major role in their present and future management. (Additional information concerning land management appears elsewhere in this report.)

The elk hunting seasons of the past biennium adequately indicate the necessity of an average sustained harvest. From 1935 until 1948, the average elk kill was 2,057, with the largest kill being made in 1948 with 3,728 animals taken. In 1949 and 1950, the either sex seasons accounted for 8,879 and 10,740 respectively. The either sex season (permit controlled) of 1951 harvested 6,852 animals. It was anticipated by the Department that the 1952 harvest would be around 3,000 to 4,000 elk. However, since 1952 was primarily a "bulls only" season and because the fall weather of that year was extremely mild, the take of elk fell a little short of the anticipated harvest with 2,846 bull elk taken.

It is the feeling of the Department that allowing the herds to build up to and even beyond the range carrying capacity and then holding one or two "slaughter" seasons is undesirable and an impractical method of game management. Rather, it is believed that a completely controlled balance between populations and carrying capacity can best be maintained on a yearly sustained, controlled harvest of both sexes.

ELK KILLS FOR 1951 AND 1952 SEASONS

	1951	*1952*
Adams	..	..
Asotin	202	237
Benton	..	..
Chelan	192	116
Clallam	188	112
Clark	..	4
Columbia	318	318
Cowlitz	126	116
Douglas	..	..
Ferry	..	..
Franklin	..	..
Garfield	76	171
Grant	..	..
Grays Harbor	936	250
Island	..	..
Jefferson	284	153
King	26	41

ELK KILLS FOR 1951 AND 1952 SEASONS—Continued

	1951	1952
Kitsap	..	..
Kittitas	518	444
Klickitat	..	11
Lewis	28	57
Lincoln	..	..
Mason	216	54
Okanogan	..	..
Pacific	801	354
Pend Oreille	15	4
Pierce	9	7
San Juan	..	..
Skagit	..	7
Skamania	30	50
Snohomish	..	..
Spokane	..	..
Stevens	..	..
Thurston	..	..
Wahkiakum	167	121
Walla Walla	36	9
Whatcom	..	2
Whitman	..	..
Yakima	2,684	208
	6,852	2,846

Mountain Goat

A complete picture of Washington's native big game herds must necessarily include the Mountain Goat. Although there is a comparatively small number in Washington (5,000 to 6,000), it is nevertheless the largest population of Mountain Goat to be found anywhere in the United States. Depending upon his agility in reaching almost inaccessible areas in his high mountain habitat, the Mountain Goat is indeed a prize for the few hunters who have the stamina to pursue him.

Controlled almost entirely by their limited range, there is little chance of increasing goat populations. Mountain Goat were originally found and are still indigenous to the Cascade Mountain range from the Canadian border south to the Mount Adams region. Additional herds were imported from Canada and planted into the Olympic Peninsula around 1924. Later plantings of Alaska importations in 1929 and 1930 helped to form the parent herd of goat whose offspring are still part of the majestic Peninsula scenery.

Hunting seasons on Mountain Goat were very liberal during the late 1890's with a bag limit of two goats per hunter. County game commissioners restricted the limit to one per hunter and continued to shorten the once 3-month season. Further restrictions in 1917 confined goat hunting to Whatcom, Snohomish and Skagit counties and in 1925, a state-wide closure was instituted. For 23 years, this closure remained in effect. Biological field research, population counts and range analysis during 1939 and 1940, and supplementary post war surveys indicated that the goats' range carrying capacity had reached the saturation point; consequently, a controlled, permit system type of hunting season was established on Mountain Goat. In 1948, 150 permits were issued. The same type of season was established in the next four years allow-

ing 400 permits each year. During any one of the past five controlled goat seasons, there have never been more than 100 goats harvested, indicating that these high mountain inhabitants have many natural protective barriers as well as those instituted by man. During the past biennium, the 800 permittees bagged a total of 127 goats; 56 in 1951 and 71 in 1952.

Since the first controlled goat hunt in 1948 through the hunting season of 1952, there have been only 362 Mountain Goats harvested—about 20 per cent of the herd's harvestable increase.

Bear

The most unheralded big game animal in Washington, and yet heavily populated, even highly prized in many other states, is the black bear. Ranging in almost all of the forested mountain areas of the state, they have increased their population density to such an extent that they have been declared predatory in five counties of Western Washington. Their mischievous nature and insatiable appetites are more often than not the reasons for the trouble they cause. Their food consists of both plant and animal life, and during the salmon spawning season in the coast areas, they feed extensively on adult fish.

During the winter months, the black bear of the mountainous areas hibernate, generally disappearing into their cave or hollow stump in late fall and early winter and emerging in the spring. However, the winters in the lowlands of Western Washington lack the snowfall and cold temperatures so prevalent in the eastern reaches of the state and bear are generally at large during November, December and January.

Occasionally, Washington hunters claim the existence of a brown bear in the state. The mistaken impression arises from a brown color phase of the black bear. It is not a distinct or separate species. A few grizzly bear have ranged in Washington and in recent years, some have been taken by hunters.

There is no accurate means of determining the number of bear, but it is apparent that there are too many in some regions of Western Washington. Damage to farm crops, fruit trees, beehives, and, in some areas, serious loss to forest growth by the stripping of bark from young trees are indicative of their over-population. For this reason, the hunting seasons on bear have been opened the year around in Western Washington in recent years. In Clallam, Jefferson, Mason, Kitsap and Grays Harbor counties, they are classified as predators. In Eastern Washington, the season has generally run concurrently with the open deer areas with a bag limit of one bear. There is no limit in Western Washington.

Land Management for Big Game

Since the inception of its land management program in 1939, Washington has led the West in the acquisition and development of big game ranges. When the program was started, it was felt that the only factor necessary in the proper management of lands was the removal of competition for available food. By eliminating livestock use, natural foods would thereby be reserved for game.

Game Department range men plant bitterbush seed in the Sinlahekin Valley. This is only a part of the Department's vast range research activities aimed at providing browse for the state's game herds.

However, extensive research showed that these land areas could produce a great deal more food with proper management and development than they would if left in the native state. To this end, the Department has reseeded or replanted more than 1,000 acres of browse and 2,000 acres of grass. In addition, it produces all the hay necessary for winter feeding of big game on Department-owned agricultural lands.

By the end of the biennium, the Game Department had nine big game ranges totalling 138,691 acres. These lands are needed to insure the future of game herds by controlling areas where game tend to concentrate during the winter months. Lands are acquired and developed in such a way as to eliminate game damage to agricultural lands. Private holdings near game ranges are fenced and protected against infiltration by game. Wherever possible, the Department has purchased lands from willing owners in order to facilitate the free movement of herds from summer to winter ranges and in order to make major hunting areas available for public use.

Multi-Purpose Ranges

The development and maintenace of these ranges is now absorbing a much larger percentage of land management monies than the acquisition of new areas. Although classed as big game ranges they are developed in such a way as to provide the maximum possible benefit for the license holders of the state.

For example, the Sinlahekin Game Range, one of the first in the state, was purchased as a winter range for big game. In addition to its development for use as a range area, nearly 80 acres of water have been impounded for the dual benefit of fish and waterfowl. The project annually produces between 200 and 300 broods of ducks. There are also patches of ground farmed along the valley floor for the production of food for upland birds. As a result of these management practices, that portion of the project suitable for the production of pheasants holds one of the heaviest concentrations of any similar area in the state. Four hundred to five hundred pheasants are taken annually from this area by hunters.

The same policy is applied to all of the land areas in the state. As a result, on the Oak Creek Game Range, which was purchased primarily for elk management, the opening of the upland bird season for chukar hunting is as keenly awaited by sportsmen as is the opening of the elk season for both the Oak Creek and the Clemons mountain areas. These regions which comprise the bulk of the range provide some of the most heavily hunted chukar range in Yakima county.

As a result of this policy of maximum development for land areas controlled by the Department, each of the big game ranges in 1952 provided more than 10,000 man days of hunting and fishing for the state's sportsmen.

The Department will continue to direct its land management activities toward the goal of producing a more abundant harvest on a sustained basis through the control of land areas for game production and harvest.

WATERFOWL

If your heart goes where the wild goose goes or your hunting pleasure comes from scanning the horizons for the cautious pintail, listening to the chuckle of feeding mallards or tracking a 12 gauge along the unpredictable flight of the teal, Washington's duck and goose populations can supply many memorable experiences for the migratory waterfowl shooter. Productive hunting areas can be found throughout the state.

Mallards, Pintail, Teal and Widgeon, in that order, are the principal varieties of duck found in the waterfowl flyways of both Eastern and Western Washington. Also available to the shooter are other species of diving ducks, such as the Scaup, the Ringnecked, Bufflehead and Golden Eye, abundant in local areas but which receive little hunting pressure from the public. The Canada Goose and the Lesser Canadian account for the bulk of Eastern Washington's goose harvest, with a few Cacklers and an occasional White Front supplying the balance. Western Washington has more variety in its goose populations but in the aggregate they produce less hunting than the two major species east of the Cascades.

Snow Geese, Black Brant, the Whitefronted Goose, Cacklers and sub-species of the Canada Goose make up the harvest taken by the coast hunter. The hunting seasons of 1951-52 produced respectively a state-wide goose harvest of 46,440 and 53,800 birds. The duck harvest for the same period was 845,010 in 1951 and 818,000 in 1952.

Land Management for Waterfowl

Since the waterfowl flyways within the United States are under the specific jurisdiction of the Federal Fish and Wildlife Service, the management of migratory species in the past has been relatively ignored by state agencies. In recent years, however, research studies showed that through local state management (does not include setting hunting dates and bag limits), waterfowl production could be boosted through acquisition, development and maintenance of waterfowl habitat areas.

Each state, by increasing its local migratory production, would therefore increase the over-all flyway populations. Today Washington produces some 800,000 ducks which equal the number harvested by hunters in the Evergreen State. This does not mean that all of the birds produced in Washington are killed in this state but that this production serves as a valuable supplement to the over-all flyway harvest.

The Department instituted this program of acquiring and developing waterfowl management units in 1947 in order to increase the production of waterfowl, furnish additional feed for migrant birds and provide a place for the free lance shooter to put out his decoys.

To date, nine of these areas have been established and acquisition has progressed to the point where the Department controls approximately 50,000 acres of land in the nine areas. It also controls 34 miles of tideland frontage. As rapidly as possible, the lands acquired are placed under intensive development to increase their desirability both as feeding and rearing areas for waterfowl. Only a small portion of each unit is placed in reserve. This part manages to hold the ducks in the general area in spite of heavy gun pressure.

These public hunting areas are at times poor places to hunt due to overcrowding and high shooting. At other times they provide excellent hunting; and at all times they provide the license holder an opportunity of a place to go.

The Department makes no attempt to limit the number of shooters on an area, but rather says in effect: "Here is an area we are managing for waterfowl production and harvest. If you have no other place to hunt, you are welcome here."

Three of the units—Sunnyside, Skagit and Lake Terrell—during the 1952 hunting season furnished 15,000 man days hunting with a kill of nearly 25,000 waterfowl. The four most important areas at this time are described as follows. There are seven additional areas in the process of being acquired and developed.

Skagit Game Range

This unit is located between the north and south forks of the Skagit River, outside of the primary dike. It is south of Mt. Vernon and west of Conway.

The area is one of tidal marshes dissected by meandering sloughs with an interspersion of independently diked islands in the south fork delta. Here the Department farms up to two hundred acres for the production of waterfowl food.

The U. S. Fish and Wildlife Service started acquisition of an inviolate sanctuary in this area in 1935. Following their initial purchases they became convinced that it would be unwise to proceed with the sanctuary and agreed that the state should have control of the area for public shooting. A land exchange agreement was entered into and this agreement was made operative by congressional legislative action and is now in the process of consummation.

There is an area of 11,669.05 acres available for public shooting in the Skagit controlled as follows:

U. S. Fish and Wildlife Service	8,623.00 Acres
State Game Department	2,292.05 Acres
Snohomish County Sportsmen	754.00 Acres
	11,669.05 Acres

When acquisition is completed and the transfer of the federal lands effected, the state will have 18,335.76 acres under management. Only preliminary development work has been done to date.

This area currently handles more duck and snow goose shooters than any similar area in the state. At least 95 per cent of the "Non-Club" hunters use the Skagit Delta as a public shooting ground.

Sunnyside Game Range

Located in Yakima County, this project is divided into two units. One, the Giffin Lake unit, is north of the Yakima River, eight miles due south of Sunnyside. The second, or Byron unit, is south of the river and north of Highway 3-A, five miles southeast of Mabton.

Acquisition was started in 1947 and was completed on the Byron unit by 1950 at which time water controls were constructed and the major development completed. Acquisition is still not complete on the Giffin Lake unit and only preliminary development work has been possible.

Both areas are composed of a series of lakes, potholes and marshes surrounded by farm lands and sage brush. The Department plants up to 300 acres of wheat and corn annually for game food. The proposed project would contain 2,484.63 acres; the Department now controls 1,399.53 acres, all of which are open to hunting.

Although heavily hunted for both pheasant and ducks, the area is consistently productive. If a person has a bird dog that will work hard in heavy cover, limits are available throughout the season. As in the case of any area, duck hunting varies with the weather; stormy or foggy days being the best.

Lake Terrell Game Range

This project is located in Whatcom county near Ferndale. The lake can be reached by driving four miles west of Ferndale on the Mount View Road and proceeding to its end.

