UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

REVIEW OF WATERPOWER WITHDRAWALS IN MIDDLE FORK WILLAMETTE RIVER BASIN, OREGON

March 1961

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by Donald W. Neal

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Conservation Division
P. O. Box 3418
Portland 8, Oregon

May 24, 1961

Memorandum

To: Chief, Branch of Waterpower Classification

From: Regional Hydraulic Engineer

Subject: Review of Waterpower Withdrawals in Middle Fork Willamette River Basin, Oregon, by Donald W. Neal

The subject report reviews all powersite withdrawals in the basin described. Existing and potential sites are considered and the adequacy of the withdrawals to protect them is estimated.

The report was reviewed by the Regional Forester's office and two discussion conferences were held with Forest Service personnel from individual forests concerned during preparation. The attached copy of the Regional Forester's letter of May 23, 1961, indicates that the Forest Service is satisfied with the recommendations made.

The review included 43,640 acres of reserved land. The recommendations would dispose of this acreage in the following manner:

Retain in reserve	11%
Restore subject to sec. 24 of F. P. Act	37%
Restore outright	52%

Lands judged to have no power value, to have value for conduit locations only, or to have power value which it appears unlikely will be developed because of the higher value of other uses made it possible to recommend restoration of a large part of the present withdrawals. Lands in reservoir sites are retained in reserve. Under existing circumstances they could be restored under the provisions of section 24 of the Federal Power Act, however, because the time when development will occur cannot be foreseen.

Loyd L Young

Loyd L Young

CONTENTS

ILLUSTRATIONS

TABLES

REVIEW OF WATERPOWER WITHDRAWALS IN MIDDLE FORK WILLAMETTE RIVER BASIN, OREGON

BASIN INDEX 12 NB

By Donald W. Neal - March 1961

INTRODUCTION

This report seeks to analyze all powersite withdrawals made within the Middle Fork of the Willamette River basin, Oregon. Recommendations concerning retention and restoration of the lands are given.

GENERAL DISCUSSION

Description of Drainage Basin

The Middle Fork of the Willamette River drains 1,354 square miles in west central Oregon. The drainage basin is bounded on the north by the McKenzie River basin and on the west by the Coast Fork of the Willamette River basin. The Cascade Range and the Calapooya Mountains form the respective eastern and southern boundaries. The Coast Fork and Middle Fork join near Eugene to form the main stem of the Willamette River.

The Middle Fork is much larger than the Coast Fork and can be considered the natural extension of the Willamette River. The largest tributary within the Middle Fork basin is the North Fork, Middle Fork whose mouth is near the town of Oakridge. The physical characteristics of the streams are shown below:

Table 1. Physical Characteristics of Middle Fork Willamette River and Tributaries

Stream	Length in mi.	Elev. (ft) Upper End	Elev. (ft) Lower End	Ave. Fall ft/mi.	Area (sq.mi.)
Main Channel-upstream from gage above mouth of Salt Cr.	40	5,260	1,200	102	392
Hills Creek	16	4,800	1,260	221	60
Salt Creek	31	5,480	1,200	138	110
Black Creek	13	5,400	2,100	254	46
Salmon Creek	24	4,840	1,160	153	126
North Fork, Middle Fork	44	5,414	1,020	100	247
Little Fall Creek	21	3,280	600	128	59
Fall Creek	34	3,600	560	89	253
Main Channel - All	85	5,260	430	57	1,354

Previous Reports

"Rogue River Valley Project and Willamette Valley Investigations" by Bureau of Reclamation and State of Oregon, 1916.

"Reconnaissance Report Showing Possibilities for Development of Water Power in Willamette River Basin, Oregon, for the Purpose of Water Power Classification of Oregon and California Railroad Grant Lands" by E. C. La Rue, 1916.

"Water Supply of Streams in Division 12 N" by E. C. Murphy, 1926.

"House Document No. 263", 72nd Congress, 1st Session, pages 52-58. Discussion of Middle Fork Willamette River power potential including plan and profile, list of power sites, and cost estimates. Referred to the Committee on Rivers and Harbors and ordered to be printed on February 29, 1932.

"A Report on Willamette Valley, Oregon Irrigation Requirements and Possibilities" by B. E. Hayden, 1938.

"Water Power in the Middle Fork of the Willamette River and Tributaries" by Randolph O. Helland, 1944.

