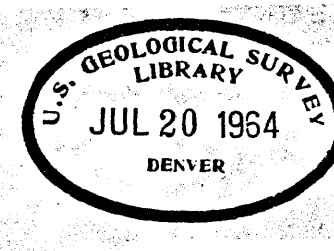
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



REVIEW OF WITHDRAWALS IN WEISER RIVER BASIN, IDAHO

by

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and

Loyd L Young

May 1964

Open-file report

Not reviewed for conformance with the editorial standards of the Geological Survey

Portland, Oregon

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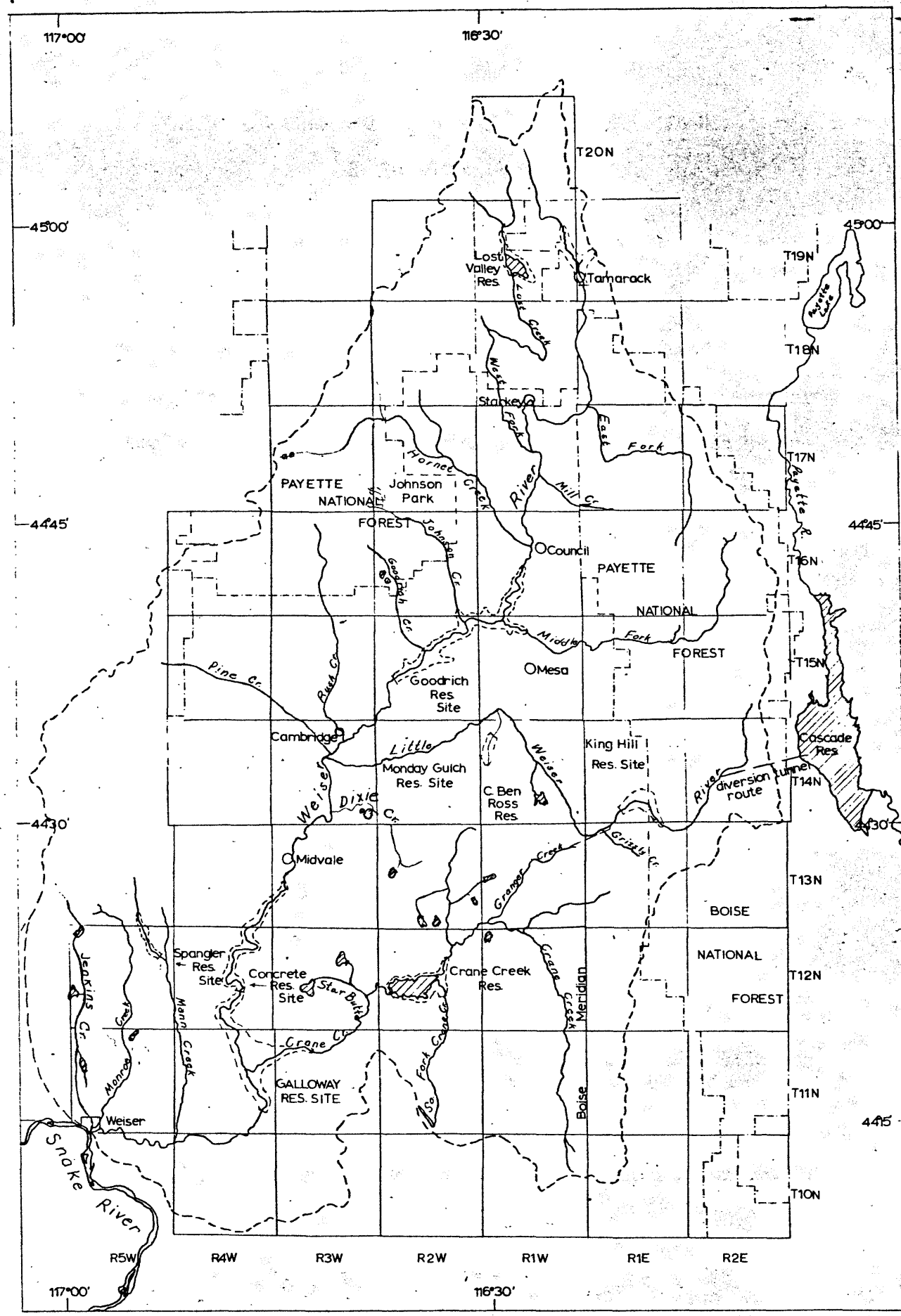
ILLUSTRATIONS

TABLES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REVIEW OF WITHDRAWALS IN WEISER RIVER BASIN, IDAHO

Basin Index 12HF

By Jesse L. Colbert
and Loyd L Young

INTRODUCTION AND BACKGROUND

The Weiser River basin is primarily agricultural and is supported by extensive irrigation. The Geological Survey has initiated withdrawals, or has made powersite classifications of lands having value for reservoir sites and for waterpower production. These withdrawals have been examined to see if they should continue in force or if it is in the public interest to restore them. The 1960 report, "Upper Snake River Basin," by the U. S. Bureau of Reclamation, and U. S. Army, Corps of Engineers included recommendations concerning potential water resource-development sites in Weiser River basin. That report furnished much of the information for this review.

Withdrawals

Powersite Reserve 168, December 15, 1910
Federal Power Project 314, June 1, 1922
Federal Power Project 419, June 11, 1923
Federal Power Project 940, December 4, 1928

Subsequent Actions

Powersite Modification 31, October 13, 1912
Powersite Modification 98 (Boise 011777), August 25, 1913
Determination application 198, June 14, 1929 - no injury
Restoration subject to sec. 24, FPA 993, July 31, 1929
Powersite Restoration 436, March 28, 1930

All of these subsequent actions affected Powersite Reserve 168.

Maps relating to the area

U. S. G. S. river surveys:

Rush Creek, Cambridge to Power House, Idaho; scale 1:31,680; contour interval 20 feet; surveyed in 1938 and 1939.