The project was started in 1947 with the drainage of the original lake. The lake now is shallow and marshy. It is approximately one and three-quarters miles long by one-half to one mile wide. It is surrounded by scattered timber, brush and fields. The Department plants approximately one hundred acres of grain annually.

The Department controls 1,038 acres, of which approximately 160 acres are in Game Reserve. The area is extremely crowded on opening days, but is a good bet for ducks on good "duck days" during the week. It also furnishes fair upland bird hunting and excellent rabbit hunting.

Columbia Basin Development

Construction work in connection with the Columbia Basin development being carried on by the Bureau of Reclamation and the construction of McNary Dam by the Corps of Engineers has made available thousands of acres of additional habitat for waterfowl in central Washington.

Many mallards nest on Washington waterfowl management areas.

A portion of the public shooting area at the Lake Terrell Waterfowl range.

Agreements have been completed under which the lands surrounding the majority of these impoundments, specifically McNary, Potholes Reservoir, Long Lake Reservoir, Winchester Wasteway, Westpotholes or Columbia Wasteway will be turned over to the state for game management purposes. It will take several years for water levels to reach their normal peak to permit maximum use by waterfowl and waterfowl hunters; however, the 1953 shooting season will be greatly enhanced by these reservoirs.

Potholes Game Range

This area encompasses perhaps the most unusual waterfowl area in the state, perhaps in the nation. Here are miles of true desert sand dunes, interspersed with hundreds of marshes and potholes of from less than an acre to 30 or 40 acres in size. Initially there were in excess of 800 such potholes. The creation of the Potholes Reservoir by the Bureau of Reclamation has resulted in a many thousand acre lake which has flooded (or will flood) at least half or more of these potholes at yearly intervals. This lake will probably fluctuate 25 or more feet annually.

The entire 38,880 acre area was purchased by the U. S. Bureau of Reclamation for reservoir purposes as part of the Columbia Basin Project. These lands are still owned by the bureau but were made available to the state for recreation and wildlife management under permit in 1952. The area can now furnish good shooting for more waterfowl hunters than are using it. The reservoir also offers excellent spiny ray fishing.

UPLAND BIRDS

Washington's imported Chinese pheasant has long been recognized as the chief game bird of our state, producing an average harvest of some 360,000 chinks a year since 1949.

In almost all counties of the state, there is a huntable population of the Chinese ringnecked pheasant, but the larger population densities are found east of the Cascade Mountains. Western Washington, with wet winters and rainy spring weather (the main restricting factor in natural bird production), is almost entirely dependent upon Game Farm reared birds in supporting an annual harvest. The two hunting seasons of the past biennium, 1951 and 1952, harvested 350,000 and 378,000 pheasants respectively.

But the upland bird shooter is not confined to pursuing pheasants alone. A wide variety of upland bird species are available for Washington's hunters.

Grouse

The grouse family offers five different huntable species. All are native to Washington. Included in this group are blue grouse of the coniferous forest regions of the state, the ruffed grouse or "native pheasant" usually found along brushy creek bottoms and in the broad, leafy forests along stream beds and the Franklin grouse (sometimes called "Fool's Hen") a small duplicate of the blue grouse, but found only in the high Cascade Mountains and some ranges in the northeastern part of the state. The other two members of the grouse family that are hunted in Washington are the sage hen and the sharp-tailed grouse. Both are indigenous to Eastern Washington, but their range is limited. Sharp-tails can be found in Okanogan, Ferry, and Stevens counties. The sage hen is available in Yakima, Kittitas and Grant counties while Douglas county produces both of these birds.

Chukar

Importations of other wild bird species have created additional recreational pleasure for Washington's hunters. For example, the chukar partridge, introduced into our state from India in 1921 is now challenging the Chinese pheasant for the title of the "most popular upland bird." Extremely hardy, they range mainly in the sagebrush and rocky slopes of Yakima and Kittitas counties. Since their habitat is generally in the arid regions of the state, they are not living in competition with other native or introduced species. Successful transplantings to other counties in Eastern Washington have been made during the past biennium, and huntable populations are available in Chelan, Okanogan, Grant, Klickitat and Benton counties.

The Hungarian partridge, introduced around 1910, produces an excellent harvest of birds in Eastern Washington and provides some shooting in Snohomish, Skagit and Whatcom counties. During the past biennium, over 110,000 huns were taken—36,500 in 1951 and 74,400 in 1952. The chukar harvest jumped from 16,740 in 1951 to 63,100 in 1952.

Quail

There are four species of quail found in Washington. All have been introduced. The combined populations of the California or Valley quail, Mountain quail, Bobwhite and Scaled quail afford an average harvest of 150,000 birds annually. The California quail is by far the principal species of this

group. Major populations can be found in Yakima, Benton, Walla Walla, Chelan, Douglas, Okanogan, Whitman, Asotin, Garfield and Columbia counties. Western Washington produces a limited number of Mountain quail in the logged off areas.

PHEASANT KILLS FOR 1951 AND 1952 SEASONS

County	*1951*	*1952*
Adams	3,935	5,409
Asotin	2,230	2,761
Benton	20,670	25,154
Chelan	4,154	6,846
Clallam	1,683	2,080
Clark	6,683	6,998
Columbia	4,088	5,598
Cowlitz	2,559	2,799
Douglas	2,522	3,669
Ferry	339	340
Franklin	1,920	4,085
Garfield	6,829	6,733
Grant	7,939	13,542
Grays Harbor	3,770	3,745
Island	5,581	5,863
Jefferson	361	530
King	8,198	10,667
Kitsap	2,409	1,627
Kittitas	23,605	24,095
Klickitat	777	1,816
Lewis	11,793	9,040
Lincoln	4,161	12,823
Mason	1,132	946
Okanogan	9,625	12,293
Pacific	2,734	1,702
Pend Oreille	347	492
Pierce	7,764	8,738
San Juan	1,814	1,627
Skagit	8,045	5,750
Skamania	77	113
Snohomish	7,603	9,267
Spokane	16,677	18,875
Stevens	6,256	6,355
Thurston	4,066	4,728
Wahkiakum	741	1,135
Walla Walla	16,524	16,908
Whatcom	5,559	6,279
Whitman	31,927	30,299
Yakima	103,109	96,532
Totals	350,206	378,259

Management Problems

There are many problems that the modern game agency must meet in upland bird management. The big question is how to produce a potential annual harvest large enough to cope with the increasing number of shooters. Population fluctuations from year to year, due to weather conditions and their subsequent effects on the parent stock during the winter and the new hatch in spring, further complicate this problem.

Applicable to all game birds, it is especially true in the grouse populations. These birds show a definite "rise and fall" cycle with a difference of from nine to eleven years between population "highs." Since there is little or nothing that can be done by man to stabilize these cycles, the length of the

hunting seasons is set according to the fluctuations of the cycle. Quail, Hungarian and chukar partridges are affected and managed similarly.

The Chinese pheasant, affected more by winter and spring weather than a cyclic fluctuation, is managed in an entirely different manner. The game farm program, which produces some 100,000 artificially reared birds annually, coupled with the all-important habitat development and field rearing projects account for the stable harvestable supply of Washington's ringneck. Living his entire life on a small land area, the pheasant is dependent upon the food provided by seeds of weed growth and residue from the production and harvest of agricultural crops. Such areas generally produce sufficient brush cover for protection against winter weather, predatory animals and other birds of prey. Water, of course, must be readily available. Areas that lack such habitat production are consequently proportionately lacking in pheasant production.

Without question, the main factor involved in expanding pheasant population densities is the same factor involved in the management of deer and elk herds. There is no doubt that the withdrawal of productive range or habitat (over-browsing, intensive agricultural activities, etc.), regardless of the species of animal it may sustain, will result in the depreciation of the population density of that animal in direct relation to the depreciation of the habitat. Therefore, in order to maintain our present bird supply, we must assure the supply of habitat. To **increase** our bird supply, we must **increase** the **habitat.**

Land Management for Upland Birds

To date, the bulk of land management for upland birds has been aimed at pheasants, the principal upland bird species. Pheasants are a by-product of domestic agriculture. A chart of their range would be almost the same as a map of the state's farming areas.

Every farm has some features that are important to the pheasant. Abundance of these birds within a farming area is dependent upon the presence and

Landowners and the Game Department enter into agreements in the planting of cover crops and shrubs for game birds.

lastic cisterns are constructed to collect water uring the wet spring onths for use by upland me birds during the dry mmer season.

relationship of three basic requirements—food, cover and water. The Department's Pheasant Habitat Development program is aimed at supplying the missing welfare factors and bringing those already available into proper relationship. This work is done on a cooperative basis with the owners of private lands. Wherever possible, the work is planned not only to help game but to benefit the landowner through the conservation of soil and moisture and by making his farm a more enjoyable place to live.

In addition to the direct development work being carried on by the Department, meetings have been held with all agencies and organizations within the state having a major interest in agricultural land use in order to familiarize them with the needs of wildlife and to effect better coordinated planning. Agreements were made with eight Soil Conservation Districts calling for cooperative action between the Game Department and landowners within the district aimed at the solution of mutual problems, the production of more wildlife and sounder land usage.

Habitat development has received valuable assistance through the independent efforts of landowners following their familiarization with the needs of wildlife through meetings, newspaper articles, radio talks and the Department bulletin **Wheatland Wildlife.** It is difficult to determine the benefits that upland birds have received from these individual efforts but, without a doubt, they have resulted in increasing bird populations.

Statistically, the program as carried on by state employees is set forth in the following table.

Pheasant Habitat—Acquisition and Development

Acquisition Summary

Project	*No. Farms Under Agreement*	*No. Habitat Areas Set Up*	*Acres in Habitat Improvement*	*Acres Farmland Under Management Agreement and Open to Hunting*
Spokane, Lincoln and Adams	249	738	2,219	208,595
Walla Walla and Columbia	20	113	520.7	33,357
Douglas	51	119	502.3	71,790
Columbia Basin	50	50	31.5	6,914
Other Misc.	37	45	95	6,450
Totals	407	1,065	3,368.5	327,106

Development Summary

Rods of fencing (approx. 90 miles)	26,688
Shrubs planted	866,937
Grass, sweet clover (acres seeded)	498
Giant rye clones	15,000
Volga rye clones	28,718
Reed canary grass	3,800
Asparagus plants	1,250
Spring developments	70
Cisterns	99
Windmills in use	6
Food patches planted	25
Food hoppers and shelters	54
Cattle guards installed	5
Stock tanks installed	5

Pheasant Habitat—Acquisition and Development

The ultimate proof of success or failure of any game management program must lie in its effect on sustaining or increasing the harvest of game.

Habitat development work was started extensively in Spokane and Adams counties. The table below shows clearly the effect of land management in these counties in contrast to adjacent Whitman county where no work of significance was performed.

PHEASANT KILL INCREASE—1947 TO 1952

Area	*Percentage*
Statewide	38.30
Whitman County	—.03
Adams County	102.00
Spokane County	104.00

FARMING UPLAND BIRDS

The game farm's place in the scheme of game management has undergone a metamorphosis in the last 20 years. Considered the backbone of bird production and hunting in the early days, game farms are looked upon today as more of an insurance policy—available whenever the occasion demands the introduction of a new bird, the planting of birds into a new area or a battle against the inconsistencies of nature, such as a wet nesting season, and detrimental agricultural practices.

Game farm production is still an essential and vital part of game management, aiding and abetting natural forces which experience extreme fluctuations. Also contributing to the rise and fall of pheasant populations along with the elements, are farming programs. The depression of the '30's proved a prosperous period for pheasants. Farm relief programs based on the curtailment of crop production were a boon to the pheasant as idle lands, found on practically every farm in the state, were planted to cover crops. Left unharvested, they provided excellent cover for pheasants. The birds multiplied and enjoyed one of their best eras since the advent of large human populations. Their honeymoon was over when war broke out in 1941 as more and more lands were brought into full scale agricultural production. Game farms since that time have played a more important role in producing game birds, although pheasant habitat development programs are gaining momentum.

Seven game farms were turned over to the Game Department in 1933. In their first year of state control, these farms turned out 35,554 birds. Four of these farms are still standing and with improvements and innovations, they, along with the six new game farms, produced more than 200,000 pheasants during the last biennium.

Among the many advancements introduced into game farms over the past two decades, these have added the most to the state's bird populations: (1) Incubators and brooders; (2) Improvements in field-rearing methods (the open pen system of holding birds), and (3) Research in types of food and pheasant diseases.

Production Machinery

Although chukars are still produced to some extent on Washington's game farms, the major portion of the game farm facilities are devoted to the kingpin of the state's bird population—the pheasant. Pheasants, like most birds, are polygamous. Broodstock is selected in February and placed in open fields

at a ratio of one cock to six hens. The hens usually start laying their eggs around the first of April, producing about 40 through the laying season which runs until the end of May. Then they are released into the wild by the first of June where they nest and raise a clutch of birds.

Chicken hens serve as foster mothers to half of the game farm eggs, incubating and rearing them, but in the long run, the mechanical incubator and brooders in which the rest are hatched and raised are more economical. The latter will probably replace the hen system in the future because of the advantage of lower costs and fewer losses. Claims that the hen reared types are hardier have been disproved by extensive research which has shown that birds produced in the brooders and incubators are the equal of field-reared birds.

Under the hen method, after the eggs are hatched, usually in 23½ days, the 20 chicks and their foster mother are transferred to coops in the open field on the game farm. The hen is kept in a coop, available whenever her stepchildren return for warmth, food and water. The young birds usually leave the pens at about six or seven weeks and are trapped and held in covered pens until they are 10 weeks old before being released into the wild.

The incubator-brooder system simplifies the process and results in a smaller percentage of loss. After hatching in the incubator, they are placed in the brooder house where they stay for six weeks until they are moved into large wire-closed pens which have been planted with cover crops. Left here until they are 10 weeks old, they are easily trapped, crated and moved to their release site. The loss of brooder birds during the 10-week period is only 10 per cent compared to 25 per cent for the hen rearing system.

GAME BIRDS PLANTED IN STATE OF WASHINGTON

	April 1, 1951 to March 31, 1952	*April 1, 1952 to March 31, 1953*	*Total*
Pheasants planted from game farms	123,248	108,824	232,072
Pheasants planted from 4-H Clubs	7,187	6,228	13,415
Pheasants planted from other sources	1,785	1,084	2,869
Total Chinese pheasants planted	132,220	116,136	248,356
Chukar partridge planted	1,003	2,842	3,845
Grand total game birds planted	133,223	118,978	252,201

The birds are released in a spot which has the three essential elements for bird production—food, cover and water.

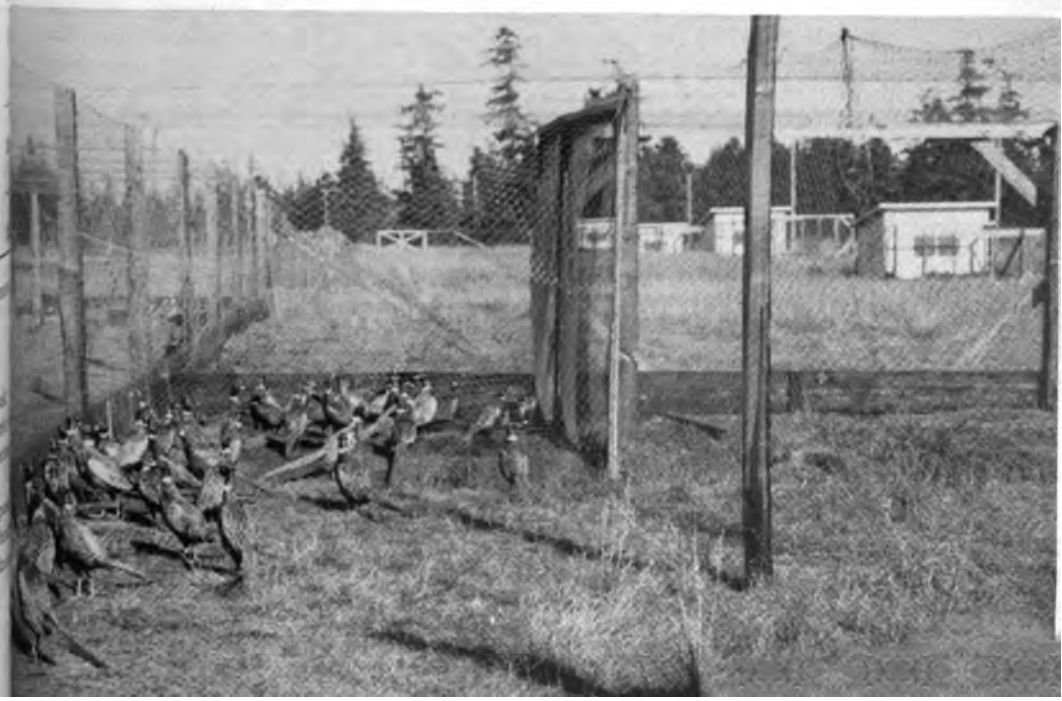
Diet and Disease

The artificial rearing of upland birds is by no means a simple task. Only through the efforts of scientific research and long hours of experiments has it been possible for the game farm program to operate effectively and economically.

As game farm production increases, the disease hazard correspondingly rises. This fact makes it necessary that adequate steps be taken preferably to prevent the introduction of a disease or, once it has occurred, to eliminate it as soon as possible and hold losses to a minimum.

A pheasant chick has his first look at one of Washington's game farms.

Approximately 100,000 birds are raised annually on the game farms and planted throughout the state for the sportsman's pleasure.



Although diseases still occur, the problem is not so menacing as it was 20 years ago when parasitic infections took a large toll of game farm birds. Following the discovery by the Western Washington Experimental Station at Puyallup that the major cause of these diseases was a diet deficiency, the Department in conjunction with Washington State College began experimenting with a new type of feed formula, containing all known nutrients. The results obtained from the use of this diet were astounding. Losses from diseases were greatly reduced while the pheasants grew faster, feathered better and lived longer after release into the wild.

Through the efforts of Dr. McGinnis, wildlife professor at Washington State College, antibiotics were introduced into the pheasant ration. These mold drugs added to the best feed formula science could devise, not only produced excellent pheasants but kept the cost per bird at the same level it was in 1937, even though the cost of labor, feed and material has doubled since that time.

The Game Department will continue to experiment with feed techniques in an effort to eliminate bird disease and produce even better game farm birds.

Future of the Game Farms

A game species like the pheasant, so dependent on factors beyond the control of game administrators, must have an artificial reserve available whenever weather and other unforeseeable circumstances jeopardize its population. There will always be a need for the game farm to step into the breach created by the shortcomings of nature.

The Game Department's Pheasant Habitat Development Program and the state-wide system of game farms are cooperative partners in pheasant production—working together to supply the largest possible number of birds for today's hunters and for sportsmen of the future.

A superficial glance at the money expended in game farm production might give the idea that artificial propagation is not economically sound. However, there are so many intangible factors to be considered that the value of the game farms cannot justifiably be placed on a dollars and cents basis. The cold facts show that at best only 30 per cent of the male birds released from the farms find their way into the hunter's bag. Looking merely at the face value of these statistics, it might seem unwise to make the plants if these are the greatest results that can be achieved.

Closer scrutiny, however, would show that these planted birds serve as an incentive to hunters and lead to a greater over-all pheasant take. It is a fact that hunters only spend time in the field when they have a reasonable chance of bagging birds. The addition of planted birds may not be large but it may provide a number large enough to attract hunters and encourage them to use the area. The hunter may not get the birds released from the farm, but their mere presence in the area, supplementing or raising the natural bird population, intensifies the hunting and in the end increases hunters' success. Farm reared birds, in other words, have made hunting worthwhile. Without a doubt, the birds released from the state's game farms have augmented nature's production.

Other Needs

Game farms are also important in the introduction of birds into new areas and into those regions vacated by birds for one reason or another. Many bird areas are submarginal and during the winter, birds leave them for more favorable spots. Come spring, these vacated areas again are capable of rais-

ing and producing pheasants. Plants from game farms into these submarginal lands broaden the field available for pheasants, in many cases making hunting possible where there would not be any otherwise.

In an effort to produce a bird which can take its place on a par with wild pheasants, emphasis on production has shifted from numbers to quality. Future game farm releases will run around the 80,000 mark, instead of the 100,000 figure of recent years. The reduction in numbers will make it possible for the game farms to hold over a larger supply of hen pheasants during the critical winter months. This will eliminate them from the annual winter battle for survival with other birds and will make it possible to plant them during the spring of the year where their broods will have an even more profound effect on fall hunting.

Although pheasant habitat development may soon carry the greater share of pheasant production, game farms are here to stay, permanent structures of game management. With their roles as guarantors that the pheasant, chukar and other game birds will always be a part of Washington's wildlife resources, Washington can justifiably be proud of the record of its game farms—farms which in the last 20 years produced over 1,500,000 birds.

FARMER-SPORTSMAN PROGRAM

In the past 20 years, there has been a tremendous change in thinking as it relates to hunting and fishing. During this period of time, the number of sportsmen in the state has trebled, creating the difficult problem of finding a place for them to hunt and fish.

Persons of all ages and walks of life, whether they live in remote areas or densely inhabited cities, partake with equal enjoyment in all forms of hunting and fishing, making these activities the most popular forms of outdoor recreation in the state of Washington. In their eagerness to take part, however, they have alienated their relationship with that portion of the population which owns the land upon which they must hunt and fish. They tend to further complicate their problems when those financially able purchase hunting and fishing rights to force further restrictions on the areas available to the not-so-privileged sportsman.

The individual's rights to wild game of the state is nowhere disputed but when access to private land is denied, this right is automatically taken away. With the passing years, it was becoming apparent that "No Trespassing" signs were increasing to such a degree that it was next to impossible for the average license holder to find a place to hunt and fish.

Realizing that the problem of getting sportsmen on game lands is an integral part of the over-all game management program, the Department joined with organized sportsmen and farmer organizations to form a Farmer-Sportsman Relations council in an effort to find a solution. The basic plan was to get sportsmen to act like sportsmen and to create friendlier posters for landholders to replace their "No Trespassing" signs. Posters were to be furnished by the Game Department and distributed by sportsmen.

This program was put into effect in 1947 and continued through the hunting season of 1949. Results of the two years' work clearly indicated that the program had merit but that it must be expanded into a more comprehensive plan in order to achieve its objectives. In 1950 with the approval and support of organized sportsmen and farmers, the Department organized an extensive Farmer-Sportsman program.

ATTENTION

NO HUNTING

Beyond This Sign

This landholder is providing land for your hunting enjoyment. Respect This Sign, Please.

THE LANDHOLDER — IT TAKES ALL THREE — THE SPORTSMAN — GAME DEPARTMENT

Help Protect Life and Property

HUNTING

WITHOUT PERMISSION

This landholder has placed confidence in you. Respect the privilege granted and maintain good hunting in Washington

THE LANDHOLDER — IT TAKES ALL THREE — THE SPORTSMAN — GAME DEPARTMENT

Help Protect Life and Property

No shot is so important it can't be made safely

Landholder

THE LANDHOLDER — IT TAKES ALL THREE — THE SPORTSMAN — GAME DEPARTMENT

PLEASE APPLY AT:

Name

Address

HUNTING BY PERMISSION

Hunting or Fishing on Private Lands Is a Privilege — Not a Right

DO NOT ABUSE IT

HUNTING WITHOUT PERMISSION

NO VEHICLES ALLOWED

Beyond This Sign

THE LANDHOLDER — IT TAKES ALL THREE — THE SPORTSMAN — GAME DEPARTMENT

Hunting or Fishing on Private Lands Is a Privilege — Not a Right

Farmer-Sportsman Plan

The organization and budget of the Game Department permitted the establishment of a Farmer-Sportsman program as outlined below. The program was flexible so that it could easily be adapted to meet changing conditions. It called for:

(1) Administration by the Game Commission, executed by the Game Department through the Education and Information division. The Farmer-Sportsman Relations council would participate in an advisory capacity with the thought of bringing the program closer to the grass roots. There was no doubt that if any degree of success was to be obtained, active support of all interested farmer and sportsman groups must be maintained.

(2) Appointment of a field supervisor of Farmer-Sportsman relations, whose duties would be to actively promote the program in the field, to attend sports and farm group meetings regularly, particularly in trouble areas, and to devote a considerable portion of his time to explaining the policies and programs of the Game Commission and Game Department as they were related to and concerned with particular farm problems.

(3) In each of Washington's 11 supervisory districts, a Farmer-Sportsman representative would be named whose duties were, in addition to his regular field activities, to assign tasks of a seasonal nature in connection with the program and meet with sports groups and other organizations in achieving Farmer-Sportsman understanding.

(4) Game Department personnel, within the limitations imposed by the performance of their regular duties, to contact landholders who display "No Trespassing" signs and solicit a change-over to "Hunting by Permission" signs. No effort was to be made to solicit any landholder then permitting unrestricted hunting on his property. At the time of contact, a definite agreement would be signed listing acreages open to "Hunting by Permission" and amount of land to be closed to protect life and property.

(5) Publicity and education to be handled through the Education and Information division through routine releases mailed from the main office and channeled through district representatives.

(6) Coordination of all activities of the program through the Farmer-Sportsman Relations council with advice and support obtained from all interested agencies.

Results

The plan was accepted and put into operation in the fall of 1950. Final tabulations for that year revealed that 490,000 acres were opened to hunting that had been previously closed. Many of these acres had been posted with "No Trespassing" signs for 20 years. Ninety-five percent, or 924 farmers, who were contacted participated in the program.

Random checks conducted by Department personnel throughout Washington state and replies from questionnaires mailed to all participating landholders expressed approval and enthusiasm for the program. Results of the 1951 season were similar to those of the previous year with 1,324 landholders participating and 758,619 acres opened to hunting.

These two years of Farmer-Sportsman activity received the commendation of sportsmen and landholders. In 1952 an effort was made to create greater enthusiasm and reaffirm farmer support through various publicity activities. Billboards, depicting Farmer-Sportsman relations, were posted throughout the state and were quite effective in restimulating interest. The

success of the 1952 season was almost the same as that of 1951, 1,114 landholders participated opening up 648,785 acres to hunting.

Four signs now form the basis of the program. They are:

(1) Red "No Hunting Beyond This Sign" for posting in critical areas where the farmer's life and property are endangered.

(2) Black "Hunting by Permission" designed to give hunters land to hunt for the asking while at the same time allowing farmers to know who is using their property.

(3) Green "Hunting Without Permission" added to the program for the first time in 1952 at the request of landholders who wanted to participate but did not want to be bothered with hunters requesting permission.

(4) Black and green "Hunting Without Permission; No Vehicles Allowed," the newest sign, used by landholders who were willing to allow hunting on their property but who objected to the indiscriminate use of vehicles on their land.