Maps Relating to the Area

The Middle Fork of the Willamette River basin is covered by topographic maps at the scale of 1:250,000. The basin is also covered

by 1:62,500 scale topographic maps except for a small area east of the 122nd meridian. Several river maps at various scales have also been made.

U.S.G.S. Topographic Quadrangles

Map Name	Contour interval in feet
1° x 2° at scale of 1:250,000	
Crescent, 1955	200
Roseburg, 1958	200
Salem, 1945	200
30 minute at scale of 1:125,000	
Diamond Lake, 1914	100
Lowell, 1935	100
Maiden Peak, 1930	100
Waldo Lake, 1923	100
15 minute at scale of 1:62,500	
Blue River, 1955	80
Chucksney Mtn, 1956	80
Eugene, 1946	10
Fairview Peak, 1955	80
Hardesty Mtn, 1955	80
Illahee Rock, 1955	80
Leaburg, 1951	40
Lowell, 1955	40
Marcola, 1950	40
Oakridge, 1956	80
Sardine Butte, 1956	80
Summit Lake, 1956	40
Toketee Falls, 1956	80
Waldo Lake, 1956	80

River Surveys -- Middle Fork of Willamette River from North Fork to mile 12, also showing Salt Creek to mile 22, Salmon Creek to mile 18, Black Creek to mile 4, and North Fork to mile 18. Scale 1:31,680; contour interval 25 feet on land, 5 feet on water. Published by U.S.G.S. in 7 sheets (3 plan, 4 profile) in WSP 349, 1913.

Middle Fork of Willamette River from mile 12 to sec. 28, T. 24 S., R. 5 E., 27 miles. Plan and profile by U.S.G.S., 1914, as a continuation of the survey of 1913 described above. Scale, 1:31,680; contour interval 25 feet on land, 5 feet on water. Published in 4 sheets (2 plan, 2 profile) in WSP 378.

Middle Fork of Willamette River, from Coast Fork to North Fork, 40 miles. Scale, 1:31,680; contour interval 20 feet on land, 5 feet on river surface. Surveyed in 1926. Published in 2 sheets (1 plan, 1 profile), 1927.

Middle Fork of Willamette River from Lookout Point reservoir site upstream to the 1,300 foot contour crossing and North Fork Middle Fork from mouth upstream to the 1,300 foot contour crossing. Scale, 1:12,000; contour interval 10 feet on land, 5 feet on river surface. Surveyed in 1935. Published in 4 plan sheets which includes Lookout Point reservoir site at 1:2400 scale, 1937.

Middle Fork of Willamette River from Hills Creek to sec. 34, T. 23 S., R. 3 E., about 15 miles. Plan by the Corps of Engineers, about 1936. Scale, 1:12,000; contour interval 10 feet. Mile 56 and Hills Creek reservoir sites shown. Not published.

Salmon Creek from sec. 33, T. 20 S., R. 4 E., to sec. 31, T. 20 S., R. 5 E., 5 miles, showing the Eagle Butte reservoir site. Plan by the Corps of Engineers about 1936. Scale 1:12,000; contour interval 10 feet. Not published.

Precipitation, Temperature, and Runoff

Yearly precipitation is high in this region and largely confined to late fall, winter, and early spring. At the Eugene and Oakridge stations 75 percent of the annual precipitation falls during the period October through March. Snow seldom stays long in the valley but in the Cascade Range along the eastern boundary of the drainage basin the snowfall is quite heavy. Unit runoff is high. The gage on the Middle Fork at Jasper indicates an average of 3.06 cfs per square mile. A summary of temperature, precipitation, and runoff data is given below in Tables 2 and 3.

Table 2. Mean Temperature and Precipitation Data

Station	Elevation (feet)	Temperature (F°)	Precipitation (in./yr.)
*Odell Lake Land Pan	4,792	40.4	60.0
Oakridge Salmon Hatchery	1,225	53.5	45.6
Lookout Point Dam	712	53.5	41.8
Lowell	660	52.2	45.5
Eugene	450	52.4	37.5

*East of the Cascade Range

Table 3. Summary of Gaging Station Records

No.	Station	Elevation	Drainage (sq.mi.)	Average Discharge (cfs)	Unit Discharge (cfs/sq.mi.)	Q90 (cfs)	Unit Q90 (cfs/sq.mi.)
1	Middle Fork above Salt Cr.*	1,200	392	1,153	2.94	282	0.719
2	Salmon Creek*	1,400	117	423	3.62	138	1.18
3	Waldo Lake outlet*	5,400	30	31.7	1.06	0	0
4	North Fork Middle Fork*	1,040	246	789	3.21	141	0.573
5	Middle Fork below North Fork*	960	924	2,737	2.96	680	0.736
6	Middle Fork at Eula a/	862	941	2,527	2.69	680	0.723
7	Middle Fork at Lowell	640	994	3,576	3.60	-	-
8	Middle Fork near Dexter	600	1,001	3,613	3.61	1,230	1.23 b/
9	Fall Creek near Fall Creek	640	186	584	3.14	39	0.210
10	Middle Fork at Jasper	520	1,340	4,107	3.06	-	-

*Near Oakridge
a/ Inundated by Lookout Point Reservoir
b/ Regulated by Dexter and Lookout Point Projects

Development Existing or Under Construction

Power developments now existing in the Middle Fork basin consist of the Lookout Point and Dexter projects near Lowell. The Hills Creek project is under construction on the Middle Fork just below the mouth of Hills Creek. These are all by the U. S. Army Engineers.

Lookout Point project -- The Lookout Point project was constructed at the Meridian damsite and completed in 1955. The powerhouse is located in sec. 13, T. 19 S., R. 1 W., on the north bank of the Middle Fork Willamette River about 1 mile upstream from the town of Lowell. The plant contains three Francis units, each having a rated capacity of 40,000 kilowatts. The dam is 258 feet high and has an overall length of 3,862 feet consisting of an earthfill portion and a concrete portion. Full pool elevation is 934 feet forming a reservoir 14.2 miles long with 349,400 acre-feet of usable storage. Gage No. 1 of Table 3 is used as a comparison for estimated continuous power as the gages nearby have only short term records.

Dexter project -- The Dexter reregulating dam located three miles downstream from the Lookout Point project was completed in 1955. Its powerhouse is located in sec. 9, T. 19 S., R. 1 W., on the north bank of the Middle Fork Willamette River about 1 mile downstream from Lowell. The plant has a single Kaplan unit rated at 15,000 kilowatts. The earthfill dam is 93 feet high and has an overall length of 2,765 feet. Full pool elevation is 697.4 feet forming a reservoir three miles long extending to the Lookout Point project

and containing 4,800 acre-feet of usable pondage. Gage No. 1 of Table 3 is used as a comparison for estimated continuous power as the gages nearby have only short term records.

Hills Creek project -- This project is located on the Middle Fork Willamette River a short distance downstream from the mouth of Hills Creek in sec. 35, T. 21 S., R. 3 E. It was begun in 1956 and will be available for flood storage in the 1961-1962 runoff year. The project is primarily for flood storage but will have a powerhouse containing two units rated at 15,000 kilowatts each. The 304 foot-high earthfill dam will form a reservoir 8.5 miles long with a full pool elevation of 1,543 feet and containing 249,000 acre-feet of usable storage.

Undeveloped Powersites

Undeveloped powersites are discussed below and their estimated power placed in Table 4 with the developed projects. Power values are given for both independent development and considering regulation of upstream sites. Average head is assumed to be 80 percent of gross head at all damsites. Unit Q90 and unit average discharge are assumed equal to the nearest or most appropriate gaging station. Usable storage at each reservoir site is assumed equal to 70 percent of the full pool storage. Regulated flow at each site is obtained from mass diagrams of the nearest or most appropriate gaging stations. An imaginary storage at the gage is obtained by multiplying average storage at the site by a factor consisting of area drained at the

gage divided by area drained at the site under consideration. Regulated flow for this imaginary storage is then obtained from the mass diagram and is multiplied by the reciprocal of the factor mentioned above to obtain regulated flow at the powersite. Total storage upstream from the powersite under consideration is used with the mass diagram to find discharge available with the upstream regulation.

