WATER RESOURCES RESEARCH INSTITUTE

Methodology For Evaluating Potential Surface-Water Reservoir Sites In Idaho

Progress Report for Period of
September 1, 1968 to September 30, 1969

by
John J. Peebles

Water Resources Research Institute
University of Idaho
Moscow, Idaho
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INTRODUCTION

Because of the current nation-wide interest in regional water-resources planning and development, the Idaho Legislature created the Idaho Water Resource Board, a new agency charged with planning for the development and conservation of the water resources of the State of Idaho. Through contracts with various agencies, the Board is now engaged in a water needs study of the State. These contracts include an "Agricultural Water Needs" study, a "Recreation Water Needs" study, and a "Municipal and Industrial Water Needs" study.

A logical step in the preparation of a State Water Plan is the determination of resources and a classification of these resources into a workable inventory for use in planning studies. There is a need to inventory not only the water supply, but also the facilities by which this supply can be put to use. An important means of utilizing water is the storage reservoir. Thus, an inventory of existing and potential surface-water reservoirs in Idaho is logically one of the next steps the Water Resource Board should take in planning for development of the State's water resources.

Similar studies have been undertaken in other areas. For example, the Illinois State Water Survey has completed three studies covering approximately two-thirds if the State entitled "Potential Surface-Water Reservoirs of South-Central Illinois". In connection with the Willamette Basin Cooperative Study, the Oregon State Water Resources Board has nearly completed an inventory of damsites entitled "Willamette Basin Damsite Study".

The Idaho Water Resource Board, in connection with its cooperative program with the University of Idaho's Water Resources Research Institute, has authorized under a contract dated October 7, 1968, a study of Idaho reservoir sites, both developed and undeveloped. The study is to be conducted during the period from September 1, 1968 to September 30, 1971.

PURPOSE AND SCOPE

The purpose of the study is to establish criteria needed to evaluate surface-water reservoir sites in Idaho and to inventory existing reservoirs and potential reservoir sites in the State in as detailed form as time and funds will permit.

This is not the first study of reservoir sites in the State as various agencies have made numerous investigations of reservoir sites and have studied the selection of these sites in various degrees of detail. There never has been, however, any comprehensive general survey of the State to locate reservoir sites for all purposes and for multipurpose water development. One of the objectives of this study is to gather and make an evaluation of all pertinent reservoir information.

In the case of undeveloped reservoirs, the study is reconnaissance in nature and no detailed field surveys will be made. The use of existing investigational data is anticipated to the fullest extent possible. The results of the study will not take the place of individual and far more detailed engineering surveys needed to establish final project feasibilities and to obtain information for design purposes. Detailed economic studies will not be made, but relative land and material costs will be considered. Favorable topography and stream runoff will be other important factors in evaluating individual sites.

In addition to the collection of data on existing reservoirs and on undeveloped reservoir sites, an attempt will be made to establish planning criteria for reservoir site selection. What is desired is a yardstick to measure the worth, whether for justification of the reservoir site on its own merits, or for its selection over an alternate site.

PLAN OF STUDY

The proposal calls for the performance of the project by the Water Resources Research Institute of the University of Idaho under the guidance of a project director, who will devote approximately 1/3 of his research time to the project. A research technologist, who is to be trained on the project, will handle the details of the work and will prepare a thesis in partial fulfillment of the requirements for a master's degree in Civil Engineering. In addition, other professional help may be called on from time to time on special problems, and subprofessional help will be employed to do routine drafting, stenographic and similar work. A progress report is to be submitted in the fall of 1969 to provide a review of accomplishments to date and to provide a medium for obtaining comments from the Idaho Water Resource Board and from other State agencies and Federal organizations interested in reservoirs. A final report is to be published in the fall of 1971.

As envisioned originally, the initial phase of the study was to consist of the establishment of criteria for evaluating surface-water reservoir sites. This was considered to be an extremely important part of the overall study, as poorly conceived criteria could result in an unmeaningful inventory. Parameters to be considered were to include actual stream discharge, ratio of discharge to reservoir capacity, ratio of watershed area to reservoir capacity, average annual precipitation, vegetative cover, watershed sedimentation potential, minimum practical surface area, minimum practical depth at dam, mean depth, required filling time, storage losses by reason of evaporation and sediment deposition, maximum length of dam, maximum height of dam, ratio of capacity to cost of dam and reservoir, and ratio of capacity to cost per acre-foot of storage.

The second phase of the study, which was to proceed simultaneously with the establishment of criteria, was to consist of the accumulation of data and the formulation and organization of the final inventory of sites both developed and undeveloped. Inventory maps were to be prepared locating all reservoir sites that could be identified. Information on existing reservoirs would help to form a basis for the criteria evaluation of potential sites. In the final report, an analysis of all sites was to be made based on suitable criteria that had been developed in the initial phase of the work. This would entail a quantification of all factors on some acceptable rating basis.

In order to obtain the advice and comments of those experienced in the planning, design, construction, and operation of surface-water reservoirs, an ad hoc committee on reservoir site selection criteria was convened on November 21, 1968. The following people attended this meeting:

NAME	AGENCY REPRESENTED
C. C. Warnick	Water Resources Research Institute, U of I
J. J. Peebles	Water Resources Research Institute, U of I
H. L. Moran	Water Resources Research Institute, U of I
Jack Chugg	College of Agriculture, U of I
Kenneth Dunn	Idaho Dept. of Reclamation, Boise
Ralph Melin	Idaho Water Resource Board, Boise
V. L. Despain	U.S. Forest Service, Ogden
E. L. Noble	U.S. Forest Service, Ogden
C. D. Blake	U.S. Forest Service, St. Maries
G. A. Stensatter	U.S. Forest Service, Missoula
L. A. Reed	F.W.P.C.A., Portland
H. D. Hafterson	U.S. Bureau of Reclamation, Boise
W. L. Robison	U.S. Soil Conservation Service, Moscow
Frank Parsons	Corps of Engineers, Walla Walla
C. K. Dam	Federal Power Commission, San Francisco
Hugh Harper	U.S. Bureau of Land Management, Boise
W. L. Burnham	U.S. Geological Survey, Boise
D. E. Barclay	Idaho Power Co., Boise
J. N. Wendle	Washington Water Power Co., Spokane
Don Watkins	Utah Power and Light Co., Salt Lake City

Primary topics of discussion at the meeting were as follows:

1. Broad guidelines for economic justification
2. Need for reservoirs
3. Specific requirements for reservoirs
4. Establishment of numerical ratings
5. Evaluation of potential reservoir sites for a range of development
6. Evaluation of foundation conditions, seepage, evaporation, types of dams, economics of construction, etc.
7. Development of parameters for evaluating reservoir sites
8. Other aspects of reservoir site evaluation
9. Recapitulation

At the outset of the meeting there was considerable comment concerning the establishment of needs for individual reservoir sites. However, as the discussion progressed, it was generally concluded that a study of needs would constitute a comprehensive project in its own right and that because of time and money limitations the needs factor associated with the inventory of reservoir sites should not be considered. In any event, needs projected today might not fulfill the requirements of the future. As a need arises it is likely that there would be several sites included in the inventory from which one could be selected for development. Thus, the physical parameters of reservoir sites should be evaluated in the inventory so that a selection could be made at the time that a need was established. Should the inventory be biased according to needs, the study would require far more time and funding than are available.

Because benefits are the fulfillment of needs, it was concluded that benefit-cost studies in connection with the inventory also should not be made at this time. This in no way would eliminate broad cost estimates used to compare various physical parameters of potential sites.

In connection with the establishment of numerical ratings and the development of parameters, interest was shown among the committee members in the possibilities of using coefficients and exponents obtained from log-log plots of pairs of parameters such as storage-elevation, surface area-elevation, head-elevation, etc., as a means of evaluating the physical features of reservoir sites.

Considerable discussion was generated concerning the minimum size of existing reservoirs and potential sites that should be considered in the study. Also, the amount of information to be obtained and reported on small sites was discussed. The concensus of opinion seemed to be that for small reservoirs involving small dams, exact locations for dams were not as critical as locations for large dams. In other words, on many small streams small dams often could be constructed almost anywhere.

As a result of the meeting of the ad hoc committee, some changes were made in the original concept of the project and a final plan of study was prepared.

The project is divided naturally into two parts, the preparation of criteria for evaluating sites, and the actual inventory of existing reservoirs, and potential reservoir sites. It was decided that while maps and other information was being compiled, the research technologist should make a comprehensive search for literature pertaining to reservoir planning criteria in general and to means of evaluating and comparing potential reservoir sites. When sufficient information was available, a systematic inventory of existing lakes and reservoirs was to be prepared. In order to do this it would be necessary to determine the minimum size of lake or reservoir to be considered. Concurrent with other work being carried on in this phase of the project, preliminary study was to be made of the type of information to be accumulated and the best methods of presenting this information in the reports.

It seemed desirable to establish some means of locating and identifying reservoirs sites, especially in the primitive areas of the State where the rectangular system of public land surveys does not exist. Also, as a result of determining the minimum size of reservoir to be considered, there would be an inherent limitation on the size of stream to be considered. Thus some means would have to be devised for determining which streams in the State should be considered in the inventory.

Because information on existing reservoirs would help in the study of criteria for evaluating potential reservoir sites, it was decided to include the existing reservoir portion of the study in the progress report for the fall of 1969 as this reporting period would come somewhat early in the life of the project. This report would include, in addition to the inventory material, a discussion of the entire project plan.

During the winter of 1969-1970, the research technologist would direct the work of technicians in inventory compilations and measurements for potential reservoir sites. At the same time, based on studies of existing reservoirs and the literature, he would study in detail various criteria for evaluating potential sites. From these studies he would prepare a thesis to be submitted in the fall of 1970.

Inventory compilations and measurements would be continued during the summer of 1970 and would be completed during the following winter. Based on information contained in the thesis and all of the inventory compilations, the final report would be prepared in the Spring of 1971 and would be published during the following summer for submittal to the Board prior to September 30, 1971.

PROGRESS OF STUDY

The project director and principal investigator is John J. Peebles, Associate Professor Civil Engineering. Henry L. Moran was engaged as graduate student and research technologist to carry on the details of the study. He commenced work on the Project September 1, 1968. Professor Robert L. Schuster, head of the Department of Civil Engineering, agreed to help with the project on special problems concerning foundations and materials of construction. It is estimated that enough routine work such as map measurements, computations, and typing will be necessary to require the equivalent of one full-time technician.

The first task of the research technologist was a preliminary literature search. This included not only books and articles concerning methods of evaluating reservoir sites but also public documents listing and describing existing reservoirs and potential reservoir sites in Idaho. The books and articles included those discussing physiography, geomorphology, terrain studies, and methods of measuring and expressing topographic forms. As might be expected, the number of books and articles of this nature were limited in number. However, the search for this type of information will be continued through the winter of 1969-1970 in connection with preparation of the graduate student's thesis. The number of documents listing and describing reservoirs and reservoir sites in Idaho also are not numerous.

In addition to the literature search, inquiries were sent to water resources boards and water resources research institutes in all of the states which have such organizations, to determine how they might be approaching this same type of study. There was a good response to these inquiries, but most of those replying indicated that they had not made detailed reservoir inventories nor did they have any plans at present to make such inventories. It was pointed out that in some states, such as in the midwest, there are so few reservoirs and potential reservoir sites that an inventory is unneccessary. Most of those replying, however, showed a lively interest in our study and indicated that they would like to have a copy of our report for possible use as a guide in the event that similar studies are made by their organizations.

During the first part of the study, a map file was completed by acquisition of maps from several sources. This file includes a complete set of U.S. Geological Survey (USGS) quandrangle maps, both published and advance sheets. These comprise only maps at scales of 1:62,500 and 1:24,000. In addition, a complete set of USGS river plan-profile sheets was acquired. A complete set of Army Map Service quandrangle sheets at a scale of 1:250,000 was already available. Also already available was a complete set of county maps of the Idaho Department of Highways Planning Survey series. Finally, a complete set of modern fire-control maps of the U.S. Forest Service was acquired.

A problem needing solution early in the study was the minimum size of existing lakes and reservoirs to be considered. No guide lines were given for this limitation in the contract or the original project proposal. It was recognized that if all existing reservoirs, including stock ponds, and all lakes down to sizes as small as a few acrew were to be considered in the inventory that the size of the resulting publication would be excessive. Also, it was unlikely that uniform information could be obtained on all of the smaller reservoirs and lakes. In any event, the storage in these small bodies of water would not be significant in the overall inventory of the state's reservoirs. After considerable deliberation it was arbitarily decided not to consider any lake or reservoir with a capacity of less than 1,000 acre-feet. Where the only information on a lake or reservoir consisted of its delineation on a map, no body of water with an area less than 40 acres would be considered. As a result of these limitations, all ponds used primarily for stock watering; small irrigation, municipal, and industrial ponds; and many small mountain lakes are eliminated from the inventory.

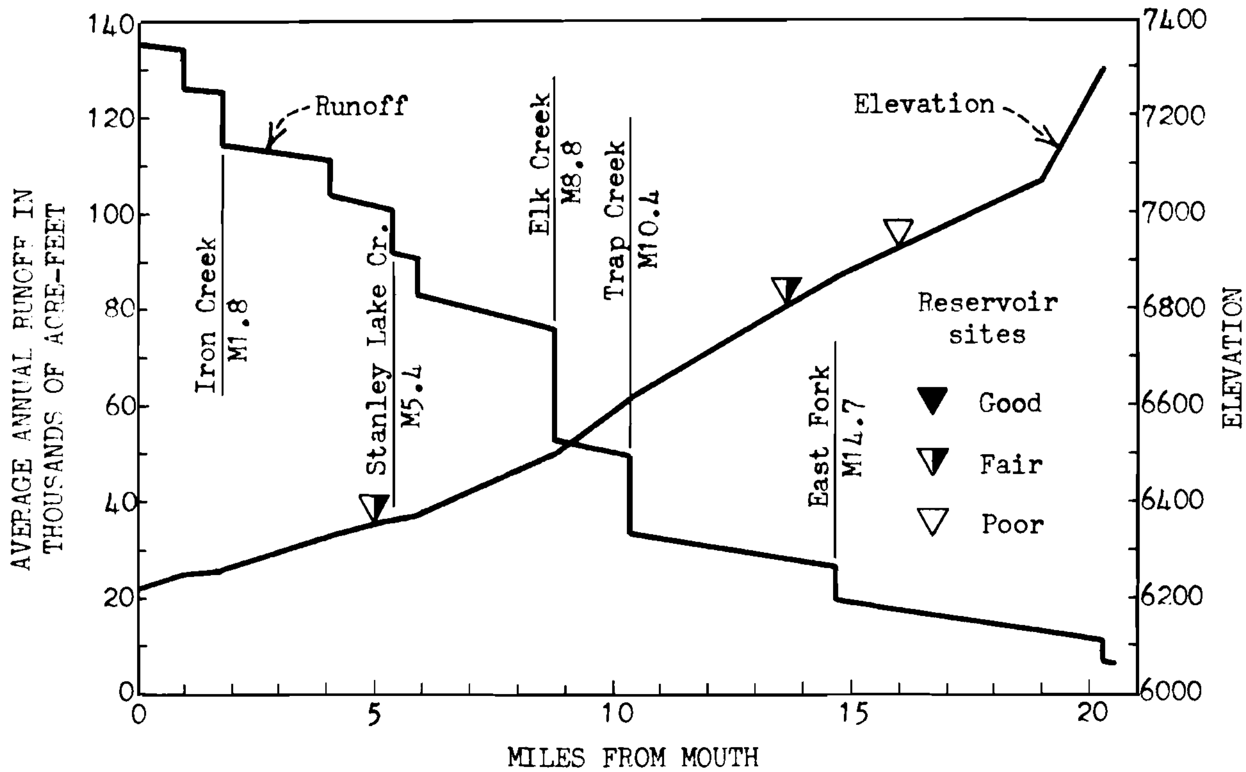
As soon as the map file had been completed, a careful search was made to locate all existing lakes and reservoirs meeting the criteria discussed above, because this information was to be an integral part of the study and because it had been decided that existing lakes and reservoirs should logically be a component of the 1969 progress report, submission of which was required relatively early in the life of the project. Along with the map study, tabulations of existing reservoirs were made from lists in Federal and State publications and from information obtained from irrigation companies and private utilities. The data from these several sources were compared and checked to avoid duplication and then were tabulated on columnar sheets by major drainage basins. These tabulations are shown in Appendix C.

During the fall of 1968, a great amount of thought was given to the factors to be considered in the reservoir study and the means for reporting and illustrating these factors in the reports. It was decided that for an existing lake or reservoir the tabular data should include identification number, name, stream, county, location by section, township, and range (where the public land survey system exists), owner, purpose or uses of the reservoir, Idaho Department of Reclamation permit number, surface elevation, surface area, capacity, length of shoreline, and the elevation-capacity relationship as expressed by a coefficient, an exponent, and a reference elevation. In addition, a brief paragraph on each of the larger reservoirs would describe the structural features of the dam, spillway, and outlet works. Most of the latter information would be compiled from various existing publications. (See Appendix B.) Several photographs showing typical reservoir installations may be included in the final report.

In the case of potential reservoir sites, it was concluded that the data to be reported should not be limited to a single level of development. Instead, some means should be devised so that the data to be reported would be suitable for any range of development from a relatively small project up to the maximum capacity of the stream at that particular location. The proposed plan for describing potential reservoir sites consists first of dividing the sites into those on the larger streams which have been studied previously in some detail by other organizations, and those on smaller tributary streams which have not been studied previously. For each of the sites on the larger streams a brief descriptive paragraph would be given describing the reservoir area and the physical conditions at the damsite. Most of this information would be compiled from existing publications. Tabular data for each of these sites would include identification number, name, stream, county, location by section, township, range (where the public land survey system exists), and relationships such as elevation-capacity, elevation-area, head-capacity, elevation-shoreline length, elevation-cost, etc., expressed in terms of coefficients, exponents, and reference elevations. Photographs showing especially promising sites might be included in the final report.

On the smaller tributaries, because of the numbers involved, it would be impractical to attempt to describe each potential reservoir site for the reasons of space limitations and the limited time available to compile such information. It was believed that on most of these streams certain reaches would be suitable for construction of small dams almost any place while other reaches, such as flood plains, would not be suitable for dams anywhere. Therefore, it was decided that information to be reported on each of these small tributaries would include a brief description of the stream basin including perhaps a single sentence on each of the following: 1. General topographic description of the stream basin; 2. General geology of the area; 3. Cultural development of the basin including existing water resources developments; 4. Reaches of stream suitable for reservoirs, estimate of water-tightness of reservoir sites, vegetation requiring removal, and relocation problems relative to habitations, transportation facilities, and utility lines; 5. Reaches of stream suitable for dam sites, general foundation conditions for damsites, recommendations for types of dams, local construction materials available for dams; and 6. Other remarks including sedimentation potential and other water quality considerations. In addition, for each stream a small chart would be prepared showing a plot of average annual runoff versus stream mileage. On the same chart a stream profile would be included. Runoff data would be obtained by measurements from water-yield maps in the Idaho Water Resources Inventory (Idaho Water Resource Board, 1968). An example of a description and chart for Valley Creek, a tributary of the Salmon River, is shown in Figure 1.