Mann Creek, Idaho; scale 1:31,680 showing Spangler damsite and Brown damsite at a scale of 1:4,800; contour intervals 10 and 20 feet; surveyed in 1936.

U. S. G. S. topographic quadrangles:

Map name and edition	Contour interval in feet
30-minute at a scale of 1:125,000	
Meadows, Idaho, 1911	100
Riggins, Idaho, 1945	100
Squaw Creek, Idaho, 1894	100
Weiser, Idaho, 1897	100
15-minute at a scale of 1:62,500	
Cambridge, Idaho, 1957	40
Cascade, Idaho, 1954	40
Copperfield, Idaho, 1957	80
Council, Idaho, 1954	40
Crane Creek Reservoir, Idaho, 1957	40
Cuprum, Idaho, 1957	80
Hornet, Idaho, 1957	80
Mann Creek, Idaho, 1953	40
New Meadows, Idaho, 1954	40
Smiths Ferry, Idaho, 1953	80
Scurgill Peak, Idaho, 1957	80
7-1/2-minute at a scale of 1:24,000	
Weiser Cove, Idaho, 1952	20
Weiser South, Oreg.-Idaho, 1951	10

Army Map Service maps:

Baker, Oregon; Idaho sheet NL 11-11, scale 1:250,000 and contour interval 200 feet.
Grangeville, Idaho; Oregon; Washington sheet NL 11-8, scale 1:250,000 and contour interval 200 feet.

Mapping needs:

The following areas of Weiser River basin are not covered by suitable topographic maps and should be remapped for publication as 15- or 7-1/2-minute quadrangles.

The NE 15-minute quadrangle of the 1909 Meadows 30-minute quadrangle.
The two western 15-minute quadrangles of the 1891 Squaw Cr. 30-minute quadrangle.
The SE 15-minute quadrangle of the 1897 Weiser 30-minute quadrangle.

Previous reports

Summary of Investigations in Weiser River Basin, Idaho by Arthur Johnson, 1942.

Water Utilization in the Weiser River Basin, Idaho, by R. G. Helland, 1949.

Water Supply Paper 887, Water Utilization in the Snake River Basin, by W. G. Hoyt, 1939.

Upper Snake River Basin, Wyoming-Idaho-Utah-Nevada-Oregon, Preliminary Summary Report, U. S. Bureau of Reclamation and U. S. Army Engineers, November 1960.

Purpose of withdrawals

The lands withdrawn by the filings for Natural Power projects were for proposed power developments along Crane Creek and a now abandoned developed project on Rush Creek. Project 418 proposed to divert water from Little Weiser River basin to Crane Creek reservoir, and from the reservoir through a canal to a powerhouse about 8-3/4 miles downstream. Project 314 proposed to divert from Canal Creek through a pipeline to a powerhouse about 2-1/2 miles downstream. Power site Reserve 184 withdrew lands along Crane Creek downstream from the reservoir for about 8 miles. Project 943 reserved lands

for a transmission line and about 200 acres in T. 16 N., R. 3 W., for a powerhouse in connection with the Rush Creek power development. Other withdrawals in the basin were for transmission lines. Lands involved in transmission-line withdrawals are opened to entry by the general determination of April 17, 1922, and are not considered in this review.

GENERAL DISCUSSION

Geography

The Weiser River drains about 1,700 square miles of west central Idaho. It flows generally southwest from the headwaters in Price Valley and empties into Snake River at Weiser. Much of the land drained is in the Payette National Forest. The flat lands along the river bottom, as well as in the tributary valleys, are established farming areas which are usually irrigated. Water is obtained from the main river or tributary streams which are often regulated by small reservoirs. Altitudes range from 2,150 feet at the mouth to about 8,000 feet in the headwaters, and annual precipitation ranges from 11 to 45 inches. The largest town is Weiser with a population of about 4,000; other small towns are Midvale, Cambridge, Mesa, Council, and Tamarack.

A branch line of the Union Pacific railroad follows the river or is near it from mouth to head, and U. S. Highway 95 is near the main river between Midvale and Cambridge (9 miles) and between Council and Tamarack (10 miles). U. S. Highway 95 follows the

Little Weiser is open valley for about 10 miles near its mouth, and dirt roads follow many of the tributaries.

Developed projects

There was one power development in the basin--the 160 kw Rush Creek plant in sections 27 and 28, T. 16 N., R. 3 W. This project was abandoned in 1943. Irrigation storage reservoirs are widely scattered throughout the basin. Where capacity is known they range in size from 187 acre-feet for Lower South Hornet Creek to 51,700 acre-feet for Crane Creek. A list of developed reservoirs follows:

Reservoirs in the Weiser River basin

Name of reservoir	Stream	Location T.	R.	Sec.	Volume (ac-ft)
Lost Valley	Lost Creek	16 N	1 W	28	9,870
Upper Hornet (upper)	S. Hornet Cr.	17 N	3 W	20	218
Lower Hornet (lower)	S. Hornet Cr.	17 N	3 W	20	187
C. Ben Evans (offstream)	Little Weiser R.	14 N	1 W	27	7,600
Dixie (?)	Dixie Cr.	14 N	3 W	25	---
Brownlee	Crane Cr.	12 N	1 W	6	280
Proposed	Unnb. to Hog Cr.	13 N	2 W	---	---
Big Canal, South	Unnb. to Hog Cr.	13 N	1 W	19	---
Proposed	S. Fk. Crane Cr.	13 N	2 W	35	---
Crane Creek	Crane Cr.	12 N	2 W	19	51,700
Bear Butte	Bear Butte Cr.	12 N	3 W	16	---
Little Crane Cr.	Unnb. Bear Butte Cr.	12N	3 W	14	---
Lowden (offstream)	Mann & Monroe Crs.	12 N	5 W	34	3,000[a]
Idaho Industrial Inst.	Meadow Cr.	12 N	5 W	19	1,000

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a. - 1,600 acre-feet usable capacity.