Objectives

The objective of the Farmer-Sportsman program has been primarily to maintain free hunting for upland game birds. This does not mean that similar problems in other phases of hunting or fishing are being ignored but rather that emphasis has been placed on critical bird areas.

Major problems involved in the program are those of educating the sporting public to its responsibilities and persuading the majority of the landholders to cooperate. It differs from most Department activities since it demands cooperation and joint responsibility from three basic groups—landholders, sportsmen and wildlife managers. However, it is the obligation of the Game Department to continually stimulate the interest of the landholder and the sportsman and to perform all of the field work in connection with the program. It is time to realize that the magnitude of this problem is directly related to the consideration it receives from wildlife administrators.

The step taken by the Game Department was a logical one brought about by the interest taken by representatives of all of those concerned. The development of a definite state-wide program to deal with the Farmer-Sportsman relations question will cultivate a relationship with each group to the mutual benefit of all concerned and to the advancement of wildlife management.

RESEARCH—THE BASIS OF MANAGEMENT PRACTICES

Research is an awesome word from which the layman usually shies away. This should not be the case since essentially it is a state of mind—a friendly attitude toward change. Research for the practical man is an effort to do things better and not be caught asleep at the switch. It is the thinking of tomorrow instead of yesterday.

Facts from unprejudiced sources are needed by game administrators if they are to be on safe ground in recommending major changes in game programs. It is human nature to dislike change but progress depends upon constantly adjusting programs to current situations based on knowledge.

Biological research falls into two categories—that aimed at gaining information on game population fluctuations and detailed studies of specific problems. Since 1933, the Department has carried on approximately 100 research projects, executing some of them alone and the rest in conjunction with in-

Fawn tagging carried on by Department biologists has helped to determine the effects of the state's game management program.

Experiments on black-tailed at the Clemons Tree Farm have given the Department the answers to important game management questions and have helped to determine the effects of present-day forestry practices in relation to deer herds.

stitutions of higher learning and other state and federal agencies. These projects deal with all phases of Department activities from the habitat requirements of the chukar partridge to the economic importance of recreational fishing and hunting in the state of Washington.

District game biologists daily study game populations so the Game Commission will at all times have accurate information on field conditions and thus be able to keep game programs in accord with ever-changing conditions.

Clemons Tree Farm

Black-tail deer project—Experiments on the Western Washington blacktail deer have been in progress on the Clemons Tree Farm, Elma, Washington, since July, 1949. As part of the over-all game research program, these experiments have provided the Department with answers to such questions as: the number of deer per section of land, amount of food in the section available to deer, condition of winter ranges and principal Western Washington browse species that will adequately support deer during critical wintering periods. In addition, it has helped to determine the effects of present day forestry practices in relation to deer herds and supplied practical information as to how many animals should be harvested to keep the herds at their healthiest, highest productive capacity.

Theoretically, a deer herd can reproduce one-third of its population in a single season. This, of course, is under ideal conditions. Since such ideal conditions have never existed and probably never will, it behooves us to accept the conditions as they exist, try to improve upon them in the most beneficial manner and thereby maintain deer production at the nearest point of their potential reproductive capabilities.

Studies on the Clemons Tree Farm have shown that in order to maintain such a production level, harvests must be allowed that will keep populations within the carrying capacities of the range, insuring a nutritionally healthy deer herd. The first fawn tagging work in the spring of 1950 showed the average fawn weight at 8.3 pounds. The fawn tagging of 1951 and 1952 showed a marked increase in their average weight, jumping to 9.7 in 1951 and 10.3 in 1952. This already indicated that the either sex harvests on the Clemons Tree Farm for those years definitely affected the condition of the deer herds.

Other Projects

With the exception of the Clemons Tree Farm, all of the Department's research projects are managed on a state-wide basis. Range surveys, waterfowl and upland bird projects (which include the chukar partridge) have been set up in key areas producing a particular species of game bird or animal.

Range Surveys—The Game Department's state-wide range surveys have shown that in order to maintain maximum deer herds in Washington, game populations must be brought in balance with range carrying capacity. Periodic checks are made throughout the state by biologists in order to determine the amount of browse available in the state, how extensively each species is used and how this utilization has affected the growth of the plant. By uncovering these facts, the Department has discovered that the supply of game is dependent entirely upon the available food supply. Present game management programs are based upon this principle. Whenever game men find that the game populations are out of proportion to available and palatable browse species, the hunting seasons are set in such a way as to crop the excess game and bring the herds in balance with the available food supply.

Research projects provide the vital information necessary in the development of the game management program. (Above) A blood sample is taken from geese in the Columbia Basin area as part of the extensive studies being conducted on Washington's ***waterfowl populations. (Below) An elk is trapped, tagged and released in an effort to find out more about the state's big game herds.***

Waterfowl—Waterfowl biologists in making their annual surveys have been able to study migration patterns, nesting areas for resident species and methods for improving habitat. Exemplifying the state-wide coverage of the three major flyways within the state of Washington are the projects on Lake Terrell, Whatcom county; the Skagit Flats, Skagit county; Byron and Giffin ponds in Yakima county; Lake Stratford and the Potholes Reservoir in the Columbia Basin and areas in Spokane, Lincoln and Whitman counties.

Upland Birds—Differing from the management of waterfowl populations, the Chinese pheasant has been aided through the artificial rearing program on the state's ten game farms. Realizing that birds raised through such a program act only as insurance against a possible depletion in wild broodstock, research in the field of upland bird management has added greatly towards stabilizing the state's bird populations. Primarily concerned with the loss of habitat due to the encroachment of intensified agricultural activity in the past 20 years, the Department has developed several programs whereby bird areas can be reclaimed.

Fisheries—Research led to the present lake rehabilitation, steelhead and hatchery programs which have been so important in the development of Washington's well-rounded fishing recreation. The Game Department's staff of fisheries biologists and hatchery men have various tools to help them in their investigations. Punchcards and catch records are two of the major factors contributing to the success of the fisheries program. Through information compiled from these statistics, the Fishery Management division is able to determine what waters are producing up to their capacity and which ones need added attention in order to bring them in line with their capabilities. This information has been used in deciding what lakes need rehabilitation and how many fish should be planted in a given water. A large measure of the credit for the improvement of steelhead fishing in recent years must be attributed to the data compiled from the steelhead punchcards.

The general functioning of all of the other divisions of the Department and the everyday work involved in providing hunting and fishing for the state's sportsmen have been facilitated through investigation and study. Each year more facts are available allowing the Game Commission to establish more exacting management practices to perpetuate the species and provide for the recreational enjoyment today and generations yet to come.

GAME LAW ENFORCEMENT

Game law enforcement is the oldest and perhaps the best known form of wildlife management. It is the foundation of the extensive wildlife program of today. A moment's thought would bring the realization that all other efforts toward game management would be wasted if Washington did not have an effective enforcement division.

Land development, game and fish discoveries would be valueless if sportsmen were allowed to run rampant on the state's wildlife resources. Some of Washington's many advancements would be impossible without the watchguard of our game heritage. The much talked about steelhead program would still be a dream if fishermen were allowed to take this migratory fish the year around; elk, deer and bird populations would become dangerously low if a person could take a shot at will 365 days out of the year. Such practices may have been all right a hundred years ago, but increased human populations make them impossible today.

In heralding advancements in fish and game management, the protection force is sometimes neglected, but just as much progress has been made in this field as in any other form of wildlife management. The modern conservation officers of today could hardly be recognized as the men who enforced the game laws of the past. They are, in every sense, true game management agents and representatives of the Department whose work brings them in contact with the public. In Washington, protectors contact 27 per cent of the license holders annually. Theoretically speaking, every fourth year they have made contact with every sportsman. The public, to a very considerable degree, formulates its opinion of the effectiveness of the entire organization by its impression of these men.

The protector has as his first goal the prevention of crimes, and secondly, the apprehension of violators. Although law enforcement is still the most important part of the protector's work, it is not by any means his only duty. He must be in a position to know and to closely evaluate the wildlife resources of the area he patrols. He is looked upon as the person who has an intelligent day-to-day knowledge of affairs in his district and as one who can supply the Game Department with valuable information upon which an effective game and fish program can be built. As a public relations man, he is in an unsurpassed position to pass on to license holders constructive and concrete information on the work of the Department.

Increased Efficiency

Through improved techniques and strict methods of selection, the efficiency of the enforcement division has increased to such an extent that today with the sportsmen's population nearly three times that of 1933, only 40 more protectors have been added to the Department's protection force.

The protector of 1933 was a game warden, and nothing more, with arrests his principal function. Today he is a technician, answer man and enforcement officer. Checking licenses and seeing to it that a person doesn't get more than his share of the state's game isn't all of his work. He plants fish and birds, traps and pelts beaver, contacts farmers and sportsmen, makes regular visits to his local newspaper and radio station and investigates damage complaints. All activities of the Game Department touch him in some way. In addition, he must be schooled in the principles of First Aid, ready to apply them in any emergency.

The airplane has proved a valuable asset in game law enforcement.

Game protectors are carefully selected after a rigorous orientation course designed to acquaint them with all phases of their duties and the Department's program.

With all of these tasks to perform, it is important that great care be taken in the employing of Washington's game protectors. Modern and rigid methods of selection have been initiated. Game protection, like any other branch of enforcement, still has a great appeal to young men. Applications for employment are therefore many. Through examinations and appearances before a personnel board, only the very best men are chosen.

Even after this preliminary step, they cannot become bona fide protectors until they have proved themselves during a 6-month probationary period in the field and in class work covering all parts of their required duties. During this training, they are assigned to an experienced protector so that they may have the benefit of the type of knowledge and training which only can be derived from a seasoned individual.

Nearly every successful game organization is one which conducts annual training courses for all of its personnel. These are essential for progress and important to the employee. Here new techniques, the results of experiments and changed policies are brought to the attention of the individual. The Department has found this such a valuable adjunct to its program that the original protectors' school has been expanded to include all Department personnel. This type of training has helped to produce an alert and able conservation officer.

Modern Equipment Necessary

Even the most capable game protector would be valueless without the proper tools with which to work. If he is to maintain the respect and dignity necessary for an agency carrying out the laws of his state, it is imperative that he have at his disposal the modern facilities employed in law enforcement.

The first tool is his uniform which makes him easily recognizable and adds to the respect which is essential in good law enforcement. He must then be provided with adequate means of transportation and all appurtenant types of equipment which are necessary in the extensive field of activity in which he must engage. In line with these thoughts, the Department has tried to keep abreast of developments and mechanizations which today play an important part in effective enforcement programs.

Airplanes have proved to be important factors in the work of Washington's protection force. Night flying has brought about spectacular results in the apprehension of deer shiners. The radio has solved the problem of adequate communications. Eleven 2-way mobile radios were at the disposal of game protectors by the end of the last biennium and more will be added during the next 2-year period. Through the cooperation of the State Patrol, the Department was able to use one of its frequencies, facilitating the Department's enforcement and creating a close working agreement between the two agencies. Radios have been of great assistance in the prevention of violations and the apprehension of game law violators and would be of invaluable aid in the event of any state or national emergency.

Protectors today make their own plaster casts of tire marks and footprints which are taken to nearby laboratories for examination. As enforcement problems become more complex and new discoveries are made, a laboratory for performing ballistic studies and identifying evidence may become a necessity.

The protector must also work in cooperation with other enforcement agencies in order to provide for interchanges of equipment which can be used to supplement the Department's own activities. The Game Department is well aware of these improvements and needs and has been quick to provide them wherever necessary and desirable.

Summary

A successful wildlife program is a balanced one which gives equal consideration according to the needs of each branch of the work. None of these branches is more important than the enforcement division. The game officer to be effective must rely on other parts of the organization. They, in turn, to be effective must depend upon him. Careful attention is being given to all portions of management and personnel so that their work will be well coordinated.

The enforcement officer of today meets more people than any other Department representative. To an extent, sometimes forgotten, the public judges the Game Department on the basis of its impression of the man who checked his license or his bag limit. The protector is the key man in game organization and his work is an essential part of the progress made.