Diamond Peak powersite -- This site was discussed by Helland in his 1944 report and is presented here essentially the same. Elevation differences with Hellands report for conduit intakes reflect the improved mapping in this area. The plan consists of diverting the Middle Fork and Swift Creek into conduits which join and release the water to a powerhouse near the mouth of Swift Creek. Head loss in conduits is assumed to be 5 feet per mile. The Middle Fork could be diverted in sec. 34, T. 24 S., R. 5 E., at an elevation of 3,480 feet and carried along its right bank 8.5 miles to the penstock intake in sec. 1, T. 24 S., R. 4 E., at an elevation of 3,440 feet. Swift Creek could be diverted in unsurveyed sec. 29, T. 23 S., R. 5 E., at an elevation of 3,455 feet and carried three miles along its left bank to the penstock intake mentioned above. A penstock one mile long would carry the water to a powerhouse near the river in sec. 12, T. 24 S., R. 4 E., at an elevation of 2,540 feet providing a static head of 900 feet. To compute power available at this site Q90 per square mile is assumed equal to the area drained by gage No. 2 of Table 3. Although average unit runoff is probably larger at the conduit intakes

than the gage at lower elevation, unit values of Q90 would not be proportionately larger due to the fluctuations of flow and speed which rainfall is realized as runoff at higher elevations.

Campers Flat powersite -- A 480-foot dam placed at Campers Flat (river elevation 2,000 feet) in sections 12 and 13, T. 24 S., R. 3 E., would back water 6.3 miles upstream to a point about one-quarter mile downstream from the mouth of Swift Creek. Such a dam would impound 474,000 acre-feet of water for an estimated usable storage of 332,000 acre-feet. The crest length of this dam would be approximately 3,200 feet. Discharge per square mile is assumed equal to the area drained by gage No. 1 of Table 3.

Sand Prairie powersite -- This site could be developed by a dam in the N½N½ of sections 3 and 4, T. 23 S., R. 3 E. It would back water to the 2,000-foot contour crossing at Campers Flat and have an approximate crest length of 3,000 feet. Such a dam would form a reservoir 10.0 miles long impounding 836,800 acre-feet of water for an estimated usable storage of 585,800 acre-feet. Unit discharge is assumed equal to gage No. 1 of Table 3. One disadvantage of this site is its location in the upper part of the Hills Creek reservoir. Full pool elevation of the Hills Creek project is 1,543 feet while river elevation at the Sand Prairie site is 1,515 feet. Total head available is 457 feet when the Hills Creek reservoir is at full pool. An alternate site (Buck Creek powersite) in the SE¼ of sec. 9, T. 23 S., R. 3 E., could be considered as a replacement for the Sand Prairie

site. The dam would back water to the same point as Sand Prairie while discharge and head would each be slightly smaller. This latter site has not been examined on the ground but the thin ridge forming the left abutment might be troublesome.

Proposals affecting the Oakridge area -- An application was filed in 1923 by the Winino Mineral Springs Corp. for Federal Power Project No. 436. The proposed project was a small diversion system on Salt Creek in sec. 36, T. 21 S., R. 4 E., to be used by the corporation for their own purposes. The project was never built and appears to be of no future significance. This head would be developed by the Salt-Salmon Creek powersite.

On December 9, 1930 the Cascade Utilities Company filed a license application for Federal Power Project No. 1145. This project consisted of a diversion dam, 3,150 feet of wood flume along Salt Creek, and a powerhouse with installed capacity of 185 kilowatts. The project was located in sec. 23, T. 21 S., R. 3 E. The application was rejected on December 21, 1932. This head would be developed by the Salt-Salmon Creek powersite.

A tunnel was built at Klovdahl Bay on Waldo Lake prior to 1916 to provide irrigation water, but was used little if at all. Leaks developed in the tunnel and amounted to about 13 cfs in 1960 when the Forest Service repaired the gate sufficiently to stop the leaking.

On December 21, 1929 Lawrence Macomber filed application for Federal Power Project No. 1046. This project contained two parts.

The first portion consists of a tunnel at Waldo Lake with the water being carried approximately 6 miles by conduit and dropped to a powerhouse on Black Creek in sec. 36, T. 21 S., R. 5 E. The second part involves a diversion intake approximately 15 miles above the mouth of Salmon Creek with the water being carried to a powerhouse on the North Fork Middle Fork in sec. 7, T. 21 S., R. 3 E. This second part is the same as a portion of Federal Power Project No. 1039. The project was vacated on October 20, 1959 except for those lands around Waldo Lake below the 5,415-foot contour. This protects future schemes that may want to use Waldo Lake storage for a conduit power system or to increase downstream flow during critically dry periods. This head would be developed by the Waldo Lake powersite and the Salt-Salmon Creek powersite.

The U.S. Army Engineers have suggested construction of a new tunnel in the vicinity of the existing works. This plan would use natural lake storage as an auxiliary water supply to be used during critical periods at powerplants downstream. Under this plan the lake level could have been lowered as much as 40 feet through a tunnel from Klovdahl Bay to Black Creek. According to studies made by the U.S. Army Engineers drawdown would have been negligible except for extremely critical periods which might be spaced as much as 10 to 15 years apart.

Waldo Lake powersite -- Although Waldo Lake might someday be developed without power as an auxiliary water supply, power potential

does exist. The gaging station at the north outlet of Waldo Lake lists an average discharge of 31.7 cfs and the records for water year 1953 give leakage past the tunnel at Klovdahl Bay as 13.0 cfs. Unit discharge of 1.49 cfs per square mile for these combined discharges indicate that extensive seepage exists. To develop power a small dam across the north outlet and a deeper tunnel at Klovdahl Bay have been suggested. A conduit could be carried 4.5 miles along the right bank of Black Creek at an elevation of 5,280 feet and dropped to a powerhouse in sec. 36, T. 21 S., R. 5 E., at an elevation of 3,120 feet. The large volume of lake storage would allow average discharge to be used in computing power. This discharge would include 13 cfs of leakage at the tunnel before it was repaired in 1960.

Salt-Salmon Creek powersite -- This plan consists of diversion conduit systems on both Salt Creek and Salmon Creek which share a common powerhouse below Aubrey Mountain on Salmon Creek. Head loss in conduits is assumed to be 5 feet per mile. Salt Creek could be diverted in sec. 6, T. 22 S., R. 5 E., at an elevation of 2,080 feet and carried along its right bank 12.0 miles to the penstock intake in sec. 13, T. 21 S., R. 3 E., at an elevation of 2,020 feet. Salmon Creek could be diverted in sec. 31, T. 20 S., R. 5 E., at an elevation of 2,085 feet and carried 13.5 miles along its left bank to the penstock intake mentioned above. The powerhouse could be located one-half mile up Salmon Creek from the Flat Creek Guard Station at a river elevation of about 1,300 feet. To compute available power

at this site Q90 per square mile is assumed equal to the area drained by gage No. 2 of Table 3.

On November 29, 1929 the Waldo Lake Irrigation and Power Company filed application for Federal Power Project No. 1039. The project consists of two conduit systems. One conduit begins at mile 14.5 on Salmon Creek and the other begins at mile 14.5 on North Fork Middle Fork. A common powerhouse in sec. 7, T. 21 S., R. 3 E., on the North Fork is used for both systems. All but two lots of the lands withdrawn by this project were vacated on October 20, 1959. This head would be developed by the Salt-Salmon Creek powersite and the Mile 6.7 powersite.

Upper North Fork powersite -- A 555-foot high dam with a crest length of 2,400 feet placed near the section line between sections 27 and 28, T. 19 S., R. 4 E., would form a reservoir 9.0 miles long. Such a reservoir would impound 718,600 acre-feet of water for an estimated usable storage of 503,000 acre-feet. River elevation at the damsite is 1,925 feet and full pool elevation would be 2,480 feet. Unit discharge is assumed equal to gage No. 4 of Table 3. This is an excellent reservoir site from the standpoint of potential volume.

Mile 6.7 powersite -- The Mile 6.7 powersite was listed as a possible future project in the U.S. Army Engineers June, 1958 report entitled "Water Resources Development - Columbia River Basin". The estimated installed generating capacity was listed as 26,000 kilowatts in the report. The site used in this report is slightly upstream

from mile 6.7 of the North Fork, Middle Fork, Willamette River with damsite in sec. 24, T. 20 S., R. 3 E. A 500-foot high dam with a crest length of 2,300 feet at this site would form a reservoir 6.2 miles long impounding 299,400 acre-feet of water for an estimated usable storage of 209,600 acre-feet. River elevation at the damsite is 1,260 feet and full pool elevation would be 1,760 feet. Unit discharge is assumed equal to gage No. 4 of Table 3.

