Environmental Investigations

HOOD BASIN Supplement

FISH AND WILDLIFE RESOURCES AND THEIR WATER REQUIREMENTS

OREGON STATE GAME COMMISSION

P.O. BOX 3503, 1634 S.W. ALDER STREET
PORTLAND, OREGON 97208

SUPPLEMENT

to

THE FISH AND WILDLIFE RESOURCES OF THE HOOD BASIN, OREGON, AND THEIR WATER USE REQUIREMENTS, DECEMBER 1963

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A Report with Recommendations to the
OREGON STATE WATER RESOURCES BOARD

From the

Oregon State Game Commission
John W. McKean, Director

FEDERAL AID TO FISH RESTORATION
Completion Report
Fisheries Stream Flow Requirements
Project 69410, Job Number 12
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Portland, Oregon

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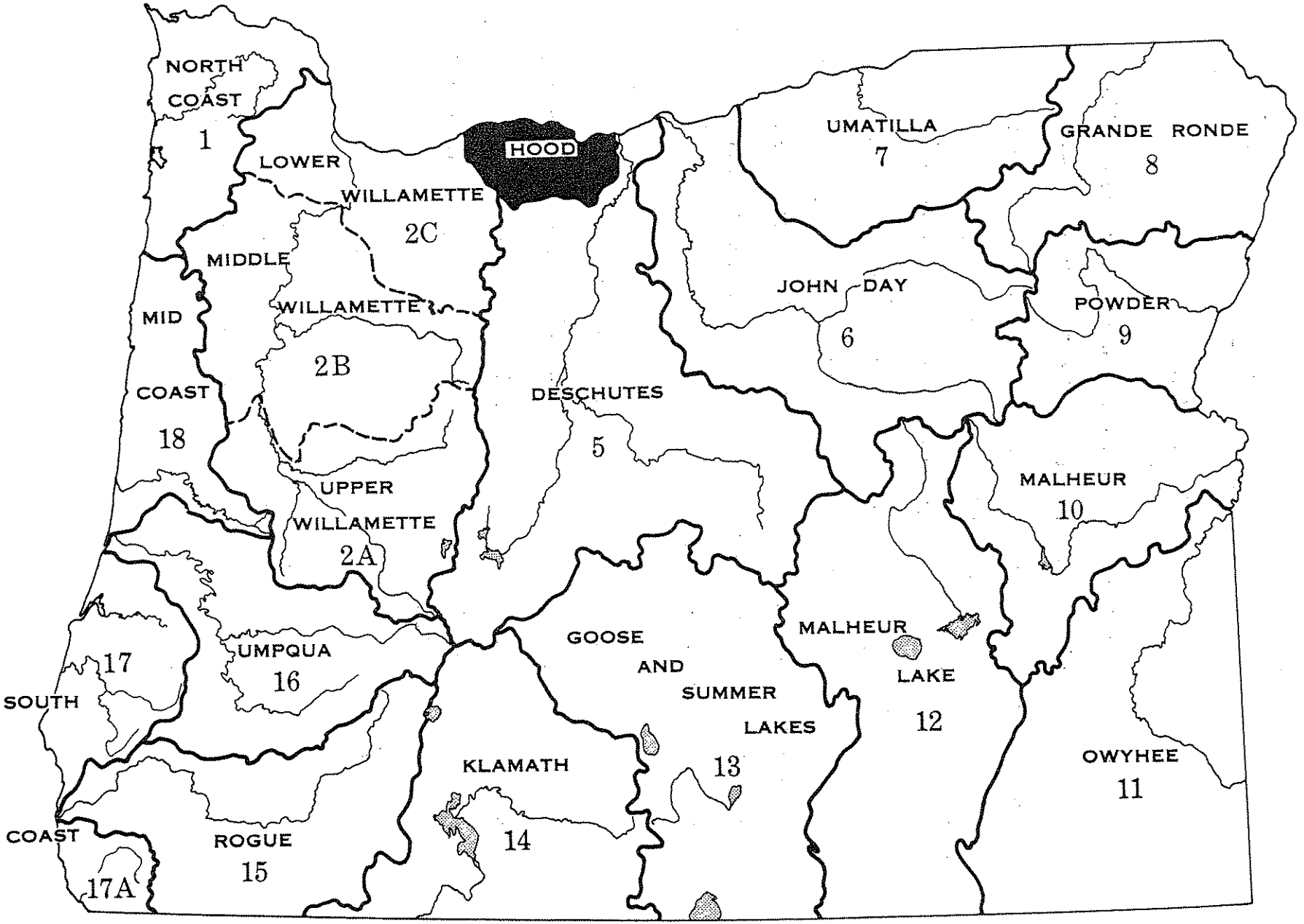
INTRODUCTION

The Oregon State Game Commission report entitled, "The Fish and Wildlife Resources of the Hood Basin, Oregon, and Their Water Use Requirements" and this supplement to that report are designed to assist the State Water Resources Board with the programming of Oregon's water resources. This supplement provides some economic and recreational considerations of the basin's fish and wildlife resources and updates sections of the original report. No data are presented on the Columbia River which borders the Hood Basin.

