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UNITED STATES DEPARTMENT OF THE INTERIOR
Harold L. Ickes, Secretary
GEOLOGICAL SURVEY
W. C. Mendenhall, Director

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WATER UTILIZATION IN THE SNAKE RIVER BASIN

BY
W. G. HOYT
WITH A PREFACE
BY
HERMAN STABLER



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Construction of the reservoir to this altitude would necessitate the partial relocation of the Oregon Short Line Railroad and the Oregon Trail Highway, both of which cut across the extreme upper end of the site. Observed and estimated run-off records for 1904 to 1925 indicate that the annual run-off at the site has varied from 65,600 to 347,000 acre-ft.

WALLOWA RIVER BASIN

Wallowa Lake Reservoir, Oreg. (12HO 1).—Storage of 39,760 acre-ft. is obtained at the 25-ft. level in Wallowa Lake, in T. 3 S., R. 45 E. The lake, formed by a glacial moraine, is about $3\frac{1}{4}$ miles long and 1 mile wide and is widely famous as one of the beauty spots of the Northwest. The dam is a concrete structure of the gravity type, at the outlet of the lake, in sec. 5, T. 3 S., R. 45 E. The lake fluctuates several feet. Dam constructed and reservoir operated by the Associated Ditch Cos. of Wallowa Valley.

Minam Lake Reservoir, Oreg. (12HO 2).—Minam Lake, in T. 4 S., R. 44 E., is utilized for storage of about 1,000 acre-ft. through the construction in 1916 by the Minam Lake Reservoir Co. of two earth dams, one 10 ft. high at the south end of the lake and one 5 ft. high at the north end. The stored water is diverted into the Lostine River through a headgate in the north end and a ditch about 500 ft. long. It is used to supplement water for irrigation of about 6,500 acres in Wallowa Valley in the vicinity of Lostine.

SALMON RIVER BASIN

Goose Lake Reservoir, Idaho (12JH 1).—In 1926 the Goose Lake Reservoir Co. built an earth dam 1,100 ft. long and 18 ft. high in sec. 13, T. 20 N., R. 2 E., at the outlet of Goose Lake on Goose Creek. The dam impounds about 3,500 acre-ft., used for storage.

CLEARWATER RIVER BASIN

Moore's Lake Reservoir, Idaho (12KD 1).—In 1924 the Grangeville Electric Light & Power Co. constructed a timber-crib dam in sec. 1, T. 26 N., R. 4 E., at the outlet of Moore's Lake, a tributary to John's Creek, which in turn is a tributary to the South Fork of the Clearwater River. The dam is 68 ft. long and 17 ft. high. The lake has an area of about 72 acres, with a range in stage of 11 ft., which provides a capacity of 750 acre-ft. The reservoir has not been used for several years. Drainage area, about 2 square miles, between altitudes of 6,700 and 8,300 ft. Estimated mean annual run-off, between 800 and 1,000 acre-ft. Stored water used to augment the low summer flows at developed sites on the South Fork of the Clearwater River. License from Federal Power Commission in connection with South Fork Clearwater plant (Idaho project 204).

Soldier Meadow Reservoir, Idaho (12KD 2).—In 1924 the Lewiston Orchards Irrigation District constructed an earth-fill dam 530 ft. long, 57 ft. high, in sec. 29, T. 33 N., R. 3 W., across Sweetwater Creek. The dam impounds about 2,000 acre-ft., used for irrigation.