REPORT OF THE ENFORCEMENT DIVISION
ARRESTS AND CONVICTIONS

	April 1, 1951, to March 31, 1952		April 1, 1952, to March 31, 1953
Cases turned over to Other Authorities	4		1
Total number of Juvenile Cases	16		26
Total number of Convictions	1,904		2,165
Total number of Bail Forfeitures	552		723
Total number of Appeals	8		5
Total number of Acquittals, Dismissals	36		35
Totals	2,520		2,955
Big Game Cases	462		440
Game Fish Cases	972		1,143
"Loaded firearm in motor vehicle" or "Shooting from public highway" Cases	450		511
Migratory Waterfowl Cases	196		185
Food Fish Cases	19		31
Fur-bearing animals Cases, Trapping violations, etc.	29		21
Miscellaneous Game Cases	378		623
Miscellaneous Non-Game Cases	14		1
Totals	2,520		2,955
Jail Sentences Imposed	2,586 days		5,084 days
Jail Sentences Suspended	2,180 days		3,050 days
Jail Sentences Served	406 days		2,034 days

FINES

Total Fines Assessed	$124,646 75		$150,245 75	
Total Bail Forfeitures	7,450 45		14,222 25	
Totals		$132,097 20		$164,468 00
Total Fines Suspended	$34,476 75		$45,506 70	
Total Fines Served in Jail	3,682 00		4,850 75	
Totals		$38,138 75		$50,447 45
Total Fines and Bail Forfeitures Collectible		$93,958 45*		$114,020 55*
One-half Due State Game Fund		$46,979 23		$57,010 28
Fines Unpaid to Date		3,541 01		10,683 27
Amount Credited Game Fund		$43,438 22		$46,327 01

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

FINES COLLECTED AND REMITTED TO STATE TREASURER
Credited—Game Fund

COUNTIES	1948		1949		1950		1951		1952	
	Number of Arrests	Amount Credited Game Fund	Number of Arrests	Amount Credited Game Fund	Number of Arrests	Amount Credited Game Fund	Number of Arrests	Amount Credited Game Fund	Number of Arrests	Amount Credited Game Fund
Adams	3	$17 50	15	$148 00	13	855 00	7	$71 25	11	$71 25
Asotin	28	593 50	47	518 50	33	642 50	25	731 25	39	833 50
Benton	52	463 10	33	195 00	19	111 25	24	137 50	39	208 75
Chelan	152	1,918 75	183	2,387 62	294	7,428 25	103	3,955 62	132	1,826 24
Clallam	38	690 25	25	249 60	58	1,282 50	87	2,187 25	64	2,305 00
Clark	79	1,558 50	72	809 75	68	472 50	77	1,475 00	72	950 75
Columbia	15	95 00	13	360 75	31	449 87	20	285 87	28	517 50
Cowlitz	81	615 00	103	1,456 75	120	974 25	160	1,377 60	118	1,004 75
Douglas	12	120 00	37	346 25	14	93 50	10	105 00	15	170 13
Ferry	17	561 25	57	1,240 25	49	946 25	47	525 00	53	655 76
Franklin	5	48 75	3	41 25	5	21 25	26	135 00	7	35 00
Garfield	9	20 00	31	256 37	17	441 75	11	294 36	12	235 00
Grant	40	297 50	83	1,003 55	58	545 00	64	463 01	93	823 24
Grays Harbor	65	976 62	121	2,538 98	125	1,801 37	161	3,436 38	205	4,179 60
Island	29	296 25	48	817 40	32	177 65	14	285 00	31	392 00
Jefferson	23	597 00	16	243 75	11	23 75	28	344 00	54	786 14
King	296	2,236 34	334	4,095 05	308	3,196 87	293	3,225 45	367	4,384 48
Kitsap	18	605 00	16	182 50	12	87 50	11	98 75	27	411 51
Kittitas	82	1,600 24	85	1,733 80	66	1,042 25	72	992 75	54	2,220 25
Klickitat	23	617 24	31	455 75	45	743 00	56	550 00	47	1,214 00
Lewis	54	814 50	73	1,401 25	66	1,518 70	55	1,425 40	87	2,753 60
Lincoln	9	91 25	37	180 75	13	67 50	19	132 50	44	571 75
Mason	40	593 75	47	307 50	39	321 50	35	668 25	75	1,553 37
Okanogan	114	1,208 50	190	2,823 00	123	1,549 00	103	1,688 75	119	1,446 75
Pacific	57	1,121 25	35	750 51	63	1,184 14	38	1,564 50	63	1,098 00
Pend Oreille	74	1,837 50	51	485 50	87	993 75	76	1,570 25	32	526 50
Pierce	130	2,184 37	177	3,415 14	155	2,720 38	146	1,276 11	154	1,711 63
San Juan	4	15 00	5	124 45	5	30 00	13	265 00	7	20 00
Skagit	71	775 75	92	477 78	94	659 50	60	617 00	99	1,008 50
Skamania	69	940 51	33	519 00	27	377 50	35	314 75	44	1,165 50
Snohomish	181	2,275 01	151	2,269 09	136	1,737 52	96	2,036 50	219	3,586 98
Spokane	69	1,152 00	71	1,938 75	61	1,144 25	85	1,765 00	83	1,075 38
Stevens	29	913 75	47	433 00	113	1,630 75	79	1,032 50	89	1,621 45
Thurston	42	472 50	38	708 75	23	559 50	37	929 00	41	949 75
Wahkiakum	5	83 75	4	265 00	13	227 50	11	55 00	8	56 00
Walla Walla	32	953 00	33	114 75	45	216 75	31	352 25	36	423 50
Whatcom	86	998 75	60	481 14	76	598 37	44	387 95	53	439 88
Whitman	9	75 00	41	270 38	32	167 50	11	40 00	22	248 75
Yakima	162	2,171 34	268	3,236 69	260	2,361 06	250	6,711 38	192	2,536 87
Totals	2,304	$32,695 27	2,826	$39,888 46	2,739	$38,561 43	2,529	$43,438 22	2,955	$46,327 01

These figures indicate amount credited to Game Fund. A like amount was credited to the county in which the arrest was made.

FUR RESOURCES

Of all the mammals, with the exception of man, beaver have brought about the most extensive changes in Washington. The beaver has had an uphill struggle in his fight for survival. No other animal has had such a colorful biography or has contributed so much to the history of America.

Early settlers were drawn to the Pacific Northwest because of the value of the fur trade, primarily on beaver, and this trade was one of the most valued economic assets of the territory. Fortunes were made and lost because of the beaver. Though their numbers seemed inexhaustible, beaver were easy prey for the trapper and by 1913, they were near the point of extinction. At this time, the taking of this animal for fur was prohibited and the management of beaver administered by each separate county.

The state assumed control of beaver in 1933 and at that time embarked upon a program to manage them, as every resource should be, to the best advantage of the people of the state. Valuable as a fur bearer, beaver are also an intrinsic part of our water resources. In their efforts to create ponds for their very existence, they have far reaching effects upon the ecology of the land which they inhabit. It has been said that these animals conserve more water—water vital to agricultural needs and fish resources—than all the man-made dams in the state.

Beaver Program

Under the management plan adopted by the Game Department, the indirect value of beaver is recognized as one of the primary objectives along with the regulated harvest of surplus animals. It is the Game Department's job to see that the proper number of beaver are maintained in suitable areas in order that their secondary benefits may be perpetuated and the natural increase harvested, leaving adequate broodstock to assure the animal's future protection and propagation.

This instinct that causes the beaver to store water for his own and man's use also causes him to build dams which at times result in damage to man's interests. In such cases, all beaver can be removed from the damage area; however, in most instances, the state enters into an agreement with landowners who have the beaver on their property to maintain a certain supply for broodstock purposes and to permit Department personnel to trap and pelt the surplus at the proper time.

The property owner receives 40 per cent of the pelt value and the Department the remainder which approximately equals the cost of administering the program. As beaver are prolific (they normally double their numbers each year), such a management system provides the farmer with monetary remuneration for any inconveniences suffered through having beaver on his land while the residents of the state obtain maximum benefit from maintaining the largest possible beaver population. Currently, there are over 2,000 landowners participating in this program with some 4,500 beaver trapped annually on their land.

If the damage to property is excessive during the summer months when the fur is of no value, state employees take the beaver in live traps and transport them to some new location where they cannot cause further trouble.

Many beaver are found on state and federally controlled lands and are under the direct jurisdiction of the Department. These animals are watched carefully to keep them in line with the available food supply. When they increase beyond this point, a closely regulated trapping program is put into effect by Department personnel, bringing the beaver in proper balance with their habitat. If allowed to increase without control, they, in some instances, destroy their own food source and move down into the agricultural areas causing damage to crops.

This operation of transplanting live beaver and pelting only surplus animals has rebuilt Washington's dwindling beaver population to one of the largest in the United States.

TABLE I

Contract Beaver

Year	*Agreements*	*Take*	*Owners' Reimbursement*
1951-1952	2,136	4,692	$23,366.16
1952-1953	2,350	4,530	25,866.30

Public Domain Beaver

Year	*Pelts*	*Revenue*
1951-1952	4,315	$48,092.21
1952-1953	4,267	58,050.17

Other Fur Bearers

The mink, otter, marten, muskrat and other fur bearers that comprise the group of small animals trapped for their pelts have never received the publicity given the more well-known beaver. Yet these animals provide some 2,000 trappers with fur worth over $222,000 annually.

Trapping is one of the oldest of Washington's enterprises and has contributed throughout the years in supplying a living for the professional trapper as well as recreation and extra money for the young, inexperienced trapper.

During the past 20 years, the Department of Game has carefully administered these animals through properly controlled seasons, the establishment of small refuges to assure an adequate breeding stock for next year's crop and strict enforcement of laws governing the individual trapper. According to records maintained by the Department, it is amazing to note that the take of these fur bearers has remained on a constant level year after year.

Since the 1938-1939 trapping season a report has been required of each trapper, showing the number and species of animals taken. This information, combined with yearly biological research, provides the Department with the knowledge to maintain the largest possible supply of small fur-bearers and, in turn, allow individual trappers to reap a maximum harvest.

FUR TAKE

YEAR	Licenses Sold	Muskrat	Mink	Otter	Raccoon	Skunk	Badger	Marten
1938-39	1,888	63,010	6,764	247	1,943	2,981	63	.....
1951-52	1,923	75,429	6,105	614	2,129	542	.....	1,498
1952-53	1,690	78,787	5,825	557	1,969	222	.....	888

GAME DAMAGE

The administration of the state's wildlife resources not only presents the problem of creating the largest possible supply of game for sportsmen, but also that of accepting the responsibility of game damage to agricultural interests.

In the early years of state control, the big game animal populations were below the carrying capacity of the ranges and, except in a few isolated instances, the destruction of agricultural crops by game was unknown. However, in the years to follow, elk and deer populations (the two game species primarily responsible for damage) were increased through seasons allowing the harvest of only male animals to the point that maximum carrying capacity of their habitat was reached and the surplus overflowed into agricultural and horticultural areas adjacent to their ranges.

By 1938 game damage was becoming a problem of grave concern to the Department and called for protective measures. During the winter months from 1938 to 1942, herding operations were carried on in an effort to discourage elk and deer from entering agricultural fields adjacent to the lower extremities of their winter range. Such activities did not solve the problem but under existing laws governing Department expenditures, they were the only aids that could be offered to property owners. In 1943, the State Legislature authorized the Commission to set aside funds for the construction of game proof fences and permitted the landholder to present claims to the legislature for payment of game damage suffered. In that year, claims totaling over $200,000 mainly for losses of fruit trees and hay crops in central and north central Washington were filed with the legislature. Since that date, the Department has provided materials for 166½ miles of elk and deer proof fences, and every effort is being made to alleviate game damage through preventive measures and proper game harvest.

It will not be possible to completely eliminate game damage, but through careful investigations, the landholder will receive fair settlement for game destruction and every reasonable effort will be made to prevent its recurrence.

The Game Commission was empowered by the legislature in 1949 to settle claims up to $1,000 thus allowing the immediate payment of almost all damage claims without the delay of one to two years between sessions of the legislature. In the biennial year of 1951-1953, the Commission reimbursed property owners $17,834.49, for the damages suffered, and $33,406.70 was spent on preventive damage controls for agricultural crops.

Game damage payments and control are integral parts of wildlife management. Most of our game species are found on or near agricultural lands, therefore it is imperative that the problems created by the presence of these animals receive fair consideration if Washington is to maintain maximum wildlife populations.

PREDATOR CONTROL

The game manager has the same basic responsibility as the farmer to minimize any interference with the production of his crop. Farmers spray their crops against insects; game managers must also act against predators which interfere with the production of the game crop.

Predators have been the subject of much debate in game management circles over the years. Some persons lean toward the "balance of nature" theory which is based on the premise that predators take only the weak and the crippled of animal herds, leaving the best of the species. Time and research have disproved the belief that predators are so selective since they usually take the animal or bird most readily accessible.

Among the most destructive predators found in Washington are the bobcat, red fox, cougar and coyote.

Bobcat—Bobcats, found throughout the state, are grayish brown with dark spots and in maturity range from 15 to 30 pounds in size. They are especially destructive to small animals and birds. Due to their wariness and the difficulty encountered in trapping them, bobcats are one of two animals which still carry a bounty. The bounty is $5.

Cougar—The largest and one of the most publicized predators is the cougar, which ranges in weight from 100 to 185 pounds. Because of their size and the fact that they inhabit the same forested areas where deer are found, cougars are especially harmful to the state's game herds. Their greatest concentration is on the Olympic Peninsula. This tan to brownish colored animal produces a litter of from one to six kittens. Wary, difficult to trap and always a fighter; the cougar is the only predator besides the bobcat which still attracts the true trapper. The successful cougar hunter gets a $75 bounty for each animal taken.

Red fox—One of the most productive animals of prey, the red fox, produces a litter of from five to seven pups. It is found principally in the lower portions of Western Washington, where it was introduced in 1920, increasing to such proportions that the Game Department was forced to classify it as a predator in 1944. Red fox are a special nemesis to game birds and domestic fowl. Game men find the remains of pheasants, ducks and domestic fowl in the dens of almost every fox they take. The species of fox found in the high mountainous areas of the Cascades are natives to the state and because of the value of their fur, no effort has been made to control them. The red fox, as its name would indicate, is a pale crimson in color. Smaller by comparison with other predatory animals, it ranges in size from 10 to 15 pounds.

Coyote—The coyote is the most damaging of all the predators due in part to the magnitude of his numbers and his wide distribution throughout the state. Coyotes produce a litter of from one to twelve pups. Readily adaptable to the civilized ways of man, they would increase to ominous proportions if left uncontrolled. The pale yellow to grayish colored coyote looks harmless, reaching a size of 25 pounds, but the deer and other game species which fall prey to it know otherwise.