The Fish Commission of Oregon concurs with the flow recommendations for fish life. Recommendations were also made for recreational and esthetic uses of water not directly related to fish and wildlife water requirements.

Important contributions to the report were made by Game Commission district biologists Allan B. Lichens and William E. Olson. Editing reviews were made by William E. Pitney and Kenneth E. Thompson, Environmental Management Section.

Fig. I. Oregon drainage basins.



EXPLANATION OF DATA

Inasmuch as ORS 536.310 (7) directs the State Water Resources Board to consider "The maintenance of minimum perennial stream flows sufficient to support aquatic life...", minimum flows have been recommended which would support a reasonable level of fish production (App. 1). In addition, optimum flow recommendations are presented which are designed to satisfy all currently understood aspects of fish production (App. 2, Fig. 3).

The recommended stream flow quantities are principally designed to accommodate the environmental requirements of salmonids because these fish receive management emphasis in the Hood Basin. Summer flow requirements of anadromous fish and resident trout are essentially the same, but the larger anadromous fish need more water during periods of migration and spawning (Fig. 2).

The minimum flow recommendations for Hood River below Powerdale Dam are the result of a unique study involving Pacific Power & Light Company, Oregon Game Commission, and the Fish Commission of Oregon (App. 1). The study field-work took place in 1964-66 and involved fishery biologists from the three agencies. An agreement was reached in 1971 for minimum flow releases below Powerdale Dam and improvement of fishways.

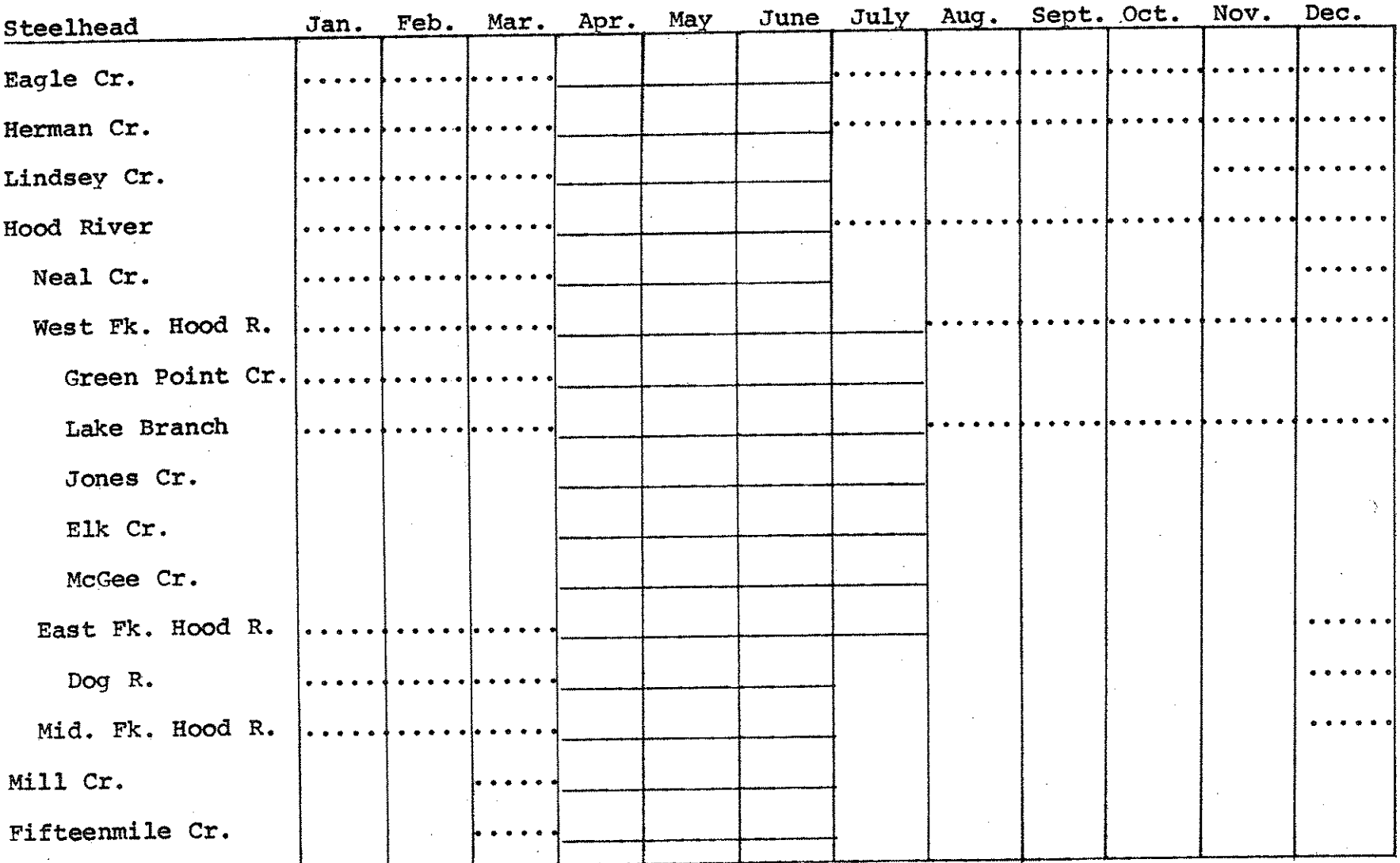


Fig. 2. Periodicity chart for adult anadromous salmonids, Hood Basin (dotted lines indicate presence in streams and solid lines indicate spawning periods).