Undeveloped projects

The principal purpose of the projects discussed in the listed reports was the improvement of water supplies for irrigation. The 1960 report by the Bureau of Reclamation and the Corps of Engineers evaluated various irrigation projects within the Weiser basin more fully than was done in previous reports, and recommended five of them as being worthy of further investigation as follows: Council, Hornet Creek, Main Weiser, Little Weiser and Mann Creek.

An additional project, the Payette-Weiser diversion, not included in the Bureau-Corps report is also discussed.

Council.—This project in the upper part of the basin would enlarge the Lost Valley Reservoir in T. 19 N., R. 1 W., by 38,100 acre-feet. This would furnish water for 1,650 new and 2,360 inadequately irrigated acres. A diversion dam on West Fork Weiser River and the West Fork-Council canal would be constructed, and the East Fork Ditch and the lateral system would be enlarged. The primary purpose is irrigation but recreation and flood control would also benefit. The report considers this project as a promising long-range future development.

Hornet Creek.—This project, also in the upper Weiser Basin, would irrigate lands along Hornet Creek, a right bank tributary that joins the Weiser River near Council. Presently storage is limited to two small reservoirs of 200 acre-feet total capacity on Hornet Creek in sec. 20, T. 17 N., R. 3 W. The plan would require

construction of Johnson Park dam on nearby Park Creek, with diversions from Johnson Creek, and distribution canals to provide a total of 1,500 acre-feet of irrigation water for 1,760 irrigable acres. Irrigation and recreation benefits are the main contributions of this project but it is judged not economically feasible at this time.

Main Weiser River.--Lands along the river from about 4 miles above Cambridge to near Weiser constitute the area in this project. They are divided by areas called: Cambridge Bench, Salubria Valley, Keithly Bench, Middle Valley East Side, and Weiser. These areas contain 17,920 acres to be irrigated from natural flow of streams and 64,200 acre-feet of stored water from eight existing reservoirs (Crane Creek, Upper and Lower Crane Creek, Hog Creek (2), South Fork Hog Creek, Deer Creek, Star Butte, and Little Crane Creek). Plans for improving the irrigation by regulation of the seasonal flows include the construction of Goodrich dam and reservoir, canals and distribution systems, and two pumping plants. The damsite is 8-1/2 miles upstream from Cambridge in sec. 10, T. 15 N., R. 2 W. A dam 180 feet above the streambed would provide 250,000 acre-feet of storage of which 50,000 acre-feet would be for sediment deposition and conservation. The remaining 200,000 acre-feet of volume would be divided between flood control and irrigation use. A supplemental benefit of recreational use would also be present with the large reservoir. The project has much in its favor even though costs are high and further study is indicated, including evaluation of alternative reservoir sites, is recommended.

Little Weiser River.--The project area for Little Weiser is about 10 miles east of Cambridge in Ts. 14 and 15 N., R. 1 W., and includes about 2,000 acres of new lands. Enlargement of the existing C. Ben Ross Reservoir in sec. 27, T. 14 N., R. 1 W., from 7,800 acre-feet to 12,150 acre-feet by raising the crest 18 feet, enlargement of the Reader Canal, and construction of a diversion dam in sec. 36, T. 14 N., R. 1 W., and headworks are the required improvements for the Little Weiser Project. Flood control and recreational benefits of the enlarged C. Ben Ross Reservoir are also considered as contributing to the feasibility of the project. The future irrigation and flood control requirements in the Weiser Valley may serve to justify development of this project.

Another reservoir site near the Ben Ross reservoir might also be developed. The site is on Monday Gulch in sec. 8, T. 14 N., R. 1 W. A reservoir 60 feet deep (altitude 3,000 to 3,020) at the dam site would have about 1,000 acre-feet of water.

Three are two small reservoir sites in the headwaters of Little Weiser River that warrant study. One or the other of these sites might be utilized in connection with a future waterpower development or a diversion of water from Weiser River to Crane Creek for the development of waterpower downstream from the existing Crane Creek Reservoir. The diversion project was studied in 1922 and an application for a Federal power project by the Southern Idaho Land and Power Company withdrew some of the lands in Federal Power Project 411.

Although it has not been suggested or seriously studied, future irrigation developments might include the diversion of water from the Payette Basin to the Weiser Basin. Should such a diversion be undertaken the reservoir and powersites in question would become quite valuable. The reservoir in either site would be small in relation to dam height, but would furnish water for a high-head powersite.

The upstream damsite is in sec. 2, T. 13 N., R. 1 E., where the water surface elevation is 3,760 feet in altitude. Raising the water 260 feet would create a reservoir of 10,000 acre-feet capacity. The downstream site, King Hill Creek site, has alternative damsites. One of these might be located in sec. 21, T. 14 N., R. 1 E. The altitude of the water surface at the damsite is about 3,640 feet above sea level and a dam that would raise the water to altitude 3,800 feet would have a crest length of about 1,000 feet according to the Council 1:12,000 scale topographic quadrangle. The reservoir would hold 40,000 acre-feet of water. The water could be used in a powerplant several miles downstream with a head of 500 to 600 feet depending upon the site chosen. The supplement from Project 43 proposed to divert water from the Little Weiser to the Cacus Creek Reservoir and use it for waterpower development between the reservoir and the Weiser River where an additional 1,000 feet of head might be developed. If water is to be diverted from the Payette Basin the possible power development of the high head plant would add to making the diversion feasible.

Mann Creek.--There are 5,060 irrigable acres in the Mann Creek and Monroe Creek valleys which would be served by new developments in the Mann Creek Project. The Main structure of the project is Spangler Dam, approved for a site at mile 2.5 on Mann Creek in sec. 11, T. 12 N., R. 5 W. The site is about 14 miles northeast of Weiser. The dam will be an earthfill structure 133 feet above streambed for a maximum pool elevation of 2,895 feet. The reservoir will store about 13,000 acre-feet of water--2,000 acre-feet is for conservation and for irrigation-season diversions to Joslin Ditch. In addition to the dam, some drainage and diversion improvements will be required. Recreational benefits will add to overall benefits. Construction is scheduled to begin in 1964.