The bounty on the coyote was removed in 1949 when it was found that greater success in removing this game foe could be obtained through hiring special trappers. Although the coyote bounty was in effect for 14 years, the number of coyotes on which the Department paid a bounty remained surprisingly constant and did not show the decline desired. A survey in 1948 revealed that the reason behind this fact was that persons were taking coyotes incidental to their other activities, principally hunters during the hunting seasons, individuals in the act of protecting their property or motorists who ran over them on the highway. There were just a few individuals who were encouraged to take coyotes for the reward.

Knowing this to be true and knowing also that in many instances coyotes were being brought into Washington from elsewhere for the purpose of collecting the bounty, the Department contacted other states which had discontinued bounty payments to determine the success of this move. When the findings of this survey coincided with their own theories on proper coyote control, the Game Commission decided against further payment of the coyote bounty in 1949.

In lieu of this, they employed some 22 salaried men on a full-time basis whose duties were to control all undesirable species that might be injurious to agriculture or game, to supplement the protection division, principally during the hunting season, and to be made available when emergencies existed in all phases of the game program. Under the present system, the Department now has employed a sufficient number of men to send them to any critical area on short notice, thus stopping predation often within a day or two.

It is the policy of the Game Department to control game depredation as completely as possible and to assist agriculturists in time of need. Since the bounty on coyotes was removed, these salaried men have taken the same number of animals as were taken under the bounty system. However, the unquestionable value lies in the fact that they were taken from areas where it was deemed the most benefit would be derived. The Department's goal was never to obtain the largest number of animals possible for its record, but rather to minimize the amount of depredation to game and agriculture. This applies to both ground and air predators.

Miscellaneous predators—Magpies, crows, skunks and weasels are found in all areas of the state and must be kept under control so that they will not become detrimental to small game.

Control Measures

The control of predators has been of particular value to the Department in the survival of game birds released from game farms. Prior to the planting of pheasants, the predator division goes to work clearing the area of ground and air varmints leaving it to the exclusive use of the planted birds.

Helping out the staff in the removal of unwanted animals and birds since 1950 has been the introduction of sodium fluoracetate, commonly called Compound 1080. This new chemical was first used experimentally in Okanogan county. Since that initial attempt and subsequent trials were so successful, 1080 has been used extensively throughout Eastern Washington. The Department has accepted this modern warfare on predators as the best solution yet in combatting the predator population. It has been found that one application of the compound has reduced predators about 75 per cent.

The Department's declaration of war on unwanted predators will continue in line with its aim, not to completely exterminate them, but rather to control their depredatory effect on the state's game and agricultural resources.

RECAPITULATION OF BOUNTIES PAID

	Bounty Paid	April 1, 1951, to March 31, 1952		April 1, 1952, to March 31, 1953		TOTAL	
		Number	Amount	Number	Amount	Number	Amount
Bobcats	$5 00	801	$4,005 00	1,169	$5,845 00	1,970	$9,850 00
Cougars	75 00	132	9,900 00	116	8,700 00	248	18,600 00
Magpies	10	7,055	705 50	6,647	664 70	13,702	1,370 20
Crows	10	1,725	172 50	1,076	107 60	2,801	280 10
Ravens	10	1	10	3	30	4	40
Totals			$14,783 10		$15,317 60		$30,100 70

PREDATORS TAKEN BY DEPARTMENT PERSONNEL

	April 1, 1951 to March 31, 1952	*April 1, 1952 to March 31, 1953*	*Total*
Coyotes	3,384	1,582	4,966
Bobcats	283	167	450
Cougars	10	7	17
Magpies	13,916	14,817	28,733
Crows and Ravens	4,285	2,756	7,041
Coyotes taken by commissioned hunters	217	222	439

EDUCATION AND INFORMATION DIVISION

In the early days of the Department, news releases and the biennial report were its only means of reaching the public. The realization that came in the 1940's that talking about your activities is part of doing them brought the Education and Information division as one of the Department's eight arms of administration in 1948.

The Education and Information division has various media for disseminating news and a variety of educational materials. Its Education Representatives travel throughout the state during the winter months presenting lectures and films to give sportsmen a chance to learn of the Department's policies and air their dissenting views. Other members of the office force and field staff also contributed a great deal during these talking tours. The Department's seven films have been viewed by over a million persons during the past two years, including television audiences all over the country. Limited by funds from adding films, the Department has two which are partially complete—one on waterfowl and another on range research which should be ready for viewing during the next biennium.

Publications

An average of three news releases a week is sent out to most of the state's newspapers and radio stations. Game coverage, long relegated to last place in some of the state's sports pages, has been increasing steadily.

News-wise, special articles have also been provided for rotogravure sections, Sunday supplements and some of the smaller magazines in the country. Larger periodicals often request and obtain materials and photographs for the preparation of their own articles.

Increasing steadily in circulation is the Department's quarterly GAME BULLETIN. The publication of this printed 8 to 12-page magazine was started in 1949 with a circulation of 2,500. Today, approximately 16,000 receive the bulletin, free of charge, in January, April, July and October with circulation increasing at the rate of more than 500 an issue.

Among other publications, the NEWSLETTER, a mimeographed summary of the Department's policies and activities, is distributed bi-monthly to Department personnel.

Final editing of the Department's biennial reports, progress reports and biological bulletins is also handled by this Division.

Educational Programs

Teachers workshops, Four-H camps and an Annual School Lecture Program comprise the Department's educational activities. The latter is the most far-reaching, taking in more than 54,000 students during the 1951-53 period.

From January through April of each year, game protectors, biologists, education representatives and game protectors present a lecture and show a film on some phase of game or fish management. In 1952, 26,000 students saw the program "Your Wildlife Heritage" and learned their part in the over-all game program of Washington.

Veering somewhat from the regular course of game and fish lectures, in 1953 the series was turned over to a study of hunting safety. Members of the Department's Enforcement and Education and Information divisions presented the tenets of hunting safety and proper firearm usage to 28,000 students in over 150 schools throughout the state. To help bring home the points of the lecture, the Department was privileged to have the Sporting Arms and Am-

Students all over Washington learn the meaning of game and fish management through an annual school lecture program.

munition Manufacturers' Institute's fine film SHOOTING SAFETY. This program received national recognition through that organization's publicity division.

The Department continued its participation in 4-H camps during the biennium. Carrying out the principle of learning by doing, education representatives presented classes in game identification, firearm safety, pheasant rearing, etc.

Educational activities are not completely centered on youngsters. The Department sends a representative to the teachers' workshops put on annually by the Superintendent of Public Instruction. Here, teachers are given an idea on the importance of and methods for instructing their students in the fundamentals of Washington's wildlife resources.

Information Material

Mimeographed and printed materials on the game and fish resources of Washington are mailed out upon request to students, teachers and interested sportsmen. During the last biennium, over 5,000 persons made use of this service.

In addition, printed literature was distributed at checking stations during the fall hunting seasons. Hunters, using the Yakima and Blue Mountain areas, were given a printed sheet on the history of the elk herd and prospects for those regions.

Fairs and Exhibits

Unable to fulfill all requests to participate in sportsmen's shows and fairs, the Department has been forced to limit its exhibits to four fairs and sports-

men's shows which are representative of the entire state. Displays are put on at the Centralia, Puyallup and Yakima fairs and the Spokane Sportsmen's show. Exhibit materials consist of animals (fox, coyote, bear, etc.), fish species and picture boards of Department activities.

The Department also participates indirectly in other fairs and sportsmen's shows through picture displays.

Complete coverage of the Department's activities and the dissemination of information to every person interested in our wildlife resource is a job that is never finished. However, it is sincerely hoped that through the Education and Information division, the Department has been able to present to the general public a complete and accurate picture of Washington's game and fisheries program.

ENGINEERING AND CONSTRUCTION

Development and maintenance of the Game Department's trout hatcheries, game ranges and game farms during the past two decades have of necessity been geared toward keeping them in step with the strides made in game and fishery management. Some of these strides, in fact, would have been difficult, if not impossible, without the modern machinery placed at the disposal of game and fish managers.

The Department's Engineering and Construction division has been charged with the task of designing, constructing and maintaining the Department's $15 million worth of installations and equipment. This division has been a must in the progress of the Game Department. It would have been impractical and expensive to call upon outside help every time a hatchery pond sprung a leak or there was painting to be done.

Only ten of the hatcheries and four of the game farms turned over to the Game Department in 1933 are standing today, and all of those have felt the touch of modern improvements. The fourteen hatcheries and six game farms constructed during this era of state administration are permanent structures, designed to stand the wear of time so they can be turned over to future generations. This does not mean that they will be left as is until their equipment becomes obsolete. With its own Engineering and Construction division, the Department can apply a face-lifting whenever and wherever necessary to make sure that these fish and game "factories" will keep abreast of the changing times.

Hatcheries constructed during the last 20 years have been: Aberdeen, Bellingham, Arlington, Chelan, Spokane, Ford, Mossyrock, Shelton, Puyallup, Omak, Tucannon, Goldendale, Yakima and Vancouver. The six game farms added were: Kennewick, Lewis County, Spokane, Ellensburg, Whidby Island and Methow.

Game ranges have also been maintained by the Department's construction crews. Since 1933, range headquarters have been constructed on the Sinlahekin, Oak Creek, Wooten and Methow game ranges and other improvements have kept them at their peak of efficiency. This division has also completed the facilities on the state's 95 developed public fishing areas.

Contributions made by the Engineering division can be seen in the more tangible assets of a new hatchery building and a fresh coat of paint on a game superintendents residence, but they are also felt, though less visibly, in the record production of a trout hatchery or a game farm where smooth-running, well-equipped installations play such a major part.

During the past 20 years, the Department's Engineering division has constructed modern trout hatcheries such as this one at Omak.

Construction Highlights

Highlights during the first 20 years of construction are listed below by biennium:

January 25, 1933 to March 31, 1934:

Operation of hatcheries and farms taken over from the counties began.

April 1, 1934 to March 31, 1936:

The following construction projects were completed during this period: Kennewick Game Farm; Bellingham, Aberdeen, Spokane, and Chelan Hatcheries.

April 1, 1936 to March 31, 1938:

Hatcheries were constructed at Yakima and Vancouver.

April 1, 1938 to March 31, 1940:

A hatchery was constructed at Goldendale.

April 1, 1940 to March 31, 1942:

Arlington, Ford, and Mossyrock Hatcheries were constructed during this period. Also, development began on Sinlahekin, Oak Creek, Squaw Creek, Tucannon, and Methow Game Ranges.

April 1, 1942 to March 31, 1944:

No report of progress was made on this period because of World War II.

April 1, 1944 to March 31, 1946:

Construction of Lewis County, Spokane, and Methow Game Farms.

April 1, 1946 to March 31, 1948:

The following new buildings were constructed: Shelton and Puyallup Hatcheries; Ellensburg and Whidby Island Game Farms; and main office building in Seattle.

Construction Highlights—Continued

April 1, 1949 to March 31, 1951:

Colville Hatchery was rebuilt, and new hatcheries were constructed at Omak and Tucannon. Game Range Headquarters were built at Oak Creek, Wooten, and Methow.

April 1, 1951 to March 31, 1953:

Moved Yakima Game Farm to Mabton and greatly enlarged its facilities. Built new incubator and egg storage building at Kennewick Game Farm. Hatcheries: Built new dam and three raceways at Tokul Creek, new hatchery building at Pend Oreille, cold storage building at Chelan, and superintendent's residences at Aberdeen and Naches Hatcheries. Game Ranges: Constructed new diversion dam and irrigation system at Sherman Creek. Dingell-Johnson projects: Constructed Little Pend Oreille Lakes Dam and Revolving screen structure at outlet of Shoecraft Lake.

A BUSINESS BASIS

Operating on the same basis as any large private business institution, the Department's methods of buying and budgeting are constantly adapted to economic changes. As the problems of game and fisheries management became more complex and necessarily led to the expansion of the Department, the problems in purchasing and budget were likewise affected.

For example, records show that in the first year of state administration ending March 31, 1934, 750 orders totaling $170,047 were written by the Game Department. In the 1952-53 fiscal year just completed, it took 7,900 orders aggregating $1,980,759 to conduct the Department's business.

It is interesting to note that although the Game Department is a branch of our state government, it is not supported by any part of Washington tax

State Game Commission main office building, Seattle, Washington.

monies. A self-supporting organization, it derives its major revenue (over 80 per cent) from the sale of hunting and fishing licenses, the remainder coming from the collection of fines, sale of pelts and other miscellaneous items.

The Game Department is allowed considerable free rein in its budget for repairs and minor maintenance, but for equipment procurement and major repairs the mass buying power of the State Purchasing Department is utilized at a worthwhile saving. Tires, storage batteries, anti-freeze, paper goods and many other items are purchased for the Game Department and other state agencies and institutions in tremendous quantities, in many instances below prevailing wholesale prices.

With its 20,000 square feet of floor space, the Department building is complete and greatly increases operating efficiency. General supplies for all phases of Departmental work are bought in large quantities, stocked in the warehouse and shipped out to the field upon requisition. Before the building was completed in 1948, practically all supplies were bought upon request from the field. This meant higher prices because of the smaller quantities purchased per order, and the vast amount of paper work involved.

The automotive repair shop, made possible with the new building, filled a long felt need. It also effected a tremendous saving. Here major and minor truck and car repairs are made; fishway screens and other steel items prefabricated; boat trailers built and beds for new trucks constructed. Previously, all of this work was done in commercial shops.