It was proposed to obtain the information listed above for small stream basins from existing topographic maps, geologic maps and reports, and other publications. In areas not covered by information of this nature, some reconnaissance-type field work would be required. This field work would be divided between the two summers of 1969 and 1970. The first field trip was made from August 4 to August 7, 1969 by Professor Peebles and Professor Schuster, and from August 8 to August 15, 1969 by Professor Peebles. During this trip 23 streams were



VALLEY CREEK (1396S)

Valley Creek basin consists of a U-shaped valley in its upper reaches and a wide valley flanked by low hills in the lower reaches. The basin is underlain by granitic rocks of the Idaho Batholith. There are some ranches in the lower reaches and some water is diverted for irrigating pastures. Water could be stored almost any place in the basin, but because there are few good damsites, there are few good reservoir sites. Dams at the few damsites would be limited in their heights because of low terraces on the abutments. Much of the material overlying bedrock is a mixture of gravel, sand, and silt, but it is unlikely that leakage from the reservoir sites would be a problem. Reservoirs in the lower reaches would require relocation of roads and utility lines and abandonment of ranches. No clearing would be required in these areas, but dense growths of lodge pole pine would require clearing from sites in the upper reaches of the stream. Earthfill-type dams are recommended with materials to be obtained from the reservoir areas. Special searching might be required to locate adequate quantities of suitable core material. Sedimentation and other water quality problems will not be a factor in the basin.

Figure 1. Example of description and chart for a small stream (Valley Creek, a tributary of Salmon River).

examined. In addition to compiling the required information for all of these streams, it was found to be difficult in most cases to separate out reaches suitable and not suitable for reservoirs and dams. Instead, most streams contain one or more distinct reservoir and dam sites. Of course, the quality of these sites varies. Where adequate topographic maps exist, reservoir sites and damsites can be evaluated from them, although not to the degree of refinement possible in a field examination. Where mapping is inadequate, it is proposed that 1:20,000 airphoto coverage be obtained for locating and evaluating reservoir sites and damsites stereoscopically.

Reservoir sites and damsites will be rated as being good, fair, or poor. The factors to be considered in rating a reservoir site are the breadth, length, and slope of the impoundment area, the estimated water-tightness of the materials underneath the site, and the relative number of habitations and communication facilities requiring relocation. The factors to be considered in rating a damsite are the required dimensions of the structure in relation to the amount of water to be impounded, the topographic configuration of the site, the general geology of the foundation area, and the proximity of suitable construction materials. Because good, fair, and poor reservoir sites may be in any combination with good, fair, and poor damsites, the field work was reported in this manner and it is proposed that the final rating for a reservoir site be obtained from the following table:

		Reservoir site rating		
		Good	Fair	Poor
Damsite rating	Good	Good	Fair	Fair
	Fair	Good	Fair	Poor
	Poor	Fair	Poor	Poor

Damsites will be shown symbolically on the charts with the resultant reservoir site rating included (Figure 1).

In addition to the descriptions, tables, and charts of existing reservoirs and potential reservoir site, all sites will be plotted by identification number on the same set of 9 major drainage basin maps as included in the Idaho Water Resources Inventory (Idaho Water Resource Board, 1968). For the 1969 progress report, a set of single page size maps will be used to show locations of existing reservoirs.

An important part of the study is the development of criteria for evaluating individual reservoir sites and for comparing the merits of one site against another. The importance of various reservoir parameters varies depending on the use to be made of the reservoir. For example, where storage is of primary concern, the elevation-capacity relationship is important. For hydroelectric power production the head-capacity relationship is important, for recreation the elevation-area and the elevation-shoreline length relationships are important, and for most uses the elevation-cost relationship is of importance. All of these relationships could, of course, be shown for each reservoir site by a set of graphs. This would, however, require more space in the final report than is practicable to provide. Some preliminary experiments with area-capacity data indicated that the relative efficiency of storage reservoirs could be compared on the basis of coefficients and exponents obtained from a log-log plot of these data. These data plot as a straight line or very nearly as a straight line. It is believed that the other relationships suggested above also would plot as straight lines from which coefficients and exponents could readily be obtained. These values could then be displayed compactly on a single line in a table of reservoir site information. The principal use of these values would be for evaluating the relative efficiencies of two or more reservoirs in an area to perform the particular functions required. In additon, these values could be used to easily reconstruct the equation for the particular relationship so that actual values of one parameter could be computed for a given value of the other parameter.

In the case of the elevation-capacity relationship, the basic equation is $C = k(E - R)^a$, where C is the capacity of the reservoir in acre-feet at elevation E in feet, R is a reference elevation in feet equal to the zero-storage elevation, k is a coefficient, and a is an exponent. The line is plotted with elevation as the ordinant and storage as the abscissa. The slope of the line as measured by the exponent a is a measure of the storage efficiency. A large value of a indicates that the increase in capacity for a unit increase in elevation is less than for a small value of a in which the increase in capacity for a unit increase in elevation is relatively large. Thus, for Dworshak reservoir, which is in a relatively narrow, steep-walled, canyon, the value of a is 3.05 while for American Falls reservoir, which is in a relatively broad, flat, area, the value of a is 1.934.

The major effort of the research technologist during the winter of 1969-1970 will be to develop other criteria similar to the elevation-capacity relationship. In additon to studying the other parameters mentioned above, a diligent search of the literature will be made to see if additional reservoir criteria can be devised using the principals of physiography, geomorphology, and terrain measurement.

The contract and original proposal for the study not only did not stipulate the minimum size of reservoir to be considered, they also did not give the minimum size of stream to be considered. There was much deliberation in arriving at this minimum size. Although the minimum size of existing reservoirs to be considered was set at 1,000 acre-feet, it was estimated that if potential reservoir sites were investigated on all streams in the State down to and including those with an average annual runoff of 1,000 acre-feet that several thousand streams would be involved. As this was an excessive number, it was decided, after considerable thought, to set the minimum size of stream at an average annual runoff at the mouth of 50,000 acre-feet and to extend the investigations up the streams to the point where the average annual runoff was 10,000 acre-feet.

There are gaging stations on relatively few streams in Idaho in the size range decided upon above. Therefore, where gaging records do not exist, some means was required to select the small streams in the State for study without the necessity, initially, of determining average annual runoff by time-consuming measurements on the water-yield maps. It was decided to make log-log plots of average annual runoff in acre-feet versus watershed area in square miles for all of the smaller streams in the State for which there are records. Because of large variations in this relationship between portions of Idaho with widely differing climatic situations, separate plots were made of the six major drainage basins (see Figures 2 to 7, inclusive). Best fitting lines were drawn on these plots from which areas were obtained for runoff values of 50,000 acre-feet and 10,000 acre-feet. To facilitate selection of the streams in each basin by use of small-scale maps, each of the areas in square miles obtained from the plots was rounded off to some equivalent multiple or fraction of a full township of 36 square miles. These values for each drainage basin are shown below:

Average annual runoff in acre-feet	Major Drainage Basin					
	Bear	Clearwater	Salmon	Southwest Idaho	Upper Snake	Panhandle
50,000	10	2	2	2	4	1
10,000	1	1/3	1/3	1/3	1 1/2	1/3

On the basis of the above criteria, over 300 streams were selected for study. Any stream in the list of those selected is subject to elimination from further consideration if it is found, in the course of detailed measurements of water yield, that it does not meet these criteria. Similarly, if runoff measurements on streams in an area are consistently running higher than original estimates, additional streams in that area, which in the initial selection were considered to be too small, will be measured and added to the list if they meet the criteria.

It seemed desirable to give an identifying number to each existing lake and reservoir and to each potential reservoir site. Several numbering systems have been devised in the past for reservoirs and lakes, but these systems are adapted to large regions and are of only incidental importance to Idaho. A numbering system in which the various components of a number could be used to accurately denote the location of a reservoir in any part of the State was desired. A numbering system of this nature would be of special value in the primitive areas of the State where the rectangular system of public land subdivision has not been extended. It was decided that each number should consist of two sets of digits separated by a single letter designating the major drainage basin. The left set would denote by four digits the stream number and the right set would be the river mileage of the dam or outlet expressed in units and tenths of a mile. Thus, a typical number might be 1684W20.2 which indicates a reservoir site at mile 20.2 of a specific stream numbered 1684 in the Southwest Idaho Basins, the latter being designated by the letter W. Differentiation between existing reservoirs and potential reservoir sites would be accomplished by underlining the numbers of existing reservoirs.

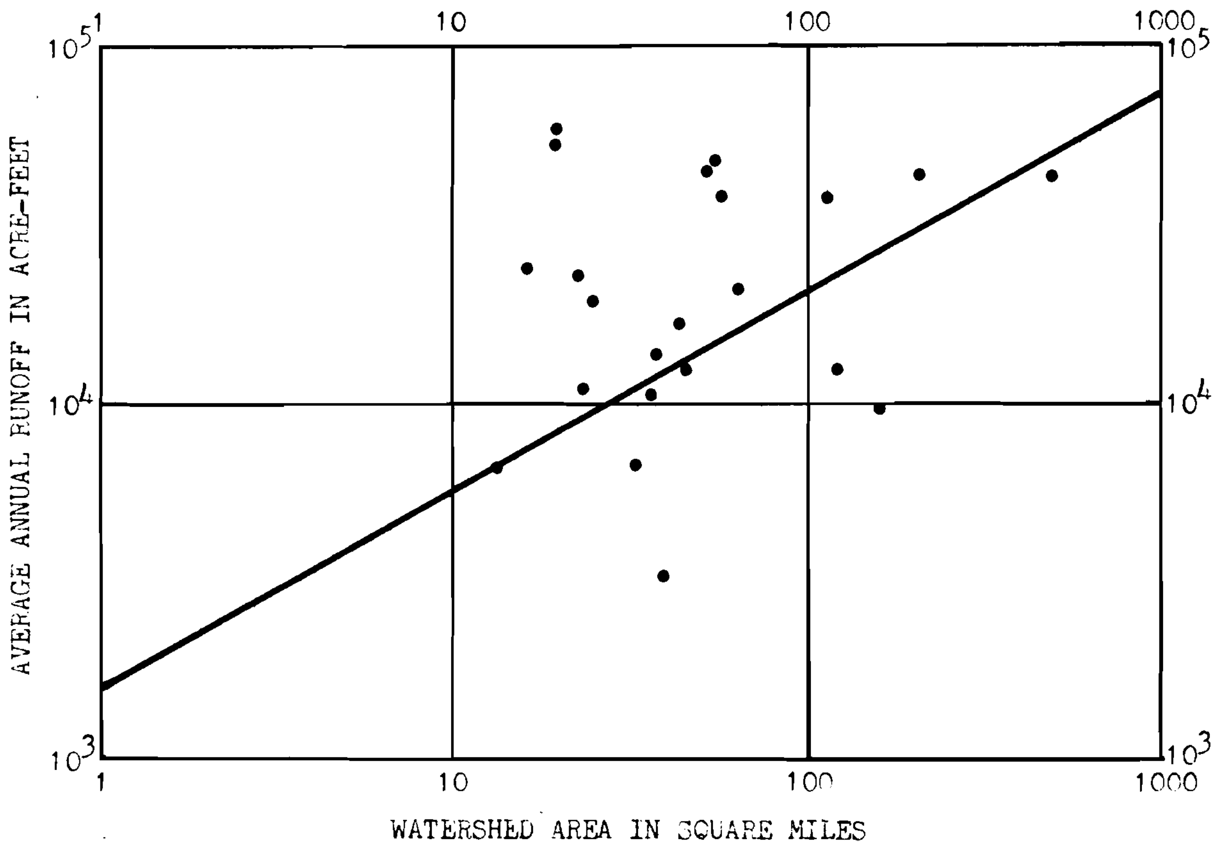


Figure 2. Relationship of average annual runoff and watershed area in Bear River Basin.

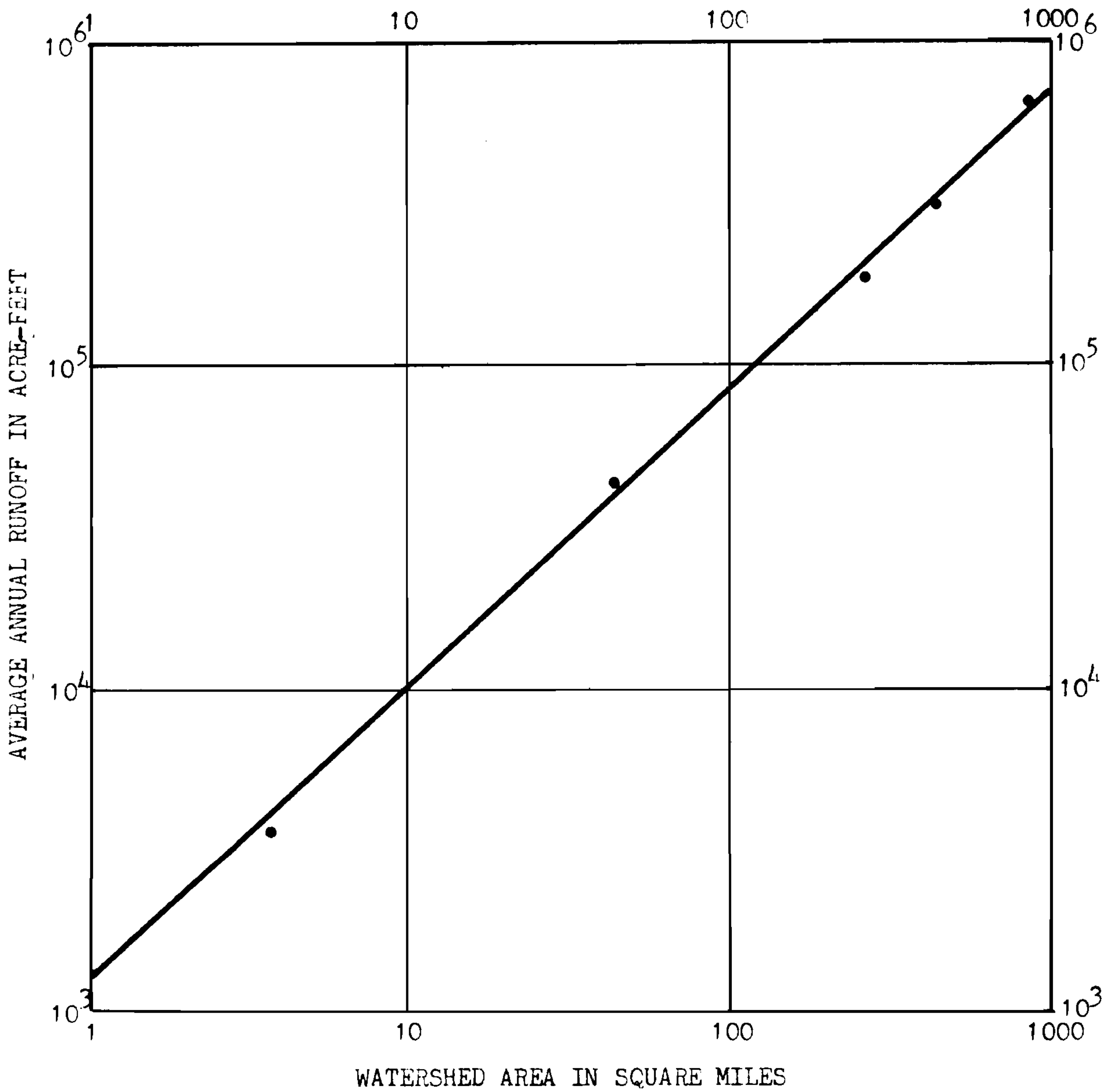


Figure 3. Relationship of average annual runoff and watershed area in Clearwater Basin.

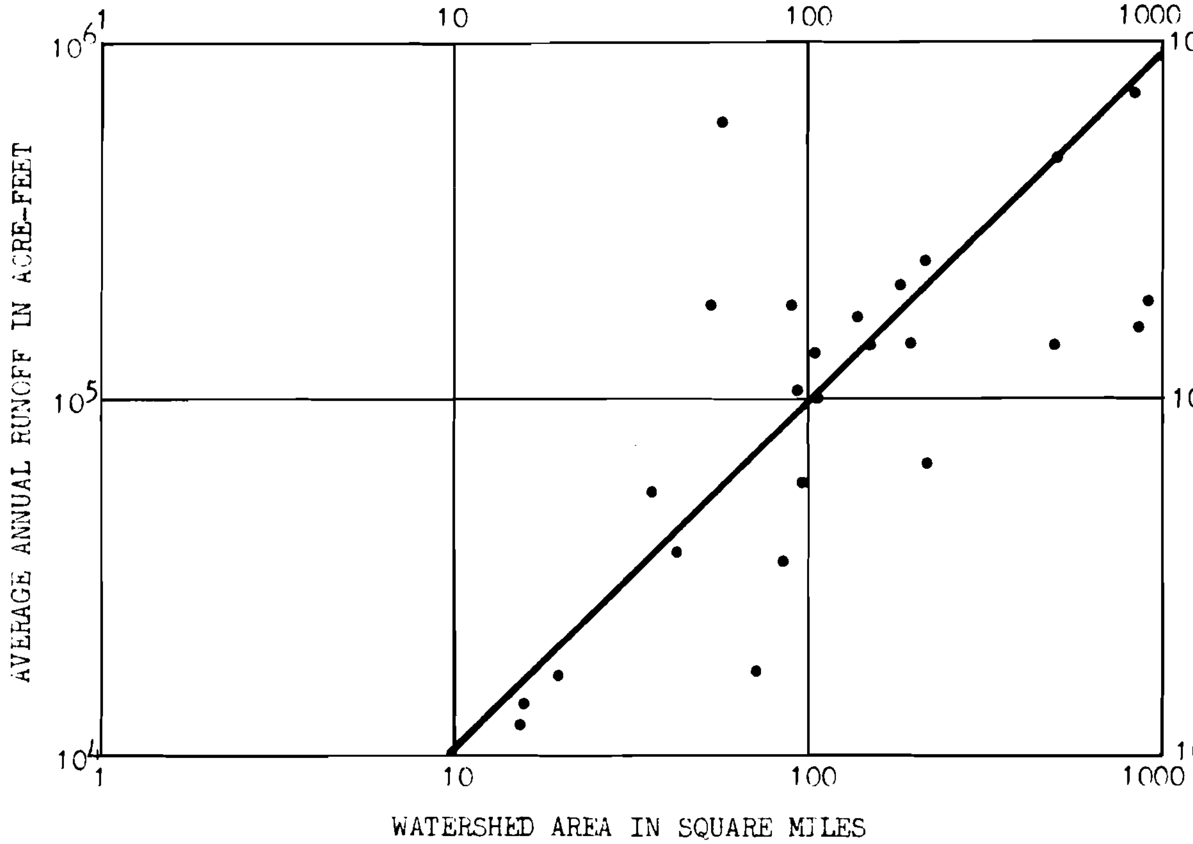


Figure 4. Relationship of average annual runoff and watershed area in Salmon Basin.

