Twenty-Ninth Biennial Report

of the

FISH AND GAME DEPARTMENT

of the

STATE OF IDAHO

July 1, 1960 to June 30, 1962

State of Idaho
Department of Fish and Game
Idaho Fish and Game Commission

HONORABLE ROBERT E. SMYLIE
GOVERNOR OF IDAHO
STATE HOUSE
BOISE, IDAHO

SIR:

Transmitted herewith for your consideration is the twenty-ninth biennial report of the activities of the Idaho Fish and Game Department.

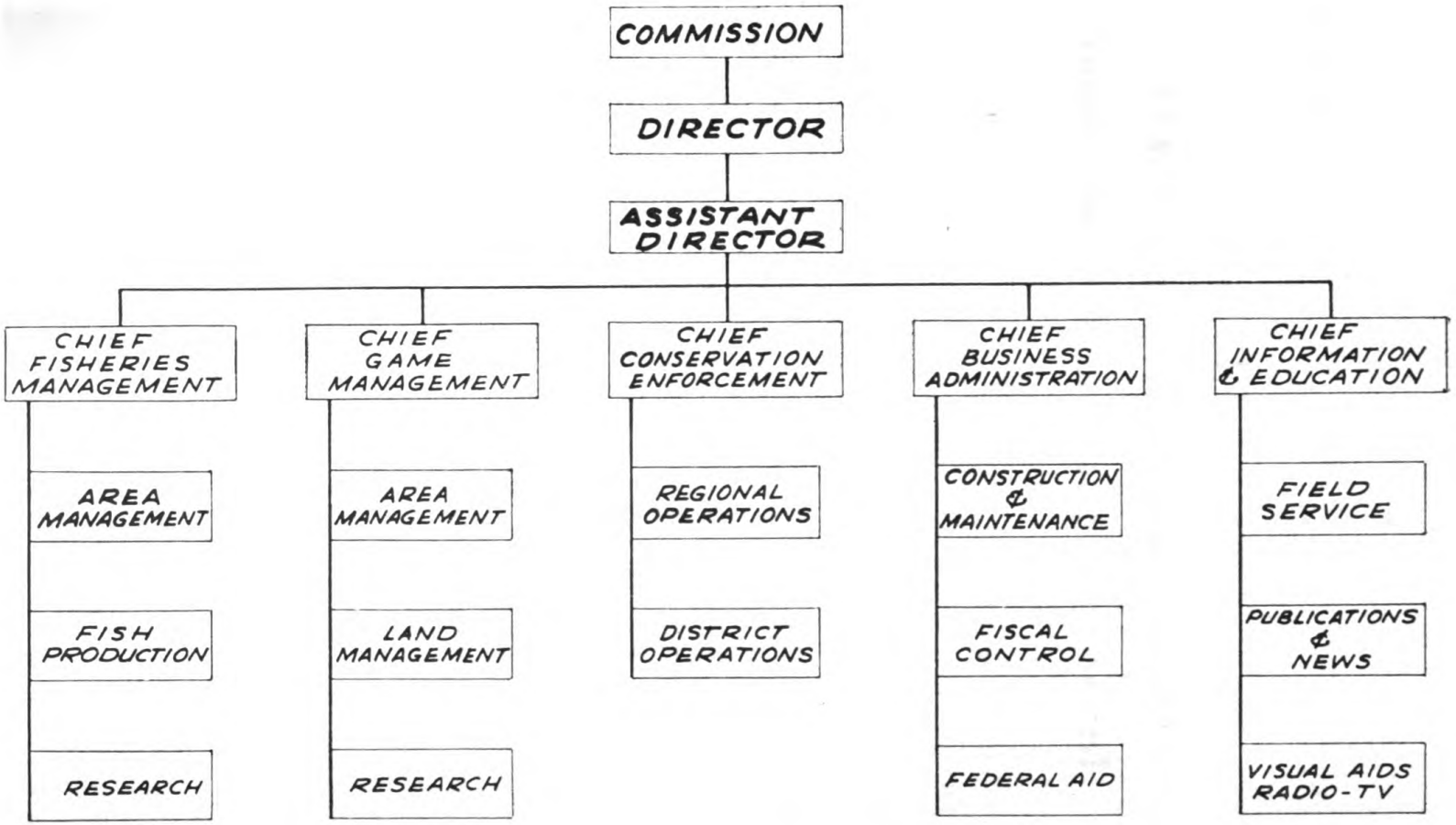
This report covers the period July 1, 1960 through June 30, 1962, with certain data for a portion of the last six months of 1962.

Respectfully submitted,

Arlie Johnson, *Chairman*
Frank Cullen
Tom Felton
R. J. Holmes
Glenn Stanger

ATTEST:

John R. Woodworth, *Director*



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Administration

Establishment of policy for the preservation, perpetuation, protection and management of all wildlife resources in the State of Idaho continued under the authority of the Idaho Fish and Game Commission. Operations of the Commission were conducted according to the initiative act of 1938.

Members of the Commission are appointed for staggered terms of six years from each of five districts in the state. The districts include the following counties:

District No. 1: Boundary, Bonner, Kootenai, Benewah, Shoshone.

District No. 2: Latah, Lewis, Clearwater, Nez Perce, Idaho.

District No. 3: Adams, Valley, Washington, Payette, Gem, Boise, Canyon, Ada, Elmore, Owyhee.

District No. 4: Lemhi, Custer, Camas, Gooding, Lincoln, Blaine, Jerome, Minidoka, Twin Falls, Cassia, Butte.

District No. 5: Clark, Fremont, Jefferson, Madison, Power, Oneida, Bannock, Franklin, Bear Lake, Caribou, Bingham, Bonneville, Teton.

Members of the Commission

Members of the Commission during the biennium were:

Frank Cullen, Coeur d'Alene, District No. 1

Tom Felton, Moscow, District No. 2

Arlie Johnson, Boise, District No. 3

R. J. Holmes, Twin Falls, District No. 4

Glenn Stanger, Idaho Falls, District No. 5

The Commission met in 8 regular sessions and 11 special sessions during the biennial period.

Glenn Stanger, Idaho Falls, served as Chairman of the Commission during 1960.

R. J. Holmes, Twin Falls, served as Chairman of the Commission during 1961.

Arlie Johnson, Boise, was elected Chairman of the Commission, January, 1962.

Director

Ross Leonard resigned as Department Director, effective January, 1962, to accept an appointment with the Natural Resources Management Staff, Department of the Navy.

Robert L. Salter served as Acting Director until July, 1962, when John R. Woodworth took over as head of the Fish and Game Department. Mr. Salter was appointed Assistant Director at that time.

Conservation Enforcement

Effective wildlife law enforcement assures (1) an inflow of revenue with which to finance department operations and programs; (2) the protection and perpetuation of basic brood stocks; (3) implementation of management practices and programs; (4) and provides each hunter and fisherman with an equal opportunity to take his share of the harvest during the open season.

Several factors have contributed to an increase in the wildlife law enforcement workload in Idaho in recent years. These factors include an increase in the number of people afield—residents as well as visitors from out of state; successful introduction of new species such as chukar partridge; addition of many thousands of acres of pheasant habitat as a result of irrigation of new land by means of wells and pumps; more hunter and fisherman use of formerly isolated areas that have been made accessible by substantial additions to Bureau of Land Management and Forest Service road systems; creation of new fishing waters as a result of the construction of a number of new reservoirs, and significantly more use of back country trails by horsemen, as well as by that new mode of transportation—the trail machine. Increased boat traffic on lakes and "impassable" rivers and air traffic to back country fields have also added to the necessity for greater patrol effort in the field. Some field time has to be applied also to litter clean-up assignments in some of the more heavily used off-forest recreation spots.

A substantial growth in revenue from sales of non-resident licenses, as well as additional prosecutions, has resulted from extra emphasis being placed on checking out resident license sales to unqualified purchasers. Hand-in-hand with the foregoing work has been a program of closer supervision of license vendors. The workload involved in these duties is especially heavy in the larger population centers. Other non-field demands are made upon the conservation officers' time by such comparatively new activities as promotion of hunter and boat safety and working in other ways with schools and youth groups, sportsmen's and service clubs. The adult education forum program is another recent addition to the activity slate. More participation in state and county fairs, in cooperation with sportsmen's groups, provides an excellent opportunity to improve our contact and relationship with farmers and ranchers.

Participation by officers in the several phases of the big game, bird, fishery and furbearer management programs has been intensified. A new system has been placed into operation whereby all complaints of wildlife depredations, and the service given thereto, will be reported and compiled.

A report and record system has also been established for recording the increased expense and effort contributed toward search and rescue work.

Division personnel have attended training schools, academies and conferences conducted by our own and other agencies.

Statewide monthly average performance figures for district conservation officers for calendar years 1960 and 1961 (Table I) substantiate the fact that these men are highly devoted to their work.

Table I Monthly Average—District Conservation Officers Work Output Summary
Number of Hours and Percentages of Total

	Total	Law Enf.	Game Mgt.	Fish Mgt.	I. & E.	Admin. (Office)	Improvemts. Equipmt. Maintenance Etc.
1960	243	161 (66%)	27 (11%)	11 (5%)	12 (5%)	19 (8%)	13 (5%)
1961	236	162 (67%)	22 (10%)	8 (4%)	10 (4%)	22 (10%)	12 (5%)

During the 1961 calendar year each officer averaged 1.5 arrests per month plus assisting with others. He averaged 4.6 days off per month, making a total of 56 days taken off, whereas he would actually have been entitled to 112. An average of only 8.7 days of annual leave was used during the year compared to an allowance of 12, and 1.1 days of sick leave compared to an allotment of 11 days. He drove an average of 1,839 automobile miles per month at an average operational cost of 4.5 cents per mile. The average officer ate 78 meals from camp groceries and spent 28 nights in his sleeping bag during the 12 month period.

Legislation

Enactments of the 1961 legislature which affect the conservation enforcement program are as follows:

(1) Section 36-306, Idaho Code, was amended to include the starling as a predatory bird.

(2) Section 36-1301, Idaho Code, was amended by clearly defining the act of shooting a pistol, rifle, shotgun, or other firearm from or across a public highway as a misdemeanor. It also strengthened the enforcement possibilities against those persons spotlighting big game.

(3) Section 36-427, Idaho Code, was amended to provide that fishermen, as well as hunters, must stop at checking stations.

(4) Section 36-1306, Idaho Code, was amended to include valley quail, gambel quail, and wild turkeys as upland game birds.

(5) Sections 36-5401 through 36-5408, Idaho Code, were amended redefining the terms "outfitter" and "guide" and providing for changes in the license fees and bonding requirements for these persons. It also removed the responsibility of issuing the licenses for these operations from the Fish and Game Department to a newly created Idaho Outfitters' and Guides' Board.

(6) Sections 36-432 through 36-438 were added to the Code and provide for revocation of the hunting license and denial of the right to secure another license for periods of up to five years for persons who are found guilty of improper handling of a gun.

(7) Sections 36-2304 and 36-2307, Idaho Code, were amended to provide that confiscated game or unclaimed game may be disposed of by donation to tax-supported, nonprofit, or charitable institutions.

(8) Section 36-428, Idaho Code, was amended to provide for the issuance of a duplicate license for a fee of $1. It also now provides that it is unlawful to purchase additional licenses and use them to obtain more than the lawful number of tags or permits.

(9) Sections 36-502 and 36-503 were amended to allow the propagation and sale of cutthroat trout by private fish pond operators.

(10) A number of sections governing the activities of raisers of furbearing animals were revised to place most of their operations under the jurisdiction of the Department of Agriculture, rather than the Fish and Game Department.

(11) Sections 36-126 and 36-127 were added to the Code and provide that the Idaho Fish and Game Commission may adopt regulations pertaining to the importation, release, sale, possession, or transportation within the state of undesirable birds, animals or fish.

(12) A uniform boat numbering law was adopted, and several sections dealing with proper and safe boat handling practices were enacted. The latter, known as "Idaho Pleasure Boating Act," provides that "Insofar as is possible, the sheriffs of the respective counties, in cooperation with the fish and game department of the state of Idaho, and the department of law enforcement, shall be primarily responsible for the enforcement of this act and in the exercise thereof shall have the authority to stop and board any vessel subject to this act."

Organization

The conservation enforcement division personnel consists of a division chief, six regional conservation officers and sixty-four district conservation officers. Density and locations of district conservation officer headquarters throughout the state are determined largely by the size of the human and wildlife populations in each locality. When considering the human factor, seasonal inflows are weighed as well as the stable year-around population. At least one officer is stationed in each county. However, in most instances his district boundaries are determined by geographical features which frequently differ from county lines.

Equipment

The Department's two-way shortwave radio network has been augmented during the biennium by the addition of five base stations located at the state office in Boise and at the regional offices in Jerome, Pocatello, Coeur d'Alene and Lewiston.

Assignment of additional mobile radio units to vehicles of other divisions has continued. In addition to the seventy-one in Conservation Enforcement and the five mobiles in the Information and Education and Administrative Divisions, the recent assignment of additional

mobile radios to the Game Management and Fisheries Management Divisions has brought the total radio-equipped vehicles for those two divisions to seventeen and nine, respectively. Additional items of equipment, such as boats and snow tractors, are equipped with radio kits which permit the rapid transfer of radio equipment into these units from regularly equipped vehicles. Our radio system of base stations, mobile and portable sets and automatic repeaters, when used in combination with the Telpak telephone system, results in an outstanding communications arrangement for both administrative and enforcement requirements.

In midsummer of 1961 our carrier radio frequency was changed from 171.475 megacycles to 151.355 megacycles. This change enhanced repeater coverage considerably.

Hunter and fisherman use of the canyon areas along the Salmon River from Riggins to the mouth of the Middle Fork and along Snake River from Lewiston upstream has increased substantially in recent years. Motor boats are now largely used in gaining access to these localities. The Department recently purchased a 21-foot jet-powered boat for both management and enforcement use in the areas concerned.

A small unused dwelling located at the old Fernwood fish holding ponds was moved to a new site on the St. Maries River at the mouth of Merry Creek, where it will be used as both a checking station and as an overnight stopping place for department personnel when working in that vicinity. Arrangements were made with Potlatch Forest Industries for similar use of a cabin owned by them, which is located at the mouth of the Little North Fork of the Clearwater River. All other patrol cabins and headquarters residences have been maintained and improved as necessary.

Arrests, Convictions and Fines

Statewide distribution is made seasonally of laws, regulations, maps, pamphlets, and placards in an effort to keep the public informed as to seasons, bag limits and other rules. Timely statewide and local news releases are used via newspapers, radio and television to further inform the hunting and fishing public. Posting is used in areas of possible confusion. Maintenance of constant patrol pressure, particularly in localities where wildlife is most vulnerable at the moment and/or where violations are most likely to occur, helps maintain a reasonable level of control. Nevertheless, violations are committed and it is the duty of the conservation officer to apprehend the offender and cite him into court. Determination of a verdict on the charge, the seriousness of the offense and the amount and degree of judgment lie wholly with the province of the court.

During the fiscal year of July 1, 1960, to June 30, 1961, a total of 1,243 arrests were made of which 56 were juvenile, 11 were dismissed, 7 were found not guilty, and 26 had the entire fine suspended. A total of $33,148.50 was collected by the magistrates, one-half of which ($16,574.25) was remitted to the county treasurers and the other half to the Department.

In the fiscal year of July 1, 1961, to June 30, 1962, a total of 1,223 arrests were made of which 75 were juvenile, 21 were dismissed, 9 were found not guilty, and 26 had the entire fine suspended. A total of $35,630.50 was collected by the magistrates, one-half of which ($17,815.25) was remitted to the county and a like amount to the Department.

During the biennium there were 2,466 arrests for wildlife law violations of which 131 were juvenile, 32 were dismissed, 16 were acquitted and 52 had the total fine suspended. Of the $68,779.00 collected by the judges, one-half ($34,389.50) was turned over to the county treasurers in the counties of jurisdiction, and the balance was remitted to the Department.

Fines during the biennium for the 2,217 cases in which fines were assessed averaged $30.33 each. The average fine assessed in 1937-38 was $25.14, in 1947-48 it was $33.54 and in 1957-58 it was $28.22. During the period since 1937-38 continuous and progressive inflation has so cheapened the dollar that it now retains only a portion of its previous value. In actual effect, the net penalty currently being imposed is only a fraction of the punishment enacted in the late thirties. No matter how dedicated the officer or how great his work output, optimum effectiveness of a wildlife law enforcement program cannot be achieved if discouragingly low penalties are assessed. Low fines certainly do not serve as a deterrent to a potential violator. In some instances, in recent years, the decision to violate the game laws has been put on a dollars and cents calculated-risk basis, in view of the probability of a light penalty if apprehended.

Table II gives the state of origin of non-residents arrested, by number and percentage, during the calendar year of 1961. Fifteen per cent (191) of the 1961 total of persons arrested (1,299) were non-residents.

Table II

State of Residence	Number of Arrests	% of Grand Total Of 1961 Arrests	% of 1961 Arrests Of Non-residents
California	54	4.1	28.3
Washington	48	3.6	25.1
Utah	47	3.6	24.6
Oregon	10	0.7	5.2
Montana	10	0.7	5.2
Miscellaneous	22	1.7	11.5

Making up the miscellaneous group of 1961 arrests of non-residents were one to three people from each of sixteen additional states plus one from Canada.

Table III shows a breakdown of violations by type for each month during the biennium.

Table IV gives a record of arrests by county and region during the period of 1954 to 1961, inclusive.

Table V shows the number of arrests and average fines for each of the counties and regions during 1961. The totals in this table do not

agree with those in Table IV because of the fact that only those cases where fines were assessed are included in Table V.

Table III

Summary of Violations

Fiscal Years 1960-61 & 1961-62	Fishing	Big Game	Upland Birds	Water-fowl	Licenses	Misc.	Trap-ping	Check Station
July	96	1	..	1	26	4	7	..
August	67	3	3	2	14	6	..	..
September	33	11	20	3	7	7	..	..
October	27	123	20	9	28	9	1	7
November	4	83	48	20	16	16	2	2
December	7	52	9	42	20	7	3	2
January	7	11	1	21	10	3	..	..
February	8	4	..	1	12	1	3	1
March	20	3	1	3	15	1	2	..
April	24	6	2	1	17	3	..	..
May	54	4	..	2	16	4	..	..
June	111	2	1	..	30	9	..	..
Annual Total	458	303	105	105	211	70	18	12
July	80	4	..	..	24	3	2	..
August	56	8	5	..	23	3	..	..
September	25	12	14	2	22	6	..	..
October	20	92	11	11	33	11	..	8
November	..	174	42	22	25	22	1	10
December	3	33	4	42	28	2	1	2
January	6	8	2	19	13	6	2	..
February	14	7	..	3	13	4	..	..
March	4	...	..	3	16	1	..	..
April	45	...	3	..	12	5	2	..
May	48	4	2	..	19	4	1	..
June	50	6	1	..	9	3	..	..
Annual Total	351	348	84	102	237	70	9	20
Biennial Total	**809**	**651**	**189**	**207**	**448**	**140**	**27**	**32**

Table IV

Total Arrests by County and Region

1954-1961

Region and County	1954	1955	1956	1957	1958	1959	1960	1961
Panhandle								
Benewah	19	19	15	17	39	35	43	24
Bonner	27	42	24	52	42	21	33	45
Boundary	19	10	9	13	18	9	17	9
Kootenai	79	49	52	128	92	42	41	31
Shoshone	20	12	28	72	22	25	22	35
Totals	164	132	128	282	213	132	156	144

Clearwater:								
Clearwater	24	14	10	14	16	29	12	41
Idaho	30	20	22	16	28	42	54	84
Latah	9	9	6	3	14	10	8	10
Lewis	4	2	3	7	2	8	5	12
Nez Perce	13	3	20	18	18	27	60	51
Totals	80	48	61	58	78	116	139	198
Western:								
Ada	55	44	88	135	82	96	42	42
Adams	12	13	20	10	9	18	12	14
Boise	18	15	20	34	28	25	35	17
Canyon	72	54	62	65	64	53	66	46
Elmore	48	20	38	31	66	25	26	26
Gem	18	9	9	5	19	9	7	23
Owyhee	31	27	31	50	73	82	61	26
Payette	21	15	10	6	7	9	8	5
Valley	55	46	63	37	26	62	44	41
Washington	22	11	25	10	13	8	5	14
Totals	352	254	366	383	387	387	306	254
Magic Valley:								
Blaine	9	57	10	20	28	43	28	21
Camas	8	10	7	3	15	4	18	7
Cassia	25	26	16	34	60	49	47	39
Gooding	26	12	13	6	27	29	24	43
Jerome	9	8	7	6	12	15	22	21
Lincoln	1	8	2	7	9	5	5	5
Minidoka	7	3	9	10	14	12	14	15
Twin Falls	44	29	31	47	27	39	61	48
Totals	129	135	95	133	192	196	218	199
Eastern:								
Bannock	73	47	27	33	51	12	27	24
Bear Lake	19	25	15	14	8	21	18	7
Bingham	30	25	32	26	55	42	27	36
Bonneville	59	33	85	39	71	35	30	42
Caribou	48	43	54	46	61	28	22	43
Franklin	18	17	16	20	29	31	16	27
Fremont	44	62	50	50	58	49	39	44
Madison	11	8	7	2	6	8	5	6
Oneida	25	7	13	8	7	10	11	58
Power	35	32	55	38	50	61	35	39
Teton	5	7	5	3	4	5	6	6
Totals	377	306	359	279	400	302	236	332
Salmon:								
Butte	16	7	11	14	15	20	12	0
Clark	13	10	21	21	34	24	8	19
Custer	28	32	34	51	47	81	66	55
Jefferson	32	38	68	76	42	58	62	51
Lemhi	32	22	22	22	46	44	31	49
Totals	121	109	156	184	184	227	179	174
Year Totals	**1,223**	**1,084**	**1,163**	**1,319**	**1,454**	**1,361**	**1,234**	**1,301**

Table V

Number of Arrests and Average Fine By County and Region

January 1 — December 31, 1961

Region and County	No. of Arrests	Average Fine
Panhandle:		
Benewah	22	$31.14
Bonner	44	34.73
Boundary	9	50.79
Kootenai	29	30.31
Shoshone	33	66.69
Total and Average	137	$42.73
Clearwater:		
Clearwater	41	$39.06
Idaho	82	37.15
Latah	9	50.00
Lewis	12	44.66
Nez Perce	38	24.22
Total and Average	182	$39.02
Western:		
Ada	37	$28.18
Adams	13	23.15
Boise	16	36.30
Canyon	41	17.66
Elmore	25	19.50
Gem	22	25.44
Owyhee	26	26.94
Payette	5	21.00
Valley	38	26.70
Washington	14	21.74
Total and Average	223	$24.66
Magic Valley:		
Blaine	20	$33.68
Camas	7	26.29
Cassia	34	19.19
Gooding	43	20.98
Jerome	18	18.53
Lincoln	5	23.00
Minidoka	15	34.67
Twin Falls	42	30.33
Total and Average	184	$25.83

Eastern:		
Bannock	22	$53.27
Bear Lake	6	32.08
Bingham	36	25.06
Bonneville	37	15.18
Caribou	40	29.10
Franklin	27	63.26
Fremont	44	59.86
Madison	5	17.38
Oneida	47	15.65
Power	37	17.74
Teton	3	58.33
Total and Average	304	$35.17
Salmon:		
Butte	..	$.....
Clark	17	37.66
Custer	54	47.76
Jefferson	45	24.15
Lemhi	46	27.81
Total and Average	162	$34.34
Total	**1,192**	**$33.62**

Game Management

Game management based upon factual information brought increased hunter participation and large harvests into actuality in 1960 and 1961. Liberal hunting seasons resulted in harvests of deer, elk, bighorn sheep and mountain goats which were greater than the harvests of these species in any previous two-year period. Quail, chukar partridge, and grouse seasons were lengthened, limited shooting of hen pheasants was permitted, and additional mallards were allowed in the waterfowl bag.

The details of the management program which makes such harvests possible are sketched but briefly in this biennial report. But the hunter in 1960 and 1961 realized more than ever before the fruitful results of years of game research followed by sound management planning.

Big Game

Although 1960, and especially 1961, were dry range years in much of the state, the accompanying light winters enabled deer to use some winter ranges for a shorter period than usual. The net effect was range improvement in a number of areas. In other areas multiple deer hunting regulations were expanded to permit larger harvests of deer from heavily used ranges. By buying the proper tags an individual hunter could legally take three deer in 1960 and four in 1961. Use of additional tags for a second deer was permitted in seven hunting units in 1960 and in nine units in 1961. Deer hunters used the additional tags on about 9 per cent of the total reported deer harvest in 1960 and on about 12 per cent of the reported harvest in 1961.

Continued progress was made in tailoring hunting regulations to the local conditions found on various land ownerships. The Fish and Game Department invited the participation of representatives of the Forest Service and the Bureau of Land Management in interagency meetings designed to consider various range and habitat problems which have a bearing upon the welfare of big game herds.

The biennium saw elk herds increasing in eastern Idaho and in many fringe areas elsewhere. Liberalized regulations permitted more elk hunting in several areas than in the previous two years. Ways of harvesting certain problem herds were being further explored in 1962.

Major jobs in each big game year are range examination, aerial and ground surveys to determine trends of local populations, and collection of harvest information during and following the hunting seasons. Coordinating the big game field work are the area big game biologists, each of whom plans the seasonal work necessary to the continuing big game program in several big game management units.

Other game biologists in the biennium were assigned to specific investigations to obtain needed information. These special assignments included big game work involving deer in southeastern Idaho; the Cassia deer herd in management unit No. 54; Lochsa-Selway elk; antelope in the Pahsimeroi, Little Lost and Copper Basin areas; con-

tinued investigations of bighorn sheep, mountain goats, deer and elk in the upper Salmon River country and special investigations in the area of the proposed Bruce's Eddy dam.

Southeastern Idaho Deer Study

During the biennium southeastern deer investigations were continued in Bear Lake and Caribou counties and expanded to include portions of Franklin, Oneida, and Bannock counties. To a lesser extent elk and moose were included in the study.

The objective of the study is to determine the adjustment in hunting pressure necessary to manage big game herds on a sustained-yield basis.

Browse measured in 21 transects for the 1961-62 winter indicated heavier use than in any of the preceding three winters. Although a two-deer bag limit for deer of either sex was provided in management units 76A and 78 during the 1960 season and in management units 75, 76 and 78 during the 1961 season, the deer population has remained close to the numbers before the extra tag was introduced; and in some areas deer have increased. Winter mortality losses on the six key transects were higher in 1962 than in 1961, with 86 and 17, respectively, found for the two winters.

One two-acre big game-livestock range exclosure was constructed in management unit 76A in 1960 and one near Sulphur Canyon in management unit 76 in 1961 in cooperation with the U.S. Forest Service. Five exclosures have been built during the last four years to facilitate comparisons of range conditions and trends under total protection from both big game and livestock with sites receiving use.

The percentage of yearling does made up an average of 37% of the yearlings and older does taken during the hunting season for management unit 76 for the 1958-1961 period. This indicates good herd productivity and fawn survival.

Observations of 62 does with fawns during the 1959-1961 summers averaged 1.6 fawns per doe indicating good fawn production.

Hunter success on a trip basis at the Trail Creek and Montpelier stations was 16.6% and 15.6% respectively. Eight stations operated during the 1961 season checked 14% fewer deer than in 1960, or 1,048 deer in 1960 and 921 in 1961. Early snow storms at higher elevations blocked hunter access into portions of unit 76 during the 1961 season. The multiple deer regulations made a reasonable harvest possible; over half of the reported kills in unit 76 were taken on the extra deer tag.

Hog-dressed weights from yearling deer were taken on 225 deer in 1960 and 154 in 1961. Average yearling buck weights for the various units varied from 103 to 114 lbs. and the yearling does from 81 to 94 lbs. in 1961; and in 1960 they were 106 to 116 lbs. and 91 to 106 lbs., respectively.

Since 1958 a total of 403 deer have been trapped, ear tagged and released to study deer movements and survival. Of this number 263 were belled. A total of 193 were trapped, tagged and released in 1960

and 82 in 1961. During the 1961-62 winter 45 deer were trapped, tagged and marked in the Ninety Percent area. A 19% tag recovery was obtained for the Ninety Percent area in 1961. A 21% tag return was obtained in Bear Lake county in 1960. Tagging studies indicate that the majority of deer stay within the management unit. However, a fawn had moved approximately 130 airline miles from the late winter trapping site to the fall kill site in 1961; and a doe was observed 110 miles from the trap site.

The 1961-62 winter aerial count totaled 549 elk compared to 201 the previous winter. The increase is due principally to the improved counting conditions and more severe winter concentrating the elk. An upward trend is indicated after three years of decline.

The moose population is considered to number 60 animals. Controlled hunts for antlered moose obtained a harvest of two in 1960 and two in 1961.

Cassia Deer Herd Study

The Cassia deer herd study covered the period from November 1, 1957 to June 30, 1962. Objectives of the intensive study were (1) to refine and improve management techniques, including population surveys, (2) to further explore the possibilities for using sex and age data from bagged animals as a gauge for deer harvest levels, and (3) to gather data concerning the range forage upon which the herd is dependent.

Areas of highest summer deer density are located at the upper elevations in association with the timber-brushland vegetative type and those of lowest deer density are found closer to the valley floor in the sagebrush-grassland and juniper-sage vegetative types.