A 1,000 gallon tank connected with the repair shop enables the Department to buy gasoline in bulk at about six cents per gallon under service station prices. Three large hauling trucks are equipped with extra saddle tanks which allow them to take on far larger quantities of this cheaper gas. An average of 1,200 gallons of gasoline is pumped per month. A small but complete woodworking shop rounds out the warehouse equipment.

With all these conveniences contributing toward a smooth-running and efficient headquarters, the Game Department is putting the money, previously expended for various commerial services, into other channels which directly benefit the hunting and fishing public.

The Office Staff

An institution operated on public funds is required to keep an accurate account of all revenues and expenditures passing through its hands and every act performed by its personnel. When that governmental body is also a separate entity, run somewhat like a business corporation, record keeping is even more essential. With so many shareholders to answer to (the Game Department has over 400,000 of them), reams of paper work are a necessity.

Only nine women were employed by the Department during its first biennium. They handled payment on vouchers, including salaries and wages, amounting to $351,000. Though the staff has scarcely more than tripled since then the work has increased 20-fold. Figures for the last biennium show that 36,551 vouchers were processed in the amount of $6,330,439.

Another clear indication of how the work has multiplied is the case of the receptionist. In the early days of the Department, she doubled as a stenographer and telephone girl. Today, she has her hands full answering more than 300 telephone calls a day during most of the year and up to 1,000 during the busy days of the hunting season.

Not so well known as the receptionist who is always in contact with the public are the other members of the office force who are somewhat behind-the-

scenes. Although their identity is not known, they help to keep the wheels turning—selling licenses, filling out orders, mimeographing reports, sorting mail, keeping records on all phases of the Department's activities, preparing and processing vouchers for payment and countless other tasks, large and small.

The work of the office force is coordinated by the Office Manager whose duties have correspondingly increased immeasureably since the early '30's. Classified as chief clerk in those days when she had only a small staff to oversee, her title has been changed to fit the duties of her position—seeing to it that the office staff is run as a well-knit unit.

Only a few of the 400,000 stockholders in the Game Department come in contact with this unseen force of the Department. Although they are somewhat anonymous, their efforts are felt in all phases of the Department's activities.

FINANCES

Since 1933, ten million hunting and fishing licenses have been sold to the residents of Washington. Each license holder has made a tangible contribution towards the furthering of the state's wildlife resources—a contribution that has allowed the Department of Game to initiate and develop management practices that have created one of the most successful game programs in the United States.

The last two decades found Washington wildlife populations faced with the most critical problems. During this period, the demand for fish and game became far greater than the supply that nature could produce making it necessary to boost nature's factory with a sound, realistic and scientific game program—a program that literally farms the game areas of the state and supplements wildlife populations with artificial propagation to produce game and fish where it may be taken in a reasonable quantity by the hunting and fishing public. This is the wildlife program of Washington—one that requires money to operate and maintain.

Hunting and fishing today can be compared to a manufacturing process. Raw materials, in the form of the labors of a skilled organization; the production of fish hatcheries, game farms, and game ranges; pheasant habitat and public hunting and fishing areas which assure the individual the right to take game and fish, are fed into the factory and the finished products that come out are the fish and game taken in the course of the game seasons. What the public gets is based primarily on what goes in as raw materials.

Sportsmen Provide Income

The Department of Game is completely self-supporting, operating on money obtained primarily from the sale of licenses. It is justifiably proud that over the past 20 years it has been able to effectively develop a sound game management program on income provided by the sportsmen of the state. The Game Department is not unlike other businesses therefore the production of wildlife is also directly affected by the economic situation of the nation. Fees established in 1933 for hunting and fishing could not produce the supply of fish and game demanded today. It has been gratifying that the sportsmen of the state have always been vitally interested in the workings of the Department. When dollar values declined, they have actually insisted that their own license fees be increased to provide sufficient money to operate an adequate game program.

The present cost of a game license is below the average of other states for similar privileges. Every effort has been made to keep the fee at a reasonable level so that all the state's residents can enjoy the benefits of the type of recreation offered by these outdoor sports.

Prior to 1933, each county collected its own revenues and developed its own artificial propagation program based on local demands. Only those counties endowed with a bountiful supply of game were able to bring in sufficient funds to develop adequate programs. The others, not so fortunate, were virtually at a stand-still. Legislative Initiative 62 passed in 1932 made it possible to combine these miscellaneous units into one well-organized administration, capable of obtaining maximum results from the state's wildlife resources. Today the Washington State Game Department is providing hunting and fishing pleasure for approximately a half million people which would have been impossible under the old system of county control. Sportsmen have reaped benefits not only through annual fish and game harvest through the years but now are mutual owners of $15 million in physical properties that are capable of producing hunting and fishing to satisfy today's needs and those of future generations.

The Game Department is operated financially like any private business. Its funds are received from license holders who expect full value from their money spent. Budgets are prepared on a biennial basis, starting on April 1 and ending two years later on March 31. It is a rather complex procedure as the Game Commission must interpret the needs of the Department nearly three years in advance, forecasting what future conditions and needs will require and what the revenues will be during this period. Then, they must equitably allocate funds to all the various functions of propagation, research, land acquisition and the other Department programs. Years ago, this was a comparatively simple matter as the Department's activities were basically fish and bird production but today it is a complex problem. The foundations of game administration are established through the correct apportionment of the budget to the various parts of the Department program.

Once the budget is prepared, the Game Commission conducts hearings throughout the state allowing representative sportsmen's groups to become thoroughly familiar with the proposed program and offer suggestions for inclusion in the final plans. The budget is then forwarded to the governor of the state who through his Director of the Budget reviews it and makes any changes believed necessary. The budget is then presented to the state legislature by the governor for consideration. In turn, the legislature may make changes and then it gives the final authorization for the expenditure of the funds. This authorization gives the Commission authority to spend the money in the manner shown in the budget if the Department earns and has available these funds proposed for expenditure during the period covered by the budget.

Principal Accounts

The Department's budget is divided into seven primary accounts. The two principal ones are (1) **Salaries and wages** covering all of the money paid to the Department's 350 full-time and more than 50 seasonal employees and (2) **Operations** consisting of all funds used in the operating requirements of the Department such as hatchery and game farm feed, lake rehabilitation, and all other Department activities which are not covered by the other accounts. The others are: (3) **Acquisition of lands** for use in obtaining lands for public hunting and fishing and game habitat areas; (4) **Payment of damages** used to

reimburse landholders for losses to their crops inflicted by game; (5) **Capital Outlay and Major Repairs** provides for the building of new installations such as a game or hatchery building and repairs to those already standing; (6) **Wildlife Restoration and Research** carried on in cooperation with the federal government which provides 75 per cent of the funds expended through the Pittman-Robertson fund, obtained from a national tax on sporting arms and ammunition, and (7) **Fish Restoration and Research** also paid for in part by the federal government from funds derived from the tax on fishing tackle.

Once funds are earmarked for one of these primary accounts, they cannot be transferred to another. For example, if there is money left over from operations, it cannot be used for wages. The Commission does have the power to use funds within an account for other functions under the same classification. However, they seldom exercise this right since an unforeseeable need for the money may arise before the 2-year budget period comes to an end. Should, for instance, the Department feel that they will have a surplus fund for hatchery feed in 1954 based on current prices and so transfer the money to game bird feed, it would be in a predicament if 1955 hatchery feed prices rose and there was no money available to pay for them.

Meting out money to various tasks is a difficult job, but the Commission through the Game Department tries to place the money where it will do the most good and where it will give the license holder the best returns for his money.

License Dealers

The middle men in the Department financial set-up are the 950 license dealers throughout Washington who sell the majority of the state's licenses. They are vital agents since it would be impossible for the Department to personally sell licenses to nearly half a million sportsmen.

The present system of license dealerships had to be arrived at through trial and error. The first five years of the Department's history saw the state trying and scrapping the County Auditor-Agent System and the Protector-Agent System. When the Department was formed in 1933, the administrative authority was vested in the Department of Licenses, and licenses were handled by the county auditors. The Department had no control over its revenues resulting in frequent conflicts in tracing expenditures and in collecting license fees. County auditors did not receive compensation for the work and in many instances were too busy to select enough agents to provide the necessary service adequate to accommodate the license buying public.

Because of the flaws in this system, the 1935 legislature placed the sale of licenses under Department control. The Director in turn placed the responsibility for finding agents on the shoulders of the game protectors. In that period, 39 game protectors were able to induce 744 agents to sell licenses. The high cost of servicing the dealers, who were frequently out of licenses whenever the public most needed them, and the extra burden placed on protectors brought about the use of the Mail Order System and the creation of the present License division in 1938.

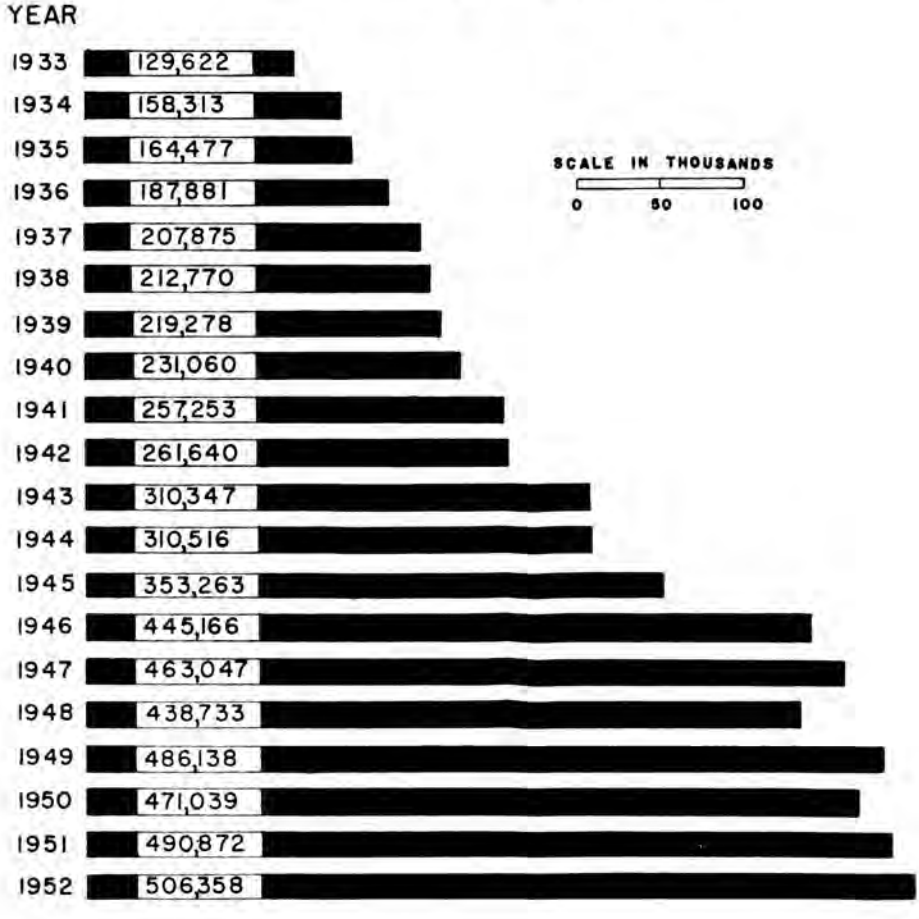
Under the Mail Order system, dealers are mailed licenses, deer tags, fishing and hunting regulations upon receipt of their requests by the License division. For their trouble, they receive a small fee for every license sold.

There are 950 license dealers working with the Game Department today. This number is more than adequate to supply the needs of the sporting public. Since the cost of operating the license division rises with each dealer, it is not economically sound to increase the number beyond this point.

The work of the license division was facilitated in 1950 when the Game Commission passed a regulation making it necessary for all license dealers to provide and pay for their own bond, assuring the Department of reliable dealerships. Money saved in payment of bonds and collecting the accounts of those dealers who proved a liability to the Department has made possible the installation of modern bookkeeping machines and the revision of the many old types of forms used in preparing reports to further streamline the license division.

The present system and machinery employed by the License division make it possible to more adequately serve the people at a lower cost per license. A comparison of the 20 years progress of the license division is given in the table below.