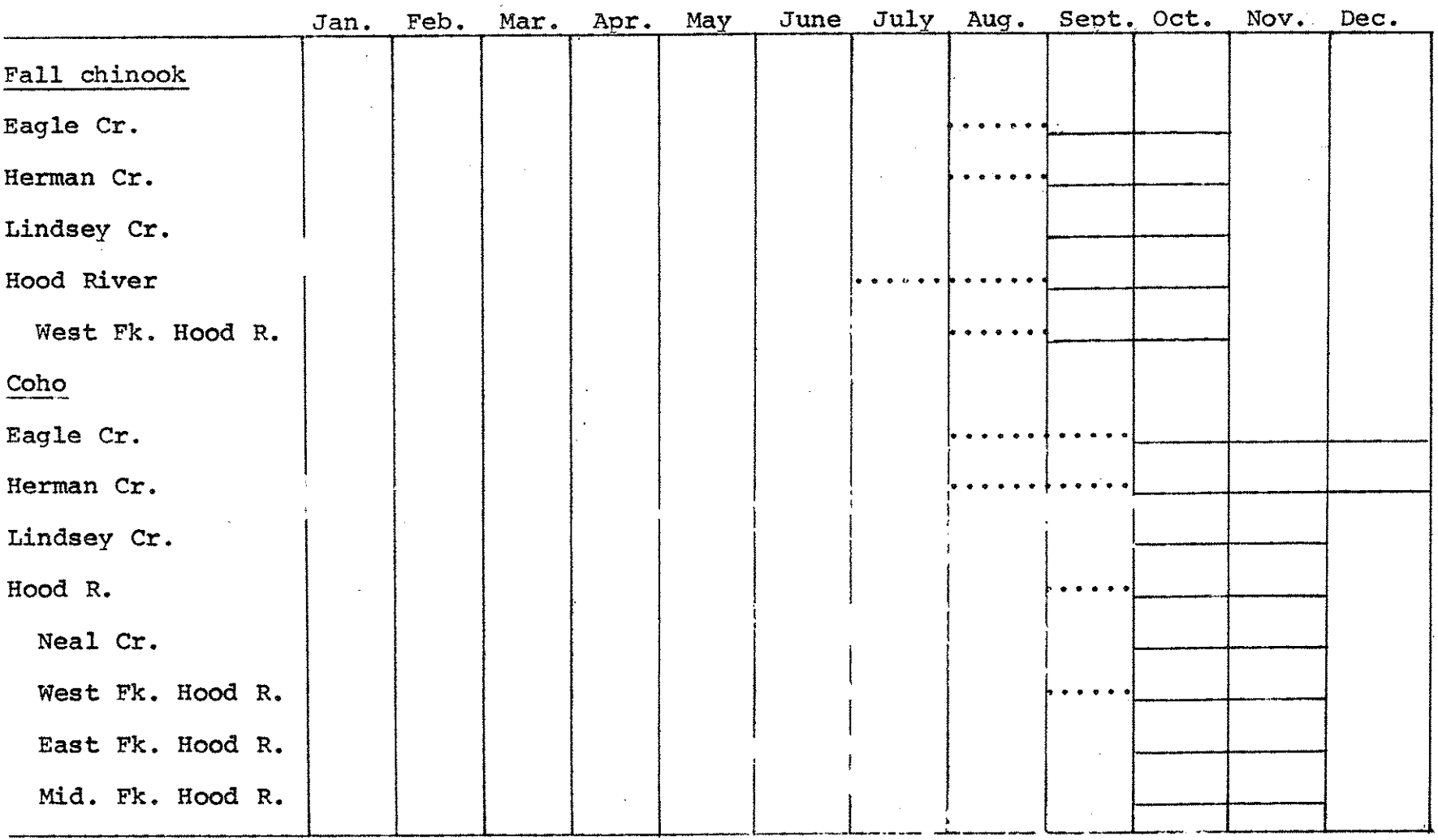