With the exception of some minor shifts, the Cassia deer herd winter distribution has not changed appreciably from that indicated following the extensive deer census efforts of the early 1940's. The heaviest winter concentrations are along the northern foothills ranging in elevation from 5,000 to 6,500 feet depending upon the severity of the weather.

Pre-hunt herd composition counts were conducted along predetermined routes from 1958 through 1961. Buck:doe:fawn ratios have remained relatively constant in spite of large year-to-year changes in hunter pressure and harvest during this period. Fawns have comprised 28-31% of the pre-hunt herd during each of the count periods.

Post-hunt herd composition counts have been conducted annually within the Cassia Management Unit since the 1957-58 winter. Fluctuations have occurred from year to year. The fluctuations are believed due to varying weather conditions which prevented access to all count areas rather than actual changes in herd composition. The percent of fawns seen in the post-hunt herd varied from 32-36% indicating relatively stable productivity.

Range conditions are classified as fair to good over most of this management unit. Browse use by deer has been relatively light during

the moderate winters since 1957. The 1961-62 studies indicated only 21% of the annual growth was browsed, suggesting that the deer herd is below the carrying capacity of its winter range

Hunter pressure increased from 1958 through 1961, with the number of hunters checked each season as follows: 1,108; 3,102; 3,951, and 4,582.

Sex and age data were collected during the 1958-1961 seasons. These data through 1960 indicated an increasing level of harvest from the deer herd. As the number of deer removed by hunting increased, shifts were noted in the composition of the harvest. At increased harvest levels the percentage of fawns increased when the harvest progressed to the point where the readily vulnerable yearlings decreased in the harvest. Increasing harvest levels also resulted in proportionately more females in the harvest. Conversely, a decrease in harvest resulted in a proportionately smaller take of females and fawns. This latter occurrence happened in 1961 when a snowstorm during the opening weekend of the season caused a drastic drop in hunting removals compared to previous recent years.

These data, along with similar data from other herds, will eventually enable game managers to determine the point at which harvest should be curtailed in order to maintain a stable population level and a sustained yield of deer. The principles involved are not new to game management, but this project has made it possible to demonstrate the method in a herd where a considerable fund of management data has been accumulated over a long period of time.

This project will result in a management plan designed to improve the carrying capacity of the range and to allow the deer herd to increase so that larger harvests can be taken in future years. This will probably require that multiple use of the area by big game and livestock be adjusted through cooperative efforts of the land administration agencies which include the Bureau of Land Management and the U.S. Forest Service.

Antelope Study

Intensive investigations of antelope, begun in 1956, were continued in the Upper Little Lost, Upper Pahsimeroi, and Copper Basin areas during the biennium to determine what factors or conditions are limiting the antelope increment.

During late May and early June, 1960, tags were placed on 61 pronghorn fawns. A total of 133 sightings of marked animals during May, June and July indicated an influx of animals occurred probably in early spring from the Little Lost River watershed into the Upper Pahsimeroi Valley and a reciprocal movement did not occur. Two does from the Upper Pahsimeroi on March 30, 1961, contained twin fetuses. About 54 does have been examined, and all but one contained twins; one very old doe had a single fetus. This high conception ratio indicates good summer range, and the high incidence of twinning indicates good winter range. However, we are confronted with heavy post-partum losses among fawns.

Differential counts from a helicopter showed the fawn-doe ratios continued to decline by the time flights were made during late August. In the Little Lost and Upper Pahsimeroi study areas 54 and 63 fawns per 100 does were observed during the August helicopter count in 1960 and 1961. The ratios for the Copper Basin area were 98 and 91 for the above years.

Intensive exploratory observations on golden eagles were made during June, 1960. It was estimated that 12 and possibly 18 eagles were on the Upper Pahsimeroi and Upper Little Lost River study area. About 70% of the refuse items at two nests and one feeding station were rabbits. No remains of antelope were found at these sites. Three active golden eagle nests (each containing two eaglets) were located in the Upper Pahsimeroi drainage in 1961. Six other eagles were known to be in this area, and five were counted in the Little Lost River drainage. Thus, a total of 17 golden eagles were actually counted in the study area with an estimated total of possibly 25 eagles during June, 1961. Observations February 6-11 indicate a maximum of 27 throughout the valleys at this time with a possible maximum of 41. On June 1, 1961, remains of one mule deer fawn, one rabbit, one magpie, and two sage grouse were found under one of the nests. No pronghorn fawn remains were found.

In addition to winter herd distribution checks, seven soil moisture and temperature stations were installed from June 22-25, 1961, in cooperation with the Soil Conservation Service. Six antelope rumen samples obtained during the latter half of the 1961 winter contained approximately 75% sagebrush and 10% Phlox by volume with only a trace of perennial grasses.

Intensive observations were made from about May 20 to June 10, 1962, on individually marked does with fawns to study mortality factors affecting antelope fawns.

The number of antelope trapped, tagged and released during the biennium are listed below.

Location and Number of Antelope Trapped and Tagged During 1960-62 Biennium

Location	Bucks	Does	Male Fwn.	Fem. Fwn.	No Age or Sex Data	Total	Color of Marker	Date
Copper Basin	20	36	14	11	2	83	Orange	10/15/61
Copper Basin to Weiser Riv. Drain.	1	5	0	0	0	6	Orange	10/16/61
*Crooked Creek	59	114	35	38	0	246	Dark Orange	1/18/61
†Birch Creek	19	65	10	15	0	109	Pink	1/19/62
‡Pahsimeroi Valley	20	55	20	25	0	120	Bucks, yellow Does, mixed	1/28/62
Totals	**119**	**275**	**79**	**89**	**2**	**564**		

* Includes 5 female retraps. † Includes 1 female retrap.

‡ Includes 5 buck and 21 doe retraps.

Lochsa and Selway Elk Study

Increased hunter pressure and hunter access made it desirable to obtain additional information relative to the Lochsa and Selway elk herd to provide for allowable annual removals which the herds would sustain within the limits of their range requirements.

The study commenced July, 1960, and has continued throughout the biennium. Elk numbers, distribution, food habits, range utilization and condition as well as hunter harvest were studied. A vegetative density estimate was used to appraise elk winter range in the Lochsa drainage.

Willow and redstem ceanothus were found to be the most abundant of the big game browses at 3,500 feet elevation in the Lochsa; whereas willow and bittercherry were the principal species at 3,000 feet elevation in the Upper Pete Creek drainage. Greatest portion of these species were in the mature and decadent age classes. The latter class has moderate resprouting in willow and redstem ceanothus, but very little was found in bittercherry.

Grand fir was high on the list of relative abundance of woody plant species. All plants in the samples were in the seedling and young age classes.

Six weather stations were read weekly during the 1960-61 winter, and four were used during the 1961-62 winter. Included were a hygrothermograph and an anemometer with hourly wind recorder at selected sites at various elevations on the divide summit and different exposures. Elk use of the various sites was correlated with climatological data obtained. Wind movements were greatest on the south-facing slopes.

The 1960-61 winter climatological studies conducted during January, February, and March indicated that snow and temperature had the greatest effect on elk behavior. Temperature effects were indirect, influencing the compactness of the snow. During the critical portion of the winter in January and February the major portion of the Lochsa elk herd was below 3,500 feet elevation. Rains in February of 1962 followed by extremely cold temperatures crusted the snow mantle permitting elk to move readily over their entire winter range.

The south exposures were used more by elk than any other exposure and had less snow cover. Elk ranged 500-700 feet higher on steep, south-facing slopes than on the east or west exposures.

Early spring aerial surveys of the lower Selway River tributaries showed about the same number of elk using the spring range in the Coolwater as there have been in the past. The animals were more dispersed during the 1961 winter than in 1960. Both Ballinger and Stuart Hot Springs natural licks were used by large herds, but they were not significantly greater than those in the past. More animals were seen on rainy or snowy cold days than on days of cloudy or warm weather; more animals were observed on cloudy days than on clear days.

Rumen samples, from big game killed by the Nez Perce Indians during the winter, were collected and preserved for future food habits analysis.

Bruce's Eddy Big Game Study

On August 10, 1960, the Idaho Department of Fish and Game and U.S. Army Corps of Engineers, Walla Walla District, entered into a cooperative agreement whereby the Corps of Engineers would finance the wildlife study contract and the Department of Fish and Game would conduct specified studies required in connection with the proposed Bruce's Eddy Dam and Reservoir. The study is still in progress.

Work conducted or in progress to date includes sampling of the canyon slopes of the North Fork of the Clearwater River the length of the reservoir site for utilization, density, and composition of browse species. The movements and distribution of big game animals, principally during the winter, are being studied. A review of the literature has been conducted and an abstract prepared of the most promising methods to follow in improving big game range in this watershed. This data is necessary for the selection of one or more adjacent range sites that may be managed to mitigate for losses which the big game herds will sustain upon construction and operation of the proposed dam.

Salmon Area Big Game Studies

Investigations were continued on selected mountain goat and bighorn sheep herds to determine their distribution, numbers, and hunting removals in an effort to determine more closely the productivity of these herds.

1. Bighorn Sheep

Winter census flights show an increase in the Challis-Morgan Creek watersheds with 96 sheep counted in January and February of 1961 and 148 counted in 1962. The herd on the East Fork of the Salmon River declined from 52 to 48 for the above respective periods. The lamb-ewe ratios for the Challis and East Fork herds were 40:100. Thirty-five ¾ or larger curl rams were counted in the Challis Creek-Morgan Creek area compared to 3 on the East Fork. The sheep are generally on their winter range prior to December 1 and leave just prior to June 1 for about six months of the year.

Two winter casualties were observed. Drs. Hadlow and Jellison of the U.S. Rocky Mountain Public Health Laboratory in Hamilton, Montana examined a 4 or 5 year old ewe found dead near Marco Creek August 9, 1961. They reported the death was due to extensive bronchopneumonia and suppurative leptomeningitis. A yearling ram was located on this range February 4, 1962; but unidentified animals had destroyed tissues so that cause of death could not be determined.

As far as could be determined hunters killed two rams in the East Fork of the Salmon River drainage in 1961 and 3 in 1960, with no kills reported for the Morgan-Challis Creek area.

The East Fork of the Salmon River population continues at a low level. Only 5 lambs were observed out of 48 sheep, indicating poor lamb survival and possibly poor production of lambs. Mortality studies

indicate that losses from disease and parasites are continuing. Only 3 (6%) legal rams were observed during the January census; the East Fork area was closed to sheep hunting for the 1962 season.

The bighorn population in the Morgan-Challis Creek area indicates good lamb survival through January. Lambs contributed 19% (28) of the 148 counted. Thirty-five ¾ curl or larger rams (24% of the herd) were counted.

2. Rocky Mountain Goat

The local mountain goat herds in the lower north side Pahsimeroi River watershed and adjacent east side of the Main Salmon River drainage was selected for special study.

The 1960 controlled hunts were held November 26-December 4. Three of the permittees did not hunt; the remaining 12 permittees each killed a goat for a 100% participating hunter success. Nine of the goats were billies (75%) and 3 (25%) were nannies. The males averaged just under 5 years of age, and the nannies were 10 years old and over.

Thirty-five permits were available in 1961, for which there were 54 applicants. Thirty-one of the permittees participated in the hunt. Twenty-six goats were killed for a participating hunter success of 84%. Fourteen billies and 16 nannies were killed. Nine of the goats were 3 years old or less, and 17 were four years or older.

During the January census 205 goats were counted in 1961 and 218 in 1962. The estimated population is 300. Kids comprised 24% and 25% of the goats counted in 1961 and 1962, respectively.

The 1961 harvest of 26 goats out of a known population of 244 constituted an 11% removal while 25% of the counted herd was composed of young of the year. This indicated modest removal of less than half of the herd increase. Further study and hunts may indicate permissible increased harvests in the future.

In addition to the bighorn sheep and mountain goat studies, data on antelope, deer, and elk was obtained and compiled for the general Salmon area.

Big Game Harvests

Big Game Management Units

Big game hunting seasons are now organized around game management units to simplify the establishment of regulations and to provide a useful basis for the recording of big game harvest, population and range data. Minor changes in some units were made in the biennium, but the system remains basically the same as that begun in 1959 and continued since then.

The job of gathering big game harvest information uses a three-pronged approach including the harvest questionnaire, big game report cards, and checking stations. Each of these three methods has an important part in getting the statewide picture.

Game Harvest Questionnaire

Beginning in 1953 a game harvest questionnaire has been mailed to approximately five percent (5%) of the purchasers of hunting licenses each year to obtain information concerning the harvest of deer, elk, bear, game birds and waterfowl. The main use of the questionnaire is in determining the statewide harvest of game by sampling a valid cross-section of all classes of license buyers. Local detailed information is supplied more readily and more extensively by the report cards and checking stations.

All deer, elk and bear harvest information included below is based upon the annual harvest questionnaire unless otherwise stated.

Statewide Deer Kill, Hunter Participation, and Success

Year	Big Game License Sales	Deer Tags Sold			Total Deer Kill*	Hunter Success†
		Regular Tags	Second Tags	Total		
1960	173,258‡	123,460	12,537	135,997	75,213	62.3%
1961	171,797‡	123,646	15,995	139,641	72,421	65.1%

* Based on statewide post-season game kill questionnaire.

† Based on license buyers hunting.

‡ Figures include 6,725 non-resident big game licenses in 1960 and 7,778 in 1961.

Statewide Elk Kill, Hunter Participation, and Success

Year	Big Game License Sales	Elk Tag Sales	Total Elk Kill*	Hunter Success
1960	173,258†	56,324	16,545	27.0%
1961	171,797†	58,727	15,720	27.5%

* Based on statewide post-season game kill questionnaire.

† Figures include 6,725 non-resident big game licenses in 1960 and 7,778 in 1961.

Big Game Report Cards

Report cards, distributed as an attachment to all big game tags, yield extensive information from all hunting units. Information from the returned cards is tabulated daily for each management unit during the season. The cards provide the Fish and Game Department with current results while hunting is in progress, and extensive use is made of the compiled results in planning the hunting seasons for the subsequent year. The main information from the cards includes the following:

1. Distribution of harvest by units.
2. Distribution of harvest by days for the entire season for each unit
3. Sexes of game taken, related to date
4. Source of hunting pressure (hunters' residence)
5. Location of kills within each unit
6. Antler points on bull elk

The tabulated data from the above items form a bulky report. Only the highlights of some of the main items for 1961 are reviewed below.

Kills by Unit. The distribution of the reported kill according to units is the best indicator of the distribution of the total kill. The table below lists the percentage of the statewide reported kill for deer and elk for each unit in 1961 based upon 26,853 reported deer kills and 7,322 reported elk kills.

Unit	Percent* of Statewide Harvest		Unit	Percent* of Statewide Harvest	
	Deer	Elk		Deer	Elk
1	2	1	39	5	3
2	1	..	40	4	..
3	1	1	41	2	No Season
4	1	3	42	2	No Season
5	1	..	43	1	2
6	1	4	44	..	..
7	..	3	45	1	No Season
8	3	3	46	..	No Season
9	..	3	47	1	No Season
10	1	13	48	1	1
10A	2	2	49	..	..
11	1	No Season	50	1	No Season
11A	1	..	51	1	No Season
11B	..	..	52	..	No Season
12	1	12	53	Closed	No Season
13	3	..	54	2	No Season
14	1	..	55	1	No Season
15	1	5	56	1	No Season
16	..	7	57	..	No Season
17	1	8	58	..	..
18	2	..	59	1	..
19	1	3	60	2	..
20	..	4	61	1	1
21	1	2	62	1	1
22	6	1	63	..	No Season
23	1	1	64	1	No Season
24	1	1	65	..	No Season
25	1	1	66	1	..
26	1	3	67	2	..
27	2	2	68	..	No Season
28	..	1	69	1	..
29	1	No Season	70	1	No Season
30	1	..	71	1	No Season
30A	..	No Season	72	1	No Season
31	1	..	73	2	No Season
32	5	1	73A	1	No Season
33	2	2	74	2	No Season
34	..	1	75	2	No Season
35	1	1	76	4	..
36	2	1	77	1	..
37	..	No Season	78	1	..
38	..	No Season			

* Listed to nearest whole number; percentage omitted if less than 0.5 percent.

Date of Kill. The table below lists the percentage of the statewide reported deer and elk kill which occurred in each calendar week of the 1961 season. There is much local variation in dates in individual units, but for the statewide area the main elk harvest period was in early October, and the main deer harvest periods were in late October and early November. (Details are available by individual units for all days of the season but not included in this biennial report.) In practically all elk units the largest kill occurred in the first few days of the season, but there were several exceptions to this in deer hunting, as follows:

1. In northern Idaho, where white-tailed deer are important game, late November was the heaviest harvest period in eleven units.

2. In the Crane Creek-Squaw Butte-South Fork Payette areas the mid-November harvest was the heaviest—after deer had moved toward winter range and when many other units had already closed.

3. In eastern Idaho November harvests topped October in most units, but the opening week was an important harvest period in all eastern units. November hunting was particularly important in Swan Valley, unit No. 67.

Since most deer are tagged with the regular tag, the weekly kill for the total deer harvest shows peaks very similar to the peaks for regular deer. Peaks for deer tagged with the various multiple tags reflect local conditions and hunting habits in the units where these tags are used. Peak kills were reported for extra deer in late October and again near the season's end in late November. Deer kills tagged with the Middle Fork tag peaked in mid-September and declined rather evenly for most of the remainder of the season. Hells Canyon tags were used more in mid-October than later, but kills on this tag held rather steady from late October to the end of the season in the third week of November.

Distribution of 1961 Reported Deer and Elk Kill by Weeks
(Shown as Percent of Season Total)

Week Ending	All Deer Combined	Elk
September 3	less than 1%	less than 1%
September 10	less than 1%	less than 1%
September 17	1%	4%
September 24	1%	4%
October 1	5%	16%
October 8	8%	17%
October 15	7%	7%
October 22	20%	11%
October 29	13%	14%
November 5	13%	9%
November 12	12%	7%
November 19	10%	4%
November 26	6%	3%
December 3	4%	3%

Fifty percent of the reported deer kill was taken by October 21 and fifty percent of the reported elk kill was taken by October 17.

The changing Sex Ratio in the Harvest as the Season Progresses. The proportion of bucks in the reported deer kill in 1961 reached its highest point in late October and much of November and dropped again in late season. More deer were harvested in the part of the season when the buck kill was at a high point than in earlier or later parts of the season. For the season as a whole **57 percent** of the reported deer kill consisted of bucks, including male fawns.

The proportion of bull elk in the reported take in 1961 reached its highest point in September and declined rather steadily for the remainder of the season. For the season as a whole **49.3 percent** of the reported elk kill consisted of bulls, including male calves.

Kills Listed According to Residence of Hunter. The deer and elk harvests made by hunters from the various counties of Idaho are roughly proportional to the human populations of the individual counties. That is, counties of large human populations have large numbers of hunters, and the harvests taken by these hunters are consequently large. The matter of nearby availability of deer or elk, is, of course, an important factor in determining hunter participation. Generally speaking, deer hunters do most of their hunting in units fairly near their homes, while elk hunters show considerable movement from all parts of the state toward the major elk units. Fortunately, much of Idaho's human population is located near good hunting units for both deer and elk. Listed below are the counties which ranked highest in total numbers of deer and elk taken by residents in 1961:

Counties Ranked According to Harvest of Deer and Elk By Local Residents

Rank	Ranked According to Number of Deer Taken By Local Residents	Percent of Statewide Reported Deer Kill
First	Ada	11
Second	Bannock	7
Third	Bonneville	6
Fourth	Canyon	6
Fifth	Nez Perce	3
Sixth	Twin Falls	3
Seventh	Idaho	3
Eighth	Kootenai	3
Ninth	Bingham	3
Tenth	Elmore, Payette Tied	2

Rank	Ranked According to Number of Elk Taken By Local Residents	Percent of Statewide Reported Elk Kill
First	Kootenai	6
Second	Ada	6
Third	Nez Perce	6
Fourth	Idaho	5
Fifth	Clearwater	5
Sixth	Shoshone	4
Seventh	Latah	4
Eighth	Canyon	3
Ninth	Bonner	3
Tenth	Benewah	2

Elk Antler Points. The 1961 antler point data requires additional study, but in nearly 3,000 reports of antlered elk the 6-point antler class was reported oftener than the spike or yearling class. The predominance of 6-point and 5-point bulls in the take is indicative of moderate harvest. Despite Idaho's large annual elk harvest the indications are that the harvest could safely go considerably higher in many areas without cutting population levels for the future.

A Comparison of Report Card Returns for the 1960 and 1961 Seasons

	Deer		Elk	
	1960	1961	1960	1961
Total tags sold	135,997	139,641	56,324	58,727
Total cards returned	46,707	41,164	19,230	17,225
Total kills reported	30,482	27,154	7,646	7,380
*Hunter success as percent of cards returned	65.2	65.9	39.7	42.8

* The reader is reminded that hunter success in this table is higher than actual since successful hunters are more apt to report than unsuccessful hunters. See hunter success under Game Harvest Questionnaire.

Checking Stations

Checking stations are used mostly to gather information on hunter success, age, weight, condition and other biological data related to productivity and animal welfare; but operations at these stations include checking of licenses and tags as standard practice in law enforcement.

Checking stations are of special value at locations where large numbers of game animals can be handled in a short period of time, and major checking efforts are accomplished only at points where heavy hunter traffic can be intercepted.

Major checking stations handled mostly deer, elk, and bear. Secondary stations were set up to meet local management needs with other species. The volume of big game handled at checking stations is indicated by the summary figures below.

Year	No. of Stations	Deer	Elk	Bear
1960	39	16,791	4,777	122
1961	45	11,486	4,399	87

Moose

Controlled hunts for antlered bull moose were continued in specified areas where moose are most plentiful in order to permit the hunters to benefit from harvesting surplus animals to the herd needs. Additional hunt areas were added as well as some being closed depending on the numbers and distribution of animals in each unit.

Summary of Controlled Moose Hunts

Year	Hunting Units	No. of Permits	No. of Applicants*	Kills				Participating Hunter Success
				Bulls	Cows	Calves	Total	
1960	24	73	478	39	1	..	40	62.5%
1961	27	81	464	40	..	..	40	62.5%

* Includes applications received for second drawing.

There were 64 hunters who went into the field hunting for moose each season as obtained from the hunter report cards and follow-up letters and contacts. A reply was obtained from all moose hunters in 1961.

Five moose were ear tagged and marked with plastic patches in Fremont County during the 1960-61 winter, and 41 during the 1961-62 period to study their dispersion, drifts and survival.

Antelope

Antelope hunting continued to be one of the most popular big game controlled hunts during the biennium. Annual winter census of the major herds as well as hunter harvest data are used in determining the number of animals to be harvested. Antelope have extended their range into new areas providing additional hunts. However, the reduction of antelope range due to changes in land use is one of the major problems confronting future management of antelope. The hunter success was up slightly over the previous two years.

Summary of Controlled Antelope Hunts

Year	No. of Units	No. of Permits	No. of Applications*	Kills			Participating Hunter Success
				Bucks	Does	Total	
1960	17	1,205	3,807	437	264	701	78%
1961	18	900	3,243	292	184	476	76%

* Includes applications received for second drawing.

The above kill figures were obtained from hunter report cards and follow-up contacts; however, these are minimum kill figures since not all hunters reported.

Ear tagging and marking of 564 antelope during the biennium has aided in the solution of some of the problems concerning their movements and migrations. Major interstate movements have been found between Montana and Idaho for portions of the Crooked Creek and Birch Creek herds. A majority of the antelope herds have not returned to the populations counted previous to the severe 1952 winter. Studies are continuing to determine the limiting factors to antelope increment and survival.

Bighorn Sheep

One of the most desired big game trophies is the bighorn sheep. All sheep hunts during the biennium were general hunts for rams of

¾ curl or larger. These general hunts were restricted to specific areas where the bighorn herds are located and where removal of trophy rams is desired and beneficial. Nearly all bighorn sheep are within the Salmon River watershed, and the only open hunts for sheep were in this area. The East Fork of the Salmon River herd is not producing or maintaining its numbers as desired and was closed to hunting for the 1962 season.

Summary of Hunter Report Cards Received for Bighorn Sheep Hunts

Year	No. Hunt Units	Type of Hunt	Tags Sold	Reported Kill	Participating Hunter Success
1960	7	General	417	57	21%
1961	7	General	555	51	18%

The characteristic of the trophy rams to spend most of the year singly or in groups separated from the ewes, lambs and young rams increases the difficulty for hunters in seeking them during the early fall hunts. The vastness of the rugged and largely isolated range in which they live presents hunter access problems and the difficult access serves to limit the number of sheep hunters.

Mountain Goat

General and controlled hunts were conducted during the 1960 and 1961 mountain goat season. The general hunts were located in specified areas north of the main Salmon River except for Lemhi county. South of this demarcation the hunts were for a specified number of permits. Both sexes are legal during the hunts. Specific areas are provided for both the general and controlled hunts to protect the herds from excessive hunting and to obtain a more equitable hunter distribution into the mountain goat range. Summary of the hunter report cards received for general and controlled mountain goat hunts is listed below.

Summary of General and Controlled Rocky Mountain Goat Hunts

Year	Hunting Units	Type of Hunt	No. of Permits	Tags Sold	Billies	Nannies	Total	Participating Hunter Success
1960	21	Controlled	115*	94	36	29	65	
1960	7	General	Unlimited	188	22	18	40	55%†
1961	25	Controlled	160*	140	41	33	74	
1961	7	General	Unlimited	186	18	24	42	60%†

* Includes controlled archery hunt for 10 permits.

† This figure constitutes overall participating hunter success for both general and controlled goat hunts.

Mountain goat are widely distributed in the mountainous portions of the state north of the Snake River Plains and not principally confined to the Salmon River watershed as are bighorn sheep. However, they tend to range in small scattered groups with each group inhabiting a

rather restricted area. This presents management problems in that the more accessible groups are subject to excessive harvests while the isolated groups are under harvested.

Bear

The closed season on grizzly bear was continued. With the exception of the four northern counties a year-long season during the biennium was provided for taking of black or cinnamon bear. In Boundary, Bonner, Kootenai and Shoshone counties the season was September 1 to November 30 in both 1960 and 1961. The bag limit was one bear per person.

A statewide harvest of about 3,373 bear was indicated by the hunter questionnaire for 1960, of which 28% were from the four northern counties. Resident hunters killed 89% and non-resident hunters 11% of the 1960 statewide bear harvest. Seventy percent of the statewide harvest was males, and males made up 72% of the harvest in the four northern counties.

Two thousand one hundred and ten (2,110) bear were killed in 1961. Approximately 25% of the statewide 1961 bear kill occurred in the four northern counties. Resident hunters killed 91% and non-residents 9% of the 1961 statewide harvest.

Caribou

The small mountain caribou herd in northern Idaho adjacent to the Canadian border was closed to all hunting. The adjacent range in Canada was closed to hunting to protect this herd. The population during this period is estimated at 100 animals. This is the only known herd of caribou in the state, and it is the desire of the Department to maintain and perpetuate this herd. The mountain caribou prefers mature, virgin forest cover where moss and lichens are one of its preferred foods. Additional research is needed to appraise what effects forest clearing and logging may have on the welfare of this herd.

Age and Weights

At selected locations during the big game seasons the sex, age, and weights of hog-dressed big game species, principally deer, were obtained. This information has shown that deer from areas where feed is scarce weigh less for the same age class than those on good range. Big game from ranges with an adequate food supply show a greater productivity in that the females breed at a younger age and also have more young. The survival of the young is also greater and the animals are in a healthier condition. Herds that are lightly hunted have a larger proportion of males and old animals in the hunter kill. Through analysis of this information adjustments are made to provide increased benefits to the hunting public and also maintain the herds at their optimum production level by obtaining a more equitable distribution of hunters and kill.

Big Game Tagging

Big game animals were trapped, tagged, and released during the biennium to obtain additional information including movements, survival, and development.

The most successful tagging and marking project for moose was accomplished during the winters of 1960-61 and 1961-62. Five moose were tagged, marked, and released during the first winter, and 41 during the latter period. The tagging was accomplished by use of a helicopter to approach the animal and a dart equipped with a hypodermic syringe device to administer an incapacitating drug. There were no losses sustained in the tagging of the 41 moose, but two losses occurred the first winter.

Black bear have also been trapped, tagged, and released. Most of these bear are taken from forest camp areas or resort areas where they become troublesome. Live trapping, tagging, and transplanting of the bears to more remote areas and releasing them has provided information on their movements and life history.

The major portion of the trapping and tagging has been financed by Federal Aid funds under project W-75-D. Permanent records are kept of each individual animal tagged, and these records are an important reference point in analyzing tagging results.

Summary of Big Game Tagging During 1960-62 Biennium

Period	Antelope	Bear	Deer	Elk	Moose
1960-61	0	5	172	3	5
1961-62	564	7	109	19	41

Protection of Stacked Crops From Big Game Depredations

The Idaho Fish and Game Department continued the cooperative program with land operators in protecting stacked crops from big game depredations by supplying panels to be placed around stacks. These depredations involve mainly deer and elk, and use of wooden panels has been one of the most successful protective methods used.

Various repellents and devices are being tried experimentally to reduce damage to orchards and other agricultural pursuits.