Upper Lookout Point powersite -- The Lookout Point powersite was listed as a possible future project in the U.S. Army Engineers June, 1958 report entitled "Water Resources Development - Columbia River Basin". The estimated installed generating capacity was listed as 20,000 kilowatts in the report. This is a separate site from the constructed Lookout Point project and is called the Upper Lookout Point site in this report to avoid confusion. The confusion arises from an apparent name switch. Early reports studied the Meridian damsite near Lowell and the Lookout Point damsite at Lookout Point (mile 37 of the river). The dam was constructed at the Meridian site but it has always been known as the Lookout Point project thus leaving the original Lookout Point site with a confusing name. River elevation at this site is 950 feet and a 290-foot high dam having a crest length of 1,000 feet would back water to the Hills Creek site on the Middle Fork, and the section line between sections 23 and 26, T. 20 S., R. 3 E., on the North Fork Middle Fork. Such a reservoir would impound 582,000 acre-feet of water for an estimated usable

storage of 407,400 acre-feet. Unit discharge is assumed equal to gage No. 1 of Table 3. Gage No. 5 (Middle Fork below North Fork near Oakridge, Oregon) contains a drainage area more comparable to the Upper Lookout Point powersite but it has only been in operation since the beginning of water year 1951. This record would form a short non-representative mass diagram. Also gage No. 6 (Middle Fork near Eula, Oregon) which was replaced by gage No. 5 at the end of water year 1950 would not form a mass diagram comparable to the others used in this report.

Fall Creek powersite -- The Fall Creek project located on Fall Creek about 1,500 feet below the mouth of Winberry Creek in sec. 1, T. 19 S., R. 1 W., was authorized by the flood control act of May 17, 1950. Construction has not been started but site selection, hydrologic studies and engineering planning are underway by the U.S. Army Engineers. The design calls for an earthfill dam 200 feet high with a crest length of 5,630 feet. Full pool elevation is 834 feet at which the reservoir contains a usable storage volume of 115,000 acre-feet and extends 6.4 miles upstream. Uses would be flood control, navigation, and irrigation with no power generating facilities planned. An estimated power entry is included in Table 4 even though present plans do not include power generation. One purpose of this report is to measure potential power and a potential does exist here. Unit discharge is assumed equal to gage No. 9 of Table 3.

An estimate of potential continuous power is given in Table 4 below.

Table 4. Estimated Continuous Power of Middle Fork Willamette River Basin

Site	Drainage Area (sq.mi.)	Unit Q90 (cfs/sq.mi.)	Unit Ave. Discharge (cfs/sq.mi.)	Discharge avail. cfs (1)	(2)	Head (3)	Power (kw) (4)	(5)
Diamond Peak								
1) on Swift Creek	15.7	1.18	3.62	18.5	-			
2) on Middle Fork	24.3	1.18	3.62	28.7	-			
				47.2	-	900	2,890	2,890
Campers Flat	178	0.719	2.94	453	-	384	11,830	11,830
Sand Prairie	265	0.719	2.94	700	761	366	17,420	18,940
*Hills Creek	389	0.719	2.94	774	1,102	243	12,790	18,210
Waldo Lake	30	0	1.49	44.7	-	2,160	6,570	6,570
Salt-Salmon Creek								
1) on Salt Creek	82	1.18	3.62	97	-			
2) on Salmon Creek	72	1.18	3.62	85	-			
				182	-	720	8,910	8,910
Upper North Fork	115	0.573	3.21	366	-	444	11,000	11,000
Mile 6.7	215	0.573	3.21	485	664	400	13,200	18,000
Upper Lookout Point	914	0.719	2.94	1,610	2,366	232	25,400	37,300
*Lookout Point	991	1.23	3.61	1,668	2,629	206	23,400	36,800
*Dexter	998	1.23	3.61	1,228	2,637	74	6,180	13,300
Fall Creek	184	0.210	3.14	326	-	160	3,550	3,550
					Totals		143,140	187,300

1 - Independent Development
2 - With upstream regulation
3 - Average head-(0.8 gross head)
4 - Site developed independent
5 - All sites developed
* - Developed projects

Withdrawals

(Portions within Middle Fork Willamette River Basin)

Powersite Reserves	Date Approved	Original Area
661	12/12/17	600.00
Waterpower Designations		
14	12/12/17	600.00
Powersite Classifications		
67	4/23/24	6,000.00
150	7/19/26	21,550.80
310	11/1/38	4,494.05
379	12/9/46	6,164.27

Federal Power Projects	Date Filed	Area outstanding Prior to Review
436	2/6/23	5.47
1039	11/27/29	80.00
1046	12/21/29	80.00
1145	12/9/30	200.00
1851	2/27/45	80.00