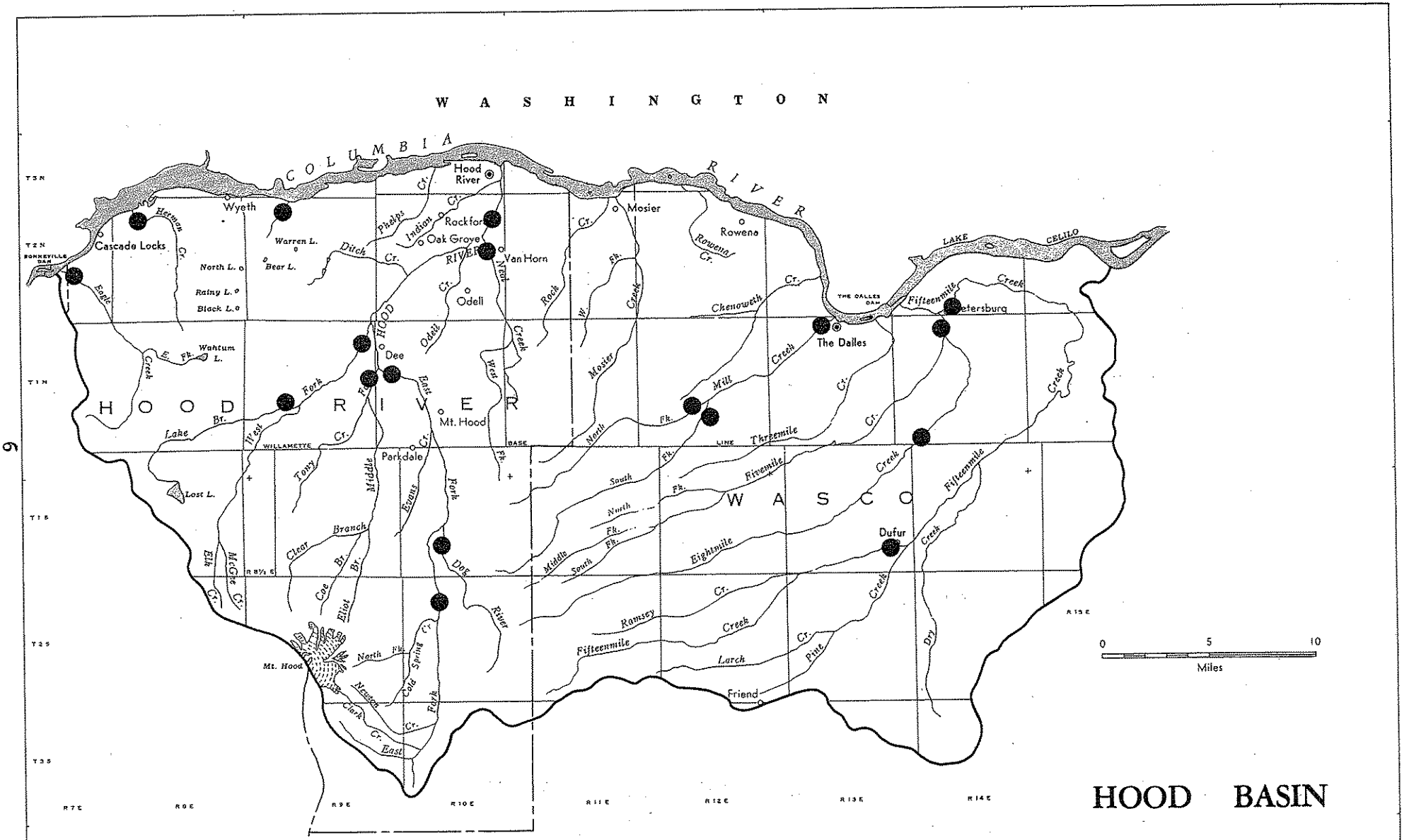