Furbearers and Predators

Furbearers

The poor fur prices which prevailed through the biennium resulted in decreased trapper interest, as is illustrated by license sales figures. Only 690 trappers' licenses were sold in 1960-61, and 532 in 1961-62. This is less than half the average number of trappers active during

the 1945-1954 decade when fur prices were more nearly normal. As a result the volume of raw fur harvested is far below average.

Annual Fur Harvest

Species	1960-61		1961-62	
	No. Caught	Average Price	No. Caught	Average Price
Beaver	7,025	$ 9.14	4,781	$ 9.23
Muskrat	70,927	.49	51,300	.57
Mink	2,592	10.09	2,040	8.00
Marten	550	5.03	350	4.63
Otter	73	16.38	64	17.09
Raccoon	632	1.33	459	1.67
Fox	80	2.71	39	2.69
Bobcat	1,173	6.14	756	4.22
Weasel	575	.51	278	.50
Coyote	156	1.37	228	1.38
Skunk	140	.67	71	.67
Civet	85	.33	13	.23
Badger	103	1.49	79	1.58
Nutria	5	.75	1	.25
Lynx	6	10.50	1	15.00

Beaver

Idaho's most valuable individual furbearer is the beaver, and activities involving this species constitute the bulk of the Department's fur management program.

After ten years of inadequate harvest under the state trapper system, open seasons were resumed in 1957-58. The first year produced a catch of 24,000 pelts; but recent harvests have fallen below the long-term average (8,000 pelts) due to the lack of trapper interest.

The status of populations on small, back-country streams where beaver are important for their contribution to fisheries and watershed management has been evaluated annually since 1959.

Permanently established trend routes are covered on foot or horseback by conservation officers each fall to determine the number of colonies present on these sample streams.

Beaver Colony Trend Counts

	No. of Routes	Stream Miles	Number of Colonies		
			1959	1960	1961
District I	8	54	28	34	42
District II	5	27	8	15	17
District III	3	19	3	6	8
District IV	9	46	40	31	46
District V	8	37	39	43	37
Total	**33**	**183**	**118**	**129**	**150**

A direct stream-by-stream comparison of the number of colonies is available for the 31 routes which have been covered all three years since 1959. These indicate a substantial increase in colonies over most of the state, an expected trend in view of the reduced beaver trapping which occurred during this period.

Beaver activity in areas of human developments often results in damage to roads, culverts, orchards, croplands, and irrigation ditches. Heavy trapping during the open season is encouraged to reduce these populations, but off-season damage control work by conservation officers and temporary hired trappers is still a substantial activity in some localities.

The number of damage complaints and direct expenditures for control measures decreased in 1961-62 for the first time since open seasons were inaugurated.

Beaver Damage Complaints

	1958-59	1959-60	1960-61	1961-62
District I	66	61	84	47
District II	13	19	9	11
District III	44	63	58	60
District IV	111	92	130	59
District V	214	295	265	221
Total	**448**	**530**	**546**	**398**
Direct control costs	$1,041.45	$3,262.19	$4,370.09	$2,290.59

Fisher

This species, one of the most valued of all furbearers, was taken by Idaho trappers in earlier years; but concrete evidence that it still occurred in the state had been lacking since the 1920's.

Through the cooperation of the British Columbia Fish and Game Branch, eleven wild fishers were live trapped by Canadian trappers and released at Chamberlain Basin in the Idaho Primitive Area in March, 1962, under the first phase of a Federal Aid transplanting project.

Additional releases are planned for the northern part of the state next year, concluding this attempt to restore a rare and interesting species of wildlife to its native range in Idaho.

Predators

Cooperative Predator Control Program

Predator control work sponsored by the Department is now confined entirely to financial support of the cooperative program, to which various federal, state, and county agencies and livestock associations contribute. The Branch of Predator and Rodent Control, U.S. Fish and Wildlife Service, administers this fund and carries out actual control

operations. Department expenditures for this activity during the biennium were $23,045.56 in 1960-61 and $22,999.38 in 1961-62.

Cougar

This animal is rapidly assuming the status of a big game trophy in Idaho, as is evidenced by the increased interest in cougar hunting as a sport. Cougar kills reported by conservation officers show that more animals were taken in recent years on this basis than were previously harvested under the statewide bounty system.

A few animals are taken incidental to deer and elk hunting or by trapping, but the bulk of the annual cougar kill is accounted for by persons actively hunting the species with hounds.

Annual Cougar Kill

	1959-60	1960-61	1961-62
District I	15	9	14
District II	36	34	79
District III	26	25	39
District IV	41	14	27
District V	1	1	5
Total	**119**	**83**	**164**

Game Birds

Neither 1960 nor 1961 were outstanding bird years. The annual hunter questionnaire surveys revealed that hunting pressures were below average for most species and that total harvest in each year was near the long-term norm. Exceptions occurred in the forest grouse and Canada geese, both of which enjoyed a particularly good production year in 1961 and had the highest harvests on record.

Major management innovations in the way of hunting regulations were the beginning of limited pheasant hen hunting in 1960, the general liberalization of quail and partridge regulations in 1961 and the introduction of the mallard bonus provision in 1961 within the principal mallard wintering areas.

Trial introductions of the wild turkey were begun in the lower Salmon River drainage during the biennium.

The following pages give a brief analysis of the status of each of the upland game birds and the waterfowl, together with a sampling of the wide range of management data collected each year.

Pheasant

The outlook for pheasants in Idaho continues to be good. The irrigated farmlands of Idaho produce each year a bountiful crop of pheasants in addition to other farm products. About one-half million pheasants are taken annually by hunters in an average year.

A considerable amount of field work is expended on the ring-necked pheasant by Idaho Fish and Game Department personnel because it is the most important upland game bird to the hunter. The first game bird management activity of each year and the one which receives effort from virtually all field men in the Department is the annual pheasant winter sex ratio count. The result of this count is used to estimate percentage harvest of cock pheasants during the preceding hunt and to establish a base for estimating trend of breeding numbers the following spring. Research studies have shown that a ratio of one cock for each seven or eight hens is adequate for breeding purposes. Our average winter sex ratio for the 13-year period summarized in the accompanying table is 2.1 hens per cock.

Idaho Pheasant Winter Sex Ratios Through the Years

Year	Statewide Sample Size (Pheasants)	Statewide Sex Ratio	
		M:100F	Hens Per Cock
1950	15,834	53:100	1.9
1951	18,168	57:100	1.8
1952	47,444	50:100	2.0
1953	16,564	55:100	1.8
1954	18,283	45:100	2.2
1955	46,639	41:100	2.4
1956	25,828	41:100	2.4
1957	22,414	52:100	1.9
1958	18,479	51:100	2.0
1959	30,896	55:100	1.8
1960	31,010	43:100	2.3
1961	16,047	46:100	2.2
1962	29,183	41:100	2.4
Average	25,906	48:100	2.1
Range		57:100 to 41:100	1.8 to 2.4

In both 1960 and 1961, data from the winter sex ratio counts, the spring breeding cock census and summer pheasant brood count routes revealed that the fall pheasant populations would be slightly above average over the state. In terms of birds bagged per hunter on opening weekend, the following table shows that individual hunter success during the 1960 and 1961 pheasant hunts were 10% and 16% higher than the long-term average. Pheasant hunting pressure was below the level of the previous biennium years.

Limited hen hunting was allowed in some counties of the state during the final few days of the hunting season in both 1960 and 1961. A modest take of hens ensued, with no heavy hunter interest. In both years check station results indicated that one hen was bagged for each cock taken during the period of the hen hunts. Recent pheasant research studies have shown that about two-thirds of the hens in the field each summer are removed by natural mortality before the follow-

Comparison of Pheasant Checks on Opening Weekend

Area	Year	No. of Hunters	Total Birds	Hours Hunted	Birds Per Hunter	Hours Per Bird
North Idaho	1960	1,217	976	3,597	0.80	3.7
	1961	881	890	2,934	1.01	3.3
Southwest Idaho	1960	2,685	3,038	9,647	1.13	3.2
	1961	2,825	3,533	9,734	1.25	2.8
Southcentral Idaho	1960	1,782	1,977	5,167	1.11	2.6
	1961	1,988	1,927	6,215	0.97	3.2
Southeast Idaho	1960	3,805	4,441	16,552	1.17	3.7
	1961	2,351	3,018	9,587	1.28	3.2
Totals	**1960**	**9,489**	**10,432**	**34,962**	**1.10**	**3.4**
	1961	**8,045**	**9,368**	**28,470**	**1.16**	**3.0**
Long-term Totals (1950-1961)		**97,860**	**99,748**	**355,383**	**1.00**	**3.6**

ing breeding season. The objective of limited hen hunting is to put some of these surplus hens into the hunter's bag. Acceptance of this regulation by the hunting public after many years of "roosters only" was excellent.

Wild Turkey

In January of 1961, the first official introduction of Merriam's wild turkey in recent times took place near Whitebird on the Salmon River drainage. This was followed by another release on a tributary creek of the Rapid River a few airline miles up the Salmon drainage from the first release site. The first introduction consisted of 17 birds and the second of 11 birds. All were mature wild stock trapped in Colorado and air-transported to Idaho, arriving in excellent condition. In exchange for the turkeys, Idaho provided Colorado with five mountain goats in the summer of 1961.

During both summers a limited amount of turkey production was evident in the release areas. The ultimate success or failure of the wild turkey introductions will not be established until several breeding seasons have elapsed.

Based on exchange of wild turkeys for Hungarian partridge, additional releases will be made in the Salmon River drainage as soon as wild-trapped stock can be provided by the Colorado Fish and Game Department.

Sage Grouse

A gradual reduction of suitable sage grouse habitat in the state continues to dim the long-range outlook for this specialized game bird. The most serious current loss of living quarters for sage grouse results from the spraying of large acreages of rangeland with weedicide for the purpose of changing the vegetative cover from a sagebrush-grass climax to grass alone. About 75% of the year-round food and cover requirements for sage grouse are furnished by sagebrush.

Since all permanent progress in game management is dependent on adequate research, the Idaho Fish and Game Commission authorized in 1960 a pilot study of sage grouse growth and survival. The study terminates in 1962. A major phase of this research was the rearing of sage grouse in captivity for the first time in sufficient quantity to obtain needed data on growth and feather development rates. The birds were reared successfully at the Jerome Game Farm. Future research projects on sage grouse will involve analyzing the quantity and quality of Idaho's remaining sage grouse ranges with a view to devising workable procedures for arresting the present decline in the habitat base.

Both 1960 and 1961 were years of mediocre sage grouse production as verified by check station results in the accompanying table. Hunting pressure on sage grouse was appreciably below the previous biennium years due to restriction of hunting opportunity and loss of hunter interest.

Comparison of Sage Grouse Check Station Results, 1960-61

Area	Year	No. of Hunters	Total Birds	Hours Hunted	Birds Per Hunter	Hours Per Bird
Southwest Idaho	1960	1,046	981	4,280	1.06	4.4
	1961	1,022	761	5,051	0.76	6.6
Southcentral Idaho	1960	285	288	1,184	1.01	4.1
	1961	1,400	993	6,358	0.72	6.4
Southeast Idaho	1960	2,463	1,947	10,418	0.79	5.4
	1961	2,199	1,769	8,730	0.80	4.9
Totals	**1960**	**3,794**	**3,216**	**15,882**	**0.85**	**4.9**
	1961	**4,621**	**3,523**	**20,139**	**0.76**	**5.7**

Forest Grouse

Idaho's rich forest grouse resource, consisting of the ruffed or willow grouse, the blue grouse and the Franklin or spruce grouse continued to furnish much recreation in all forested parts of the state. 1960 was an average production year, but in 1961 the ruffed grouse had a bumper crop, particularly in north Idaho where most of the state's ruffed grouse habitat is located. The forest grouse harvest reached record proportions in 1961.

Sharp-tailed Grouse

The sharp-tailed grouse, once abundant over the southern part of the state, is still present in the few remaining areas where native grasslands of the type preferred by this bird still exist. Each year a limited open season on this species is held in Fremont county where sharptails are taken incidental to sage grouse hunting. A total of 95 sharptails were checked in 1960 and 86 in 1961; about five sage grouse were bagged for each sharptail.

The Partridges and the Quail

Idaho's two species of partridge, the Hungarian and the chukar, and four kinds of quail, the mountain, valley, Gambel and bobwhite have been only lightly hunted over the years. Although these species offer excellent hunting recreation, hunter interest has centered on the larger upland game birds.

In an effort to obtain broader utilization of this fine game bird resource, the Commission authorized longer seasons and larger bag

Idaho Waterfowl Mid-winter Inventory
January 1961 and 1962

Species	1961	Average 1952-61	1962	% Change From 10-yr. Av.	% Change From 1961
Mallard	416,445	374,304	428,322	+ 14	+ 3
Gadwall	2,025	1,085	2,606	+140	+ 29
Baldpate	14,805	17,216	17,000	- 1	+ 15
Green-winged Teal	3,270	1,960	2,286	+ 17	- 30
Shovelers	540	728	61	- 92	- 89
Pintail	6,015	12,910	26,719	+107	+344
Wood Duck	10	26	2	.....	.....
Redhead	12,680	4,760	6,710	+ 41	- 47
Canvasback	4,075	2,348	3,293	+ 40	- 19
Scaup	6,745	3,641	4,621	+ 27	- 31
Ringneck	710	717	1,700	+137	+139
Goldeneye	14,495	13,894	16,597	+ 19	+ 15
Bufflehead	725	804	1,216	+ 51	+ 68
Ruddy Duck	175	159	681	+328	+289
Mergansers	13,520	5,544	4,799	- 13	- 65
Unidentified Ducks	6,445	7,393	5,179	- 30	- 20
Total Ducks	502,690	447,489	521,792	+ 17	+ 4
Snow Goose	12	6	4	.....	.....
Canada Goose	15,252	9,265	9,471	+ 2	- 38
Lesser Canada	.....	.....	200	.....	.....
Cackling Goose	.....	1	20	.....	.....
Total Geese	15,264	9,272	9,695	+ 5	- 36
Whistling Swan	110	122	208	+ 70	+ 89
Trumpeter Swan	161	294	384	+ 31	+139
Coot	35,165	25,462	17,936	- 30	- 49
Total Waterfowl	**553,390**	**482,639**	**550,015**	+ 14	**No Change**

limits during 1961. An experimental September hunt in one part of the state during 1961 demonstrated that an early quail-partridge season would be successful and could be extended to other parts of the state.

The partridges had below average production in both years. Hunting was generally mediocre except in a few hot spots around the state.

Quail had an average year in 1960 but were abundant in 1961. Hunter questionnaire returns indicated the second best quail harvest on record in the latter year.

Waterfowl

Due to drought conditions on the Canadian prairies where 80 percent of the annual duck supply is produced, continental waterfowl numbers during the biennium were adjudged by Federal waterfowl authorities to be at their lowest point in over a decade. Waterfowl which migrate through the Pacific Flyway, of which Idaho is a part, were apparently not as drastically affected by the drought in the prairies. Weekly counts on key concentration areas in Idaho revealed that the fall flights of ducks through the state in 1960 and 1961 were not appreciably different than during the previous biennium years.

Duck harvests during both 1960 and 1961 were the lowest in recent years. The drop in Idaho duck kill was due to a combination of reduced hunting season length, a decrease in the number of waterfowl hunters and low water conditions in some parts of the state. The goose harvest, on the other hand, remained average during 1960 and rose to the highest point on record during 1961.

The existence of the amazing wintering mallard buildup in the Pacific Northwest in recent years was recognized by the Federal government by the granting of two "bonus" mallards in the daily duck bag within prescribed areas of Washington, Oregon and Idaho during the 1961 hunt. This was a beginning step toward obtaining a more adequate harvest of this population.

Mourning Dove

Nationwide breeding population surveys, in which Idaho participates annually, show that the population status of the mourning dove remains at a high level.

Maximum numbers of doves are usually available in Idaho in August, before the hunting season opens. In many years the bulk of the doves have passed through the state before the September 1 opening allowed by Federal regulations. This apparently occurred in both 1960 and 1961 and hunter success in those years was about average. Approximately 19 million doves are harvested annually in the United States; Idaho's usual share of that total is a fraction of 1%.

Game Farm Operations

During the biennium, game farm production of pheasants at both the Lapwai and Jerome game farms was stabilized at a reduced level

adequate to meet needs. All pheasant chick production was performed at Jerome, with sexed day-old chicks air-shipped to Lapwai for rearing. Cock pheasants other than those retained for next year's game farm breeding stock were released just prior to the hunting season in heavily hunted areas in order to get the best possible hunter take. This procedure was adopted after careful study of hunter recovery rates for game farm birds released in Idaho and other states. The fall release program worked well, with band recoveries indicating that a high percentage of the released birds showed up in the hunter's bag. The usual spring releases of hens held over winter at the two game farms were made in marginal pheasant habitat where over-winter losses of pheasants were believed to be high. Production and release records are given in the accompanying table.

Chukar production at the Jerome farm continued at a reduced level sufficient to provide birds for the few remaining areas which have not yet received initial breeding stock releases.

Game Farm Chukar Partridge Release Record

County	1961 Spring Release	1961 Brood Stock	1961 Fall Release	1961 Total	1962 Spring Release	1962 Brood Stock	1962 Total
Bonneville	125	...	...	125	...	...	...
Butte	50	...	...	50	55	...	55
Custer	...	...	...	...	55	...	55
Gooding	...	14	200	214	...	...	...
Idaho	...	...	...	...	100	...	100
Lemhi	150	...	...	150	300	112	412
Nez Perce	100	...	...	100	...	...	...
Lewis	...	...	...	...	100	...	100
Franklin	...	130	...	130	...	...	...
Totals	**425**	**144**	**200**	**769**	**610**	**112**	**722**

Pheasant Incubation Record
Jerome Game Farm

	1961	%	1962	%
Eggs set	20,199		18,680	
Infertile	1,468	7.3	1,715	9.2
Dead shell	2,584	12.8	4,008	21.5
Broken	143	0.7	123	0.7
Culls	171	0.8	166	0.9
Hatch	15,833	78.4	12,668	67.8

Game Farm Pheasant Release Record

County	1961 Spring Release	1961 Brood Stock	1961 Summer Release	1961 Fall Release	1961 Total	1962 Spring Release	1962 Brood Stock	1962 Summer Release	1962 Fall Release	1962 Total
Ada	75	77	150	75	377	100	75	.....	75	250
Bannock	.....	400	.....	.....	400	100	.....	.....	.....	100
Benewah	350	.....	.....	600	950	460	.....	.....	704	1,164
Bingham	.....	.....	.....	400	400	.....	.....	.....	.....	.....
Bonner	25	.....	.....	.....	25	.....	.....	.....	.....	.....
Bonneville	.....	.....	.....	.....	.....	.....	.....	.....	100	100
Boundary	200	.....	.....	800	1,000	258	.....	.....	800	1,058
Butte	404	.....	.....	.....	404	.....	705	.....	.....	705
Caribou	.....	410	.....	.....	410	.....	390	.....	.....	390
Cassia	288	.....	.....	.....	288	.....	.....	.....	.....	.....
Clearwater	38	.....	.....	.....	38	77	.....	.....	.....	77
Custer	200	.....	.....	.....	200	.....	300	.....	.....	300
Elmore	.....	.....	.....	.....	.....	300	.....	.....	100	400
Franklin	.....	400	.....	.....	400	310	.....	.....	.....	310
Gooding	.....	21	.....	.....	21	.....	.....	.....	.....	.....
Idaho	162	.....	.....	450	612	233	.....	200	500	933
Jefferson	.....	.....	.....	600	600	.....	300	.....	750	1,050
Jerome	.....	.....	300	.....	300	.....	.....	300	.....	300
Kootenai	150	.....	.....	.....	150	200	.....	.....	.....	200
Latah	125	.....	.....	450	575	155	.....	.....	500	655
Lewis	52	.....	.....	.....	52	.....	.....	.....	.....	.....
Madison	.....	400	.....	.....	400	.....	300	.....	.....	300
Minidoka	200	.....	75	.....	275	.....	75	.....	75	150
Nez Perce	115	.....	397	1,014	1,526	155	.....	303	876	1,334
Oneida	.....	375	.....	.....	375	200	.....	.....	.....	200
Owyhee	.....	.....	.....	250	250	100	.....	.....	200	300
Payette	.....	.....	.....	.....	.....	.....	.....	.....	300	300
Power	.....	.....	.....	200	200	.....	.....	.....	.....	.....
Twin Falls	105	.....	660	635	1,400	105	.....	930	.....	1,035
Totals	**2,489**	**2,083**	**1,582**	**5,474**	**11,628**	**2,753**	**2,145**	**1,733**	**4,980**	**11,611**

Land Management

The land management section of the Department is responsible for wildlife habitat improvement and the maintenance and development of the state's wildlife management areas.

Habitat Improvement

The objective of the Department's habitat improvement program is to increase the wildlife carrying capacity of Idaho lands. The basic habitat needs for all wildlife are food, cover, and water. The distribution of these essentials on the land is as important as their presence. The problems of upgrading the living quarters for wildlife are usually highly complex, but their solution is the only way of permanently increasing wildlife numbers on a given unit of game range.

Three game biologists were assigned to habitat improvement activities in specific sections of Idaho during the biennium. The work was carried out under federal aid project 80-D.

For Game Birds

One of the main limitations to game bird abundance on the irrigated farmlands of Idaho is the lack of suitable cover. Cover is important to farm game at all times of the year for such varied activities as nesting, brooding of young, and escape from natural enemies. A particularly critical need for protective cover occurs during the winter months when weather is severe and most farm fields offer nothing but plowed ground. At this time of the year, cereal grains, the normal food supply for game birds, is often unavailable due to snow and freezing conditions. If cover is of the right type, it also offers emergency food for wildlife in addition to protecting them from the elements and from natural enemies.

For these reasons, a major part of the habitat improvement program is aimed at encouraging the planting of permanent cover in the form of selected trees and shrubs on the private farm lands of Idaho.

Working closely with the Soil Conservation Districts of the state, about 292,000 trees and shrubs were planted by Department crews during the biennium (see accompanying table). This constituted a major increase in the tree and shrub program. One-third of the total tree and shrub acreage planted since the program began in 1952 was done during the past two years. Most of the 1962 acreage was in eastern Idaho where winter conditions are most severe for farm game. Eighty percent of the planting stock was used in field windbreaks which have other utilitarian uses to the landowner in addition to their value for game.

Before plantings are made on farms, the landowner agrees that he will allow a reasonable amount of hunting to those who ask permission. This stipulation resulted in 126,188 acres being assured to the hunting public during the past two years. Since 1952, the program has resulted

Summary of Tree and Shrub Plantings, 1961-62

Year	Number of Planting Sites				Trees and Shrubs Planted		Acres Planted	Acres Open to "Hunting By Permission"
	SCD*	Pvt.	Dept. Lands	Other	In New Plantings	For Replants		
1961	168	0	5	1	225,530	13,668	285	57,890
1962	161	2	5	0	237,859	14,664	289	68,298
Total	**329**	**2**	**10**	**1**	**463,389**	**28,332**	**574**	**126,188**

* SCD—Plantings made in cooperating Soil Conservation Districts.

in a 283,393 acres being available to hunting. This is an important contribution during an era when more and more private lands are being posted against public hunting.

The Department has cooperative working agreements with 41 of the 52 Idaho Soil Conservation Districts. The agreements include the tree and shrub planting program as well as other aspects of wildlife management.

In addition to the above program which deals primarily with habitat improvement for pheasants on private farm lands, the following list gives a sampling of the diverse types of game bird habitat improvement work performed by field biologists during the past biennium:

1. Installing artificial watering devices for game birds in water-deficient areas and testing new designs for watering devices.
2. Testing new tree, shrub and grass species for survival ability and value to wildlife.
3. Planting of cereal grains and perennial grasses to increase the carrying capacity of selected lands for game birds and waterfowl.
4. Evaluation of previous habitat improvement work for the purpose of improving future operations.
5. Evaluation of desirable wildlife lands for possible acquisition and development by the Department.
6. Construction and maintenance of fencing to protect tree and shrub plantings, water developments and other habitat installations.
7. Construction of artificial nesting sites for Canada geese in those goose areas where natural nesting sites are in short supply.
8. Attending many public and private meetings to participate in decisions affecting wildlife habitat.

For Big Game

Cooperative work between the Department, the U.S. Forest Service and the U.S. Bureau of Land Management resulted in about 1,725 acres of important big game winter range being seeded to bitterbrush for big game during the past two years. Most of the planting was done on burned over range lands. Planting methods included the use of hand planters, aerial seeding and machine seeding.

Two 3,000-gallon concrete watering devices for antelope were constructed in Power county in an experimental attempt to increase the carrying capacity of this area for the far-ranging pronghorns.

In cooperation with the U.S. Forest Service, experimental work was begun in 1961 on a research project to develop an economically feasible method of increasing the production of mountain mahogany, an important big game browse species in some areas of the state.

Wildlife Management Areas

In the face of rapidly expanding human populations and continuing loss of habitat, particularly wetland units important to waterfowl, there is a strong need for areas on which the principal land use is directed toward wildlife.

The Department now has 14 wildlife management areas as listed in the accompanying table. None of these are refuges in the sense of game protection alone. All but a small portion of the total lands in management areas are open to hunting and fishing in season. They are called wildlife management areas because their objectives are:

1. To provide optimum living quarters for wildlife, and
2. To provide places where the public can enjoy hunting, fishing or just observing wildlife.

Acquisition, development and maintenance of these areas are financed from Pittman-Robertson funds.

During the biennium a severe pinch in the availability of funds put the wildlife management area program on a maintenance basis, with much of the needed development deferred until financing is available. Such maintenance during the past two years has included most of the types of work which would have to be done on any ranch or farm such as operation of irrigation facilities, weed control, maintenance of roads, buildings and fences.

Crops are planted for wildlife use on the management areas. Trees and shrubs are planted to provide best cover conditions for game birds. Haying and grazing operations are carried on where they do not conflict with wildlife use of the area. Range revegetation is done where big game can be benefited.

An increasing amount of effort and funds is going into providing additional facilities and accommodations for public use. Within budgetary limitations, boat launching sites, sanitary facilities and parking areas are being provided to accommodate the rapidly increasing flow of visitors to the State's wildlife management areas.

Location and Major Use of Wildlife Management Areas

Albeni Falls	Bonner	Waterfowl, deer, access
Boise River	Ada, Boise, Elmore	Deer, elk, access
Boundary County	Boundary	Waterfowl, furbearers, deer, fishing

Carey Lake	Blaine	Waterfowl, sage grouse, furbearers, fishing
C. J. Strike	Owyhee, Elmore	Waterfowl, pheasant, quail, fishing, access
Farragut	Kootenai	Deer, access
Fort Boise	Canyon, Payette	Waterfowl, access
Hagerman	Gooding	Waterfowl, pheasant, quail, fishing, access
Market Lake	Jefferson	Waterfowl, pheasant, furbearers, fishing
Middle Fork Salmon	Custer, Lemhi, Valley	Deer, elk, chukars, access
North Lake	Jefferson	Waterfowl, pheasant, antelope sage grouse, fishing
Sand Creek	Fremont	Elk, moose, deer, waterfowl, sage and sharptailed grouse, fishing
Star Lake	Lincoln	Waterfowl, pheasant, sage grouse
Valley County	Valley	Waterfowl, deer, kokanee spawning

Information and Education

Demand for the regular services in information and education continue to increase during the biennium, although considerable emphasis was placed on improving the coverage of special programs. Several new community programs in hunter safety were initiated through the work of the field educators in cooperation with the other field personnel of the department. In addition, Landholder-Sportsman relations programs continued to receive attention, and exhibits for fairs and sportsmen's jamborees were established on many occasions throughout the state.

The name of the conservation information forums was changed to "Fish and Game Information Series." Presented in a series of five illustrated lectures, the series of programs was presented to most of the major communities in the state by the end of the biennium. The program was well received in most communities, and during 1962 some experimenting was done with the series, in presenting it to the high schools, with good success.

Field work of the division was augmented during the biennium by the placement of an additional conservation educator in Pocatello. Not only were the other divisions of the department assisted in their information and education work, but the field staff maintained constant contact with sportsmen's groups, service clubs, schools and other organizations in their district throughout the two years.

Department-wide in-service training schools were conducted in March of each year at the Idaho National Guard facilities on Gowen Field near Boise. Short courses in fish and game management, law enforcement and related fields were presented to all personnel during the three and one-half day schools.

Additional training was afforded to department personnel at the three regular district meetings held each year.

Three of the regular services offered by the division were complimented on a national scale during the biennium. The American Association for Conservation Information made awards to the department for its news releases, the motion picture entitled, "The Trumpeter Swan," and the weekly radio program on department activities.

Following is a listing of the information and education services conducted during the biennium, followed by additional details on the information and education work of the department.

Information Services:

1. Maintenance of a central office news service:
   a. Dated news releases on department activities, usually Monday through Thursday.
   b. A weekly condensation of the news for Thursday release.
   c. Distribution of pictures and mats on department activities for Thursday release.
   d. Distribution of a feature article on Idaho wildlife for Sunday release.
   e. Special news releases to the wire services.

2. Publication of the "Idaho Wildlife Review," a bi-monthly magazine.
3. Publication of various conservation information and education pamphlets and circulars.
4. Publication of regulations and legal notices.
5. Production of a statewide wildlife information radio program.
6. Presentation of a weekly live television program.
7. Maintenance of a film-loan library on various wildlife subjects.
8. Photographic services, including both still and moving picture production.