Payette-Weiser diversion.--The proximity of the Payette and Weiser Basins and the complementing water-supply condition of these areas suggest an interbasin diversion for irrigation water from the Payette River to the Weiser River valley. The 1960 upper Snake River basin project by the Bureau of Reclamation and Corps of Engineers states on page 7-139 that an average of 1,029,000 acre-feet of water passes Black Canyon dam in excess of present irrigation requirements. Some of this surplus water might be used in Weiser River basin to provide supplemental irrigation to the presently irrigated 41,000 acres in the valley or to irrigate an estimated 30,000 acres of new land. A bench south of Weiser River in the vicinity of Crane Creek and its tributaries upstream from Crane Creek reservoir is believed to include at least 30,000 acres of

lands which are level enough and otherwise suitable for irrigation. Altitudes on these lands vary between 3,100 feet and 3,800 feet above sea level. To irrigate the 39,000 acres, a transbasin diversion of 130,000 acre-feet would be required. Cascade Reservoir stores 130,000 acre-feet in the top 5 feet. From the reservoir a tunnel about 5 miles long could surface on Anderson Creek, a tributary of Little Weiser River, at an altitude of 4,650 feet above sea level. According to the Cascade 15-minute quadrangle, the tunnel would begin in sec. 18, T. 14 N., R. 3 E., and end in sec. 21, T. 14 N., R. 2 E. If desired the Payette River water could be added to Little Weiser River water for the production of hydroelectric power through a head of 1,000 feet and still be diverted on to the above-mentioned benchlands for irrigation.

If the water diverted from the Payette River basin were used for irrigation in the Crane Creek basin, it might be reregulated in an enlarged Crane Creek reservoir and used to develop waterpower through most of the 1,400 feet of fall to the Galloway Canal on Weiser River. The spillway of the present Crane Creek Reservoir is at altitude 3,191 feet--about 45 feet higher than the lowest outlet. It could be canaled in an open conduit about 8 miles along the left bank of Crane Creek to the diversion dam for the old Crane Creek canal in sec. 3, T. 11 N., R. 3 W. The altitude of the old diversion is about 2,925 feet, according to the Crane Creek Reservoir topographic quadrangle. The total drop from the forebay (at altitude 3,191 feet) to the tailrace altitude of 2,805 would be 525 feet.

The water could be rediverted along the route of the old Crane Creek canal which follows the left banks of Crane Creek and Weiser River, and all amounts in excess of demands for irrigation could be dropped through a second powerhouse near the Galloway diversion dam on Weiser River in sec. 35, T. 11 N., R. 4 W. The Galloway Canal diverts water at an altitude of about 2,195 feet and the Payette water could reach the canyon wall above at altitude 2,560 feet as estimated from the Mann Creek topographic quadrangle. The total fall through the two penstocks would be 880 feet (525 and 365). The capacity of the sites would depend upon the volume of water diverted from Payette River. During the irrigation season an average of 58,790 acre-feet per year of Crane Creek water could be used in the upper plant. By making appropriate arrangements with the irrigation company to replace Crane Creek water during the irrigation season with Payette River water, the powerplants would not have to remain idle during non-irrigation seasons. The Crane Creek Reservoir could be increased in size by heightening the present dam and by constructing a dike about one-fourth mile long in a saddle north of it. An increase of 10 feet in the depth of the water would give the reservoir a capacity of about 92,000 acre-feet--the present 51,700 plus an additional 40,300.

The Payette River had an average discharge of 1,318 cfs from Cascade Lake for the 20-year period ending September 30, 1961. All of this water, if needed, could be diverted from the basin for the benefit of the Territory of the Little Weiser and Crane Creek

powersites for developing waterpower with Payette River water, we might assume that 500 cfs (362,000 acre-feet) is to be diverted to the Weiser Basin from Cascade Reservoir. A tunnel and penstock to a powerhouse site on Little Weiser River at the mouth of Dog Creek (sec. 27, T. 14 N., R. 1 E.) would be about 9 miles long and would create a gross head of 1,178 feet when Cascade Reservoir is full (altitudes 4,828 to 3,650). A second powerplant probably in sec. 6, T. 14 N., R. 1 E., could develop an additional 200 feet of head. The water could then be used as required for irrigation on the Crane Creek bandlands and again for waterpower development through a gross head of nearly 1,000 feet downstream from the existing Crane Creek Reservoir. The 500 cfs acting through the total combined head of 2,300 feet would produce 91,000 kilowatts at 80 percent efficiency. The power would have exceptional value for peaking purposes because of the regulating capabilities of Cascade Reservoir so that installations might be as much as four times the continuous capability of the sites.

Water supply

The gaging station near Weiser, with a drainage area of 1,460 square miles, shows a range of flow from 14 cfs to 19,900 cfs and an average of 1,218 cfs. Proportionately similar ranges occur at the other stations in the basin. The flood flows should be stored in reservoirs for release as needed for power or irrigation, but many valleys which are otherwise suitable for large reservoirs are occupied by valuable farm lands, towns, highways, and a railroad. The resulting high land values and required expensive relocations raise the costs of reservoirs to a point where feasibility is doubtful.

Table 1 shows a summary of current stream flow records in Weiser Basin. All of the stations indicate the same wide range of flow with high flow occurring in late winter and spring and low flows in summer. Approximately 85 percent of the runoff occurs between the first of February and the end of June, and only 2.5 percent from July 1 to September 30 at the station above Crane Creek where the drainage area is 1,160 square miles. Records of runoff at the stations listed in table 1 are published in Water-Supply Papers.

Table 1. Summary of current streamflow records in Weiser River basin, Idaho.

Station	Beginning and period of record	Drainage area sq mi	Maximum cfs	Minimum cfs	Average cfs	Average cfs/sq mi	Location S	Location T	Location R
Weiser at Tamarack	3/36	36.5	1,320	0.5	44	1.2	31	19 N	1 E
W. Br. nr Tamarack	6/59	3.36	32	0.5	-	-	34	20 N	1 E
Goat Cr. nr Tamarack	3/30	29.4	680	0.0[a]	39.3	1.3	28	19 N	1 W
Weiser nr Cambridge	3/39	695	10,300	3.9	654	1.1	1	14 N	3 W
Pine Cr. nr Cambridge	5/38	58	850	0.7	39.0	0.7	31	15 N	3 W
L. Weiser nr Indian V.	6/38[b]	81.9	1,840	2.9	104	1.3	1	13 N	1 W
Crane Cr. nr Highway	5/28	282	8,200	0.0[a]	74.3	.3	19	12 N	2 W
Crane Creek at mouth	2/21	289	1,170	0.2	82.8	.3	14	11 N	5 W
Weiser above Crane Cr.	7/28-9/52	1,460	18,000	5.98	891	.77	10	11 N	5 W
Weiser nr Weiser	10/52[d]	1,460	19,000	14	1,190	.82	23	11 N	5 W
Weiser Canal	9/20	-	223	0.0[c]	-	-	32	11 N	5 W
Mann Creek nr Weiser	4/37	56	1,540	0.0	40.4	.7	11	12 N	4 W

a - Dam closed.
b - Also 2/24-10/27.
c - Gate closed.
d - Fragmentary until 10-52.

Potential waterpower

In 1962 the Geological Survey made a detailed inventory of developed and undeveloped waterpower sites for the Western States. The report shows the Weiser River basin as having no developed sites and 7 undeveloped sites with a gross theoretical power potential of 1,000 kw or more for Q50 discharges. The estimates were based upon gross head and 100 percent efficiency as prescribed by World Power Conference standards for making estimates of gross theoretical waterpower. The estimators studied the standards carefully and applied them uniformly so that the results are comparable with similar estimates on a world-wide basis. Significant criteria from the World Power Conference standards as defined in 1962 are:

Powersites

> Waterpower sites, or "powersites", are definite locations on a stream which are developed or are capable of being developed for the production of waterpower.

Potential power resources

> The potential power resources of any country, section, or river basin shall be the aggregate of the gross theoretical power at all the powersites, both developed and undeveloped, in such country, section, or river basin.
>
> In order to be included in these statistics, an undeveloped site shall have such gradient, flow, and physical conditions that its development for the production of power may reasonably be assumed to be eventually practicable.

Gross theoretical power of powersites

The "gross theoretical power" of a powersite shall be the full potential output at 100 percent efficiency expressed in kilowatts, and shall be determined by taking the product of the flow per second by the gross head.

Gross theoretical power shall be taken as:

$$0.085\ Qh$$

when the head "h" is in feet and the flow "Q" is in cubic feet per second.

Rates of flow

The gross theoretical power of powersites shall be computed for three different rates of flow, defined as follows: Q35, Q50, and arithmetical mean flow.

When "modified" flow differs from "natural" flow, the former, either as measured or as estimated, shall be used

Heads at powersites

The "gross head" shall be the difference in elevation at the time of such flow between the water surface at the beginning and at the end of the powersite, without reduction for losses.

The "net head" shall be the gross head reduced by arbitrary hydraulic losses and by reservoir drawdown. (World Power Conference 1962).

Table 9 lists all of the powersites in the basin having a potential of 1,000 kw at 100 percent efficiency for discharge available 80 percent or more of the time. The developed reservoirs are included because of the regulating effect upon the downstream river. Development of power in the Peace River basin is not anticipated in the near future as already indicated. Future requirements for large reservoirs

Table 2. Developed and potential storage, gross theoretical waterpower, and potential power with regulation, Weiser River basin, Idaho.

Site	Powerhouse or damsite location Sec.	T.	R.	Storage (acre-feet) Existing	Potential	Gross Head (feet)	Gross theoretical power in MW with gross head and 100% efficiency and flows at 0.95	0.50	Mean	Potential power in MW of regulated stream at 80% efficiency
[illegible]-Fruitvale	15	17 N	1 W	–	26,000	1100	.09	1.07	4.0	2.6
[illegible] Valley	7	18 N	1 W	10,000	89,000	1250	.22	1.6	4.2	3.50
Upper South Hornet	20	17 N	3 W	213	213	–	–	–	–	–
[illegible] South Hornet	20	17 N	3 W	157	157	–	–	–	–	–
[illegible] Park	31	17 N	2 W	–	1,[illegible]	–	–	–	–	–
[illegible] – B	[illegible]	[illegible] N	2 W	–	230,000	370	.14	2.28	8.97	4.50
[illegible]	15	1[illegible] N	3 W	–		[illegible]	.07	1.2	4.7	2.40
Cold Spring Ridge	27	1[illegible] N	1 E	–		1900	1.27	2.12	3.83	1.1
[illegible] Hill Creek	28	1[illegible] N	1 E	–	60,000	–	–	–	–	–
[illegible] Res.	27	18 N	1 W	7,500	12,[illegible]	26	–	–	–	–
[illegible]day	[illegible]	18 N	1 W	–	13,000	–	–	–	–	–
[illegible]	2[illegible]	14 N	3 W	U	–	–	–	–	–	–
[illegible]	2[illegible]	12 N	4 W	–	+	+	+	+	+	
[illegible]	[illegible]	12 N	1 W	200	200	–	–	–	–	–
Unnamed	33	13 N	2 W	U	–	–	–	–	–	–
[illegible] Creek Butte	19	15 N	1 W	U	–	–	–	–	–	–
Unnamed	28	10 N	2 W	U	–	–	–	–	–	–
[illegible] Butte	15	12 N	3 W	U	–	–	–	–	–	–
Crane Cr. Reservoir	7	12 N	3 W	51,700	92,000	800	.79	1.40	5.36	4.09
Little Crane Cr.	1[illegible]	12 N	3 W	U	–	–	–	–	–	–
Galloway	25	1[illegible] N	4 W	–	1,300,000	300	.7	7.85	27.2	15.[illegible]
[illegible]ngler	32	11 N	4 W	–	13,000	780		–	–	–
[illegible]	34	12 N	5 W	3,050	3,050	–	–	–	–	–
Totals				73,200	1,800,650		2.63	17.35	58.25	32.83

[illegible] Utilizing all potential storage at upstream sites.
[illegible] Crane [illegible] Res. (140,000 ac-ft, 270-foot head, 5 MW, 5.4 MW, and 19 MW) is included in Galloway Res. site.
U Existing storage unknown.

in the basin, however, or the diversion of water from the Payette River basin may make waterpower feasible in the distant future. The effect of diverting water from Payette Basin was discussed briefly in the section on undeveloped projects. The estimates for regulated power shown in table 7 are based upon the use of all upstream storage.

Upstream from Tamarack.--A reservoir behind a dam about 57 feet high to altitude 4,159 at a site in sec. 30, T. 12 N., R. 1 E., would provide an active storage in the top 20 feet of 26,000 acre-feet, sufficient for an estimated flow of 35 cfs. It would flood three miles each of railroad and Federal highway as well as 1,650 acres of valley lands which are suitable for irrigation. Continuous power developed from this with no allowance for irrigation requirements and an average head of 18 feet would amount to only about 120 kw.

Tamarack to Fruitvale.--A series of diversions downstream from the Tamarack reservoir through a reach of the river having a fall of about 1,101 feet to Fruitvale would depend upon the Tamarack reservoir to provide a uniform flow of about 35 cfs. Potential firm power is 2,601 kw. The river runs through a relatively narrow section in which there is very little, if any, irrigation. Except for the land required for the Tamarack reservoir the use of the water for power would not interfere with irrigation in this reach, but potential power is small considering that the head would be developed at several sites.

Lost Creek (West Fork).--A plan to increase the size of the Lost Valley Reservoir by 38,100 acre-feet to a total size of 49,000 acre-feet by raising the dam 50 feet is currently under consideration by the Bureau of Reclamation in their General Investigations Program in fiscal year 1962. Irrigation of the valley around Council is the main use of Lost Valley Reservoir by releases through Lost Creek and diversions from the upper reaches of the West Fork Weiser River. Because of the location of the reservoir relative to the West Fork, it appears possible that some power could be developed. The reservoir could be tapped by a tunnel and penstock about three miles long to a powerhouse near the confluence of Lost Creek with the West Fork in sections 7 or 8, T. 18 N., R. 1 W. About 40 cfs could be utilized from the reservoir through the available head of 1,280 feet for a power output of 4,400 hp. Except for a difference in time of the scheduled use of the water, development of power would not interfere with irrigation requirements.

If adjustment of power development to irrigation requirements could be made the two uses would not be incompatible. Such intermittent power production does not seem desirable.

Indianola to Council.--The river flows in a fairly broad valley with about 100 feet of fall for the 8 miles between Indianola and Council. There are no good damsites and there is extensive irrigation of valuable farmland in this area. Construction of dams for head is not justified and stream flow with no regulation is too variable for power production.

A diversion point near Fruitvale below the mouth of the West Fork Weiser River would have the benefits of upstream regulation. Regulation afforded by an enlarged Lost Valley reservoir would assure a firm flow of about 40 cfs and regulated flow from a potential Tamarack Reservoir of about 35 cfs plus inflow downstream from the reservoirs might amount to a total firm flow of 80 cfs. The estimated mean flow is 130 cfs. Diverting to a powerhouse at Council just upstream from Hornet Creek would provide about 125 feet of head and develop 630 kw firm or about 100 kw per mile. This is insufficient to qualify as having enough power value to warrant classification as a powersite.

Council to Cambridge.--The Goodrich reservoir as proposed by the Bureau of Reclamation and the Corps of Engineers in their report on the Upper Snake River basin in 1960 would occupy most of this reach. The damsite is in section 20 of T. 15 N., R. 2 W. The reservoir would serve primarily for irrigation with some flood control and supplemental recreational benefits. The 450,000 acre-foot reservoir would back water to the town of Council and provide 200,000 acre-feet of active storage. The Weiser damsite in sec. 32 of T. 18 N., R. 1 W., considered workable by the Bureau of Reclamation would be submerged.

The irrigable lands are in the Weiser valley downstream from the damsite, in the vicinity of Cambridge, and in the vicinity of Midvale 15 miles from Cambridge. If irrigation demands could be coordinated with power releases the storage would provide a firm flow estimated as 77 cfs. Estimated power head based on the use of 200,000 acre-feet

between the 2,790-foot altitude and the 2,857-foot altitude would be 140 feet. Power under these conditions would amount to 3,600 kw or about 215 kw per mile of reach developed. A modest-sized powerplant might be included with an irrigation, flood control, and water conservation project. If it is assumed that all of the upstream reservoirs discussed (Tamarack, Lost Valley, and Goodrich) were built and their releases coordinated, the total storage would provide a flow of 470 cfs including regulated flow and estimated 15 cfs as inflow from areas between reservoirs 95 percent of the time. This would produce about 4,800 kw continuous at the Goodrich site.

Little Weiser River.--There is a high-head waterpower site in the headstream area of the Little Weiser River that would include separate water-gathering facilities on the Little Weiser River and on Anderson Creek. The drainage area above diversion points at elevation 4,700 feet on these streams is 30 square miles. Estimated, annual discharges based upon the gaging station near Indian Valley are 20 cfs; Q90, 7 cfs; and Q50, 15 cfs. By combining the discharges from the several tributaries as described above in a powerhouse located in sec. 27, T. 14 N., R. 1 E., a gross head of 1,000 feet could be developed. The combined length of all conduits would be about 8.8 miles, and would include about three-fourths of a mile of tunnel between the Little Weiser River and Grouse Creek in the vicinity of the township line between T. 14 N., Rs. 1 and 2 E.