Subsequent Actions

Powersite Interpretations	Date Approved	Withdrawal Affected	Area Change
61	4/17/25	PSC 67	0.00
91	1/21/27	PSC 150	0.00
* 108	5/4/28	PSC 150	+ 243.00
* 165	12/22/30	PSC 150	- 332.15
220	2/20/34	PSC 67	+1,489.43
* 223	8/2/34	PSC 67	+ 784.38
223	8/2/34	PSC 150	+2,017.63
232	6/20/35	PSC 150	0.00
241	12/11/35	PSC 150	+ 180.00
267	4/26/38	PSC 150	+ 29.82
276	11/1/38	PSC 150	+ 667.80
308	9/4/41	PSC 150	+ 6.97

* See audit in minutes for description of error in original entry.

Powersite Cancellations	Date Approved	Withdrawal Affected	Area Change
97	9/7/49	PSC 150	- 80.00

Actions Under Section 24 of the Federal Power Act

Determination No.	Date	Determination	Restoration No.	Date
62	9/27/38	No injury	1051	3/29/40
104	10/3/25	No injury		
135	10/10/27	No injury		
136	10/10/27	No injury		
137	10/10/27	No injury		
138	10/10/27	No injury		
139	10/10/27	No injury		
368	8/29/49	Rest. Recommended Canc. 97		9/7/49
471 (Part A)	12/3/58	Rest. Recommended by U.S.G.S. No action taken by F.P.C.		
(Part B)	10/20/59	Vacated		

Acreage Outstanding in Withdrawals Prior to Review

Withdrawal	Area	Subsequent Action	Area Change	Outstanding
PSR 661	600.00			600.00
WPD 14	600.00			600.00
PSC 67	6,000.00			6,000.00
		PSI 61	0.00	6,000.00
		PSI 220	+1,489.43	7,489.43
		*PSI 223	+ 784.38	8,273.81
		Audit	- 323.00	7,950.81
PSC 150	21,550.80			21,550.80
		PSI 91	0.00	21,550.80
		*PSI 108	+ 243.00	21,793.80
		*PSI 165	- 332.15	21,461.65
		PSI 223	+2,017.63	23,479.28
		PSI 232	0.00	23,479.28
		PSI 241	+ 180.00	23,659.28
		PSI 267	+ 29.82	23,689.10
		PSI 276	+ 667.80	24,356.90
		PSI 308	+ 6.97	24,363.87
		Canc. 97	- 80.00	24,283.87
		Audit	- 18.66	24,265.21

* See audit in minutes for description of error in original entry.

Withdrawal	Area	Subsequent Action	Area Change	Outstanding
PSC 310	4,494.05			4,494.05
PSC 379	6,164.27			6,164.27
FPP 436	5.47			5.47
FPP 1039	80.00			80.00
FPP 1046	80.00			80.00
FPP 1145	200.00			200.00
FPP 1851	80.00			80.00
			Total	- 44,519.81