Education Activities:

1. Public school assistance:
   a. Special lectures on hunter safety and conservation.
   b. Classroom conservation projects.
   c. Liaison work with school administrators and teachers in conservation education.
2. Summer youth camp education with lectures and exhibits.
3. Wildlife exhibits for fairs and sportsmen's jamborees.
4. Assisting the Idaho Wildlife Federation in conservation education including the statewide essay contests.
5. Landholder-Sportsman Council program activities.
6. Talks, lectures, and demonstrations on wildlife conservation to clubs and organizations.
7. Conducting the "Idaho Conservation Information Forum" series of lectures for adult groups.

Information

Requests for information concerning fishing, hunting and department operations increased to an all-time high during the biennium. Interest has been significant from Idaho schools, with requests for leaflets and bulletins almost doubling over two years previous. Approximately 15 thousand written requests were answered and nearly 50 thousand information publications were sent from the Boise office in addition to regular printings dealing with seasons and regulations.

Department news releases are prepared and sent to 265 newspapers, radio stations and individuals each week. These include four separate stories—one for each of the first four days of the week. A round-up of the four articles is also prepared for use by papers who would rather run the material under one head. A feature story is sent to six daily papers each week for Sunday release, together with a large, glossy photograph. News is also released through wire services on a more timely basis.

The American Association for Conservation Information awarded the first place plaque for conservation news releases to the department in 1961.

Additional information coverage is provided from the Boise headquarters by film showings, speaking engagements, special radio and television appearances, and personal contact at the office.

Publications

Interest in Idaho wildlife and department programs and operations has been apparent through increased requests for the department magazine, "The Idaho Wildlife Review." The magazine is now in its 15th year of publication with over 16,000 copies going to subscribers every two months. The magazine is issued without charge to Idaho residents—a fee of $1.00 per year is charged for out-of-state mailings.

Publication costs have increased slightly during the biennium along with mailing fees. Ten major articles dealing with wildlife management were reprinted for general distribution.

Information regarding fishing and hunting seasons and regulations is published according to species. It now requires 300 thousand each of fishing regulations and big game seasons and regulations. Each of these contains a map outlining specified areas.

In addition, the department issues 200 thousand bird regulations, 100 thousand waterfowl regulations and 20 thousand fur regulations as seasons are established. Special leaflets prepared include Care of Game Meat; Proper Care to Prevent Becoming Lost; Salmon Fishing Areas and Regulations and over 50 single sheets dealing with detailed information.

The popular Idaho Mountain Lakes book was completely revised—new areas mapped and added– and a third printing made. This 50-page book is issued without charge. A fourth printing will be necessary in 1963.

Two Annual Summary of Operations reports were published during the biennium. These provide detail of operations for each year and include all special projects and studies being carried on by the department.

Photography and Films

One new 22-minute sound and color motion picture was produced with the cooperation of the Washington and Oregon Fish and Game Departments. This film deals with safe handling of firearms and shows a father, son and daughter on deer and game bird hunting trips. This film will be used to promote gun safety as a part of the training course and will also be available for general use by the public. Production costs were shared three ways on this film.

The department motion picture "Trumpeter Swan" received national recognition by being awarded first place for conservation films in 1961. The award was made by the National Association for Conservation Information.

Film footage was obtained during the two years on department projects and operations for later use. Some was used for television showing—portions were edited for short subjects as a part of the Information Series. Extensive footage of wildlife was made available to the Idaho Department of Commerce and Development for the Centennial film.

Hundreds of still photos were obtained and filed. Many are used to illustrate articles in department publications and for news coverage. Several hundred prints are mailed out upon request from many sources each year.

The department conducts a regular television show each week in addition to a number of special shows at different stations around the state. The regular show deals with hunting and fishing information in addition to facts about wildlife and conservation.

The department film library has been enlarged to a degree, and now includes 151 reels covering subjects of game and fish management, hunting, fishing, hunting safety, gun safety and departmental activities. Extensive use of these films is indicated through the fact that about 3,800 films were checked out for use during the biennium. Schools and sport groups are the primary users and many schools make multiple showings for different classes in the school. Civic groups and churches are also important users. It is difficult to meet the demands during the school year.

A number of new films were purchased and added to the department library as requests for wildlife and conservation type films increase steadily. Present plans call for production of a film dealing with mountain lakes, and possibly another co-operative motion picture dealing with a management problem common to all three northwestern states.

Radio and Television

The tape-recorded radio programs covering all department activities were issued during the entire biennium on a weekly basis to an average of 24 radio stations. Some special extra programs were added on occasion or request for a total of 110 individual programs and 2,640 copy tapes. These taped programs are supplied in either five or fifteen minute versions, as desired by individual stations. The programs are based primarily on field activities and usually feature interviews with department personnel and occasionally outside authorities or people who are actually in the field for hunting, fishing or camping. Such field recordings are made with a portable "Midgetape" recorder acquired during the biennium. This recorder is also used in recording the weekly fishing report information direct from the field via Telpac telephone service through the entire summer.

The department's radio program received nationwide recognition by being awarded third place for conservation radio programs in 1962. This award was also made by the American Association for Conservation Information.

Department personnel are also used on direct telephone interview radio programs by some stations.

A regular weekly television program is presented on a free-time basis on one station, and other programs are presented on request through other television stations. Short film strips with written narration are also supplied to stations for use at their discretion. A total of 124 live programs were presented during the biennium.

These television presentations cover current activities, operations, seasons, regulations and laws, and a series on game animals and fish; giving characteristics, life history and unusual facts about individual species occuring in Idaho. All shows include demonstrative materials such as animals, photos, films, charts and mounted specimens.

The television presentations are apparently well-received by the public and stations. It is a field which could be properly expanded.

Northern Idaho

The Conservation Educator stationed at Lewiston maintained the usual field services of the division in the ten northern Idaho counties.

Giving talks, slide lectures and film showings to sportsmen's clubs, civic and professional groups was perhaps the major activity. Seventy-five such contacts involving three and a half thousand persons were made. Demonstrations, talks and movie and slide showings were presented to 2,500 young people in summer camps, schools and organizations. Over six hundred of those were given three or more hours of hunter safety training.

In all, 163 motion picture showings were made and sixty-five slide lectures given. A total of 162 film loans were made to various groups from the small motion picture film library maintained at the Lewiston office.

Under sponsorship of sportsmen's and civic clubs, Idaho Fish and Game Information Series were conducted in Sandpoint, Wallace, Coeur d'Alene, Pierce, Lewiston, Craigmont and Grangeville. Average attendance at these programs was twenty-four. Although this was a lower average attendance than in other parts of the state, the Series were considered worthwhile by audiences as well as by the twelve Conservation Officers and biologists who participated.

Two displays of live, wild animals were conducted at county fairs. Containing specimens of twelve wildlife species native to Northern Idaho, the displays were very popular with fair goers. Five other displays on wildlife and resource conservation were set up at sportsmen's jamborees and in store windows for festivals and National Wildlife Week.

Fifty-three news and feature stories were written and distributed to newspapers, radio and television stations for a total of 134 releases. Department activities, wildlife, etc. were photographed in black and white and color still pictures and movies. Many of the photographs were released to and used by newspapers throughout the Clearwater and Panhandle Regions.

Assistance was given on numerous projects such as mountain goat trapping and transplanting and salmon egg planting. In addition, over thirty man days were spent on enforcement patrol and manning checking stations.

Southwestern Idaho Area

Fish and Game Information Series

This informational program was initiated in southwestern Idaho in the spring of 1960. Aimed at adult audiences, the series has been taken into fourteen communities in 73 separate sessions in this part of the state.

Informative and educational material presented includes the history of wildlife management, the basic principles of biology, and enforcement and management techniques employed by fish and game department workers on Idaho wildlife problems. The program was presented

by a staff of department personnel, under sponsorship of organized sportsmen, community service clubs or other local community organizations interested in wildlife conservation.

Audiences ranged from a dozen to 75 or more persons, with total attendance at all Southwest Idaho sessions more than 2,800 people. A streamlined TV series was presented in Boise for another 80,000 viewers in the southwest Idaho area. An adaptation of the adult program also was presented in two Ada County high schools. Films, slides, flip charts and other visual aids are used to enliven the offerings. The department plans to continue this community-type program in the coming biennium.

Firearm Safety Education

Safety in handling firearms continues a major activity of I & E personnel, working primarily through the junior high schools, but also cooperating with sportsmen's and other groups interested in this type of work with youth. More than 8,000 junior high students received the regular two or three day training during the biennium in southwestern Idaho under Fish and Game department personnel, with cooperation of school administrators. Objective is to reach all 7th grade students in the district, with gun nomenclature, safety rules and theory of safe gun handling, with some attention to correct shooting on indoor targets. This sets the stage for adults in community groups to follow up with range training with live ammunition for certification of students. Many such groups are participating.

Conservation Essay Contest

The I & E Division cooperated in the current biennium with the Idaho Wildlife Federation in supervising the 4th and 5th annual conservation essay contests sponsored by the sportsmen: "How to Improve our Outdoor Manners" and "Wildlife Values—What They Mean to Me." Students all over the state participated, with approximately 500 essays being received annually for final judging in state finals. Prizes are awarded annually by the Federation.

The division assists in securing supplies of reference materials for these contests, publicizing the affair and serving as liaison with the schools. Publicity is made available to teachers at the six teacher conventions held in the fall at points in the state, where this and other supplies of conservation teaching aids are distributed. An average of 35,000 to 40,000 leaflets of all kinds are taken from the display tables by interested teachers as result of this activity.

School and Camp Programs

More than 8,000 school students in elementary and high school classes and summer camps received the department's wildlife programs in this corner of the state in the biennium. These talks, illustrated with the traveling display of mounted birds and game heads and hides, stress the importance of care of all natural resources. The "Conservation Chart" provides the theme for the presentation.

In addition to this program a traveling display of large panels of wildlife and scenics in color was circulated in Ada County elementary schools during the biennium, and were used by teachers at the fourth grade level in teaching conservation to approximately 4,500 students.

A number of high schools requested I & E division personnel to speak at "career day" exercises to assist upper-class students choose careers.

Adult speaking engagements of I & E personnel in southwest Idaho included over 200 appearances before adult groups in service clubs, garden clubs, social and religious groups, sportsmen's organizations, chambers of commerce, etc., totaling over 8,000 persons, in response to requests for these appearances to explain department programs, activities and policy.

Exhibits and Fair Displays

In 1960 and 1961 the two state fairs at Boise and Blackfoot each drew between 50,000 and 75,000 adults in addition to the numbers of juveniles who viewed the department's wildlife displays. Live birds and animals and mounted specimens were featured, along with the display of live game fish in aquaria, and drew large crowds each day.

Other exhibits in this period included the smaller county fair displays put up and manned by department personnel, exhibits at sportsmen's conventions and the Treasure Valley Trade Show wildlife display.

Southeastern Idaho

The Conservation Educator stationed at Pocatello has duties related to information and education programs of the department for all of southeastern Idaho including the Salmon region. This station was activated for the first time starting in the late summer of 1960. The importance of having an information and education specialist to provide services in that section of the state has been evident by the report of activities for the area.

This is emphasized by the variety and volume of contacts established during the period especially when related to public meetings and motion picture showings made during the biennium.

For example, over 45 talks regarding wildlife, conservation and department operations were given to service clubs and other meetings of persons not directly associated with sportsmen's clubs. Approximately 40 appearances and talks were also made at regular sportsmen's sessions around the area.

In addition, over 35 Fish and Game Information Forums sessions were prepared and presented to interested people. These regular weekly programs include a complete educational type presentation of biological information and all phases of fish and game operations and management.

The Educator in this region also either showed, or distributed, nearly 200 conservation and wildlife films throughout his area during the two years. The viewing audience represents over 5,000 people. Twenty-eight firearms safety training programs were taught to school children with the assistance of department field personnel and sportsmen.

Specially prepared slide talks on department projects and operations were given to nine different groups as well as several radio and television programs for special events. Seven exhibits were prepared with major attendance records at the Blackfoot Fair each fall.

Conservation programs were also given at summer camps in the eastern part of the state along with hundreds of contacts relative to general wildlife information.

Basin Investigations

The office of Basin Investigations was created in September, 1959 to handle the increasing load of Departmental work involving water resource development. The coordinator works under the general supervision of the Director's office, and his primary responsibility is the planning and coordination of water resource development programs between the various divisions of the Department and with other governmental and private agencies.

Much of the work is related to anadromous fish of the Columbia Basin and becomes, therefore, of an interstate nature. Salmon and steelhead migrating to Idaho spawning streams must pass through Oregon and Washington waters, past a series of Federal water development projects, completed, under construction, or being planned. Idaho participates in the coordinated interstate and interagency planning which involves fish protective and mitigative measures, including fish passage, at these projects. We also participate in matters of planning studies or of policy relating to operation and maintenance of fish facilities.

Within the boundaries of the state, fish and wildlife aspects of water use projects are coordinated with private and governmental agencies and with the fishery and game management divisions of the department. Field studies involving the fish and game resources affected by these projects are planned and recommended to the proper management division. Management biologists of these divisions conduct the necessary field work. Funds for conducting much of this work are provided by the construction agency and the negotiations for these contractual studies and their funding are carried on by the office of Basin Investigations.

Water Development Project Studies

Water-use project studies for which funding negotiations have been conducted for the Department during the past biennium are:

1. **Bruces Eddy Game Studies**.....**$35,000**
   To determine the most suitable methods and sites for replacing big game winter range which would be lost by inundation of present range by the proposed Bruces Eddy project (Corps of Engineers).
2. **Bruces Eddy Fishery Studies**.....**$40,000**
   To determine, through life history studies of steelhead trout, the location, operation, and other features of fish passage facilities at the proposed Bruces Eddy project (Corps of Engineers).
3. **Brownlee-Oxbow Fish Passage Evaluation**.....**$83,580**
   To evaluate the efficiency of the various components of fish passage facilities at the Brownlee-Oxbow projects (Idaho Power Company).
4. **Lucky Peak Reservoir—Big Game Migration Studies**....**$ 2,400**
   To determine the feasibility of using air-bubbling equipment to maintain ice-free migration routes across Lucky Peak reservoir for deer (Corps of Engineers).

5. **Experimental Flow Studies at Oxbow**.....**No Funds**
A cooperative study between the Idaho Department of Fish and Game, Idaho Power Company, and the Oregon Fish Commission to study the characteristics of several flows of water released at the Oxbow dam spillway for attraction, transportation, and propagation purposes around the oxbow to the powerhouse.

Water-Use Project Development

Cooperating agencies have provided fish and game development at some of their projects during the past biennium:

1. **Clark Fork River Artificial Spawning Areas.**
The development of supplemental spawning areas within the channel of the Clark Fork River below Cabinet Gorge Dam, primarily for the use of spawning Dolly Varden trout (Washington Water Power Company).

2. **Oxbow Experimental Incubation Channel.**
An artificial incubation channel at Oxbow dam to determine the feasibility of this type of structure for supplemental production of fall chinook salmon (Idaho Power Company).

Fish Facility Inspection and Operation

As part of a basin-wide plan to regularly inspect fish facilities on main-stem Columbia and Snake river projects, weekly visits are made to the Middle Snake River projects, Brownlee and Oxbow, to determine if fish passage and other facilites are operating as designed or as prescribed by design criteria. Representatives of Oregon, Washington, and Federal fishery agencies make similar inspection trips to projects on the Columbia and lower Snake rivers.

The Oxbow incubation channel was operated by Fishery Division personnel after January 1, 1962. This operation includes holding adult salmon, taking eggs, egg incubation, placement of eyed eggs in the gravels of the channel and evaluation of the operation. The costs of this operation are being reimbursed by Idaho Power Company.

Project Planning and Review

There has been participation in project planning and studies on a number of major project proposals during the biennium, John Day dam on the Columbia; Ice Harbor, Lower Monumental and Little Goose on the lower Snake; Lewiston and Bruces Eddy on the Clearwater; and Hells Canyon, Oxbow, and Brownlee on the Middle Snake river have required review of project plans and proposals for protection, mitigation or replacement for losses to the fish and wildlife resources of Idaho. Particular attention has been given to fish passage facilities at these projects.

Libby Dam on the Kootenai River will affect fishery and waterfowl resources in Idaho. This authorized project has received careful review by planning and study committees to determine the best methods to

prevent damage to the unique ling fishery of the Kootenai River through a changed habitat which is expected to occur. Recommendations have also been made to prevent losses to waterfowl production and resting areas in both the United States and Canada.

Black Canyon Dam has undergone studies preliminary to feasibility work aimed at the reintroduction of anadromous fish above the structure. The Boise River below Lucky Peak Dam has received considerable attention to re-establish a resident trout fishery. Negotiations are underway for reservation of flood control storage space in Lucky Peak Reservoir in order to accomplish this.

During the biennium numerous project reports, from preliminary to advanced in nature, have been reviewed at the techincal level for effects on fish and wildlife.

Committee Assignments

The coordinator has represented the Department on a number of committee assignments in addition to those mentioned above. The most important of these is the Columbia Basin Fishery Technical Committee which gives technical review to all Columbia Basin water resource developments and research programs as they pertain to the fish and wildlife resources of the basin. From these reviews, recommendations are made to the administrators of the fishery agencies for review and action.

Representation has also been made on the Fisheries Engineering Technical Advisory Committee of the Corps of Engineers, the technical sub-committee of the Governor's Salmon and Steelhead Conservation Committee, the Columbia Basin Interagency Committee's, fishery subcommittee and at the Pacific Marine Fishery Commission meetings.

Small Reclamation Projects

Proposals for five small reclamation projects as provided for in Public Law 984, as amended, were reviewed by Basin Investigations during the biennium. One of these, Cassia Creek Project, has been approved by Congress. These small reclamation projects are limited to a total cost of $5 million and may include enhancement features for fish and wildlife which may or may not be cost-reimbursable. Local participation is desirable unless the project effects for fish and wildlife are regional in scope.

Small Watershed Projects

Public Law 566 provided for watershed protection through small watershed projects. Projects are limited to a total area of about 400 square miles and not including any single structure which provides more than 5,000 acre feet of total capacity. This law is administered by the Soil Conservation Service. Of thirty-eight applications for small watershed projects made since 1954, three have been approved.

Cooperative Wildlife Research Unit

The staff and graduate students of the Cooperative Wildlife Research Unit worked on twelve different projects, completing four during the biennium. Six investigations concerned big game, four in fisheries and one involved upland game birds, and one supported by the U.S. Weather Bureau.

The investigation on the influence of salt in elk management, a subject of much conjecture and all too little light, proved its worth in savings to the Department. As a result of this research salting of big game has been curtailed by some 91 percent, from a high of over 230 tons a year.

Patterns of elk migration in the lower Selway and fluctuations in the winter range use was determined in considerable detail. The influence of natural licks in the seasonal and daily movements can readily be seen by the deep radiating trails, and the considerable excess use of the shrubby vegetation. In the steep Selway country such excessive use is a contributing factor to land slips which start high on the spur ridges and end at the bottom of the canyons.

A significant contribution to the management of sage grouse was completed at the beginning of the biennium as a result of eight years of study. One phase of the study lead to new methods of sexing and aging sage grouse, useful tools for the game manager. Other segments of the study showed the interrelationship of strutting grounds and an evaluation of present methods of census as indices of the male population. The amount of country occupied in a year's time by a given population was determined by trapping and banding on the strutting grounds. Distances from strutting grounds, to summer brood range to winter range and back to the breeding grounds may, in years of severe winters, cause sage grouse to move as much as 150 to 200 miles.

The foundation for better and more intensive big game management has been laid in two studies centering in the Juniper Buttes and surrounding areas of stabilized sand in Fremont County. The results of the second part of this investigation are contained in the master's thesis "Big Game and Livestock Browse Utilization and Feeding Habits on a Sandy Range in Southeastern Idaho." An area of about twenty-three square miles provides winter range for a herd of approximately 450 deer, 500 elk and 70 moose. Bitterbrush and chokecherry are the principal browse species which sustain the big game. The area is also used spring and fall by domestic sheep for a total of 153,000 sheep days of use during the fall and winter of 1961-62. Despite the more severe winter this amount of use by big game and livestock was not excessive, but some areas of game concentration were over-used. Browse consumption by sheep increased markedly with six inches of snow or more. Domestic sheep remove, annually the largest amount of forage. Elk use only slightly more than half as much as sheep. Deer and moose together remove about the same amount of total forage as elk. Uncontrolled burning is the greatest cause of browse depletion followed by big game and livestock.

White-tailed deer investigations on the University Experimental Forest are centered in an 800 acre enclosure. The present study con-

cerns the reasons for the distribution of deer in the various cover types at the different seasons of the year. The concealment value of the habitat plays an important role in the choice of cover. Choice food shrubs bent down by deep snow make additional stems available, but because the protective cover was near zero the deer made little attempt to use this food and remained in the dense timber. The combinations of low cover and deep snow were apparently the worst possible conditions for avoidance of predators. Cold temperatures did not appear to influence the choice of cover types as long as the animals could move relatively easily over the snow and as long as a degree of concealment and food were present, the area was occupied. Despite contrasting weather conditions during two consecutive winters the overall use patterns are quite similar, and correlations significant.

The limnological survey of the backwater of the lower St. Joe River was completed in June 1961.

Bottom fauna production in the backwater is considered poor. Inshore fauna was six times more productive by number than mid-channel samples. A definite seasonal trend in the quantity of bottom fauna was evident. From a July minimum the bottom fauna increased to a maximum in December. Plankton density was greatest in the lower section of the backwater which averaged 55 times more zooplankton and 1.7 times more phytoplankton than the upper section. There was no correlation in seasonal fluctuations of water temperatures and chemistry and the seasonal trend in bottom organism production.

The influence of logging on trout streams is a long term study in which the physical, chemical and biological conditions are determined on two watersheds, before, during and after logging. The project is now in the post-logging stage.

The study on the life history of the Columbia River squawfish in the Cascade Reservoir was completed late in the biennium. Typical of new reservoirs the waters soon became dominated by rough fish, mostly squawfish and perch. The study provided fundamental information on the characteristics of the squawfish population.

Fisheries Management

Fishing in most waters in Idaho continued very good throughout the biennium. The production of catchable fish in our State hatcheries has been sufficiently high for us to keep roadside streams stocked throughout the fishing season. In some areas, particularly the South Fork of Payette River and Middle Fork of Boise River, it has been necessary to plant streams and rivers almost weekly to keep abreast of fishing pressure.

Drouth conditions which extended from 1959 through 1961 were responsible for some drastic reductions in fish populations in most irrigation reservoirs and several small streams and rivers. However, in 1962 there was sufficient precipitation to alleviate the condition and most reservoirs ended the irrigation season with a good carry-over of water and comparable carry-over of fish.

The drouth presented the Department with an opportunity to rehabilitate many irrigation reservoirs by purging them of the undesirable non-game fish. Even though complete kills were not obtained in several of the reservoirs treated, the numbers of fish present were drastically reduced; consequently, game fish populations should flourish for several years.

Interest in the excellent and varied fisheries of the Middle and Lower Snake River continues to increase each year. Fishing interest for channel catfish was exceptionally high and catfish weighing up to 18 pounds were not uncommon. The small mouth bass fishery of the Snake River is unexcelled in the Pacific Northwest. Private and commercial boats take fishermen some 90 miles up the Snake River from Lewiston to fish for steelhead, sturgeon, channel catfish and smallmouth bass. Angling for chinook salmon is noticeably on the increase in the Snake River near Lewiston and in the Salmon River near White Bird and Riggins. In some areas of the state, fishing pressure in 1962 declined under that of previous years. The reasons for the decline are not apparent at this time.

The rehabilitation of the spring chinook salmon run in the Clearwater River drainage is progressing according to schedule. Although the program is only in its second year, the survival of fingerling from eggs planted in 1961 appears to be very good.

Management

Sockeye Salmon — Redfish Lake

The sockeye salmon runs entering the Columbia River during 1961 and 1962 were two of the smallest in the last 15 years. The reasons for the apparently poor survival of the 1957 and 1958 classes have not been ascertained. The disease **Columnaris** has been quite prevalent in the lower Columbia and Snake Rivers during the past 5 years and further reduced the number of adults that successfully completed spawning. The disease may have also caused mortality to the downstream migrating juveniles.

Since 1954 the Fish and Game Department has operated a fish counting weir on Redfish Lake Creek between Redfish and Little Redfish Lakes. The primary purpose of this weir has been to trap the adult upstream and juvenile downstream migrant sockeye salmon. The numbers of fish counted through the weir in past years are as follows:

Year	Adults (Upstream)	Juveniles (Downstream)
1954	998	.....
1955	4,361	48,720
1956	1,381	40,000
1957	571	32,857
1958	55	38,000
1959	290	12,324
1960	75	2,000
1961	11	19,857
1962	39	22,447

The number of adult sockeye salmon that reached Redfish Lake in 1961 and 1962 was also much reduced. The relatively large number of juveniles migrating to the ocean in 1961 and 1962 was a result of substantially increased survival in Redfish Lake of the 1959 and 1960 year classes. With a smaller number of juvenile sockeye in the lake to start with, the fish grew faster and most only stayed one year in the lake before leaving for the ocean.

Chinook Salmon and Steelhead

Checking stations were operated to determine the salmon and steelhead harvest from the South Fork Salmon River drainage. One of the largest chinook runs on record was present in the South Fork in 1960 and a large harvest was obtained. The chinook run was considerably smaller in 1961 and a corresponding decrease in harvest was apparent. The 1962 steelhead catch shows a decrease from the 1961 catch. Late opening of the access roads into the fishing area, however, caused the 1962 fishing period to be approximately one-half the length of the 1961 fishing period.

Chinook checking stations were operated for the first time in Bear Valley during the 1962 fishing season. Several more year's information will be necessary before harvest trends can be established. The data to date, however, indicate that the chinook harvest from the Dagger Falls area of the Middle Fork of the Salmon River is considerably less under present regulations than when the falls area was open to fishing. The new road to the falls makes access easier, but closure of the falls area to fishing apparently outweighs this factor as far as harvest is concerned.

Salmon and steelhead catch data from the South Fork Salmon River drainage and from the Bear Valley area are shown in the following tables:

South Fork Salmon River Drainage

Chinook

Year	Angler Trips	Angler Days	Fish Caught
1960	6,724	12,328	3,937
1961	5,010	10,049	1,797
Steelhead			
1961	1,819	3,007	560
1962	1,116	1,722	369
Bear Valley Area			
Chinook			
1962	2,028	3,548	568

Each year since 1950 surveys have been conducted in Idaho to determine the amount and success of spawning by chinook salmon. The amount of spawning is determined by counting the number of redds, either from the air or on foot. The counts, along with harvest information, are used to evaluate the effectiveness of management practices in providing for the maximum allowable harvest by sport fishermen and the necessary escapement for spawning. Length frequencies, scale samples, sex ratios and spawning success were obtained from spawned out dead fish to measure sex and age composition and spawning success of the runs. Of particular interest was the poor return in 1961 of progeny of the extremely large 1957 escapement. Relatively good survival and return of progeny from the 1956 and 1958 escapements was apparent. A surprisingly large number of 5 year cycle fish from the 1956 year class returned in 1961 providing for a near average harvest and escapement.

The reasons for the poor survival of the 1957 year class have not been, and probably will not be, completely determined. Based primarily on field observations there did not appear to be any conditions that would have caused a heavy mortality to the juvenile fish while they were in Idaho waters. The meager evidence available indicates that progeny from the 1957 year class experienced heavy mortality during their seaward migration and/or ocean stay. The production from the 1957 year class was poor for most races of upriver Columbia River salmon.

Cisco-Bear Lake

Interest in fishing for the Bonneville cisco has continued to increase. The fishing occurs in January when the fish move into the shallow waters along a 1½ mile stretch of the rocky east shore to spawn. The fish, which average 7½ inches in length, are dipped with long handled nets from holes chopped in the ice. In 1962, a creel census was taken on all fishermen as they left the fishing area. The fish were available to the fishermen for only 10 days during which time 3,100 fishermen caught 130,000 fish. Each fisherman was entitled to 50 fish.

Lake Pend Oreille

A creel census is conducted at Lake Pend Oreille each year for the purpose of determining the size and quality of the annual fish harvest. During 1960 and 1961, about three-fourths of the fishermen sought kokanee primarily and the catch of near one million each year was average for the species. Incomplete censusing shows the 1962 catch is down somewhat, but about as expected, due to variations in abundance of year classes. Variations in the catch of kokanee from year to year appear to be caused mainly by:

1. **Cycles of abundance (strength of parent year classes).**
2. **Climatic conditions, which affect fishing effort during late winter, spring and early fall, the periods of greatest fishing success.**

The harvest of trophy-size trout continued on a high plane, with several near world-record-size kamloop rainbow caught by sport fishermen. Trends of trout abundance continued, with rainbow trout increasing and the native Dolly Varden and cutthroat declining.

Fishing for trophy-size kamloop trout is increasing in popularity. Increasing natural propagation of this introduced species has been occurring annually, but the fishery is largely dependent upon stocking from hatcheries. Experimental stocking of fish of different sizes and hatchery sources is being assessed to determine the most economical method of supplying quality fishing. Some 12,000 marked kamloops. averaging one pound in weight, were reared under fast growth conditions at the Hagerman Hatchery and stocked along with 10,000 marked kamloops of several size groups from the Clark Fork Hatchery. Indications are that the larger fish produce the greater returns to the creel in the year of planting, but evaluation of subsequent growth and survival will have to wait until succeeding years.