The site has a capability of 3,830 kw for average discharge and being that small, probably will not be developed in the foreseeable future unless water is diverted from the Payette Basin as already discussed.

Cambridge to Midvale.--The only suitable area for power production in this reach is in a five-mile portion through sections 15, 22, 27, and 34 of T. 16 N., R. 3 W. About three miles of this is a narrow canyon. The fall in the stream is about 40 feet to a powerhouse site in sec. 33. A dam which would raise the water surface above 2,840 feet would flood the town of Cambridge as well as several hundred acres of farmlands downstream from Cambridge. Diverting at the upstream end of the canyon at the 2,800-foot altitude to the powerhouse would develop all of the 40 feet of head. Power production would depend upon any upstream regulation afforded by the Goodrich dam, Lost Valley reservoir, or Tamarack reservoir.

Assuming that this regulated flow would be available for diversion, plus any inflow downstream from these reservoirs, the estimated flow would be made up of 345 cfs including regulated upstream, and an estimated 20 cfs inflow from areas below the reservoirs 95 percent of the time. This flow and 40 feet of head would produce 1,230 kw. The potential power shown for the Cambridge site in table 2 assumes development of 80 feet of head--all head between the Goodrich tailrace and the plant site.

Midvale to Crane Creek.--In the 19 miles of river valley between Midvale and Crane Creek, the distribution of the flow is such that reservoirs are necessary to make development feasible. This part of the valley is relatively narrow and is not extensively irrigated. The river flows through a canyon for 11 miles between a point two miles downstream from Midvale to a damsite at Concrete in secs. 22 and 23 of T. 12 N., R. [illegible] W. It falls 250 feet through this reach (altitude 2,540 to 2,290 feet). One dam to develop all of this head would create a reservoir with a capacity of 140,000 acre-feet.

With the storage of the Concrete reservoir, 140,000 acre-feet, the regulated flow could be [illegible] cfs. With 200 feet of head at the dam the potential power is [illegible] kw. With the 38[illegible],000 acre-feet available for regulation at four sites the estimated regulated flow is 724 cfs. No allowance for further inflow is made. The mean head at the dam would be about 200 feet with a mean pool altitude of 2,[illegible] feet. Potential firm power under these conditions is 9,760 kw. Potential power for the Concrete site is included with the Galloway site power amounts in table 2.

Crane Creek.--The possibility of power from an interbasin diversion from the Cascade Reservoir in the Payette Basin was discussed earlier in this report. Without water from the Payette River there is little likelihood of any power development on Crane Creek [illegible] proposed in 1928 that would have supplemented Crane Creek water by a diversion from Little Weiser [illegible] Power Project [illegible]. The potential power of Crane Creek

is shown in table 2 without benefit of any out-of-basin water. The power that could be developed in the 840 to 1,000 feet of head below the Crane Creek Reservoir would depend upon the amount of water brought in from the Little Weiser or from the Payette Basin. There are no other possible sources.

By raising the Crane Creek dam 10 feet its capacity could be increased by about 40,000 acre-feet for a total of about 92,000 acre-feet. Increasing the capacity of the reservoir does not seem likely unless water is brought from another stream.

Crane Creek to Mann Creek.--Galloway dam in sec. 35, T. 11 N., R. 4 W., is a constructed low diversion dam for the Galloway canal which follows along the right bank of the river to the vicinity of Weiser. Below this dam the valley widens, is irrigated, and has no favorable damsites. In sections 25 and 26 of this township, about three-fourths of a mile upstream from the diversion dam, there is a dramsite topographically suitable for a dam high enough to include the Concrete reservoir site in its reservoir. The present water surface of Weiser River at the Galloway damsite is about 2,195 feet. A 50-foot dam would back water 8 miles to the Concrete site (altitude 2,230), and a 345-foot dam would back water to the vicinity of Midvale (altitude 2,540 feet). The 95-foot dam would create a reservoir capable of holding about 50,000 acre-feet of water and the 345-foot dam would provide 1,400,000 acre-feet of storage.

The gross theoretical potential power of the 95-foot head is 170 kw, 1,820 kw, and 6,500 kw for existing Q95, Q50, and Qmean discharges. The potential power for the high dam is shown in table 2.

A table and graph of accumulated acre-feet were made for Weiser River above Crane Creek (station 13-2630) for water years 1922 to 1952 inclusive, a period of 11,323 days. Average discharge during that period was 991 cfs and a reservoir with a capacity of 2 million acre-feet could have given complete control of the stream at the gaging station. The 1,400,000 acre-foot Galloway reservoir described could have provided a minimum discharge of 600 cfs, including losses. It is safe to assume that the inflow between the gage and the Galloway damsite which drains an additional 800 square miles including Crane and Bear Creeks, is sufficient to provide for reservoir losses. A full reservoir on August 1, 1928 would have been completely depleted on October 1, 1938 and would have refilled again by April 1, 1943. Except for the 11-year period 1928 through 1938, the reservoir would have been more than adequate. If, as estimated, the 340-foot dam would have provided an average head of 280 feet, the continuous power potential of the site computed at 80 percent efficiency is 15,230 kilowatts. The large reservoir would make operations very flexible and, if used for only six hours per day, the plant could generate 60,000 kw (360,000 kwh per day). Any water diverted from the Cascade Reservoir could be added to the 600 cfs for producing power.

Mann Creek.--The reservoir on Mann Creek as proposed by the Bureau of Reclamation at the Spangler site in sec. 11, T. 12 N., R. 5 W., would be for irrigation purposes. It has a capacity of 13,210 acre-feet with a dam 133 feet high. A gaging station in the same section as the dam site shows an average discharge over a 23-year period of 42 cfs. However, it varies from a flow of zero to a maximum during flood stage of 1,540 cfs, so regulation is also required on this stream for advantageous use of the water.