Fig. 2. (continued)



HOOD BASIN

Fig. 3. Location of flow recommendations for fish life, Hood Basin.

The recommended flow regimen, although based on all biological requirements currently understood, do not consider two signficant effects of natural stream flows. High flows are generally believed necessary to stimulate upstream migrations of adult salmon and steelhead and to flush out sediments which settle into the gravel during low discharge periods.

The 1966 State Water Resources Board program for the Hood Basin included only three streams (Hood River, West Fork Hocd River and East Fork Hood River) for minimum flow protection of fish. However, there are at least 23 streams in the basin with anadromous fish (Fig. 4 and 5). The Game Commission recommends that minimum flows be established for 15 streams (App. 1). Some, especially those in Wasco County, are overappropriated. An effort should be made to protect the remaining unappropriated water and to make existing water use more efficient. A combination of protecting unappropriated water and more efficient use of the currently appropriated water will help guarantee a continuing fish and wildlife resource. In addition, constructing reservoirs designed to store excess winter and spring run-off and releasing it during the summer could help alleviate water shortage problems (App. 5).

Spawning escapement estimates of anadromous salmonids are presented in Table 1. Detailed distribution of steelhead

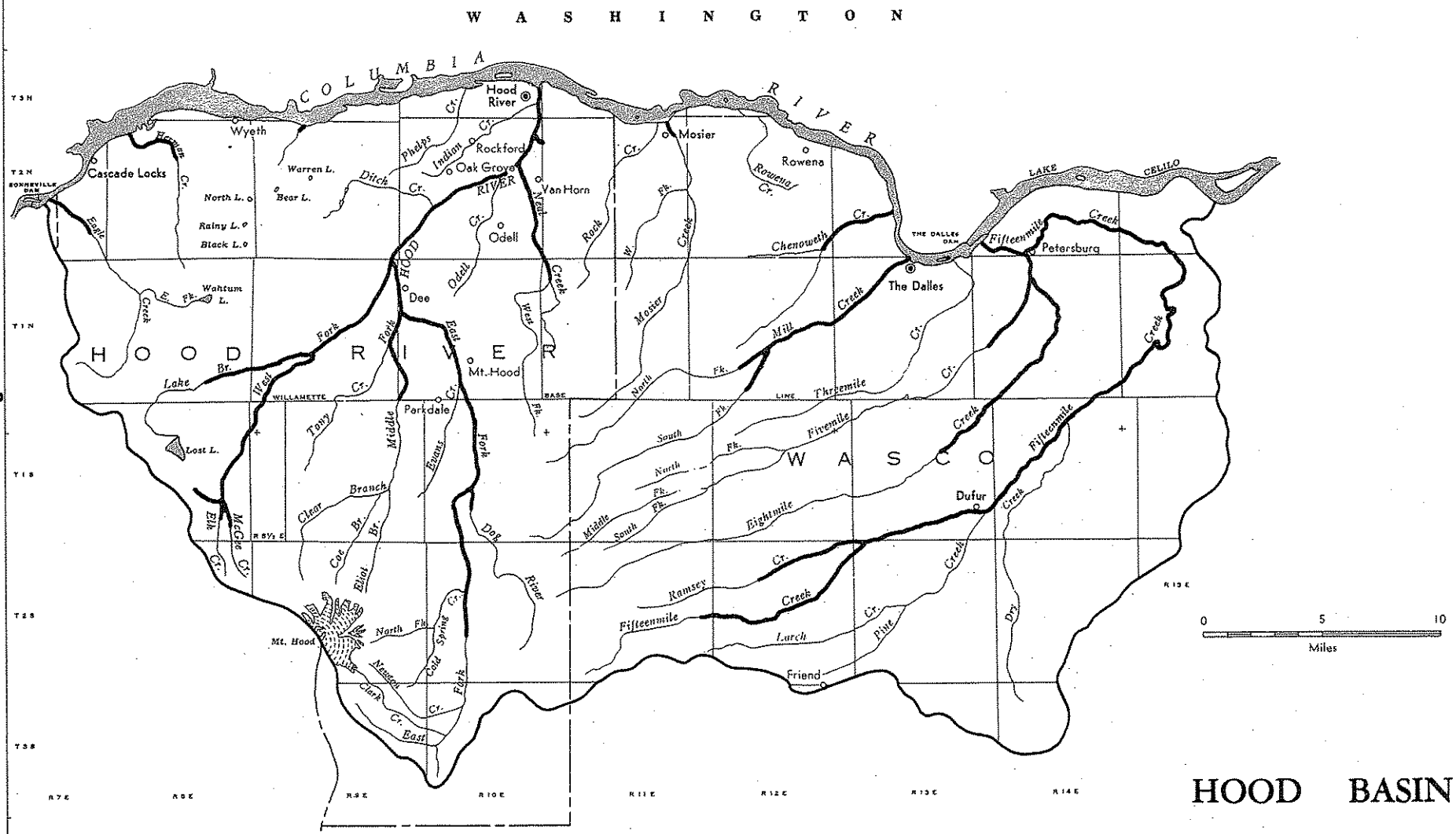


Fig. 4. Summer and winter steelhead distribution, Hood Basin.