Lake Coeur d'Alene

Increased stocking of kokanee in Coeur d'Alene Lake during recent years has greatly improved fishing success. This lake now rivals other large lakes of the state in popularity with local and visiting fishermen. The quality of the kokanee fishery during the past 22 year period has fluctuated almost directly with plantings and must be maintained by artificial propagation, owing to low survival of eggs in natural spawning beds. Large numbers of one and two year old kokanee in the lake are an indication of continued improvement in the fishery during the next biennium.

Lost Valley Reservoir

Lost Valley Reservoir, which was rehabilitated in the fall of 1959 and stocked with fingerling rainbow trout, opened for fishing in 1961. A total of 1,119 anglers caught 10,609 trout on opening day. A stunted perch and bullhead population had caused trout fishing to be practically non-existant in the reservoir prior to treatment.

C. Ben Ross Reservoir

C. Ben Ross Reservoir, which was treated in the fall of 1960, was stocked with creel size rainbow trout and opened for fishing in the spring of 1961. Fishing success averaged 0.7 fish per hour on opening weekend with weight limits being taken by the end of the season in October. Trout fishing had been incidental in the reservoir prior to treatment.

Spring Valley Reservoir

Spring Valley Reservoir, in Latah County, was formed by the construction of a 45-foot high earth-filled dam. It covers an area of 52 acres and was filled with water during the winter and spring of 1962. Funds for the project were provided under Federal Aid in Fisheries.

The reservoir was stocked in May of 1962 with 10,440 catchable rainbow trout. An opening day crowd of approximately 300 anglers caught 1,600 fish, which represented 15 percent of the trout planted.

Spot checks during the season showed that crowds of several hundred anglers used the reservoir on weekend days and fishing success remained generally high. Supplemental plantings of catchable size trout were made throughout most of the season.

The Moscow Wildlife Association has provided outdoor toilet and picnic area facilities. The Troy Chamber of Commerce provided culverts and equipment to construct a ¼-mile long access road to the picnic area. The Troy-Moscow Highway Districts cooperated in improving and graveling a 1.2-mile section of road leading to the area. The joint efforts of these organizations have helped make this recreation area a success.

Mountain Lake Investigations

A total of 33 mountain lakes in the Payette and Boise River drainages which presently contain fish or are capable of holding fish were investigated during the biennium. Lakes were checked for presence of fish, production, and success of previous plants. A total of 20 of these lakes (15 of them barren) was stocked. Access trail construction is being sought for lakes that are largely inaccessible at present. In addition, mountain lakes were checked in other areas of the state and fish releases were made where necessary.

A new method for stocking fish in mountain lakes was developed and tested during 1962 and proved to be very satisfactory. The old method consisted of carrying fish, water and ice in ten gallon milk cans or large canvas bags, with two cans or bags packed by a horse or mule. Total weight of the load averaged about 225 pounds to transport 1½ to 2 pounds of fingerlings. The new method consists of 2 plastic bottles charged with pure oxygen, carried in an insulated back pack. The entire pack only weighs 22 pounds, completely loaded, and will transport as many fish as 2 ten gallon cans. An equivalent of four horse loads can now be packed on one horse. The fish can be

hauled for as long as 12 hours without any mortality. Since the pack can also be easily carried by a man, many barren lakes are being stocked that would normally be inaccessible for planting.

Stream Improvement

With some of the first funds available to the Targhee National Forest for fish and wildlife habitat improvement, a cooperative stream improvement program was initiated on the Buffalo River in Fremont County. Materials, part of the labor costs, and equipment were provided by the U.S. Forest Service while area sportsmen, along with Idaho Fish and Game Department personnel provided additional labor. A total of 10 improvement structures consisting of 36-foot log wings and 6- by 6-foot rock filled cribs were installed. Buffalo River was chosen for stream improvement work because:

1. Food and shelter under natural conditions are poor in this stream section.
2. It has relatively stable stream flows, keeping future maintenance costs to a minimum.
3. Annually, high fishing demands are placed upon the area of stream improvement.
4. Almost constant supervision after construction could be given the structures by Forest Service personnel.

Road Inspections

Road construction programs by Federal and State agencies and by private operators tend to center along the stream beds because of the rugged terrain of much of Idaho. Every effort is made to see that these operations do not create stream blocks or straighten the channels of streams and decrease the habitat.

Plan-in-hand inspections and coordination meetings are held to point out specific problem areas on the ground and to outline basic needs and problems to preserve the habitat. Generally, the cooperation of the road builders has been good, but as in most conflicts of interests, some compromises result in damages to the habitat.

Recent streamside construction along the Lochsa River; the North Fork and South Fork of the Clearwater River; the Little Salmon River is noted to point out the wide-spread impact on major rivers. Almost all important tributaries in the area have, or will have, road systems in the near future. How these are constructed will have a great impact on the fish producing capacities of the streams involved.

Whitefish Control—Teton River

Experimental control tests for whitefish reduction by electro-shocking methods were conducted from 1956 through the fall of 1960. These tests disclosed electro-shocking as a means of control had only limited value.

If whitefish populations were being reduced noticeably, it was known this would be reflected by size decline in whitefish shocked the following year, along with a decline in average age composition. After 5 years of electro-fishing over an extended river distance, whitefish size range dropped only slightly and age composition was not changed perceptibly.

Fish Kills

Drouth

Drouth conditions in 1961 resulted in total losses of game fish populations in Fish Creek, Mormon, Thorn Creek, Little Camas, Pioneer and other irrigation reservoirs. Secondary loss through emigration was also pronounced in some reservoirs, particularly below Magic Dam where large numbers of trout died due to overcrowding and suffocation after the water was turned off.

Runoff conditions in 1962, however, were much more favorable and most of the reservoirs were filled to near capacity levels. Good fishing was provided during the 1962 season by stocking these reservoirs with both fingerlings and catchable size trout. The catchables produced fishing during the first three months and by late August the fingerlings had reached creel size.

Pollution

Attempts to re-establish perch, bass, and crappie in Milner Reservoir in 1961 were unsuccessful, following another fish kill similar to the one that occurred in December, 1961. Decomposition of industrial wastes from potato processors and domestic sewage in the Burley area again reduced oxygen levels in the water below the minimum required to sustain fish and a heavy fish kill took place on November 9, 1961. Until pollution abatement measures are effectively accomplished, stocking of fish in Snake River between Burley and Milner Dam will be ineffectual.

Bruces Eddy Steelhead Study

A Corps of Engineers sponsored project is being conducted at the mouth of the North Fork Clearwater River to study the downstream migration patterns of young steelhead and the effects of environment changes on their movements at the proposed Bruces Eddy damsite.

A suspended, motorized trap, capable of lateral movement on river spanning cables has been constructed. Conventional, stationary floating traps could not be operated in the North Fork because of the spring log drive. The suspended skimmer trap can be raised by the operator when logs endanger the trap.

During trap construction and during low flows, a barge trap has been operated. Data to date is too limited for analysis.

Another active segment of this project involves determination of inter-tributary movements of steelhead progeny.

Evaluation Study of Fish Facilities At Brownlee and Oxbow Dams

In February 1961 the Fish and Game Department signed an agreement with Idaho Power Company to begin a fish facility evaluation study at Brownlee and Oxbow Dams on the middle Snake River. The study is concerned with evaluating only the up and downstream facilities for passing migratory game fish past the two dams.

During the spring and summer months of 1961, considerable effort was expended to find and test suitable gear for the capture of downstream migrant salmon and steelhead. This work was done in the main Snake River above Brownlee Reservoir near Weiser. A barge-type inclined plane trap, or "scoop" trap was found to be the most efficient means of capturing downstream migrant salmon and steelhead. A larger "scoop" trap was designed and four were constructed during the fall and winter of 1961-62.

A fall chinook salmon tagging study was conducted during the fall and winter of 1961-62. The study was designed to determine if trucking of adult salmon to Weiser for release in the Snake River would be more beneficial than releasing them in Brownlee Reservoir.

A total of 686 salmon were tagged and released in Brownlee Reservoir and 689 were tagged and released in the Snake River a few miles above Weiser.

Each load of salmon to be tagged was anesthetized to prevent injury to the fish and permit rapid handling. The anesthetic used was Sandoz MS-222.

Spawning ground surveys were conducted during November, December and January to recover tags and gather other biological data.

Even though there was an 18 percent greater return of Weiser tags, chi-square analysis showed no significant advantage in hauling fish to Weiser.

During the spring of 1962, five "scoop" traps, four 4- by 10- by 17-foot and one 6- by 6- by 17-foot were employed to catch, mark (fin clip) and release over 16,500 downstream migrant salmon and steelhead in the Snake River at Weiser.

An additional 11,600 salmon and steelhead smolts were captured, marked and released in Eagle Creek in Oregon in cooperation with the Oregon Game Commission during the fall of 1961.

A summary of the catches from the Snake River and Eagle Creek by species and age group appears in Table I and II. The number and percent of marked fish recovered at the Brownlee barrier net by species and age groups is given in Table III.

The recovery rates of marked fish at the barrier ranged from 0.8 percent to 10 percent (Table III). This indicates an unsatisfactory escapement of juvenile salmon and steelhead through the reservoir for the maintenance of normal returns of adult salmon and steelhead.

Table I

Catch of Downstream Migrant Chinook Salmon and Steelhead Trout Snake River, Weiser, Idaho, 1962

	Salmon Age Group		Steelhead Age Group	
Month	**0**	**I**	**I**	**II**
March	0	0	2	4
April	251	1,302	0	518
May	11,028	1,532	10	572
June	1,471	55	0	19
July	1	3	0	0
Total	**12,751**	**2,892**	**12**	**1,113**
*	**3,130**	**6**	**0**	**63**
Grand Total	**15,881**	**3,898**	**12**	**1,176**

* Number marked and released by the U.S. Fish and Wildlife Service, Bureau of Commercial Fisheries, Weiser, Idaho.

Table II

Catch of Downstream Migrant Chinook Salmon and Steelhead Trout Eagle Creek, Baker County, Oregon, 1961

	Salmon Age Group		Steelhead Age Group			
Date	**0**	**I**	**0**	**I**	**II**	**III**
October 1 to November 4	211	6,949	290	1,084	482	153
November 5 to 15	33	2,286	18	65	4	0
Total	**244**	**9,235**	**308**	**1,149**	**486**	**153**

Six tests were made during 1961 and 1962 to determine the efficiency of the barrier net pumping system to transfer fish from the barges to the shore loading facility. These tests were made during the normal operation of the facilities. A known number of marked, hatchery reared salmon, were released in the brail compartment of the three barges. The fish were held until the next morning and pumped to shore for enumeration. The percent of marked salmon recovered ranged from 74 percent to 100 percent and the mean recovery rate was 90 percent.

The efficiency of the barrier net to attract and capture downstream migrant salmon and steelhead was tested during 1962. Three test lots of hatchery reared salmon were released at various locations (50 feet—100 yards) upstream from the barrier net. Recovery rates of marked fish to the collection facility ranged from 4 percent to 0.3 percent. Indications are that migrant salmon find the artificial outlets by chance because the attraction currents are limited to a small area in relation to the surface area that does not have these attraction currents.

Intensive tests of the efficiency of the barrier net to attract and capture downstream migrant salmon will be made during 1963 to

Table III

Marked Salmon and Steelhead Trout Recovered at Brownlee Barrier Net from Upstream Marking Sites, 1962

	Snake River					Eagle Creek					
	Salmon Age Group		Steelhead Age Group			Salmon Age Group		Steelhead Age Group			
Month	0	I	0	I	II	0	I	0	I	II	III
February	.....	.....	..	..	....	...	7	...	.....	...	...
March	.....	.....	..	..	.....	...	300	...	.....	...	...
April	.....	2	..	..	.....	...	95	...	.....	...	...
May	13	215	..	..	1	...	197	...	2	1	...
June	18	72	..	..	.....	...	37	...	1	1	...
July	2	2	..	..	.....	...	.....	...	.....	...	...
Total Recovered	**33**	**291**	..	..	**1**	...	**636**	...	**3**	**2**	...
***Total Marked**	**15,881**	**2,898**	..	**12**	**1,176**	**244**	**9,235**	**308**	**1,149**	**486**	**153**
Percent of Marks Recovered	**0.2**	**10.0**	..	..	**0.09**	...	**6.9**	...	**0.3**	**0.4**	...

* Data from Table I.

verify the results of 1962. The effectiveness of the net in preventing fish from by-passing the net position will also be evaluated in 1963.

Columbia River Fishery Development Program

In July 1956 the State of Idaho became an active participant in the Columbia River Fishery Development Program. This program, federally financed except for land purchase, provides funds to aid the production of anadromous fish species.

Field surveys to determine the location of barriers to salmon and steelhead passage, fish losses in irrigation diversions, sources of water supply for hatching and rearing purposes and the availability of adequate spawning areas were completed in this bienniun and reports prepared.

By August 30, 1962 a total of 166 fish screens had been installed in irrigation canals located in the upper Salmon River drainage, About 250 will be installed eventually in the main Salmon River and its tributaries above Shoup. In 1960 a louver-type fish screen was installed for study purposes in a canal near Salmon. This design proved to be efficient in prohibiting the loss of small fish in the canal and will be utilized in screening larger ditches along the main Salmon River.

To evaluate the efficiency of the screens, traps were placed in some fish bypass pipes during the 1961 irrigation season. A total of 27,888 small salmon and 899 rainbow trout were captured in 12 traps, some of which operated only part time. This work will be continued at least

one more year to reflect variations in the downstream migration pattern of anadromous fish species.

Dagger Falls fishway, constructed on the Middle Fork of the Salmon River in 1960, proved in this biennium to be successful in passing chinook salmon over the falls without appreciable delay. Concentrations of late-running salmon below the falls have not been observed in the past two seasons.

Study of possible revision to fishways at the Washington Water Power Company Dam near Lewiston culminated in an agreement be tween the Company, the Bureau of Commercial Fisheries and the Idaho Department of Fish and Game to finance, with Washington Water Power Company and Columbia River Fishery Development Program funds, design and construction work necessary to improve the fishways for the upstream passage of salmon and steelhead. Revision of one fishway is expected to commence in 1962.

Engineering and geologic feasibility studies, including core drilling, have been completed and preliminary plans to construct a vertical-slot fishway around Selway Falls, located about 21 miles above the mouth of the Selway River, have been prepared. Construction of this fishway is expected to commence in 1963.

In the fall of 1961 work was initiated on removal of barriers to upstream anadromous fish migration in the Selway River drainage. This work, confined to summer months, will be expanded to other streams in the Clearwater and Salmon River drainages in the next two years.

During July and August 1961 adult spring and summer-run chinook salmon were captured in the upper Salmon River drainage, held in ponds until sexually mature and then spawned. The eggs were transported by aircraft to an eyeing station near Lewistion. This station, utilizing vertical incubators, was constructed specifically to eye up salmon and steelhead eggs. When eggs had eyed up, 845,000 were planted in the stream bed of the upper Selway River near Magruder Ranger Station. Adult chinook salmon from the 1961 spring run also were captured at Bonneville Dam, transported by tank trucks to the Carson National Fish Hatchery and held to maturity in ponds. Some 610,000 eyed eggs from this source were planted in Bear Creek, a tributary to the Selway River. This project, of similar scope, is expected to continue a minimum of five years.

In the fall months of 1960 and 1961 plantings of eyed eggs from fall-running chinook salmon were made in the lower Selway and Lochsa River drainages. This study is intended to determine if adult salmon from races common to the main Snake River above Oxbow Dam and the Columbia River at the Spring Creek National Fish Hatchery can be expected to return to the Clearwater River drainage. Approximately one-half million eyed eggs from the Spring Creek Hatchery were planted each year in a prepared channel in the Selway River near the mouth. In 1960 about forty-thousand eyed eggs from Snake River stock were planted in Warm Springs Creek, a tributary stream of the Lochsa River. In 1961 about two-hundred and fifty-thousand were planted. Feasibility of establishing these races of fish by eyed egg

plantings will be judged from the number of adult fish returning in the next three years.

A project designed to investigate all presently used methods of planting salmonoid eggs and to develop new, more feasible means as necessary and practicable, was carried out in 1961. Insulated picnic coolers proved to be highly satisfactory containers for the shipment of green salmonoid eggs. Open wire baskets were used to transport eyed eggs satisfactorily for as long as thirty hours. High pressure, portable pumps proved very useful in preparing the stream bottom for planting eggs. It was concluded that, generally, satisfactory methods are presently available for planting eyed eggs in the numbers contemplated. Further study to develop a container in which eggs could be packed at a hatchery, transported to the planting site and deposited in the stream bed without again being handled is recommended.

To learn whether steelhead can be transferred successfully to other tributary streams within a major drainage, 42 adult steelhead were removed from the north ladder at the Lewiston Dam of the Clearwater River and transported by tank truck to Meadow Creek on the South Fork of the Clearwater River drainage. To insure the fish would remain in the release area so observations could be made on their behavior, two weirs were erected to contain the fish in a one mile section of the stream. From April 4 to May 31, 1961, daily observations were made. During this period, a minimum of 15 steelhead spawned.

Based partially on the above work, the first step to reintroduce steelhead into the South Fork of the Clearwater and Lemhi River drainages was initiated in 1962. A holding pond for adult fish was constructed adjacent to the south fishway of the Lewiston Dam to tributaries of the South Fork of the Clearwater River. Eyed eggs from fish held in the Lewiston pond were planted in the incubation channels. Seventy-eight percent of the eggs placed in the Red River channel hatched and left the channel as fry.

A weir was built at the mouth of Lemhi Big Springs Creek and will be used to evaluate the success of the program and study the factors that affect survival. In 1962 some 92,000 eyed steelhead eggs were planted in a hatching channel near the creek. Approximately 66,000 steelhead fry were produced in the channel and entered Lemhi Big Springs Creek. As the young steelhead leave the creek during the next 2-3 years, they will be marked for later identification in the sport and commercial fisheries and when they return to the Lemhi River to spawn.

Rough Fish Control Projects

Blackfoot Reservoir

Blackfoot Reservoir has never been a popular body of water with sport fishermen, although in recent years some good catches of five and six pound cutthroat have been taken during October.

A biological, chemical and physical check of the water in the reservoir indicated that it would be capable of producing an excellent

fishery for trout if the non-game species of Utah chubs, carp and Utah suckers were eliminated or drastically reduced in number.

Blackfoot Reservoir has a maximum surface area when full of 18,900 acres and a storage capacity when full of 413,180 acre feet. Its maximum depth is 38 feet. Because of the drouth which had prevailed from 1959 through 1961, the storage in the reservoir was reduced to 74,420 acre feet and the surface area was 11,000 acres by September 30, 1961. Since water storage in the reservoir was at its lowest point since 1934, it was the opinion of Department personnel that an effort should be made to rehabilitate the reservoir.

Even though water storage in the reservoir was low, the volume of water remaining was so large that the project could not be justified economically if the usual fish toxicant, rotenone, was used. The Department therefore decided to use toxaphene. Retonone, however, was used to treat Blackfoot River.

Reservoir treatment was begun on October 3 and concluded the following day. Application of the toxicant was difficult in some areas because of the shallowness of the water.

Because of the turbid condition of the water, the toxaphene was applied at a concentration of 0.045 ppm which is somewhat higher than that used on non-turbid waters. Water temperature at the time of treatment was 55°F.

Due to the slow action of the toxaphene, it was impossible to derive an accurate estimate of the total number of fish killed; however, from a flight over about two-thirds of the reservoir shoreline on October 19, it was estimated that over 1,100,000 carp weighing one pound or more were observed. From some shoreline checks, it was also estimated that the fish kill consisted of 95 percent carp, 3 percent suckers and 2 percent chubs. The number of trout killed was insignificant.

Blackfoot River, from its mouth upstream to the narrows, was treated with 495 gallons of emulsifiable rotenone. The upper end of the river was not treated because of the high cutthroat trout population. Unfortunately, a complete kill of carp was not achieved.

The cost of the project was $6,590. No charges for labor were included in treatment costs.

The reservoir was closed to fishing in 1962, but will open with the general fishing season in 1963. Tributary streams, however, were stocked with catchable fish during the spring of 1962 and were open to fishing during the general season.

Roseworth Reservoir

Creel checks during July 1961 revealed that the rainbow trout in the reservoir were in very poor body condition. Further survey showed that 80 percent of the trout population was in the 6- to 8-inch length group and the remaining 20 percent in the 10- to 12-inch length group. Apparently very few trout were surviving after 15 months in the reservoir. Gill net samplings revealed a heavy population of shiners

and about equal numbers of suckers and trout. Large shiners were being taken by bait fishermen throughout the summer. Poor body condition of the trout was attributed to direct food competition with the large population of shiners.

On September 10, 1961, the reservoir and drainage was treated with emulsifiable rotenone. Estimated storage at the time of treatment was only 35 acre feet. The re-infestation of rough fish, shiners and suckers apparently came from fish that were missed in the House Creek drainage during the 1953 eradication project. Total cost of the project in 1961 was $600 compared to $12,000 in 1953. The reservoir was restocked in 1962 with fingerling and catchable size rainbow. The larger rainbow provided fair fishing through the early summer and by late August, the fingerlings were large enough to begin entering the creel.

Mormon Reservoir

Mormon Reservoir was first treated in the fall of 1960 with a concentration of 0.04 ppm toxaphene on an experimental basis. Tests made in the spring of 1961 showed that the reservoir had completely detoxified and a remnant population of adult perch and suckers had survived. The rapid detoxification and subsequent incomplete kill no doubt resulted from the combined actions of shallow water and extreme turbidities. Catchable size and fingerling trout were stocked in 1961 and provided fair fishing until July 22 when the reservoir was drawn down to a minimum storage and high water temperatures caused a complete kill of trout. Since the high temperatures had no effect on the suckers and perch, the reservoir was again treated on September 11, 1961, with a concentration of 0.1 ppm toxaphene. Total cost of the project was $180.

In the spring of 1962 the reservoir was stocked with fingerling and catchable size rainbow. With the removal of the former heavy fish populations, a tremendous build-up in food organisms occurred in 1962 in the form of copepods, water fleas, midges and clam shrimp. This brought about an accelerated growth rate and after four months in the reservoir, many rainbow that averaged one-half pound when planted, were exceeding 2 pounds.

Little Camas Reservoir

Following an incomplete eradication in the reservoir in 1959, a substantial population of perch and rough fish had become re-established. In 1961 the reservoir was drawn down to dead storage in July, which was followed by a gradual complete temperature mortality on trout. Since the rough fish survived, the reservoir and drainage were re-treated on September 12, 1961 with both rotenone and a concentration of about 0.1 ppm toxaphene. Total cost of the project was $340 and surveys made during 1962 indicate a complete kill of all rough fish.

A build-up in food organisms occurred in 1962 similar to the one in Mormon Reservoir and fish growth was excellent. During August 1960, fingerlings were collected in the reservoir which had developed

ulcerous lesions on the skin which were probably due to bacterial infection associated with warm water during the summer. A heavy infection was again prevalent in 1962 and the effect on the fish population is not known.

Magic Reservoir

Following the rehabilitation of the reservoir in October 1960, restocking with fingerling rainbow was initiated in the spring of 1961. It became apparent that water storage would become critical because of low runoff during April and May and further planting of fish was halted. In June a large barrier net 285 feet long and 25 feet deep was placed in front of the outlet gate in an attempt to prevent migration of fish out of the reservoir. The net was later removed following a decision by the irrigation company to drain the reservoir as low as possible.

In the spring of 1962 the reservoir was filled and stocked with 2½ million fingerlings and 30,000 catchable size rainbow averaging 10 inches in length. Fish growth during 1962 has been excellent, with the fingerlings ranging from 8 to 10 inches by late August and the catchables running up to 16 inches. During June a number of fish were taken weighing from 1½ to 4 pounds. Scale studies showed that fish from 1½ to 3 pounds were from the 1961 fingerling plant that had survived the drawdown and fish over 3 pounds had entered the reservoir from Wood River or Camas Creek.

Because of the complex drainage system involved, re-infestation by rough fish is inevitable. Some drift of small suckers out of Camas Creek was observed in July. Several perch have also been caught by fishermen in the reservoir and quite probably were planted there by persons who opposed the project in 1960.

Soldiers Meadow Reservoir

Soldier's Meadow Reservoir in Nez Perce County was treated with emulsifiable rotenone in September 1962 to remove the trout population which has been subjected to periodic outbreaks of disease and parasites and to eliminate the dace which were present in large numbers.

The Lewiston Orchard Irrigation District cooperated by drawing the reservoir down from its maximum depth of 42 feet to 10 feet, thereby reducing the volume from 2,080 to 175 acre feet. Sixty gallons of emulsifiable rotenone were spread in the lake from one outboard motor boat by use of a boat bailer. An additional 10 gallons of toxicant were used in the tributaries in two separate treatments.

Approximately 100 observers salvaged less than 1,000 rainbow trout, with very few of these up to 16 inches in length. The kill of dace was impressive when large numbers were washed ashore on the day following the treatment. From sample shoreline counts, an estimated 250,000 dace were killed. The reservoir will be re-stocked with catchable rainbow trout in 1963 and opened to fishing during the general trout season.

Hidden Lake

The largest high altitude lake in the panhandle, Hidden Lake in Boundary County, was treated with a light dose of toxaphene for the purpose of eradicating a stunted population of brook trout so that the lake could be effectively re-stocked with the variety of cutthroat trout which are native to the area. The lake remained slightly toxic during 1962 and cannot be re-stocked prior to the summer of 1963.

Orofino Creek

The resident non-game and game fish populations in approximately 75 miles of Orofino Creek, located above an impassable falls, were treated with 75 gallons of emulsifiable rotenone and 1,300 pounds of powdered rotenone during August 1961.

Dace, shiners, suckers and sculpin were abundant in the lower stretches of the tributaries and in the main stem of Orofino Creek. Progressively smaller numbers of these species were found in the upper portion of the drainage. Remnant populations of small brook and rainbow trout were left in most tributaries above the range of non-game fish.

The Orofino Creek drainage was re-stocked with 24,270 catchable size and 90,000 fingerling rainbow trout in 1962 and was open for fishing during the general season. Some of the fingerlings were being taken as 4- to 5-inch fish by late August of 1962.

Comparisons of growth rates and population densities of game and non-game fish will be used to evaluate the success of this program in following years.

Federal Aid In Fisheries

Dingell-Johnson Program

F 18-R Statewide Fishing Harvest Survey

Each year a postal card survey is made to determine trends in the Idaho harvest of chinook salmon and steelhead trout and the amount of fishing pressure placed upon these resources. During 1960 there were nearly 246,000 licensed anglers in Idaho, Nearly one out of five of these anglers fished for chinook salmon and/or steelhead trout. Only about one out of five of the salmon or steelhead anglers fished for both species. Non-resident anglers comprised about one-third of all anglers seeking salmon and steelhead.

The calculated catch of chinook salmon in 1960 was 43,000 as compared to 40,000 in 1959. As in past years, most of the fish were caught from the Salmon River and its tributaries.

The calculated catch of steelhead trout in 1960 was 60,000 fish as compared to 62,000 in 1959. The Salmon River yielded the most steelhead with a catch of 27,000, followed by the Clearwater River with

Lake Rehabilitation

Year	Name	County	Surface Acres	Volume Acre-feet	Undesirable Species	Species Restocked	Toxicant
1961	Blackfoot Reservoir	Caribou	18,900	74,000	Chub	Rainbow	Toxaphene
1962	Bull Run Lake	Kootenai	100	800	Bullheads, perch and tench	LMB, black crappie and rainbow	Rotenone
	*Little Camas Reservoir	Elmore		50	Perch, suckers, shiners, dace		Toxaphene Rotenone
1961	Chesterfield Reservoir	Caribou		65	Utah chub	Rainbow	Rotenone
1961	Hidden Lake	Boundary	50	2,500	Stunted brook	Cutthroat	Toxaphene
	Mormon Reservoir	Camas		75	Perch, suckers		Toxaphene Rotenone
	†Roseworth Reservoir	Twin Falls		35	Shiners, suckers		Rotenone
	Soldier Meadow	Nez Perce	114	75	Dace	Rainbow	

* Included about five miles of stream treated above the reservoir.

† Drainage treatment included 2½ miles on Cedar Creek and 11 miles on House Creek.

Stream Rehabilitation

Year	Name	County	Volume c.f.s.	Miles Treated	Undesirable Species	Species Restocked
1961	Blackfoot River (Blackfoot Reservoir Upstream)	Caribou	60	24	Suckers, carp	Rainbow Cutthroat
1961	Little Blackfoot River	Caribou	10	1	Chub	Rainbow
1961	Meadow Creek	Caribou	11	20	Chub, suckers	Cutthroat
1962	Orofino Creek	Clearwater		75	Dace, shiners, suckers	Rainbow

18,000, and the Snake River with 13,000. Many of the fish caught in the Snake River would undoubtedly have entered the Salmon and Clearwater Rivers. The spring season catch was estimated to be 25,000 steelhead with a fall season catch of 35,000.

As a part of the 1961 survey, the non-respondents are being studied to determine if they are a possible source of bias in calculating harvest estimates.