COMPARATIVE LICENSE SALES



SUMMARY OF RECEIPTS AND EXPENDITURES
(April 1, 1951 to March 31, 1953)

Game Fund Balance on Hand, March 31, 1951, Treasurer's Report		$ 820,139.16
REVENUES April 1, 1951 to March 31, 1953		5,905,329.15
Total		$6,725,468.31
EXPENDITURES April 1, 1951 to March 31, 1953	$6,330,439.08	
Warrants issued prior to March 31, 1951—paid during 1951-1953 biennium	522,747.37	6,853,186.45
BALANCE		**$—127,718.14**
Warrants issued and not cashed in 1951-1953 biennium		428,629.08
Cancelled warrants in biennium		455.62
GAME FUND balance on hand, March 31, 1953, Treasurers Report		$301,366.56

EXPENDITURES FROM STATE GAME FUND
(April 1, 1951 to March 31, 1953)

Code No.	*Appropriation*	*Expended for Biennium*
49-1	Salaries and Wages	$2,414,315.53
49-2	Operations	2,180,178.03
49-4	Payment of Game Animal Damages and Expenses	6,121.67
49-5	Wildlife Restoration and Research	636,782.65
49-6	Capital Outlays and Major Repairs	96,491.94
49-7	Acquisition of Lands for Public H & F Areas, Game Habitat Areas, Access Areas to Lakes and Streams and Other Purposes	488,325.15
49-8	Capital Outlays—Reappropriation	34,252.00
49-9	Wildlife Restoration and Research	410,946.65
49-10	Fish Restoration and Research	50,484.18
	Reliefs (damage claims)	11,712.82
	Deficiency	828.46
	Total Expenditures for Biennium	$6,330,439.08

COLLECTIONS BY DEPARTMENT OF GAME *Credited the State Game Fund*		*Number of Licenses Issued* *4/1/51-3/31/52*	 *4/1/52-3/31/53*	*Total Amount Collected* *4/1/51-3/31/52*	 *4/1/52-3/31/53*
State Resident Hunting and Fishing	@ $5.00	333,836	356,776	$1,669,180.00	$1,783,880.00
State Non-Resident Hunting and Fishing	@ 25.00	241	288	6,475.00	7,200.00
Recip. Oregon Hunting and Fishing	@ 65.00	5	13	390.00	845.00
Recip. Idaho Hunting and Fishing	@ 50.00	1	2	50.00	100.00
State Alien Hunting and Fishing	@ 25.00	7	2	175.00	50.00
State Non-Resident Game Bird	@ 15.00	134	118	1,905.00	1,770.00
Recip. Oregon Game Bird	@ 35.00	103	107	3,605.00	3,745.00
Recip. Idaho Game Bird	@ 20.00	109	103	2,180.00	2,060.00
State Resident Supplemental Elk	@ 5.00	51,490	44,263	262,905.00	221,315.00
State Non-Resident Supplemental Elk	@ 25.00	108	105	3,200.00	2,625.00
Recip. Oregon Non-Res. Suppl. Elk	@ 35.00	1	3	35.00	105.00
State Non-Resident Fishing	@ 10.00	582	849	5,820.00	8,490.00
Oregon Non-Resident Fishing	@ 15.00	1,781	2,485	25,935.00	37,275.00
State 10-Day Non-Resident Fishing	@ 1.50	14,628	18,257	21,799.50	27,385.50
Oregon 10-Day Non-Resident Fishing	@ 5.00	1,378	1,534	6,870.00	7,670.00
Idaho 10-Day Non-Resident Fishing	@ 3.00	854	946	2,532.00	2,838.00
Game Farm—New	@ 20.00	26	32	520.00	640.00
Renewal	@ 10.00	73	92	730.00	920.00
Importers —New	@ 20.00	3	4	60.00	80.00
Renewal	@ 10.00	7	7	70.00	70.00
State Fur Dealer	@ 10.00	56	43	560.00	430.00
State Taxidermist	@ 5.00	18	19	90.00	95.00
State Trapping	@ 5.00	1,922	1,691	9,615.00	8,455.00
Duplicate Licenses	@ .50	1,894	2,084	947.00	1,042.00
County Resident Hunting and Fishing	@ 2.50	83,554	84,642	208,757.50	211,605.00
County Alien Fishing	@ 5.00	87	105	435.00	525.00
Total Game Licenses Sold	.....	492,898	514,570	$2,234,841.00	$2,331,215.50
Big Game Seals	@ .50	229,012	244,936	114,731.50	122,468.00
Total Receipts from Licenses and Seals	.....	721,910	759,506	$2,349,572.50	$2,453,683.50

COLLECTIONS BY DEPARTMENT OF GAME Credited the State Game Fund	Number of Licenses Issued 4/1/51-3/31/52	 4/1/52-3/31/53	Total Amount Collected 4/1/51-3/31/52	 4/1/52-3/31/53
Fines Collected	.....	.....	$43,438.22	$46,327.01
Sale of Importers Fish Tags	.....	.....	16.25	125.00
Tagging Game, Game Fish and Furs	.....	.....	1,412.75	1,499.65
Sale of Pelts and Skins	.....	.....	82,327.49	138,070.93
Sale of Domestic Poultry	.....	.....	9,844.76	6,364.92
Contest Permit Fees	.....	.....	27.00	31.00
Lease of Land	.....	.....	102.95	2,545.35
Rental of Residences	.....	.....	1,033.00	1,349.00
Payment Cooperative Agreement	.....	.....	.....	750.00
Partial and Payment of Land Under Condemnation—Squaw—U. S. Army	.....	.....	110.40	50,040.00
Deposit on Plans and Specifications	.....	.....	10.00	.....
Claim Settlements	.....	.....	.....	99.44
Federal Aid (75% reimbursed)	.....	.....	360,905.14	330,008.76
Sale of State Property	.....	.....	3,803.50	1,439.80
Sale of Salvaged Material	.....	.....	909.93	812.73
Sale of Confiscated Material	.....	.....	51.40	3,453.75
Miscellaneous	.....	.....	359.88	.....
Refunds	.....	.....	1,424.08	2,573.86
Deposit Interest	.....	.....	4,927.27	5,877.93
Total Revenues	.....	.....	$2,860,276.52	$3,045,052.63
				2,860,276.52
Total Revenues for Biennial Period—April 1, 1951-March 31, 1953	.....			$5,905,329.15

EXPENDITURES
April 1, 1951 to March 31, 1953

DIVISIONS	SALARIES AND WAGES April 1, 1951 to March 31, 1952		OPERATIONS April 1, 1951 to March 31, 1952		SALARIES AND WAGES April 1, 1952 to March 31, 1953		OPERATIONS April 1, 1952 to March 31, 1953		TOTAL April 1, 1951 to March 31, 1953
STATE GAME COMMISSION	.....	$7,674 75	.....	$1,940 12	.....	$8,474 39	.....	$4,116 05	$22,205 31
RETIREMENT—Employer's 5% Contribution	.....	.....	.....	48,339 21	.....	.....	.....	60,622 85	108,962 06
GENERAL ADMINISTRATION	.....	73,277 80	.....	30,169 74	.....	75,343 86	.....	40,202 86	218,994 26
GENERAL OPERATING									
Department Building	$2,049 97	.....	$8,664 06	.....	$2,200 00	.....	$9,634 72	.....	.....
Warehouse and Shop	25,673 91	.....	22,120 93	.....	26,501 00	.....	28,811 98	.....	.....
General Office	58,700 52	86,424 40	22,597 65	53,382 64	53,779 71	82,480 71	34,472 87	72,919 57	295,207 32
LICENSE DIVISION									
Administration	.....	13,329 32	$9,675 17	.....	.....	18,703 23	$8,623 60	.....	.....
H and F Licenses, Game Seals, Pamphlets	.....	.....	24,981 28	34,656 45	.....	.....	29,167 07	37,790 67	104,479 67
EDUCATION AND INFORMATION	.....	21,927 83	.....	14,652 26	.....	23,836 72	.....	19,774 62	80,191 43
ENFORCEMENT DIVISION									
Administration	.....	370,541 18	$169,909 35	.....	.....	387,503 35	$205,169 34	.....	.....
Bounties	.....	.....	17,328 10	187,237 45	.....	.....	14,967 60	220,136 94	1,165,418 92
GAME MANAGEMENT DIVISION									
Administration and Research	$38,381 81	.....	$14,121 35	.....	$31,999 74	.....	$14,595 10	.....	.....
Game Farms	115,084 85	153,466 66	116,865 41	130,986 76	108,098 24	140,097 98	138,942 80	153,537 90	578,089 30
FISHERY MANAGEMENT DIVISION									
Administration and Research	$53,852 63	.....	$21,496 45	.....	$56,029 72	.....	$24,515 19	.....	.....
Eyeing Stations	13,746 50	.....	7,542 35	.....	13,104 01	.....	6,996 17	.....	.....
Screening	7,350 52	.....	6,676 57	.....	3,059 50	.....	7,934 69	.....	.....
Lake and Stream	12,522 80	.....	71,985 42	.....	8,701 00	.....	42,155 29	.....	.....
Hatcheries	250,549 40	.....	326,481 22	.....	268,848 78	.....	353,553 83	.....	.....
Fish Restoration and Research	.....	347,021 85	.....	434,182 01	14,861 97	364,004 98	35,622 21	470,777 38	1,616,586 22

EXPENDITURES
April 1, 1951 to March 31, 1953—Continued

DIVISIONS	SALARIES AND WAGES April 1, 1951 to March 31, 1952		OPERATIONS April 1, 1951 to March 31, 1952		SALARIES AND WAGES April 1, 1952 to March 31, 1953		OPERATIONS April 1, 1952 to March 31, 1953		TOTAL April 1, 1951 to March 31, 1953
FUR AND DAMAGE CONTROL DIVISION									
Fur Management	$97,153 60		$6,744 19		$89,407 39		$23,012 38		
Damage Control	12,211 70		20,183 67		10,064 00		12,503 45		
Deer and Elk Control			3,150 49				2,703 27		
Contract Beaver—40% Landowner's Share			38,199 42				23,346 24		
Fencing Agreements			6,293 97				14,010 08		
Payment Game Animal Damage and Expense		$79,364 70	8,745 91	$83,317 65		$99,471 39	9,088 58	$84,064 00	$346,817 74
ENGINEERING AND CONSTRUCTION DIVISION									
Engineering	$32,170 97		$12,493 70		$42,700 14		$16,287 01		
Capital Outlays and Major Repairs	30,737 32	62,908 29	50,033 29	62,526 99	6,321 63	49,021 77	43,651 70	59,938 71	234,395 76
COWLITZ DAM HEARINGS		761 29		4,035 05				14,979 29	19,775 63
LAND MANAGEMENT DIVISION Wildlife Restoration Includes: Acquisition, Development and Maintenance of Big Game Ranges and Habitat Research	$123,905 64		$184,564 41		$180,062 71		$549,196 54		
Acquisition of Lands for H & F Areas, Etc.:									
Administration	11,644 46		10,255 70		13,514 27		16,196 75		
Bird Areas	29,327 96		16,909 64		27,535 93		39,126 05		
Public Fishing Areas	33,745 51		33,828 03		46,485 47		58,853 66		
Waterfowl Areas	24,138 50	232,762 07	27,416 05	272,973 83	15,694 20	283,292 58	86,913 98	750,286 98	1,539,315 46
TOTAL									$6,330,439 08

ORGANIZATIONAL CHART

State Game Department

March 31, 1953

GOVERNOR

Appoints Game Commission. Each two years appoints two Commissioners for a six year term each.

6-MAN APPOINTIVE GAME COMMISSION

Set Seasons
Establish Policies
Appoint Director

DIRECTOR

Responsible for all Operations Of The Organization

OFFICE MANAGER — **ASSISTANT DIRECTOR** — **BUSINESS MANAGER**

OPERATIONAL DIVISIONS

FISH MANAGEMENT	FUR RESOURCES DAMAGE CONTROL	ENGINEERING AND CONSTRUCTION	LICENSE	ENFORCEMENT AND PREDATOR CONTROL	EDUCATION AND INFORMATION	LAND MANAGEMENT	GAME MANAGEMENT
Fish Hatcheries Stream Improvement Lake Improvement Research	Fur Management Game Damage Control Beaver Management Research	Construction Maintenance Repairs Surveying	Sales Distribution Collection	Prevention and Enforcement of Law Violations Predator Control	Publicity Information Education Movies Exhibits	Land Acquisition Public Hunting and Fishing Areas Game Ranges and Habitat Areas Federal Aid	Big Game, Upland Bird and Waterfowl Management Game Farms Research and Census

THE WORK OF EACH DIVISION IS COORDINATED IN THE FIELD THROUGH ELEVEN ADMINISTRATIVE DISTRICTS

DISTRICT 1 Spokane	DISTRICT 2 Colfax	DISTRICT 3 Walla Walla	DISTRICT 4 Yakima	DISTRICT 5 Wenatchee	DISTRICT 6 Stanwood	DISTRICT 7 Seattle	DISTRICT 8 Tacoma	DISTRICT 9 Longview	DISTRICT 10 Aberdeen	DISTRICT 11 Columbia Basin Moses Lake
COUNTIES: Ferry Pend Oreille Spokane Stevens	COUNTIES: Lincoln Adams Whitman E. Franklin	COUNTIES: Walla Walla Columbia Garfield Asotin	COUNTIES: Yakima W. Benton Kittitas	COUNTIES: Okanogan W. Douglas Chelan	COUNTIES: Whatcom Skagit Island San Juan	COUNTIES: Snohomish Kitsap King	COUNTIES: Pierce Thurston Lewis	COUNTIES: Wahkiakum Cowlitz Clark Skamania Klickitat	COUNTIES: Clallam Jefferson Grays Harbor Mason Pacific	COUNTIES: Grant E. Douglas S.W. Adams W. Franklin E. Benton
HATCHERIES: Colville Ford Pend Oreille San Poil Spokane		HATCHERIES: Walla Walla Tucannon	HATCHERIES: Naches Yakima	HATCHERIES: Chelan Chiwaukum Omak	HATCHERIES: Bellingham Lake Whatcom	HATCHERIES: Arlington Seward Park Tokul Creek	HATCHERIES: Mossyrock South Tacoma Puyallup	HATCHERIES: Vancouver Goldendale	HATCHERIES: Aberdeen Shelton	
GAME FARMS: Colville Spokane	GAME FARMS: Kennewick	GAME FARMS: Walla Walla	GAME FARMS: Ellensburg Yakima		GAME FARMS: Whidbey Island	GAME FARMS: Auburn	GAME FARMS: Lewis County South Tacoma			
		[illegible]	[illegible]	GAME RANGES:	GAME RANGES:			GAME RANGES: [illegible]	GAME RANGES: [illegible]	GAME RANGES: Pot Holes