RECOMMENDATIONS

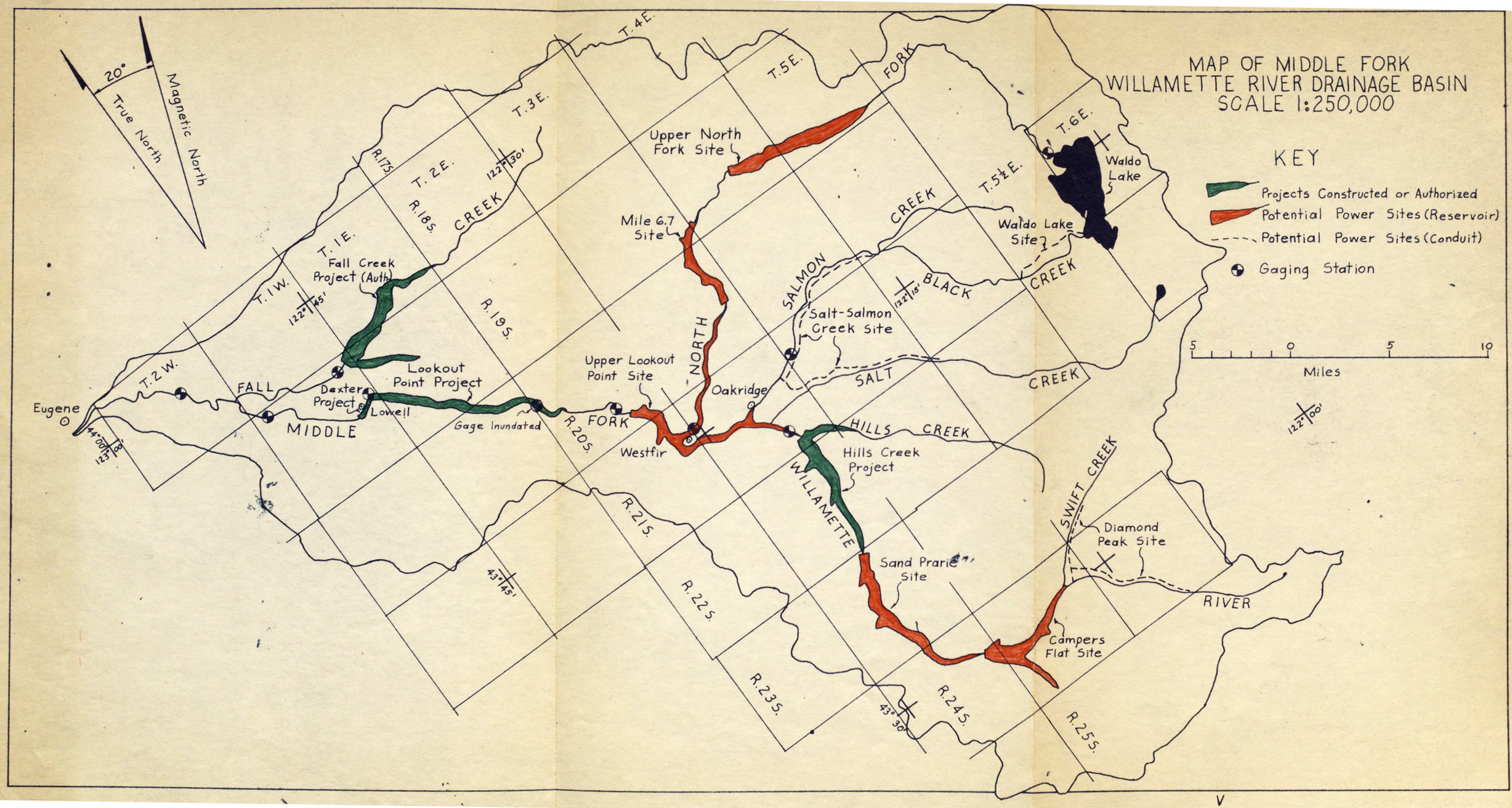
Basis for Recommendations

A.--Projects which are constructed, under construction, or authorized shall be protected. Reserved lands within the project boundaries are recommended for retention in withdrawal.

B.--Reserved lands which have definite power value for other than conduit location but whose development is not imminent are recommended for restoration under section 24 of the Federal Power Act.

C.--Reserved lands which appear to have no value for power development or have value only for conduit locations, except lands along major water courses, are recommended for outright restoration.

D.--In cases where one parcel of land is withdrawn by more than one Powersite Classification the latest one is recommended for outright restorstion on the duplicate lands.


MAP OF MIDDLE FORK
WILLAMETTE RIVER DRAINAGE BASIN
SCALE 1:250,000
KEY
Projects Constructed or Authorized
Potential Power Sites (Reservoir)
Potential Power Sites (Conduit)
Gaging Station
5 0 5 10
Miles
20°
True North
Magnetic North
T.4E.
T.5E.
T.6E.
T.3E.
T.2E.
T.1E.
T.1W.
T.2W.
T.5½E.
R.17S.
R.18S.
R.19S.
R.20S.
R.21S.
R.22S.
R.23S.
R.24S.
R.25S.
FORK
CREEK
NORTH
SALMON
BLACK
SALT
HILLS
SWIFT
RIVER
MIDDLE
FALL
WILLAMETTE
Upper North Fork Site
Mile 6.7 Site
Waldo Lake
Waldo Lake Site
Fall Creek Project (Auth.)
Lookout Point Project
Dexter Project
Lowell
Gage Inundated
Upper Lookout Point Site
Salt-Salmon Creek Site
Oakridge
Westfir
Hills Creek Project
Sand Prarie Site
Diamond Peak Site
Campers Flat Site
Eugene
122°30'
122°45'
122°15'
122°00'
44°00'
123°00'
43°45'
43°30'