F 32-R Tests for Increasing the Returns of Hatchery Trout

Studies to determine the role of hatchery trout in the harvest and spawning runs at Williams Lake were combined during 1961 and 1962. It was found that 50-60 percent of the harvest in 1960 were fish that had been planted as fingerlings in 1959. In 1961 these 1959 planted fingerlings were found to make up about 20-30 percent of the early summer catch. By 1962 few of the marked 1959 plants were observed. Fishing success at Williams Lake in 1962 was below average for the lake and is attributed to poor survival of the 1961 fingerling plant.

The 1959 fingerling plant did not contribute significantly to the spawning runs in the inlet during 1960, 1961 or 1962. There were a large number of spawners (up to 1,000 some years) that try to spawn along the shoreline of the lake, but with little success. Few of these shoreline spawners enter the inlet to spawn.

A study to determine the movements of hatchery trout planted in the Salmon River was conducted during 1960 and 1961. Hatchery catchable size trout caught during the same season as released were found to move very little. More than 90 percent were caught within 2 miles of the release sites. Hatchery trout that had been in the river over winter did disperse a little more, however, over 90 percent were recovered within 5 miles of the release sites.

Some 4,200 large kamloop trout were tagged and planted in Alturas Lake in an experiment to see if a large trout fishery can be developed in the lake. The kamloops were raised 2 years in a hatchery to a size (12-16 inches) where they start to feed extensively on fish, mainly kokanee, which are present in Alturas Lake.

The effectiveness of buffer agents in controlling carbon dioxide concentrations in fish transportation tanks was investigated. It was determined that 7.0 grams of a buffer agent (Tris-amino) per gallon of water were effective in controlling carbon dioxide concentrations in an oxygen-stone aeration fish tank for transportation times of up to three hours.

Tests were conducted at two north central Idaho lakes to determine the comparative rates of return to the creel of hatchery trout planted as fingerlings and as catchable size fish.

Creel census over three fishing seasons indicated accumulative returns of 4, 7 and 13 percent of three lots of fish planted as fingerlings in the fall and 23, 48, 50 and 96 percent from four lots of trout planted as catchable size fish in the spring.

Fall planted fingerlings recovered after 20 to 21 months, which included seasons, had grown approximately 6 inches. Spring planted, catchable size trout, grew only one inch in 13 months following their release in the same waters.

As a follow-up study, tagged, catchable size trout were planted in two lakes in the fall of 1960 after the close of the fishing season. Similar plants were made prior to the opening of the 1961 fishing season. Tag returns from check stations and voluntary returns showed a 2:1 ratio of recovery favoring the trout planted just prior to the fishing season. The fall planted catchable size trout which survived to enter the creel in 1961 showed no increase in size.

General conclusions from these studies are: A. Catchable size rainbow trout do not grow significantly after release in these waters and that approximately 50 percent of those fish planted in the fall die before the next year's open season. Catchable size trout should be planted on a put-and-take basis only to allow their harvest as soon after planting as is possible. B. It appears that limited fingerling plantings in these waters is justifiable to convert the food chains to game fish biomass. Each body of water differs in size, stability (some are drawn-down for irrigation), fertility and in their ability to produce fish.

The planting program for each lake must be developed separately. Since these lowland lakes are close to centers of populations and are heavily fished, the program of put-and-take stocking will continue to be the most important source of trout.

A two year study was completed on Mackay Reservoir to determine the effects of irrigation drawdown on the fishery. Tagging and fin clipping of large and small rainbow released in the reservoir showed that very little migration out of the reservoir occurs until water storage volumes drop below 5,000 acre feet. During 1961 14 percent of the tagged fish returns were taken below the dam. Movement of fingerlings out of the reservoir is even proportionately greater than that of the larger fish. During both years, movement of fish through the outlet was great enough that there was no "piling up" of fish as the reservoir was drawn down. This was evident from returns of marked fish and the fact that there was no sharp increase in fishermen success as the water volume decreased. The study indicates that emergency closures on Mackay Reservoir during extreme drawdown to preserve fish have little value since the fish will migrate through the outlet into the river. The study also demonstrated that catchable size rainbow should be planted following years of low storage to supplement fishing. During 1960 and 1961 ten thousand catchables were stocked each year and made up about 63 percent of the creel during the season.

F 34-R Water Quality Investigations

During the past two years water quality studies have been carried out on portions of the Snake River and the lower 54 miles of the Boise River. A pollution study on the Snake River, between the city of Burley and Milner Dam, was initiated in December of 1960. In December 1960 an extensive fish kill occurred in Milner Reservoir, located in

Twin Falls County, 10 miles west of the city of Burley. Investigation showed that a large amount of organic matter, mainly potato and sugar plant wastes, were being discharged into the river upstream in the vicinity of Burley and that the low water flow through this area was incapable of handling the high oxygen demand of these wastes. Further investigation showed that much of the organic material settled in Milner Reservoir and the consequent decomposition that occurred, in combination with an extensive ice cover on the reservoir, reduced the dissolved oxygen levels to a critically low point, resulting in the catastrophic fish kill. An estimated 250,000 fish perished. A similar kill occurred again one year later in November 1961.

It appears from information obtained on the pollution study of the lower Boise River that the pollution problems are a combination of the following four factors:

1. Lack of dilution water due to continuous low flows the past few years.
2. Organic wastes from approximately 24 industrial concerns (mostly food processing industry) being released into the river.
3. Untreated or partially treated domestic sewage being released into the river.
4. Inorganic materials, mostly silt, entering the river from return flow irrigation useage.

The combination of these factors has resulted in reducing the bottom fauna by covering the river bottom with slimes, sludge and silt. Also, the high water temperatures become critical for trout survival during the summer months due to low flows and the large amount of suspended silt in the water.

In June of 1961 water quality studies were initiated on Brownlee Reservoir, a 55-mile long body of water, located on the Snake River separating Baker County, Oregon and Washington County, Idaho. The objectives of the studies were to obtain basic water quality information on the reservoir and the Snake River upstream and to determine, if possible, the detrimental effects of upstream pollution on the reservoir. Limnological investigations thus far have shown that oxygen deficiencies exist throughout the reservoir during the summer months. Plankton samples have been collected from several stations on the reservoir and identified to species. Water samples have been collected at different depths throughout the reservoir to determine mineral content (especially nutrients), pH, conductivity, etc. All the data collected have not yet been analyzed completely as the study is still in progress. Indications are, however, that the oxygen deficiencies are due to a combination of decomposing plankton and decomposition of organic matter on the bottom from upstream food processing plant wastes. It appears very probable that the large phytpolankton blooms are brought about from the addition to the reservoir of inorganic fertilizers from irrigation return flow into the Snake River. Additional data will be obtained when the concentrations of phosphates and nitrates recorded in the summer are compared with the concentrations of these nutrients recorded in the fall after the irrigation season terminates.

Water quality studies are also being carried out on Oxbow Reservoir, a narrow, 12 mile long reservoir, located directly downstream from Brownlee. Data obtained to date shows that the water quality is Oxbow becomes progressively worse towards the end of summer and early fall. This is apparently due to:

1. The sudden onslaught of dead and decomposing algae which is produced in Oxbow and also enters from Brownlee as fall nears.
2. Water of low oxygen saturation from various levels of Brownlee Reservoir which enter Oxbow as temperatures and water densities change with the change of season.

Bioassays of the following commercial pesticides were made to test their relative toxicity to fish: DDT, Dieldrin, Toxaphene and Phygon XL. The 96 hour median tolerance limit (TLm) was used as the index of relative toxicity. The TLm is established as that concentration at which 50 percent of the test animals die in a specified period of time, in this case, 96 hours. These was very little difference observed in the toxicity of toxaphene to rainbow fingerlings using water from three different lakes as the dilutent waters. Average 96 hour TLm values for two replications were 0.0135 ppm, 0.0165 ppm and 0.0145 ppm for Mormon Reservoir, Magic Reservoir and Redfish Lake water respectively. Average 96 hour TLm values were 0.0237 ppm, 0.388 ppm and 0.074 ppm for Dieldrin, DDT and Phygon XL respectively for two replications.

Bioassays of two insecticides, toxaphene and Dieldrin, were made to test their relative toxicity to rainbow trout fingerlings and two fish food organisms—mayfly nymphs and amphipods. Comparative tests between the fish and the invertebrate organisms showed that both invertebrates were much more tolerant to the two insecticides than were the fish.

F 37-R Middle Fork of Salmon River Trout Fishery Investigation

This investigation was conducted during 1959-62 to collect information and evaluate the current status of the trout populations found in the Middle Fork of the Salmon River. Studies were conducted on distribution, age and growth, movements, and reproduction.

Some of the important biological aspects of the populations include:

1. Cutthroat trout out-number both Dolly Varden and rainbow trout in the angler harvest.
2. The trout populations are relatively long-lived and spawn at a late age.
3. Cutthroat trout 12-13 inches long are in at least their fifth year of life.
4. Cutthroat trout do not mature until reaching a length of approximately 12 inches.
5. Approximately one-third of the fish caught are fish which would have spawned the following spring.

6. Many, but not all, of the recovered tagged fish displayed extensive movements in the Middle Fork drainage and into the Salmon River. There seems to be a downstream movement in the fall and upstream movement in the spring by at least a portion of the population.

The Middle Fork of the Salmon River is unique in that it contains one of the few remaining populations of large cutthroat trout. It is accessible by road only at the head and mouth. The bulk of the fishing pressure is by parties floating down the river with fishing as one of the attractions of the trip, but not necessarily the most important, and it is classified as a Primitive Area so that access by road will probably be restricted for many years to come.

Based on the findings of the investigation, it seems that the cutthroat trout population does not have the inherent capacity to support an extensive fishery. If we are to retain the quality fishery for trout in the Middle Fork, especially the cutthroat trout, it will be necessary to maintain the spawning stock at a high level of abundance. Aid from artificial means does not appear particularly promising at the present.

Because of the great esthetic values associated with the Middle Fork and its fishing, it is proposed that the Middle Fork be made into a "fish for fun" stream. By releasing most of the fish caught, the anglers will be helping to maintain the population at a high level, thus insuring fine quality angling for the future. In order to permit the anglers to eat fish while in the Middle Fork and allow the retention of those fish seriously injured, a small daily bag limit would be allowed.

During 1962 a hatching channel was built on the North Fork of the Salmon River. Eyed cutthroat trout eggs were planted to gain information on operation of such a facility and determine if hatching channels would be feasible means of supplementing the trout production in the Middle Fork drainage.

F 48-D-1 Channel Clearance in Priest Lake Tributary Streams

Some six miles of spawning streams on the Priest Lake State Forest were cleared of accumulated logging debris in cooperation with the State Forestry Department. This work was undertaken as an aid to the restoration of spawning habitat of native Dolly Varden and cutthroat trout and is scheduled to continue during 1963.

Fish Hatcheries

Maintenance and Improvements

American Falls: Installation of concrete piling in brood stock ponds. Erected bulk feed bin with storage capacity of 25,000 pounds dry feed.

Ashton: Installation of a temporary metal conduit across the head pond and a metal box around main water supply spring to prevent algae from entering water system and stopping water flow.

Clark Fork: Construction of utility and living room adjoining superintendent's house trailer.

Eagle: Replace 90 feet of rotted wooden pipeline with concrete line. Constructed dividing wall 450 feet long in the horseshoe pond to facilitate handling fish and cleaning ponds.

Grace: Installed 10 vertical incubators which increased the egg hatching facilities of the station by 1,500,000 trout eggs. Increased the height of the hatchery water surge tanks to handle water supply to vertical incubators. Installed a water measuring weir on hatchery water supply. Erected bulk feed bin with a storage capacity of 25,000 pounds of dry fish feed. Installed storm windows on superintendent's residence.

Hagerman: Constructed fish display pond and public sanitary facilities near display pond. Built and installed storm windows on all dwellings at the station.

Hayspur: Constructed dry fish feed storage bins inside the fish hatchery building.

Kamiah Redistribution Station: Installed water recirculating system in raceway to increase fish holding capacity. Refinished exterior of cabin. Installed chlorination system for domestic water supply.

Mackay: Remodeled interior cabinet work in original hatchery dwelling. Repaired cracks and erroded concrete on pond system constructed in 1950.

Sandpoint: Built storm windows and installed metal roof on assistant's dwelling.

Warm River: Painted exterior of all buildings.

Fish Transportation and Handling

Purchased 900 gallon insulated aluminum fish tank for Grace Fish Hatchery. Installed AC, gasoline driven, generators on large fish transports to supply power for electric motor-driven water agitators.

Fish conveyors were purchased for American Falls and Grace fish hatcheries to facilitate rapid fish handling at these stations.

Operations

The Department operated the Oxbow Experimental Artificial Incubation Facilities on Snake River below Oxbow Dam for the Idaho Power Company under contract.

A total of 1,668,900 eggs were collected by the Oregon Fish Commission and Idaho Department of Fish and Game hatchery personnel. These eggs were taken from 397 females for an average of 4,204 eggs per female.

A summary of egg disbursement is as follows:

Number of eggs taken	1,668,900
Eyed eggs	1,466,752
Mortality to eye up—12.11 percent	202,148
Eyed egg transfers:	
State Fish Hatchery, Eagle	78,752
Clearwater River Drainage	250,800
Eyed eggs planted in channel	1,083,800
Eggs retained in hatchery for comparison with channel	53,000

Eyed fall chinook eggs were planted by hand in the artificial incubator channel. Chinook salmon fingerlings were trapped and counted as they left the rearing facilities. A total of 391,636 fingerling were counted out of the facilities into Snake River. It was estimated that 310,000 additional fingerling escaped into the river without being counted. The combined counted and estimated release was 601,636 fish.

ROUGH FISH REMOVAL — SEINING PERMITS

(in pounds)

(November 1, 1960 — September 30, 1962)

Species	Year	Pounds
Carp	1961	358,986
	1962	220,315
Chubs	1962	61,990
Suckers	1961	1,991,864
	1962	523,075
Unidentified	1961	150,045
	1962	299,610
Totals	1961	2,500,895
	1962	1,104,990
Biennium Totals		**3,605,885**

FISH COUNTS
LEWISTON DAM FISH LADDERS
(November 1, 1960 — September 30, 1962)

Month	Year	Steelhead	Chinook Salmon
November	1961	516	...
	1962	15	...
December	1961	2	...
	1962	12	...
January	1961	96	...
	1962	14	...
February	1961	521	...
	1962	236	...
March	1961	9,990	...
	1962	4,115	...
April	1961	3,489	2
	1962	12,031	...
May	1961	174	24
	1962	2,204	1
June	1961	9	82
	1962	91	6
July	1961	.....	28
	1962	9	5
August	1961	.....	...
	1962	136	1
September	1961	2,434	1
	1962	9,423	3
October	1961	6,864	2
Totals	1961	24,095	139
	1962	28,286	16
Biennium Totals		**52,381**	**155**

IDAHO FISH PLANTINGS*

By Species, Size — All Agencies

(November 1, 1960 — September 30, 1962)

Species	Year	0 - 3"	3" - 6"	6" - Up	Total	Pounds
Rainbow	1961	4,690,036	2,038,954	2,868,609	9,597,599	818,212
	1962	7,866,921	1,638,620	1,961,178	11,466,719	617,982
Cutthroat	1961	6,309,956	448,405	17,635	6,775,996	7,591
	1962	5,897,140[1]	4,472	231,428	6,133,040	23,835
Brook	1961	153,112	157,684	.....	310,796	3,740
	1962	43,000	70,200	.....	113,200	924
Brown	1961	.....	.....	11,600	11,600	2,020
	1962	115,500	.....	800	116,300	463
Kamloops	1961	113,575	31,035	35,099	179,709	17,151
	1962	421,090	40,717	51,722	513,529	30,809
Mackinaw	1961	.....	.....	59,370	59,370	11,725
	1962	.....	.....	18,672	18,672	4,475
Golden	1961	27,772	.....	.....	27,772	7
	1962	13,500	.....	.....	13,500	2
Kokanee	1961	1,927,518	.....	.....	1,927,518	677
	1962	1,437,379[2]	.....	.....	1,437,379	493
Chinook Salmon	1961	1,996,480[3]	.....	.....	1,996,480	72
	1962	3,433,108[4]	53,886	.....	3,486,994	7,830
Large Mouth Bass	1961	53,000	6,450	22	59,472	161
	1962	48,060	.....	140	48,200	130
Steelhead	1962	194,843[5]	.....	.....	194,843	.....
Rainbow and Cutthroat	1962	495,715	.....	.....	495,715	170
Biennium Totals		**35,237,705**	**4,490,423**	**5,256,275**	**44,984,403**	**1,548,469**

* Excludes all salvaged fish—these are reported in another table.

[1] Includes 631,492 eyed eggs.

[2] Includes 396,528 eyed eggs.

[3] Includes 1,990,000 eyed eggs.

[4] Includes 3,433,108 eyed eggs.

[5] Includes 194,843 eyed eggs.

FISH PLANTINGS IN IDAHO BY OTHER AGENCIES

(November 1, 1960 — September 30, 1962)

Station	Year	Rainbow		Cutthroat		Totals	
		Numbers	Pounds	Numbers	Pounds	Numbers	Pounds
U.S. Springville (Utah)	1961	1,450	725	.....	.....	1,450	725
U.S. Hagerman (Idaho)	1961	660,980	86,820	.....	.....	660,980	86,820
	1962	765,047	75,676	.....	.....	765,047	75,676
U.S. Jackson (Wyoming)	1961	.....	.....	46,000	1,150	46,000	1,150
	1962	.....	.....	100,994	6,872	100,994	6,872
U.S. Albuquerque (New Mexico)	1962	1,500	660	.....	.....	1,500	660
U.S. Ennis (Montana)	1962	28,386	10,113	.....	.....	28,386	10,113
U.S. Greston (Montana)	1962	82,340	22,600	.....	.....	82,340	22,600
Wyoming State	1961	.....	.....	424,713	654	424,713	654
	1962	.....	.....	172,033	757	172,033	757
Totals	1961	662,430	87,545	470,713	1,804	1,133,143	89,349
	1962	877,273	109,049	273,027	7,629	1,150,300	116,678
Biennium Totals		**1,539,703**	**196,594**	**743,740**	**9,433**	**2,283,443**	**206,027**

HATCHERY PRODUCTION

(November 1, 1960 — September 30, 1962)

Hatchery	Year	Rainbow		Cutthroat		Brook		Brown		Kamloops		Mackinaw	
		Nos.	Lbs.	Nos.	Lbs.	Nos.	Lbs.	Nos.	Lbs.	Nos.	Lbs.	Nos.	Lbs.
American Falls	1961	1,087,962	112,124	37,600	80	48,390	624	.....	.....	.....	.....	.....	.....
	1962	930,070	117,320	86,656	116	.....	.....	.....	.....	.....	.....	.....	.....
Ashton	1961	901,247	46,865	465,250	373	.....	.....	.....	.....	.....	.....	.....	.....
	1962	1,764,320	41,920	397,815	294	.....	.....	.....	.....	.....	.....	.....	.....
Clark Fork	1961	209,200	23,575	433,460	164	.....	.....	.....	.....	179,709	17,151	.....	.....
	1962	130,305	21,060	239,000	217	.....	.....	.....	.....	476,429	16,209	.....	.....
Eagle	1961	1,066,980	24,041	566,800	174	.....	.....	11,600[1]	2,020	.....	.....	.....	.....
	1962	1,630,632[4]	33,302	224,000	70	.....	.....	116,300	463	.....	.....	.....	.....
Grace	1961	977,528	87,589	658,195	3,520	.....	822[2]	.....	.....	.....	.....	59,370	11,725
	1962	2,550,529	78,950	1,150,998	21,708	.....	.....	.....	.....	.....	.....	18,678	4,475
Hagerman	1961	1,320,090	309,555	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1962	1,497,641[5]	208,018	.....	.....	.....	.....	.....	.....	37,600	15,100	.....	.....
Hayspur	1961	934,002	43,354	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1962	932,802	36,495	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Henrys Lake	1961	.....	.....	1,569,966	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1962	.....	.....	975,048	324	.....	.....	.....	.....	.....	.....	.....	.....
Mackay	1961	1,028,875	64,160	26,211	24	.....	.....	.....	.....	.....	.....	.....	.....
	1962	1,019,995	60,408	79,848	39	.....	.....	.....	.....	.....	.....	.....	.....
McCall	1961	335,190	154	399,285	169	.....	.....	.....	.....	.....	.....	.....	.....
	1962	266,600	113	595,250	217	.....	.....	.....	.....	.....	.....	.....	.....
Mullan	1961	272,520	111	747,060	280	262,332	84	.....	.....	.....	.....	.....	.....
	1962	359,785	220	858,870	236	271,492	52	.....	.....	.....	.....	.....	.....
[3]Sandpoint	1961	594,960	1,240	133,750	54	68,930	1,870	.....	.....	.....	.....	.....	.....
	1962	319,920	519	287,811	186	70,200	900	.....	.....	.....	.....	.....	.....
Twin Falls	1961	444,550	19,010	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1962	190,400	17,250	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Warm River	1961	.....	2,394[2]	1,278,706	863	.....	.....	.....	.....	.....	.....	.....	.....
	1962	.....	.....	1,010,192	735	.....	.....	.....	.....	.....	.....	.....	.....
Totals	1961	9,178,104	734,172	6,306,283	5,788	442,932	3,773	11,600	2,020	179,709	17,151	59,370	11,725
	1962	11,592,999	615,575	5,854,988	24,137	341,692	952	116,300	463	514,209	31,309	18,678	4,475
Biennium Totals		**20,766,103**	**1,349,747**	**12,161,271**	**29,925**	**784,624**	**4,725**	**127,900**	**2,483**	**693,918**	**48,460**	**78,048**	**16,200**

HATCHERY PRODUCTION
(November 1, 1960 — September 30, 1962)

		Goldens		Kokanee		Chinook		Largemouth Bass		Rainbow and Cutthroat		Totals	
	Year	Nos.	Lbs.	Nos.	Lbs.	Nos.	Lbs.	Nos.	Lbs.	Nos.	Lbs.	Nos.	Lbs.
American Falls	1961	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,178,952	112,828
	1962	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	966,726	117,436
Ashton	1961	.....	.....	244,518	249	.....	.....	.....	.....	.....	.....	1,679,295	47,947
	1962	.....	.....	90,600	151	.....	.....	.....	.....	.....	.....	2,252,735	42,365
Clark Fork	1961	.....	.....	1,584,000	396	.....	.....	.....	.....	.....	.....	2,406,369	41,286
	1962	.....	.....	808,000	202	.....	.....	.....	.....	.....	.....	1,653,734	37,688
Eagle	1961	.....	.....	.....	.....	6,480	72	59,472	161	.....	.....	1,701,332	26,468
	1962	.....	.....	.....	.....	53,886	7,830	48,060	120	.....	.....	2,072,878	41,785
Grace	1961	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,695,098	103,656
	1962	.....	.....	.....	.....	.....	.....	.....	.....	110,329	46	3,880,529	105,174
Hagerman	1961	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,320,090	309,555
	1962	.....	.....	.....	.....	.....	.....	140	10	.....	.....	1,535,381	223,128
Hayspur	1961	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	934,002	43,354
	1962	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	932,802	36,495
Henrys Lake	1961	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,569,966	.....
	1962	.....	.....	.....	.....	.....	.....	.....	.....	385,386	124	1,360,484	448
Mackay	1961	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,055,086	64,184
	1962	.....	.....	43,251	110	.....	.....	.....	.....	.....	.....	1,143,094	60,557
McCall	1961	36,500	8	99,000	32	2,190	.....	.....	.....	.....	.....	872,165	368
	1962	13,500	2	99,000	30	.....	.....	.....	.....	.....	.....	974,350	362
Mullan	1961	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,281,912	475
	1962	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,218,655	456
[3]Sandpoint	1961	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	792,640	3,164
	1962	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	677,481	1,605
Twin Falls	1961	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	444,550	19,010
	1962	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	190,400	17,250
Warm River	1961	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,278,706	3,257
	1962	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,010,701	735
Totals	1961	36,500	8	1,927,518	677	8,670	72	59,472	161	.....	.....	18,205,158	775,547
	1962	13,500	2	1,040,851	493	53,886	7,830	48,200	130	495,715	170	19,819,850	685,184
Biennium Totals		**50,000**	**10**	**2,968,369**	**1,170**	**62,556**	**7,902**	**107,672**	**291**	**495,715**	**170**	**38,025,008**	**1,460,731**

[1] Browns include 6,600 brown-rainbow hybrids.
[2] Represents weight increase of fish, prior to planting, which were transferred from another station.
[3] Includes 240,800 (860 lbs.) rb. transferred to Clark Fork for holding (1961).
[4] Includes 18,620 (4,900 lbs.) rb. transferred from Hagerman in 1961.
[5] Includes 40,020 (1,334 lbs.) rb. transferred to Mackay and held over winter.

EGGS TAKEN BY STATE

(November 1, 1960 — September 30, 1962)

Station	Year	Species	Numbers Green Eggs	% Eye Up	Numbers Eyed Eggs
American Falls	1961	Rainbow	2,634,810	83.04	2,187,874
	1961	Rainbow	381,501	87.50	333,819
	1962	Rainbow	3,259,836	77.70	2,532,756
	1962	Rainbow	245,531	96.51	236,951
Clark Fork	1961	Kamloops	521,314	85.00	443,120
	1962	Kamloops	1,176,372	81.76	961,783
Clearwater River	1962	Steelhead	403,038	48.34	194,843
Cocolalla Creek	1961	Cutthroat	375,335	47.02	176,500
Eagle	1961	Rainbow	468,423	90.28	422,893
	1962	Rainbow	1,367,284	84.93	1,161,315
Hayspur	1961	Rainbow	1,040,424	88.09	916,500
	1962	Rainbow	1,055,624	90.62	956,624
Henrys Lake	1961	Cutthroat	10,551,558	81.43	8,592,042
	1961	Cutthroat and Rainbow	423,894	91.97	389,868
	1962	Cutthroat	9,373,782	89.11	8,352,816
	1962	Cutthroat and Rainbow	508,972	95.71	487,146
Pend Oreille Lake and	1961	Kokanee	1,751,560	98.00	1,716,530
Priest Lake	1962	Kokanee	1,398,936	98.92*	992,400*
Salmon River	1961	Chinook Salmon	933,748	90.50	845,000
	1962	Chinook Salmon	1,264,174	88.80	1,121,974
Spring Creek	1962	Kamloops	62,496	46.08	28,800
Williams Lake	1961	Rainbow	1,459,444	93.73	1,367,959
Totals	1961		20,542,011	(Av.) 84.67	17,392.105
	1962		20,116,045	(Av.) 84.64	17,027,408
Biennium Totals			**40,658,056**	**(Av.) 84.65**	**34,419,513**

* 895,786 eggs planted as green eggs.

FISH SALVAGED AND PLANTED
(November 1, 1960 — September 30, 1962)

Station Area	Year	Trout	Whitefish	Large-mouth Bass	Bullhead Catfish	Crappie	Perch	Total	Pounds
Ashton	1961	300	.....	.....	.....	.....	.....	300	.....
Eagle	1961	.....	.....	22,530	3,400	53,000	3,200	82,130	4,056
	1962	.....	.....	21,000	22,365	21,000	21,000	85,365	3,475
Hagerman	1961	.....	.....	50	.....	.....	.....	50	.....
Hayspur	1961	2,572	.....	.....	.....	.....	.....	2,572	1,696
Mackay	1961	13,360	700	.....	.....	.....	.....	14,060	2,260
	1962	2,435	820	.....	.....	.....	.....	3,255	570
Totals	1961	16,232	700	22,580	3,400	53,000	3,200	99,112	8,312
	1962	2,435	820	21,000	22,365	21,000	21,000	88,620	4,045
Biennium Totals		**18,667**	**1,520**	**43,580**	**25,765**	**74,000**	**24,200**	**187,732**	**12,357**

EGGS RECEIVED BY PURCHASE OR EXCHANGE FROM OTHER AGENCIES

(November 1, 1960 — September 30, 1962)

Species	Year	Number
Rainbow	1961	8,003,939
	1962	11,470,867
Brook	1961	484,756
	1962	310,954
Mackinaw	1961	90,882
	1962	153,614
Golden	1961	51,660
	1962	15,795
Kamloops	1961	205,632
	1962	101,920
Kokanee	1961	287,232
	1962	264,402
Chinook Salmon	1961	1,156,135
	1962	2,628,100
Totals	1961	10,280,236
	1962	14,945,652
Biennium Totals		**25,225,888**

FISH FEED

(November 1, 1960 — September 30, 1962)

Item	Year	Pounds	Cost
Liver	1961	37,971	$ 3,800.87
	1962	26,947	2,823.90
Slaughterhouse By-products	1961	95,765	5,125.61
	1962	58,744	3,162.00
Fish and Fish Viscera	1961	58,906	3,245.04
	1962	64,600	3,615.80
Meal and Meal Products	1961	1,819,632	171,362.95
	1962	1,594,148	145,240.64
Totals	1961	2,012,274	$183,534.47
	1962	1,744,439	154,842.34
Biennium Totals		**3,756,713**	**$338,376.81**

Business Administration

Financing Wildlife

During the reporting biennium, a number of changes occurred in the procedures of the Business Administration Division. The basic problem, however, of providing increased services with a shrinking dollar was still with us. To alleviate the problem, the Department will approach the 1963 legislature for license and tag increases and a 5-point program to explain the need.

It should be recognized that wherever there is an increase in field responsibilities and services, there is a commensurate increase in services within the Administration Division.

License Sales

The leveling off trend for sale of resident hunting and fishing licenses continued. The trend of increased dollar contributions from the sale of non-resident combination hunting and fishing license continued. The new tourist one-day, and additional day, fishing license made a considerable impact on the resource by permitting larger numbers of people to take advantage of the fishing resource.

Examples of the economic squeeze can be analyzed from our license tabulation chart as follows: (1) The transactions of free deer and elk tags issued to holders of old age permits. In 1952, the Department issued 880 free deer and elk tags; in 1961, there was an increase of six times as many tags issued, or 5,265. (2) Duplicate license authorized by the legislature in 1961 made quite an impact on our license sales. From May to December of 1961, 988 duplicate licenses were issued. From January to October of 1962, 1,100 duplicate licenses were issued with two months to go in the year.

Fiscal

It was reported in the previous biennium that data processing equipment had been leased for use in fiscal operations. The present biennium programming was refined and, in addition, one year of budgetary allotment accounting was produced. Other annual applications include payroll records and reports, controlled hunt drawings, statistical tabulations of hunter report cards, tabulations of game and fishing questionnaires and fur trapper reports.

It is planned that non-expendable equipment will be inventoried by machine and it is anticipated that additional statistical tabulations will be requested along with a revised payroll record system in the coming biennium.

Audits

All financial records of the Department were audited by the State Bureau of Public Accounts, Federal Fish and Wildlife Service, Bureau

of Sport Fisheries and Wildlife and the Federal Fish and Wildlife Service, Bureau of Commercial Fisheries. All accounts were found to be in good condition and fiscal procedures were conducted according to recognized accounting methods.

New Building

The 1961 legislature authorized in the passage of House Bill 350, an expenditure up to $350,000 from the Fish and Game funds for a new headquarters building. It is with pleasure that we report that through efficiencies and cooperation by all department personnel, we were able to make this money available without seriously affecting the wildlife program. Policies which affected the savings will be continued in the future so as to insure the sportsmen of getting the most for their license dollar.

Land Acquisition

One of the problems of the Department is to provide areas whereby the hunters and fishermen of the State have access to its streams and lakes for hunting and fishing purposes. In the continuance of this program, as well as for the general operations and the management of wildlife, the following land holdings have been acquired by the Department of Fish and Game during the biennium.

Project Area	County	No. Acres	Consideration
Antelope Creek Public Access	Butte and Custer	5.0	$ 50.00
Bear River Public Access	Caribou	45.0	112.50
Lower Boise River Public Access	Canyon	0.86*	125.00
Lower Boise River Public Access	Canyon	1.85*	600.00
Lower Boise River Public Access	Canyon	3.46*	500.00
Lower Boise River Public Access	Canyon	4.09*	600.00
Lower Boise River Public Access	Canyon	9.1 *	150.00
Lower Boise River Public Access	Canyon	31.25	79.00
Hayden Lake Public Access	Kootenai	0.5	600.00
Hayden Lake Public Access	Kootenai	0.5	600.00
Lost River Public Access	Custer	40.0	1,800.00
Lower Payette River Public Access	Payette	60.0	5,000.00
Lower Payette River Public Access	Payette	61.79	5,000.00
Lower Payette River Public Access	Gem	1.42	150.00
Rose Lake Public Access	Kootenai	29.65	7,000.00
Silver Creek Public Access	Blaine	80.0	12,000.00
Snake River Public Access	Jerome	40.0	1,250.00
Snake River Public Access	Canyon	40.0	100.00
Snake River Public Access	Canyon	160.68	402.00
Snake River Public Access	Canyon	26.91	67.00
Snake River Public Access	Canyon	57.1	104.00
Snake River Public Access	Owyhee	31.7	80.00
Snake River Public Access	Owyhee	1.1	400.00

Snake River Public Access	Owyhee	41.57	8,000.00
Snake River Public Access	Washington	5.27*	1,900.00
Cocolalla Lake Spawn-taking Station	Bonner	2.60†	200.00
Lemhi River Salmon Trap Site	Lemhi	11.0	3,000.00
Spring Valley Dam and Reservoir Site	Latah	247.6	34,000.00
Spring Valley Dam and Reservoir Site	Latah	48.8	2,940.00
Sweetwater Spring Hatchery Site	Nez Perce	15.0	6,500.00
Boise River Deer and Elk Winter Range	Elmore	1,580.0	25,000.00
Fort Boise Wildlife Management Area	Canyon	60.23	18,000.00
Fort Boise Wildlife Management Area	Canyon	74.90	30,600.00
Market Lake Wildlife Management Area	Jefferson	214.48	16,000.00
Market Lake Wildlife Management Area	Jefferson	527.98	50,000.00
Sand Creek Wildlife Management Area	Fremont	10,207.32	180,000.00
Sand Creek Wildlife Management Area	Fremont	160.0	160.00
Sand Creek Wildlife Management Area	Fremont	1,557.92‡	1,083.10
C. J. Strike Wildlife Management Area	Owyhee	120.0	3,000.00

* Easement.

† 2 Easements.

‡ 10 year state lease.

Columbia River Fishery Development Program: In cooperation with this program, the Department of Fish and Game has secured easements providing for the installation of 108 additional fish screens in Lemhi and Custer Counties.

Construction and Maintenance

Construction and maintenance projects accomplished during the biennium period; details for which may be found in the Division reports, are listed below:

Capital Improvements:

American Falls Fish Hatchery
Eagle Fish Hatchery
Grace Fish Hatchery
Hagerman Fish Hatchery
Spring Valley Dam and Impoundment, Dingell-Johnson project
Pettit Lake Migration Block, Dingell-Johnson project
Gold Island Management Area, Pittman-Robertson project
Fort Boise Management Area, Pittman-Robertson project
Lucky Peak Reservoir, Experimental Deer Crossing, Pittman-Robertson project
North Fork Salmon, Experimental Cutthroat Hatching Channel
Lemhi River, Little Springs Creek Fish Counting Weir
Lemhi River Steelhead Experimental Hatching Channel, Columbia River project
Clarkia Patrol Cabin
Salmon River, Lemhi River, Pahsimeroi River Fish Screens, Columbia River project

Moose Creek Dam Fishway, Columbia River Program project
Sweetwater Salmon Eying Station, Columbia River project
Selway and Lochsa Rivers, Migration Barrier Removal, Columbia River project
Lewiston Dam Steelhead Egg Taking Facility, Columbia River project
Meadow Creek Steelhead Experimental Hatching Channel, Columbia River project
Stolle Meadows Salmon Egg Taking Facility, Columbia River project
Decker Flat Salmon Egg Taking Facility, Columbia River project
Bear Valley Salmon Egg Taking Facility, Columbia River project
Lemhi River Salmon Egg Taking Facility, Columbia River project
Lost River Public Access Development, Dingell-Johnson project
Silver Creek Public Access Development, Dingell-Johnson project
Cedar Draw Public Access Development, Dingell-Johnson project
Garfield Bay Public Access Development, Dingell-Johnson project
Hayden Lake Public Access Development, Dingell-Johnson project
Homedale-Marsing Public Access Development, Pittman-Robertson project
Lansing Lane-Ward Public Access Development, Pittman-Robertson project
Albeni Falls-Clark Fork Segment Public Access Development, Pittman-Robertson project

Maintenance Projects:

Ashton Hatchery
Hayspur Hatchery
Sandpoint Hatchery
Mackay Hatchery
Bear Valley Patrol Cabin
Lowman Patrol Cabin
Garden Valley Officer's Headquarters
Deary Officer's Headquaretrs
Jerome Administrative Headquarters
Boise Central Warehouse
North Lake Management Area, Pittman-Robertson project
Hagerman Management Area, Pittman-Robertson project
Spirit Lake Public Access, Dingell-Johnson project
Shepherd Lake Public Access, Dingell-Johnson project
Cocolalla Lake Public Access, Dingell-Johnson project

Federal Aid In Fish and Wildlife Restoration

Wildlife Restoration

The Federal Aid in Wildlife Restoration Act provides that the Federal Government will finance 75 percent of approved wildlife projects. Under this act Congress appropriates annually funds received from revenue derived from an 11 percent excise tax on sporting arms and ammunition. The Idaho Legislature passed an enabling act authorizing the Fish and Game Department to participate in this program on March 4, 1939.

Types of Suitable Projects

The basic requirements are that all projects shall be substantial in character and design. Depending upon objectives, they embrace activities in four groups as follows:

1. **Land Purchase:** Purchase of lands for the rehabilitation of wildlife.
2. **Land Development:** To make land and water areas more suitable for and productive of wildlife through planting food and cover planting, creating new water impoundments, stabilization of water levels, introduction of game species into suitable habitat and other activities necessary to accomplish this purpose.

   Provisions are made under development projects to maintain all Federal Aid projects, buildings or land improvements.
3. **Investigations and Surveys:** Research to solve pressing wildlife management problems. These studies must be confined to procurement of factual information designed to improve the administration of the wildlife resources of the State.
4. **Coordination:** The preparation and submission of proposed projects for consideration of Director, Fish and Game Commission, the U.S. Fish and Wildlife Service and Department of Interior, and the coordination of active projects in compliance with Federal and State law.

The act providing for Federal Aid in Wildlife Restoration was amended August 12, 1955, to provide that up to 30% of the funds so appropriated may be used for game management. (Measures concerned with harvest and control of wild birds and mammals being managed by the state fish and game department; law enforcement and public relations are not approvable activities.)

Wildlife Restoration Funds Received

One-half the Federal funds available to the states for wildlife restoration projects is allocated in the ratio that the area of each state bears to the total area of all the states; the remainder is allocated in the ratio of the states' paid hunting license holders to the total number of paid hunting license holders in all the states. No state shall recieve less than one-half of one percent, nor more than five percent of the

total amount apportioned to all the states. Since March 11, 1939, when the Idaho Legislature passed the act enabling participation, $4,140,469.23 in Federal apportionments has been allocated to the State of Idaho.

The following financial report is for the period July 1, 1960 to June 30, 1962:

Unobligated balance of Federal funds, July 1, 1960	$ 83,584.00
Federal appropriation for fiscal year 1961	283,299.49
Federal appropriation for fiscal year 1962	260,544.97
Total Federal money available to finance approved projects for period July 1, 1960 to June 30, 1962	$627,428.46
Unobligated balance of Federal funds as of June 30, 1962	$ 46,103.39

Federal Aid in Wildlife Restoration Projects Initiated

During Biennium July 1, 1960 to June 30, 1962

Project		Federal	State	Est. Total
FW 40-C-20	Fish & Wildlife Mgmt. Coordination.	$ 18,135.00	$ 6,045.00	$ 24,180.00
FW 40-C-21	Fish & Wildlife Mgmt. Coordination.	17,670.00	5,890.00	23,560.00
Total Coordination		**$ 35,805.00**	**$ 11,935.00**	**$ 47,740.00**
Development				
FW 2-D- 9	C. J. Strike Wildlife Mgmt. Area.	$ 12,900.00	$ 4,300.00	$ 17,200.00
FW 2-D-10	C. J. Strike Wildlife Mgmt. Area.	10,050.00	3,350.00	13,400.00
FW 4-D- 7	Carey Lake Development.	5,625.00	1,875.00	7,500.00
W 36-D-12	Hagerman Refuge.	10,425.00	3,475.00	13,900.00
W 36-D-13	Hagerman Refuge.	6,675.00	2,225.00	8,900.00
W 55-D-14	North Lake Wildlife Mgmt. Area.	23,175.00	7,725.00	30,900.00
W 55-D-15	North Lake Wildlife Mgmt. Area.	14,250.00	4,750.00	19,000.00
W 60-D-10	Boundary Co. Wildlife Mgmt. Area.	1,275.00	425.00	1,700.00
W 60-D-11	Boundary Co. Wildlife Mgmt. Area.	1,575.00	525.00	2,100.00
W 64-D-10	Boise Riv. Deer & Elk Winter Range.	7,725.00	2,575.00	10,300.00
W 64-D-11	Boise Riv. Deer & Elk Winter Range.	5,250.00	1,750.00	7,000.00
W 73-D-10	Star Lake Wildlife Mgmt. Area.	9,000.00	3,000.00	12,000.00
W 73-D-11	Star Lake Wildlife Mgmt. Area.	3,525.00	1,175.00	4,700.00
W 75-D- 9	Trapping and Transplanting.	6,150.00	2,050.00	8,200.00
W 80-D-14	Game Habitat Improvement.	34,575.00	11,525.00	46,100.00
W 80-D-15	Game Habitat Improvement.	37,725.00	12,575.00	50,300.00
W 89-D-11	Sand Creek Wildlife Mgmt. Area.	22,725.00	7,575.00	30,300.00
W 89-D-12	Sand Creek Wildlife Mgmt. Area.	12,225.00	4,075.00	16,300.00
W 103-D- 6	Farragut Wildlife Mgmt. Area.	577.51	192.51	770.02
W 113-D- 7	Primitive Area Winter Range.	6,750.00	2,250.00	9,000.00
W 113-D- 8	Primitive Area Winter Range.	6,525.00	2,175.00	8,700.00
W 116-D- 5	Market Lake Wildlife Mgmt. Area.	23,025.00	7,675.00	30,700.00
W 116-D- 6	Market Lake Wildlife Mgmt. Area.	10,050.00	3,350.00	13,400.00
W 119-D- 2	Gold Island Wildlife Mgmt. Area.	5,250.00	1,750.00	7,000.00
W 123-D- 3	Boise-Payette River Access.	2,700.00	900.00	3,600.00
W 121-D- 2	Hunter Access Roads—Owyhee Co.	300.00	100.00	400.00
W 121-D- 3	Hunter Access Roads—Owyhee Co.	1,125.00	375.00	1,500.00
W 123-D- 2	Snow Removal.	3,600.00	1,200.00	4,800.00

W 123-D- 3	Snow Removal	2,475.00	825.00	3,300.00
W 124-D- 1	Fort Boise Wildlife Mgmt. Area	15,375.00	5,125.00	20,500.00
W 124-D- 2	Fort Boise Wildlife Mgmt. Area	14,250.00	4,750.00	19,000.00
W 124-D- 3	Fort Boise Wildlife Mgmt. Area	12,000.00	4,000.00	16,000.00
W 126-D- 2	Albeni Falls Wildlife Mgmt. Area	3,900.00	1,300.00	5,200.00
W 126-D- 3	Albeni Falls Wildlife Mgmt. Area	3,300.00	1,100.00	4,400.00
W 128-D- 1	Carey Lake Wildlife Mgmt. Area	5,475.00	1,825.00	7,300.00
W 128-D- 2	Carey Lake Wildlife Mgmt. Area	4,350.00	1,450.00	5,800.00
W 130-D- 1	Public Hunting Access (Homedale-Marsing Segment)	2,156.25	718.75	2,875.00
W 130-D- 2	Public Hunting Access (St. Joe Natl. Forest)	900.00	300.00	1,200.00
W 130-D- 3	Pub. Hunting Access (Lansing-Lane)	600.00	200.00	800.00
Total Development		**$349,533.76**	**$116,511.26**	**$466,045.02**
Lands				
FW 1-L- 2	C. J. Strike Wildlife Mgmt. Area	$ 2,325.00	$ 775.00	$ 3,100.00
W 61-L-10	Boise Riv. Elk & Deer Winter Range	18,825.00	6,275.00	25,100.00
W 71-L- 3	Sand Creek Wildlife Mgmt. Area	136,425.00	45,475.00	181,900.00
W 115-L- 5	Market Lake Wildlife Mgmt. Area	12,075.00	4,025.00	16,100.00
W 115-L- 6	Market Lake Wildlife Mgmt. Area	2,043.75	681.25	2,725.00
W 115-L- 7	Market Lake Wildlife Mgmt. Area	9,900.00	3,300.00	13,200.00
W 122-L- 4	Boise-Payette River Access	5,625.00	1,875.00	7,500.00
W 127-L- 2	Fort Boise Wildlife Mgmt. Area	13,650.00	4,550.00	18,200.00
W 127-L- 3	Fort Boise Wildlife Mgmt. Area	49,050.00	16,350.00	65,400.00
W 129-L- 1	Public Hunting Access (Weiser)	1,545.00	515.00	2,060.00
W 129-L- 2	Public Hunting Access (Homedale-Marsing)	6,097.50	2,032.50	8,130.00
W 129-L- 3	Public Hunting Access (Nesbitt)	225.00	75.00	300.00
W 129-L- 4	Public Hunting Access (Lansing Lane-Ward)	150.00	50.00	200.00
W 129-L- 5	Public Hunting Access (Walter's Ferry)	393.75	131.25	525.00
W 129-L- 6	Public Hunting Access (Walter's Ferry)	697.50	232.50	930.00
W 134-L- 1	Snake River Island—Blackfoot Segment	3,675.00	1,225.00	4,900.00
Total Lands		**$262,702.50**	**$ 87,567.50**	**$350,270.00**
Research				
W 85-R-12	Idaho Big Game Harvest Census and Range Study	$ 78,750.00	$ 26,250.00	$105,000.00
W 85-R-13	Idaho Big Game Harvest Census and Range Study	103,125.00	34,375.00	137,500.00
W 96-R- 9	Game Bird Survey & Investigations	4,500.00	1,500.00	6,000.00
W 96-R-10	Game Bird Survey & Investigations	5,175.00	1,725.00	6,900.00
W 111-R- 9	Artificial Revegetation Studies	6,750.00	2,250.00	9,000.00
W 111-R-10	Artificial Revegetation Studies	6,750.00	2,250.00	9,000.00
W 125-R- 2	Sage Grouse Investigations	10,200.00	3,400.00	13,600.00
W 125-R- 3	Sage Grouse Investigations	9,225.00	3,075.00	12,300.00
W 131-R- 1	White-tailed Deer Studies	2,193.75	731.25	2,925.00
W 132-R- 1	Range Forest Competition Study	2,563.50	854.50	3,418.00
W 133-R- 1	Mule Deer Range & Prod. Study	4,406.25	1,468.75	5,875.00
Total Research		**$233,638.50**	**$ 77,879.50**	**$311,518.00**

Summary of Initiated Projects

Type of Project	Federal	State	Total	% of Total Money Obligated
Coordination Projects	$ 35,805.00	$ 11,935.00	$ 47,740.00	4.06%
Development Projects	349,533.76	116,511.26	466,045.02	39.64%
Land Projects	262,702.50	87,565.50	350,270.00	29.80%
Research Projects	233,638.50	77,879.50	311,518.00	26.50%
Totals	**$881,679.76**	**$293,893.26**	**$1,175,573.02**	**100.00%**

Fish Restoration

A Federal Act passed on August 9, 1950, provides that Federal funds obtained from a 10% excise tax on fishing rods, creels, reels and artificial lures, baits and flies, be made available to participating states on the following basis: 40% in the ratio that the area of each state, including coastal and Great Lake waters, bears to the total area of all states; and 60% in ratio that the number of persons holding paid licenses to fish for sport or recreation in each state bears to the number of licensed fishermen in all the United States.

These funds available to the Idaho Fish and Game Department are used to finance approved fish restoration and management projects in exactly the same manner as for the Wildlife Restoration projects.

Since August 9, 1950, when the Idaho Legislature passed the Act enabling participation, $820,172.57 in Federal apportionments has been allocated to the State of Idaho.

Fish Restoration

The following financial report is for the period July 1, 1960 to June 30, 1962:

Unobligated balance of Federal funds, July 1, 1960	$ 6,914.33
Federal appropriation for fiscal year, 1961	88,831.66
Federal appropriation for fiscal year, 1962	93,141.74
Total Federal money available to finance approved projects for period July 1, 1960 to June 30, 1962	$188,887.73
Unobligated balance of Federal funds as of June 30, 1962	$ 46,103.39

Federal Aid in Fish Restoration and Management Projects Initiated
During Biennium July 1, 1960 to June 30, 1962

Project	Federal	State	Est. Total
FW 40-C-20 Fish & Wildlife Mgmt. Coordination.	$ 5,115.00	$ 1,705.00	$ 6,820.00
FW 40-C-21 Fish & Wildlife Mgmt. Coordination.	5,580.00	1,860.00	7,440.00
Total **Coordination**	**$ 10,695.00**	**$ 3,565.00**	**$ 14,260.00**

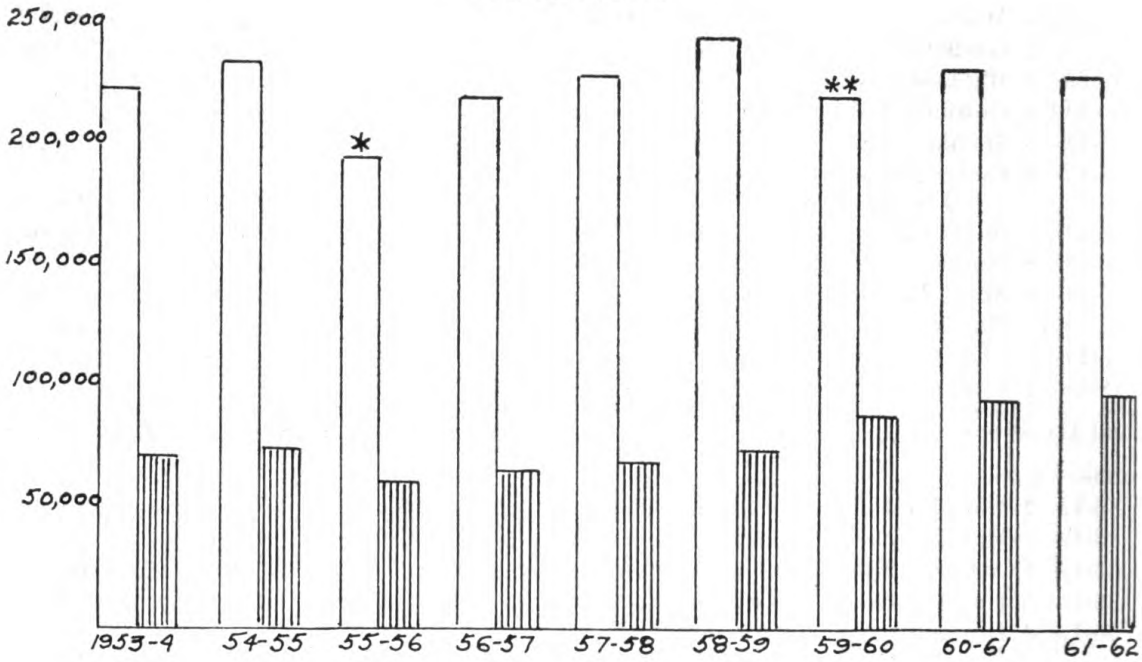
Development				
F 40-D- 1	Glendale Res., Pub. Access Amend. 2	$ 192.76	$ 64.26	$ 257.02
F 44-D- 1	Spring Valley Dam	88,093.04	29,364.35	117,457.39
F 45-D- 1	Waha Lake Public Fishing Access	1,200.00	400.00	1,600.00
F 45-D- 2	Garfield Bay Public Fishing Access	2,475.00	825.00	3,300.00
F 45-D- 3	Big Lost River Public Fishing Access	3,975.00	1,325.00	5,300.00
F 45-D- 4	Cocolalla Lake Public Fishing Access	1,500.00	500.00	2,000.00
F 45-D- 5	Shepherd Lake Public Fishing Access	1,312.50	437.50	1,750.00
F 45-D- 6	Cedar Draw-Bordewick Public Fishing Access	2,775.00	925.00	3,700.00
F 45-D- 7	Silver Creek Public Fishing Access	2,250.00	750.00	3,000.00
F 45-D- 8	Hayden Lake Public Fishing Access	900.00	300.00	1,200.00
F 45-D- 9	Spirit Lake Public Fishing Access	1,125.00	375.00	1,500.00
F 45-D-10	Hayden Lake Public Fishing Access	2,625.00	875.00	3,500.00
F 46-D- 1	Fish Barrier Dam—Pettit Lake	5,664.23	1,888.08	7,552.31
F 48-D- 1	Channel Clearance—Priest Lake	2,625.00	875.00	3,500.00
Total Development		**$116,712.53**	**$ 38,904.19**	**$155,616.72**
Lands				
F 36-L- 2	Rose Lake Public Fishing Access	$ 5,325.00	$ 1,775.00	$ 7,100.00
F 36-L- 3	Hayden Lake Public Fishing Access	525.00	175.00	700.00
F 36-L- 4	Auger Falls Public Fishing Access	1,200.00	400.00	1,600.00
F 36-L- 5	Hayden Lake Public Fishing Access	525.00	175.00	700.00
F 36-L- 6	Horseshoe Bend Millponds Public Fishing Access	1,875.00	625.00	2,500.00
F 36-L- 7	Antelope Creek-Soda Point	210.00	70.00	280.00
F 43-L- 1	Big Lost River Access	1,387.50	462.50	1,850.00
Total Lands		**$ 11,047.50**	**$ 3,682.50**	**$ 14,730.00**
Research				
F 18-R- 7	Statewide Fishing Harvest Survey	$ 1,575.00	$ 525.00	$ 2,100.00
F 18-R- 8	Statewide Fishing Harvest Survey	3,525.00	1,175.00	4,700.00
F 32-R- 4	Tests for Increasing the Returns of Hatchery Trout	7,875.00	2,625.00	10,500.00
F 32-R- 5	Tests for Increasing the Returns of Hatchery Trout	9,000.00	3,000.00	12,000.00
F 34-R- 4	Water Quality Investigations	13,275.00	4,425.00	17,700.00
F 34-R- 5	Water Quality Investigations	7,575.00	2,525.00	10,100.00
F 47-R- 1	Life History of the Idaho Cutthroat Trout	2,553.75	851.25	3,405.00
F 49-R- 1	Salmon and Steelhead Investigations	8,250.00	2,750.00	11,000.00
Total Research		**$ 53,628.75**	**$ 17,876.25**	**$ 71,505.00**

Summary of Initiated Projects

Type of Project	Federal	State	Total	% of Total Money Obligated
Coordination Projects	$ 10,695.00	$ 3,565.00	$ 14,260.00	5.57%
Development Projects	116,712.53	38,904.19	155,616.72	60.77%
Land Projects	11,047.50	3,682.50	14,730.00	5.74%
Research Projects	53,628.75	17,876.25	71,505.00	27.92%
Totals	**$192,083.78**	**$ 64,027.94**	**$256,111.72**	**100.00%**

COMPARISONS OF SPORTING LICENSE SALES

BY NUMBER

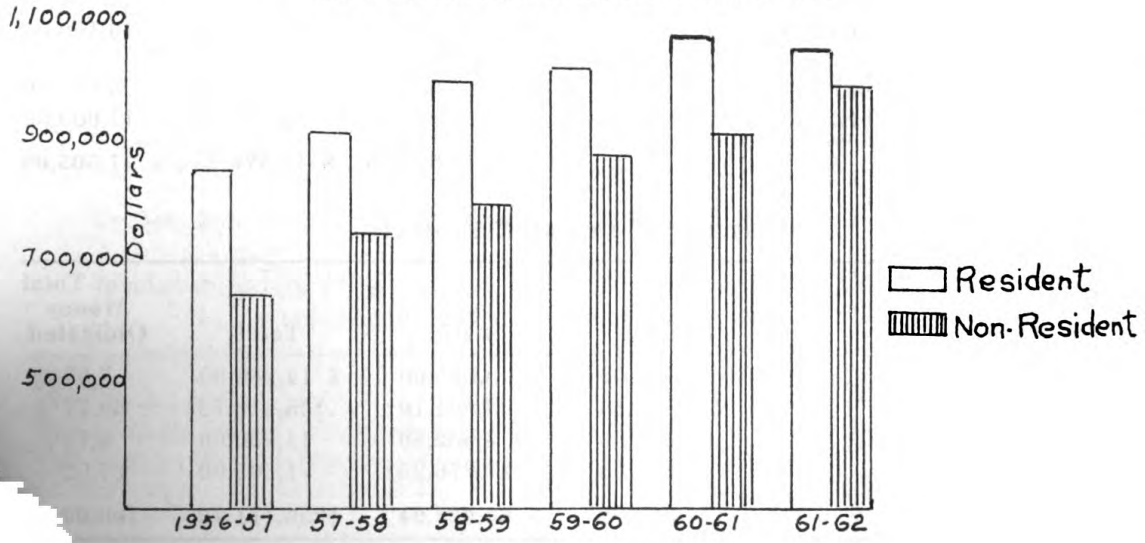


* Fiscal year following license increase.