No power has been assigned to the proposed reservoir by the Bureau of Reclamation inasmuch as there are over 5,000 acres in the Mann and Monroe Creek Basins which could be irrigated with water stored in the reservoir. Spangler Dam will create a head averaging 76 feet at the site and could regulate the flow to about 25 cfs. If irrigation requirements are ignored the potential power would be only 125 kw. It is not practical to develop power on Mann Creek.

Mann Creek to Weiser.--Between Mann Creek and its confluence with Snake River, Weiser River flows through a broad relatively flat irrigated valley. The fall amounts to about 40 feet in seven miles. No damsites are available and power development is not practical.

NEW RESERVOIR SITE DATA

Several reservoir sites for which no previous data have been published have been measured on 1:62,500 scale quadrangles or on maps of the sites made by the Bureau of Reclamation or the Geological Survey. Area and capacity tables for these sites follow.

Area and capacity of Middle Fork Reservoir Site,
Middle Fork Weiser River, Idaho
with dam in sec. 14, T. 15 N., R. 1 W.,
(Drainage area 84 square miles)

Altitude (feet)	Area (acres)	Capacity (acre-feet)
3000	0	0
3020	15	150
3040	42	700
3060	68	1,800
3080	72	3,300
3100	122	5,400
3120	150	8,200
3140	182	11,500
3160	217	15,500
3180	238	20,200
3200	310	25,900

Note: Table from area-capacity graph of Bureau of Reclamation.

Area and capacity of Mesa Reservoir Site,
Bacon Creek, Idaho
with dam in sec. 18, T. 15 N., R. 1 W.
(offstream - Middle Fork Weiser River)

Altitude (feet)	Area (acres)	Capacity (acre-feet)
2920	0	0
2960	50	1,000
3000	120	4,400
3040	220	11,200
3080	460	24,800

Note: Measured from 1:62,500 scale Cambridge and Council quadrangles.

Area and capacity of Rush Creek Reservoir Site,
Rush Creek, Idaho
with dam in sec. 15, T. 15 N., R. 3 W.,
(Drainage area 26 square miles)

Altitude (feet)	Area (acres)	Capacity (acre-feet)
2980	0	0
3000	10	100
3040	60	1,500
3080	160	5,900
3120	350	16,100
3160	820	35,500

Note: Measured from 1:62,500 scale Cambridge quadrangle.

Area and capacity of Fourbit Reservoir Site,
Little Weiser River, Idaho
with dam in sec. 2, T. 13 N., R. 1 E.,
(Drainage area 40 square miles)

Altitude (feet)	Area (acres)	Capacity (acre-feet)
3760	0	0
3780	6	60
3800	11	230
3820	19	530
3840	31	1,030
3860	43	1,770
3880	59	2,790
3900	72	4,100
3920	86	5,680
3940	108	7,620
3960	134	10,000
3980	159	12,900
4000	185	16,300

Note: Area and capacity from 1:12,000 scale map of reservoir by Geological Survey.

Area and capacity of King Hill Creek Reservoir Site,
Little Weiser River, Idaho
with dam in sec. 28, T. 14 N., R. 1 E.,
(Drainage area 57 square miles)

Altitude (feet)	Area (acres)	Capacity (acre-feet)
3560	0	0
3600	30	600
3640	90	3,000
3680	150	7,800
3720	240	15,000
3760	340	27,000
3800	450	40,000

Note: Measured on 1:62,500 scale Council quadrangle.

Area and capacity of Monday Gulch Reservoir Site,
Monday Gulch (offstream), Little Weiser River, Idaho,
with dam in sec. 8, T. 14 N., R. 1 W.

Altitude (feet)	Area (acres)	Capacity (acre-feet)
2935	0	0
2960	60	750
2980	115	2,400
3000	385	7,200
3020	735	18,000
3040	1130	37,000

Note: Table from area-capacity graph from Bureau of Reclamation.

Area and capacity of Mickey Gulch Reservoir Site,
with dam in sec. 14, T. 14 N., R. 2 W.,
(offstream - Little Weiser River, Idaho)

Altitude (feet)	Area (acres)	Capacity (acre-feet)
2820	0	0
2840	30	300
2880	110	3,100
2920	330	11,900
2960	630	31,100
3000	790	59,500

Note: Measured from 1:62,500 scale Cambridge quadrangle.

Area and capacity of Junction Gulch Reservoir Site,
with dam in sec. 34, T. 15 N., R. 2 W.,
(offstream - Little Weiser River)

Altitude (feet)	Area (acres)	Capacity (acre-feet)
2850	0	0
2880	20	300
2920	110	2,900
2960	260	10,300

Note: Measured from 1:62,500 scale Cambridge quadrangle.

Area and capacity of Concrete Reservoir Site,
Weiser River, Idaho
with dam in sec. 22, T. 12 N., R. 4 W.,
(Drainage area 1,160 square miles)

Altitude (feet)	Area (acres)	Capacity (acre-feet)
2280	0	0
2320	40	600
2360	150	4,400
2400	360	14,000
2440	600	34,000
2480	830	62,000
2520	1,390	106,000
2540	2,130	140,000

Note: Measured from 1:62,500 scale Mann Creek quadrangle.

Area and capacity of Galloway Reservoir Site,
Weiser River, Idaho
with dam in secs. 25 & 26, T. 11 N., R. 4 W.,
(Drainage area 1,460 square miles)

Altitude (feet)	Area (acres)	Capacity (acre-feet)
2195	0	0
2200	10	25
2240	335	6,900
2280	1,300	39,600
2320	2,590	117,000
2360	3,720	244,000
2400	4,798	414,000
2440	6,030	630,000
2480	7,340	898,000
2520	8,940	1,223,000
2540	10,300	1,416,000

Note: Measured from 1:62,500 scale Mann Creek quadrangle.