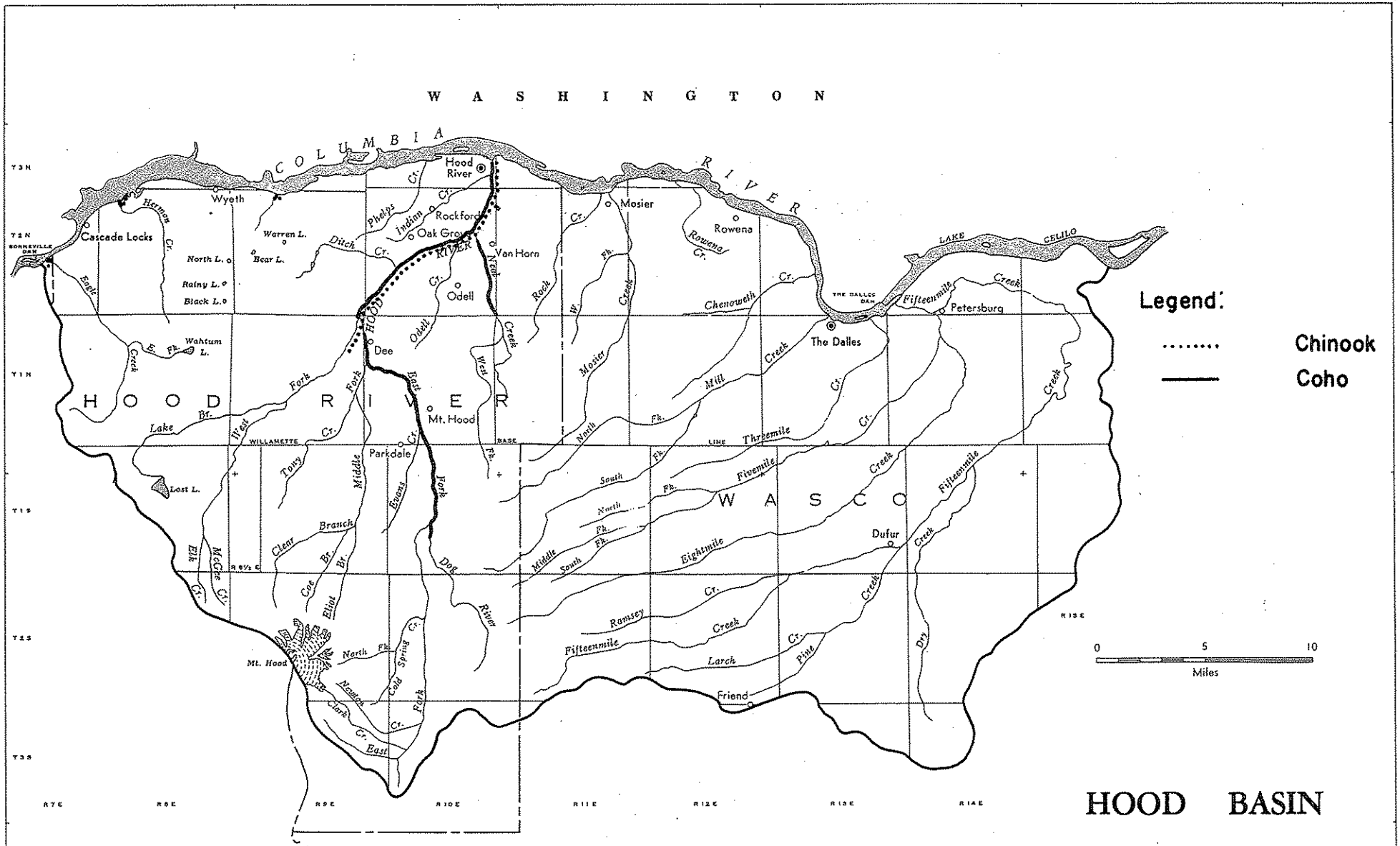


Fig. 5. chinook and coho salmon distribution, Hood Basin.

and salmon is shown in Figures 4 and 5. There probably are remnant runs of spring chinook and sockeye salmon in Hood River.

The importance of angling and hunting is reflected in Tables 2 and 3. Fur harvest value appears in Table 4.

More people with more leisure time will greatly increase future angling pressure. A three-fold increase in license sales is expected in the next 30 years. Stream flow levels are vital not only for maintaining desirable fish populations, but also to provide proper water conditions for angling. Consequently, the Game Commission has developed angling flow recommendations which could help accommodate the growing demand for more sport fishing opportunities (App. 3).

One indication of the intensity of recreational usage is shown by use figures of parks, waysides and campgrounds furnished by Oregon Division of Highways, Hood River County and U. S. Forest Service. These areas within the basin received over 930,000 day-visits in 1971. Many visits are directly related to fish and wildlife or water-based recreation. Therefore, adequate stream flows and lake levels which contribute significantly to the maintenance of aquatic life and esthetic appeal must be protected to assure these values (App. 4).

Table 1. Estimated number of anadromous salmonids spawning in Hood Basin streams 1/

Stream system	Salmon		Steelhead		Sea-run cutthroat trout
	Fall chinook	Coho	Winter	Summer	
Eagle Creek	1,000	3,000	1,480	0	0
Herman Creek	500	250	Present	0	0
Lindsey Creek	100	200	Present	0	0
Hood River (Main stem and unlisted tributaries)	220	1,158	561	75	96
West Fork Hood R.	0	14	50	485	0
East Fork Hood R.	0	96	246	0	0
Middle Fork Hood R.	0	34	100	0	0
Hood River system total	220	1,302	957	560	96
Mill Creek	0	0	200	0	0
Fifteenmile Creek	0	0	550	0	0
GRAND TOTAL	1,820	4,752	3,187	560	96

1/ Estimates by Game Commission biologists.

The numbers indicate spawning escapement. The total run would be computed by adding appropriate sport, commercial and Indian harvest figures.

Estimates include hatchery contributions.

Table 2. Estimated annual harvest, angler-days and gross expenditures for angling, Hood Basin (App. 6) 1/

Area	Harvest	Angler-days	Gross Expenditures
Hood River system			
Salmon	50	250	$ 3,700
Steelhead	2,039	10,195	150,886
Other Columbia R. tributaries			
Salmon	0	0	
Steelhead	110	450	8,140
Entire basin			
Resident trout	128,489	78,045	491,684
Warm-water game fish	70,200	14,040	88,452
TOTAL			$ 742,862

1/ Hood Basin produced salmon are caught in the ocean and Columbia River. Steelhead are caught in the Columbia River. The number and value of these fish are presently impossible to determine.

Table 3. Estimated annual harvest, hunter-days and gross expenditures for hunting, Hood Basin, 1970-71 (App. 6)

Species	1970 Hunter-days	1970 Harvest	1970 Gross Expenditures	1971 1/ Hunter-days	1971 1/ Harvest	1971 1/ Gross Expenditures
Deer	18,957	812	$ 564,919	---	532	---
Elk	4,025	46	107,065	4,120	43	$ 109,592
Bear	1,697	18	56,001	---	---	---
Pheasant	11,926	6,924	71,556	6,585	4,793	39,510
Quail	3,030	3,308	18,180	1,666	2,272	9,996
Chukar	2,442	3,595	14,652	1,358	1,925	8,148
Hungarian partridge	980	520	5,880	545	325	3,270
Grouse	1,467	1,110	8,802	816	610	4,896
Dove	2,654	7,224	15,924	---	4,216	---
Pigeon	669	358	4,014	---	---	---
Turkey	1,222	109	7,332	742	56	4,452
Duck	5,354	3,114	42,832	---	1,312	---
Goose	3,465	839	27,720	---	323	---
Squirrel	1,963	1,656	11,778	1,022	800	6,132
Coyote	205	77	1,230	---	---	---
Bobcat	175	53	2,450	---	---	---
TOTAL			$ 960,335			

1/ Data incomplete for 1971.

Table 4. Estimated furbearer harvest and value to trapper, Hood Basin, 1970-71 and 1971-72

	1970-71		1971-72	
Species	Harvest	Value	Harvest	Value
Beaver	45	$ 428	77	$ 1,070
Otter	2	47	8	255
Mink	7	23	19	94
Muskrat	45	41	99	126
Raccoon	22	44	34	128
Marten	1	6	0	0
Skunk	1	1	1	1
Weasel	0	0	2	1
Wildcat	5	68	8	168
Coyote	28	194	1	9
TOTAL	156	$ 852	249	$ 1,852

REFERENCES

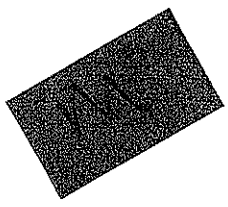
Oregon State Game Commission. 1963.
The Fish and Wildlife Resources of the Hood Basin, Oregon, and Their Water Use Requirements. Oregon State Game Commission, Portland. 33 p. and app.

Oregon State Game Commission and Fish Commission of Oregon. 1968.
Hood River Minimum Flow Study (mimeo). 34 p.

State Water Resources Board of Oregon. 1965.
Hood Basin. Salem. 114 p. and app.

State Water Resources Board of Oregon. 1966.
Hood Basin program (mimeo).

A P P E N D I C E S



Appendix 1. Recommended minimum stream flows for fish life, Hood Basin 1/

Stream	Location	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Eagle Creek	Above hatchery dam intake	47	47	47	70	70	70	47	56	84	84	70	70
Herman Creek	Mouth	40	40	40	60	60	60	40	48	72	72	60	60
Lindsey Creek	Mouth	15	15	15	20	20	20	15	15	24	24	20	15
Hood River 2/	Below Powerdale Dam	170	270	270	270	170	170	130	100	100	100	100	170
Neal Creek	Mouth	13	13	13	20	20	20	13	13	5	20	20	13
West Fork Hood River	USGS Gage 14-1185	100	100	100	150	150	150	100	120	180	180	150	120
Lake Branch	Mouth	67	67	67	100	100	100	100	67	67	67	67	67
East Fork Hood River	Above Middle Fk. Hood R.	100	100	100	150	150	150	150	100	100	150	150	150
East Fork Hood River	Above Pollalie Creek	50	50	50	75	75	75	75	50	50	40	40	50
Dog River	Mouth	8	8	8	12	12	12	8	8	4	12	12	8
Middle Fork Hood River	Mouth	100	100	100	150	150	150	100	100	40	150	150	100
Mill Creek	Mouth	4	4	10	15	15	15	10	10	4	4	4	4
North Fork Mill Creek	Mouth	2	2	5	7	7	7	5	5	2	2	2	2
South Fork Mill Creek	Mouth	2	2	7	10	10	10	7	7	2	2	2	2
Fifteenmile Creek	Above Eightmile Creek	4	4	13	20	20	20	13	13	4	4	4	4
Fifteenmile Creek	Dufur	2	2	10	15	15	15	10	10	2	2	2	2
Eightmile Creek	Mouth	2	2	10	15	15	15	10	10	2	2	2	2
Eightmile Creek	Highway 197	2	2	7	10	10	10	7	7	2	2	2	2

1/ Flows are expressed in cubic feet per second. Recommended flows should arrive at the point of recommendation and continue to the mouth or to the next point for which a different flow is recommended. Recommended minimum flows are designed to provide instream conditions capable of maintaining a minimum desirable level of fish production. No consideration is given to beneficial impacts of winter freshets. The recommended flows may not be desirable flow releases below future impoundments. Recommended reservoir releases for fish would require further investigation. These recommendations supersede interim minimum flow recommendations dated January 20, 1965.

2/ These minimum flow releases were agreed upon in 1971 by Pacific Power & Light Company, Oregon Game Commission, Fish Commission of Oregon and National Marine Fisheries Service.

Appendix 2. Recommended optimum stream flows for fish life, Hood Basin 1/

Stream	Location	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Eagle Creek	Above hatchery dam intake	70	70	70	120	120	120	70	84	143	143	120	120
Herman Creek	Mouth	60	60	60	102	102	102	60	72	122	122	102	72
Lindsey Creek	Mouth	20	20	20	34	34	34	20	20	41	41	34	20
Hood River	Below Powerdale Dam	270	270	270	460	460	460	325	325	552	552	460	325
Neal Creek	Mouth	20	20	20	34	34	34	20	20	13	34	34	20
West Fork Hood River	USGS Gage 14-1185	150	150	150	255	255	255	150	180	306	306	255	180
Lake Branch	Mouth	67	67	67	170	170	170	170	100	100	100	67	67
East Fork Hood River	Above Middle Fork Hood R.	150	150	150	255	255	255	255	150	150	255	255	255
East Fork Hood River	Above Pollalie Creek	75	75	75	127	127	127	127	75	75	50	50	75
Dog River	Mouth	12	12	12	20	20	20	12	12	8	20	20	12
Middle Fork Hood River	Mouth	150	150	150	255	255	255	150	150	100	255	255	150
Mill Creek	Mouth	10	10	15	26	26	26	15	15	10	10	10	10
North Fork Mill Creek	Mouth	5	5	7	12	12	12	7	7	5	5	5	5
South Fork Mill Creek	Mouth	7	7	10	17	17	17	10	10	7	7	7	7
Fifteenmile Creek	Above Eightmile Creek	13	13	20	34	34	34	20	20	13	13	13	13
Fifteenmile Creek	Dufur	10	10	15	26	26	26	15	15	10	10	10	10
Eightmile Creek	Mouth	10	10	15	26	26	26	15	15	10	10	10	10
Eightmile Creek	Highway 197	7	7	10	17	17	17	10	10	7	7	7	7

1/ Flows are expressed in cubic feet per second. Recommended flows should arrive at the point of recommendation and continue to the mouth, or to the next point for which a different flow is recommended. Recommended optimum flows are designed to provide instream conditions capable of maintaining an optimum level of fish production. No consideration is given to beneficial impacts of winter freshets.

Appendix 3. Recommended angling flows for selected Hood Basin streams 1/ 2/

Stream	April-October	November-March
Eagle Creek	30	75
Herman Creek	25	
Hood River	300	300
East Fork Hood River (at mouth)	100	200
" " " " (above Pollalie Cr.)	75	
West Fork Hood River	200	
Lake Branch	60	
Middle Fork Hood River	50	
Mosier Creek	15	
Mill Creek	15	
Fifteenmile Creek	30	60

1/ Flows are expressed in cubic feet per second.

2/ Flows are to reach the mouth of the stream or to the next point of recommendation.

Appendix 4. Selected Hood Basin streams that should be protected for their esthetic value

Stream	Section
Eagle Creek	Above the hatchery
Hood River	Above river mile 4
West Fork Hood River	Entire
Lake Branch	Entire
Middle Fork Hood River	Above river mile 4
South Fork Mill Creek	Above river mile 1

Appendix 5. Reservoir sites presently thought compatible with fish and wildlife, Hood Basin 1/

Stream	River system	Location
Indian Creek	Hood	T 2 N, R 10 E, Sec. 2
"	"	" " Sec. 3
"	"	" " Sec. 17
Neal Creek	"	T 1 N, R 11 E, Sec. 7
"	"	T 1 N, R 10 E, Sec. 11
Mosier Creek	Columbia	T 2 N, R 12 E, Sec. 31
Chenoweth Creek	Columbia	T 2 N, R 12 E, Sec. 36
Jap Hollow	Fifteenmile	T 1 N, R 14 E, Sec. 31
Dry Creek	"	T 1 S, R 14 E, Sec. 10
"	"	" " Sec. 21
"	"	" " Sec. 20
"	"	T 2 S, R 14 E, Sec. 7
Mays Canyon Creek	"	T 2 S, R 13 E, Sec. 1
Pine Creek	"	T 2 S, R 13 E, Sec. 15
Larch Creek	"	T 2 S, R 13 E, Sec. 19
"	"	T 2 S, R 12 E, Sec. 28

1/ Detailed studies should be conducted to determine total impact on fish and wildlife before any of the above sites are considered for development.

Appendix 6. Values used in Tables 2 and 3

Species	Gross Expenditure
Salmon and steelhead	$74.00 per fish harvested
Trout and warm-water game fish	6.30 per angler-day
Mule deer	29.80 per hunter-day
Roosevelt elk	26.60 " " "
Black bear	33.00 " " "
Bobcat	14.00 " " "
Coyote	6.00 " " "
Upland game	6.00 " " "
Waterfowl	8.00 " " "