** Fiscal year following license increase and new tourist license.

COMPARISONS OF SPORTING LICENSE SALES

BY DOLLARS, LICENSES AND TAGS



Comparisons of Sporting License Sales

Sales by Number

		Resident		Non-resident	
		Number	Percent	Number	Percent
Fiscal Year	1961-62	225,049	70.5	94,037	29.5
	1960-61	228,512	70.8	94,327	29.2
	1959-60	221,088	72.0	85,939	28.0
	1958-59	246,101	78.6	66,799	21.4
	1957-58	231,385	78.0	66,495	22.0
	1956-57	215,828	78.0	59,570	22.0
New License	1955-56	185,782	76.5	56,897	23.5
	1954-55	231,404	77.5	67,092	22.5
	1953-54	224,712	77.2	66,057	22.8

Sporting License and Tag Sales by Dollars

		Resident		Non-resident	
		Dollars	Percent	Dollars	Percent
Fiscal Year	1961-62	$1,044,408.15	52.1	$958,541.45	47.9
	1960-61	1,054,071.55	54.2	889,491.65	45.8
	1959-60	1,030,809.90	54.4	863,112.05	45.6
	1958-59	986,234.81	56.6	756,099.30	43.4
	1957-58	900,834.21	55.0	734,969.40	45.0
	1956-57	856,309.00	58.0	629,945.00	42.0

SPORTING LICENSE SALES BY NUMBER AND DOLLARS

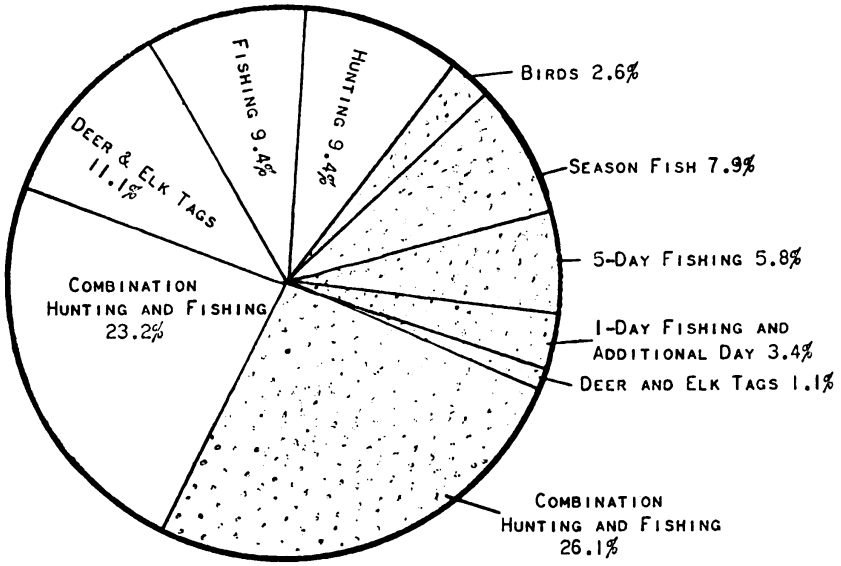
July 1, 1960 — June 30, 1962

RESIDENT

NON-RESIDENT

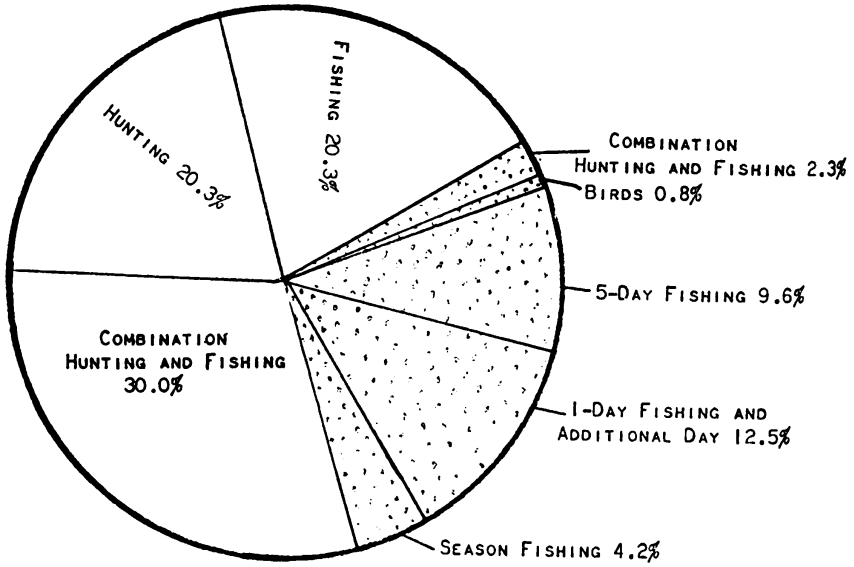
SPORTING LICENSE SALES BY DOLLAR

RESIDENT - $2,098,479.70 (53.1%)
NON-RESIDENT - 1,848,033.10 (46.9%)



SPORTING LICENSE SALES BY NUMBER

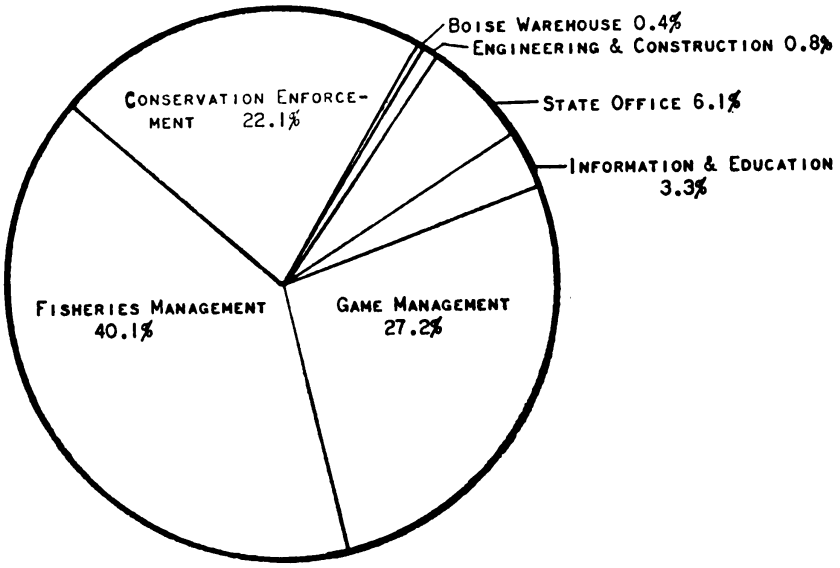
RESIDENT - 453,571 (70.6%)
NON-RESIDENT - 188,364 (29.4%)



ANALYSIS OF REVENUES AND EXPENDITURES

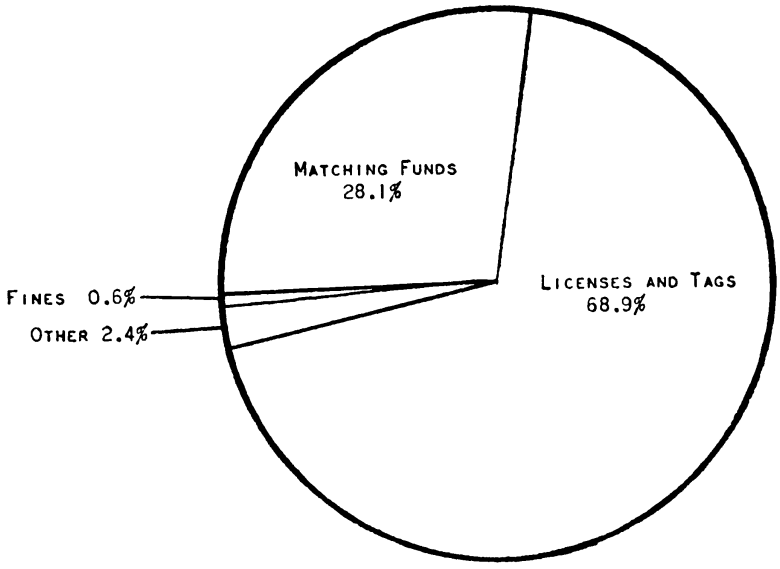
July 1, 1960 — June 30, 1962

HOW YOUR FISH AND GAME DOLLAR WAS USED



$5,545,279.08

WHERE THE FISH AND GAME DOLLARS CAME FROM



$5,851,745.38

TABULATION OF LICENSE SALES

By Series

	Resident Fish and Game	Resident Game	Resident Fish	Non-res. Big Game	Non-res. Bird	Non-res. Fish	Tourist Fish	Tourist 1-day Fish	Additional 1-day Fish	Shipping Permits	Regular Deer Tags	Elk Tags	General Season* Goat Tags	General Season* Sheep Tags	General Season* Archery Antelope Tags	Issued Without Charge To Old Age Permit Holders Regular Deer Tags	Issued Without Charge To Old Age Permit Holders Elk Tags
1952	124,793	48,714	44,106	3,187	820	13,407	42,533	.....	.....	1,542	105,562	47,469	...	...	..	502	378
1953	126,772	46,030	44,456	3,309	1,035	14,641	46,632	.....	.....	1,492	101,582	44,097	...	...	..	898	743
1954	125,316	46,465	45,393	3,638	1,162	14,823	49,107	.....	.....	1,315	103,702	48,201	...	...	.	1,434	1,240
1955	118,189	46,315	47,095	3,729	1,133	13,042	41,379	.....	.....	1,062	106,840	50,757	...	...	..	1,658	1,500
1956	104,944	56,962	54,305	4,046	1,334	12,874	41,686	.....	.....	1,191	114,019	52,627	63	75	89	1,967	1,794
										M.F. Deer	327						
1957	104,035	57,086	57,504	4,882	1,818	13,837	45,063	.....	.....	1,253	110,836	50,732	76	193	92	2,226	2,065
										Ext. Deer	7,166						
1958	106,423	63,958	62,613	5,112	2,175	14,601	44,419	.....	.....	1,075	120,448	54,920	96	255	58	2,491	2,278
										Ext. Deer	9,123						
										M.F. Deer	2,687						
1959	108,325	62,281	59,825	6,369	3,261	14,270	30,492	22,433	7,717	1,005	123,335	56,381	108	379	69	2,514	2,244
										Ext. Deer	8,400						
										M.F. Deer	3,373						
1960	100,924	65,609	65,561	6,725	2,521	13,839	30,466	28,387	10,138	937	123,460	56,324	188	417	82	2,682	2,393
										Ext. Deer	5,900						
										M.F. Deer	3,841						
										H.C. Deer	2,796						
1961	97,804	66,215	66,248	7,778	2,811	14,036	30,716	30,194	10,731	896	123,646	58,727	186	555	81	2,780	2,485
										Ext. Deer	7,152						
										M.F. Deer	3,148						
										H.C. Deer	5,695						

* This does not include controlled hunt permits.

M.F. Deer—Middle Fork deer tags.

Ext. Deer—Extra deer tags.

Statement of Total Fund Operations

July 1, 1960 — June 30, 1962

	Fish and Game Fund 6	Predatory Animal Control Fund 60	Pittman-Robertson Fund 61	Dingle-Johnson Fund 65	Columbia River Fund 66	Special Studies Fund 68	Rotary Fund 8558	Total
Beginning balance	$ 619,538.65	$ 4,894.93	$ 718.54	$ 37,565.84	$ 76,694.16	$ 8,175.43	$2,000.00	$ 749,587.55
Revenue:								
Licenses	4,032,816.35	.....	.....	.....	.....	.....	.....	4,032,816.35
Matching funds	.....	.....	819,102.84	175,721.58	585,255.30	68,646.17	.....	1,648,725.89
Other	144,642.42	.....	25,185.31	.....	375.41	.....	.....	170,203.14
Total Revenue	$4,177,458.77	$.....	$ 844,288.15	$175,721.58	$585,630.71	$ 68,646.17	.....	$5,851,745.38
Department transfers	(429,170.43)	41,170.43	275,000.00	88,000.00	.....	25,000.00	.....	.....
Total funds available	$4,367,826.99	$46,065.36	$1,120,006.69	$301,287.42	$662,324.87	$101,821.60	$2,000.00	$6,601,332.93
Disbursements:								
Salaries and wages	$1,887,778.15	$27,575.05	$ 384,445.28	$ 50,215.38	$251,543.37	$ 48,735.65	.....	$2,650,292.88
Travel	115,787.06	.....	20,813.41	4,133.17	12,171.42	3,778.01	.....	156,683.07
Other expenses	1,124,671.16	18,469.89	291,014.96	33,826.01	152,305.78	15,934.43	.....	1,636,222.23
Capital outlay	308,768.11	.....	387,759.59	177,817.24	224,251.81	3,107.90	.....	1,101,704.65
Refunds	351.25	.....	.....	25.00	.....	.....	.....	376.25
Total expense	$3,437,355.73	$46,044.94	$1,084,033.24	$266,016.80	$640,272.38	$ 71,555.99	.....	$5,545,279.08
State transfers	85,015.66	19.80	10,134.54	1,462.88	5,915.78	906.04	.....	103,454.70
Total disbursemts.	$3,522,371.39	$46,064.74	$1,094,167.78	$267,479.68	646,188.16	$ 72,462.03	.....	$5,648,733.78
Fund balance	**845,455.60**	**.62**	**25,838.91**	**33,807.74**	**16,136.71**	**29,359.57**	**2,000.00**	**952,599.15**
Less outstanding orders	67,055.90	.....	835.82	.....	256.07	5,882.75	.....	74,030.54
Unencumbered fund balance	**$ 778,399.70**	**$ .62**	**$ 25,003.09**	**$ 33,807.74**	**$ 15,880.64**	**$ 23,476.82**	**$2,000.00**	**$ 878,568.61**

Statement of Division Expenditures—Fish and Game Fund Only

(Fund No. 6)

July 1, 1960 — June 30, 1962

	Total	Salaries and Wages	Travel	Operating Expense	Capital Outlay	Refunds
Administration, construction, fiscal and warehouse	$ 408,419.36	$ 246,540.04	$ 29,289.24	$ 111,986.42	$ 20,252.41	$351.25
Conservation enforcement	1,224,572.40	810,236.63	49,137.21	236,999.91	128,198.65	.....
Fisheries management	1,258,390.19	499,682.60	21,767.17	628.009.73	108,930.69	.....
Game management	366,850.61	230,377.98	11,892.76	79,818.24	44,761.63	.....
Information and education	179,123.17	100,940.90	3,700.68	67,856.86	6,624.73	.....
Total Fish and Game Fund No. 6	**$3,437,355.73**	**$1,887,778.15**	**$115,787.06**	**$1,124,671.16**	**$308,768.11**	**$351.25**

Columbia River Fisheries Development Program
Statement of Operation

Construction Funds as of June 30, 1962

Federal appropriation fiscal year 1957		$200,000.00	
Federal appropriation fiscal year 1958		125,000.00	
Federal appropriation fiscal year 1959		300,000.00	
Federal appropriation fiscal year 1960		24,375.00	
Federal appropriation fiscal year 1961		295,000.00	
Federal appropriation fiscal year 1962		261,627.29	
Total Federal funds available for program			$1,206,002.29
Disposition of Funds:			
CRP- 1	Investigation and planning	$316,000.00	
CRP- 2	Access and fill at Salmon Whse.	1,344.82*	
CRP- 3	Salmon whse. plans and specifications	1,975.97*	
CRP- 4	Well at Salmon whse.	539.00*	
CRP- 5	Dagger Falls plans and specifications	9,207.26*	
CRP- 6	Fish screens plans and specifications	8,298.55*	
CRP- 7	Operation and maintenance (1959)	.....*	
CRP- 8	Fish screen construction	433,097.80*	
CRP- 9	Operation and maintenance (1959)	.....*	
CRP-10	Dagger Falls fishway construction	122,612.43*	
	Dagger Falls access	50,627.29*	
CRP-11	Salmon whse. construction	50,692.22*	
CRP-14	Selway Falls fishway, pre-engineering	24,315.73	
CRP-15	Stream clearance and minor falls crtn.	10,000.00	
CRP-17	Screening irrigation diversions	125,000.00	
CRP-18	Fish counting and fishway study, Lewiston Dam	5,000.00	
CRP-19	Selway Falls fishway, plans and specs.	15,000.00	
CRP-21	Stream clearance and minor falls crtn.	28,000.00	
Total funds expended or contracted			**1,201,711.07**
Balance Federal appropriation June 30, 1962			**$ 4,291.22**

Operation and Maintenance Funds as of June 30, 1962

Federal appropriation fiscal year 1960	**$ 16,249.58**	
Federal appropriation fiscal year 1961	**25,000.00**	
Federal appropriation fiscal year 1962	**35,000.00**	
Total Federal funds available for program		**$ 76,249.58**
Disposition of Funds:		
CRP-12 Operation and maintenance screens	$ 16,249.58*	
CRP-13 Operation and maintenance screens	24,759.52*	
CRP-16 Operation and maintenance screens	35,000.00	
Total funds expended or contracted		**76,009.10**
Balance Federal appropriation June 30, 1962		**$ 240.48**

Columbia River Operational Study Projects As of June 30, 1962

CRP-OS-1	Introduction of fall-spawning Chinook salmon into the Clearwater Riv. drain.	$ 4,992.74*	
CRP-OS-2	Development of techniques and equipment to facilitate planting of salmon and steelhead eggs	2,435.62*	
CRP-OS-3	Reintroduction of spring and summer-run Chinook salmon into the Selway River, Clearwater River drainage, Idaho	52,286.13*	
CRP-OS-4	Transfers of adult steelhead for spawning purposes, south fork of the Clearwater	4,253.68*	
CRP-OS-5	Planting of eyed fall-spawning Chinook salmon eggs in the Clearwater Riv. drain.	7,000.00	
CRP-OS-6	Reintroduction of spring and summer-run Chinook salmon into the Selway River, Clearwater River drainage, Idaho	26,000.00	
CRP-OS-7	Reintroduction of steelhead trout into the south fork of the Clearwater River and the Lemhi River	26,000.00	
CRP-OS-8	Reintroduction of spring and summer-run Chinook salmon into the Selway River	53,000.00	
Total funds expended or contracted			**$ 175,968.17**

* Project completed.

DETAIL OF CASH RECEIPTS
Fish and Game Fund No. 6
Biennium Ending June 30, 1962

		Number	Dollars
01	Resident Hunting and Fishing	192,937	$ 916,450.75
02	Resident Hunting	130,515	371,967.75
03	Resident Fishing	130,119	370,839.15
10	Non-resident Hunting and Fishing	14,467	1,030,773.75
11	Non-resident Bird	5,292	100,548.00
12	Non-resident Season Fish	27,233	310,456.20
13	Non-resident 5-day Fish	61,209	232,594.20
14	Tourist First-day Fish	59,236	112,548.40
15	Tourist Additional 1-day Fish	20,926	19,879.70
16	Non-resident Gun	1	1.90
20	Shipping Permits	1,830	732.00
21	Deer Tags	247,106	234,750.70
22	Elk Tags	115,051	218,596.90
23	Extra Deer Tags	13,052	12,399.40
24	Middle Fork Deer Tags	6,986	6,639.55
25	Hells Canyon Deer	8,491	8,066.45
28	Beaver Tags	12,559	11,921.55
29	Commission Saved		5,732.70
30	Resident Trapper	1,218	6,086.50
31	Commercial Fish	452	4,520.00
32	Resident Outfitter	94	470.00
33	Guide License	70	350.00
34	Resident Fur Buyer	77	390.00
35	Taxidermist	43	430.00
36	Private Pond Permit	71	710.00
37	Game Bird Farm Permit	42	420.00
38	Non-resident Outfitter	14	350.00
40	Non-resident Trapper	3	225.00
41	Non-resident Fur Buyer	9	180.00
42	Duplicate Licenses	1,215	1,215.00
50	Deer Permits	986	2,958.00
51	Elk Permits	3,700	18,500.00
52	Moose Permits	154	3,850.00
53	Moose Tags	155	1,550.00
54	Sheep Permits		.....
55	Sheep Tags	972	9,720.00
56	Goat Permits	244	1,225.00
57	Goat Tags	618	6,175.00
58	Antelope Permits	2,105	6,315.00
59	Antelope Tags	2,273	2,273.00
98	Erroneous License Sales		4.80
	Total Licenses and Permits		$4,032,816.35

Rentals	24,670.50
Fines and Confiscations	33,392.84
Miscellaneous Sales	13,026.56
Sales of Capital Assets	6,059.85
Insurance Adjustments	410.12
Refunds	66,388.60
Federal Reimbursement	693.95
Total Receipts Fund No. 6	**$4,177,458.77**

Employees of the Idaho Fish & Game Department

As of June 30, 1962

Director—John R. Woodworth

Assistant Director—Robert L. Salter

BUSINESS ADMINISTRATION DIVISION

Amos K. Belnap, Chief

T. D. Biladeau, Assistant Federal Aid Coordinator
Alice L. Cannaday, Senior Key Punch Operator
Claude Clapsaddle, Tab Operator and Programmer
Mary Ann Edson, Accounting Machine Operator
Gloria Elliott, Secretary
Anne Epeldi, Principal Clerk II
Jack G. Fisher, Engineer
*Dovie Fordham, Principal Secretary
Josephine Freeman, Clerk-Typist
Betty Ray Harbert, Senior Clerk
Forrest R. Hauck, Coordinator, Basin Investigations
Betty Heidel, Secretary
R. E. Hoffman, Chief Clerk
Bernice E. Howell, Secretary
Carla Johnson, Secretary
Kenneth L. Johnson, Construction Foreman
Ralph E. Johnson, Property, Supply and Warehouseman
John Langenheder, Construction Foreman
Carlos B. Livingston, Transitman
Leola Lowry, Receptionist-Clerk II
D. W. McRae, Construction Foreman
*Gayla J. Norton, Posting Machine Clerk
Richard J. Nourse, Senior Clerk
George O. Palmer, Equipment Operator II
Vernon B. Rich, Federal Aid Coordinator
Robert W. Robertson, Junior Accountant
Ivol E. Sies, Improvement Supervisor
Al P. Slaton, Equipment Operator II
Louise B. Snodgrass, Principal Secretary
Worth A. Stevens, Duplicating Machine Operator II
Fran B. Wheelock, Accounting Clerk
Fay Whitson, Principal Clerk II

FISHERIES MANAGEMENT DIVISION

James C. Simpson, Chief

B. D. Ainsworth, Fish Hatchery Superintendent II
B. D. Ainsworth, Jr., Fish Hatchery Helper
Harvey Albrethsen, Fish Hatchery Superintendent I
John Austin, Fish Hatchery Helper
E. O. Bailey, Fish Hatchery Superintendent I
Leland Batchelder, Fish Hatchery Superintendent I
Robert J. Bell, Fisheries Biologist II
Walter Bethke, Fish Hatchery Superintendent I
Ted C. Bjornn, Fisheries Biologist II (Education leave of absence)
Burt Bowlden, Fish Hatchery Superintendent I

* Resigned.

Osborne E. Casey, Fisheries Biologist II
Bradley Christensen, Equipment Operator
Alan J. Clark, Fish Hatchery Superintendent I
†J. E. Clark, Fish Hatchery Superintendent I
John M. Coleman, Fish Hatchery Superintendent I
Donald Corley, Fisheries Biologist I
Calvin E. Coziah, Fisheries Biologist I
Paul E. Cuplin, Fish Hatchery Supervisor
Garrett E. Craig, Fish Hatchery Helper
James E. Dayley, Fish Hatchery Helper
Wilfred Fiscus, Equipment Operator
Norman C. Floyd, Fish Hatchery Superintendent II
Merriam F. Fuller, Secretary
Frank E. Gaver, Fish Hatchery Superintendent I
L. W. Gaver, Fish Hatchery Superintendent I
Stacy V. Gebhards, Fisheries Biologist II
James R. Graban, Fisheries Biologist I
Paul W. Jeppson, Fisheries Biologist II
James F. Keating, Fisheries Biologist II
Fred J. Keppner, Fish Hatchery Superintendent I
Wayne Klavano, Fisheries Biologist I
Billy F. Knorpp, Fish Hatchery Foreman
Delbert C. Ledington, Fish Hatchery Foreman
James W. McLin, Fish Hatchery Foreman
Jerry L. Mallet, Fisheries Biologist I
Hark L. Misseldine, Fish Hatchery Foreman
Leon W. Murphy, Fishery Development Supervisor
Charles D. Neider, Fish Hatchery Superintendent I
Donald E. Packard, Fish Hatchery Helper
Evan M. Parrish, Fish Hatchery Helper
Melvin G. Prince, Equipment Operator II
Charles R. Quidor, Fish Hatchery Foreman
Walter Rast, Fish Hatchery Helper
Melvin Reingold, Fisheries Biologist I
Monte R. Richards, Jr., Fisheries Biologist II
Wallace C. Roberts, Fish Hatchery Foreman
Carolyn Marie Rose, Stenographer
Charles Sherwood, Fish Hatchery Superintendent I
Rex Spackman, Fish Hatchery Helper
William E. Webb, Fisheries Biologist I
Thomas L. Welsh, Fisheries Biologist I

GAME MANAGEMENT DIVISION

Levi L. Mohler, Chief

Elwood G. Bizeau Game Bird Supervisor
Charles Blake, Game Biologist II
Orrin F. Blattner, Refuge Manager
Rose Marie Brumback, Stenographer
Alexander W. Bruner, Assistant Refuge Manager
H. E. Cherry, Refuge Manager
Arnold Coleman, Game Biologist II
E. G. deReus, Game Biologist II
Wallace P. Ekren, Assistant Game Farm Superintendent
William Gnemi, Game Farm Superintendent
Betty Jo Graham, Secretary
*Hugh A. Harper, Land Management Supervisor
Deral J. Haycock, Refuge Manager
Charles Haynes, Game Biologist II
Keith Heezen, Game Biologist I
Lester Hendrickson, Refuge Manager
Floyd D. Horne, Game Biologist I
Dale Jensen, Game Biologist II
Howard Kaster, Refuge Manager
*Fred Kindel, Game Biologist II
Howard D. Livengood, Game Farm Superintendent
Martin Luther, Refuge Manager
Errol Nielson, Game Biologist II

* Resigned. † Retired—Part time.

Elmer Norberg, Game Biologist II
Richard C. Norell, Game Biologist II
David P. Osterhaut, Assistant Refuge Manager
Duane B. Pyrah, Game Biologist II
Ray Rogers, Game Biologist II
Clyde Scott, Game Biologist II
Wesley M. Shaw, Game Biologist III
Robert K. Sherwood, Game Biologist I
Dale Tanner, Game Biologist II
Lester Trout, Game Biologist II
Roger Williams, Game Biologist III
Thomas R. Williams, Game Biologist I
Richard Wilson, Refuge Manager

INFORMATION & EDUCATION DIVISION

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William R. Cunningham, Conservation Educator I
Marshall Edson, Conservation Educator III
Marilynn Gorton, Stenographer
Patti Heaton, Stenographer
James Humbird, Conservation Educator I
*George Nichols, Conservation Educator II
Michael Throckmorton, Conservation Educator III
Milton T. Williams, Conservation Educator II

CONSERVATION ENFORCEMENT DIVISION

Hawley Hill, Chief

Janet Simpson, Stenographer

Clearwater Region

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Joseph A. Bross, Jr., DCO II
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†Ray J. Kernan, DCO II
Frank R. Keough, DCO II
Tom M. Kilmer, DCO II
Donald D. McPherson, DCO II
William S. Platts, DCO II
Glen H. Richardson, DCO II
Dale Turnipseed, DCO II

Eastern Region

Wendell Twitchell, Regional Conservation Officer
Dale A. Barney, DCO II
†Melvin Barrus, DCO II
Richard H. Bross, DCO II
†O. R. Christensen, DCO II
Delmer Cousland, DCO II
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Lloyd G. Edwards, DCO I
Donald C. Grimes, DCO II
Maurice T. Harding, DCO II
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A. LaVarr Jacklin, DCO II
Norman Jockumsen, DCO II
Glen S. Page, DCO II
Derrel G. Wright, DCO II

Magic Valley Region

Hawley Hill, Regional Conservation Officer to Chief 9/10/62
Walter T. Arms, DCO II
Robert G. Atnip, DCO I
Dale S. Baird, DCO II
†Alonzo F. Brown, DCO II
Walter R. Browne, DCO II
L. Dean Davis, DCO II
†Grover C. Davis, DCO II
Frederick S. Edwards, DCO II

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* Resigned. † Retired—Part time.

Keith L. Hawn, DCO II
Stanley L. Larson, DCO II
†T. J. Mizer, DCO II
Joel C. Reynolds, DCO II
Marion A. Rhodes, DCO II
Frank A. Smith, DCO II

Panhandle Region

Edward B. Scholes, Regional Conservation Officer
Walter T. Berry, Jr., DCO II
Murvle E. Crook, DCO II
Lester C. Gissel, DCO II
Howard R. McKeever, DCO II
Peter A. Printz, Jr., DCO II
Tom D. Reinecker, DCO II
Cecil R. Sanford, DCO II
John P. Smith, DCO II
*Robert P. Spinde, DCO II
George F. Staudt, DCO II

Salmon Region

P. J. McDermott, Jr., Regional Conservation Officer
Joe Blackburn, DCO II
Vern D. Gardner, DCO I
Buddy Jack King, DCO II
Kenneth A. Mackenzie, DCO II
Gary R. McNeill, DCO II
Ralph V. Pehrson, DCO II
Boyd D. Thietten, DCO II
J. M. Wilkins, DCO II

Western Region

W. R. Horning, Regional Conservation Officer
†William Lee Black, DCO II
William H. Dorris, DCO II
Heyward W. Jack, DCO I
William R. Jennings, DCO II
Albert F. Lyle, DCO II
Claude I. Matthews, DCO II
Martel Morache, DCO II
John W. Plummer, DCO II
Keith S. Rudd, DCO II
John W. Smith, DCO II
William B. Strack, DCO II
Philip Swanstrum, DCO II
Jim A. Uranga, DCO I
Francis G. Watkins, DCO I

* Resigned. † Retired—Part time.