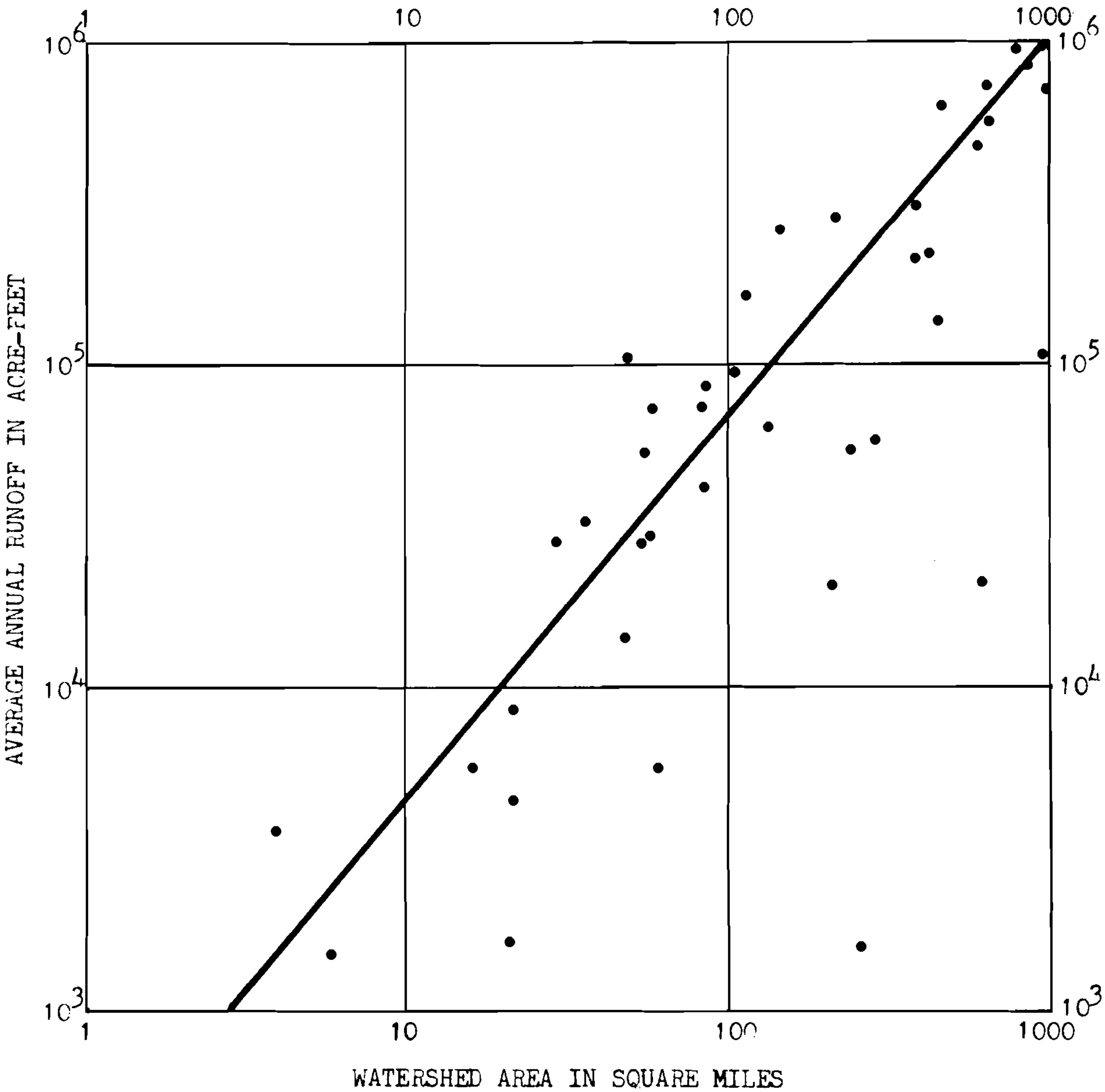


Figure 5. Relationship of average annual runoff and watershed area in Southwest Idaho Basins.

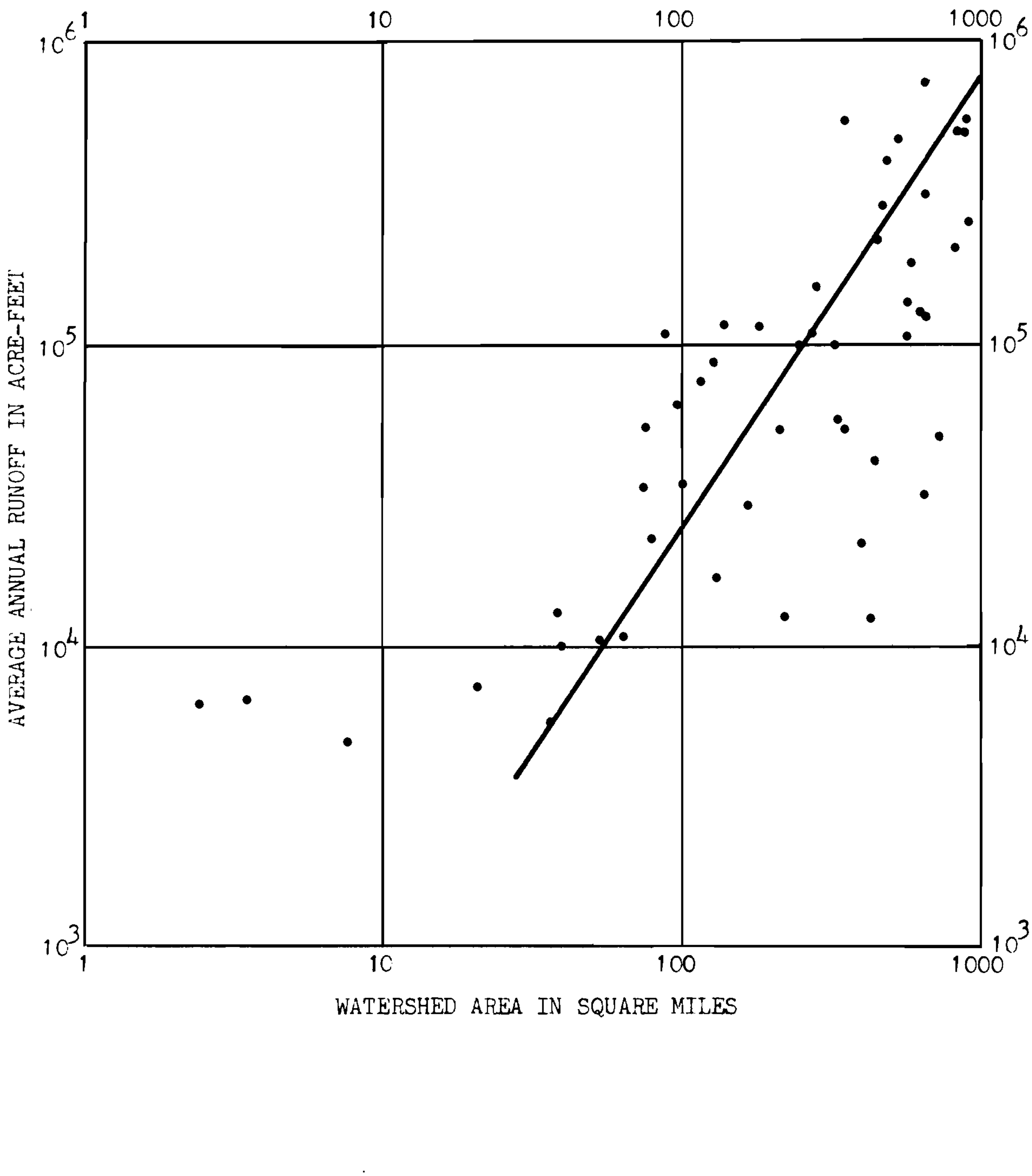


Figure 6. Relationship of average annual runoff and watershed area in Upper Snake River Basins.

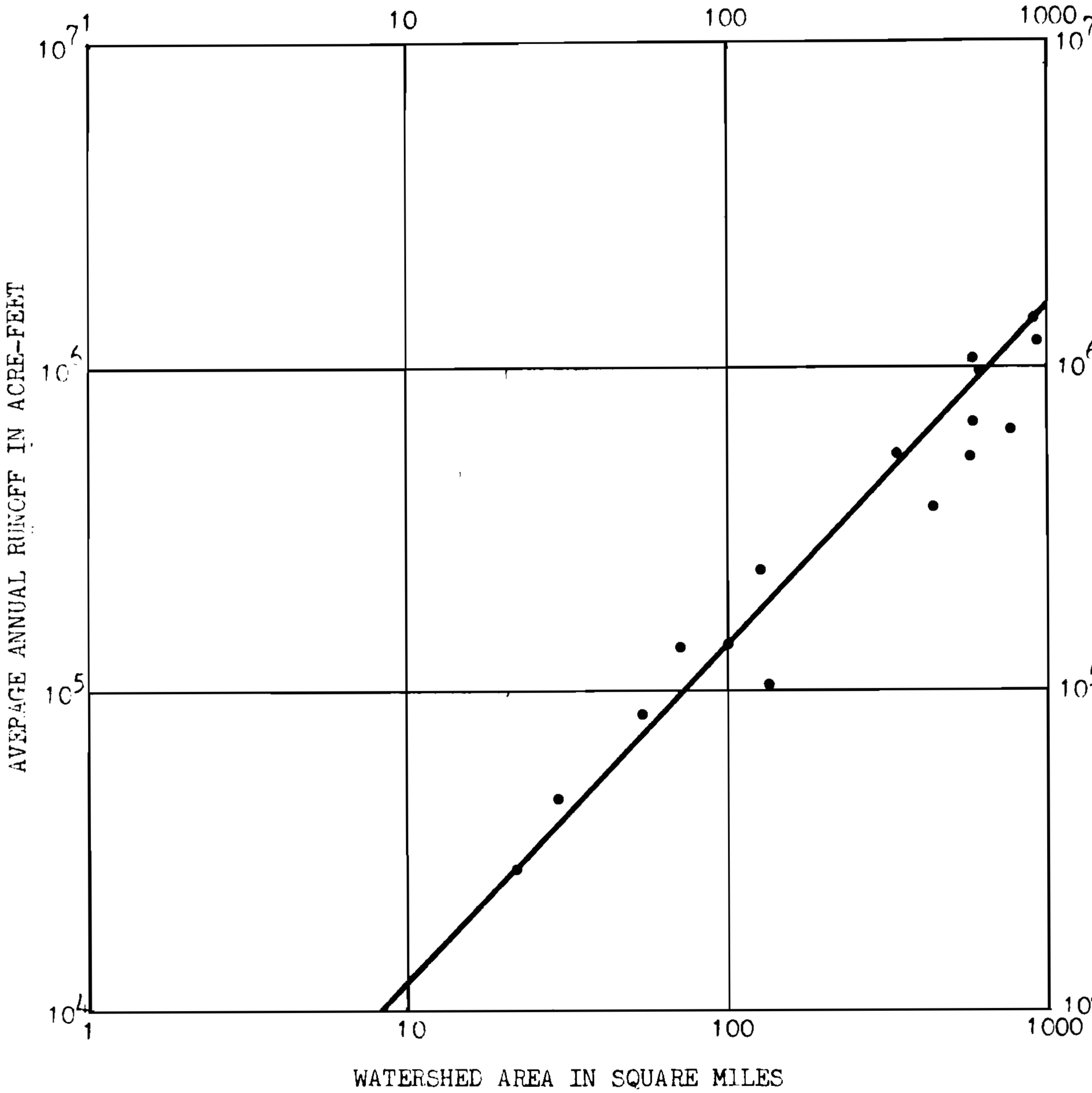


Figure 7. Relationship of average annual runoff and watershed area in Panhandle Basins.

In order to compile identifying numbers for the reservoirs, lakes, and reservoir sites, it was necessary to provide numbers for all of the streams selected for the study. To make these numbers more useful, they were devised and listed so that an order of magnitude, based on average annual runoff, and the branching system of tributaries would be evident. The basic number consists of four digits. A number ending in even thousands indicates a first order stream, with an average annual runoff of between 10,000,000 and 100,000,000 acre-feet. Similarly, a number ending in even hundreds indicates a second order stream with an average annual runoff of between 1,000,000 and 10,000,000 acre-feet. Numbers for 1st and 2nd order streams in the State are as follows:

Snake River	1000C,S,W,&U
Clearwater River	2000C
North Fork Clearwater River	2200C
Middle Fork Clearwater River	2500C
Selway River	2600C
Lochsa River	2700C
Salmon River	1100S
South Fork Salmon River	1200S
Middle Fork Salmon River	1300S
Payette River	1500W
Boise River	1600W
Henrys Fork	1900U
Spokane-Coeur d'Alene River	3400P
South Arm Coeur d'Alene Lake	3500P
St. Joe River	3600P
South Fork Coeur d'Alene River	3800P
Pend Oreille-Clark Fork River	5000P
Priest River	5200P
Kootenai River	7000P

The entire numbering system, including letter designations for the major drainage basins, and the list of streams, is shown in Appendix A. The system of indentation in the list shows the heirarchy of tributaries, streams below and to the right being tributary to streams above and to the left. There are a few exceptions to this, where a tributary is of the same order as the parent stream as, for example, the Snake and Clearwater Rivers at Lewiston, which are both first order streams. In a few other cases, small streams estimated to be of a certain order have been shifted to another order so that the proper tributary heirarchy could be illustrated. The numbering system, of course, proceeds upstream. A space above a stream name indicates that the stream is not tributary to the stream of next higher order directly above.

To complete the reservoir, lake, and reservoir site numbers it was necessary to extend the river mileage indexes prepared by the Columbia Basin Interagency Committee (CBIAC) and to prepare indexes for all of the smaller tributaries selected for study. August and September of 1969 were devoted to these measurements. A reply to an inquiry directed to the Regional office of the U.S. Bureau of Reclamation at Salt Lake City, indicates that river mileage measurements in that region by the

the Pacific Southwest Inter-Agency Committee are still in the planning stage. Therefore, mileage measurements for the Bear River under this study were started at the Utah State line with mile 0. The CBIAC did not attempt to establish mileage values, for Big Lost River, Little Lost River, and Birch Creek. In order to provide numbers for these streams, mileage measurements were made by assigning arbitrary whole-mile values as starting points where the streams cross township lines nearest to the location of their final sinks.

While the results of the mileage measurements are considered to be a valuable part of the overall study, it is not proposed to include this material in the final report because of space limitations. Perhaps at some future time these tabulations can be combined with the CBIAC indexes pertaining only to Idaho and can then be retyped.

FINANCIAL SITUATION

Under the contract, the Board agrees to make payments for costs incurred by the University of Idaho, Water Resources Research Institute, in an amount not to exceed $9,000 for the period of September 1, 1968, to June 30, 1969, and a $9,000 sum for each of the fiscal years 1969-1970, and 1970-1971, subject to the availability of appropriated funds.

In addition to paying salaries for the project director and other faculty members involved in the project, the University of Idaho agrees to furnish facilities on the campus for conducting the study. Two unsuccessful attempts were made to obtain Federal matching funds from the Office of Water Resources Research of the Department of the Interior. The University of Idaho's Engineering Experiment Station will provide some irregular help and capital outlay funds for the fiscal year 1969-70.

A financial statement of budgeted funds and expenditures made between September 1, 1968, and August 31, 1969, is shown on page 20.

Description	Idaho Water Resource Board (IWRB Reservoir 45-075)			Engineering Experiment Station (University of Idaho 17-002)			Civil Engineering Department (University of Idaho 08-003)		
	Budgeted Amount	Expenditures	Balance	Budgeted Amount	Expenditures	Balance	Budgeted Amount	Expenditures	Balance
Fiscal Year 1968-69									
Salaries	$5,000.00	5,000.00	0.00	2,304.00	2,304.00	0.00			
Irregular Help	900.00	871.70	28.30						
Travel	500.00	190.22	309.78						
Other Expense	1,217.00	755.13	461.87						
Capital Outlay									
Reserve									
Staff Benefits									
Indirects Costs	1,383.00	0.00	1,383.00						
Total	9,000.00	6,817.05	2,182.95	2,304.00	2,304.00	0.00			
Fiscal Year 1968-69 (Expenditures and balances as of 31 August 1969)									
Salaries	6,000.00	1,000.00	5,000.00	2,424.00	303.00	2,121.00	500.00	500.00	0.00
Irregular Help	1,400.00	884.85	515.15	848.00[a]	0.00	848.00			
Travel	450.00	370.00	80.00						
Other Expense	216.95	50.00	166.95						
Capital Outlay				400.00	0.00	400.00			
Reserve									
Staff Benefits	350.00	60.00	290.00						
Indirect Costs	2,766.00	0.00	2,766.00						
Total	11,182.95[b]	2,364.85	8,818.10	3,672.00	303.00	3,369.00	500.00	500.00	0.00
Grand Total (As of 31 August 1969)		9,181.90	8,818.10		2,607.00	3,369.00		500.00	0.00

[a] Includes 6 percent fringe benefits
[b] Includes $2,182.95 carry-over from fiscal year 1968-69

REFERENCES CITED

Hoyt, W. G., 1935, Water utilization in the Snake River Basin: U.S. Geol. Survey Water-Supply Paper 657, 379 p.

Idaho Water Resource Board, 1968, Idaho water resources inventory: Idaho Water Resource Board, Planning report no. 1, 598 p., 50 maps.

Young, L. L., and Colbert, J. L., 1965, Waterpower resources of Idaho: U.S. Geol. Survey open file report, 203 p.

APPENDIXES

APPENDIX A

STREAM NUMBERING SYSTEM FOR IDAHO

STREAM NUMBERING SYSTEM FOR IDAHO

Name of major drainage basin	Letter designation
Bear River Basin	B
Clearwater Basin	C
Salmon Basin	S
Southwest Idaho Basins	W
Upper Snake River Basins	U
Panhandle Basins	P

Order of Stream	Average annual runoff in acre-feet
1st	Between 10,000,000 and 100,000,000
2nd	Between 1,000,000 and 10,000,000
3rd	Between 100,000 and 1,000,000
4th	Between 10,000 and 100,000
5th	Between 1,000 and 10,000
6th	Between 100 and 1,000

Stream number ending in	Order of stream
1,000's	1st
100's	2nd
10's	3rd
Units	4th
Tenths	5th
Hundredths	6th

Order of Stream	1st	2nd	3rd	4th	5th	6th	Number of Stream
GREAT BASIN							
				Deep Creek			1B
			Bear River				10B
				Malad River			12B
					Little Malad River		12.8B
COLUMBIA RIVER BASIN							
	Snake River						1,000C,S,W,&U
			Palouse River				950C
	Clearwater River						2000C
			Lapwai Creek				2050C
				Sweetwater Creek			2052C
				Mission Creek			2055C
			Potlatch River				2080C
				Big Bear Creek			2083C
				Big Canyon Creek			2171C
					Little Canyon Creek		2171.2C
		North Fork Clearwater River					2200C
			Elk Creek				2210C
				Reed Creek			2225C
			Little North Fork Clearwater River				2230C
				Breakfast Creek			2231C
				Skull Creek			2248C
				Orogrande Creek			2267C
				Weitas Creek			2271C
			Kelly Creek				2280C
				Moose Creek			2284C
				Cayuse Creek			2285C
			Orofino Creek				2340C
				Jim Ford Creek			2381C
			Lolo Creek				2420C
				Musselshell Creek			2427C
			Lawyers Creek				2430C
		Middle Fork Clearwater River					2500C
				Clear Creek			2511C
		Selway River					2600C
				Ohara Creek			2606C
			Meadow Creek				2620C
			Moose Creek				2650C
				North Fork Moose Creek			2652C
			East Fork Moose Creek				2660C
				Bear Creek			2672C
				Running Creek			2675C

Order of stream	1st	2nd	3rd	4th	5th	6th	Number of stream
				Running Creek			2675C
				White Cap Creek			2677C
				Little Clearwater Creek			2681C
				Deep Creek			2685C
		Lochsa River					2700C
			Fish Creek				2730C
			Warm Springs Creek				2770C
			Crooked Fork Creek				2780C
				Brushy Fork			2784C
			White Sand Creek				2790C
				Big Sand Creek			2797C
			South Fork Clearwater River				2810C
				Cottonwood Creek			2811C
				Johns Creek			2815C
				Tenmile Creek			2817C
				Newsome Creek			2818C
				Crooked River			2819C
			American River				2820C
				Red River			2823C
		Salmon River					1100S
				White Bird Creek			1131S
				Slate Creek			1141S
					Little Slate Creek		1141.7S
			Little Salmon River				1160S
				Rapid River			1161S
				Hazard Creek			1164S
				Goose Creek			1167S
				French Creek			1175S
				Wind River			1181S
				Crooked Creek			1191S
				Warren Creek			1195S
		South Fork Salmon River					1200S
			Secesh River				1210S
			East Fork South Fork Salmon River				1220S
			Johnson Creek				1230S
				Big Mallard Creek			1251S
				Bargamin Creek			1261S
				Sabe Creek			1271S
				Chamberlain Creek			1281S
					McCalla Creek		1281.3S
				Cottonwood Creek			1289S
				Horse Creek			1291S
		Middle Fork Salmon River					1300S
			Big Creek				1310S
				Rush Creek			1312S
				Monumental Creek			1314S
			Camas Creek				1320S
				Yellowjacket Creek			1321S

Order of stream	1st	2nd	3rd	4th	5th	6th	Number of stream
				Yellowjacket Creek			1321S
				West Fork Camas Creek			1324S
				Silver Creek			1325S
			Loon Creek				1330S
				Warm Springs Creek			1331S
				Mayfield Creek			1332S
				Little Loon Creek			1334S
				Marble Creek			1335S
				Indian Creek			1336S
				Pistol Creek			1337S
					Little Pistol Creek		1337.2S
				Rapid River			1338S
				Sulphur Creek			1339S
			Bear Valley Creek				1340S
				Elk Creek			1343S
				Marsh Creek			1347S
				Owl Creek			1349S
			Panther Creek				1350S
				Clear Creek			1351S
				Napias Creek			1353S
				Moyer Creek			1354S
				North Fork Salmon River			1358S
				Carmen Creek			1359S
			Lemhi River				1360S
				Hayden Creek			1362S
				Big Timber Creek			1364S
				Canyon Creek			1365S
				Texas Creek			1366S
				Eighteen Mile Creek			1367S
					Hawley Creek		1367.2S
				Iron Creek			1368S
				Big Hat Creek			1369S
			Pahsimeroi River				1370S
				Patterson Creek			1373S
				Big Creek			1374S
				Doublespring Creek			1375S
					Goldburg Creek		1376.1S
				Morgan Creek			1377S
				Challis Creek			1378S
					Warm Springs Creek		1379.3S
			East Fork Salmon River				1380S
				Road Creek			1382S
				Herd Creek			1383S

Order of stream	1st	2nd	3rd	4th	5th	6th	Number of stream
				Herd Creek			1383S
				Squaw Creek			1388S
				Warm Springs Creek			1389S
			Yankee Fork				1390S
				Valley Creek			1396S
				Wildhorse River			1451W
				Brownlee Creek			1461W
			Weiser River				1480W
					Monroe Creek		1480.1W
				Mann Creek			1481W
				Crane Creek			1482W
					South Fork Crane Creek		1482.4W
					Keithly Creek		1482.9W
				Little Weiser River			1483W
					Grays Creek		1483.3W
				Pine Creek			1484W
				Middle Fork Weiser River			1486W
				Hornet Creek			1487W
				West Fork Weiser River			1488W
				East Fork Weiser River			1489W
		Payette River					1500W
				Big Willow Creek			1511W
					Little Willow Creek		1511.1W
				Squaw Creek			1521W
					Little Squaw Creek		1521.4W
				Shafer Creek			1526W
			North Fork Payette River				1530W
				Clear Creek			1534W
				Big Creek			1535W
			Gold Fork River				1540W
				Kennally Creek			1543W
				Boulder Creek			1549W
			Lake Fork				1550W
			Middle Fork Payette River				1560W
				Silver Creek			1565W
			Deadwood River				1570W
				Clear Creek			1581W
				Warm Spring Creek			1591W
		Boise River					1600W
				Indian Creek			1621W
					Sand Creek		1621.6W
				Mason Creek			1623W
				Willow Creek			1625W
					North Fork Willow Creek		1625.6W
				Fifteenmile-Tenmile-Blacks Creek			1627W
					Dry Creek		1631.1W

Order of stream	1st	2nd	3rd	4th	5th	6th	Number of stream
					Dry creek		1631.1W
			Mores Creek				1650W
				Grimes Creek			1653W
					Granite Creek		1653.3W
			South Fork Boise River				1660W
				Willow Creek			1661W
				Fall Creek			1665W
				Lime Creek			1666W
				Feather River			1668W
				Big Smoky Creek			1671W
					Little Smoky Creek		1671.2W
				Sheep Creek			1679W
			North Fork Boise River				1680W
				Crooked River			1684W
				Bear River			1685W
			Owyhee River				1710W
			Jordan Creek				1720W
				Cow Creek			1723W
				Boulder Creek			1727W
					Rock Creek		1727.7W
				North Fork Owyhee River			1728W
			South Fork Owyhee River				1730W
				Little Fork So. Fk. Owyhee Riv.			1732W
					Tent Creek		1732.5W
				Stream passing through sec. 25, T16S.,R.3W.			1733W
				Red Canyon Creek			1734W
				Deep Creek			1735W
					Deer Creek		1735.3W
					Pole Creek		1735.5W
					Nickel Creek		1735.6W
					Hurry Back Creek		1735.9W
					Piute Creek		1736.1W
				Battle Creek			1737W
					Juniper Creek		1738.1W
				Blue Creek			1739W
					Squaw Creek		1739.4W
					Shoo Fly Creek		1739.5W
				Sucker Creek			1741W
					McBride Creek		1741.5W
				Jump Creek			1742W
				Squaw Creek			1743W
				Reynolds Creek			1744W
					Rabbit Creek		1744.9W
				Sinker Creek			1745W

Order of stream	1st	2nd	3rd	4th	5th	6th	Number of stream
				Sinker Creek			1745W
				Castle Creek			1746W
					Catherine Creek		1746.2W
				Birch Creek			1747W
				Corder Creek			1748W
				Shoofly Creek			1749W
			Bruneau River				1750W
				Little Valley Creek			1751W
					Sugar Creek		1751.1W
					Halfway Gulch		1751.2W
					Stream passing through sec.36,T.8S.,R.4E.		1751.3W
					Big Jacks Creek		1751.4W
						Wickahoney Creek	1751.47W
						Duncan Creek	1751.48W
					Little Jacks Creek		1751.5W
					Hot Creek		1752.3W
					Miller Water		1752.8W
				East Fork Burneau River			1753W
					Stream with mouth in sec.26,T.11S.,R.9E.		1753.3W
					Stream with mouth in sec.18,T.12S.,R.10E.		1753.4W
					Big Flat Creek		1753.7W
					Three Creek		1753.8W
					Deadwood Creek		1753.9W
				Sheep Creek			1755W
					Louse Creek		1755.7W
				Marys Creek			1756W
					Stream with mouth in sec.27,T11S.,R.7E.		1757.1W
				Jarbidge River			1758W
					Poison Creek		1758.3W
					Cougar Creek		1758.4W
					Dorsey Creek		1758.7W
					Columbet Creek		1758.9W
				East Fork Jarbidge River			1759W
				Canyon Creek			1761W
					Squaw Creek		1761.3W
						Mud Springs Creek	1761.36W
					Rattlesnake Creek		1762.1W
					Dry Creek		1762.3W
					Browns Creek		1762.5W
						West Fork Browns Creek	1762.53W
					Bennett Creek		1762.8W
						Hot Springs Creek	1762.83W
				Sailor Creek			1763W

Order of stream	1st	2nd	3rd	4th	5th	6th	Number of stream
				Sailor Creek			1763W
					Pot Hole Creek		1763.2W
					Cold Springs Creek		1764.3W
					Little Canyon Creek		1765.3W
				Deadman Creek			1766W
					Rosevear Creek		1766.7W
				King Hill Creek			1767W
				Clover Creek			1768U
			Big Wood River				1770U
				Dry Creek			1771U
			Little Wood River				1780U
				Fish Creek			1786U
			Camas Creek				1790U
			Big Lost River				1810U
				Antelope Creek			1813U
				East Fork Big Lost River			1818U
				Little Lost River			1821U
					Wet Creek		1821.6U
				Birch Creek			1823U
				Medicine Lodge Creek			1825U
					Warm Springs Creek		1825.2U
				Camas Creek			1827U
				Beaver Creek			1828U
			Salmon Falls Creek				1840U
					Devil Creek		1842.1U
				Cedar Creek			1843U
				Deep Creek			1844U
				Shoshone Creek			1849U
			Rock Creek				1850U
				Goose Creek			1862U
				Raft River			1865U
					Cassia Creek		1865.3U
					Rock Creek		1866.1U
				Bannock Creek			1869U
			Portneuf River				1870U
				Marsh Creek			1875U
				Ross Fork			1879U
			Blackfoot River				1880U
			Willow Creek				1890U
				Grays Lake Outlet			1896U
		Henrys Fork					1900U
			Teton River				1910U
				Moody Creek			1911U
				Bitch Creek			1914U
			Falls River				1930U
				Conant Creek			1932U
			Warm River				1950U

Order of stream	1st	2nd	3rd	4th	5th	6th	Number of stream
		Spokane-Coeur d'Alene River					3400P
			Hangman Creek				3450P
				Rock Creek			3452P
				Little Hangman Creek			3456P
				Wolf Lodge Creek			3491P
				Lake Creek			3495P
		South Arm Coeur d'Alene Lake					3500P
		St. Joe River					3600P
			St. Maries River				3610P
				Alder Creek			3612P
				Santa Creek			3614P
				Emerald Creek			3616P
				West Fork St. Maries River			3618P
				Mica Creek			3631P
				Big Creek			3633P
				Marble Creek			3641P
				Slate Creek			3651P
				Fishhook Creek			3658P
				North Fork St. Joe River			3661P
					Loop Creek		3661.5P
				Sisters Creek			3671P
				Bluff Creek			3678P
				Simmons Creek			3681P
				Plummer Creek			3561P
				Benewah Creek			3591P
				Latour Creek			3781P
		South Fork Coeur d'Alene River					3800P
				Pine Creek			3811P
			North Fork Coeur d'Alene River				3910P
				Steamboat Creek			3921P
				Beaver Creek			3931P
				Pritchard Creek			3941P
					Eagle Creek		3941.2P
				Shoshone Creek			3951P
				Teepee Creek			3971P
					Independence Creek		3971.3P
					Trail Creek		3971.5P
	Pend Oreille-Clark Ford River						5000P
		Priest River					5200P
				Lower West Branch Priest River			5211P
				East River			5221P
					Middle Fork East River		5221.2P
				Upper West Branch Priest River			5231P
				Kalispell Creek			5251P
				Granite Creek			5261P
				Caribou Creek			5271P
				Hughes Creek			5281P

Order of stream	1st	2nd	3rd	4th	5th	6th	Number of stream
				Hughes Creek			5281P
				Hoodoo Creek			5321P
				Cocolalla Creek			5331P
			Pack River				5350P
				Rapid Lightning Creek			5352P
				Grouse Creek			5353P
				Lightning Creek			5391P
	Kootenai River						7000P
			Boundary Creek				7210P
			Smith Creek				7220P
				Mission Creek			7236P
				Myrtle Creek			7261P
			Deep Creek				7270P
			Moyie River				7310P
				Deer Creek			7311P
				Boulder Creek			7331P

APPENDIX B

DESCRIPTIONS OF EXISTING RESERVOIRS IN IDAHO WITH CAPACITIES OF 10,000 OR MORE ACRE-FEET

The following descriptions of existing reservoirs in Idaho with capacities of 10,000 or more acre-feet were compiled mainly from the publications "Water Utilization in the Snake River Basin" (Hoyt, 1935) and "Waterpower Resources of Idaho" (Young and Colbert, 1965). Also, considerable use was made of "Idaho Water Resources Inventory" (Idaho Water Resource Board, 1968), Federal Power Commission publications, and information from electric power companies. Where discrepancies existed between the data from these several sources, values were used from what was considered to be the most reliable source for each individual case.

BEAR RIVER BASIN

10B33.3 Narrows Plant (Oneida) Reservoir of the Utah Power and Light Company is located on the Bear River where the drainage area is 4,130 square miles. The capacity of the reservoir at normal pool elevation 4852 is 11,500 acre-feet, but the Oneida Plant, like all of the plants on Bear River downstream from Bear Lake, benefit from 1,432,000 acre-feet of storage in the lake. The plant, which is located in sec. 23, T.13S., R.40E., develops head between elevations 4852 and 4707.

10B75.9 Soda Point Reservoir of the Utah Power and Light Company is located on Bear River. The capacity of the reservoir at normal pool elevation 5719 is 11,800 acre-feet, but the Soda Power Plant benefits from 1,432,000 acre-feet of storage in Bear Lake. The plant, which is located in sec. 17, T.9S., R.41E., develops head between elevations 5719 and 5640.

20B Bear Lake, which straddles the boundary between Utah and Idaho, is 20 miles long and seven miles wide. Before 1915, the outlet of the lake was a meandering channel that extended north across some 15 miles of swamp lands and joined Bear River a few miles northwest of Montpelier. Bear River did not flow directly into Bear Lake, but flooded the marshlands during high water and backed water into the lake. After the flood season, this water flowed back through the marshlands into the river. In order to make better use of the lake as a regulating reservoir, an inlet canal was built from the river near Dingle to the lake by way of Mud Lake and the natural outlet at the north end of the lake was improved by dredging and straightening. A pumping plant was installed at the outlet for maintaining uniform flow during time of drought, so that the flow of the Bear River is now regulated as desired. The usable storage in the lake is 1,432,000 acre-feet.

CLEARWATER BASIN

2200C1.9 Dworshak Reservoir, on the North Fork of the Clearwater River, is presently (1969) under construction by the Corps of Engineers. The drainage area at the damsite is 2,440 square miles and the average annual runoff is 4,082,000 acre-feet. The reservoir has a capacity at normal pool elevation 1600 of 3,453,000 acre-feet (usable capacity 2,000,000 acre-feet), an area of 17,000 acres, and a length of 53 miles. The concrete-gravity type dam, which will rise 693 feet above the foundation and will have a crest length of 3,300 feet and a volume of approximately 6,000,000 cubic yards, is located in section 26, T.37N., R.1E. The initial power generating equipment consists of three units with a total capacity of 400,000 kilowatts. By adding three more units in the future the total generating capacity can be raised to 1,060,000 kilowatts. The estimated completion date for the project is 1972.

SALMON BASIN

1000S247.0 Hells Canyon Power Plant on the Snake River was completed by the Idaho Power Company in 1968. The drainage area of the Snake River at this point is approximately 73,300 square miles. The reservoir has a capacity at maximum normal pool elevation 1688 of 170,000 acre-feet (11,200 acre-feet live), and a length of 23 miles. The dam, which is a concrete straight gravity type with a maximum height above rock of 330 feet, a crest length of 910 feet, and a volume of 640,000 cubic yards, is located in sec. 15, T.22N., R.3W., Boise Meridian. The overflow-type spillway has a capacity of 300,000 cubic feet per second and contains 3-43 feet by 50 feet radial gates. There are three generating units with a total installed capacity of 391,500 kilowatts. The plant capability is 425,000 kilowatts.

SOUTHWEST IDAHO BASINS

1000W273.0 Oxbow Dam on the Snake River in sec. 21, T.19N., R.4W., Boise Meridian, was completed in 1961 by the Idaho Power Company. A tunnel connects the reservoir to the powerhouse in sec. 9, T.7S., R.48E., Willamette Meridian, Oregon. The drainage area is 72,800 square miles. Head between elevations 1805 and 1683 is developed and the 52,500 acre-foot reservoir, 13 miles long, provides some storage in addition to reregulating Brownlee releases. The dam is rockfill with a structural height of 205 feet, a crest length of 725 feet, and a volume of 1,300,000 cubic yards.

1000W285.0 Brownlee Dam is in sec. 2, T.17N., R.5W., Boise Meridian, where the drainage area is 72,590 square miles. The dam, completed in 1958, is rockfill with a structural height of 395 feet, a crest length of 1,320 feet, and a volume of 6,000,000 cubic yards. At spillway level, the reservoir has a capacity of 1,426,700 acre-feet, of which 984,500 acre-feet are prinipally for power. The reservoir is also drawn down when necessary to provide space for storing floodwater.

1000W492.0 The C.J. Strike Plant of the Idaho Power Company was constructed in 1952. The dam is in sec. 34, T.5S., R.4E., and the drainage area is 40,786 square miles. The reservoir backs about 15 miles up the Bruneau River and about 30 miles up the Snake River, and has a gross capacity of 250,000 acre-feet. Most of this storage is required to maintain head. C. J. Strike Dam is earthfill, 132 feet in structural height, 3,220 feet long at the crest and contains 2,320,000 cubic yards of fill. The powerplant tailrace is at elevation 2367 and the full reservoir is at elevation 2445.

1481W13.0 Mann Creek (Spangler) Reservoir is located on Mann Creek, a tributary of the Weiser River, where the average annual runoff is 29,540 acre-feet. The reservoir has a total capacity of 13,000 acre-feet (active capacity 11,000 acre-feet), a surface area at normal water surface elevation 2889 of 280 acres, and a length of approximately two miles. The water is used for irrigation. The dam, which is an earthfill structure with a height of 136 feet above the streambed, a crest length of 1,050 feet, and a volume of approximately 1,000,000 cubic yards, is located in sec. 11, T.12N., R.5W. The spillway is of the glory-hole type with a 10'-6" diameter discharge tunnel and a capacity of 4,350 cubic feet per second. The outlet works has a capacity of 345 cubic feet per second and the flow is regulated by two 24-inch hollow-jet valves. The project was constructed by the U.S. Bureau of Reclamation and was completed in 1967.

1482W12.8 Crane Creek Reservoir. In 1912 the Sunny Side and Crane Creek Irrigation Districts constructed a dam on Crane Creek. The dam is near the head of the Crane Creek Canyon, in the SE¼, sec. 19, T.12N., R.2W. In 1920 the dam was raised and now consists of earth with a concrete core wall, the crest of which is 63 feet above the original channel of the creek. The height of the spillway is 55 feet. The length of the dam is 1,400 feet. The reservoir at gage height 55 has a capacity of 44,300 acre-feet. The capacity prior to 1920 was 35,000 acre-feet. Stored water is carried in the natural channel of Crane Creek for about 6 miles to the main point of diversion in sec. 3, T.11N., R.3W.

1488.6W10.7 Lost Valley Reservoir. In 1910 the Mesa Orchards Company built an earth dam in sec. 28, T.19N., R.1W., on Lost Creek. The dam had a maximum height of about 25 feet and formed a reservoir having a capacity of 8,600 acre-feet. It was raised 6 feet in 1929 to provide a capacity of about 10,000 acre-feet. The drainage area above the reservoir is 30 square miles. Stored water supplements the natural flow of the Weiser River for land near Council.

1500W38.7 Black Canyon Dam is a concrete gravity structure in sec. 22, T.7N., R.1W., where the drainage area is 2,680 square miles. The dam was built in 1924 by the Bureau of Reclamation. It is 183 feet in structural height, 1,039 feet long at the crest, contains 81,204 cubic yards of concrete, and has a reservoir with a capacity of 44,650 acre-feet for irrigation and power.

1511.1W16.3 Paddock Valley Reservoir, on Little Willow Creek, was constructed in 1918 by the Little Willow Creek Irrigation District. The dam is a thin concrete arch 89 feet high and 200 feet long, in the SW¼, sec. 17, T.10N., R.2W. The spillway, which is 50 feet wide, is in solid rock. The area of the reservoir is nearly 1,500 acres and its capacity is about 33,000 acre-feet. Stored water is carried about 8 miles in Little Willow Creek to the point of first diversion in sec. 13, T.9N., R.3W., where it is used to irrigate lands in the irrigation district.

1530W39.9 Cascade Dam in sec. 26, T.14N., R.3E., was completed in 1949 by the Bureau of Reclamation. It is an earthfill structure 107 feet in structural height with a crest length of 785 feet and a volume of dam of 395,000 cubic yards. The drainage area is 620 square miles. The reservoir stores 703,200 acre-feet of water (653,200 acre-feet active) for irrigation, power and flood control.

1530W75.4 Payette Lake Reservoir. Between 1919 and 1923 the Payette Lake Reservoir Association obtained a small amount of storage by regulating Payette Lake a few feet by means of a low timber-crib dam. In the fall of 1923, the Association constructed a permanent structure on the North Fork of the Payette River between lots 3 and 4, sec. 8, T.18N., R.3E., about 300 feet below the outlet of the lake. The dam, as rebuilt in 1943, increases the capacity of the lake by 35,000 acre-feet by controlling between elevations of about 4983 and 4990.

1550W18.0 Little Payette Lake Reservoir. In 1926 the Lake Irrigation District constructed dams raising the level of Little Payette Lake about 15 feet, forming a reservoir having a capacity, without flashboards, of about 13,500 acre-feet. Through use of 4-foot flashboards the capacity is increased several thousand acre-feet. The main dam, which is a rock-fill structure with an earth face, is located in the NW¼, sec. 13, T.18N., R.3E. The area of the reservoir is about 1,500 acres and the elevation at the bottom of the outlet tunnel is 5097. Stored water is carried a short distance in the channel of Lake Fork and is used on 6,800 acres of district lands near Norwood, largely in T.18N., R.3E.

1570W24.4 Deadwood Reservoir with a dam in sec. 8, T.11N., R.7E., has a drainage area of 112 square miles. The crest of the spillway is at elevation 5334 and the reservoir at this level has a capacity of 164,000 acre-feet, all of which is used for irrigation. Storage began in 1930 and the dam was completed in 1931, by the Bureau of Reclamation. It is a constant radius arch, 165 feet in structural height, having a crest length of 749 feet, and a volume of 56,360 cubic yards. The reservoir is capable of completely controlling the river.

1600W63.8 Lucky Peak Dam is on the Boise River in sec. 12, T.2N., R.3E. The drainage area is 2,680 square miles. The dam was built in 1955 by the Corps of Engineers for irrigation and flood control. It is an earthfill structure with a structural height of 340 feet and a crest length of 1,700 feet. It contains 6,299,000 cubic yards of fill. The tailwater elevation at Lucky Peak is about 2820, the normal pool water surface is elevation 3060, and the maximum pool is elevation 3072. The dam backs water 110 to 122 feet higher than the toe of Arrowrock Dam when the flood control storage space is in use. Lucky Peak Reservoir has gross and active storage of 310,000 and 279,000 acre-feet, respectively.

1600W74.0 Arrowrock Dam built by the Bureau of Reclamation is in sec. 13, T.3N., R.4E. The reservoir created by the dam is about 17 miles long, covers a maximum area of 3,100 acres, and has a maximum capacity of 286,600 acre-feet. The dam is a concrete structure built with a gravity section upon a curved plan. It rests upon a granite foundation of excellent quality.

It is 353.5 feet high above bedrock and is 1,150 feet long. There are 25 outlets through the dam, and at the right or north end is a side channel spillway designed to carry 40,000 second-feet. Work on the dam and spillway proper, which contain 635,969 cubic yards of concrete, or about 2.2 cubic yards per acre-foot of storage, was commenced in November 1912 and completed in November 1915. The dam was raised 5 feet in 1937. Stored water is used for irrigation in Boise Valley.

1609W Lake Lowell (Deer Flat Reservoir) is an offstream storage facility in Tps. 2 and 3 N., Rgs. 2 and 3 W. The reservoir has a capacity of 190,100 acre-feet (active capacity 177,000 acre-feet) and floods 9,840 acres. It is formed by two large earth embankments, the upper with a maximum height of 72.5 feet and a crest length of 4,000 feet and the lower with a maximum height of 53.5 feet and a crest length of 7,500 feet. The dams were constructed by the Bureau of Reclamation and were substantially completed in 1908. The reservoir is filled by diversion from the Boise River through the New York Canal, Indian Creek, and a feeder canal. Direct inflow to the reservoir is inconsequential. Somewhat over 100,000 acres of land lie under canals diverting from this reservoir.

1660W43.5 Anderson Ranch Dam, in sec. 1, T.1S., R.8E., was completed in 1951 by the Bureau of Reclamation. The dam is earthfill, 456 feet in structural height, 1,350 feet long at the crest, and is comprised of 9,653,000 cubic yards of fill. The capacity of the reservoir is 493,200 acre-feet (423,200 acre-feet active) and the water is used for irrigation. The normal pool is at elevation 4196. The spillway, which consists of an overflow-type crest and a concrete-line chute on the left abutment, is controlled by two 25-foot by 22-foot radial gates.

1664W5.6 Little Camas Reservoir is on Little Camas Creek and was constructed by the Mountain Home Cooperative Irrigation Co. The reservoir is formed by an earth dam 50 feet high and 2,000 feet long, in sec. 9, T.1S., R.9E. In 1912 the dam was raised about 18 feet. The crest of the dam is 46 feet above the bottom of the outlet tunnel and 8 feet above the spillway crest. The elevation of the spillway is 4965, at which the reservoir has a capacity of 22,300 acre-feet and floods 1,250 acres. Stored water is carried 7 miles through canal, flume, and tunnel into Long Tom Basin; thence into Long Tom Reservoir, and on to irrigate about 5,000 acres in the vicinity of Mountain Home.

UPPER SNAKE RIVER BASINS

1000U640.0 Milner Dam, in sec. 29, T.10S., R.21E., was constructed about 1905 and is a combination earth and rock-fill structure that raises the water level of the Snake River about 50 feet to permit diversion into the canals that supply the Twin Falls North Side and South Side irrigated areas and the Milner-Gooding Canal. Milner Lake, thus created, floods an area of about 3,000 acres at elevation 4135 and is maintained near this elevation during the irrigation season. The total storage created by the construction of the dam probably amounts to about 80,000 acre-feet, of which about 77,500 acre-feet is dead storage, because the lake has to be maintained at levels near its maximum height in order to supply the canals that divert from it. The dam is owned by the Twin Falls Canal Co. and the North Side Canal Co.

1000U675.0 Minidoka Dam, on the Snake River in sec. 1, T.9S., R.25E., creates the reservoir known as Lake Walcott. The dam, which was constructed by the Bureau of Reclamation during the period 1907-1909, is a rock-fill concrete-faced structure 4,475 feet long, with a maximum structural height of 86 feet. The crest elevation is 4200. Modifications to the structure were made in 1913 and in 1943. The spillway section has a total length of 2,385 feet. Discharge is controlled by steel flashboards and four radial gates each 10 feet by 12 feet. The structure acts as a combined storage, diversion, and power dam. Storage between elevations 4186 and 4195 is 95,200 acre-feet and the total capacity of the reservoir is 210,000 acre-feet. The average power head is 48 feet. Water is diverted on both sides of the river into canals of the Minidoka Project.

1000U714.0 American Falls Dam, on the Snake River in sec. 30, T.7S., R.31E., near the city of American Falls, was constructed under the supervision of the Bureau of Reclamation during the period February, 1925, to September, 1927. Storage was begun in March, 1926, and the reservoir was filled for the first time in June, 1927. The dam consists of a concrete gravity section with rolled earth-fill embankments at the ends. The structural height of the dam is 94 feet. The spillway section has 15 radial gates, each 33 feet long and 11 feet 4 inches high, providing a total spillway discharge of 75,200 second-feet. The lake created by the dam, is 22 miles long and 12 miles wide. The capacity of the reservoir is 1,700,000 acre feet.

1000U901.6 The Palisades Reservoir, in sec. 17, T.1S., R.45E., was constructed primarily as a holdover facility to provide supplemental water for 650,000 acres of land. The total capacity of the reservoir is 1,402,000 acre-feet. Palisades Dam is an earthfill structure containing 13,571,000 cubic yards. It is 270 feet high and 2,100 feet long at the crest. The powerhouse contains four 28.5-MW generating sets. The full reservoir is at elevation 5620 and the plant tailwater is at elevation 5375.

1770U60.0 Magic Reservoir, is on the Big Wood River in Tps. 1 and 2 S., Rgs. 17 and 18 E. The dam is in sec. 18, T.2S., R.18E. It has a maximum height of about 129 feet and is 700 feet long and 700 feet wide at the bottom. At the right end of the main dam there is an earth embankment 1,600 feet long with a concrete spillway section 375 feet long. Water is discharged into a concrete tower and into a tunnel outlet through the dam. The reservoir was constructed in 1908-9 by the Idaho Irrigation Co. and repaired and raised 5 feet in 1917. Storage was first started July 14, 1909. The bottom of the outlet gates is at elevation 4818.5, the crest of the concrete spillway is at elevation 4930, and the top of the flashboards is at elevation 4935. The storage capacity is 192,000 acre-feet. Stored water is used on lands in the Big Wood and Little Wood River Basins.

1780U71.0 The Little Wood Reservoir is in sec. 13, T.1N., R.20E., where the drainage area is 279 square miles. Little Wood Dam is an earthfill structure, 122 feet high and 3,100 feet long. The storage capacity of the reservoir is 30,000 acre-feet and the water is used for irrigation.

1786U11.2 Fish Creek Reservoir is formed by a multiple-arch concrete dam constructed during 1921-22 by the Carey Valley Reservoir Company on Fish Creek in sec. 15, T.1N., R.22E. The dam has a maximum height of 105 feet above bedrock, is 1,800 feet long, and creates a reservoir having an area of 625 acres and a capacity of 18,000 acre-feet. The drainage area above the dam is about 60 square miles. Stored water is diverted from Fish Creek into a main canal in sec. 33, T.1N., R.22E. The lands irrigated lie in T.1N., R.22E., and T.1S., Rgs. 21 and 22E.

1795U0.4 Twin Lakes (Mormon) Reservoir is located on McKinney Creek, a tributary of Camas Creek, in Camas County. The reservoir, which has a capacity of 31,400 acre-feet and an area of 1,159 acres, is used for irrigation. The dam is located in sec. 4 T.2S., R.14E. It is an earthfill structure 40 feet high with a crest length of 1,070 feet. The spillway consists of a concrete sill on the left abutment with an unlined discharge channel in natural rock. Water is released through the dam by means of a 36-inch diameter concrete culvert. The dam was constructed by the Twin Lakes Reservoir and Irrigation Co., and was completed in 1909.

1810U81.8 Mackay Reservoir, constructed in 1915-16 by the Utah Construction Co., was formed by an earth dam on the Big Lost River in sec. 12, T.7N., R.23E., 4 miles northwest of Mackay. The dam has a length of 1,200 feet at its crest, which is 75 feet above the bottom of the concrete core wall, below which there is 15 feet of sheet piling. The right abutment is a limestone cliff, the left abutment a gravel delta. The crest of the spillway is 10 feet below the crest of the dam and 55 feet above the bottom of the outlet tunnel. The capacity at spillway level is 44,400 acre-feet. The reservoir floor is an alluvial deposit underlain by sand and gravel to an unknown depth. The foundation of the dam is very porous, and heavy seepage loss occurs from the reservoir; however, most of the seepage reappears in the stream channel 1½ miles downstream and is fully utilized. Stored water is used in the vicinity of Arco, where about 6,700 acres of land are irrigated.

1827U Mud Lake is a perched body of water in Tps. 6 and 7 N., Rgs. 34 and 35 E. Through the construction of dikes along the east, south, and west sides, the water surface has been confined within fairly definite limits. The capacity of the lake is about 41,500 acre-feet, and its area 3,140 acres. Water is pumped from the lake for use in irrigation.

1840U46.0 Salmon Creek (Salmon River Canal Company) Reservoir is formed by a dam on Salmon Falls Creek in sec. 18, T.14S., R.15E. It is about 10 miles long and 1 mile wide and has a capacity of 182,700 acre-feet and an area of 3,000 acres. The dam, which is a concrete-arch structure constructed in 1909-10, is about 220 feet high, has a crest length of 450 feet, a bottom width of 119 feet, and a top width of 15 feet. Water was first stored in 1911. The stored water is diverted through two tunnels each 10 feet by 10 feet and 2,500 feet long, separated by an open cut 800 feet long. Stored water is used for land under the Twin Falls-Salmon River Carey Act System, operated by the Salmon River Canal Company in Tps. 11, 12, and 13 S., Rgs. 15, 16, and 17E. The reservoir has never been filled; the maximum capacity ever observed was 123,700 acre-feet on May 30, & 31, 1922

1853U6.0 Cedar Creek Reservoir is formed by an earth dam with concrete core wall on Cedar Creek in the E½, sec. 12, T.14S., R.13E., just below the junction of Horse and Cedar Creeks. The dam, which was constructed in 1920 by the Idaho Farmers Development Company, has a maximum height of about 80 feet and a top length of 400 feet. The reservoir floods lands in secs. 12, 13, 14, 22, 23, and 24, T.14S., R.13E., and secs. 18 and 19, T.14S., R.14E., and has a capacity of 26,000 acre-feet. In addition to storing the run-off of Cedar Creek, the reservoir receives water diverted from Deadwood Creek, a tributary of the Bruneau River, in sec. 28, T.15S., R.12E. The total run-off is generally insufficient to fill the reservoir. The stored water is carried in Cedar Creek about 6 miles to the point of diversion of the main canal, which extends about 8 miles to the head of the irrigated lands in T.12S., R.13E.

1859U Wilson Lake Reservoir is formed by a masonry dam with earth-fill approaches in sec. 24, T.9S., R.19E. The dam, about 35 feet in height, was constructed about 1909 by the Twin Falls North Side Land & Water Company across the outlet of a small natural depression in the typical lava formation of the Snake River Plain. The reservoir thus created stores about 18,500 acre-feet and floods 1,420 acres when filled. The reservoir forms part of the North Side Canal Company's system and is supplied by its canal diverting from the Snake River at Milner Dam. The reservoir was built originally to furnish stored water for use later in the season, but on account of losses through the bottom it is now used more as a regulating basin until midsummer, when it is generally drawn down, allowing the canal to flow through the natural coulee in the bottom.

1862U26.0 Lower Goose Creek (Oakley) Reservoir is formed by a dam constructed during 1911-12 by the Twin Falls-Oakley Irrigation Company on Goose Creek in sec. 19, T.14S., R.22E. Besides storing the run-off of Goose and Trapper Creeks, the reservoir receives additional water supply by diversion in a canal 6 miles long from Birch Creek in sec. 24, T.14S., R.22E. The dam is of earth, about 145 feet high and 1,120 feet long; it has an upstream slope of 3:1, a downstream slope of 2:1, and a 16-foot crest width, with a concrete core wall extending from bedrock to the crest. The reservoir created by the dam has an area of about 1,100 acres and a capacity of 74,300 acre-feet at the 136-foot level. It extends about 5½ miles up Goose Creek and 1½ miles up Trapper Creek. Sluice gates at the bottom of the reservoir discharge into a tunnel, into which also discharge gates at three different levels in an outlet tower. Stored water is diverted 2,000 feet below the reservoir in sec. 24, T.14S., R.22E.

1870U85.0 Portneuf Reservoir is on the Portneuf River in secs. 11, 13, 14, and 24, T.6S., R.38E., near Chesterfield. It is formed by an earth dam in Lot 4, sec. 19, T.6S., R.39E. The reservoir has a capacity of 23,700 acre-feet. Besides storing the run-off of the upper Portneuf River, the reservoir receives water from Topons Creek, a tributary of the Portneuf River below the reservoir, through a canal 6 miles long, diverting in sec.33, T.6S., R.38E.

1880U78.0 Blackfoot River Reservoir was formed by construction of a dam during 1908 and 1909 by the Indian Service in sec. 12, T.5S., R.40E., across the Blackfoot River, flooding what was known as Blackfoot Marsh. The dam consisted of a loose rock and hydraulic fill structure 120 feet long at the base, 250 feet long at the crest, and 40 feet high above the bed of the river. The reservoir was about 17 miles long and 3½ miles wide and had a capacity at spillway level (elevation 6118) of about 300,000 acre-feet. During the period 1922-24 the dam was raised and reconstructed. The present dam is an earth and rock fill structure with concrete core wall, downstream slope 1½:1, upstream slope 3½:1, base width 190 feet, crest length 304 feet, elevation of outlet gates 6086, elevation of spillway crest 6118.5, and elevation of maximum water surface 6124. The capacity at spillway crest is 312,000 acre-feet, and the maximum capacity, with flashboards to elevation 6124, is 413,000 acre-feet. During the period 1911-16 considerable leakage apparently occurred when the storage exceeded 150,000 acre-feet. The greater part of this leakage seemed to occur in an arm of the reservoir in secs. 6 and 7, T.7S, R.42E. When the main dam was reconstructed, an earth embankment was thrown across the outlet of this arm. The stored water is diverted from the Blackfoot River on the Fort Hall Indian Reservation for use in irrigation.

1896U33.0 Grays Lake was formed by construction of a dam during 1924 by the Indian Service across the outlet of Grays Lake in secs.

31 and 32, T.3S., R.43E. The dam is an earth dike about 1,200 feet long and 12 feet high. The lake has a theoretical capacity of 342,000 acre-feet. Stored water is diverted out of the Willow Creek Basin southwestward through an artificial channel known as Clarks Cut, extending from the SW¼ sec. 1 to the NW¼, sec. 3, T.5S., R.42E., and thence 7½ miles in the channels of Sheep and Meadow Creeks into the Blackfoot River Reservoir for use on irrigated lands on the Fort Hall Indian Reservation.

1900U93.0 Island Park is the largest constructed reservoir in the Henrys Fork Basin. The dam, in sec. 28, T.13N., R.43E., where the drainage area is 481 square miles, contains 564,000 cubic yards of earth and rockfill. Its structural height is 91 feet and the length of the crest is 9,448 feet. The reservoir's capacity is 127,600 acre-feet between elevations 6239 and 6302 and the water is used for irrigation and flood control. About 600 acre-feet of dead storage occupies the space between elevations 6230 and 6239. The dam was constructed in 1938 by the Bureau of Reclamation.

1900U124.0 Henrys Lake Reservoir. During 1922 the North Fork Reservoir Company, a group of water users under the Dewey, Last Chance, St. Anthony Union, Salem Union, Egin Consolidated Farmers, and Independent Canal Companies constructed a dam at the outlet of Henrys Lake, in the E½ sec. 26, T.15N., R.43E. The dam is a concrete-buttress structure, about 400 feet long, with a maximum height above the river bed of 28 feet. The concrete spillway section is provided with five radial gates, each 4 feet 6 inches by 12 feet. The capacity of the lake is 49,000 acre-feet at elevation of 6630 and 79,400 acre-feet at elevation of 6635. Its maximum area is 6,578 acres. Storage was first begun in September, 1922.

PANHANDLE BASINS

3400P102.1 The Post Falls Power Plant of the Washington Water Power Company utilizes water from a drainage area of 3,840 square miles. This is the most downstream development on the Spokane River in Idaho. The plant tailrace is at elevation 2069 and the forebay is at elevation 2125. The reservoir has 225,000 acre-feet of usable storage capacity available for power production by slightly manipulating the water surface in Couer d' Alene Lake. The total capacity of Couer d'Alene Lake at elevation 2125 is 238,500 acre-feet. The Post Falls plant was constructed in 1906, the first plant built by Washington Water Power Co. in Idaho.

5000P90.1 The Albeni Falls Project was completed by the Corps of Engineers in 1955. The dam is a concrete gravity structure on the Pend Oreille River in sec. 29, T.56N., R.5W., where the drainage area is 24,200 square miles. The normal full reservoir is at elevation 2,062.5 feet and the dam provides 1,155,000 acre-feet of usable storage by lowering Pend Oreille Lake 12.8 feet below this elevation for firming up low flows on the Columbia River in addition to generating power at the site. At elevation 2062.5 the total capacity of Pend Orielle Lake is 1,552,000 acre-feet. The average elevation of the tailrace is 2,034.2.

5000P149.9 The Cabinet Gorge Dam, in sec. 27, T.55N., R.3E., where the Clark Fork Drainage area is 21,840 square miles, was completed in 1952 by the Washington Water Power Company. The gross head developed is between elevations 2175 and 2078 and the reservoir contains 42,780 acre-feet of water. The Cabinet Gorge Dam and Power Plant are in Idaho but the reservoir lies principally in Montana, and the power is divided equally between the two states. The total capacity of the reservoir is 112,000 acre-feet.

APPENDIX C

TABLES OF EXISTING RESERVOIRS AND LAKES IN IDAHO

Identification No.[2]	Name	Stream	County	Location[2] T.,R.,S.	Owner	Purpose[3]	Permit No.[4]	Surface elevation[5]	Surface area,[5] acres	Capacity,[5] acre-feet	Length of shoreline,[5] miles	a	k	Reference elevation
	BEAR RIVER BASIN													
1B5.1	Curlew Valley Reservoir	Deep Creek	Oneida	15S32E35	Pratt Irrigation Company	ID	2945			6,594				
10B33.3	Narrows Plant Reservoir	Bear River	Franklin	13S40E23						11,500				
10B61.7	Cove Plant Reservoir	Bear River	Caribou	10S40E28	Utah Power & Light Company	P	R18			4,000				
10B75.9	Soda Point Reservoir	Bear River	Caribou	09S41E17	Utah Power & Light Company	P	15596	5719	1,010	14,500		5.475	6.575×10^{-7}	5707.5
12B19.5	Samaria Reservoir No. 1	Big Malad River	Oneida	14S35E22	Samaria Water & Irrig. Co.	ID	R637			1,000				
12B20.1	Samaria Reservoir No. 2	Big Malad River	Oneida	14S35E16	Samaria Water & Irrig. Co.	ID	R791			1,300				
12.6B14.6	Henderson Reservoir	Deep Creek	Oneida	14S37E18	Deep Creek Irrigation Co.	I	R830		76	5,400	3.9			
12.8B(?)	Daniels Reservoir	Little Malad River	Oneida	12S34E26	St. John Irrigation Company	I	R1104			9,500				
12.7B(?)	Devil Creek Reservoir	Devil Creek	Oneida	13S36E13	Malad Valley Irrigation Co.	I	R682 21844 17,604	5172.4	140	4,450				
13.2B12.8	Worm Reservoir	Worm Creek	Franklin	15S40E08	Preston-Whitney Irrig. Co.	ID	R364			6,000				
13.23B3.7	Lamont Reservoir	Tributary of Worm Creek	Franklin	15S40E20	Preston-Whitney Irrig. Co.	I	R793			2,408				
13.24B(?)	Radio Station Reservoir	Tributary of Worm Creek	Franklin	15S39E13	Preston-Whitney Irrig. Co.	I	R1009			3,500				
14.5B13.3	Weston Creek Reservoir	Weston Creek	Oneida	15S37E15	Weston Creek Irrigation Co.	ID	R316, R886	5490	20	2,066	1.0			
14.75B0.1	Twin Lakes Reservoir	Tributary of Deep Creek	Franklin	14S38E24										
14.7B12.3	Swan Lake	Deep Creek	Bannock	13S38E14										
14.8B9.9	Treasureton Reservoir	Battle Creek	Franklin	14S39E02										
14.82B(?)	Mink Creek Reservoir	Tributary of Battle Creek	Franklin	14S39E22	Twin Lakes Canal Company	I	R986			1,930				
14.83B3.6	Preston-Whitney Reser. No. 2	Tributary of Battle Creek	Franklin	14S39E14	Twin Lakes Canal Company	IWS	R679			2,300				
16.4B(?)	Soda Creek Reservoir	Soda Creek	Caribou	08S41E36	Farmers Land Irrigation Co.	ID	R1152			2,500				
16.4B(?)	Tule Lake Reservoir	Soda Creek	Caribou	08S41E13	Lau,D.,J.,J.E. and C.A.	ID	R602			3,000				
16.5B0.6	Unknown (Lake)	Ledger Creek	Caribou	09S42E20					44					
18B(?)	Montpelier Creek Reservoir	Montpelier Creek	Bear Lake	12S45E27	Montpelier Irrigation Co.	I	R1150	6520	135	4,500				
20B	Bear Lake	Off Stream	Bear Lake	15S44E16	Utah Power & Light Company	IP	Decree	5929		1,432,000		1.074	5.174×10^{4}	5902
	CLEARWATER BASIN													
950C134.6	Potlatch Reservoir	Palouse River	Latah	41N05W12										
2000C4.6	Lewiston Power Plant Res.	Clearwater River	Nez Perce	36N05W27				762.4		2,340				
2011C8.1	Mann Lake	Lindsay Creek	Nez Perce	35N04W17	Lewiston Orchards Irrig. Co.	I			136	3,000	2.2			
2050C25.0	Lapwai Lake	Lapwai Creek	Lewis	33N02W06				3902	91		3.8			
2052.3C14.8	Soldiers Meadow Reservoir	Webb Creek	Nez Perce	33N03W29	Lewiston Orchards Irrig. Co.		R294,	4522	118	2,000	3.6			
2052.7C	Lake Waha	Lake Creek	Nez Perce	33N04W16			15945	3389	96	6,900	1.9			
2089C1.0	Moose Creek Reservoir	Moose Creek	Latah	41N01W26				2883	41		2.3			
2200C1.9	Dworshak Reservoir	North Fork Clearwater River	Clearwater	37N01E26	U. S. (Corps of Engineers)	P	24715	1600	17,000	3,453,000	183	3.05	9.76×10^{-3}	970
2210C18.4	Unknown (Reservoir)	Elk Creek	Clearwater	40N02E35										
2295C11.7	Fish Lake	Lake Creek	Clearwater	40N12E10				5945	118					
2677.58C1.2	Canyon Lake	Tributary of Canyon Creek	Idaho											
2797C13.7	Big Sand Lake	Big Sand Creek	Idaho					5285	76		1.6			
2797.4C3.8	Hidden Lake	Hidden Creek	Idaho					5805	138		1.9			
2815.53C5.0	Moores Lake	Moores Lake Creek	Idaho					6325	61		1.4			
	SALMON BASIN													
1000S274.0	Hells Canyon Reservoir	Snake River	Adams	22N03W15	Idaho Power Company	P	24393	1688		170,000		2.97	1.967×10^{-2}	1475
1164S11.2	Hazard Lake	Hazard Creek	Idaho	22N03E31				7060		63	1.6			
1164S13.6	Upper Hazard Lake	Hazard Creek	Idaho	21N03E07				7428		40	1.1			
1164.7S0.7	Big Hazard Lake	Tributary of Hazard Creek	Idaho	22N03E30				6968		141	2.1			
1167S13.9	Goose Lake	Goose Creek	Adams	20N02E13	Goose Lake Reservoir Company	IWS	Decree	6362	380	3,500	5.5			
1167.6S1.5	Brundage Reservoir	Brundage Creek	Adams	20N03E30	Brundage Meadow Res. Co.	ID	R612	6218	212	3,538	3.9			
1167S17.4	Twin Lakes	Goose Creek	Adams	20N02E02				7164	40		1.4			
1213S4.8	Enos Lake	Enos Creek	Valley	20N05E04					62		1.6			
1214S1.6	Loon Lake	Loon Creek	Valley						96		1.5			
1232S4.6	Riordan Lake	Riordan Creek	Valley	18N08E15				6513	75					
1281S2.7	Warm Lake	Warm Lake Creek	Valley	15N07E18				5298	512					
1289.2S1.6	Black Lake	Peak Creek	Idaho											
1306S5.0	Ship Island Lake	Ship Island Creek	Lemhi					7835	86		2.5	2.5		
1364S1.9	Williams Lake	Lake Creek	Lemhi	20N21E34				5252	168					
1378S15.4	Mosquito Flat Reservoir	Challis Creek	Lemhi		Paul Giampedraglia, Mike Gini	ID	R849		44	1,400				

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Identification No.[2]	Name	Stream	County	Location[2] T.,R.,S.	Owner	Purpose[3]	Permit No.[4]	Surface elevation[5]	Surface area,[5] acres	Capacity,[5] acre-feet	Length of shoreline, miles[5]	a	k	Reference elevation
1382S1.8	Jimmy Smith Lake	Big Lake Creek	Custer	10N17E25				6326	62		2.8			
1387S2.8	Sullivan Lake	Sullivan Creek	Custer	10N17E03				6731	41		1.6			
1396.3S7.4	Sawtooth Lake	Iron Creek	Custer											
1396.5S3.2	Stanley Lake	Stanley Lake Creek	Custer	11N12E28										
1397S0.7	Little Redfish Lake	Redfish Creek	Custer	10N13E26				6489	64		1.7			
1397S2.6	Redfish Lake	Redfish Creek	Custer					6547	1,510		9.6			
1398S5.7	Hell Roaring Lake	Hell Roaring Creek	Custer					7407	55		1.5			
1398S8.5	Imogene Lake	Hell Roaring Creek	Custer					8436	73		2.6			
1399S7.1	Perkins Lake	Alturas Lake Creek	Blaine	07N14E20				7014	51		1.3			
1399S7.7	Alturas Lake	Alturas Lake Creek	Blaine	07N14E20				7016	834		4.4			
1399.1S2.2	Yellow Belly Lake	Tributary of Alturas Lake Cr.	Custer					7076	184		3.1			
1399.1S8.7	Toxaway Lake	Tributary of Alturas Lake Cr.	Custer					8323	119		3.3			
1399.2S1.2	Petit Lake	Tributary of Alturas Lake Cr.	Blaine	08N14E21				6996	399		4.8			
1399.2S6.6	Alice Lake	Tributary of Alturas Lake Cr.	Blaine					8596	69		1.9			
1399.2S7.7	Twin Lakes	Tributary of Alturas Lake Cr.	Blaine					8854, 8854	52		2.0			
	SOUTHWEST IDAHO BASINS													
1000W2730	Oxbow Reservoir	Snake River	Adams	19N04W21	Idaho Power Company	P	22442	1805	1,230	52,500		3.32	4.4×10^{-3}	1668
1000W285.0	Brownlee Reservoir	Snake River	Washington	17N05W02	Idaho Power Company	P	R90523925	2077		1,426,700				1800
1000W456.0	Swan Falls	Snake River		02S01E18	Idaho Power Company	P		2307		6,900		0.795	5.9×10^{5}	
1000W492.0	C. J. Strike Reservoir	Snake River	Owyhee	05S04E34	Idaho Power Company	P	21671	2455	7,600	250,000		2.7	1.336	2365
1480.12W	Barton Reservoir	Off Stream	Washington	11N05W03	Monroe Creek Irrig. Dist.	I	152,2297		88	3,050				
1481W13.0	Mann Creek Reservoir	Mann Creek	Washington	12N05W11	U.S. (Bureau of Reclamation)	I	R1182,	2889	280	13,000		2.765	1.925×10^{-2}	2760
					Mann Creek Irrig. Dist.		R698							
1482W12.8	Crane Creek Reservoir	Crane Creek	Washington	12N02W19					2,320	44,300		2.59	1.424	Gage
1483.4W2.3	C. Ben Ross Reservoir	Off Stream	Adams	14N01W35	Ellis B. Snow	ID	R585	3148.5	357	7,800		2.16	1.485	3093
1488.6W10.7	Lost Valley Reservoir	Lost Creek	Adams	19N01W28				4774.5	730	10,000		1.723	39.1	4749
1500W38.7	Black Canyon Reservoir	Payette River	Gem	07N01W22	U.S. (Bureau of Reclamation)			2497.5	1,040	44,650		3.25	1.043×10^{-2}	2386.5
1511.1W16.3	Paddock Valley Reservoir	Little Willow Creek	Washington	10N02W17	Little Willow Creek	I	8966,	3191	1,500	33,000		1.976	22.2	3150
					Irrigation District		R1237							
1515.19W0.2	Van Dusen Reservoir	Tributary of Bissell Creek	Gem	08N01W19	David Little	ISW	R1034		1,000					
1521.75W2.1	Sage Hen Reservoir	Sage Hen Creek	Gem	12N02E35					180					
1530W39.9	Cascade Reservoir	North Fork Payette River	Valley	14N03E26	U.S. (Bureau of Reclamation)	IPFC	R646	4828	28,300	703,200		2.905	3.35	4759
1530W75.4	Payette Lake	North Fork Payette River	Valley	18N03E08	Lake Reservoir Company	ID	216,R257	4990	5,700	35,000		1.02	4.26×10^{3}	4970
1530W92.9	Upper Payette Lake	North Fork Payette River	Valley	21N03E36	Lake Reservoir Company	IDP	R413	5558	590	2,400	4.8	1.22	1.747×10^{2}	5550
1534.2W1.7	Herrick Reservoir	Skunk Creek	Valley	12N04E16					44					
1535W5.5	Warner Pond	Big Creek	Valley	13N04E03										
1535.1W4.6	Corral Creek Reservoir	Corral Creek	Valley	13N04E13				5242	50					
1535.3W0.6	Horsethief Basin Reservoir	Horsethief Creek	Valley	14N04E36	State of Idaho (Dept. of	R Prop.	R1140			5,000				
					Fish and Game		R1221							
1536.1W1.4	Smalley Creek Reservoir	Glen Cove Creek	Valley	15N04E31	F. H. Smalley	ID	R834			1,032				
1539.1W3.8	Poison Lake	Tributary of Cascade Res.	Valley	15N02E12	Henry Cross	ID	R169			1,590				
1549W20.4	Boulder Lake	Boulder Creek	Valley	18N04E27	Roseberry Irrigation Co.	ID	R49,R954		114	3,757				
1549.7W0.8	Shaw Reservoir	Jug Creek	Valley	17N04E05	John Shaw	ID	R741,850			1,132				
1550W17.8	Little Payette Lake	Lake Fork	Valley	18N03E13	Lake Irrigation Company	I	R170		1,500	16,950				
1550W22.1	Browns Pond	Lake Fork	Valley	18N04E09	Edward A. Cruzen	ID	R739,1011			1,232				
1551W5.2	Box Lake	Box Creek	Valley	20N04E32	Lake Reservoir Company	ID	R448		143	1,395	2.2			
1552.4W1.8	Granite Lake Reservoir	East Fork Lake Creek	Valley	20N03E03	Lake Reservoir Company	ID	R433	6734	169	2,600	2.2			
1555W	Cruikshank Reservoir	Off Stream	Valley	18N04E18	James Cruikshank	I	R841,1099			1,426				
							R1141,662							
1570W24.4	Deadwood Reservoir	Deadwood River	Valley	11N07E08	U.S. (Bureau of Reclamation)	IP	R403		3,170	164,000		3.15	3.14×10^{-2}	5197
1591W13.8	Bull Trout Lake	Warm Springs Creek	Boise	11N10E09										
1599.2W	Edna Lake	Off Stream	Boise											
1600W63.8	Lucky Peak Reservoir	Boise River	Ada	02N03E12				3060	2,800	310,000		2.25	1.37	2820
1600W74.0	Arrowrock Reservoir	Boise River	Boise	03N04E13				3216	3,100	286,600	42	2.815	4.66×10^{-2}	2959
1609W	Lake Lowell	Off Stream	Canyon	03N03W19				2530.5	9,840	190,100	24.6	4.2	2.725×10^{-1}	2456.5
1621W49.7	Indian Creek Reservoir	Indian Creek	Ada	01N04E30	Indian Creek & Res. Irrig. Co.	I	Decree	3334	128	4,800	1.8			
1623.6W	Hubbard Reservoir	Off Stream	Ada	02N01E17					240	7,500	3.5	2.215	6.26	2757.3
1627W35.9	Blacks Creek Reservoir	Blacks Creek	Ada	02N03E31	Pleasant Valley Irrig. Co.	IFCWS	R305		89	7,900	1.8			
1660W43.5	Anderson Ranch Reservoir	South Fork Boise River	Elmore	01S08E01	U.S. (Bureau of Reclamation)			4196	4,740	493,200		3.27	2.975×10^{-3}	3866
1664W5.6	Little Camas Reservoir	Little Camas Creek	Elmore	01S09E09	Mountain Home Irrig. Dist.	I		4965	1,250	22,300				
1695.2W2.5	Browns Lake	Little Queens River	Elmore	07N11E23										

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1727.7W11.1	Triangle Reservoir	Rock Creek	Owyhee	07S02W30				5144	83		2.6			
1727.72W2.1	Spencer Reservoir	Meadow Creek	Owyhee	07S03W13				5103						
1728.37W3.1	Booth Reservoir	Tributary of Cherry Creek	Owyhee	09S06W11	Thomas J. Booth	ID	R747			1,300				
1737.7W2.1	Unknown (Reservoir)	Dry Creek	Owyhee	10S01E29										
1738.1W6.8	Juniper Basin Reservoir	Juniper Creek	Owyhee	16S01W04						1,400				
1739W21.7	Blue Creek Reservoir	Blue Creek	Owyhee	13S02E11	J. A. Sewell	ID	5512		163	1,900				
1739.4W11.7	Riddle Reservoir	Squaw Creek	Owyhee	14S04E32		ID	1173	6105	130	1,000				
1739.5W1.4	Unknown (Reservoir)	Shoofly Creek	Owyhee	13S02E31										
1739.51W5.4	Fromm Reservoir	Harris Creek	Owyhee	13S02E21	Paul Fromm	ID	R22			800				
1739.7W2.0	Little Blue Creek Res.	Little Blue Creek	Owyhee	13S03E17	Blue Creek Land & Livestock Company	I	4249		159	1,910				
1739.9W1.3	Unknown (Reservoir)	Tributary of Blue Creek	Owyhee	11S02E09										
1744.4W	Jensen Lake	Off Stream	Canyon	01S02W22					50		1.6			
1745.1W	Unknown (Reservoir)	Off Stream	Owyhee	03S01E18				2406						
1755.75W	Grasmere Reservoir	Off Stream	Owyhee	12S05E19	Chester Tindall	ID	R501			1,575				
1755.76W	Unknown (Reservoir)	Off Stream	Owyhee	12S05E30										
1756.7W3.2	Snow Creek Reservoir	Snow Creek	Owyhee	15S04E15	William Strickland	ID	R881,717			1,540				
1758.3W2.4	Cowan Reservoir	Cougar Creek	Owyhee	15S08E30	John Cowan	ID	R832			1,337				
1761W17.1	Frazier Reservoir	Canyon Creek	Elmore	03S05E29	William L. Frazier	ID	7062	3109	52	3,535	8.7			
1761.8W6.7	Long Tom Reservoir	Long Tom Creek	Elmore	01S07E35	Mountain Home Irrig. Dist.	I		4456	165	4,100	3.8			
1762.1W20.4	Mountain Home Reservoir	Rattlesnake Creek	Elmore	03S07E19	Mountain Home Irrig. Dist.	ID	Decree		410	5,700	5.0			
1762.83W6.2	Hot Springs Creek Reservoir	Hot Springs Creek	Elmore	03S08E34					93					
1764.76W1.8	Unknown (Reservoir)	Tributary of Alkali Creek	Elmore	04S10E19					156					
1766.3W10.9	Trail Reservoir	Little Canyon Creek	Elmore	04S10E29	Lee Trail	I	R959			2,532				
1766.31W2.0	Morrow Reservoir	Tributary of Little Canyon Cr	Elmore	05S09E12					44					
	UPPER SNAKE RIVER BASINS													
1000U640.0	Milner Lake	Snake River	Twin Falls	10S21E29	Twin Falls Canal Company and Northside Canal Company	ID	11888, 3752	4135	3,000	80,000		1.117	1.43x10^2	Gage
1000U675.0	Lake Walcott	Snake River	Cassia and Minidoka	09S25E01	U.S. (Bureau of Reclamation)	I	66,4126	4195	11,800	210,000		3.2	0.635	4142.5
1000U714.0	American Falls Reservoir	Snake River	Power	07S31E30	U.S. (Bureau of Reclamation) Bannock Power Company			4354.5	56,100	1,700,000	100	1.934	6.65x10^2	4296.5
1000U901.6	Palisades Reservoir	Snake River	Bonneville	01S45E17	U.S. (Bureau of Reclamation)			5620	16,100	1,402,000	54	2.815	0.247	5370
1768U9.9	Pioneer Reservoir	Clover Creek	Gooding	05S12E17				3082	234		5.0			
1768.3U	Bray Lake Reservoir	Off Stream	Gooding	04S13E35					106					
1770U60.0	Magic Reservoir	Big Wood River	Blaine	02S18E18				4797		192,000				
1772U17.4	Thorn Creek Reservoir	Thorn Creek	Gooding	03S15E01				5507	112					
1780U71.0	Little Wood River Res.	Little Wood River	Blaine	01N20E13	U.S. (Bureau of Reclamation)		R1049	5236.3	574	30,000		2.18	1.053	5126
1783U	Star Lake	Off Stream	Lincoln	07S19E12										
1786U8.5	Fish Creek Reservoir	Fish Creek	Blaine	01N22E15	Carey Valley Reservoir Co.	ID	R81		625	18,000				
1786.1U1.4	Carey Lake	Tributary of Little Wood Rv.	Blaine	01S21E26										
1786.6U4.8	Little Fish Creek Reservoir	Little Fish Creek	Blaine	01N21E03	Ed Cameron & A. Albrethsen	ID	R464			1,200				
1786.9U3.3	Campbell Reservoir	Tributary of Little Wood Rv.	Blaine	02N21E30	John P. Campbell	ID	7573			2,700				
1793.1U2.0	Kelly Reservoir	Tributary of Camas Creek	Camas	01S15E25					94					
1793.6U7.0	McHan Reservoir	Spring Creek	Camas	02S15E22					56					
1793.64U0.3	Spring Creek Reservoir	East Fork Spring Creek	Camas	02S15E11					50					
1795U0.4	Twin Lakes Reservoir	McKinney Creek	Camas	02S14E04	Twin Lakes Reservoir and Irrigation Company	ID	3473, R782	5043	1,159	31,400				
1797.3U6.5	Cow Creek Reservoir	Cow Creek	Elmore	01S11E12	Francis P. Foster and C. Trullinger	I	7291, 1364	5239	44	1,283	1.2			
1810U81.8	MacKay Reservoir	Big Lost River	Custer	07N23E12		IWS	R882, 11934	6061	1,380	44,400	7.2			
1821.3U	Hawley Reservoir	Off Stream	Butte	07N28E05	L. R. Hawley	I	R833			2,960				
1821.8U	Summit Reservoir	Off Stream	Custer	11N25E05	Big Lost River Irrig. Dist.				112		2.0			
1827U	Mud Lake	Camas Creek	Jefferson	07N35E32				4779	3,140	41,500	22.4			
1827U6.8	Rays Lake	Camas Creek	Jefferson	07N36E30				4788	210		7.0			
1827.1U	Sandhole Lake	Off Stream	Jefferson	07N36E20										
1827.2U	Two-way Pond	Off Stream	Jefferson	07N36E18										
1840U46.0	Salmon Creek Reservoir	Salmon Falls Creek	Twin Falls	14S15E18	Twin Falls, Salmon Reservoir Land and Power Company	ID	2659,3269 3267,5519		3,000	182,700		1.376	4.25x10^2	Gage
1844U38.4	Deep Creek Reservoir	Deep Creek	Twin Falls	13S16E19	Deep Creek Land & Water Co.	ID	2129	4689	87	1,500	2.9			

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1853U6.0	Cedar Creek Reservoir	Cedar Creek	Twin Falls	14S13E12	Utah Construction Company Idaho Farm Development Co.	ID	11920 11195			26,000				
1854U4.6	Unknown (Reservoir)	Cottonwood Creek	Twin Falls	12S17E02					52		1.4			
1854.4U9.2	Williams Reservoir	North Cottonwood Creek	Twin Falls	13S17E26	W. T. Williams	ID	R831	5748	44	1,500	1.5			
1859U	Wilson Lake Reservoir	Off Stream	Jerome	09S19E24	Twin Falls Northside Land and Water Company			4012	502	18,500	9.2			
1861U3.1	Murtaugh Lake	Dry Creek	Twin Falls	11S20E18				4125	840	8,950	8.5			
1862U26.0	Lower Goose Creek Reservoir	Goose Creek	Cassia	14S22E19	Twin Falls Oakley Land and Water Company	I	3751, 4731		1,100	74,300		2.015	3.57	Gage
1865.2U	Sublett Reservoir	Sublett Creek	Cassia	13S29E03	Sublett Irrigation District	I	R658	5333	87	2,600				
1870U85.0	Portneuf Reservoir	Portneuf River	Caribou	06S39E19				5391	176	23,700				
1880U16.2	Equalizing Reservoir	Blackfoot River	Bingham	03S36E07				4524	521					
1880U78.0	Blackfoot River Reservoir	Blackfoot River	Caribou	05S40E12	U.S. (Bureau of Indian Affs.)			6124	18,900	413,000		1.91	$412x10^2$	6086
1886.3U	Crag Lake	Off Stream	Caribou	07S41E01					137		3.7			
1896U33.0	Grays Lake	Grays Lake Outlet	Bonneville	03S43E31	U.S. (Bureau of Indian Affs.)	I IFPC	R161, 15905, R329,2710 2163	6388		342,000				
1896.71U4.0	Unknown (Reservoir)	Tributary of Grays Lake	Bonneville	04S42E03			R678	6738	168					
1899.1U0.4	Roberts Slough	Tributary of Snake River	Jefferson	05N37E34	Dairy Farms Irrigation Dist.	ID	R191, 14483		139	3,500	4.1			
1899.2U	Market Lake Slough	Off Stream	Jefferson	05N37E07					553		5.8			
1899.27U	Market Lake	Off Stream	Jefferson	05N37E08				4762	75		3.2			
1900U44.0	Ashton Reservoir	Henrys Fork	Fremont	09N42E28				5154	340	2,000	9.8			
1900U93.0	Island Park Reservoir	Henrys Fork	Fremont	13N43E28	U.S. (Bureau of Reclamation)	ID	R686,R590	6302	7,800	127,600	78.0	5.07	$4.87x10^{-4}$	6229
1900U124.0	Henrys Lake	Henrys Fork	Fremont	15N43E26	North Fork Reservoir Company	ID	75	6635	6,578	79,400	20.6	1.2	$3.08x10^3$	6620
1912U	Quayles Lake	Off Stream	Fremont	07N39E18				4849	166		3.8			
1913U	Egin Lakes (3)	Off Stream	Fremont	07N39E03				4882	80		3.4			
1943U2.3	Lemon Lake	Sand Creek	Fremont	09N41E36				5122	40		1.5			
1943U9.1	Lower Arcadia Reservoir	Sand Creek	Fremont	09N41E02				5390	69		3.1			
1943U9.8	Upper Arcadia Reservoir	Sand Creek	Fremont	09N41E02				5429	50		3.5			
1943.8U0.5	Sand Creek Reservoir	Blue Creek	Fremont	10N41E10				5511	65		2.4			
1964U0.2	Silver Lake	Thurman Creek	Fremont	12N42E35				6119	183		2.9			
1964U3.0	Golden Lake	Thurman Creek	Fremont	12N42E22				6133	48		2.7			
1976.6U0.2	Sheridan Reservoir	Tributary of Sheridan Creek	Clark	13N40E13				6452	118		5.3			
1976.34U1.1	Unknown (Reservoir)	West Fork Lee House Creek	Fremont	13N41E15				6453	67		1.9			
1985.6U0.6	Upper Palisades Lake	Tributary of Palisades Creek	Bonneville	01N45E02				6683						
	PANHANDLE BASINS													
3400P102.1	Post Falls Res. (Coeur d' Alene Lake)	Spokane River	Kootenai	50N05W03	Washington Water Power Company	P	Decree	2125	56,000	238,500		1.61	$7.2x10^3$	2120
3475P	Hauser Lake	Off Stream	Kootenai	51N05W18	J. H. Wright et al	I	R490	2185	536	2,300	4.4			
3478P	Twin Lakes	Rathdrum Creek	Kootenai	52N04W08				2306	907		9.3	1.08	60	
3485P	Hayden Lake	Hayden Creek	Kootenai	51N03W19				2238	3,792		27.5	1.133	$2.22x10^3$	2219.35
3485.1P0.3	Avondale Lake	Tributary of Hayden Lake	Kootenai	51N03W18				2288	57		1.8			
3489P0.6	Fernan Lake	Fernan Creek	Kootenai	50N03W19					348		5.0			
3500P5.51	Hidden Lake	South Arm Coeur d'Alene Lake	Benewah	47N03W30				2125	336		3.8			
3500P6.31	Chatcolet Lake	South Arm Coeur d'Alene Lake	Benewah	46N03W06				2125	1,694		11.5			
3500P6.32	Round Lake	South Arm Coeur d'Alene Lake	Benewah	47N03W32				2125	947		8.2			
3500P10.3	Benewah Lake	South Arm Coeur d'Alene Lake	Benewah	46N03W11				2125	336		3.8			
3625.1P	Turtle Lake	Off Stream	Benewah	46N01W17				2188	59					
3703P	Anderson Lake	Bell Creek	Kootenai	48N03W31				2141	486		4.0			
3709P0.1	Thompson Lake	Thompson Creek	Kootenai	48N03W21				2129	199		2.3			
3714P0.3	Blue Lake	Blue Lake Creek	Kootenai	48N03W23					248		2.6			
3721P0.4	Swan Lake	Tributary of Coeur d'Alene Rv.	Kootenai	48N03W31					411		1.9			
3722P0.1	Black Lake	Black Creek	Kootenai	47N03W01					348		5.1			
3726P0.7	Cave Lake	Willow Creek	Kootenai	48N02W28					681		3.4			
3731P0.5	Medicine Lake	Evans Creek	Kootenai	48N02W28					174		1.8			
3741P0.3	Killarney Lake	Killarney Creek	Kootenai	48N02W14					504		2.0			
3761P	Rose Lake	Off Stream	Kootenai	49N01W33					311		1.5			
5000P90.1	Albeni Falls Reservoir (Pend Oreille Lake)	Pend Oreille River	Bonner	56N05W29	U.S. (Corps of Engineers)	P		2062.5	105,000	1,552,000		0.84	$1.82x10^5$	2049.7
5000P149.9	Cabinet Gorge Reservoir	Clark Fork	Bonner	55N03E27	Washington Water Power Co.	P		2175	3,500	112,000		1.44	475	2140

[1] Only lakes and reservoirs with surface areas in excess of 40 acres and capacities in excess of 1,000 acre-feet are shown.

[2] Mileage portion of Identification No. and land coordinates refer to location of dam or outlet.

[3] D = Domestic, Prop = Propagation of fish, SW = Stock water, Mig = Migratory bird refuge, P = Power, R = Recreation, FC = Flood control, I = Irrigation, WS = Water supply

[4] Idaho Department of Reclamation.

[5] At normal maximum stage.

Identification No.[2]	Name	Stream	County	Location[2] T.,R.,S.	Owner	Purpose[3]	Permit No.[4]	Surface elevation[5]	Surface area,[5] acres	Capacity,[5] acre-feet	Length of shoreline,[5] miles	a	k	Reference elevation
5111P	Fish Lake	Spirit Creek	Bonner	54N05W22				2256	144		2.8			
5121P	Spirit Lake	Spirit Creek	Kootenai	53N04W06				2440	1,555		12.9			
5181.1P	Freeman Lake	Freeman Creek	Bonner	56N06W12										
5200P44.0	Priest Lake	Priest River	Bonner	59N04W05				2438	32,900	128,000	49.6			
5200P70.8	Upper Priest Lake	Priest River	Bonner	63N04W33				2439	1,342		10.0			
5215.1P1.7	Blue Lake	Blue Creek	Bonner	57N04W21				2238	66		1.3			
5243.11P1.1	Sorg Lake	Tributary of Soldier Creek	Bonner	59N04W11	H. F. Sorg	D	R85	2475	74	1,300	1.8			
5241.1P1.6	Chase Lake	Tributary of Priest Lake	Bonner	59N04W15				2495	211		2.7			
5321P8.9	Hoodoo Lake	Hoodoo Creek	Bonner	55N04W34				2138	93		3.1			
5331P7.0	Cocolalla Lake	Cocolalla Creek	Bonner	55N02W06				2203	828		6.1			
5341.1P4.7	Shepard Lake	Tributary of Sagle Creek	Bonner	56N02W23				2280	101		2.1			
5358.1P	Gamble Lake	Off Stream	Bonner	56N01E06				2083	112		1.8			
5374.1P2.3	Mirrow Lake	Tributary of Pend Oreille Lk.	Bonner	56N01W31				2370	96					
7224.3P5.8	Hidden Lake	Beaver Creek	Boundary	64N03W20				5443	46		1.1			
7236.1P5.1	Brush Lake	Brush Creek	Boundary	64N01E29				2998	48		1.8			
7270P17.3	McArthur Lake	Deep Creek	Boundary	60N01W34				2085	138		3.7			
7317.3P0.1	Robinson Lake	Gillow Creek	Boundary	65N02E21				2642	56		2.4			
7327P10.4	Perkins Lake	Curley Creek	Boundary	62N03E04				2632	51		0.4			

[1] Only lakes and reservoirs with surface areas in excess of 40 acres and capacities in excess of 1,000 acre-feet are shown.

[2] Mileage portion of Identification No. and land coordinates refer to location of dam or outlet.

[3] D = Domestic, Prop = Propagation of fish, SW = Stock water, Mig = Migratory bird refuge, P = Power, R = Recreation, FC = Flood control, I = Irrigation, WS = Water supply

[4] Idaho Department of Reclamation.

[5] At normal maximum stage.

APPENDIX D

MAPS SHOWING EXISTING RESERVOIRS

AND LAKES IN IDAHO

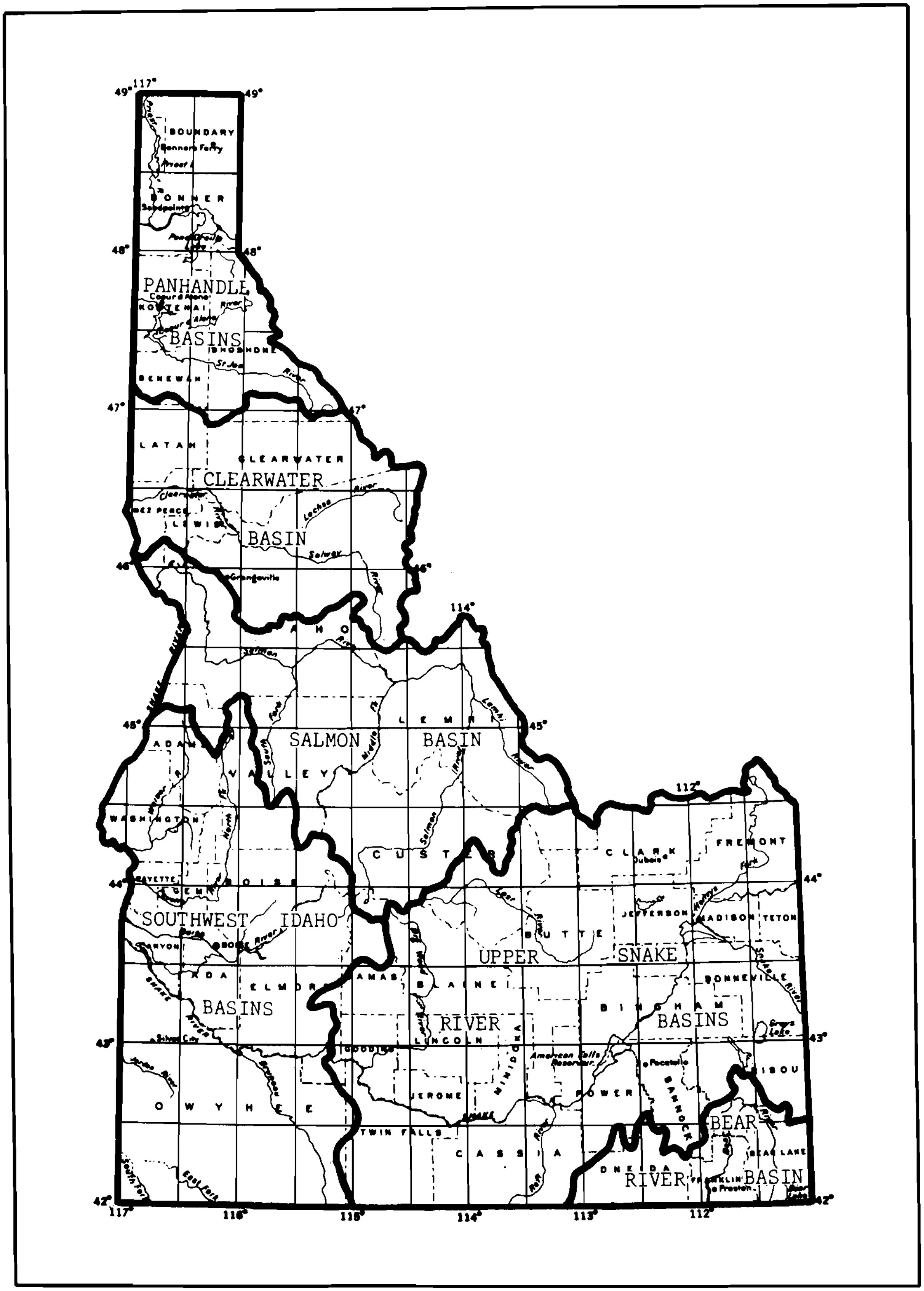

Figure 8. Major drainage basins of Idaho.

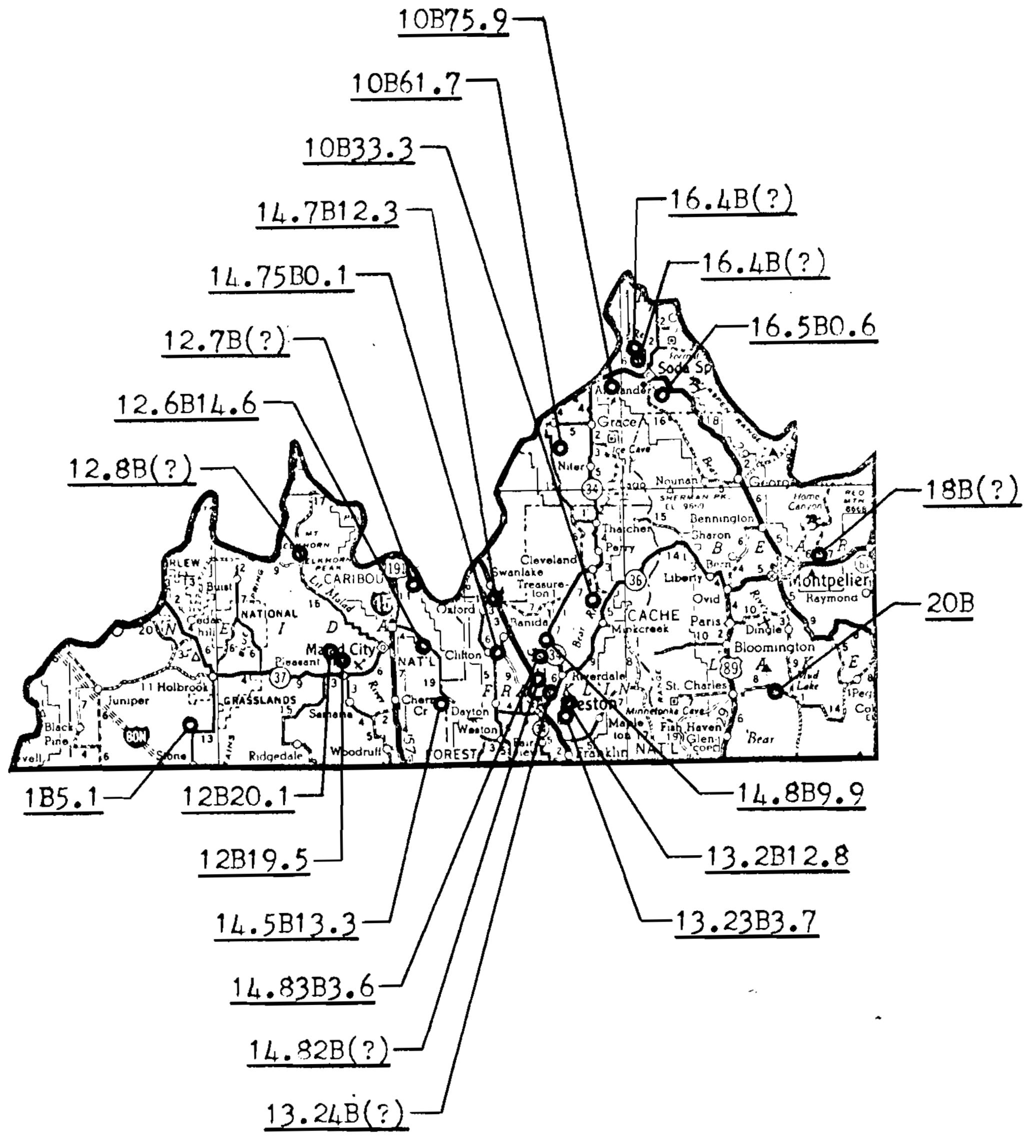

Figure 9. Existing reservoirs and lakes in Bear River Basin.

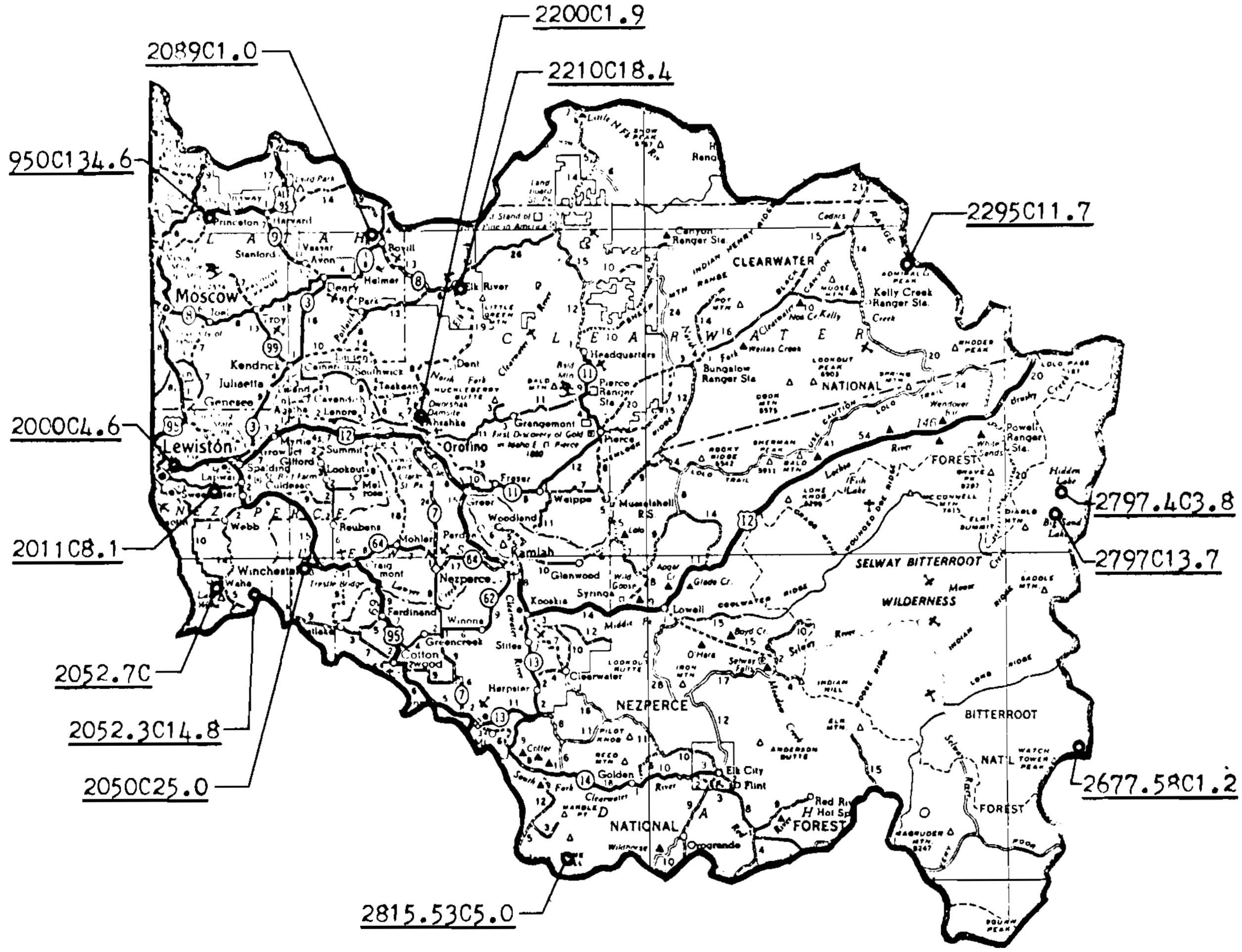

Figure 10. Existing reservoirs and lakes
in Clearwater Basin.

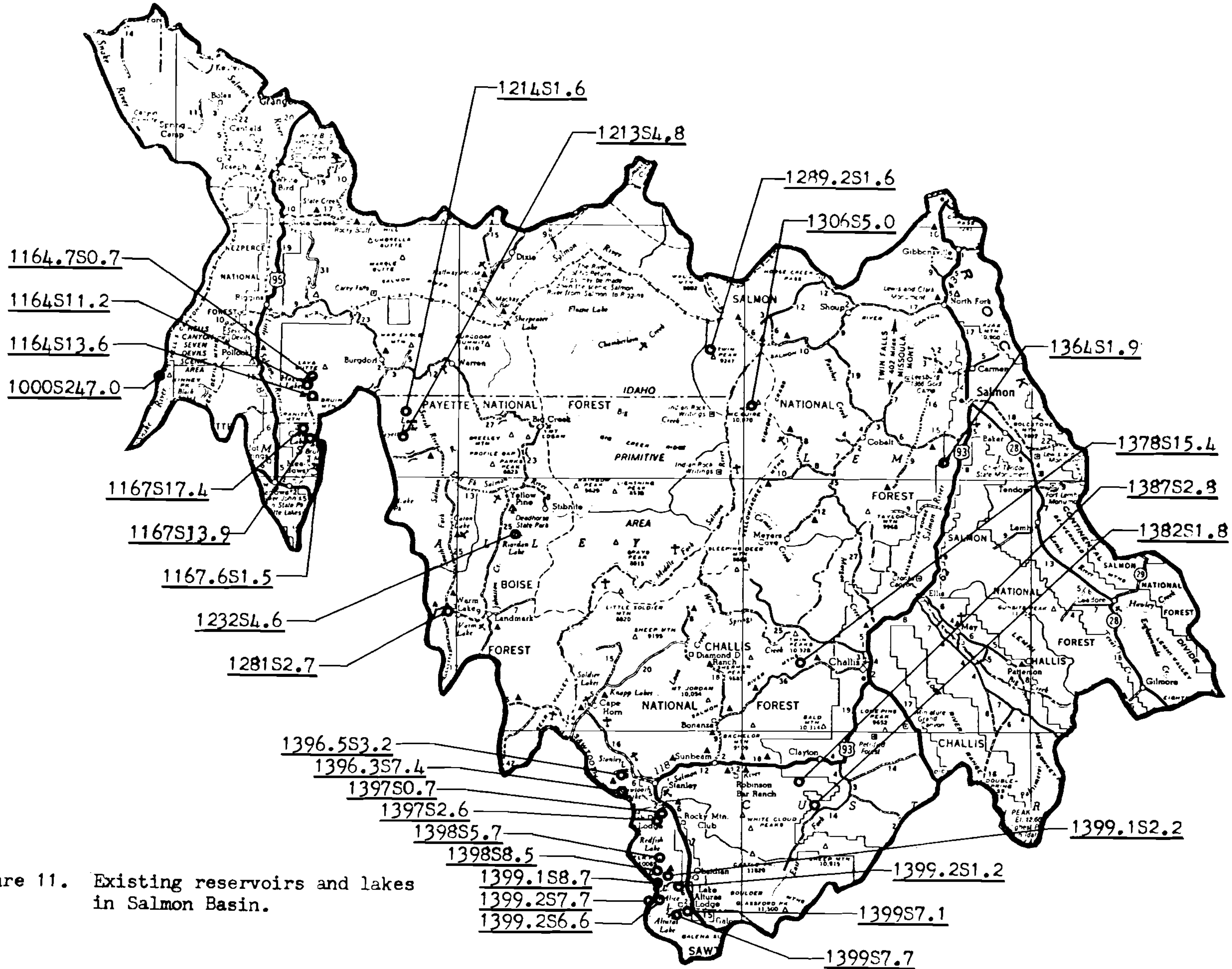

Figure 11. Existing reservoirs and lakes in Salmon Basin.

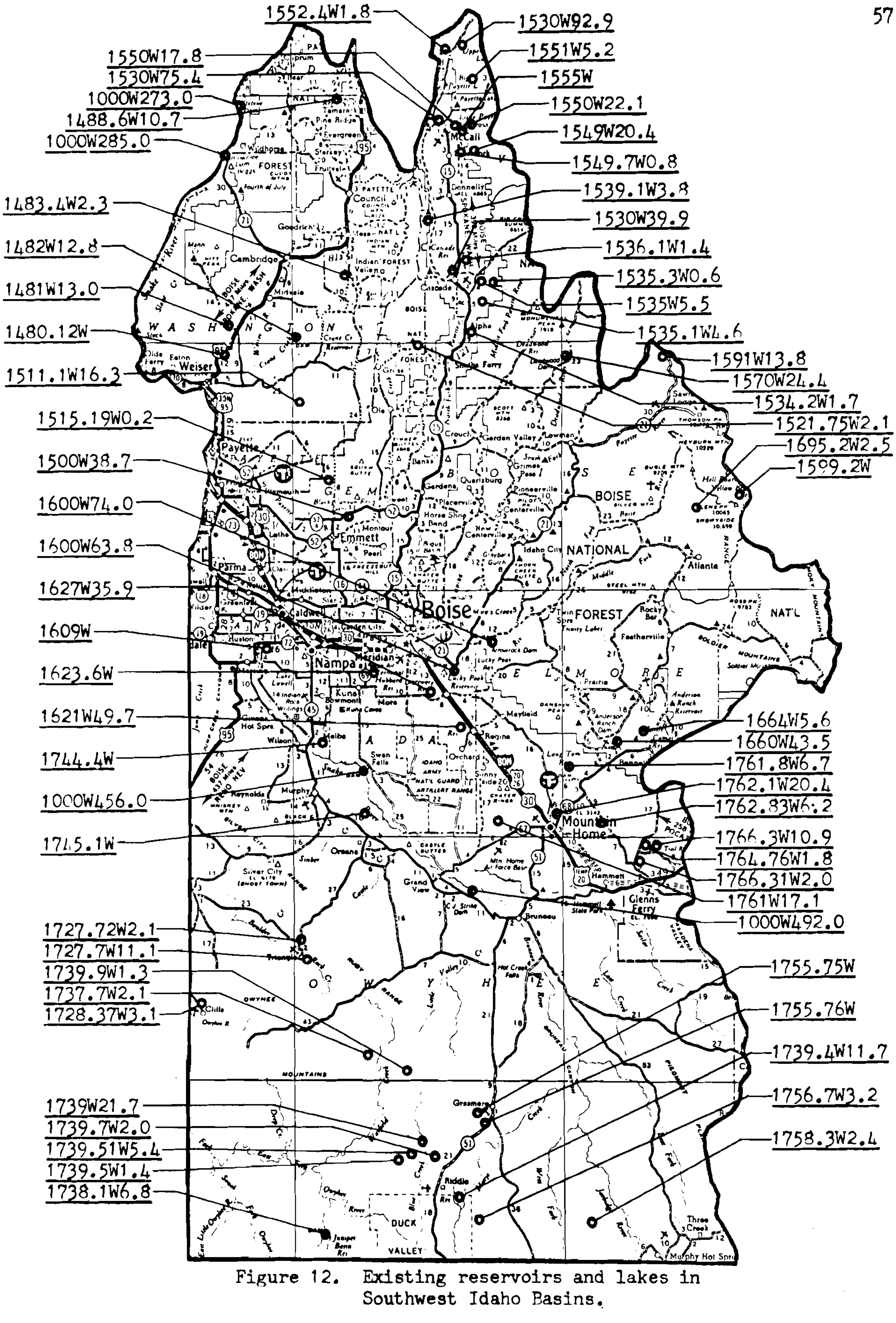

Figure 12. Existing reservoirs and lakes in Southwest Idaho Basins.

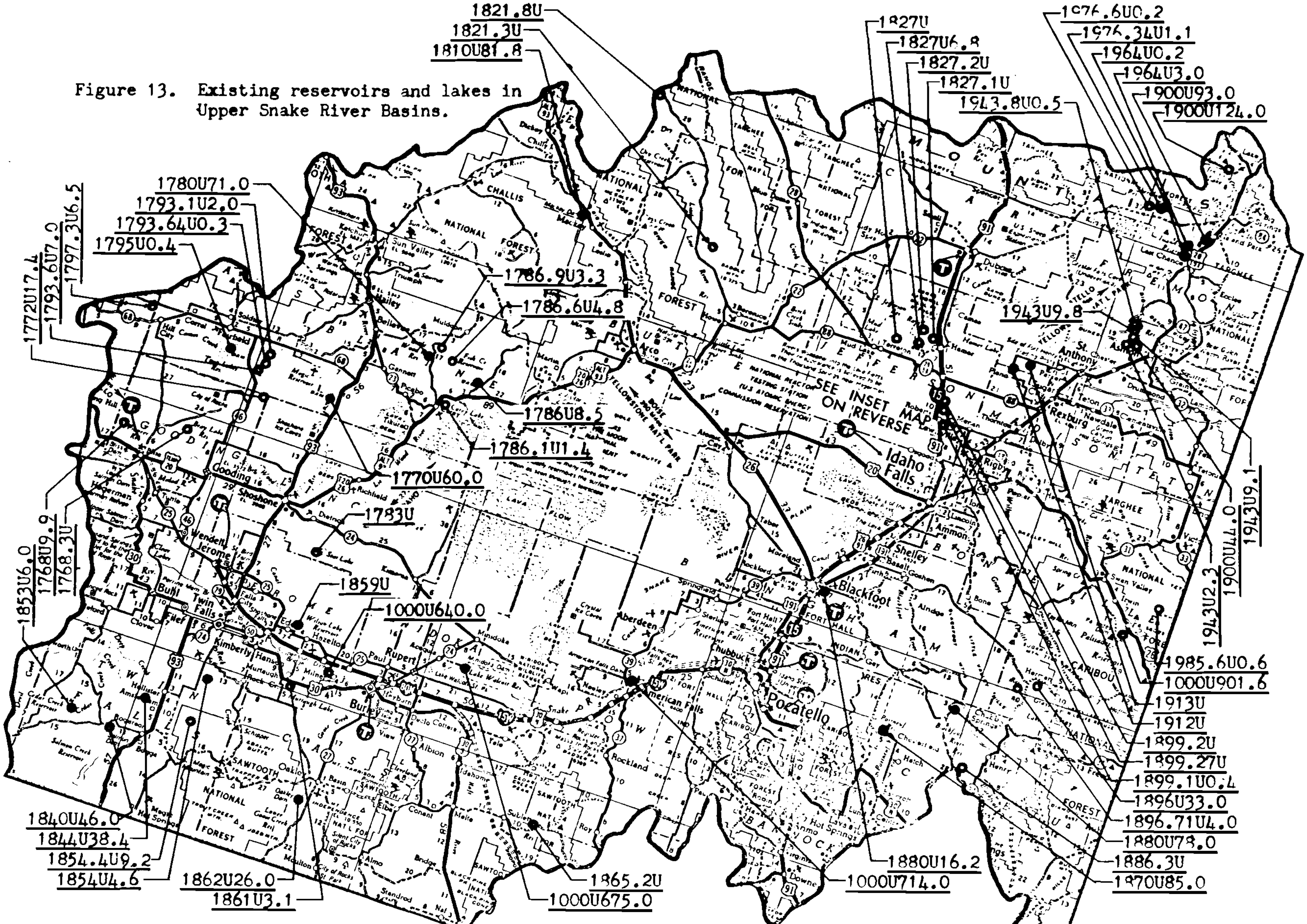

Figure 13. Existing reservoirs and lakes in Upper Snake River Basins.

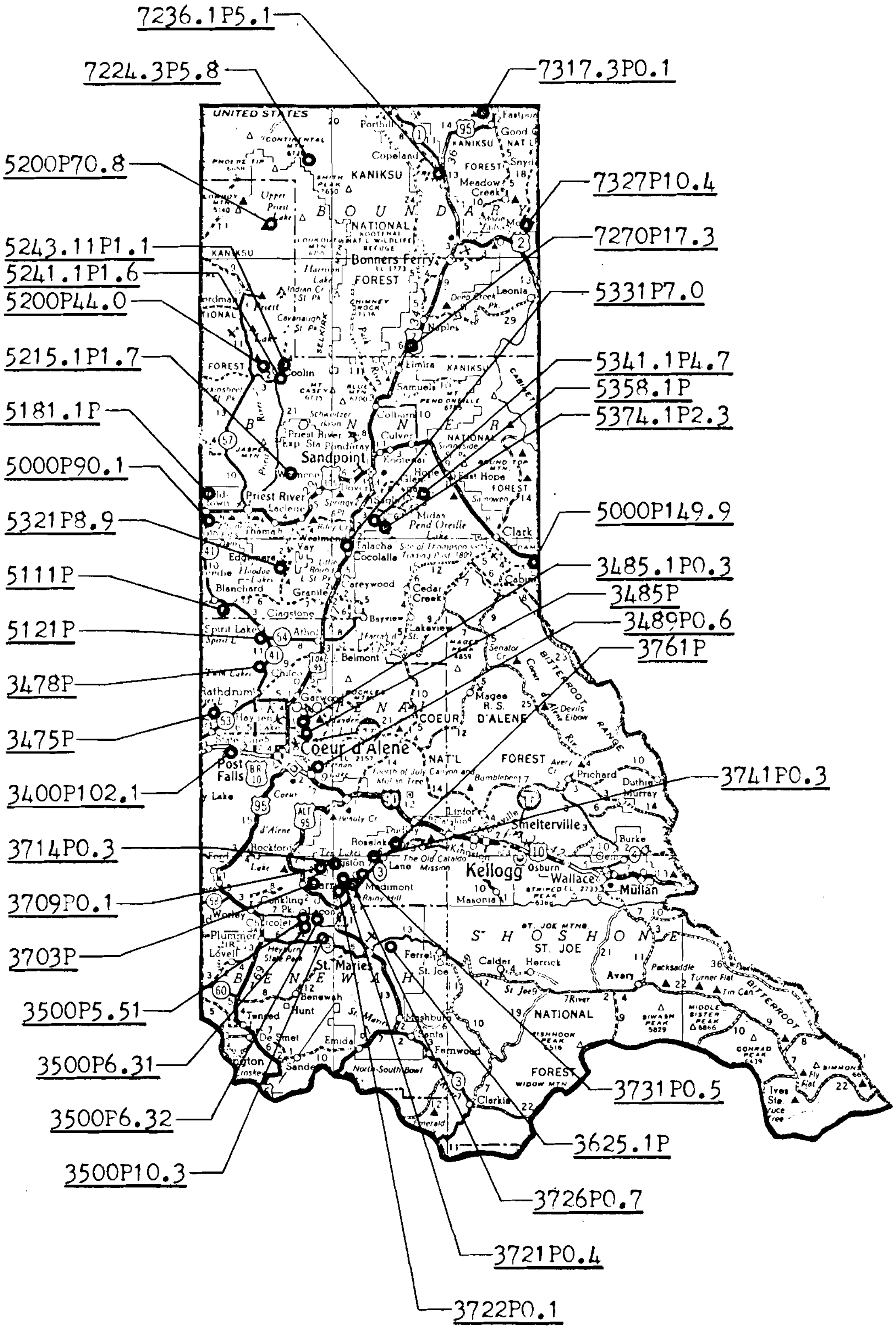

Figure 14. Existing reservoirs and lakes in Panhandle Basins.