UNDEVELOPED STORAGE

SUMMARY

Irrigation development has reached a point in the Snake River Basin beyond which there can be no large increase in acreage without the construction and utilization of additional storage reservoirs or through the development of additional water supply by pumping. Moreover, the recurrence of years of abnormal low run-off has demon-

strated the desirability of holdover storage for irrigated areas which under normal climatic and run-off conditions have a reasonably adequate water supply. In addition to present irrigated areas there is at least 1,300,000 acres of arable land in the Snake River Basin which may eventually be irrigated, only a small part of which can be developed without the use of storage. Storage, either for flood prevention or for power regulation, may also be desired eventually in certain localities. To meet these possible future requirements this report describes 97 sites having a combined capacity of 7,746,000 acre-feet located by basins and States as follows:

	Number	Capacity
By basins:		<i>Acre-feet</i>
Snake River direct.....	4	3,363,000
Snake River tributaries.....	93	4,252,000
By States:		
Wyoming.....	5	848,350
Nevada.....	2	62,600
Idaho.....	64	5,714,000
Oregon.....	21	592,000
Washington.....	5	398,000

It is impossible to predict which of the storage sites described will be developed first or when the development will take place. It seems reasonably certain, however, that activities in connection with additional storage will be increased as a result of the continued recurrence of years of low run-off. Future storage development is so closely allied with future irrigation development that no definite scheme of development can be outlined. An attempt has been made in the complete report, however, to describe all known sites and to discuss briefly the water and storage requirements necessary for more complete utilization of the present water supply.

On the Snake River above Milner between 1,000,000 and 1,500,000 acre-feet of additional storage will be required eventually for new lands. Storage primarily for flood control may also be necessary to remedy a situation below Heise, where there is a possibility of sufficient shift in the location of the channel to affect seriously irrigation deliveries. In parts of the Henrys Fork Basin water shortages are acute. These shortages may eventually be remedied by utilizing storage sites in the Henrys Fork or Snake River Basins. In the Mud Lake area the development of storage and reduction of water losses is essential to future extension of irrigation and stabilization of water supply. In the upper Owyhee Basin in Nevada storage is desirable for the rehabilitation of Indian lands. In the Boise River Basin holdover storage or diversions into the basin will doubtless be desirable to relieve late summer shortage and for the extension of present areas.

Potentially irrigable areas in Snake River Basin—Continued

BY STATES		Acres
Wyoming.....		15, 000
Nevada.....		25, 000
Idaho.....		1, 053, 000
Oregon.....		161, 000
Washington.....		37, 000
		1, 291, 000

In addition to irrigation on the new areas listed above more reliable water supplies will be made available for lands now under canal through the use of additional storage, diversions, pumping from present sources, pumping in connection with drainage and from ground water, reduction in canal losses, and improved irrigation practices. A summary of the probable activities in this connection for the larger areas is as follows:

Henry's Fork Basin: Additional storage.

Mud Lake and Camas Creek: Storage on tributary streams; drainage of swampy areas and pumping, and diversion from Henry's Fork or Snake River.

Big Lost and Little Lost Rivers: Pumping.

Big Wood and Little Wood Rivers and Fish Creek: Pumping.

SNAKE RIVER, Henry's Fork to Milner: Drainage and pumping.

Minidoka area: Drainage and pumping.

North Side and South Side Twin Falls areas: Drainage and pumping.

Boise River: Additional storage or diversions into basin, drainage, and pumping.

Upper Owyhee River: Additional storage.

Malheur River and Bully Creek: Storage, drainage, diversions into basin, and pumping.

At the present time there seems to be little economic justification for greatly increasing the cultivated area, but no one can predict just when the situation will be reversed. During the intervening time there is an opportunity for the perfection of a complete plan for the utilization of the Snake River. That such a plan is necessary for complete water utilization will be evident by a reading of this report. It is realized that in the future, as in the past, political expediency or economic considerations, apart from engineering features, may be dominating factors in such utilization. For these reasons no detailed plan for development is herein suggested. An attempt has been made, however, to present in this report the available essential information that should be of value in the formulation of a comprehensive plan.

WATER SUPPLY

Present or future power rights not being taken into account, the amount of water that passes the Milner diversion dam is an index of the present utilization of the Snake River for irrigation above Milner and a measure of future possibilities. During the 10 years 1921-30 this flow has been as follows: