

State of Idaho

The State Water Plan — Part Two

Idaho Water Resource Board:

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December 1976

Idaho Water Resource Board, Statehouse, Boise, Idaho 83720

STATE OF IDAHO

JOHN V. EVANS

Governor

"There shall be constituted a State Water Resource Agency composed as the Legislature may now or hereafter prescribe which shall have power to formulate and implement a state water plan for optimum development of water resources in the public interest . . . "

Constitutional Amendment

First printing December 1976
1,000 Copies

Second Printing February 1977
500 Copies

Third Printing July 1977
500 Copies

Fourth Printing January 1978
500 Copies

Fifth Printing February 1978
500 Copies

Sixth Printing June 1980
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STATE OF IDAHO

IDAHO WATER RESOURCE BOARD

STATEHOUSE
BOISE, IDAHO 83720

December 29, 1976

To the Citizens of Idaho:

It is our pleasure to present to you *The State Water Plan - Part Two*. Valuable time and effort has been expended by many citizens around the state in helping us develop this plan, and we gratefully acknowledge this assistance. We realize that the contents of this document will not meet the desires and expectations of every citizen, but we feel that *Part II* represents the best approach for the greatest number of Idahoans.

The success of this plan depends on how actively we all work toward its implementation. The Board looks forward to working closely with individual citizens, the legislature, and local, state and federal government to make our recommendations in this report a reality.

The State Water Plan will serve Idaho only as long as it continues to reflect the needs of Idaho. We urge every citizen to monitor the plan as it is put to practical use and to suggest changes to the Board when necessary. The plan will be subject to public and formal review at least once every five years.

We seek the assistance and support of the people of Idaho so that together we may work towards providing for the future economic growth and protection of our natural resources that are so important to Idaho.

Sincerely,

A handwritten signature in black ink, reading "John F. Streiff".

JOHN STREIFF, Chairman
Idaho Water Resource Board

RESOLUTION TO ADOPT

December 29, 1976

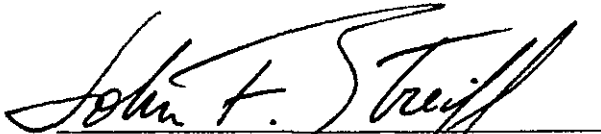
WHEREAS, the Idaho Water Resource Board is charged with the task of formulating a coordinated, integrated, multiple-use water resource policy, and

WHEREAS, draft documents for the State Water Plan - Part Two have been published and distributed to the public for the Panhandle, the Snake River, and the Bear River Basins, and

WHEREAS, public meetings and hearings have been held throughout Idaho to gain input as to the content of those draft plans, and such input has been taken into full consideration by this Board,

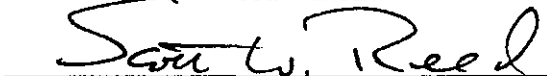
NOW THEREFORE, BE IT RESOLVED, that pursuant to Article XV, Section 7 of the Constitution of the State of Idaho, and pursuant to the powers granted to us by statute, we hereby adopt the attached document as Part Two of the State Water Plan to guide the future use and conservation of Idaho's water resources.


BE IT FURTHER RESOLVED, that the Board, in recognition of constantly changing economic and environmental conditions which must be considered in establishing a state water resource plan will formally review this document and provide opportunity for public input annually upon request, but at least once every five years from the date of adoption of this order.


John F. Streiff, Chairman


Franklin Jones

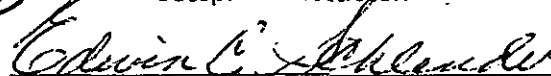

M. Reed Hansen


Scott W. Reed


George L. Yost, Vice-Chairman


Donald R. Kramer, Secretary


Joseph H. Nettleton


Edwin C. Schlender

FOREWORD

The State Water Plan - Part Two is the result of ten years of thought, study and research by the Idaho Water Resource Board to fulfill its constitutional mandate "to formulate and implement a State Water Plan. . ." Many studies and reports were published during that time, numerous public meetings and hearings have been held and thousands of pages of testimony and public comment have gone into making up the policies contained herein.

Prior to creation of the Idaho Water Resource Board in 1965, water use had developed through custom and legislation since Lewis and Clark traveled through the northwest from 1804 to 1806. On June 27, 1855, settlers in Lemhi County first put water to use by irrigating land to raise the family garden and feed for their livestock. By 1896, the Office of the State Engineer had been established to oversee the development of new land and the construction of water works. The State Engineer in 1896 reported to the Governor that 315,000 acres had been cultivated, the majority of which required irrigation. Since that time, approximately six million more new acres have been put under cultivation (four million are irrigated), technology has enabled Idaho farmers to participate in a worldwide marketplace, and the state's once seemingly plentiful supply of a valuable natural resource — water — now has more demands on it than it is capable of satisfying.

The State Water Plan - Part Two, a guide to future water resource management in Idaho, is the most recent in a series of documents that comprise the State Water Plan. In July 1972, the *Interim State Water Plan* was published which catalogued the resources of the state and presented the various alternatives for future water policy to the public. *The State Water Plan - Part One, The Objectives*, was published in June 1974 to guide the direction of later efforts to formulate the final water plan. Finally in March, 1976, a draft version of *The State Water Plan - Part Two* was distributed to the public and various private and governmental agencies for review and comment. These previous efforts are now culminated in this document.

Water policy for the three planning basins — the Snake River, Panhandle and Bear River basins — is set forth within this document. Chapter 4 contains the goals and recommendations of the Board to be used in guiding future water resource management in Idaho. Some of the policy statements pertain only to a single basin or vary in their application to each basin, and these are discussed separately.

Implementation of the policies contained in Chapter 4 will require several changes in Idaho law and public attitudes. The Board will work closely with the legislature to secure changes in the law where necessary.

Public understanding and compromise will be required by those with special interests to assure the plan's full implementation. Unless the plan is implemented quickly, there may not be sufficient water supplies left in many areas to maintain Idaho's quality of life. The Idaho Water Resource Board has found great support among the citizens of Idaho for a state water plan and feels confident that this document will be accepted as a beginning process for continuing Idaho's economic growth while protecting a quality environment.

Because public priorities and economic and social conditions change, the Board has provided a procedure whereby the plan will be updated at least once every five years to insure that the State Water Plan continues to be dynamic, responsive plan for developing, protecting and preserving Idaho's water resources for generations to come.

ACKNOWLEDGEMENTS

Formulation of *The State Water Plan - Part Two* has involved a great number of Idahoans from all walks of life. Their involvement may have been at information meetings, public hearings or merely taking the time to let the Idaho Water Resource Board know their views and opinions on the water resource issues confronting Idaho. Without this citizen response and testimony the State Water Plan would not have been possible.

The Board gratefully acknowledges the efforts and contributions of state, federal and local agencies who have cooperated in this endeavor. Their assistance insures a broad view of public interest to be considered in future water resource decisions.

The private sector, from small businesses to large corporations to special interest associations and organizations, are an equal voice in Idaho and many have contributed to this State Water Plan. Their response and reaction brings new dimensions to the decision making process.

The Board sincerely appreciates the assistance given by the staff of the Department of Water Resources. Many, many times they have given extra time to accomodate various Board actions. The staff of the Department of Water Resources has demonstrated the highest standards of professionalism in the gathering of basic resource data, conducting extensive evaluations and assembling that data into an orderly form. Their efforts will stand as a bench mark in water resources planning regionally and nationwide.

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**R. Keith Higginson, Director
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Chapter 1

The Water Planning Program

The State Water Plan was adopted by the Water Resource Board to guide the development, management, and use of the state's water and related land. The plan recognizes past actions, addresses present conflicts and opportunities, and seeks to ensure that future water resource uses will complement and supplement state goals directed toward achieving a "quality of life" for the citizens of Idaho. The plan must be viewed as a dynamic document, subject to change, to best reflect citizen desires and to be responsive to new opportunities and needs.

Constitutional Authority

The basic authority for the preparation of a State Water Plan is contained in the Idaho Constitution, Article 15, Section 7. This constitutional amendment, adopted in November 1964 following a statewide referendum, provides that:

There shall be constituted a Water Resource Agency, composed as the Legislature may now or hereafter prescribe, which shall have power to formulate and implement a state water plan for optimum development of water resources in the public interest; to construct and operate water projects; to issue bonds, without state obligation, to be repaid from revenues of projects; to generate and wholesale hydroelectric power at the site of production; to appropriate public waters as trustee for Agency projects; to acquire, transfer and encumber title to real property for water projects and to have control and administrative authority over state lands required for water projects; all under such laws as may be prescribed by the Legislature.

Section 7 provided the basic guidance and authority to formulate the State Water Plan. Previous to the adoption of Section 7, Section 3 provided the basic guidelines for appropriation of water and allocations of water during low water conditions. Although no legal confrontations have been encountered, Section 7 probably tempers Section 3 in that future decisions must be in conformance with the State Water Plan. Section 3 provides,

The right to divert and appropriate the unappropriated waters of any natural stream to beneficial uses, shall never be denied, except that the state may regulate and limit the use thereof for power purposes. Priority of appropriation shall give the better right as between those using the water; but when the waters of any natural stream are not sufficient for the service of all those desiring the use of the same, those using the water for domestic purposes shall (subject to such limitations as may be prescribed by law) have the preference over those claiming for any other purpose; and those using the water for agricultural purposes shall have preference over those using the same for manufacturing purposes. And in any organized mining district those using the water for mining purposes or milling purposes connected with mining, shall have preference over those using the same for manufacturing or agricultural purposes. But the usage by such subsequent appropriators shall be subject to such provisions of law regulating the taking of private property for public and private use, as referred to in section 14 of article I of this Constitution.

The State Water Plan was developed within the authority and constraints established by the Idaho Constitution.

Legislative Authority

The constitutional amendment (Section 7) called for the creation of a "Water Resource Agency" but did not establish the agency. This was done in 1965 by the legislature which established the Water Resource Board with the power and duties:

To progressively formulate an integrated, coordinated program for conservation, development, and use of all unappropriated water resources of this state, based upon studies and after public hearings in affected areas at which all interested parties shall be given the opportunity to appear.
(Idaho Code 42-1734, [6])

To assist the Water Resource Board in the preparation of the State Water Plan, the legislature provided for the director of the Department of Water Resources:

To perform administrative duties and such other functions as the Board may from time to time assign to the Director to enable the Board to carry out its powers and duties. (Idaho Code 42-1805, [6])

The Board formally requested the assistance of the director through the passage of a resolution calling for the director to take action as necessary to carry out the planning activities of the Board.

History of the Idaho Water Resource Board

The Water Resource Board was established in March 1965 by an act of the 38th Idaho Legislature. Initially the Board was a separate agency, having its own staff and hiring its own director. The Board staff grew from a two-man unit in 1966 to approximately 30 employees in 1974.

Since its creation, the Board has adopted several position and policy statements on specific projects and programs which are important to the formulation of the State Water Plan. A brief summary of key Board statements follows.

1. Reconnaissance study of Bear River Basin in Idaho, February 21, 1967: Board initiated study.
2. Rathdrum Prairie Project, September 15, 1967: Board supported the project.
3. Southwest Idaho Water Development Project, August 17, 1968: Board supported the proposed project.
4. Bear River Policy Statement, April 8, 1969: Board supported efforts of the Bear River Negotiating Team regarding possible modifications of the Bear River Compact and supported the Caribou Project.
5. Multiple Use Classification, December 11, 1970: Board opposed the inclusion of potentially irrigable lands under the BLM Multiple Use Classification Program until the State Water Plan is completed.
6. Owyhee Project, February 19, 1971: Board supported the project.
7. Salmon Falls Division of the Upper Snake River Project, February 19, 1971: Board supported the project.
8. Swan Falls-Guffey Project, May 7, 1971: Board supported the project.
9. Replacement of American Falls Dam, November 29, 1972: Board supported the replacement of American Falls Dam at the present elevation.

In 1974, as a result of a statewide referendum, state agencies were reorganized and the Water Resource Board staff was combined with the Department of Water Administration to form a Department of Water Resources. The director of the Department of Water Resources is no longer appointed by the Board, but is directed by law to assist the Board in carrying out its planning activities.

The Water Resource Board remains as the water policy making body for the state. The Board of which no more than four members can be from the same political party consists of four members who are appointed at-large and four members appointed from each of the four districts in Idaho.

By law, the Board meets at least once each quarter, but the press of items for consideration often requires more frequent meetings. Although Boise is often chosen as the site for meetings because of its central location, meetings are also held in other Idaho cities to provide exposure to regional needs and problems.

Formulation of the State Water Plan

Approach

Formulation of the State Water Plan is a three-phase process. The first phase was completed with publication of the July 1974 report entitled, *The State Water Plan - Part One, The Objectives*. In that report, objectives were adopted by the Board to guide future water planning efforts. In *The State Water Plan - Part Two* actions and methods are presented which have been adopted by the Board as water policy to meet the objectives outlined in *Part One*. Implementing the policies in *Part Two* will require the combined efforts of the government agencies, the legislature, private concerns and the public. Consequently, the report delineates those areas where legislative action is required, identifies the programs the Board will pursue, and describes the areas where cooperation of public and private interests is necessary. The third and final phase will involve a continuing planning process which will be directed toward the completion of a series of feasibility reports on specific projects and programs.

Planning Process

Planning for the Snake River Basins was accomplished by a state-federal multi-disciplinary study team led by a representative of the Department of Water Resources. Planning in the Panhandle and Bear River basins was essentially an effort of the Department of Water Resources. The planning concepts promulgated by the U.S. Water Resources Council in the *Principles and Standards*, and adopted by the Board in the *Objectives Report* were adhered to. Specific methods to formulate the plan were developed to fit the resource conditions and needs of the state. The methodology was compatible with that used by federal members of the U.S. Water Resources Council.

The basic steps followed in the planning process were:

1. A comprehensive public involvement program to determine public views and desires regarding resource problems, needs, and potentials;
2. An evaluation of the water and land resource base and an estimation of the probable future conditions without a plan;
3. A determination of public views about conceptual environmental quality (E.Q.) and economic development (E.D.) plan alternatives;
4. An evaluation of the effects of E.Q. and E.D. programs and projects;
5. The preparation of a draft report delineating alternatives and proposed plans, including a display of their beneficial and adverse effects, along with a comparison of conditions without the plan;
6. Final adjustment of the plan and publication of a final report based on public response and action taken by the Water Resource Board on the draft report;
7. The adoption of the *State Water Plan - Part Two*, by the Idaho Water Resource Board as required by Article 15, Section 7, of the Idaho Constitution.

The state water planning process included an extensive public involvement program and the information received through the program was used in formulating the State Water Plan. Information meetings were held in 30 cities throughout the state during January to May 1975 to answer questions the public might have concerning the planning process and the basin reports and to solicit public input and comments. A newspaper supplement entitled "You and Water," which outlined the major identified water problems in each basin and presented conceptual environmental quality (E.Q.) and economic development (E.D.) alternative plans, was widely distributed throughout the basins. Included in the newspaper supplement was a section asking the public to respond to 18 questions related to the formulation of the State Water Plan and to comment on the economic and environmental concepts.

Public Participation

The following year the draft basin plan reports were published and official public hearings were held in nine towns in the Snake River Basin in May 1976, in three towns in the Panhandle in October 1976, and in two towns in the Bear River Basin in December 1976.

Relationship to Other Planning Efforts

The review and coordination of planning studies by other state and federal governmental entities was accomplished by the State Study Team. As a multi-disciplinary state-federal unit, the study team provided an excellent mechanism for the review of planning activities of individual agencies and for assuring coordination. Input to the State Water Plan was provided by the U.S. Departments of Interior, Commerce, Agriculture, Corps of Engineers, Housing and Urban Development, Environmental Protection Agency, Federal Power Commission; and the state agencies of Parks and Recreation, Fish and Game, Health and Welfare, Lands and the Division of Budget, Policy Planning and Coordination. The Idaho Inter-Tribal Policy Board represented the Indian tribes.

The study team worked with other planning organizations to coordinate the State Water Plan with regional and national water programs. Some of these planning organizations are listed below.

Pacific Northwest River Basins Commission

The Commission is a federal-state partnership and serves as the principal agency for the coordination of federal, state, and interstate water planning activities in the Pacific Northwest. The Commission is charged with the responsibility to prepare and keep up-to-date a comprehensive, coordinated joint plan (CCJP), and to establish priorities for projects and programs that will complete and implement the CCJP plan. River Basin Commissions were authorized by Title I of the Water Resources Planning Act of 1965. Commission authorities are limited to planning — not regulation, construction, or management.

Idaho was instrumental in the formation of the Pacific Northwest River Basins Commission and actively participates in Commission activities. The chairman of the Water Resource Board was appointed by the Governor to serve as Idaho's Commission member and also currently serves as the Commission vice-chairman of the state delegation. The director of the Department of Water Resources is the alternate Commission member and department staff are active in the various technical committees. All of Idaho, with the exception of the Bear River Basin, is in the area encompassed by the Pacific Northwest River Basins Commission.

Pacific Southwest Interagency Committee

The Interagency Committee was established in 1948 to serve as a regional coordinating entity. Interagency Committees include state and federal members and provide forums where each agency can communicate its planning program to other agencies. An Interagency Committee's ability to achieve coordination is limited and it operates without central officers or staff. The Bear River Basin is the only part of Idaho encompassed by the Pacific Southwest Interagency Committee. Staff of the Idaho Department of Water Resources are assigned to the various technical committees and provide basic data and information to the Interagency Committee on issues which affect the state.

The Council was created in June 1965 at the Western Governors' Conference. The Western States Water Council is made up of the eleven western Governors and thirty-three additional council members appointed by the Governors. The states that are members of the Council are: Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. The western states are able to bring together western water officials in the forum of the Council to discuss and act upon water issues of mutual concern and interest. The Council takes external positions only to act as a body if there is a consensus of opinion among the member states. On matters concerning out-of-basin transfers of water, a unanimous vote of all member states is required. On other external matters, a two-thirds majority vote is needed for the Council to take a position. The Council frequently serves as a catalyst and an information gathering aid so that member states are better able to respond and represent their position on major water matters.

Western States Water Council

The Interstate Conference on Water Problems (ICWP) is a national organization of state, intrastate, and interstate officials associated with water resources administration. ICWP was established in 1959 as an outgrowth of regional conferences on water problems. The purpose of ICWP is to facilitate cooperation, consultation, and exchange of information among members and to promote a consensus or understanding of views on water and related land issues. One general meeting is held each year and special meetings for the officers and executive committee are scheduled throughout the year on a need basis.

Interstate Conference on Water Problems

An extensive effort was made to coordinate state water planning activities and other state agencies having a responsibility and interest in water resources. Agencies were requested to have a representative join the State Study Team. Special meetings were scheduled to foster a better understanding of how other agency plans could be coordinated with the State Water Plan. Work is also continuing with other state agencies on the development of alternative population and growth projections to serve as a common base for state agency studies. A discussion of the purpose and general responsibilities of other state agencies involved with water and related land resources planning is provided in Chapter 3.

State Agencies

Federal agencies such as the Corps of Engineers, Bureau of Land Management, Bureau of Reclamation, Forest Service, Soil Conservation Service, Environmental Protection Agency, and others, are involved in water and land resources planning in Idaho. Their actions, rules and regulations, policies and studies all substantially impact the state's efforts and ability in developing and implementing the State Water Plan. The constraint placed on federal agencies in some instances must also be recognized, and the significance of federal agency assistance in planning and implementation

Federal Agencies

cannot be overlooked. A discussion of the purpose and responsibilities of these agencies is included in Chapter 3.

Local Agencies

In response to the Idaho Local Planning Act of 1975 individual counties are preparing comprehensive county plans which are to include how the counties' land and water resources are being used. The plans are to show the trends and desirable goals and objectives or desirable future condition of the county's land, water, and recreational facilities.

Chapter 2

Resources

The natural assets of the state include: land, ground and surface waters, fish and wildlife, forest and minerals. In a special resource category are the people of Idaho. Virtually all of these resources have common interests, are interdependent, and must be recognized perspectively in planning for any one resource.

Idaho, in comparison with many other states, has large quantities of undeveloped resources. Time has been particularly kind in evolving a geological area of rich mineral deposits, timbered mountains and generous watersheds. Wilderness areas provide another kind of wealth to Idahoans and the nation.

Elevations range from over 730 feet to 12,662 feet above sea level. The Clearwater Mountains form the largest concentrated range, extending 125 miles from the St. Joe River south to the Salmon River. A 14,000-square-mile plain, part of the Columbia Plateau, extends in a crescent across southern Idaho from east to west and is traversed by the Snake River; it overlays one of the largest aquifers in the world. Of more than 2,000 lakes, Coeur d'Alene, Pend Oreille and Priest lakes, located in the Panhandle, are the largest.

The state's major river systems, the Snake, Salmon, Clearwater, Kootenai, Clark Fork-Pend Oreille, Coeur d'Alene-Spokane, and Bear, all follow courses that have been influenced by their surrounding topography. The course of the Snake River in southern Idaho was altered by lava flows that poured across the land surface many times. While this was occurring, the entire Snake River plain was undergoing an extensive downwarping, or subsidence. In the mountainous area of central Idaho, a general uplift caused the major streams to accelerate their downcutting and carve deep canyons.

Topography more than latitude determines Idaho's varied climate. Located on the western slope of the Continental Divide and exposed to Pacific winds, the area has a milder climate than might be expected from its geographical position. The Divide also acts as a barrier to the severe cold spells from the Canadian-Prairie provinces.

The state's record low temperature of -60 degrees F. occurred at Island Park Dam (eastern Idaho) in January 1943; a high of 118 degrees occurred at Orofino (northern Idaho) in July 1934. Monthly means of less than 32 degrees generally occur for 5 months of the year at elevations of 5,000 feet or above; and for only one or two months below 3,000 feet. The Lewiston area has an average 200-day frost-free season. The basins of the central Snake, lower Boise, Payette and Weiser rivers have a frost-free period of 150 to 180 days a year — a 125-day season is common near Pocatello and Idaho Falls. Many higher mountain valleys average less than one month per year without freezing temperatures.

Precipitation amounts vary greatly because of the topography. Large areas in the mountain portions of the Clearwater, Payette, Boise, Salmon, and Priest river basins receive from 40 to 50 inches of rainfall annually, while some arid plains in southern Idaho record less than 10 inches. Challis has the lowest recorded average annual precipitation of 6.93 inches and Roland West Portal in Shoshone County has the highest of 53.75.

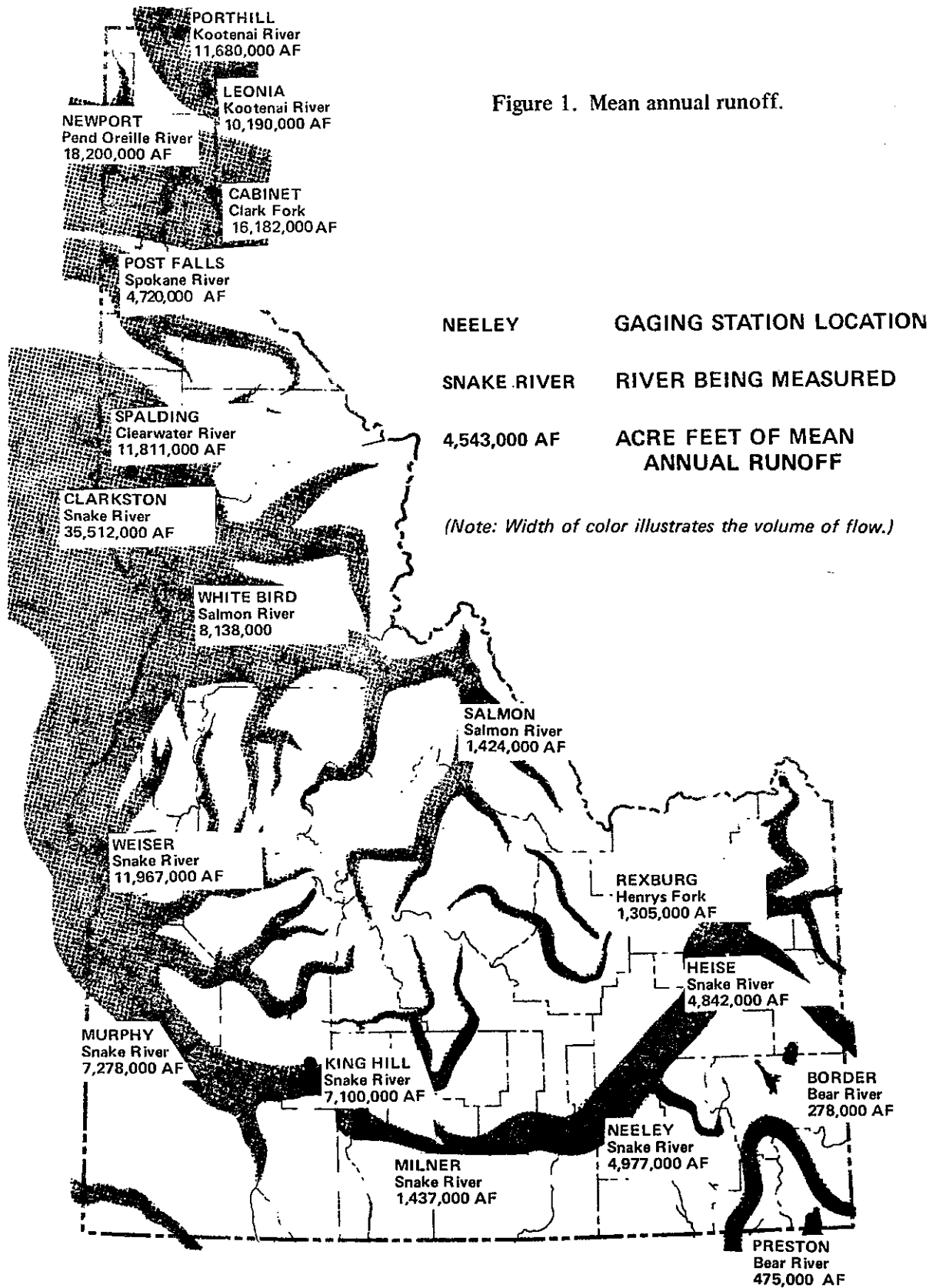
Average precipitation of near 70 inches is estimated in a few mountain peak areas in the northern part of the Clearwater drainage.

The land area of Idaho is 52,900,000 acres — about that of Great Britain. In addition, there are 577,000 acres of water in ponds and lakes over 40 acres in size and rivers over one-eighth mile wide.

Ownership is an important factor affecting land use and management. About 64 percent of Idaho area is owned by the federal government. Private interests own about 30 percent and almost 6 percent is owned by state and local communities. The Forest Service and the Bureau of Land Management are the dominant governmental land holders — with over 96 percent of the total federal lands.

Runoff of the principal streams is illustrated in Figure 1. Relative mean annual runoff is based on streamflow records of 1928 to 1972, adjusted to reflect the 1974 level of development. The pattern and magnitude of seasonal flows of the Snake River and many of its tributary streams are affected greatly by storage facilities, diversions and return flows from irrigation. In dry years, flows of many southern Idaho streams are almost entirely diverted.

Natural lakes occur mostly in the central mountainous area; the largest, however, is north Idaho's Pend Oreille with 148 square miles of surface area.



The largest man-made reservoir is behind Dworshak Dam. This lake is 53 miles long, has a surface area of 26.7 square miles and contains 3.468 million acre-feet of water when full.

A number of natural lakes are regulated within prescribed limits by outlet dams, and thus provide storage water that can be released as desired. Included in this category are Payette, Bear, Coeur d'Alene, Priest and Pend Oreille lakes. A Wyoming lake, Jackson Lake, was enlarged primarily to provide water for irrigation in Idaho.

Many large reservoirs were built as multi-purpose, having allotted spaces of storage amounts for power production, irrigation supply, fish and wildlife, flood control and other purposes. The operation criteria established for each reservoir is dependent upon the purposes authorized for the project and the relative priorities assigned.

The groundwater resources of Idaho have barely been tapped although over-development has occurred in some parts of the state. The principal aquifers occur beneath the Snake River Plain, Rathdrum Prairie, and the western Snake River Valley. Over-development of the groundwater resource has occurred in the Raft River Valley, the Blue Gulch area west of Twin Falls, a portion of the Goose Creek-Cottonwood drainage south of Burley and in Curlew Valley in southeast Idaho.

Groundwater provides for the flows of springs — Thousand Springs, for example — and to lakes, reservoirs and streams. Projects and uses which influence groundwater often affect the surface systems also. Changes in surface systems likewise affect associated groundwater systems.

Over one million acres of land are irrigated with groundwater in the state. In addition, nearly all water requirements for municipal, industrial, domestic and livestock uses are met from groundwater. Many uses have nearly constant demands; but the largest use, irrigation, has primarily a seasonal demand.

A continuing planning effort is underway by various state and federal agencies to explore the possibility of developing the Snake Plain aquifer to supply pumped irrigation water and to store excess winter surface water flows as recharge. The quality of groundwater is generally excellent. However, the chemical compatibility of recharge water with that already in the aquifer requires study, as does the problem of how the recharge water moves from the original site, the possible water-logging of adjacent lands, biological and mechanical plugging of recharge facilities, impact on Thousand Springs and other operational problems.

There are at least 380 hot springs and wells which have been identified in the central and southern parts of Idaho. A 1973 study of the Idaho Department of Water Administration in cooperation with the U.S. Geological Survey inventoried 124 of these hot water sources as possible geothermal resource sites. That study identified 25 areas as having potential geothermal possibilities based upon geochemical investigations.

There are five major river systems in Idaho. They are: Bear, Snake, Coeur d'Alene-Spokane, Clark Fork-Pend Oreille and Kootenai rivers. In the course of water planning studies, the Coeur d'Alene-Spokane, Kootenai, and Clark Fork-Pend Oreille rivers were combined as the Panhandle River Basins.

Snake River Basin

The Snake River is the largest river system in Idaho with a drainage area of approximately 87 percent of the state. The Snake River headwaters are in Wyoming on the western slope of the Continental Divide. Crossing Idaho's eastern border, it flows northwestward 59 miles through a canyon to Heise where it opens onto the Snake River Plain. From Heise to Milner, a distance of 219-river miles, the river is not deeply entrenched. It is in this reach that numerous diversions for irrigation are made.

At Milner, the river enters a deep canyon cut through lava and sedimentary beds and continues for 216 miles in a west and northwesterly direction. Near the Oregon border, the river emerges from the canyon and flows through a broad valley to Weiser, a distance of about 75 miles. Downstream from Weiser the river enters Hells Canyon and flows a distance of about 190 miles to Lewiston. It leaves Idaho at Lewiston, turning westward for 139 miles to its junction with the Columbia River near Pasco, Washington.

The largest tributaries of the Snake are the Salmon and the Clearwater rivers. Other important tributaries are the Henrys Fork, Wood, Boise, and Payette rivers. Basin areas outside of Idaho which contribute substantially to the river's flow include the upper basin in Wyoming, the Owyhee, Malheur, Burnt, Powder and Imnaha rivers in Oregon and the Grande Ronde River in Washington. Small portions of the Snake River Basin also lie in Utah and Nevada.

The principal characteristics of the Snake River Basin climate include a wide range of temperature, relatively low precipitation, wide variation in snow depth, abundance of sunshine, low humidity, high evaporation, and an almost complete absence of severe storms.

Climate

Over the Snake River Plain, the mean annual temperature is high, but in the timbered mountain areas, temperatures are low and the precipitation is much greater than on the plain. Snow rarely remains long on the ground over most of the areas of the Snake River Plain. In the mountains large accumulations of snowmelt in the spring and early summer furnish practically all of the summertime natural streamflows.

Average annual precipitation in the Snake River Basin ranges from about 7 inches per year to near 70 inches per year. Large areas in southern portions of the basin receive less than 10 inches annually, while higher elevations in the Clearwater, Payette, and Boise basins receive an average of 40 to 50 inches per year. Seasonal distribution of precipitation shows a marked pattern of winter maximum and midsummer minimum amounts in the northern and western portions of the basin.

Average annual temperatures in the basin indicate the pronounced effect of altitude. The highest annual average temperatures are found in the lower elevations of the Clearwater and Salmon river basins and along the Snake River Valley in southwestern Idaho, including portions of the lower Boise, Payette, and Weiser valleys. The growing season, like the average temperature, varies throughout the basin due to differences in elevation. The valleys in the immediate vicinity of Lewiston have the longest growing season with about 200 days. This is followed by sizeable areas along the Snake, lower Boise, Payette, and Weiser valleys in Southwestern Idaho with 150-day growing seasons. The growing season shortens to 120 days in the Pocatello-Idaho Falls area. Above Idaho Falls, the season diminishes to 90 days or less.

Surface Water

Most of the streamflows of the Snake River Basin are derived from snowmelt in the mountainous areas. The average runoff in the Snake River below the Clearwater River where it leaves Idaho is about 35.5-million acre-feet per year. Before the Snake River leaves the state, an additional 45-million acre-feet of its flow are either consumptively used by man or lost through evaporation. Approximately one-third of the flow leaving Idaho is derived from the basin above Weiser. Another third comes from the Clearwater River Basin. The Salmon River produces about one-fourth, with the remaining amount of approximately 10 percent coming from tributaries in Oregon and Washington and small streams in Idaho below Weiser. Average annual runoff under present conditions at principal gaging stations in the Snake River Basin is shown in Table 1. Location of these gages is shown on

Figure 2. Losses from river flow between pairs of gages (Snake River, Neeley to Milner, and the Boise and Payette River gages) are due to major irrigation diversion. The dramatic gain in Snake River flow between Milner and King Hill is largely the result of discharge from the Snake Plain aquifer in the Thousand Springs area. Seasonal variations in Snake River flow are shown in Figure 3. The flows at Heise as indicated in Figure 3 result from natural snowmelt modified by reservoir storage operations for summertime irrigation. At King Hill, the seasonal hydrograph is principally affected by the near-constant discharge of groundwater from the Snake Plain aquifer. It is also affected by the flows which pass Milner Dam in high runoff years. Flows at Weiser reflect the affects of the storage, diversion, and groundwater management in virtually all the irrigated area of the Snake River Basin. At Clarkston, the hydrograph is dominated by runoff from the vast unregulated areas of the Salmon and Clearwater basins.

The Snake River Basin is subject to wetter-than-normal and drier-than-normal periods of runoff. High and low runoff years in the Snake River Basin are illustrated in Figure 4. The hydrographs illustrate the general sequence of wet and dry periods in the eastern portion of the basin at Heise, in the southwestern portion at Twin Springs in the Boise River system, and in the northern portion of the basin at Whitebird on the Salmon River. These locations were chosen because of their relatively long period of available records. In each hydrograph the sequence of years of lowest runoff generally occurred between 1929 and 1942. This sequence was the most severe water-short period in the basin during the twentieth century. Using the record of the Columbia River at The Dalles, Oregon, the longest record of streamflow data in the Columbia Basin, it appears probable that the period in the 1930's was the driest in the past 100 years.

A period of above normal runoff began in 1965 and continued through water-year 1976, although 1968 and 1973 were drier than normal. The period 1950 to 1957 was also one of very high runoff.

The longest streamflow records in the basin are similar to those shown in Figure 4 and have data generally for less than 60 years. During this period, major changes have occurred in water use and control. Irrigated agriculture has increased by some 3 million acres. Nearly all of the major irrigation, power, and flood control reservoirs have been constructed during this time period. Groundwater recharge and discharge from the Snake Plain aquifer has been significantly changed, thereby modifying the flow pattern of the river. Because of these changes, historic records in themselves are often not useful to describe the water supply of a river because they do not reflect current development.

Therefore, hydrologic data reported in this and following sections of the report generally refer to the base period of 1928 to 1972 adjusted to 1974 levels of development.

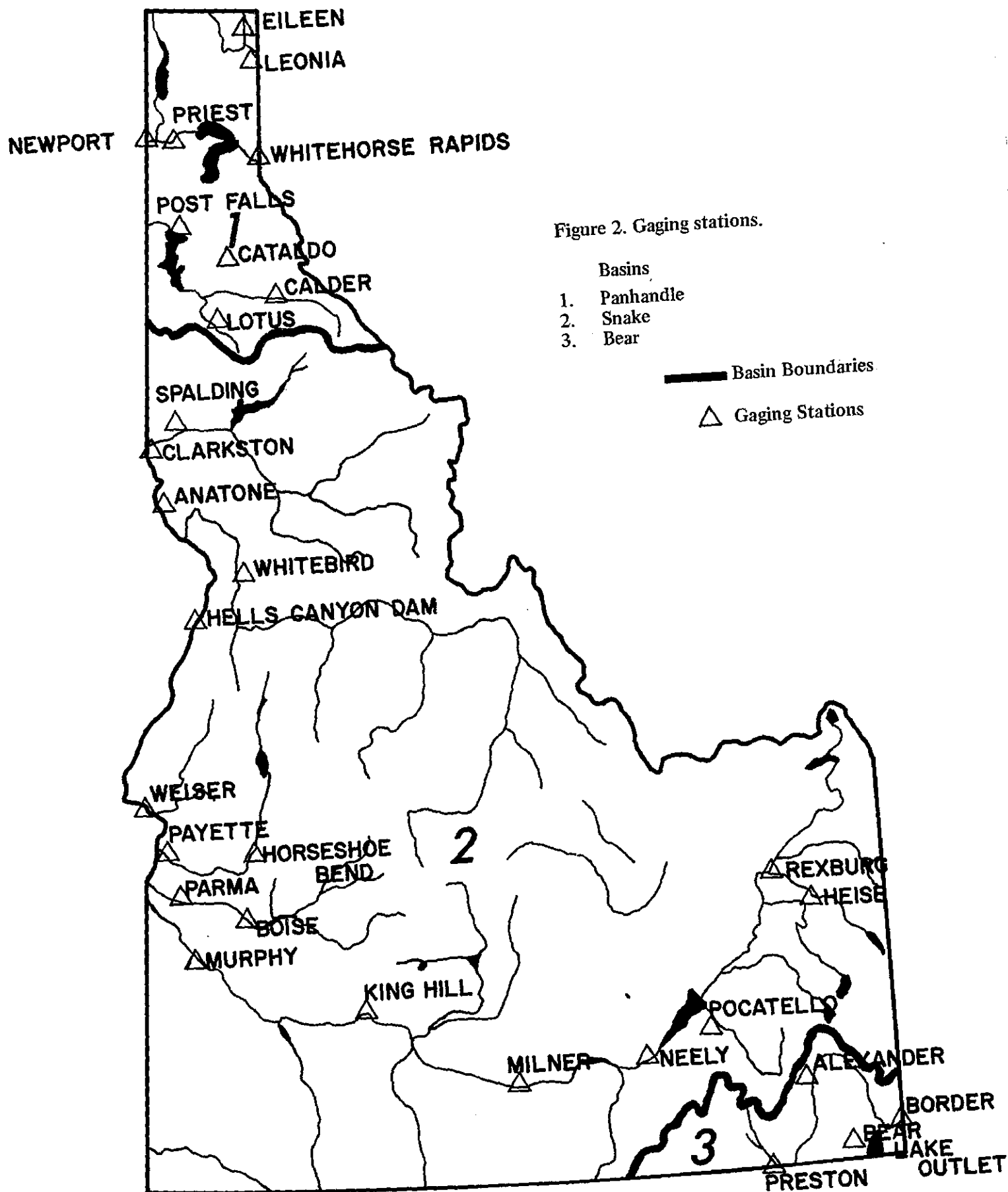
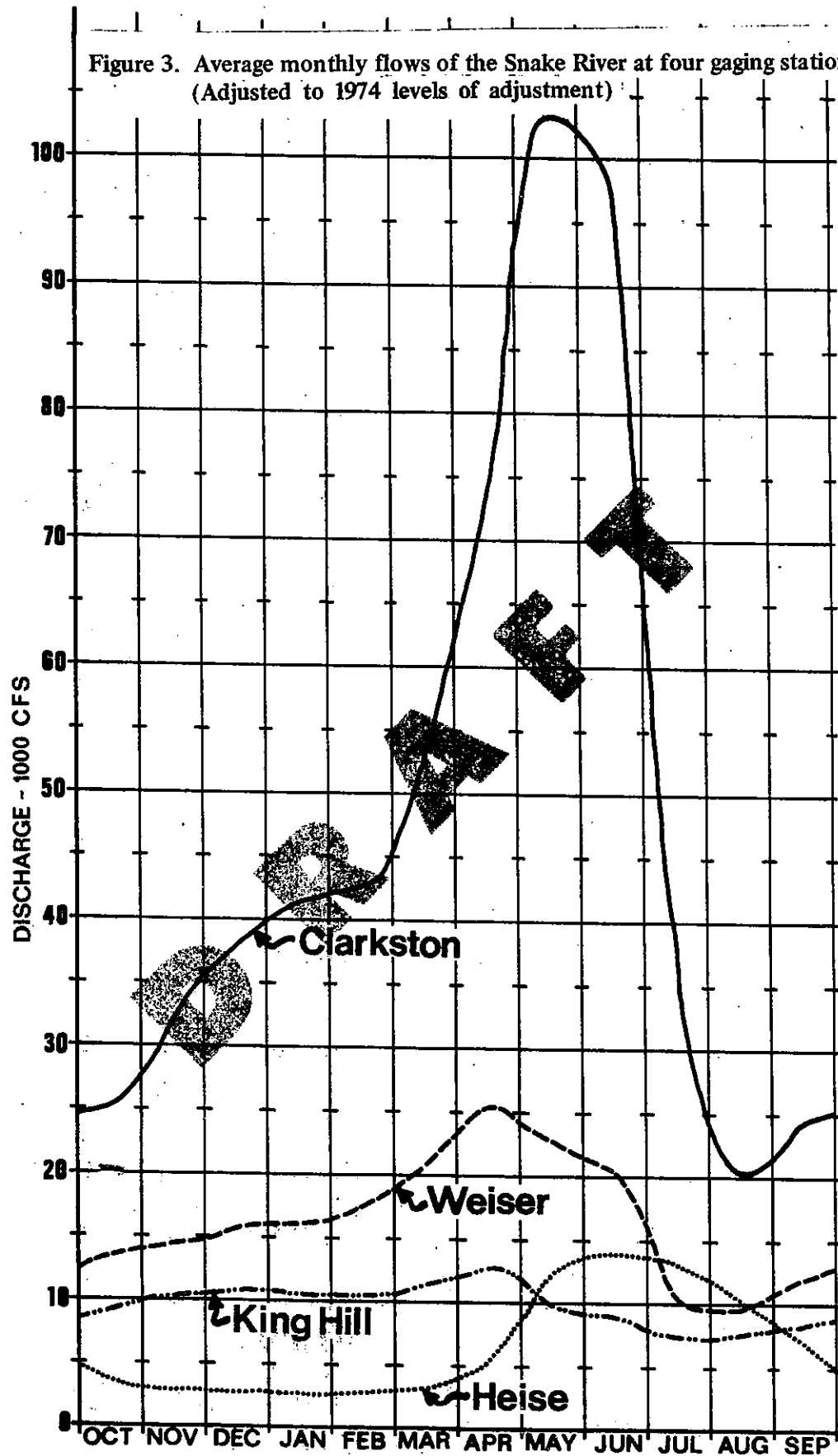


Figure 3. Average monthly flows of the Snake River at four gaging stations.
(Adjusted to 1974 levels of adjustment)



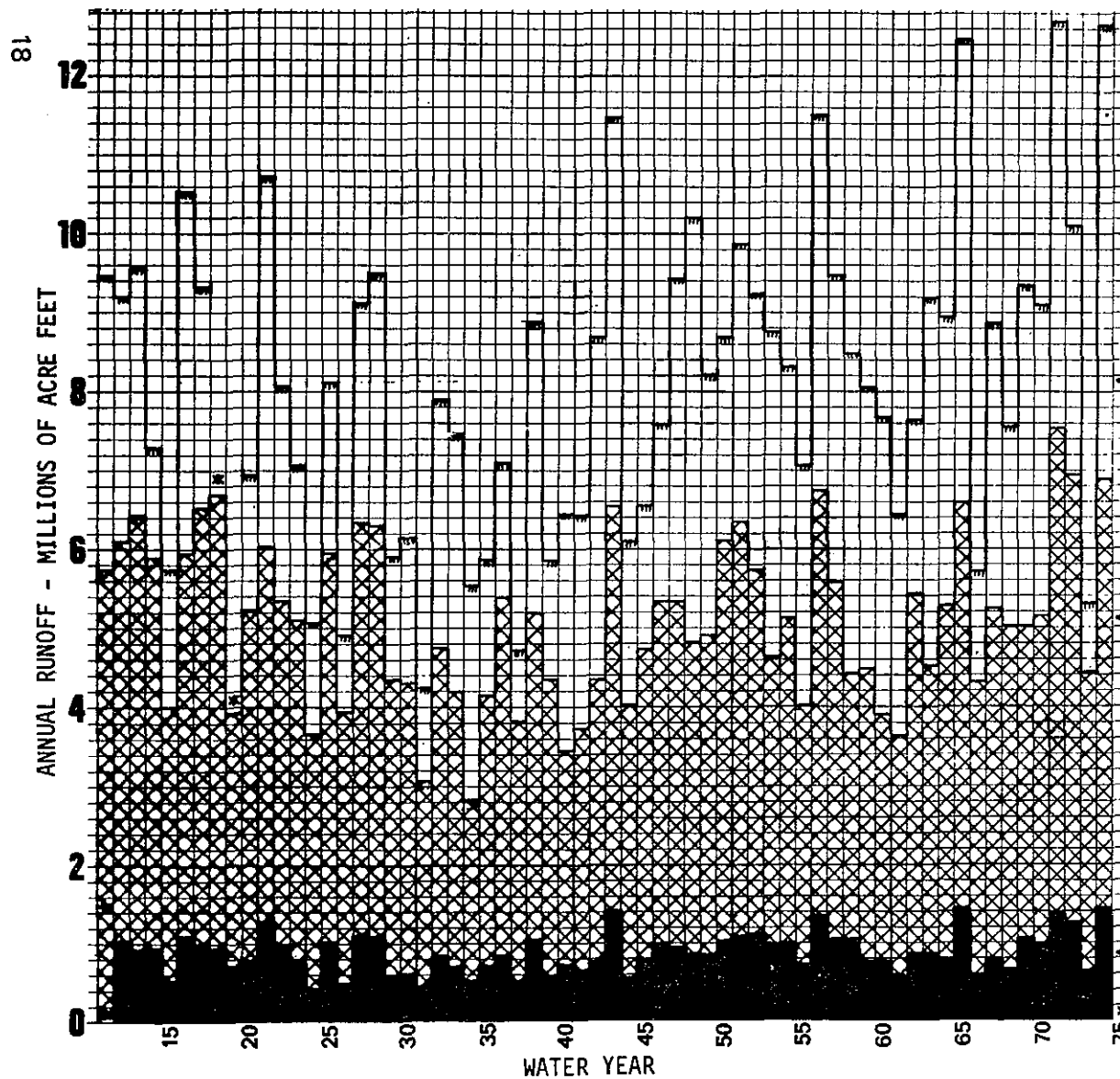


Figure 4. Annual runoff at selected sites in the Snake River Basin.

Salmon River at Whitebird
Average - 8,155,000 Ac. Ft./Year

Snake River near Heise
Average - 5,102,000 Ac. Ft./Year

Boise River near Twin Springs
Average - 876,200 Ac. Ft./Year

*No data for these years.

The Snake River is intensively managed. Controls on the flow are imposed by a system of reservoirs and diversions. Table 2 contains a list of reservoirs in the basin having an active capacity greater than 10,000 acre-feet. The reservoirs were constructed for one or more purposes, but irrigation use is involved in most of the Snake River system reservoirs. Some idea of the operation of each reservoir can be gained from its purposes listed in Table 2.

Irrigation is the principal use for the waters of the Snake River system. It accounts for an estimated 99 percent of the consumptive use. Municipal and industrial uses account for most of the remainder. Snake River flows are also used for power generation, fish production, recreation, and navigation.

Records of diversions are available for only a fraction of the irrigation, canals, and other uses of the Snake River Basin. Groundwater withdrawal and consumption generally is not measured. Because of this, total water use can only be estimated by indirect methods.

The 3.6 million acres of irrigated land in the Snake River Basin deplete the river flow by about 6 million acre-feet per year. Approximately 25 percent of this is withdrawn as groundwater. Irrigation diversions have their primary effect on the river during the summer months.

Table 3 contains a list of hydroelectric power plants on the Snake River and its tributaries. Most of these are run-of-river plants which generate power with available flow but without the benefit of storage operations to control it for maximum generation. There are two major reservoirs which are operated primarily for power. Brownlee regulates the Snake River flows for generation at Idaho Power Company power plants at Brownlee, Oxbow, and Hells Canyon dams. Dworshak Dam regulates the North Fork of the Clearwater for power at the dam and for downstream plants on the Lower Snake and Columbia rivers.

Approximately 2 million acre-feet of groundwater are consumptively used in the Snake River Basin each year to irrigate about 1 million acres. In addition, nearly all municipal, industrial, domestic, and over half of livestock water requirements use a groundwater source. Small quantities of groundwater can be obtained from wells and springs throughout the Snake River Basin in nearly all years. However, only in specific areas, can large quantities of water be obtained within present economical limits. These areas are mainly in the southern portions of the basin.

Most areas where large quantities of groundwater are available have been extensively developed. A long growing season, large tracts of arable land, and the need for supplemental water supplies have caused the majority of irrigation wells to be drilled in the southern and southwestern part of the basin. Throughout the Snake River Plain and in many areas southeast, south and southwest of the Snake River, the majority of wells obtain their

Table 2. Major Existing Reservoirs in the Snake River Basin.

Name	Stream	Total Storage (acre-feet)	Purpose
Jackson Lake (Wyo.)	Snake River	847,000	Irrigation, Flood Control
Palisades	Snake River	1,402,000	Irrigation, Flood Control, Fish and Wildlife, Power, Recreation, Municipal and Industrial
Henrys Lake	Henrys Fork	83,200	Irrigation
Island Park	Henrys Fork	127,600	Irrigation
Grassy Lake (Wyo.)	Off-Stream	15,450	Irrigation
Ririe	Willow Creek	100,000	Irrigation, Flood Control, Fish and Wildlife, Recreation
American Falls	Snake River	1,700,000	Irrigation, Power
Lake Walcott	Snake River	210,000	Irrigation, Power
Milner Lake	Snake River	28,200	Irrigation
Grays Lake	Willow Creek	100,000	Irrigation
Blackfoot	Blackfoot River	413,000	Irrigation
Portneuf-Marsh Valley	Portneuf River	23,695	Irrigation
Oakley	Goose Creek	74,350	Irrigation
Wilson Lake	Off-Stream (Active)	18,500	Irrigation
Salmon Falls Creek	Salmon Falls Creek	228,000	Irrigation
Cedar Creek	Cedar Creek	29,930	Irrigation
Mud Lake	Camas, Beaver Creek	61,600	Irrigation
Mackay	Big Lost River	44,500	Irrigation
Little Wood	Little Wood River	30,000	Irrigation, Fish and Wildlife, Flood Control, Recreation
Fish Creek	Fish Creek	13,500	Irrigation
Twin Lakes	McKinney Creek	31,240	Irrigation
Magic	Big Wood River	192,000	Irrigation
Anderson Ranch	So. Fork, Boise River	493,200	Irrigation, Flood Control, Recreation
Arrowrock	Boise River	286,600	Irrigation, Flood Control
Lucky Peak	Boise River	307,000	Irrigation, Flood Control, Recreation
Lake Lowell	Off-Stream	190,100	Irrigation
Cascade	No. Fork, Payette River	703,200	Irrigation
Deadwood	Deadwood River	164,000	Irrigation, Fish and Wildlife, Power
Brownlee	Snake River	1,426,700	Power, Flood Control
Oxbow	Snake River	57,500	Power
Hells Canyon	Snake River	164,000	Power
C.J. Strike	Snake River	250,000	Power
Little Camas	Little Camas Creek	22,500	Irrigation
Payette Lake	No. Fork, Payette River	35,000	Irrigation
Lake Fork	Lake Fork, Payette River	16,950	Irrigation
Paddock Valley	Little Willow Creek	32,000	Irrigation
Lost Valley	Lost Creek	10,000	Irrigation
Crane Creek	Crane Creek	60,000	Irrigation
Spangler	Mann Creek	13,000	Irrigation, Fish and Wildlife, Flood Control, Recreation
Dworshak	No. Fork, Clearwater River	3,453,000	Flood Control, Power, Navigation, Recreation
Total		13,458,515	

Table 3. Hydroelectric Power Plants in the Snake River System.

Project Name	Stream	Owner	Gross Head (ft)	Installed Power (MW)	Average Power (MW)	Hydraulic Capacity (cfs)
Palisades	Snake River	U.S. Bureau of Reclamation	245	114.0	70	8,100
Ponds Lodge	Buffalo River	Ponds Lodge, Inc.	30	0.2	Minor	NA
Ashton	Henrys Fork	Utah Power & Light Co.	48	0.6	Minor	780
St. Anthony	Henrys Fork	Utah Power & Light Co.	14	5.8	4	1,830
Felt	Teton River	Fall River R.E.A. Coop.	90	1.9	1	NA
Upper Hydro	Snake River	City of Idaho Falls	21	2.4	2	2,400
City	Snake River	City of Idaho Falls	22	2.0	2	2,400
Lower Hydro	Snake River	City of Idaho Falls	20	3.0	3	2,400
American Falls	Snake River	Idaho Power Co.	49	27.5	17	8,270
Minidoka	Snake River	U.S. Bureau of Reclamation	48.3	13.4	10	4,300
Twin Falls	Snake River	Idaho Power Co.	147	13.5	8	933
Shoshone Falls	Snake River	Idaho Power Co.	214	12.4	12	860
Clear Lake	Clear Lake Springs	Idaho Power Co.	68	2.5	2	474
Thousand Springs	Spring	Idaho Power Co.	182	8.0	7	560
Upper Salmon B	Snake River	Idaho Power Co.	37	16.5	17	6,500
Upper Salmon A	Snake River	Idaho Power Co.	45.9	18.0	19	6,500
Lower Salmon	Snake River	Idaho Power Co.	59.0	60.0	29	16,000
Upper Malad	Malad River	Idaho Power Co.	129.4	7.2	7	800
Lower Malad	Malad River	Idaho Power Co.	161.4	13.5	12	1,200
Bliss	Snake River	Idaho Power Co.	70	75.0	43	15,000
C.J. Strike	Snake River	Idaho Power Co.	88	82.8	56	13,800
Swan Falls	Snake River	Idaho Power Co.	24	10.3	11	8,000
Anderson Ranch	Boise River	U.S. Bureau of Reclamation	330	27.0	17	1,500
Atlanta	North Fork Boise River	Atlanta Power Co.	98	.2	Minor	NA
Boise River Diversion	Boise River	U.S. Bureau of Reclamation	31	1.5	1	800
Cascade	Payette River	Idaho Power Co.	39	0.3	Minor	80
Black Canyon	Payette River	U.S. Bureau of Reclamation	94	8.0	9	1,200
Brownlee	Snake River	Idaho Power Co.	272	360.4	255	23,000
Oxbow	Snake River	Idaho Power Co.	120	190.0	118	25,000
Hells Canyon	Snake River	Idaho Power Co.	210	391.5	225	25,000
Dworshak	No. Fork Clearwater River	U.S. Corps of Engineers	630	400.0	202	11,000
Total				1,869.4	1,159	

principal supply of water from consolidated formations — principally basalt interbedded with sediments and fractured zones. The principal supplies of groundwater to be obtained from unconsolidated formations occur in the geologically young alluvial fans and valley-fill deposits or along the major stream channels.

The Snake Plain aquifer is the largest and most important aquifer in the state. The Snake Plain aquifer extends eastward and northeastward roughly 200 miles from Bliss to St. Anthony. It is a broad undulating surface of about 8,500 square miles bounded on the north, east, and south by mountain ranges and broad, alluvial-filled intermontane valleys, and on the west by a broad, lava-capped plateau.

In the Snake Plain aquifer, some groundwater occurs in sand and gravel alluvial deposits. However, the most important occurrence of groundwater is in the porous basalt and sedimentary interbeds underlying nearly the entire plain. These are a series of successive basaltic lava flows which include interflow beds of sedimentary materials.

The Snake River contributes water to and receives water from the Snake Plain aquifer. Springs discharge water to the river in stretches from the mouth of the Blackfoot River to below American Falls Reservoir and from below Milner through Hagerman Valley to Bliss. Elsewhere, the river channel is above the regional water table and river flow recharges the groundwater system.

A major source of water to the aquifer is precipitation on the mountains surrounding the Snake River Plain. All streams on the northern side of the Snake River Plain except the Big and Little Wood rivers terminate on the plain and percolate into the aquifer, however they also lose some water from their streambeds to the aquifer.

The sources of recharge in order of importance are: (1) percolation from irrigation, (2) seepage from streams entering or crossing the plain, (3) underflow from tributary basins, and (4) precipitation on the plain. Direct precipitation on the plain probably accounts for less than ten percent of the total recharge to the aquifer. Total recharge from all sources amount to approximately 6.5 to 7 million acre-feet annually.

Water in the main aquifer occurs mostly under water-table (unconfined) conditions. Some flowing wells occur locally where artesian conditions exist. Generally groundwater movement is west and southwestward from sites of recharge to sites of discharge. Discharge from the aquifer averages about 8,000 cfs, 80 percent of which occurs in the Thousand Springs area.

Secondary water bodies (perched water tables) have formed at places where beds of low permeability underlie areas of heavy irrigation. Egin Bench, the Rupert and Mud Lake areas overlie perched water bodies.

Mountain ranges along the north side and east end of the upper basin are high rainfall areas and precipitation at the higher elevations generally is 40 to 60 inches. Precipitation on the south and southeast flanks of the basin is less, but many mountains receive 25 to 40 inches at higher elevations. Streams receive groundwater effluent throughout the year nearly everywhere in the foothills and mountains. Because of the limited storage capacity and the steep hydraulic gradients underlying the tributary basins, base flow of the aquifers decreases greatly during prolonged dry periods. Streams in the northern and eastern part of the basin lose part or all of their discharge on reaching the part of the basin underlain by the deep alluvial and deep younger basalt materials. No stream draining the north side of the basin between the mouth of Henrys Fork and the Big Wood River, a distance of 160 miles, reaches the Snake River.

The Snake River is the trunk drain and all outflow from the region is through it. However, through the Snake River Plain, the Snake River alternately gains and loses in several areas before finally collecting all known surface and groundwater discharge near the western end of the subregion.

In summary, the Snake River loses flow in its alluvial fan below Heise to the regional and perched aquifers. The Teton River in its lower reaches and Henrys Fork below St. Anthony are above the regional water table and lose water to it but receive inflow from perched aquifers. The Snake River for several miles downstream from its junction with Henrys Fork near Menan Buttes is at about the same level as the regional water table. The river may alternately gain or lose in this reach depending on river stage and other factors. There are no perched aquifers on the north side of the river in this upper river area, but there may be some on the south side. From near Roberts to a point a few miles downstream from Blackfoot, the Snake River is above the regional water table and loses water to it. However, the river may receive inflow from local perched aquifers at some places. A few miles downstream from Blackfoot to the upper end of Lake Walcott, the Snake River receives large quantities of inflow from both regional and perched aquifers. From Lake Walcott to Twin Falls, the river is above the regional water table and loses water to it but receives inflow from perched aquifers in the vicinity of Rupert and Burley. From Twin Falls to Bliss, the river is below the regional and perched aquifers and receives large quantities of groundwater.

The headwaters of the Boise and Payette rivers have moderately good base flow which is maintained by groundwater inflow into hundreds of small tributaries. The lower reaches of these rivers receive large quantities of groundwater return flow from irrigation. Dry season flows in these reaches are greater now than they were before the lands were irrigated.

South of the Snake River and the Owyhee Mountains in Idaho, the mountains in Nevada are underlain by rocks of relatively low permeability. These mountains receive 20 to 30 inches of precipitation annually. There are

many springs in these areas, and most streams receive perennial groundwater inflow. Most of the south half of the subregion is an arid to semiarid plateau underlain by moderately permeable to very permeable aquifers. The water table is usually deep; the infrequent small streams are generally far above the regional water table and are ephemeral and intermittent. Only trunk streams, such as the Jarbidge, Bruneau, and Owyhee rivers, receive perennial groundwater inflow. In some reaches even some of the larger streams are above the regional water table. The relative altitude of the water table and the water surface of the river suggest that the East Fork Bruneau River is above the regional water table.

Snake River Compact

The Snake River Compact between the states of Idaho (Idaho Code 42-3401) and Wyoming was made on October 10, 1949, and ratified by each state in February 1950. Congressional consent to the compact was given March 21, 1950 (64 Stat. 29). A brief general analysis of the compact follows.

1. The water of the Snake River (at the Idaho-Wyoming stateline), as determined on an annual water-year basis, is allocated 96 percent to Idaho and 4 percent to Wyoming for storage and diversion purposes, subject to certain exceptions and conditions. Those water rights which have been validly established of record in Wyoming prior to July 1, 1949, and by the same date on the Salt River in Idaho and present and future domestic and stock water for use in Wyoming, if the storage reservoir does not exceed 20-acre-feet, are all excluded from the allocations made by this compact.
2. Water from the Snake River shall not be diverted for use in Wyoming outside the drainage area of the Snake River without the approval of Idaho, nor shall water from any tributary of the Salt River be diverted for use outside the drainage area of said tributary without the approval of Wyoming.
3. Water impounded or diverted in Wyoming from the Snake River exclusively for hydroelectric generation shall not be charged to the allocated shares; water impounded for hydroelectric power generation use shall be subservient to the use of such water for domestic, stock, and irrigation purposes.
4. The compact shall be administered by an official from each state who, by unanimous action, may adopt rules and regulations consistent with the provisions of the compact. Such official shall be the official in charge of administering the public water supplies of that state.

5. The provisions of the compact are not to interfere with the right of either state to regulate within its boundaries the appropriation, use, and control of the waters allocated to such state by the compact.
6. Either state may file application for permits to construct dams or storage reservoirs or diversion works in the other state for purposes of conservation and regulating its allocated water, but such state must comply with the law of the other state with regard to such right.

Congress, by Act of March 1, 1925 (43 Stat. 1268) and July 16, 1952 (66 Stat. 737) gave its consent to the states of Idaho, Montana, Oregon, Washington, and Wyoming to enter into a compact providing for the equitable division and apportionment of the waters of the Columbia River, and all of its tributaries in the states entering into such compact, upon the condition that one qualified person shall be appointed by the President of the United States as a representative of the United States. This congressional consent was modified to include the states of Nevada and Utah by Act of July 14, 1954 (68 Stat. 468).

Columbia Interstate Compact (Unperfected)

Several drafts of the proposed compact have been prepared and signed by the compact commissioners; however, not all of the state legislatures have adopted the compact. The Idaho legislature approved the 1955 and 1961 drafts but did not act upon the 1957 draft. The last compact draft revision submitted was approved by Idaho in 1963 (Idaho Code 43-3403); however, because of changing conditions and the lack of approval by Oregon or Washington, the Idaho approval was rescinded in 1975. There are no active negotiations to establish a new compact, although there appears to be a current latent interest in Washington and Oregon to reactivate compact discussions.

Streamflow in much of the Panhandle is largely the result of runoff conditions in upstream Montana and British Columbia. The Kootenai River derives most of its flow from both these areas, whereas the Clark Fork drains a large portion of western Montana. The third major Panhandle river, the Coeur d'Alene-Spokane, originates entirely within Idaho.

The Kootenai enters Idaho from Montana at Leona and discharges about 11.7 million acre-feet per year (15,300 cfs) into British Columbia at Port Hill. It gains an average of about 2,000 cfs in Idaho, including approximately 700 cfs from the Canadian portion of the Moyie River. The average flow of the Moyie near its mouth is about 900 cfs.

The Clark Fork, largest of the Panhandle rivers, enters Idaho at Cabinet Gorge and leaves the state at Newport, Washington, where it is called the Pend Oreille River. Average annual runoff at Newport is 18.2 million acre-feet per year (24,500 cfs). The average gain in Idaho is about 3,800 cfs. Principal Idaho tributaries are the Pack River and Priest River. The Clark Fork flows through Idaho's largest lake, Lake Pend Oreille. Lake levels have been controlled by Albeni Falls Dam near Newport since 1952.

The average annual flow of the Spokane River at Post Falls is about 4.6 million acre-feet (6,500 cfs). Two tributaries, the Coeur d'Alene and the St. Joe, join at Lake Coeur d'Alene to form the Spokane River.

Climate

Precipitation over the Panhandle area is generally heavier than elsewhere in the state. The average annual precipitation is about 39 inches, ranging from approximately 20 inches on Rathdrum Prairie in the Spokane Basin to over 70 inches in the mountain areas. Approximately 70 percent of the annual precipitation occurs between October and March. Most of this is in the form of snow at the higher elevations although rainstorms can occur at all elevations in the winter. The largest floods have been in December and January when warm rains fell on melting snow.

Temperatures in the Panhandle closely follow the seasons. January is the coolest month with July the warmest. Valleys in the vicinity of Coeur d'Alene experience the warmest climate. Summer temperatures throughout the Panhandle are generally cooler than most other areas in the state although the area has a relatively long growing season. Temperature records for Coeur d'Alene, St. Maries, Kellogg, Sandpoint, Port Hill and Bonners Ferry all show the average frost-free season exceeds 150 days.

Table 4. Major Existing Reservoirs in the Panhandle River Basins.

Name of Dam	Stream	Total Storage (acre-feet)	Purpose
McClellan No. 2	Tributary to Rock Creek	250	Irrigation
Albeni Falls	Pend Oreille River	1,561,300	Power, Navigation, Flood Control
Blanchard Creek	Blanchard Creek	329	Irrigation, Domestic Water Supply
Brown	Colburn Creek	125	Logging
Cabinet Gorge	Clark Fork	44,000	Power
Halquist	Tanner Creek	150	Irrigation
Priest Lake	Priest River	112,000	Power, Recreation
Mason	Round Prairie Creek	240	Stock Water
McArthur	Dodge & Deep Creeks	1,630	Recreation, Fish Culture
Moyie	Moyie River	16,000	Power
Nixon Noil	Smith Lake	240	Irrigation
Chilco	Chilco Creek	580	Irrigation, Domestic Water Supply, Power
Twin Lakes	Twin Lakes, Rathdrum Creek	9,090	Irrigation, Domestic Water Supply
Fernan Lake	Fernan Lake	1,500	Recreation
Hauser	Hauser Lake, Mud Lake	2,300	
Hayden Lake	Hayden Creek	48,000	Flood Control, Irrigation
Post Falls	Spokane River	190,000	Power
Spirit Lake	Spirit Lake	5,000	Irrigation, Recreation
Total		1,992,734	

Surface Water

The Panhandle River Basins are unique in Idaho in that generally the entire area has an abundance of water. Only in extreme years, such as 1973, are water-short problems exposed. The basic problem is to manage the existing water supplies for a variety of uses.

The resources which can be managed, conserved, or developed include surface and groundwater supplies; the existing system of storage facilities; and sites for possible new storage, either on-stream or off-stream. Total existing storage amounts to 1,993,000 acre-feet in the Panhandle. Table 4 lists the existing reservoirs in the Panhandle Basins with total storage of 100 acre-feet or more. In addition, there are several smaller reservoirs with a combined storage of approximately 350 acre-feet. Average annual runoff at principal gaging stations in the Panhandle Basins is shown in Table 5. Location of these gages is shown on Figure 2.

Table 5. Average Annual Runoff of Major Rivers in the Panhandle Basins.

Gage	Runoff (acre-feet)
Kootenai at Leonia	10,190,000
Moyie at Eileen	649,000
Kootenai at Porthill	11,680,000
Clark Fork at Whitehorse Rapids	16,182,000
Pend Oreille at Newport	18,200,000
Coeur d'Alene at Cataldo	2,151,000
Spokane at Post Falls	4,720,000
Priest at Priest River	1,220,000
St. Joe at Calder	1,746,000
St. Maries at Lotus	378,000

It should be noted that, on the average, 10,190,000 acre-feet per year enter Idaho in the Kootenai River. This has increased by 1,490,000 acre-feet to 11,680,000 acre-feet when the river leaves the state near Port Hill. On the Clark Fork, approximately 16,182,000 acre-feet enter Idaho near Cabinet. This increases by about 2,018,000 acre-feet to 18,200,000 acre-feet when it leaves the state at the Pend Oreille River at Newport. Approximately 4,720,000 acre-feet of water leaves the state at Post Falls in the Spokane Basin. This water is produced entirely within Idaho. Overall, approximately 8,228,000 acre-feet of water are produced in the Panhandle River Basins.

The most productive aquifer in the Panhandle area underlies the Rathdrum Prairie, a roughly triangular lowland, in northern Kootenai County. The prairie overlies a basin formed by glaciers and partly filled with coarse sediments deposited as the glaciers receded. Around the border of the prairie are depressions occupied by lakes with no surface outlet, which drain by seepage to the water table. No streams flow across the prairie, and only the Spokane River along the extreme southern edge maintains a perennial flow.

Groundwater occurs under water-table conditions in the sand and gravel deposits which underlie the prairie. These deposits are extremely permeable and form one of the most productive water-bearing formations in Idaho. Remnants of basalt and lake beds that were not scoured out by the glaciers contain very small amounts of water. Granitic and metamorphic rocks form the boundaries of the groundwater basin and are not regarded as important water-bearing formations.

Groundwater is recharged by infiltration of rain and melted snow on the prairie, seepage from lakes, including the southern tip of Lake Pend Oreille, several small streams which drain onto the prairie, and by percolation of irrigation water diverted from the Spokane River, Hayden Lake and Twin Lakes. Depth to water ranges from 125 feet at the Washington stateline to 500 feet near the northern edge of Kootenai County.

The groundwater moves generally southwestward through the pervious fill of alluvial and glacial deposits and discharges to the Spokane River beyond the stateline in Washington. An estimated 500,000 acre-feet of groundwater originating in Idaho is discharged annually to the Spokane River.

Groundwater is withdrawn for irrigation, municipal, industrial, domestic and stock use. It is estimated that groundwater serves about half the population. Several irrigation wells are in use and yields range from 1,000 to 3,000 gallons per minute.

Large volumes of groundwater occur in lake beds, glacial outwash deposits, and alluvium that underlie the lowlands within Boundary and Bonner counties. In the Kootenai and Priest River valleys and in the Bonners Ferry-Sandpoint area, fine-grained lake beds and glacial deposits yield water slowly. In the Hoodoo Valley area, only that part south of Cocolalla Lake contains deposits coarse enough to yield quantities suitable for irrigation. Abundant recharge keeps the water-bearing deposits filled during most years so that some areas become water-logged and require drainage before the land can be put to productive use.

Situated almost entirely within the mountainous area, Benewah County has a minimal potential for development of major groundwater supplies. Alluvium along the valleys of the St. Joe and St. Maries rivers yields domestic and small municipal supplies from shallow depth. Near the western boundary volcanic rocks of the Columbia Plateau and alluvial deposits in the valley of Hangman Creek may contain supplies of groundwater suitable for

modest irrigation development. There are no data on which to base estimates of this potential. Elsewhere in the county, groundwater in sufficient quantities for domestic and stock use may be developed from small alluvial areas.

River System Management

Rivers in the Panhandle are managed for power and flood control purposes. There are no reservoirs on the Kootenai River in Idaho, but the recently completed Libby Project in Montana effectively controls flows through Idaho. Regulation at Libby will result in control of all but about one percent of the future floods originating from the Kootenai River. The regime of the river flow will also be considerably modified through the year. While flood flows are reduced to the channel capacity, there will be a longer period of higher flows as power and flood control releases are made from late summer through the winter.

The Clark Fork is regulated by Hungry Horse Reservoir, Flathead Lake, and numerous small reservoirs in Montana. Seasonal regulation by those reservoirs results in greater fall and winter flows entering Idaho than would otherwise be the case. Daily fluctuations are also imposed on the river by power operations at the Noxon Rapids and Cabinet Gorge dams in Montana.

Lake Pend Oreille is regulated as part of the Columbia River system for downstream power and flood control by Albeni Falls Dam. The normal summer level is at elevation 2,062.5. Beginning in September, the lake is drafted at a near uniform rate so as to reach elevation 2,060 by the end of October. This procedure minimizes lake shoreline erosion. A continuing draft may be made until December for system power purposes if needed. Normally, the lake is at winter flood control level by December 1. Between then and spring, the lake is held at a nearly constant level. When springtime flood inflows occur, the spillway is opened allowing free flow. The lake then rises as it would without a dam. As the flood recedes, the lake is allowed to return to the normal summer level.

Priest Lake is controlled by a small dam constructed in 1950. This structure is used during the summer to hold the lake at a nearly constant level about three feet above the natural lake summer level. Following the recreation season, the stored water is released for downstream power. The dam is operated by Washington Water Power Company under an agreement with the State of Idaho, owner of the dam.

Presence of an outlet control has produced a pronounced shift in outflows from July through November. The July and August outflows have been reduced by approximately 40 percent, and September outflows by about 30 percent. The October and November discharges have been increased by about 250 percent due to evacuation of storage. Discharges during the remainder of the year are relatively unaffected.

Lake Coeur d'Alene is controlled by Post Falls Dam on the Spokane River nine miles downstream from the lake outlet. Post Falls Dam is operated by Washington Water Power Company for power generation on site and at several other plants in Washington. The normal summer level of the lake is elevation 2,128. Beginning in September, it is drafted three to five feet for power generation purposes. This lowering of the lake elevation also provides winter flood protection for lake shoreline properties and downstream points. Winter lake levels are quite variable as inflows fluctuate. Following spring runoff, lake levels decline to elevation 2,128, the gates are closed and the dam is operated to hold the lake at that level through the summer.

Bear River Basin

The Idaho portion of the Bear River Basin is situated in the southeast corner of the state. Elevations range from 4,400 feet in the valley to over 9,000 feet. About one-half of the area is mountainous and lies above 6,000 feet.

The major valleys and mountain ranges trend north-south. Tributary valleys intersect at right angles. Tributary stream gradients are steep, whereas main valley gradients are comparatively gentle.

The entire Bear River Basin drainage comprises 7,474 square miles and includes portions of three states: Utah (3,255 square miles), Idaho (2,704 square miles), and Wyoming (1,515 square miles). Although the State Water Plan covers only that portion of the Bear River Basin situated in Idaho, it is necessary to understand important characteristics of other parts of the basin.

There are three small water basins located west of Malad Valley that are included in the Bear River Basin which are not actually in the Bear River drainage. They are Pocatello Valley, the Curlew Valley and Black Pine basins and encompass about 700 square miles. These valleys are often described as being arms of the single Curlew Valley which extends southward into Utah as a portion of the Great Salt Lake drainage basin. The Black Pine area includes the headwaters of several small ephemeral streams that have a reliable flow during spring snowmelt. The mean annual precipitation for the area varies from 10 to 15 inches on the valley bottom to approximately 30

inches on the ridge near Black Pine Peak. The drainage in Curlew Valley is primarily from Deep Creek, a perennial stream. Numerous small, ephemeral streams exist but contribute little to Deep Creek except during spring runoff. Pocatello Valley is a small closed basin west of Malad and east of Curlew Valley. The combined volume of precipitation on the Pocatello, Curlew and Black Pine valleys within Idaho has been estimated at 510,000 acre-feet per year.

The Bear River begins on the northern flank of the Uinta Mountains in Utah. Confined generally to a mountain valley, it flows northerly into Wyoming. Near the community of Evanston, the river flows again into Utah, returns to Wyoming, and then flows into Idaho. In Idaho, the Bear River is diverted into Mud Lake and Bear Lake. From Bear Lake, the river flows northwesterly toward the community of Soda Springs, where it turns southerly toward the Great Salt Lake. In Franklin County, Idaho, below the Oneida Narrows, the river meanders broadly in the ancestral Lake Bonneville bottom lands before leaving Idaho. After a circuitous journey of 440 miles and five crossings of state lines, the Bear River terminates in the Great Salt Lake.

Bear Lake is the most striking physical feature in the basin. The blue-green waters of this large, deep lake extend about equally into Idaho and Utah. Once isolated from all but flood flows of the Bear River, the lake has been reunited to the river by a canal.

Climate

The climate of the basin varies depending on elevation. Areas lying in the valley experience about 14-15 inches of precipitation annually while in the higher elevations up to 50 inches can be expected annually. Average annual precipitation for the entire basin is 19 inches. The months of January through April account for about two-thirds of the annual total of precipitation. This winter precipitation occurs as snow.

Temperatures and other factors such as growing season also vary depending on the elevation. The growing season length varies considerably in the Idaho portion of the Bear River Basin from an average of 80 days near Montpelier to 130 days at Malad.

Surface Water

As with other major streams in Idaho, most of the streamflow in the Bear River is the result of snowmelt in the higher elevation portions of the watershed. Only a portion of the flow is derived from lands in Idaho. Where the river enters Idaho, near the community of Border, Wyoming, it has drained an area of 2,500 square miles and has an average annual (1927-1972) flow of 278,000 acre-feet.

Average annual runoff at principal gaging stations in the Bear River Basin is shown in Table 6. Location of these gages is shown on Figure 2.

Table 6. Average Annual Runoff of the Bear River.
(1927-1972 base period)

<u>Gage</u>	<u>Run-off (acre-feet)</u>
Bear River near Border	278,400
Bear Lake Outflow	260,000
Bear River at Alexander	463,800
Bear River near Preston	474,900

Major Idaho tributaries of the Bear River are the Thomas Fork, Cub River and the Malad River. Although the Bear River gains flow at successive downstream locations, irrigation diversions make these gains much smaller than if there were no irrigation. For example, the estimated annual flow of the Bear River near Preston would be approximately 231,000 acre-feet greater if there were no irrigation depletion in the Idaho portion of the basin.

Monthly flows at the various gaging stations are influenced to varying degrees by reservoir regulation, irrigation diversions and return flows. Table 7 contains a list of major reservoirs in the basin. The Bear River at Border is somewhat regulated by upstream storage, and is depleted by irrigation diversions in Wyoming and Utah. The Thomas Fork and the Malad River exhibit monthly flows typical of unregulated streams. Peak runoff occurs during the snowmelt season and then declines throughout the summer months. Bear Lake regulation allows snowmelt season runoff to be stored for use during periods of peak irrigation and power demand. The peak monthly lake outflow occurs during July, with August averaging only slightly less. The monthly regime of flows in the reach below Preston shows the effects of unregulated tributary inflow and substantial irrigation diversions. This results in high flows in May and June and very low flows in July, August and September.

The Bear River system, like other river basins, is subject to variation in runoff due to seasonal and annual precipitation. Dry periods can reduce water available for irrigation on headwater streams with little or no storage. Long periods of low precipitation can deplete storage in Bear Lake.

Annual runoff for two locations on the Bear River are shown on Figure 5. The period 1931 through 1946 represents one of below average streamflow. The fact that these dry years occurred in sequence is important, because storage in Bear Lake was exhausted after several years. This resulted in substantial irrigation shortages. Had these same dry years occurred in another sequence, one that contained a few average or above years

Table 7. Major Existing Reservoirs in the Bear River Basin.

Name	Stream	Total Storage (acre-feet)	Purpose
Bear Lake	Bear River	1,421,000	Power Irrigation
Little Valley	Hammond Creek	(400)*	Irrigation
Montpelier Creek	Montpelier Creek	4,050	Irrigation Fishing Sediment
Mud Lake	Bear River	31,000	Wildlife
Sheep Creek	Sheep Creek	(500)	Irrigation
Thomas Fork	Wood Canyon	(140)	Irrigation
Lakey Reservoir	Swan Lake Gulch	(400)	Irrigation
Soda Creek	Soda Creek	2,500	Irrigation
Soda Point	Bear River	15,000	Power Irrigation Recreation
Soda Springs	Big Springs	830	Irrigation
Condie Reservoir	Mink Creek via Twin Lakes Canal	(940)	Irrigation
Foster Reservoir	Worm Creek	3,500	Irrigation Fishing
Glendale Reservoir	Worm Creek	11,000	Irrigation Fishing
Johnson Reservoir	Worm Creek	(940)	Irrigation
Lamont Reservoir	Worm Creek	(3,000)	Irrigation
Oneida Narrow Reservoir	Bear River	11,500	Power Irrigation Fishing
Strong Arm Reservoir	Battle Creek	4,500	Irrigation
Treasureton Reservoir	Battle Creek	(7,000)	Irrigation Recreation
Tule Lake	Soda Creek	3,040	Irrigation
Twin Lakes	Mink Creek via Twin Lakes Canal	14,000	Irrigation Fishing
Winder Reservoir	Mink Creek	1,930	Irrigation Fishing
Crowthers Reservoir	Spring Creek	1,056	Municipal & Industrial
Daniels	Little Malad	11,900	Irrigation Recreation
Deep Creek Reservoir	Deep Creek	5,400	Irrigation
Deep Creek Upper	Deep Creek	500	Irrigation
Devil Creek	Devil Creek	4,450	Irrigation Recreation
Pleasant View Lower	Big Malad Springs	500	Irrigation
Pleasant View Upper	Big Malad Springs	1,300	Irrigation
Samaria Lake	Samaria Creek		Irrigation
St. Johns Reservoir	Davis Creek	4,450	Irrigation Recreation
Weston Reservoir	Weston Creek	3,150	Irrigation
Total		1,556,376	

*() Estimated.

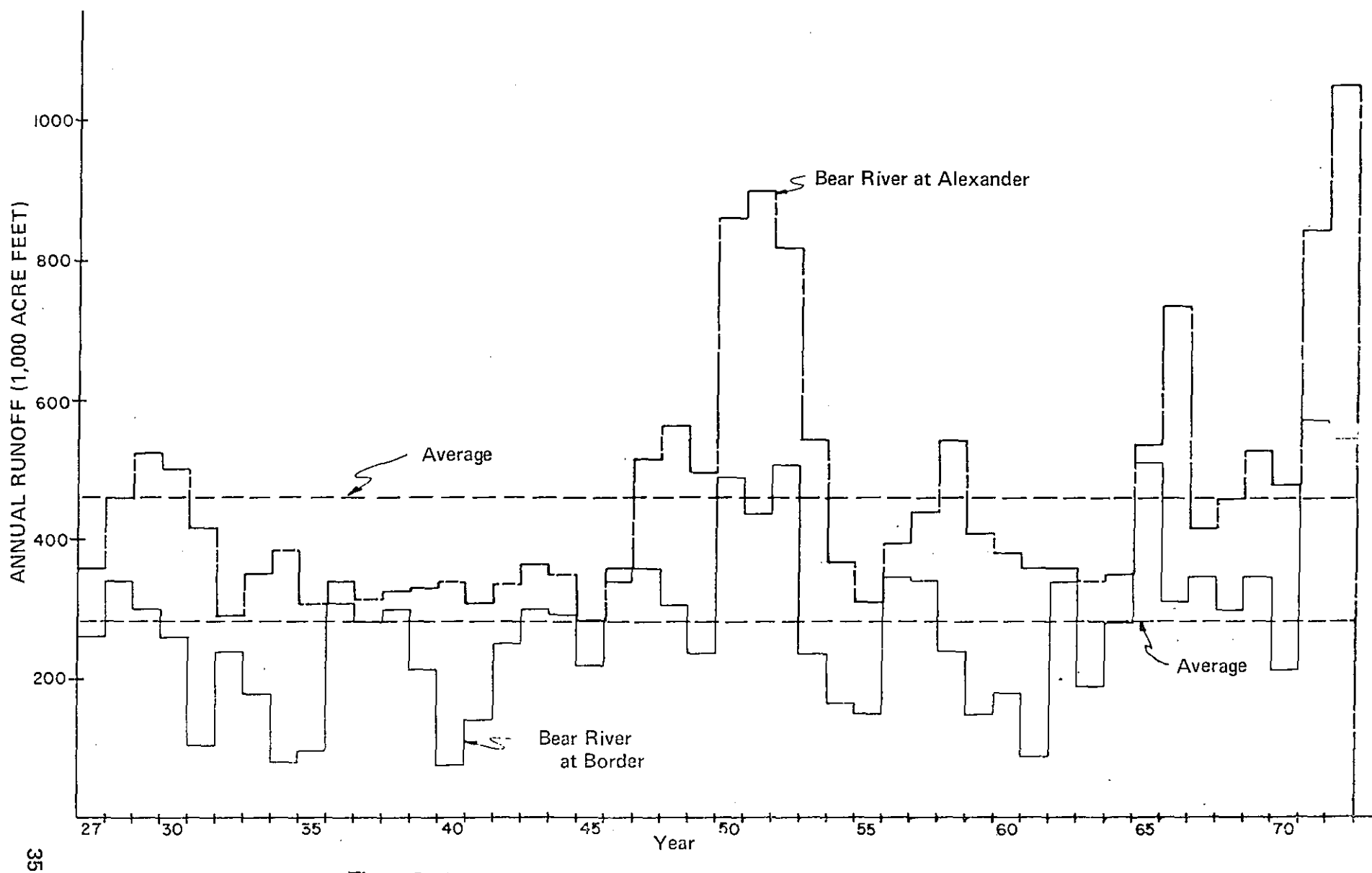


Figure 5. Annual runoff at two stations assuming present level of development.
(1927-72 base period)

interspersed with them, the impact would have been much different. There is evidence that the below normal runoff years that occurred in the 1930's is a rare event. Since almost no hydrologic records exist for the period prior to 1920, it is difficult to determine the true frequency of occurrence of the 1930's dry period. Since 1966, runoff has been considerably above average.

Groundwater

There are five areas in the Bear River Basin that have some groundwater — the valley area north of Bear Lake, the area north of Soda Springs, Gem Valley, Cache Valley, and Malad Valley. Information on groundwater supplies and the potentials for further development in the Bear River Basin generally is limited. The U.S. Geological Survey has conducted a number of studies in the area including two studies in Gem Valley, Idaho and Cache Valley, Utah. A summary of the potential for further development of each of the five areas follows.

Bear Lake Valley

The valley north of Bear Lake is a broad sediment-filled basin with some apparent potential for groundwater development. However, the valley sediments are apparently saturated, and all available evidence shows the deposits to be too fine textured to readily yield significant quantities of water to wells. In general, therefore, the Bear Lake Valley and the trough extending northward toward Soda Springs offer no real potential for groundwater development. There may be a large volume of water in storage, but the small amount of information now available indicates it may not be economically recoverable.

Valley Area from Soda Springs to China Hat

Northward from Soda Springs, the valley broadens and rises toward the lava fields of the Blackfoot River drainage. High mountains along the eastern flank of the valley provide a large volume of recharge water annually. Along the western flank of the valley, the Chesterfield Range separates the valley from the much lower Gem Valley. Tenmile Pass cuts through the Chesterfield Range and once served to drain a part of the valley area. The pass is now partly filled with lava and no longer provides surface drainage.

China Hat is a prominent landmark east in the lava field at the southeastern edge of the Blackfoot Reservoir. Blackfoot River and the reservoir lose some water into the lava field, and much of that water moves southward to discharge into the Bear River near Soda Springs. The lava and sediments of the valley are permeable and yield large volumes of water. There appears little doubt that large volumes of groundwater could be pumped from this area. The valley and its outflow areas have been investigated by preliminary geophysical surveys, but no test drillings have been done to investigate specific locations to gain additional quantitative data.

Gem-Portneuf Valley

Bear River flows westward from Soda Springs into an elongated northwest-southeast valley now largely filled with basaltic lava. The underflow of the river is divided — part moving northwestward to the Portneuf River, and part moving southward to the Bear River. There is evidence that the Bear River once flowed northwestward as a tributary of

the Portneuf River, but the lava flows changed the river course southward. Groundwater now occurs in part of the lava and in the underlying sediments.

The valley area of water saturated lava and sediments is large and at some localities large yields can be obtained from wells. Extensive subsurface investigation, with drilling and surface geophysical studies, is needed before the groundwater conditions can be further defined.

Cache Valley occupies a long, slender trench along the western flank of the Wasatch Range, mostly in Utah. The part of the valley in Idaho narrows sharply toward the northwest, is flanked on the west by the high peaks of the Malad Range, and contains a wide variety of sediments. Hydrologic conditions beneath the valley floor vary widely.

Cache Valley

Data from wells and from gravity and seismic surveys show that the eastern and central parts of the Idaho part of the valley fill are poorly permeable so that wells of large yield are rare. High yields may be obtained from coarse deposits along the northwestern margin of the valley, but the available data show these deposits to be thin, with only about 200 feet of saturated section. The coarse deposits are only a few square miles in area and, although recharge from the west is large, the total storage volume is moderate and seasonal recharge and discharge cause large water-level fluctuations. Recharge is believed sufficient to replace all existing annual withdrawals.

Geophysical data also suggest that bedrock, or at least high-density material, underlies much of the western side of the valley at shallow depth and south of the area of coarse sediments. Much additional study will be necessary to define details of the hydrology of the valley, but present data do not suggest availability of a large groundwater supply.

As a result of extensive applications for groundwater development in the Idaho portion of the Curlew Valley, concern was expressed that continued development would cause water level declines such as had been experienced in recent years in Utah. A subsequent review by the Idaho Department of Water Resources of prior groundwater studies suggests that approximately 18,000 to 20,000 acre-feet of groundwater underflow moves from Idaho to Utah each year. Applications presently being processed in Idaho, if all were approved, would provide for consumptive uses of at least 17,000 acre-feet of groundwater withdrawal by 1980. This represents virtually full development of the remaining groundwater resources. As a result, the Curlew Valley was declared a critical groundwater area and closed to further development on March 15, 1976.

Curlew Valley

Bear Lake, the largest lake in the basin and an important off-stream storage site, receives water from the Bear River via two canals diverting at Stewart Dam near Dingle, Idaho. The capacity of these canals is large enough that most flood flow can be diverted. Water from these canals first enters Mud Lake, then Bear Lake. Water levels in Bear Lake are controlled by a dike between Mud and Bear lakes. Release of the top three feet of Bear Lake

River System Management

water (elevation 5,923.65 to 5,920.65) is made by gravity. The Lifton Pumping plant is used to draw Bear Lake below the outlet level (from elevation 5,920.65 to 6,902.00). All elevations are given in Utah Power and Light Company Bear Lake datum which is 2.75 feet lower than mean sea level datum.

Present usable capacity of the lake is 1,421,000 acre-feet. Bear Lake is operated by Utah Power and Light Company to generate power and maintain an assured water supply to meet irrigation water commitments to Utah-Idaho Sugar Company in Utah. Also, the lake is, in effect, operated for flood control, as fall and winter releases are made to insure flood space for snowmelt runoff.

Below Stewart Dam the Bear River flows through a series of power generation facilities owned by Utah Power and Light Company.

Bear River Compact

In the late 1800's water diversions were limited to small tracts of land located near the stream. As settlement continued to increase so did the amount of water diverted for agricultural use. It became apparent that because of different water administration procedures of the three states of Utah, Wyoming and Idaho, a system was needed that would regulate water uses based upon filing priority without regard to state lines.

The Bear River Compact, agreed to by each of the three states and approved by Congress (1958), provides the administration for this regulation. It limited the amount of storage that could be constructed above Bear Lake and established an "irrigation reserve" in Bear Lake which restricted the power company from releasing Bear Lake storage for power purposes except in an emergency. The reserve is defined as the water below elevation 5,914.61 amounting to 794,900 acre-feet.

Since river inflow below Bear Lake is appropriated for irrigation, power and other uses, the Bear River Compact did not allocate the water between Utah and Idaho for further development. Article 6 of the compact encouraged additional projects for the development of the water resources of the Bear River to obtain the maximum beneficial use provided that projected water rights are subjected to prior rights. It also contained language that "at intervals not exceeding twenty years" the Commission should review the provisions of the compact and may propose amendments to any of the provisions provided that after public hearings the amendment should be verified by each state's legislature and the Congress.

History of Negotiations

As a result of controversy over a Bureau of Reclamation project proposal, the Governors of Utah and Idaho met in Salt Lake City on September 25, 1967, and agreed there was a need for interstate discussions to solve questions surrounding Bear River water resource development. This eventually led to designation of a Tri-State Negotiating Committee consisting of representatives appointed by the Governors of Utah, Idaho, and Wyoming. Committees were generally comprised of Bear River Commission members and additional representatives from the state water resource agencies.

Negotiating meetings began with the first meeting in Pocatello on January 7, 1970. The meetings have occurred irregularly but averaged approximately four per year. The intent in the creation of the negotiating group was that they were to seek an informal understanding of possible allocation of water between the three states for possible modification of the Bear River Compact. The Negotiating Committee had no formal legal status, but if a proposed allocation could be derived, the commission would be the body which would seek Compact modifications through legislative approval. Issues that impact negotiations are:

Current Issues

1. Increasing uses in both Utah and Idaho from tributaries, groundwater and direct diversions from the Bear River result in less natural flow available to meet the major diversion requirements on the lower river. In order to offset these uses more reliance has been placed on Bear Lake.
2. Since the Compact requires delivery of water to right holders without regard to stateline, Utah's greater potential for early growth of industrial and other uses threatens to commit all remaining water in the Lower Division (below Bear Lake) to that state.
3. Wyoming and (perhaps Utah) can apparently block any federal Lower Division development unless the storage allowance above Bear Lake is increased to their satisfaction.
4. Additional depletions above Bear Lake resulting from increased storage there would adversely affect recreation uses of Bear Lake. If sufficiently large, they would also injure existing irrigation and other uses below Bear Lake in both Idaho and Utah.
5. Upstream depletion could be increased without injury to downstream irrigation rights by fully utilizing Bear Lake's operating range of 1,421,000 acre-feet. This, however, would cause lakeshore flooding problems when the lake was completely full (Utah Power and Light Co., operator of the lake, does not completely fill the lake now to avoid this problem). It would also result in downstream flood problems which are now avoided by using Bear Lake as a flood control reservoir.
6. Wyoming's interest in the negotiations is to remove the storage limit that now constrains them. In return they offer "no objection" to federal projects in the Lower Division. The present Compact does not constrain them regarding groundwater.
7. The Utah Division of Water Resources has a long range concept of transbasin diversion to municipal and industrial use in the Salt Lake City area from the upper Bear River Basin. This concept has been shown as one alternative in Utah brochures on their state water plan.

8. Utah and Wyoming are seeking to enlarge the existing Woodruff Narrows Reservoir. The present Compact storage restrictions prevent them from making that enlargement. One legal interpretation of the Compact holds that such enlargement would be legal within the present Compact, but this is disputed by the Idaho Attorney General's office.
9. The Bear River migratory bird refuge of the U.S. Fish and Wildlife Service near the mouth of the river has a Utah water right (unadjudicated) for 1,000 cfs having a 1928 priority date. If this right is fully valid and provided in its order of priority, it would virtually preclude any new storage or other type development on the Bear River. Because of that, any new use may have to be acceptable to the Bureau of Sport Fisheries and Wildlife. The Bureau of Reclamation avoided conflict with the refuge in their Oneida project plan by including planned flow augmentation for the refuge within an "ideal pattern of flow" which would more nearly meet the refuge needs than would their water right.
10. Utah Power and Light Co. will be affected by almost any change in the Compact. The company already has problems trying to meet its contractual obligations to supply irrigation water from Bear Lake while avoiding lakeshore and downstream flooding. They realize low water years will bring major complaints from recreation users when the lake is drawn down for extended periods.

*Idaho's Interest in the
Bear River Negotiations*

Most of the issues cited above are of interest to the State of Idaho. These issues are complex and negotiators have not always fully understood their implications. Idaho's most important consideration in the negotiations relates to the second issue described above. Idaho will eventually lose any capability to use additional Bear River water (if new Utah rights develop before uses in Idaho) unless the "without regard to stateline" provision is limited to only those rights currently in existence. Idaho negotiators feel modification of this provision should be coupled with an allocation of developable water to the respective states.

Water Rights

The basis for use of water in Idaho is the appropriation doctrine which provides that the first in time is the first in right. Since 1971, an established water right must be evidenced by an approved permit issued by the Department of Water Resources. The waters of two rivers — the Bear and Snake — have been allocated by interstate compacts which were approved by the states affected and the Congress of the United States.

There are an estimated 250,000 water rights to beneficially use the ground and surface waters of Idaho. The total number of recorded existing water rights, including all court decrees, licenses, permit applications and claims to a water right filed with the Department of Water Resources, total about 35,000. About 215,000 or 86 percent of the existing uses of water are not on record and are subject to some future determination.

Existing Water Rights

A part of the water rights on several major rivers and tributary streams has been adjudicated and identified by court decree. These decrees identify about 12,000 water rights which represent only a fraction of the total of existing water rights. Major early water right decrees include the Snake River and tributaries above Milner Dam, and Wood, Lost, Boise, and Weiser rivers. These decrees do not include all rights on the respective rivers and do not reflect changes in use of water since the decrees were issued.

Water Right Adjudication

Adjudication studies are currently being prepared to assist the Idaho courts in issuing decrees on Basin Creek, Cassia County; Warm Creek, Franklin County; Monroe Creek, Washington County; Twin Lakes, Kootenai County; and the Payette River. These decrees when issued will identify an additional 13,000 water rights.

Many of the small streams throughout the state are becoming fully appropriated during the low flow months. Eventually, conflicts will arise that will require an adjudication proceedings to be undertaken.

The federal government has certain unidentified rights based on the "Reservation Doctrine" in which Congress, at the time it created the various federal land reserves, such as the National Forests, reserved the waters for federal use. The priority date of use is the date of the original reservation. The extent of these rights is and will continue to be the subject of litigation. Water rights may have also been established for the Indian tribal lands under the "Winters Doctrine." The extent of water rights by Reservation and Winters Doctrine at this date has not been determined.

Federal Claims to Water

Water Short Areas

Six groundwater areas have been designated as critical groundwater areas in accordance with Section 42-233a, Idaho Code. Further groundwater development is prohibited in these areas. These areas located south of the Snake River are Blue Gulch, Artesian City, Cottonwood, Oakley-Kenyon, Raft River and Curlew Valley as shown on Figure 6. These areas have been designated critical because of insufficient groundwater to provide a reasonably safe supply for established uses.

The Snake River between Milner Dam and the Idaho-Oregon border is at or near full appropriation when all existing rights, permits, and applications are considered. If all existing permits and applications are approved, the summer flows of Snake River in this reach will require augmentation by upstream storage to avoid water shortages.

The Bear River is presently fully appropriated. New development will depend on the outcome of on-going negotiations to revise the existing Bear River Compact.

Water Quality

Rules and regulations relative to the quality of Idaho's waters lies within the jurisdiction and responsibility of several federal, state, district and local agencies. The departments of Fish and Game, Land, Health and Welfare and Water Resources have rules and regulations relative to Idaho's water quality.

The Idaho Department of Health and Welfare has approval authority for disposal of substances that affect Idaho's water quality. This agency is also doing water quality management planning. The Idaho Department of Water Resources has approval authority and responsibility for water resource use and planning which includes the quality of that resource.

The principal federal authorities that affect water quality are: the Environmental Protection Agency, Army Corps of Engineers, and Council on Environmental Quality. The authority is largely contained in the Federal Water Pollution Control Act as amended by P.L. 84-234, P.L. 91-224, Executive Orders 11507 and 11514 and P.L. 92-500. Also, authority is contained in the National Environmental Policy Act of 1969 (P.L. 91-190) and the Safe Drinking Water Act (P.L. 93-523).

The local authority is vested in a multitude of regulations. Most of the regulatory authority results from regulation of water disposal. The other area of authority is the 208 area-wide water quality management planning process.

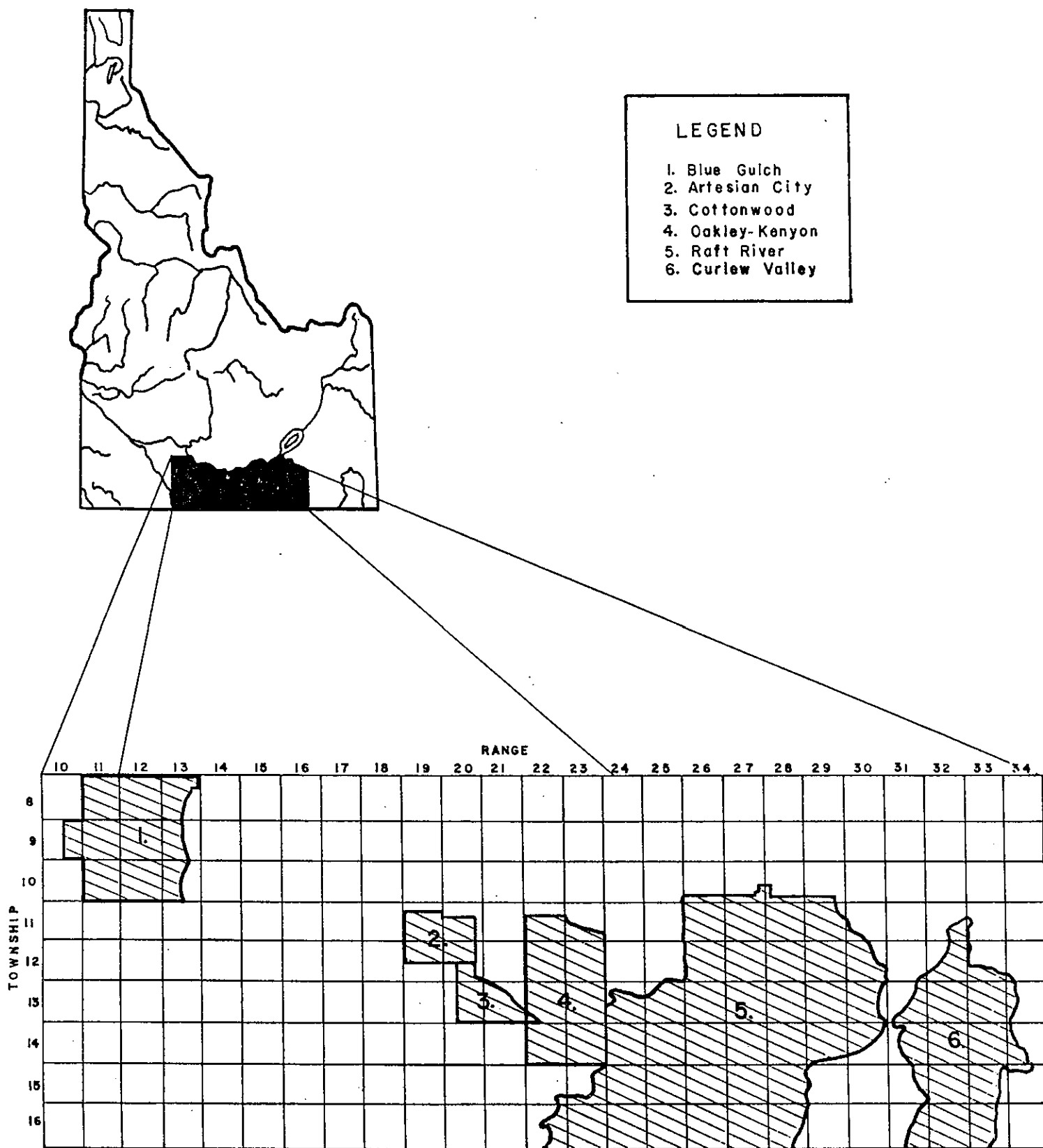


Figure 6. Approximate boundaries of six critical groundwater areas.

Most surface waters originate in mountainous areas and are of high quality. Degradation of quality in many of the streams occur as the streams pass through or are used on irrigated areas, as municipal and industrial effluents are discharged into them or as sediments from soils erosion are deposited in the streams. Degradation also occurs because of runoff and leaching from feedlots located adjacent to streams, from fish hatcheries, from mine tailings and other sources. However, corrective actions have been taken at many of the larger operations in recent years.

Groundwater supplies originate from precipitation, canal and irrigation seepage, streams that seep into the aquifer and artificial recharge. Most municipalities and individuals obtain their domestic and industrial water supplies from the groundwater. Generally, groundwater supplies are of good-to-excellent quality. In some instances irrigation wastewaters enter the aquifer, either by natural seepage or through disposal wells and create a source of pollution.

Natural lakes, including those that have outlet structures to raise the water surface, have a varied water quality. Some lakes such as Payette Lakes, Warm Lake, Henrys Lake and others have many residences and recreational facilities located on their shorelines. Drainage and seepage from septic tanks and leach fields are a source of contamination in many of those areas. Similarly, some man-made reservoirs, such as Cascade Lake and Island Park Reservoir, experience contamination problems. Progress is being made in some of these areas to correct the problem through construction of systems to collect and treat wastes.

The water quality of 220 stream segments in Idaho has been assessed and given a status designation of either "water quality limiting (WQL)" or "effluent limiting (EL)." This data is summarized in Table 8. These terms mean: WQL - either the quality of the water has not been adequately determined or the water is polluted to some degree and will not be cleaned up using present pollution abatement programs; EL - either the water is not polluted or it will be cleaned up using present abatement programs. Many of the segments whose status is "WQL - Insufficient Information" probably will be reclassified "EL" when additional studies are completed.

These stream segments have also been classified as either A, B or E. Of the 220 segments, 211 are Class A streams, 6 are Class B, and 3 are Class E. Class A water is defined as primarily contact recreational water for uses where the human body may come in direct contact with the raw water to the point of complete submergence. Class B water is defined as secondary contact recreational water for uses in which the raw water supply is suitable for support and propagation of fish, aquatic, and semiaquatic life, and other forms of wildlife. Water classified as Class E is that whose quality for natural and/or man-made causes is compatible with recreational uses. There are specific water quality standards attached to each classification. These standards deal with coliform concentration, dissolved oxygen, hydrogen ion concentration, temperature, turbidity, and total dissolved gas.

Table 8. Water Quality Basin Summary (number of segments).							
Status	Bear River	Clearwater	Upper Snake	Southwest	Salmon	Panhandle	Total
EL	4	3	8	8	9	9	41
WQL (Insufficient information)	8	20	23	26	11	9	97
WQL	6	14	18	14	5	25	82
Total	18	37	49	48	25	43	220

Authority for the programs for water quality improvement are in P.L. 92-500 (Water Quality Act Amendments of 1972) and P.L. 93-523 (Safe Drinking Water Act). Public Law 92-500 deals almost exclusively with pollution of surface waters. Discharge to groundwater from septic tanks and drain wells is considered to implement the provisions of the law. Idaho Code also authorizes state permits and compliance schedules which may be issued for any source. Pollutant sources and their respective abatement programs are divided into two major categories. These are "Point Sources" and "Non-Point Sources."

Point sources are those which discharge pollutants in such a way that the point of discharge is easily identified. Abatement of such pollutants is through the National Pollutant Discharge Elimination System (NPDES). Permits issued by the Environmental Protection Agency under P.L. 92-500 make it a federal offense, punishable by fines and imprisonment, for pollutant discharges but impose conditions on the discharger designed to reduce the level of pollution, over a period of time, to conform with set standards by specified dates.

Non-point sources of pollutant are those which cannot be identified as discharging at a specific point. The majority are diffuse sources which discharge over a large area such as croplands, grazing lands, logging areas, and construction areas. Primarily, pollution from non-point sources consists of suspended solids. There are several programs in Idaho that are presently administered to reduce non-point source pollution. These programs, for the most part, are of a voluntary nature and do not require mandatory compliance. They are generally designed to save soil and not to protect water quality. They are overlapping, and different programs apply to federal, as opposed to state or privately owned lands. Studies are now underway by the state to determine the best way to combat non-point sources of water pollution.

Land Use

The land resources of Idaho reflect cumulative effects of geologic activity and the weathering impacts of climate and human habitation. They are diverse in character ranging from the desert flat lands of southern Idaho to forested lake country of the Panhandle.

Idaho is the 13th largest state with a land area of approximately 52,900,000 acres plus 577,000 acres of water area. About 31.8 percent of this total is privately owned. The federal government owns approximately 63.3 percent of the state's land resources with the State of Idaho and local governments owning 4.9 percent.

The Bear River Basin has 50.6 percent of its total land base in private ownership and is followed by the Panhandle (39.3 percent), and the Snake River Basin (30.3 percent). In addition, the Bear River Basin has the smallest percentage of federal ownership, with 46.8 percent, compared to 52.8 percent in the Panhandle Basin, and 56 percent in the Snake River Basin. Table 9 summarizes land ownership, cover, and land use for the Panhandle, Snake and Bear river basins.

As indicated in Table 9, the Snake River Basin encompasses the largest land area with 46,557,000 acres or 86.8 percent of the state's total. This is followed by the Panhandle with 5,062,000 acres (9.0 percent), and the Bear River Basin with 1,858,000 acres (3.2 percent).

Forest and range are the dominant land uses and control 83 percent of the state's land resources. However, with the exception of the Panhandle, irrigated cropland is the major economic use.

A portion of the federally owned lands are reserved and set aside as the Cataldo Mission National Monument, the Coeur d'Alene Indian Reservation, and the McArthur National Wildlife refuge in the Panhandle; Craters of the Moon National Monument, Sawtooth National Recreation Area, and the Nez Perce, Duck Valley and Fort Hall Indian reservations in the Snake River Basin. Other state lands have been reserved as state parks and wildlife management areas. Additional lands, although not reserved under legislative action, are managed under contractual agreement with various federal agencies and local governments.

There are approximately 6,883,000 acres of cropland in Idaho. Of this about 56 percent or 3,844,000 acres are irrigated. A wide variety of crops can be grown successfully depending upon water supply, suitable soil and climate. Alfalfa hay, pasture, small grain, potatoes and sugar beets are the principal crops.

A large portion of the state's existing rangeland is suitable for irrigation. The potentially irrigable lands in the state's river basins are listed in Table 10. As noted in Table 10, there are approximately 1,218,850 acres of potentially irrigable soils with a classification of Class 1. Class 1 lands, being well drained, and with smooth topography, have a high potential for irrigation. The soil types in Class 1 are mostly fine sandy loams, but may include permeable clay loams. Substrata of sand, gravel and cobble are not uncommon and occur at depths of 40 inches or more.

Approximately 3,733,552 acres of Class 2 lands have been identified in the state. Class 2 lands have moderate limitation for irrigation agriculture, with rolling topography being the most characteristic limiting factor. Another characteristic of Class 2 lands is the gravel and cobble commonly found within the tillage layer.

Table 9. Land Ownership, Cover and Land Use for the Panhandle, Snake and Bear River Basins - 1975^{1/}.

Basin	Land Use	Acres	Ownership (Percent)			
			Private	BLM	Forest Service	State
Panhandle (Pend Oreille-Clark Fork, Spokane, Kootenai)	Forest	4,359,000	38	3	51	8
	Range	167,000	65	0	29	6
	Irrigated Cropland	25,000	100	0	0	0
	Nonirrigated Cropland	299,000	100	0	0	0
	Other Land	49,000	78	0	0	22
	Large Water Areas	163,000	0	0	0	100
	Basins Total	5,062,000	39.3	3.0	49.8	7.9
Snake	Forest	15,984,000	7.5	19	71.6	1.8
	Range	22,557,000	28.5	43.8	22.7	5.0
	Irrigated Cropland	3,625,000	100.0	0	0	0
	Nonirrigated Cropland	2,361,000	99.8	0	0	0.2
	Other Land	1,657,000	14.7	34.3	25.2	25.8
	Large Water Areas	373,000	0	0	0	100.0
	Basins Total	46,557,000	30.3	27.2	37.8	4.7
Bear	Forest	274,000	1	11	86	2
	Range	927,000	59	19	17	5
	Irrigated Cropland	194,000	100	0	0	0
	Nonirrigated Cropland	379,000	100	0	0	0
	Other Land	43,000	47	0	0	53
	Large Water Areas	41,000				
	Basins Total	1,858,000	50.6	19.8	27.0	2.6
Total for all Basins	Forest	20,617,000	15.1	11.0	69.9	3.9
	Range	23,651,000	29.8	42.6	22.5	5.1
	Irrigated Cropland	3,844,000	100.0	0	0	0
	Nonirrigated Cropland	3,039,000	99.9	0	0	0.1
	Other Land	1,749,000	17.2	32.2	23.6	27.0
	Large Water Areas	577,000	0	0	0	100.0
	Total	53,477,000	31.8	25.8	37.5	4.9

Source: U.S. Department of Agriculture - State of Idaho
Snake River Cooperative Study

^{1/} Acreages computed to nearest county boundary.

Table 10. Potentially Irrigable Lands of the Panhandle, Snake, and Bear River Basins.

Basin	(acres)			Total
	Class 1	Class 2	Class 3	
Panhandle	40,370	206,140	269,950	516,460
Snake	1,112,500	3,100,200	3,184,700	7,397,400
Bear	65,980	427,212	173,920	667,112
Total	1,218,850	3,733,552	3,628,570	8,580,972

Class 3 lands of about 3,628,570 acres comprise the remaining potentially irrigable land. Class 3 lands are generally of the same nature of Class 2 lands but have more severe limitations for irrigated agriculture. Most have the potential to return satisfactory economic returns under irrigation but require careful management.

The state contains approximately 20,617,000 acres of forest land. This is 2.9 percent of the nation's total and enough to rank Idaho tenth nationally. There are about 15,192,000 acres of commercial forest or 3.0 percent of the nation's total. Idaho contains a net volume of timber of 31,563 billion cubic feet or 4.4 percent of the nation's supply. This volume ranks the state sixth nationally. Annual removals are approximately 357,256,000 cubic feet or 2.5 percent of the nation's annual cut and enough for a national ranking of fourteenth. Leading species harvested are true firs and white pine, followed by Douglas fir and western larch.

The federal government owns approximately 80.8 percent of the state's forest lands.

In Idaho Indian land resources are limited to one reservation and other small holdings in the Panhandle and three reservations in the Snake River Basin. These lands and their respective ownership are listed in Table 11.

Although the original reservation boundaries exist today, Indian ownership has been reduced substantially as a result of the Homestead Act of 1906. Indian ownership represents only a small percent of land within the boundaries.

Idaho leads the nation in the production of silver and ranks second in lead and zinc. Most of this production comes from the Panhandle. The Panhandle-Spokane River Basin contains Idaho's and one of the world's most productive mining areas, the Coeur d'Alene district. This district, located in the South Fork Coeur d'Alene drainage, has been in operation since the

1880's. 1884 to 1965 metal production totaled approximately 2.1 billion dollars. 54.7 million dollars of ore was produced in 1972. This historical output represents 444,300 ounces of gold, 703,300 ounces of silver, 116,000 tons of copper, 6,833,500 tons of lead, and 2,385,300 tons of zinc. This represents 84 percent of the total metal production of the state.

In 1973 metal production in the Snake River Basin totaled 1,100 tons of copper, 1,091 tons of zinc, 165,136 ounces of silver, 883 tons of lead and 190 ounces of gold. Small amounts of iron, tungsten and vanadium are also mined. The largest single mineral land use is for open pit mining of phosphate ore. Approximately 60 percent of the nation's phosphate reserves are located in the Snake and Bear river basins. The expansion of existing operations may utilize 8,000 acres of land in the next 25 years.

Human Resources

Demographic Characteristics

Analysis of alternatives for the management of the water and related lands of Idaho requires an understanding of present and potential demands of human resources. These demands, such as municipal and industrial water supplies, relate to population and industrial activity. Others, such as food, fiber, and recreation have regional or national demands and markets and are influenced by outside pressures.

There were 712,567 persons in Idaho in 1970. This represented a 6.8 percent increase from 1960. The estimated population for 1975 was 837,000 persons or an increase of 15 percent from 1970. The historical population of Idaho from 1930 through 1975 is given in Table 12. On the average, birth and fertility rates in Idaho are above that of the nation. In 1970, the birth rate for Idaho was 18.8 and the fertility rate was 90.0. The median age of the population was 26.4 years. The population distribution for the state reflects the higher birth rates common to the west. The population distribution for Idaho for 1970 is listed in Table 12.

Some cities in the state have experienced rapid population growth during the last decade. Cities reporting growth in excess of 50 percent for the decade ending in 1970 are Boise (117.5 percent), Lewiston (105.4 percent), Chubbuck (83.9 percent), Rexburg (73.5 percent), Orofino (57.1 percent), Fernan Lake (173.1 percent) and Hansen (174.8 percent). A portion of this city growth is due to annexation of nearby areas. However, the majority is due to increased migration into the area.

Employment

Idaho is an area of continued growth. Both employed and unemployed labor force continues to increase as people migrate to the state faster than the economy can assimilate them.

The economy of Idaho centers around the primary industries associated with natural resource extraction and use. However, other non-resource based industries account for the largest portion of the state's employment. The

Table 11. Land Ownership within the Boundaries of the Indian Reservations in Idaho.

Reservation	Indian Trust (acres)	Percent	Non-Indian Trust (acres)	Percent	Total Acres
Kootenai	2,390	100.0	0	0	2,390
Coeur d'Alene	70,056	20.3	274,944	79.7	345,000
Nez Perce	86,849	11.6	663,151	88.4	750,000
Fort Hall	523,000	100.0	0	0	523,000
Duck Valley	<u>290,000</u>	<u>100.0</u>	<u>0</u>	<u>0</u>	<u>290,000</u>
Total	972,295	50.9	938,095	49.1	1,910,390

Table 12. Historical Population of Idaho – 1930-1975.

Basin	1930	1940	1950	1960	1970	1975
Panhandle (Kootenai, Pend Oreille- Clark Fork, Spokane)	62,607	72,499	74,687	77,864	82,137	99,000
Snake	359,303	428,817	492,862	570,119	613,318	715,000
Bear	<u>25,242</u>	<u>25,841</u>	<u>26,664</u>	<u>25,184</u>	<u>22,572</u>	<u>23,000</u>
State Total	445,032	524,873	588,637	667,191	712,567	837,000

contribution of various sectors to average annual employment for 1972 is shown in Table 13. As indicated, the state's economy is well diversified and tied closely to agriculture which adds stability.

Table 13. The Contribution of Various Industrial Sectors to Average Annual Employment for Idaho 1972.

Sector	Employment	Percent of Contribution
Agriculture	41,368	12.8
Manufacturing (includes food processing)	43,444	13.5
Mining	2,686	0.8
Construction	11,609	3.6
Transportation	14,714	4.5
Trade	57,286	17.8
Finance	9,293	2.8
Services	41,768	12.9
Federal Government	10,198	3.1
Military	5,302	1.6
State and Local Government	45,406	14.1
Other	38,035	11.8
Total	321,491	100.0

Personal Economics

The average unemployment rate has increased to 7.3 percent in 1975 from 5.8 percent in 1970. These rates are substantially below the national average. However, unemployment rates as high as 14.6 percent are observed in the Panhandle basins during the period January through April 1.

Personal income within Idaho's river basins fluctuate, in large part, with the activities in lumber and mining, and with the price of agricultural commodities. Normally per capita personal income falls below the national average.

A comparison of per capital personal income as a percentage of national income shows that the state as a whole is gaining ground. However, the growth is centered around the economic well-being and stability found in the Snake River Basin. As indicated in Table 14 the Bear and Panhandle river basins show stable to recent modest improvement, yet the total state per capita income is only 91 percent of the national average.

Also, as indicated in Table 14 of the states bordering Idaho, only Utah continues to compare less favorably with the national average than Idaho. Of particular interest are Washington and Nevada with per capita incomes of 102 percent and 114 percent of the national average. These figures not only enumerate the levels of income but measure the degree of income against the U.S. average.

Table 14. Per Capita Personal Income as a Percent of the National Average for Selected Years.

	----- 1965	(Percent) 1972	----- 1973	----- 1974
Basin				
Panhandle	79	65	77	80
Bear	85	77	88	92
Snake	89	88	85	89
State				
Idaho	88	82	87	91
Washington	106	101	102	105
Oregon	98	95	96	97
Nevada	115	115	113	111
Utah	86	82	82	82
Wyoming	94	94	97	99
Montana	88	90	94	91

Demographic and employment projections were developed using a combination of the Cohort-Survival method of population forecasting and an econometric method for determining migration. The Cohort-Survival portion of this process recognized decreases in population due to deaths and increases resulting from births. Increases and decreases resulting from in-and-out migration were determined through a mechanism which balanced available workers with available jobs.

Demographic and Employment Projections

Through use of this methodology, estimates of population were produced for 1980, 1990 and 2000. These estimates for each county in the Panhandle, Bear and Snake river basins are listed in Table 15. As indicated, Idaho's population is expected to increase by approximately 198 percent from 1970 to the year 2000. This rate of growth is significantly greater than the 160 percent for the 1930-1970 time period. The Snake River Basin is projected to increase the greatest at approximately 199.4 percent by the year 2000. The Panhandle and Bear River basins follow closely with 185.1 percent and 158.8 percent respectively. Total population for the state could increase to approximately 925,885 persons in 1980, 1,197,493 persons in 1990 and 1,411,128 persons in 2000.

Statewide employment is projected to increase at an average annual rate of 1.94 percent. Wholesale-retail trade will continue to be the dominant employer (21.1 percent) followed by state and local government (16.1 percent), manufacturing (13.6 percent) and services (12.7 percent). Table 16 shows the projected employment for the various basins in the state.

Table 15. Projected Total Population for Panhandle, Bear and Snake River Basins — 1980-2000.

Basin	County	1980	1985	1990	1995	2000
Panhandle	Benewah	7,827	8,866	9,902	10,732	11,494
	Bonner	21,186	23,798	26,421	28,146	29,292
	Boundary	7,698	8,798	9,980	11,167	12,212
	Kootenai	52,370	59,918	67,502	74,478	80,938
	Shoshone	18,588	18,901	18,970	18,603	18,123
	Total	107,669	120,281	132,775	143,126	152,055
Bear	Bear Lake	6,186	6,681	7,202	7,507	7,498
	Caribou	8,419	9,793	11,266	12,602	13,865
	Franklin	8,865	9,478	9,906	10,019	10,152
	Oneida	3,447	3,806	3,984	4,118	4,342
	Total	26,917	29,758	32,358	35,246	35,857
Snake	Ada	162,901	195,079	228,344	259,394	289,059
	Adams	3,482	3,763	4,055	4,306	4,515
	Bannock	66,899	77,862	88,237	97,385	106,576
	Bingham	34,225	37,636	40,633	42,554	43,904
	Blaine	8,956	10,777	12,739	14,701	16,596
	Boise	2,945	3,600	4,325	5,116	5,779
	Bonneville	66,341	76,507	86,902	95,996	104,139
	Butte	3,177	3,283	3,375	3,456	3,515
	Camas	880	898	817	757	749
	Canyon	81,797	93,674	104,787	113,657	121,917
	Cassia	21,074	24,075	27,032	29,505	31,635
	Clark	978	1,041	1,058	1,056	1,096
	Clearwater	10,082	11,116	12,314	13,264	14,089
	Custer	3,699	4,152	4,566	4,817	5,033
	Elmore	23,886	26,274	28,421	31,086	33,997
	Fremont	10,524	11,939	13,494	14,694	15,483
	Gem	12,316	14,162	15,954	17,365	18,620
	Gooding	10,984	12,216	13,267	13,869	14,300
	Idaho	14,653	16,465	18,658	20,496	21,832
	Jefferson	14,979	17,360	19,614	21,220	22,624
	Jerome	15,160	17,720	20,000	21,652	23,143
	Latah	31,602	35,872	40,193	44,559	48,952
	Lemhi	7,275	8,443	9,861	11,190	12,313
	Lewis	4,383	4,735	5,090	5,292	5,369
	Lincoln	3,984	4,064	3,877	3,831	3,860
	Madison	20,388	24,837	29,331	32,916	36,941
	Minidoka	18,628	21,162	23,429	28,606	25,293
	Nez Perce	35,415	38,998	42,573	45,439	47,761
	Owyhee	7,764	8,742	9,878	10,856	11,692
	Payette	15,255	16,676	18,116	19,174	20,027
	Power	6,024	6,714	7,329	7,814	8,342
	Teton	2,991	3,394	3,881	4,430	4,668
	Twin Falls	53,012	61,457	69,855	77,053	83,669
	Valley	4,746	5,395	6,164	6,872	7,488
	Washington	9,924	12,017	14,191	16,264	18,236
	Total	791,299	912,109	1,032,360	1,140,642	1,223,216
	Grand Total	925,885	1,062,144	1,197,493	1,318,014	1,411,128

Table 16. Projected Employment for Idaho – 1980, 1990 and 2000.

Industry	1980		1990		2000	
	Employment	Percent Distribution	Employment	Percent Distribution	Employment	Percent Distribution
Agriculture	37,975	9.3	33,474	6.4	28,968	4.5
Manufacturing	57,009	14.0	71,745	13.8	86,481	13.6
Mining	2,589	0.6	2,451	0.5	2,340	0.3
Construction	17,497	4.3	29,899	5.7	43,252	6.8
Transportation	18,111	4.4	21,742	4.2	25,379	3.9
Trade	80,361	19.6	107,183	20.5	134,004	21.1
Finance	13,716	3.4	18,914	3.6	24,121	3.8
Services	53,255	13.1	66,980	12.8	80,711	12.7
Federal Government	10,980	2.7	11,968	2.2	13,003	2.0
Military	7,025	1.7	8,911	1.7	10,825	1.7
State and Local Government	62,636	15.4	82,410	15.8	102,185	16.1
Other	46,891	11.4	65,510	12.6	84,883	13.3
Total	407,990	100.0	521,094	100.0	636,006	100.0

Development Options

The development of water in the future will be done largely through private actions. The majority of the water will be developed for agricultural uses while there will be waters developed for municipal, industrial, and electric energy uses. Publically developed water supplies will be multi-purpose in use with federal or state assistance limited to large projects.

There will be a continuing demand for water for instream uses of fish, wildlife, water quality and recreation. Instream flows for hydroelectric power production are sometimes competing. There will be an effort within economic limits to provide an amount of water to allow for a viable sport fishery in the tributary streams to the main stem Snake River, main stem Snake River to Minidoka, Panhandle Basin streams and the Bear River and tributary streams. The occurrence of flows that would degrade the fish resource should happen only in the unusually dry years. For the main stem Snake from Minidoka to the Washington stateline there will be various levels of river flow established, all of which are less than desirable for the single purpose use of fish production. Likewise, a single purpose electrical energy operating plan is not possible. Future structural and non-structural remedial actions can alter these conditions.

To provide additional water there will be three general types of projects. These are groundwater development, water conservation or water saving projects on presently irrigated lands, and new storage projects both on-stream and off-stream.

A majority of the new irrigated land development will be with water from groundwater sources. This development can take place with private funds and generally with little environmental loss from the development of water supply. Impact upon the main rivers or tributary streams is also limited.

Groundwater Development

Because groundwater is not always located under all the high quality potentially irrigable land, selected areas will receive early pressures for agricultural development. The Snake Plain aquifer in eastern Idaho as the largest aquifer in the state will continue to be developed. The growing season is shorter than in southwest Idaho; however, the lands that overlay the more shallow groundwater still will receive the earliest development pressure. A prime area for early development consideration includes the lands in and around the Idaho National Engineering Laboratory where land could be developed at a low cost. Other areas that have good irrigated agriculture development potential from groundwater are the valleys from Kootenai and Rathdrum Prairie of north Idaho to Payette and Boise Valley in southern Idaho and Henrys Fork and the Bear River area of eastern Idaho. As the demand for agricultural land increases, even with higher electric energy costs, the feasible pumping depths will increase.

A second type of groundwater use will also come into more use as water supplies become more committed to use. That is the use of the underground reservoirs for "insurance water" in the years of low winter

precipitation such as 1961. There could be stand-by wells drilled and made ready for production with pumps and motors to supply water supplemental to surface supplies in these low water years. Some of the pumps could be driven with diesel engines so as to lessen the demand for peak-period electric energy.

Also, there could be groundwater wells developed to be used every year but only as a supplement to surface water diversion and in the late part of each irrigation season. Future river diversions onto the Bruneau Plateau from the Snake River may be possible during spring months; however, because river flows become excessively low during July and August, wells developed in eastern Idaho could be utilized to move water into and down the river for the irrigation river-pumps or canal diversions. Intervening instream water uses would benefit for there would be water flow past areas such as Milner which currently have little summer water flow.

There could be exchange of surface water for groundwater. In irrigated areas such as the Boise Valley or the Upper Snake River Valley where the groundwater is close to the surface — within 10 feet in many areas — there could be an exchange of river natural flow and reservoir storage for groundwater. This type of exchange would provide for new irrigation or other development projects. In addition to developing the shallow groundwater, added benefit is achieved of relieving a drainage problem.

Groundwater exchange could take place for an entire irrigation district or irrigation company area or for hard to maintain areas if acceptable price and conditions can be agreed upon.

In some areas of the state there are generally good groundwater aquifers but with little developable amounts of water. In these areas, such as the Bruneau Plateau, the Mountain Home Plateau, Raft River Valley and Goose Creek areas, there is a high potential to recharge these aquifers in years of high stream runoff. The Snake Plain aquifer could also be recharged from streams such as the Big and Little Wood rivers. Recharge efforts will probably be by state or federal or local water recharge districts in order to spread costs among all beneficiaries. The groundwater recharge efforts likely will be initiated in the dry or depleted aquifers before being undertaken in the Snake Plain aquifer which has large discharges since greater benefits generally can be shown for the amount of money spent.

Most areas of the state where there are large quantities of groundwater available have extensive irrigation developments and most can sustain further development. These areas of extensive development are:

- Lower Teton Area
- Snake River Plain
- Michaud Flats
- Raft River Valley (needs recharge)
- Albion Basin
- Rock Creek-Goose Creek Area (needs recharge)
- Salmon Falls Tract
- Little Lost River Basin
- Big Lost River Basin

Big Wood-Silver Creek Area
Bruneau-Grandview Area
Boise Valley
Payette Valley
Rathdrum Prairie
Malad Valley

In addition to those areas that have been extensively developed from groundwater there are other areas which have a potential for development of groundwater. These areas are:

Upper Teton Basin
Willow Creek Highlands
Portneuf River Valley
Arbon Valley
Rockland Valley
Birch Creek Basin
Camas Prairie
Bruneau Plateau (needs recharge)
Mountain Home Plateau (needs recharge)
Homedale-Murphy Area
Garden Valley Area
North Fork, Payette River Valley
Weiser River Basin
Stanley Basin
Challis-Round Valley Area
Pahsimeroi River Valley
Lemhi River Valley
Craigmont Cottonwood Area
Lewiston Area
Palouse River-Potlatch River Area

Water Conservation

As irrigation water use technology increases many of the farm operators in older irrigation areas are finding it economically desirable to alter their water application system. In specific situations capital (new facilities) and labor are replacing water with the results of higher production with a greater variety of crops but with the paradox of less water being used.

In the future as the demand for water increases there will be an additional incentive in the older irrigation areas to alter the water application system. That is, a market will be available for the water not used with the revised irrigation system. The occurrence of this situation is dependent upon the state allowing the transfer of the water saved to new agricultural lands. Impacts of each specific transfer of water will need to be analyzed to determine the effects. Some will have immediate impacts on runoff and groundwater and others will be distant and occur after several months. Each proposed transfer should be handled on a case-by-case basis. Transfer of water will encourage the highest amount of use from a limited water supply through the replacement of water with additional increments of capital and labor including management. Some new legislation may be required to fully implement this alternative. To assist the existing owners and potential

purchasers in the determination of the natural flow rights as well as the risk of storage rights to fill, some governmental assistance would probably be helpful. With the added information, on the yearly risk of receiving the necessary amounts of water, farm owners will more readily release the portion of their water not needed or used and new purchasers more willing to buy. The rate of the sale of water likely will not be fast; although, the rate will be somewhat dependent on the price being offered for the extra water rights.

When storage water is sold or reallocated to different uses some of that storage water may not have a high chance of filling every year such as at Palisades or Anderson Ranch Reservoir. In these cases there will need to be groundwater back-up wells for use in the low water runoff years. Also, approval of the U.S. Congress will be needed in most cases for federal storage reservoirs before the changing of the storage water purchasers will be allowed.

Water conservation of varying degrees will likely take place on nearly all farm lands without government assistance or encouragement. The water savings anticipated is an average of 27 percent in eastern Idaho and 10 percent in southwest Idaho.

About 40 percent of the land will be sprinkler irrigated, a 16 percent increase added to the present 24 percent of sprinkler irrigated land. Also, to save water on the remaining gravity irrigated farms, there will be leveling to make larger fields, and installation of concrete ditch and gated pipe on about 24 percent of the farms. There will also be pumpback systems for those farms in which the runoff water from the farm returns directly to the river.

For delivery systems there will be closer control of the amount of water allowed in the canals, particularly in the early spring and late fall. The major seepage areas in the canals will be rebuilt, some of which will be placed in concrete sections, others will be excavated and lined with clay material.

A much higher level of water conservation could take place but would require an intensive public education and financial program to insure its accomplishment. A high level of water conservation would require almost all farmers to improve their system to an appreciable extent. The potential water savings is an average of 40 percent in eastern Idaho and 11 percent in southwest Idaho.

Most systems would be kept on a surface irrigation system, however, each system would provide pumpback systems, land leveling, and/or gated pipe or concrete ditches. There would also be extensive transferring over to sprinkler systems instead of putting money into improving gravity system.

For the delivery systems almost all irrigators would have to make major improvements throughout their systems. This would require large amounts of seepage control by lining with clay and earth throughout areas that have significant canal seepage. For the spring and fall periods there would also be very close control of the amount of water placed in the canal so only the amount of water needed on the farms is diverted from the river.

For this high level of water conservation to take place, legislation would be needed as well as a considerable amount of funding to assist in covering the large financial costs.

Storage

Additional water can be made available by additional storage of spring runoff. In some drainage basins, however, there is complete reservoir storage and control by dams of the runoff in dry years. This situation exists in the Snake River Basin above Milner Dam and the Boise River Basin. In these basins the additional storage will need to be large so water can be carried over from a wet year to a dry period. This will result in higher costs for the amount of water received. A partial solution is the dual construction of reservoirs to retain and allow for the use of water during the high runoff years and the construction of groundwater stand-by wells for use during low flow years.

The alternative solution is to use the groundwater wells at all times. This of course solves the construction of the storage project but it does cause an increase in operating costs by using electricity at all times and demands new electric generating facilities. Also, greater impacts are made upon the groundwater resource with yearly pumping. These impacts could partially be reduced with groundwater recharge in years of high water runoff.

There are many areas in the state that additional surface storage would fill and be used every year, including areas in the Bear River drainage, the northern streams that flow into the Snake Plain aquifer such as Big and Little Lost rivers and Birch Creek, the Snake River below Milner Dam, Big and Little Wood rivers, Bruneau River, Payette River, Weiser River and many other smaller streams in southern Idaho as well as the tributary and primary streams of central and northern Idaho.

In many cases the only water storage site is located on the stream. In other limited cases in southern Idaho, an off-stream reservoir site can be found including groundwater recharge where water is stored below ground level.

The storage method of the three development options provides for using the uncontrolled and less useable water of the spring runoff particularly in the high runoff years. Several storage sites have been identified, some of the larger and more actively considered sites are shown in Table 17. There are other feasible sites, especially smaller sites of under 20,000 acre-feet in southern Idaho, that should still be considered for future development. At some of the sites there are existing dams and reservoirs that could provide additional storage with an increase in height of dam. Some of the Snake River sites, such as the Lynn Crandall site, have large storage volumes but, because of other existing major reservoirs and river flows, do not yield the large annual amount that their capacities indicate.

Throughout the entire Columbia River Basin agricultural development is projected to increase from 25 to 30 percent by the year 2020. It has been estimated that because of future irrigation requirements an additional one million acre-feet of new storage would be required to prevent diminishing

Table 17. Major Undeveloped Storage.

Name	Stream	Total Reservoir Capacity (acre-feet)	Construction Cost (1975 price level)	Cost per Acre-Foot	Remarks
Upper Snake					
Lynn Crandall	Snake River	1,460,000	\$177,300,000	\$121	
American Falls (Exist.)	Snake River	790,000	36,700,000	46	13 Ft. Raise
Clear Lakes	Snake River	1,070,000	141,600,000	132	
Thousand Springs	Snake River	595,000	105,00,000	176	With Clear Lakes
Warm River	Henrys Fork	140,000	43,100,000	308	
Blackfoot (Exist.)	Blackfoot River	38,000	1,400,000	37	6 Ft. Raise
Driggs	Teton River	50,000	10,400,000	208	
Medicine Lodge	Medicine Lodge Creek	12,120	7,800,000	644	
Birch Creek	Birch Creek	24,000	6,200,000	258	
Boulder Flats	Big Wood River	61,500	15,200,000	247	
Bliss	Big Wood River	16,000	2,700,000	169	Off-Stream
Shoestring	Snake River	1,100,000			
Monday Gulch	Little Weiser River	35,000	8,600,000	246	Off-Stream
Lucky Peak (Exist.)	Boise River	35,000	9,150,000	261	12-Ft. Raise Water Surface
Southwest Idaho					
Grindstone Butte	Snake River	115,000	14,800,000	129	Off-Stream
Sailor Creek	Snake River	113,000	22,700,000	201	Off-Stream
Guffey (High Altern.)	Snake River	330,000	39,900,000	121	
Garden Valley	South Fork, Payette River	1,700,000	127,600,000	75	Active Storage
Gold Fork	Gold Fork, Payette River	80,000	6,800,000	85	
Twin Springs	Boise River	410,000	66,300,000	162	
Lost Valley (Exist.)	Lost Valley Creek	19,900	2,700,000	136	22½-Ft. Raise
Tamarack	Weiser River	29,500	6,700,000	227	
Goodrich	Weiser River	250,000	38,000,000	152	

Table 17. Major Undeveloped Storage (Continued).

Name	Stream	Total Reservoir Capacity (acre-feet)	Construction Cost (1975 price level)	Cost per Acre-Foot	Remarks
Central Idaho					
Nez Perce	Lower Snake River	6,600,000			
Crevice	Salmon River	1,480,000			
Pahsimeroi	Salmon River	1,500,000			
Texes Creek	Lemhi River	19,000			
Palouse	Palouse River	15,000			
Bear River					
Plymouth	Malad River in Utah	150,000			
Oneida Narrows	Bear River	435,000			
Caribou	Bear River	40,000			
Thomas Fork	Thomas Fork	12,000			
Bear Lake Pumps	Bear River	100,000			Pump below present Exchange with Bear Lake
Smithfield	Bear River in Utah	70,000			
Mapleton	Cub River	34,000	Higher Cost		
North Idaho					
Enaville	Coeur d'Alene River	700,000			
Squaw Hump	Hangman Creek	15,000			

firm power generation or conflicts with other uses of existing Columbia River storage. It has also been estimated that each additional one-million acre-feet of storage in the Columbia River system will increase the average annual energy capability of the river by approximately 1,260 megawatts. New storage in the Idaho portion of the Columbia River Basin provides some of these estimated new storage requirements.

Studies and inventories of small dam sites have been made and there are numerous sites throughout the state that could be developed. Such dams could have multi-purpose uses to provide minor flood control, small instream flows and recreation in addition to irrigation benefits. One drawback to small dams and reservoirs is the relatively high cost per acre-foot of storage. At 1975 price levels, the construction costs for the smaller dams would be \$700 to \$800 per acre-foot of storage whereas the larger dams and reservoirs are in the range of \$200 to \$300 per acre-foot.

Development of water resources in Idaho has been accomplished principally through private and federal expenditures. The federal monies have been for projects designed by the Bureau of Reclamation, Soil Conservation Service and the Corps of Engineers. Private sources of capital have been the principal beneficiary of development and the corporate entities who are providing services at large to the public, such as electric power companies. These sources of funds have relied on stable economic conditions and a growing Idaho economy as justification for investment. Other sources of funds, state and local government, have not been utilized in Idaho as effectively as in other states. Local government development is limited to municipal water supplies, drainage districts, sewage treatment, recreation districts and port facilities for navigation. State contributions are the least of any source and presently are limited to the Departments of Parks and Recreation, Fish and Game, and Health and Welfare. A comprehensive water resource development funding program, however, has not been adopted for Idaho.

Funding of water projects in the future is unclear. The federal government continues to reevaluate the discount rate, cost allocation procedures, and cost sharing programs. The trend in recent years has been to raise the discount rate and lower the cost sharing of the federal government. The current rate of 6 3/8 percent is under additional study by the federal Office of Management and Budget and the Water Resource Council. The impact of an increased discount rate would be to favor projects that have short term benefits with fast repayment of capital costs. All federal agencies participating in project development have been instructed to reduce the federal share and increase the user share of new development.

Private investment continues to fluctuate as does the market. High prices for agricultural commodities results in demand for more irrigated land. Strong economic growth and industrial development result in energy demand and municipal expansion. The private source of funding has been the backbone of new projects and is expected to continue that role. Private funding can pick up part of the reduced federal share of projects with the balance borne by state government. It is anticipated the present state agency funding will continue for recreation, fish, wildlife, and water quality. Local government will continue in its present role of funding local projects with state or federal assistance.

The State of Idaho is at a crossroads in terms of development or no development of its water resources. Federal legislation and public attitudes require comprehensive plans and special provisions on almost any new development. This situation gives rise to the question, "Who should pay the additional costs?" Because of the wide-spread benefits generally resulting from multi-purpose development, the State of Idaho should consider adopting a long-term program to assist in financing water projects for all uses of water.

The program should consider but not be limited to:

General Fund Appropriations
General Obligation Bonds
Dedicated Funds
Conservancy Districts
Joint-Venture Projects
Revenue Bonds
Water Use Charges

Any program considered should also be fully integrated with available federal funds and private monies.

The Columbia River Basin Account (16 USC 835j,k,l,m) was established to provide financial assistance for federal reclamation development in the Pacific Northwest. For the purpose of establishing eligibility for funds from the Basin Account, the entire State of Idaho is considered to be in the Pacific Northwest.

Columbia River Basin Account

Surplus power revenues from the Columbia River Federal Power System comprise the Basin Account. Basin Account funds are not prorated to the eligible states; use of the funds is confined to the repayment of allocated irrigation construction costs determined to be beyond the "ability to pay" of the water users within the prescribed repayment period of each project. Limits placed on the use of Basin Account funds are as follows:

- Total assistance to all irrigation projects, both existing and future in the Pacific Northwest shall not average more than \$30 million annually in any period of 20 consecutive years or a total of \$600 million in any 20-year period.
- Financial assistance from the Columbia River Federal Power System will be only from net revenues.
- Construction of reclamation projects will be scheduled so that financial assistance requirements will not cause increases in the rates and charges of the Bonneville Power Administration.

At present, there are ten irrigation developments in Idaho authorized to receive financial assistance. The total aid to these projects totals about \$62 million. Potential federal reclamation projects such as Salmon Falls, Cub River, Oakley Fan, Raft River, and the Mountain Home and Bruneau Plateau development would likely qualify for financial assistance but the amount is not known. It is significant to note that since the account funds are not prorated to the various states, halting water development in Idaho will increase the amount of account funds available to others in the Pacific Northwest.

The availability of financing from the Basin Account is a key issue that Idaho must take into consideration in decisions regarding future management and development of water and related land resources.

There has been discussion that the purposes should be expanded for which the Basin Account may be used. The new purposes would include environmental enhancement actions. Any increase in actions financed would likely provide for a corresponding increase in the allowed project expenditure. There also has been discussion that the rates set for electric power use should have the majority approval of the Pacific Northwest states.

Reclamation Fund

A reclamation fund (43 USC 391) has been established by the U.S. Congress to provide funds for "the examination and survey for and the construction and maintenance of irrigation works for the storage, diversion, and development of waters for the reclamation of arid and semiarid lands" in the western states. Forty percent of the money received from the sales, bonuses, royalties, and rentals of public lands in the United States, except in Alaska and on naval petroleum reserves, goes into the above fund. (An additional fifty percent of the money is returned to the states, 30 USC 191.)

Therefore, the federal royalties from mineral leases can assist development in Idaho or in other states, depending on where the pressures for its use are placed. In the past more funds have been used within Idaho than have been contributed by operations within Idaho. The rapid development of phosphate reserves in eastern Idaho could alter this balance unless additional development would be encouraged within the state. Also the expansion of the function of the use could be made to include environmental enhancement actions.

Also, funds from the sale of public lands for agricultural purposes as authorized under the Bureau of Land Management's new administrative law provides for irrigation development of other lands; although a large share of the money is consumed in studies of various projects and other administrative activities.

Chapter 3

Water Resource Programs

An understanding of the responsibilities and programs of state, federal, local and private agencies and their organizations is essential to an understanding of the State Water Plan. Legislation enacted at the federal and state level impacts all agencies at varying levels through resultant agency requirements and/or guidelines. Actions by private interests, ranging from cooperative or group interests to individuals, influenced the desirability and practicality of program elements included in the State Water Plan.

State Agencies

State government has been concerned with natural resource development and management since the territorial government was established in 1863. Fur trappers, miners, irrigators and outdoorsmen were early users of Idaho's water. Competition for the water increased to the point in 1881 that the Idaho Territorial Legislature passed a law regulating the appropriation of water. Additional laws were enacted and when statehood was granted in 1890, Idaho had established a direction in water and other resource management. In the ensuing years, new laws were passed and agencies established to protect the resource and regulate its use. The number of agencies managing natural resources continued to grow until 1973 when the Idaho constitution was amended to limit the number of executive state agencies to twenty. The state agencies presently concerned with natural resources are the Departments of Water Resources, Fish and Game, Health and Welfare and Parks and Recreation.

Authority. The Department of water Resources was established in 1974 with the merger of the Idaho Water Resource Board and the Department of Water Administration. The Board originated in 1964 with adoption of an amendment to the Idaho Constitution (Article 15, Section

Department of
Water Resources

7). The Department of Water Administration history can be traced back to 1895 when the Office of the State Engineer was created by an act of the legislature. The constitution and legislation provides the planning authority and regulatory authorities of the department.

Organization. Policy direction of the department is provided by the Idaho Water Resource Board consisting of eight members appointed by the Governor with the consent of the Senate. Administrative supervision of the department is by the director who also is appointed by the Governor with consent of the Senate.

Programs and Activities. Numerous duties and responsibilities have been assigned to the department. The department, as the principal state agency for water planning, provided staff assistance to the Board for preparing the State Water Plan. Other programs include:

1. Administer permits and licensing of water rights;
2. Supervise the distribution of water through watermasters;
3. Investigate water quantity and quality;
4. Conduct adjudication of water rights under court authority;
5. License water well drillers and supervise water well drilling to protect the state's water resources;
6. Approve plans and supervise construction of non-federal dams in order to protect the safety and welfare of the public;
7. Protect stream channels from unnecessary alteration;
8. Control the use of waste disposal and injection wells to protect the state's water resources;
9. Control and protect the geothermal resources of the state;
10. Administer the Carey Act;
11. Develop projects to utilize and protect the state's water resources;
12. Coordinate selected federal water resource programs.

Department of Fish and Game

Authority. The first Idaho legislative assembly in 1863 drafted the first law regulating fish and game management. The legislature began formation of the Department of Fish and Game in 1899, and in 1903, finished forming the department with the establishment of hunting and fishing licenses. In 1938, a voter referendum established a five-man commission with the power to declare rules and regulations; policy to guide department operations;

provide plans for the future management of wildlife; set seasons and bag limits; acquire lands or water suitable for hatcheries; wildlife restoration; public hunting or fishing; enter into cooperative agreements; establish divisions; authorize scientific or other studies and employ persons to carry out the purposes of the act.

Organization. Policy direction of the department is provided by the Fish and Game Commission consisting of five members appointed by the Governor. Administrative supervision of the department is by the director appointed by the Commission. The director has authority to hire and appoint all necessary officers and employees to carry out the provision of the Fish and Game laws.

Programs and Activities. The basic policies of the department, as stated in the Idaho Code, are as follows :

All wildlife, including all wild animals, birds and fish within the State of Idaho is hereby declared the property of the State of Idaho. It shall be preserved, protected, perpetuated and managed.

The overall goal of the department, therefore, is to manage the state's wildlife resources for the use and enjoyment for all the people, now and in the years ahead.

Specific objectives of the department includes the maintenance of the resources for their intrinsic, ecological values, provision of recreational use to fishing and hunting, recognition of scientific and educational uses and the general contribution of wildlife to the social and economic welfare of Idaho. The department programs are game management, fisheries, enforcement, environmental services, and information and education.

Authority. The 1972 Act (I.C., Title 39) empowers the director of the Department of Health and Welfare to formulate and recommend to the Board of Health and Welfare rules, regulations, codes and standards, to deal with problems related to water pollution, environmental protection and health.

Department of
Health and Welfare

Organization. The Idaho Department of Health and Welfare for many years has been charged with public health responsibilities in regards to municipal and industrial waste treatment, sanitary waste disposal, and general water pollution control.

The water quality planning and policy making functions are primarily conducted by the Division of Environment.

Implementation programs are administered by the Bureau of Regional Environmental Services through five regional offices. These programs include review of plans and specifications for wastewater treatment systems, in-stream water quality monitoring, treatment facility inspections, various review functions, and other related work.

Programs and Activities. A key department program is water quality planning. The process, known as "Continuing Planning Process" (CPP) is that which describes the planning which will be done by the department in order to systematically provide Idaho with water quality and management information necessary for coordinated water quality management decisions.

Department of Parks

Authority. The Department of Parks was created by an act of the legislature in 1965. It has the authority to formulate and put into execution a long-range, comprehensive plan for the acquisition, planning, protection, operation, maintenance, development, and wise use of areas of scenic beauty, recreational utility, historic, archaeological, or scientific interest.

Organization. The department is governed by the Park Board consisting of six members appointed by the Governor to terms of six years each. The Board is authorized to appoint a director who is its administrative officer and secretary.

Programs and Activities. The department has prepared a statewide Outdoor Recreation Plan. More specifically the objectives of the plan are to: (1) preserve and protect water areas of unique or exceptional scenic value for present and future generations; (2) provide opportunities for recreational use of water areas and for outdoor recreation in water area surroundings; (3) portray and explain plant and animal life associated with water and explain geology and hydrology as a part of a park interpretation program; (4) promote the wise use and conservation of Idaho's water resources, including pollution control and water fluctuation control; and (5) cooperate with all water resource management agencies within the state for effective management and development of Idaho's recreational water resources.

Department of Lands

Authority. The Department of Lands carries out the directives of the State Land Board. Article 9, Sections 7 and 8 of the Constitution provide for establishment of the State Land Board and defines administrative guidelines to be followed. Title 58, Chapter 1, Idaho Code provides for creation of the Department of Lands and defines its powers and duties. The State Land Board and Department of Lands are concerned only with endowment lands and do not have responsibilities over other state lands.

Organization. The Board is a constitutional agency consisting of the Governor, Secretary of State, Attorney General, State Auditor, and Superintendent of Public Instruction (Section 7, Article 9, Idaho Constitution). The Board exercises its constitutional functions through the Department of Public Lands, which is headed by the State Land Commissioner who is appointed by the Board. The commissioner is authorized to employ other department personnel. The department currently has one of its employees engaged in water-related activities, specifically those related to the use of the beds of navigable lakes, rivers, and streams.

Programs and Activities. The department's program is related to its responsibility to administer the endowment lands of the state, including the beds of navigable lakes, streams, and rivers. The department staff is actively engaged in supervision of forestry operations, mining, grazing, and other uses of state land. The department reviews applications for dredge mining and other uses of the lands in the beds of navigable streams below the natural or ordinary high water mark to provide for their commercial, navigable, recreational, or other public use.

State Legislation

State water law has evolved over the year to meet new problems brought about by increased competition for use of a precious natural resource — water. Such changes will continue in the future and indeed the State Water Plan identifies and proposes several changes. A listing of the more significant legislation adopted at the state level since 1895 follows.

1. **Idaho Dam Safety Act - 1895 (42-1707, Idaho Code, *et seq.*).** Provided for a method of reviewing safety of water storage structures.
2. **Idaho Carey Act - 1895 (42-2001, Idaho Code, *et seq.*).** Accepted the provisions of the federal Carey Act and provided procedures for state operation of the Carey Act.
3. **Statutory Method of Appropriation of Water - 1903 (42-201 Idaho Code, *et seq.*).** Provides method by which water might be appropriated by obtaining a permit, applying water to use and receiving a license as evidence of a water right. Idaho Supreme Court later declared that rights could also be obtained by diversion and use.
4. **Statutory Method of Appropriating Ground Water - 1951 (42-229 Idaho Code).** Provided a mandatory method of establishing water rights for the use of groundwater by an application and permit system.

5. Statutory Method of Filing Claims to Water Rights - 1967 (42-225a Idaho Code). Provides a method by which water right holders who have no record of their right can make a claim and have it recorded for later use in establishing their right.
6. Idaho Dam Safety Act - 1969 (42-1710 Idaho Code, *et seq.*). Established comprehensive safety of dams program, requires biannual inspection, approval of plans, and compliance with minimum standards, provides procedure to take emergency action and enforce requirements.
7. Statutory Method of Appropriation of Surface Water - 1971 (42-201 Idaho Code). Amended law to make permit method of appropriation mandatory.
8. Idaho Stream Channel Protection Act - 1971 (42-3801 Idaho Code, *et seq.*). Provides a procedure for approval of alterations of stream channels to protect fish and wildlife habitat, aquatic life, recreation, aesthetic beauty, and water quality.
9. Idaho Waste Disposal and Injection Well Act - 1971 (42-3901 Idaho Code, *et seq.*). Provides method of controlling the use of injection wells used to dispose of waste materials.
10. Idaho Geothermal Resources Act - 1972 (42-4001 Idaho Code, *et seq.*). Provides for the protection and control of the state geothermal resources.
11. Environmental Protection and Health Act of 1972 - (39-101 Idaho Code, *et seq.*). Provided, among other items, a permit system to control pollution sources.
12. Lake Protection Act - 1974 (58-142 Idaho Code, *et seq.*). Provides authority and procedure to control encroachments on lake beds.
13. Legislative Reservation of Water in Trust for Idaho Citizens.

Big Payette Lake	1925	67-4303 I.C.
Coeur d'Alene Lake	1927	67-4304 I.C.
Pend Oreille Lake	1927	67-4304 I.C.
Priest Lake	1927	67-4304 I.C.
Malad Canyon	1972	67-4307 I.C.
Niagra Springs	1972	67-4308 I.C.
Big Springs	1972	67-4309 I.C.
Box Canyon	1972	67-4310 I.C.
Thousand Springs	1972	67-4311 I.C.

Federal Agencies

Numerous federal agencies have direct and indirect responsibilities for the management, use, and preservation of the state's water and related land resources. A brief discussion of the authority, organization, programs and activities of the key federal agencies, grouped by department, follow.

The three agencies in the Department of Agriculture that have overall responsibility in water and land resource planning programs are: Economic Research Service, Forest Service, and Soil Conservation Service.

Department of Agriculture

Authority. The authority for the Service to participate in planning is contained in P.L. 566, 83rd Congress, as amended. The Service participates in Department of Agriculture and interagency efforts to formulate policies, plans, and programs for the use, preservation, and development of national resources.

Economic Research Service

Organization. The Service is one of three agencies in the Department of Agriculture responsible for planning programs and activities. The Service has seven divisions with both Washington and field staffs. There are six regional offices and Idaho is in the northwest region with its headquarters at Logan, Utah.

Programs and Activities. Within the Department of Agriculture, the Service has general responsibility for basin-wide and interregional economic aspects of comprehensive river basin planning. It analyzes the agricultural sector of the economy including appraisals of trends in land and water use; develops projections of agricultural production, employment, income, and land use and analyses the economic impacts of flood prevention, land drainage, irrigation, and other water development programs on production, employment, and income in the agricultural and related sectors of the economy. The Service also participates in the formulation of comprehensive plans for river basin development, including the analysis of the economic implications of alternative plans.

Authority. A number of federal laws enacted since the Forest Service was organized in 1905 provide the authority and direction for Forest Service activities. The Forest Service has the responsibility for promoting the conservation and best use of the nation's forest lands.

Forest Service

Organization. Idaho embraces three Forest Service administrative regions: Region 1 (Northern Region), Region 4 (Intermountain Region), and Region 6 (Pacific Northwest Region). Each region is directed by a regional forester who is responsible to the Chief of the Forest Service for all regional activities except research. The regions are further broken down into national forests, headed by a forest supervisor, and the national forests are subdivided into management units which are administered by a district ranger.

Programs and Activities. The Forest Service is responsible for a variety of programs and activities designed for applying sound conservation and utilization practices to the national forests and natural grasslands. Achieving multiple use and sustained yield development and management of forest lands are the key ingredients of watershed management. Major work activities include, (1) management of national forests and national grasslands, (2) cooperation with states and private owners on programs affecting state and privately owned forest and watershed lands, (3) forest and range research, and (4) specific water and related land resource planning. An activity of special significance to Idaho is the Forest Service's designation as the agency responsible for USDA activities under the Wild and Scenic Rivers Act. This includes leadership in directing the studies of the St. Joe, Moyie, Priest and Main Stem of the Salmon rivers as potential additions to the national wild and scenic river system, and the administration of the Hell's Canyon section of Snake River, the Middle Fork of the Salmon River, Middle Fork of the Clearwater River above Kooskia, and the Lochsa and Selway tributaries of the Middle Fork, as components already within the system.

*Soil Conservation
Service*

Authority. The Soil Conservation Service was created by the Conservation Act of 1935. The principal legislative authorities under which the Service operates are: the Omnibus Flood Control Act (1936) P.L. 738; the Flood Control Act (1944) P.L. 534; the Watershed Protection and Flood Prevention Act (1954) P.L. 566; Section 102 of the Food and Agriculture Act (1962) P.L. 703.

Organization. The Service operates through a state office in each of the 50 states and two territories. Each state is further subdivided into area offices (three in Idaho) and field offices (43 in Idaho) whose staff works directly with landowners and operators and with rural and urban groups.

Soil Conservation Districts play a key role in providing local participation and control for an active program of conservation. These districts (51 in Idaho) are organized under state law and are autonomous and governed by locally elected supervisors who serve without pay. Each district is responsible for soil and water conservation within its boundaries much as a county is responsible for its roads or a school district for education.

Programs and Activities. The technical assistance available throughout the Soil and Water Conservation Districts includes soil surveys; assistance to individuals and groups of landowners, operators, and organizations in the formulation and application of their conservation plans; leading the planning and providing technical assistance to Resource Conservation and Development projects; participation with state and other federal agencies in comprehensive basin planning; technical assistance on permanent type conservation practices of the County Agricultural Conservation program; and cooperative snow surveys and seasonal water supply forecasts.

**Department of
the Army**

The Corps of Engineers represents the Department of Army in water resources planning, construction, and operation.

Authority. Congress formally established the Corps of Engineers' civil functions in 1894. The Corps is the federal agency having basic jurisdiction over federal investigations and improvements over the nation's navigable waterways. Authority for the Corps' programs and activities are covered under a large body of law beginning with the Act of April 30, 1824, and extending through a series of Flood Control Acts starting in 1936 to more recent federal legislation such as the Water Quality Amendments of 1972, P.L. 92-500.

Corps of Engineers

Organization. The civil works activities of the Corps are directed by the Chief of Engineers through his office in Washington, D.C. The United States is divided generally along hydrologic boundaries into divisions which are further divided into districts. All of Idaho, except the Bear River Basin, is included in the North Pacific Division headquartered in Portland, Oregon. The Bear River Basin is part of the South Pacific Division headquartered in San Francisco, California. The districts within the North Pacific Division which include portions of Idaho are the Walla Walla District and the Seattle District. The Bear River Basin is part of the Sacramento District.

Programs and Activities. The Civil Works Program of the Corps encompasses a broad range of resource development activities for navigation, flood control, major drainage, shore and beach restoration and protection, hurricane flood protection, related hydroelectric power development, water supply, water quality control, fish and wildlife conservation and enhancement, outdoor recreation and environmental quality.

Corps activities of special interest to Idaho include (1) survey investigations to ascertain the need and justification of specific projects; (2) the development and construction of flood control projects, (3) providing flood plain information reports for communities and counties; (4) participating in regional or river basin studies; and (5) conducting comprehensive studies of water problems in selected urban areas.

The Department of Interior was created in 1849 and is concerned almost solely with conservation, management, and development of natural resources. The nine offices and bureaus within Interior that are of significance to Idaho are: (1) Bonneville Power Administration, (2) Fish and Wildlife Service, (3) Geological Survey, (4) Bureau of Indian Affairs, (5) Bureau of Land Management, (6) Bureau of Mines, (7) National Park Service, (8) Bureau of Outdoor Recreation, and (9) Bureau of Reclamation.

*Department of
Interior*

Authority. The Bonneville Power Administration (BPA) was created by the Bonneville Power Administration Act of 1937, to market the power from Bonneville Dam. BPA has since been designated to market power from other federal hydroelectric projects in the Pacific Northwest.

*Bonneville Power
Administration*

Organization. BPA serves the states of Washington, Oregon, Idaho, and Montana west of the Continental Divide, plus small adjacent portions of

California, Nevada, Utah, and Wyoming. BPA does not build dams or power plants. The federal projects in the region, most of which are multi-purpose, have been built and operated by the Corps of Engineers or Bureau of Reclamation. BPA offices are located in Portland, Oregon, and there are five area offices in Seattle, Portland, Spokane, Walla Walla and Idaho Falls which provide for power operation and maintenance.

Programs and Activities. BPA is authorized and directed to sell at wholesale rates the electric energy from Bonneville Dam and from other designated federal dams to public bodies, cooperatives, private agencies and persons, but not to individual customers. Transmission lines and substations have been constructed to interconnect the Bonneville project with other federal projects and publicly owned systems. BPA is directed to encourage the widest possible use of all the electric energy that can be generated and marketed and prevent monopolization by limited groups.

Fish and Wildlife Service

Authority. The Fish and Wildlife Service was established by the Fish and Wildlife Act of 1956 with two bureaus — the Bureau of Sports Fishery and Wildlife and the Bureau of Commercial Fisheries. The Bureau of Commercial Fisheries was transferred to the Department of Commerce in 1970, and redesignated the National Marine Fisheries Service. The Bureau of Sports Fishery remained in Interior with responsibility for wild birds, mammals (except whales, sea lions, and seals), and sport fisheries except ocean fisheries. With the signing of PL 93-271 on April 22, 1974, the Bureau of Sport Fisheries and Wildlife became the U.S. Fish and Wildlife Service.

Organization. The Service is composed of the headquarters office in Washington D.C., six regions, and the Alaska area office encompassing approximately 600 field stations, including wildlife refuges, fish hatcheries and research laboratories. Idaho is within Region 1 headquartered at Portland, Oregon. The service is under the supervision of the Assistant Secretary for Fish and Wildlife and Parks.

Programs and Activities. The Service has responsibility to (1) investigate and report on water resource development projects prior to their construction or license by the federal government, (2) determine the probable effects of such projects on fish and wildlife resources and associated habitats, and (3) recommend measures for preventing or reducing damages to and improving conditions for these resources. Two program areas of significance to Idaho are the Service's administration and operation of a national system of fish hatcheries and the Service's development and operation of a national system of refuges.

Geological Survey

Authority. The Geological Survey was established in 1879 to classify and examine the resources and products of the public lands. In 1881, the law was extended to include the states in addition to the national domain. During the 98 years of its evolution, several activities of the Survey have served to form the nuclei of new separate bureaus such as the Forest Service, Bureau of Reclamation, and the Bureau of Mines. The Survey has retained its emphasis on scientific surveys, investigations, and research.

Organization. The Survey's national headquarters is at Reston, Virginia. The United States is subdivided into three regions. Idaho is within the Western Region, headquartered at Menlo Park, California. A district office or laboratory is located in each state. In Idaho the district office is at Boise.

Programs and Activities. The broad objectives of the Survey are to perform surveys, investigations, and research covering topography, geology, and the mineral and water resources of the United States; classify lands as to mineral character and water and power resources; furnish engineering supervision for power permits and Federal Power Commission licenses; enforce Interior Department regulations and publish and disseminate data relative to the foregoing activities.

Authority. The Bureau of Indian Affairs was created in the War Department in 1824 and transferred in 1849 to Interior upon its creation by Congress. The major legislation governing the conduct of Bureau activities includes the General Allotment Act of 1887, Snyder Act of 1921, the Indian Reorganization Act of 1934 and the Indian Self-Determination and Education Assistance Act of 1975.

Bureau of Indian Affairs

Organization. The United States is subdivided into ten areas for Indian resource management. Idaho, except for the Duck Valley Indian Reservation, is within the Portland Area with its headquarters at Portland, Oregon. The Duck Valley Indian Reservation is in the Phoenix Area with its headquarters at Phoenix, Arizona.

Programs and Activities. The principal objectives of the Bureau are to encourage and train Indian and Alaskan Native people to manage their own affairs under the trust relationship to the federal government; to facilitate, with maximum involvement of Indian and Alaskan Native people, full development of their human and natural resource potential; to mobilize all public and private aids to the advancement of Indian and Alaskan Native people for use by them; and to utilize the skill and capabilities of Indian and Alaskan Native people in the direction and management of programs for their benefit. The Bureau is responsible for seeking the development of all feasible irrigation projects on Indian lands when consistent with stated goals and objectives of the tribal governing body.

Authority. The Federal Land Policy and Management Act of 1976 consolidated the legal authority for all Bureau of Land Management programs. The Bureau of Land Management was created in 1946, when a Reorganization Act consolidated the Grazing Service and the General Land Office, both in the Department of the Interior.

*Bureau of Land
Management*

Organization. The Bureau maintains a service center at Denver, Colorado, which exercises certain administrative and technical functions for BLM activities in the states of Alaska, Oregon, Washington, California, Nevada and Idaho. The operating programs of the Bureau are the jurisdiction of state directors and district managers. In Idaho there are six districts headed by district managers under the supervision of the state director located in Boise.

Programs and Activities. Although the Bureau was originally created to serve as a "caretaker" of federal lands pending their final disposal, the agency has evolved into a land management agency with the policy (as expressed in the Federal Land Policy and Management Act of 1976) of retaining the public lands in federal ownership. The programs and activities of the Bureau are of special significance to Idaho because of the vast amount of lands it administers in the state.

The major BLM functions can be grouped into the three general categories of (1) lands and minerals; (2) resource protection, management, and development; and (3) cadastral surveys. The lands and minerals function of the Bureau includes issuing leases, managing mineral materials and administering mining laws, classifying public lands, improving public lands and maintaining ownership records for all public domain lands. Under the resource protection, management and development function, BLM seeks to maximize public and private benefits from available financial and land resources utilizing the multiple use philosophy, and under the cadastral surveys function, the Bureau installs and maintains the official public land surveys.

Bureau of Mines

Authority. The Bureau of Mines was established in 1910 to conduct programs designed to conserve and develop mineral resources, and to promote safety and healthful working conditions in the mining and mineral industries.

Organization. The Bureau of Mines operates the four field operation centers at Spokane, Washington; Denver, Colorado; Pittsburg, Pennsylvania; and Juno, Alaska. Idaho is included in the western field operation headquartered at Spokane, Washington.

Programs and Activities. The Bureau of Mines has no direct responsibility or authority in water resource development or management. The Bureau assists federal and state planning entities by assessing the current status of the mining and mineral industry in the region and by projecting mineral production value and employment in mining.

National Park Service

Authority. The National Park Service was established by Congress in 1916 to promote and regulate the use of National Parks, monuments, and semi-reservations in order to "conserve the scenery and the natural and historic objects and the wildlife herein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

Organization. The United States has been divided into six regions to help the National Park Service administer its programs and activities. Idaho is included in the Pacific Northwest Region which is headquartered at Seattle, Washington.

Programs and Activities. The Service plans, develops, and administers the natural, historical land recreational areas which compose the National Park System. The National Park Service programs and activities are guided by a concern for environmental quality and seek to communicate an environmental ethic to enhance man's well-being. The natural and historic landmarks program encourages preservation of significant natural and historic values. On federal water projects, the Service assumes study responsibility for archaeological, historical, natural, and visual environmental resources.

Authority. The Bureau of Outdoor Recreation was established by an order of the Secretary of the Interior in 1962. This action was confirmed by Congress by the Act of May 28, 1963. The responsibilities of the Secretary of Interior under the Federal Water Project Recreation Act of 1965 were delegated to the Bureau. This Act provides for full consideration of outdoor recreation opportunities in investigation of planning of all federal water resource development projects and also for the views of the Secretary of Interior on the extent of which the proposed recreation and fish and wildlife development conforms to and is in accordance with the state comprehensive plan.

*Bureau of Outdoor
Recreation*

Organization. The United States is divided into seven regions, and Idaho is included in the Northwest Region with the states of Oregon and Washington. The Northwest Regional headquarters is at Seattle, Washington.

Programs and Activities. The Bureau is responsible for preparing and maintaining a continuing inventory and evaluation of the outdoor recreation needs and resources of the United States; formulating and maintaining a comprehensive nationwide outdoor recreation plan; and cooperating with and providing technical assistance to the states, their political subdivisions, and private outdoor recreation interests. The Bureau also sponsors, engages in, and assists in outdoor recreation research; promotes coordination of federal outdoor recreation plans and activities; and encourages interstate and regional planning in cooperation. Special activities include implementation of the Wild and Scenic Rivers Act, National Trail System Act, and Section 4(f) of the Department of Transportation Act.

Authority. The Reclamation Act of 1902 authorized the Secretary of the Interior to locate, construct, operate, and maintain works for the storage, diversion, and development of waters for the reclamation of arid and semi-arid lands in the western states. In July 1902 the Secretary approved the organization of the Reclamation Service within the Geological Survey. In March 1907 the Reclamation Service was removed from the Survey and established under a director. In June 1923, the Secretary created the position of Commissioner of Reclamation and changed the name Reclamation Service to Bureau of Reclamation.

Bureau of Reclamation

Organization. The Bureau of Reclamation is headed by a commissioner in the Washington, D.C. office, regional directors in the regional offices, and area engineers in the area planning and development offices within each region. Idaho is included within Region 1 headquartered in Boise.

Programs and Activities. Planning activities of the Bureau concern the development of the water and related land resources of the 17 western states. The primary objective of the Bureau's investigations is the development of multi-purpose plans for the maximum utilization of the water and related land resources. When the Bureau contemplates developing a project, the Bureau studies all related aspects of the project, including irrigation, municipal and industrial water supply, hydroelectric power, flood control, navigation, preservation and propagation of fish and wildlife, outdoor recreation, drainage, pollution abatement, water quality control, stream flow augmentation, and watershed protection and erosion control. The Bureau also makes loans and/or grants to local interests for use in developing small irrigated reclamation projects.

**Environmental
Protection Agency**

Authority. The Environmental Protection Agency (EPA) was established in 1970 to bring together in a single agency the major federal environmental control programs. While some of EPA's authority was contained in the original Presidential Executive Order establishing the agency, Congress subsequently increased this authority in 1970 with the Clean Air Amendment and the Resource Recovery Act; in 1972 with the Federal Water Pollution Control Act Amendments, the Federal Environmental Pesticide Control Act, the Noise Control Act, and the Marine Protection, Research and Sanctuaries Act; and in 1974 with the Safe Drinking Water Act.

Organization. EPA administers these laws through its headquarters in Washington, D.C., and ten regional offices. Idaho is in Region 10 along with Washington, Oregon, and Alaska. Region 10 offices are in Seattle, Washington. EPA has established a field office in Boise to help administer the water pollution permit program.

Programs and Activities. The EPA mission is to control and abate pollution in the areas of air, water, solid waste, pesticides, noise, and radiation. The key water quality programs are those set forth in the 1972 Water Quality Amendment (P.L. 92-500): developing long-term comprehensive waste treatment management plans (Sec. 208), comprehensive basin plans (Sec. 209), statewide continuing planning process (Sec. 303[e]), effluent limitation guidelines (Sec. 304[b]), National Pollutant Discharge Elimination System (NPDES) (Sec. 402) and permits for dredged or fill material (Sec. 404).

**Department of
Housing and Urban
Development**

Authority. Congress established the Department of Housing and Urban Development on November 9, 1965, with responsibility for all programs administered by the Housing and Home Finance Agency and its constituents. Programs in the department which pertain directly or indirectly to water and related land resources are covered by The Comprehensive Planning Assistance Program, established under Section 701 of the Housing Act of 1954, as amended.

Organization. Program administration is vested in several locations serving the Pacific Northwest, with the regional office located in Seattle, Washington. Within the region, there are area offices in Boise, Portland, Seattle and Anchorage, and the Spokane Insuring Office.

Programs and Activities. In establishing the department, Congress declared that, "The general welfare and security of the Nation and the health and living standards of our people require, as a matter of national purpose, sound development of the Nation's communities and metropolitan areas in which a vast majority of its people live and work." The Comprehensive Planning Assistance Program provides grant assistance to most general purpose and regional municipal organizations in order to foster good community, metropolitan and statewide planning. The department provides mortgage credit insurance for a variety of land development and housing purpose, and administers the program of Mortgage Insurance for New Communities. Related programs of the department deal with upgrading open space lands and the building of new communities.

Federal Legislation

Policies and procedures at the federal level have evolved over a period of years in conjunction with increased federal expenditures in water development. The 20th century brought forth the first of many significant pieces of legislation which expanded the federal role. The 1902 Reclamation Act thrust the federal government into water resource development in the western states. Planning criteria for water resources, comparable to present day criteria, were first expressed in the 1936 Flood Control Act. In that Act, criteria were first set forth which incorporated economic rationale as a basis for evaluating the merits of a water development project.

Following World War II, increasing emphasis was placed at the federal level on multiple-purpose water development projects. In 1963, evaluation criteria were redefined by Congressional action as expressed in Senate Document No. 97. The criterion of economic efficiency was again stressed along with national goals such as conservation and recreation.

Major congressional directives illustrate the rapidly changing role in federal policy in water resource planning and development. The following list contains federal acts passed since 1965; a summary statement is included.

1. **The Appalachian Regional Development Act of 1965 (Public Law 89-4)** authorized the preparation of a comprehensive plan for development of water and related land resources of the region as a means of expanding economic opportunities. The plan for water and land resources is to be an integral and harmonious component of the regional economic development program authorized by the Act.

2. **The Federal Water Project Recreation Act of 1965** (Public Law 89-72) provides for full consideration of opportunities for recreation and fish and wildlife enhancement in federal projects under specified cost allocation and cost-sharing provisions.
3. **The Water Resources Planning Act of 1965** (Public Law 89-80) establishes a comprehensive planning approach to the conservation, development, and use of water and related land resources. The Act emphasizes joint federal-state cooperation in planning and consideration of the views of all public and private interests.
4. **The Public Works and Economic Development Act of 1965** (Public Law 89-136) establishes national policy to use federal assistance in planning and constructing public works to create new employment opportunities in areas suffering substantial and persistent unemployment and underemployment. The Act provides for establishing federal-state regional commissions for regions that have lagged behind the nation in economic development.
5. **The Water Quality Act of 1965** (Public Law 89-234) provides for establishing water quality standards for interstate waters. These standards provide goals that must be incorporated into planning procedures.
6. **The Northeastern Water Supply Study of 1965** (Public Law 89-298), Congress recognized that assuring adequate supplies of water for the great metropolitan centers of the United States has become a problem of such magnitude that the welfare and prosperity of this country require the federal government to assist in solution of water supply problems.
7. **The Clean Water Restoration Act of 1966** (Public Law 89-753) provides assistance for developing comprehensive water quality control and abatement plans for river basins.
8. **The Department of Transportation Act of 1966** (Public Law 89-670) provides standards of evaluating navigation projects and provides for the Secretary of Transportation to be a member of the Water Resources Council.
9. **The Wild and Scenic Rivers Act of 1968** (Public Law 90-542) provides that in planning for the use and development of water and related land resources consideration shall be given to potential wild, scenic, and recreational river areas in river basin and project plan reports, and comparisons are to be made with development alternatives which would be precluded by preserving wild areas.
10. **The National Flood Insurance Act of 1968** (Title XIII, Public Law 90-448) provides that states, to remain eligible for flood insurance,

must adopt acceptable arrangements for land use regulation in flood-prone areas. This provision, together with Executive Order 11296, August 10, 1966, places increased emphasis on land use regulations and administrative policies as means of reducing flood damages. Planning policies must include adequate provisions for these new enactments and directives in an integrated program of flood-plain management.

11. The Estuary Protection Act of 1968 (Public Law 90-454) outlines a policy of reasonable balance between the conservation of the natural resources and natural beauty of the nation's estuarine areas and the need to develop such areas to further the growth and development of the nation.
12. The National Environmental Policy Act of 1969 (Public Law 91-190) authorizes and directs federal agencies in the decision-making process to give appropriate consideration to environmental amenities and values along with economic and technical considerations. The results of this analysis are to be included in proposals for federal action.
13. The Environmental Quality Improvement Act of 1970 (Public Law 91-224) further emphasizes congressional interest in improving the environment and the major responsibility that state and local governments have for implementing this policy.
14. The Flood Control Act of 1970 (Public Law 91-611) requires in Section 122 promulgation of guidelines designed to assure that possible adverse economic, social and environmental effects relating to any proposed project have been fully considered in developing such project, and the final decisions on the project are made in the best overall public interest, taking into consideration the need for flood control, navigation and associated purposes, and the cost of eliminating or minimizing such adverse effects.
15. The Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500) sets forth as an objective the restoration and maintenance of the chemical, physical and biological integrity of the nation's waters. The Act provides (1) that it is a national goal to eliminate by 1985 the discharge of pollutants into navigable waters; (2) that by July 1, 1983, an interim national goal be achieved such that where attainable, water quality is provided which would provide for the protection of fish, shellfish and wildlife and for recreation in and on the waters; (3) it is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited; (4) it is the national policy that federal assistance be provided to construct publicly owned waste treatment works; (5) it is the national policy that area-wide waste treatment management planning processes be developed and implemented; and (6) it is the national policy that a major research and demonstration effort be made to develop the

technology necessary to eliminate the discharge pollutants into the nation's waterways.

16. The Flood Disaster Protection Act of 1973 (Public Law 93-234) sets strict time periods by which state, county, and local entities must adopt acceptable arrangements to control land use in flood plains in order to be eligible for any federal funding in the area affected.
17. The Endangered Species Act of 1973 (Public Law 93-205) sets forth the criteria and guidelines directed toward prohibiting any adverse effect on endangered species.
18. The Safe Drinking Water Act of 1974 (Public Law 93-523) calls for EPA to issue a set of regulations specifying minimum requirements for state programs to control underground injection of fluids that threaten the quality of water in aquifers used for public supply.
19. The Federal Land Policy and Management Act of 1976 (Public Law 94-579) sets forth the national policy that public lands be retained in federal ownership and provides a consolidation of legal authority for BLM to administer the lands under its jurisdiction.

Local Government

Local Water Resource Programs

Local government concern with planning, until recently, has been directed toward street improvements, schools, domestic water supplies and sewage collection and treatment. With the increasing awareness of natural resource developments and growth, cities and counties began to question the wisdom of the lack of local planning, particularly land use planning. In addition to the cities and counties, some resource uses required specialized assistance and planning, and the federal government established some major resource goals and objects to be implemented locally. This combination of factors has encouraged a wide variety of local resource planning entities in Idaho. Discussion of the principal local entities impacting water resources follows.

208 Water Quality Studies

Section 208 of Public Law 92-500 (Federal Water Pollution Control Act) establishes authority for local entities to conduct water quality studies and prepare waste treatment management plans. There are currently three areas in Idaho consisting of nine counties which have been designated and have received funds to begin their studies. The areas are: Ada-Canyon, Southwest Idaho Council of Governments (Caribou and Bannock counties) and Panhandle Area Council (Boundary, Bonner, Kootenai, Benewah and Shoshone counties). The primary objectives of these studies are to:

1. Identify municipal and industrial waste treatment needs.
2. Establish a regulatory program to implement a waste treatment management plan.
3. Identify cultivated land related non-point sources of pollution.
4. Identify mine related sources of pollution.
5. Identify construction activity related sources and pollution.

Many of the 208 planning activities are directly related to the goals and objectives of the State Water Plan. To insure coordination between the 208 studies and the State Water Plan, personnel from the Department of Water Resources are actively participating in the 208 Technical Advisory Committees, developing work activities and reviewing planning procedures.

The Local Planning Act of 1975, Title 67, Chapter 65, Idaho Code requires planning and zoning commissions to prepare and implement a comprehensive plan covering all land within their jurisdiction. Eighty percent of the 44 counties in Idaho now have or are in the process of preparing a comprehensive plan. There are several components of the plan which are related to water resource planning. These include the analysis of the uses of rivers, lakes and other natural resources. The Idaho Code requires that existing comprehensive plans be updated by January 1, 1977.

*Local Planning Act
of 1975*

There are currently five RC&D Project Councils operating in Idaho in 18 counties. RC&D Projects are local projects usually covering several counties in which residents work to improve their economy and environment through the conservation, development, and better utilization of their natural resources. RC&D Projects receive leadership, technical assistance, and funds through the Soil Conservation Service. Because many of the project measures are directly related to the development and conservation of water resources, the Department of Water Resources offers technical assistance and are members of the councils' resource committees.

*Resource Conservation
and Development
Projects*

Chapter 4

The State Water Plan

Much has been accomplished since Article 15, Section 7 of Idaho's Constitution was ratified in 1964 and the Idaho Water Resource Board was created in 1965. The water resources have been inventoried, problems identified, and the needs of a growing population, expanding agriculture, industrialization and protection of the environment have been recognized and incorporated in this State Water Plan.

This is a policy and management plan for coordinating and integrating the multiple uses of the state's water resources. The plan considers all beneficial uses presently recognized under Idaho law. Based upon existing uses, it is, however, a plan providing new opportunities, recognizing new values. Further, it is a guide to other states and the federal government that Idaho desires to take a strong active role in solving its water problems.

The plan is based on the most recent inventories of Idaho's water supply, the most recent knowledge concerning present water use and the public desires and the most recent information concerning future water needs. Idaho's State Water Plan demonstrates that Idaho does not have excess waters available for diversion to other parts of this nation. But it does recognize that Idaho has great water supplies in comparison to some areas of the country. These supplies are presently utilized to meet the economic and environmental attributes and the quality of life that is enjoyed in Idaho.

The plan is not a final plan but rather a dynamic planning process which has as its purpose the protection of the quality of life enjoyed in Idaho. It includes a significant allocation of presently unused water for economic uses and industrial growth while at the same time proposing a variety of programs to protect the quality of the natural environment that exists throughout the state. The plan does not propose specific projects, however, it does provide a framework within which private enterprise and federal, state and local entities can make and propose water resource projects. The plan is based on existing state and federal legislation and planning criteria. Future detailed studies will determine the economic, environmental and social conditions that must prevail before a particular project or program can be incorporated or approved for implementation.

The recent enactment of the Federal Land Policy and Management Act of 1976 presents a major question regarding the future availability of any substantial amount of public lands to accommodate future irrigation development. Should the Bureau of Land Management refuse to permit a significant amount of lands under their jurisdiction to pass into private ownership via the Carey Act or the Desert Land Entry Program, the entire premise on which allocations are based in the State Water Plan would need to be revised. The State Water Plan would, therefore, require major revisions in accordance with a revised agricultural policy for the state, which in turn would impact other functional use goals, objectives, problems, and needs.

Idaho was granted 3 million acres under the Carey Act and 600,000 acres have been developed and patented. The state desires to continue to utilize the public land laws to orderly transfer public lands to private ownership. The federal program should work with the State Water Plan in adopting procedures to implement the new public land law. The state, working through the Idaho Water Resource Board, the Department of Water Resources, its Congressional delegation and others is seeking clarification of this issue and will keep the legislature and the general public informed on its status.

The *State Water Plan - Part Two* supplements and complements the *State Water Plan - Part One, The Objectives* which provided the planning criteria. These criteria which are reviewed annually are:

1. **Beneficial and efficient water use:** The policy of the Idaho Water Resource Board is to follow a broader definition of the term "beneficial use of water" to include all water uses, both consumptive and non-consumptive (for example, stream resource maintenance flows) and to seek implementation of those water resource projects and programs which provide for this definition through efficient water use practices.
2. **Electric energy:** The Idaho Water Resource Board adopts as a planning objective, a reduction in the reliance upon imported electric power. To achieve this objective, the state water resource policy is to promote and encourage those projects and programs which provide for the development of new electrical energy and more efficient use of existing energy sources.
3. **Environmental quality:** The policy of the Idaho Water Resource Board is to maintain, and where possible enhance, environmental quality in Idaho.
4. **Erosion and sedimentation:** The policy of the Idaho Water Resource Board is to insure that projects and programs adequately consider their effects with regard to the erosion and deposition of the soil.

5. **Fish and wildlife:** The policy of the Idaho Water Resource Board is to give equal consideration to the needs of fish and wildlife in any project or program designed to promote the conservation, development and optimum use of the state's water resources. The Board recognizes that fish and wildlife are important elements of the state's economy and quality of life and will recommend stream maintenance flows in the basin reports.
6. **Fish-farming (aquaculture):** The policy of the Idaho Water Resource Board is to support continued growth of the aquaculture industry.
7. **Flood damage reduction:** The Idaho Water Resource Board adopts as a planning objective the preference of management over structural alternatives in reducing or preventing flooding damages.
8. **Food and fiber (agriculture):** The policy of the Idaho Water Resource Board is to seek an orderly growth of agricultural production in the state at a rate sufficient to maintain the state's current share of the national and international market.
9. **Indian lands and related water resources:** The Idaho Water Resource Board adopts as a planning objective the protection of the natural resources and community environment of Indian reservations in Idaho. To achieve this objective, the state water resource policy is to cooperate with the Indians and tribes to identify and inventory their resources as a first step toward formulation of a resource plan.
10. **Interbasin water transfer:** The Idaho Water Resource Board adopts as a planning objective, opposition to interstate transfer and diversion of water from Idaho.
11. **Recreation:** The policy of the Idaho Water Resource Board is to support those projects and programs which are designed to protect and enhance recreational opportunities in Idaho.
12. **State-federal rights:** The policy of the Idaho Water Resource Board is to actively promote state control over the use and conservation of Idaho's water resources. As a positive means to help resolve the question of federal versus state jurisdiction of water uses, the Board supports the proposal for enactment of federal legislation which would require all federal rights and responsibilities to be clearly identified. This should be done in cooperation with state agencies and the effects clearly identified in the basin reports. Board-proposed projects and programs, and those brought to the Board for approval or concurrence, will be evaluated as to their effects on maintaining a strong position with regard to state control of all water uses.

13. Wild and scenic rivers: The policy of the Idaho Water Resource Board is to support the concept of designating selected Idaho river segments as "wild and scenic," through either federal or state programs, so that legal protection can be provided to insure that the rivers and their immediate environments are preserved for the benefit and enjoyment of present and future generations.

Idaho can no longer rely on the federal government and private interests to act as the catalytic agent to develop or preserve the water resources of the state. The complexities of water resource management, inadequate water supplies and growing demands are causing the state to reassess its water policies. Limited funding, the conflict between state and federal water rights, reduced emphasis on water resources development projects at the national level and the past failures to include local objectives in water resource plans are principal reasons why the State of Idaho should develop a stronger, more effective water resource planning, management and development program. This state program should expand and incorporate all uses of water resources to insure that the public interest is protected.

Policies

The Idaho Water Resource Board adopts the following policies as the basis of future water resource development, conservation and preservation in the state. These policies are the *State Water Plan - Part Two*. They incorporate and supplement *State Water Plan - Part One, The Objectives*, and are in conformance with the constitutional and legislative directives to the Board. Future detailed technical and feasibility studies, the *State Water Plan - Part Three* will be conducted and prepared within the framework of the policies established by the *State Water Plan - Part Two*. These studies will be undertaken on a small geographic area or tributary basin and generally will be multi-purpose in scope. The exclusion of any consideration, project program, potential or research topic does not preclude its eventual incorporation in the plan but it does signify that current values did not require its recognition at this date.

Policy 1
Public Interest

Applications for future water permits shall not be approved if they are in conflict with the State Water Plan adopted by the Idaho Water Resource Board in the public interest. Section 42-203, Idaho Code, should be amended to provide the following: (1) protection for all existing water rights. Nothing in this plan shall adversely affect water rights established and vested under the Constitution and laws of Idaho; (2) all new water uses, both consumptive and non-consumptive such as irrigation, municipal, industrial, power, mining, fish and wildlife, recreation, aquatic life, and water quality will be judged to have equal desirability as beneficial uses subject to Article XV, Section 3, of the state Constitution; (3) if conflicts occur between meeting new water uses, the approval or denial of the application shall consider the public interest including an evaluation of the beneficial and adverse economic, environmental and social impacts as identified in the State Water Plan as adopted by the Idaho Water Resource Board.

Presently there are four criteria that must be considered by the director of the Department of Water Resources in approving or denying an application. The present criteria are:

1. Is there a water supply available?
2. Does the proposed use interfere with existing rights?
3. Does the applicant have sufficient financial resources with which to complete the work involved?
4. Is the application made for delay or speculative purposes?

This policy proposes a fifth criteria: will the proposed use conflict with the State Water Plan adopted by the Idaho Water Resource Board in the public interest?

Since statehood, questions have been raised as to whether it is in the public interest to issue water rights without considering their effect upon those not directly affected by the proposed diversion. In disputes, the question of an application being in the public interest has been raised. In the recent Malad Canyon Case, the Idaho Supreme Court decision contains language suggesting that decisions be made on a case-by-case basis as to whether a proposed appropriation of water is a beneficial use. That language seems to indicate that the question of whether the proposed use is beneficial in the public interest should be addressed. Decisions made by the director could be appealed to District Court if any applicant was dissatisfied with the director's decision. The proposed criteria applies only to new applications.

Policy 2
Nature of Use of
Water Rights

Water users should be allowed to change the nature of use of their own water rights for use within the State of Idaho provided other water rights are not injured thereby. Section 42-222 should be amended to allow existing water right holders to make such changes provided the change is not in conflict with the State Water Plan adopted by the Idaho Water Resource Board.

As water uses increase and conflicts arise, many new uses will depend upon transferring existing water rights from one use to another. The Idaho Code is now silent as to the authority and procedure to be used. Section 42-222 should be amended to permit such transfers and provide adequate protection to other right holders and the public. Such provisions would reduce future conflicts if changes can take place in a regulated market system, particularly in changes from consumptive uses to non-consumptive uses. The proposed amendment should address the question of urban areas encroaching on irrigated farm lands and identify an equitable procedure to remove urban areas from irrigation districts. Maintaining agricultural lands in production should be considered as in the public interest.

Policy 3
Consolidate State
Water Quantity and
Quality Planning
and Administration

The state programs of water quantity and water quality planning and administration should be consolidated in the Department of Water Resources. The Idaho Code should be amended to implement this policy.

Planning and administration of water quantity and water quality are presently divided between two state agencies even though they are two directly interrelated physical properties of the same source. The Department of Water Resources is responsible for programs relating to water quantity and the Department of Health and Welfare is responsible for protecting the quality of the state's water. To attempt to solve problems involving either property of the water resource without considering the other compounds problems.

Different levels of funding and different planning schedules have not permitted water quantity planning and water quality planning to be fully integrated in the State Water Plan. Recently, because of P.L. 92-500 and extensive federal government efforts to protect and improve water quality, new programs closely paralleling ongoing activities are being initiated. Because of this, and the present split of responsibilities, there is some confusion among water users and the public of Idaho.

The responsibility to issue and control rights to use waters of the state rests with the Department of Water Resources. However, only minimal authority rests with the Department of Water Resources to consider the water quality effects of the proposed use of those waters. Such effects could be analyzed and defined at the time of issuance of a water right permit instead of placing the water user in a position of having to comply with an effluent limitation after he has already spent time and resources on initiating the use according to his permit. The same department responsible for controlling the diversion of water from the stream or groundwater body could monitor the eventual return flow from that use.

A combination of water quantity and water quality planning and management would neither increase nor diminish the goals of either program. It would help to reduce confusion and improve service to the public. The consolidation of water quantity and water quality planning and administration should not diminish any state or national goal to improve the quality of the state's water.

Claims should be submitted on all existing unrecorded water rights within the State of Idaho by June 30, 1982. Legislation implementing this policy should provide that failure to file such a claim by the prescribed filing date shall be grounds for forfeiture of the claimed right.

**Policy 4
Unrecorded Water
Rights**

Many rights in Idaho date from early periods when filing on water rights was not required. Adequate protection cannot be given to existing holders of such rights as pressures for water use increases unless their rights are defined and recorded. Unrecorded rights are a source of uncertainty for those contemplating new development and present difficulties to those responsible for planning and allotting water supplies. Both existing and future water right needs would be served by filing of all unrecorded claims. This procedure may ultimately result in an adjudication of all rights on all streams in Idaho. In the absence of a filing of unrecorded claims, new irrigation and instream flow claims could exceed available water supplies and claimants could be severely injured.

Policy 5
Flood Prone Area
Identification

The sellers of parcels of land within flood prone areas as identified by the Department of Water Resources should be required to notify the buyer in writing that such lands are within such flood prone areas. Written notification, with an acknowledgement by the buyer, should be recorded with the title to the lands. Legislation implementing this policy should also provide that the buyer may recover damages from the seller if the seller fails to so notify the buyer.

Prospective buyers should be made aware of identified flood prone areas. The pressures to develop areas subject to periodic flooding will continue to increase as population increases, available lands diminish and second homes become more prevalent. Buyers should realize that flood prone areas require special construction provisions to avoid flood losses. Public investment in flood fight and flood damage reduction projects is increasing at such a rapid rate that all nonstructural steps also should be taken to reduce potential damages. This can be accomplished only if purchasers and sellers fully realize the damage potential and provide for potential flooding. The Department of Water Resources would utilize existing flood plain studies in establishing uniform and consistent flood prone area boundaries. Federal guidelines and regulations contained in the Flood Disaster Protection Act of 1973 may be modified in the future and lose much of their effectiveness in preventing future flood damages. Idaho should evaluate all flood control rules and regulations in considering this policy.

Policy 6
Instream Flows

Water rights should be granted for instream flow purposes. The legislation authorizing this policy should recognize and protect existing water rights and priorities of all established rights and delegate responsibilities for determining flows and administrative authority to the Department of Water Resources. The legislation should also direct that the Idaho Water Resource Board shall be the only applicant for instream flow.

Instream flows are essential to many uses of the state's water resources, including hydropower production, fish and wildlife propagation, recreation and navigation. Many of the uses have direct effects on the economy while others represent elements of Idaho's valued environment. Presently no procedure exists for establishing a right to an instream flow from the unappropriated waters of the state. The Idaho Supreme Court, in the Malad Canyon Case of the State of Idaho, Department of Parks vs. State of Idaho Department of Water Administration, indicated that a procedure could be adopted by the legislature. In order to protect present economic and environmental uses, such a procedure is an integral portion of the State Water Plan.

Methodolgy to determine instream flows for fish, wildlife and recreation has not been available until recent years and even now some streams are difficult to evaluate due to physical characteristics and resident species. In Idaho, instream flows should be evaluated to achieve a stream maintenance flows (SRMF). SRMF's are defined as a range of flows within which all aquatic life and related recreational activity are maintained and protected. The Idaho Water Resource Board believes this policy will further protect existing water rights because water would be maintained in the rivers and streams rather than allowing appropriations to dry up a water supply.

The basic provisions of instream flow legislation should include:

1. The name of the stream and legal description of the point on, or reach of the stream where the instream flow is proposed to be appropriated and determined;
2. The instream flow proposed in cfs;
3. The purposes for which the instream flow appropriation is proposed to be made;
4. The period of time or season of the year during which said appropriation is proposed;
5. Will not interfere with any vested water right, permit, or water right application with a priority of right date earlier than the date of receipt in the office of the director, Department of Water Resources, of a complete application for appropriation of instream flow filed under the provisions of this act;
6. Is in the public, as proposed to private, interest;
7. The extent to which flows are necessary for the preservation of fish and wildlife habitat, aquatic life, recreation, aesthetic beauty, navigation, transportation, power generation, or water quality of the stream;
8. The extent to which flows are capable of being maintained as evidenced by records or streamflows and water levels, and the existing or future establishment of necessary gaging stations and bench marks;
9. Identify the Idaho Water Resource Board as the only applicant for instream flows.

**Policy 7
State Natural
and Recreational
System**

A State Natural and Recreational River System should be established and designed to fit the desires of the citizens of Idaho. Legislation implementing this policy should permit the protection of the unique features that exist on each of the various rivers within the state and should provide the necessary authorization and adequate funding to state and local government to protect such rivers and related lands for recreational, scenic and natural values while still allowing the widest possible opportunity for use by private interests. Funds would be provided from the Water Management Fund created under Policy 31 for this purpose.

In recent years, Idahoans have expressed a desire to retain some rivers in a free-flowing condition. However, at the present time no state legislation exists to accomplish this objective which limits protection to that which can be provided by the federal government through the National Wild and Scenic Rivers Program. A state system would be more responsive to the needs and desires of Idahoans and could be managed to improve the recreational sector of the state's economy.

The system should be composed of two parts: (1) natural rivers utilizing a natural wilderness type of management and administration; and (2) recreational rivers utilizing a rural, agricultural or urban type of management and administration. Administrative jurisdiction would be at the state level. Existing land and water uses generally should not be preempted, but preserved. Authorization should be provided, however, for purchase of future development or change of present land use rights.

The State Natural and Recreational River System is designed to protect and preserve free-flowing river values. It should be equal to the National Wild and Scenic Rivers System in authority. All rivers in the Idaho system should be relatively free of pollution and the water quality sufficiently high to meet primary management purposes. Instream flows should be established for each river segment in the system and any future development, improvement, diversion, or impoundment in, above, or below the classified river segment should be regulated so as to protect the streamflows and free-flowing condition of the river segment.

The river classifications should be in two parts, defined as:

1. Natural Rivers or those rivers or sections of rivers that are free of diversions and impoundments, inaccessible to the general public except by water and foot- or horse trail, and with river area primitive in nature and free of manmade developments except foot bridges.

2. Recreation Rivers, or those rivers, or section of rivers, that are relatively free of diversions and impoundments. A river should not be excluded from classification due to small

dams. There can be general road access with river areas largely undeveloped or which are partially or predominantly used for agriculture, forest management and other dispersed human activities which do not substantially interfere with public use and enjoyment of the rivers and shorelands.

Limited existing exceptions to the criteria for both classes of river should not be an automatic basis for exclusion from designation. Rather, the river area should be examined as a whole with its overall worthiness for inclusion being the deciding factor. Studies should identify the following.

1. All proposals should be evaluated to determine whether designation and management could be accomplished under a state or local program. Preference will be given to the inclusion of river segments under a state or local program so that control will remain at the state level.
2. All proposals (federal and state) must clearly identify the environmental, economic, and social impacts.
3. An analysis of the benefits and costs associated with the operation and maintenance of the proposal must be included.

Policy 31 provides the funding to administer such a program. Stream segments or reaches considered as having potential for inclusion in a State Natural and Recreational River System include:

Snake River Basin

1. Salmon River - North Fork to mouth
2. Salmon River - headwaters to North Fork
3. South Fork of Salmon River, including the East Fork of South Fork and Johnsons Creek
4. Bruneau River - stateline to Bruneau Valley, including Sheep Creek and Jarbidge River
5. Owyhee River and tributaries
6. Henrys Fork - Warm River to Big Springs
7. Teton River - headwaters to confluence with the North Fork Teton River
8. Payette River - North Fork
9. Payette River - South Fork

Panhandle Basins

1. North Fork Coeur d'Alene River
2. Lower Priest River
3. St. Maries River
4. Kootenai River
5. North Fork St. Joe River
6. Pack River

Bear River Basin

1. Cub River

**Policy 8
Greenway-Greenbelt
Program**

State and local greenway and greenbelt systems should be established. Legislation implementing this policy should provide for local county and city government planning, regulations and administration of lands adjacent to Idaho's rivers. State financial and technical support would be provided on a project by project basis. Funds would be provided from the Water Management Fund created under Policy 31 for this purpose.

Numerous rivers in the state are in scenic settings and attract many visitor days of use. Most, however, do not qualify for consideration as "wild river" but instead are day-use oriented. As Idaho's population continues to grow, an opportunity exists for local government to capitalize on these areas for recreation.

A greenway is a system of open or park lands located along a river or stream created through local zoning or voluntary easement. Public access is not guaranteed under this concept.

A greenbelt is a system of open or park lands located along a river or stream acquired by voluntary sale, willing buyer-willing seller. Purchase of the lands by a public entity guarantees public access.

As an aid to local government interpretation, the guidelines would include:

1. Recognition that river resources are depletable and that their protection and enhancement is in the public interest;
2. Farm use is desirable and should be an integral part of the greenway/greenbelt. Farmland is depletable and should be conserved;
3. Preservation of historic sites and protection of scenic views to and from the river or stream should be accomplished;
4. Adjacent lands should be classified as to their ability to sustain various human activity and managed in the greenway/greenbelt system accordingly;
5. Access to and along the river should be obtained as needed, and parks and open space are to be encouraged;
6. Farm use zoning, equitable taxation practices, easements, and other methods aimed at perpetuating farm use should be encouraged and employed to the fullest extent.

Each city and county should prepare plans for their portion of the greenway/greenbelt at a scale suitable for local plans. These plans should magnify local values, needs, and interpretations, within the general framework of local goals and legislative guidelines.

The following areas should be given early consideration for inclusion in a greenway:

Snake River Basin

1. Snake River
2. Boise River
3. Big Wood River
4. Payette River
5. Portneuf River
6. Teton River
7. Big Lost River
8. Rock Creek at Twin Falls

Panhandle Basins

1. Kootenai River
2. South Fork Coeur d'Alene River - Mullan to Enaville
3. St. Joe River - through St. Maries
4. Priest River - McCabe Falls to Pend Oreille Lake

Bear River Basin

1. Bear River

State and local units of government should prepare lake and reservoir surface management plans. The authorizing legislation should also define and adopt procedures and provide for enforcement. Funds would be provided from the Water Management Fund created under Policy 31 for this purpose.

Policy 9 Lake and Reservoir Surface Management Plan

Comprehensive plans and management guidelines should be prepared concerning surface uses of Idaho's lakes and reservoirs relative to the conservation, development and protection of these resources. These guidelines should define appropriate uses of lakes and the portions of lakes wherein certain uses can be conducted. Size of motors and boats allowed, allowable speed, prohibition of motors or houseboats, scheduling of log tows, and regulating the time at which various uses may be conducted are basic considerations.

Such a plan should be prepared jointly by local and state agencies with assistance from federal agencies where appropriate. The plan should be subject to adoption by the Idaho Water Resource Board as part of the State Water Plan. Lakes and reservoirs affected by this recommendation include:

Snake River Basin

Alturas, Redfish, Williams, Upper Payette and Little Payette, Warm and Henrys lakes, and Anderson Ranch, Arrowrock, Black Canyon, Brownlee, Cascade, Deadwood, Deer Flat, Hells Canyon, Horsethief, Lost Valley, Lucky Peak, Spangler, Little Camas, C.J. Strike, Fish Creek, Little Wood, Mackay, Magic, Murtaugh, Roseworth, Salmon Falls, Sublett, Walcott, American Falls, Ashton, Blackfoot, Chesterfield, Island Park, Palisades, Dworshak and Paddock reservoirs.

Panhandle Basins

Priest, Pend Orielle and Coeur d'Alene lakes

Bear River Basin

Bear Lake

Policy 10 Protection of Lake and Reservoir Shorelands

Local units of government should prepare comprehensive plans and adopt zoning standards for the management of lake and reservoir shorelands to protect the water resources and its uses. Title 67, Chapter 65, Idaho Code, the Local Planning Act of 1975 should be amended to implement this policy. Funds would be provided from the Water Management Fund created under Policy 31 for this purpose.

Lake and reservoir shorelands are being used in increasing proportions. Often when land-use abuse occurs, the resulting eroded material, or other pollutant, ends up in the lake or reservoir. Use of the shorelands should continue; however, locally prepared plans could reduce problems.

The amending legislation should specify the values to be preserved and protected. Authority should be included for standard ordinances and local ordinances should require protection at least equal to the adopted standard ordinance. The lakes and reservoirs identified in Policy 9 should be analyzed under this recommendation.

Policy 11 Water Supply Bank

A water supply bank should be established for the purpose of acquiring water rights or water entitlements from willing sellers for reallocation by sale or lease to other new or existing uses. Legislation authorizing the water supply bank should also provide for the bank to be self-financing in the long run with initial funding to be provided by creation of a Water Management Fund as provided for in Policy 31.

The state is approaching a situation where all water supplies capable of being developed have been utilized. Presently there is difficulty in finding buyers for blocks of water when such water becomes available, primarily because the water rights for sale are either too small to be made into an economical block or too large for a single buyer to acquire. This proposal would create a self-financing program for the acquisition and sale of water entitlements and would act as a mechanism to acquire and hold water for future users. Water rights would be purchased from willing sellers and then resold to new users at a cost sufficient to cover expenses associated with the original purchase. Water rights held in the bank for future uses could be "leased" or "rented" for interim uses to cover costs of administering the bank until resold. Public benefits derived would be considered.

Water Conservancy Districts should be established where needed. Legislation implementing this policy should provide for an equitable funding procedure to spread costs among all beneficiaries.

**Policy 12
Conservancy
Districts**

A mechanism is needed to finance obligations and operate areawide water conservation or groundwater recharge projects and programs. Beneficiaries of groundwater recharge projects will be all residents who receive sustained or augmented water levels or quantities of water from wells. Presently there is no mechanism to spread the obligation for such projects over the area benefited. Conservancy Districts could include or supplement several other types of districts such as Irrigation Districts, Drainage Districts and Weather Modification Districts, and should have authority to collect assessments based upon evaluation of benefits to specific classes of users.

A water conservancy district would have power to own and operate storage, diversion and delivery systems to provide the total water needs of large geographic parts of the state such as river basins or single or multi-county areas. It would have authority to levy taxes on all property benefited and to bond and contract for project construction. Water could be supplied for irrigation, domestic, municipal, industrial, recreation and other purposes. Such districts could also sponsor artificial groundwater recharge projects and thereby distribute the costs over the entire population of an area which indirectly benefits from such a project. They could also integrate the use of the surface and groundwater resources of a river basin for more efficient use of available resources in periods of low and high streamflow.

**Policy 13
Energy Plan**

A State energy plan should be prepared. The Department of Water Resources should contribute the water related components to such a plan. Legislation authorizing this policy should also provide funding through the Energy Development and Study Fund for this purpose as provided in Policy 31.

Energy production will be continuing major problem for Idaho and the Pacific Northwest as well as the nation. In 1974, Idahoans consumed the following quantities of energy:

Electricity - $11,723 \times 10^6$ KWH
Oil - 3.922 million barrels
Natural Gas - 40.970 billion cubic feet
Coal - .464 million tons
Gasoline and Diesel - 62.7 trillion BTU equivalents

Energy use and production may involve significant quantities of water. Presently Idaho is only producing electrical energy at hydro-generating facilities and does not have any commercial coal, oil or natural gas developments. Idaho is served by numerous public and private business concerns that buy energy in other parts of the nation and ship it to Idaho for consumption. All energy uses are projected to increase. Historical average annual load growth for electricity has been 8.3 percent per year since 1950.

The dilemma facing Idaho is where and how to attract energy supplies when few energy sources are located in Idaho. As Idaho's economy continues to grow energy supplies will be faced with a multitude of problems in meeting energy demands. The location, size and effects of new facilities are of vital concern to all citizens.

Since any one energy supplier serves only a part of the state, and some of the future developments will be extremely large, it is desirable to prepare a statewide energy plan, to inform the public and to offer assistance where needed. Information in the State Water Plan is the first attempt to measure statewide concerns, problems, impacts and needs of electrical energy. This activity should be continued.

A state energy plan should address all forms of energy utilized in Idaho's economy. Specifically, the energy plan should evaluate sources, availability, cost relationships, regional growth and local management, conservation programs, reservation of conventional and pumped storage and hydroelectric generating sites, thermal plant siting, downstream hydroelectric plants, research and development of new sources, and information and education programs.

Claims to water by Idaho Indian tribes should be identified by June 30, 1982.

**Policy 14
Water Claim
by Indian Tribes**

The Indian tribes in Idaho should be encouraged to complete water and land resource inventories and adopt plans for their development, conservation, and preservation.

Each tribe has an inventory and planning program underway, however, no conclusions have been reached. Reservations affected by this Policy include:

Snake River Basin

Fort Hall
Duck Valley
Nez Perce

Panhandle River Basins

Coeur d'Alene
Kootenai

Bear River Basin

None

Claims to water by the federal government should be identified by June 30, 1982.

**Policy 15
Federal Water
Claims**

The large acreage of federal lands in Idaho, coupled with the present attitude of the U.S. Department of Justice regarding waters reserved to those lands, poses problems which need immediate attention and resolution. The federal government claims sufficient water was reserved for federal lands to develop for any use consistent with the reservation, without reliance upon state water law. Approximately 64 percent of the land base in Idaho is federally owned and no claims have been submitted for development or preservation of those lands. Federal government claims, if any, for those lands should be submitted by June 30, 1982, or sooner to provide the basis for fully evaluating Idaho's water resources and related land resource availability.

Policy 16
Federal Reservoirs
Water Allocation

An agreement should be established with federal agencies to allow review by the Idaho Water Resource Board of any proposed allocation of water in excess of 500 acre-feet annually from federal reservoirs.

The Idaho Water Resource Board would be guided in such a review by the conformance of the proposed allocation with the State Water Plan. Such actions are necessary if the State Water Plan is to be implemented in a coordinated manner. This policy would not encroach upon the authority of the federal agencies to operate the facilities according to congressional authorization but would help to insure that their actions occur with state review and concurrence. This procedure has been followed informally in the past, but should be formalized to avoid misunderstanding and identify the basis of such review for the interested public.

Policy 17
State Administration
of Federal Programs

Federal programs dealing with water should be administered by the state when the state has the option to do so.

Specific examples of such federal programs are: P.L. 92-500, the Federal Water Pollution Control Act Amendment of 1972, including the 404e permit program of the Corps of Engineers; P.L. 93-523, Safe Drinking Water Act of 1974; the Federal Dam Safety program; and the National Wild and Scenic Rivers program. State administration of such programs could preserve the opportunity of the citizens of the state to affect the approach to and method of administration of such programs.

Policy 18
Combine Applications
for Water Resources

Existing state statutes should be reviewed and amended so that applicants may complete a single application form to request approval from necessary state authorities to develop or utilize the state's water and related land resources.

This policy is intended to assist the public of Idaho in complying with the laws of the state by consolidating forms and centralizing water regulations. In addition, it should increase the efficiency of handling requests and improve cooperation in protecting the public interest in the state's natural resources. Agencies responsible for administering the various resource laws should be given one year to jointly study and adopt such a procedure.

A Legislative Committee on Water Resources should be appointed to work with the Idaho Water Resource Board in implementing the State Water Plan.

**Policy 19
Legislative
Committee**

The State Water Plan represents the public interest in water resources. The policies involve substantial legislative and management changes. It is imperative that the legislature and the public of Idaho have a full understanding of resource potential, availability and demands in fully implementing the State Water Plan. If a water plan for Idaho is to gain the greatest benefits to Idaho citizens, a cooperative effort to implement the elements of the plan is imperative. Through a committee effort, the legislature can gain a comprehensive understanding of the plan and its impacts.

Where the supply of water from a particular water source is limited, it is preferable to develop lands of higher agricultural productivity over those of a lower productivity.

**Policy 20
Land Development
Policy**

As of July 1, 1976, applications to reclaim national resource lands under the Desert Land Entry Program totaled 1,260 applications for 405,000 acres. Similarly, applications to develop land under the Carey Act Program totaled 141 applications for 600,000 acres. The total consumptive water requirements for these lands is approximately two million acre-feet. Some of the proposed development will utilize groundwater, however, the major emphasis is on the Snake River in southwest Idaho. Current applications for the Carey Act and Desert Land program if approved will exceed the supply in the Snake River in the Thousand Springs to Murphy reach during July and August. Some applications have been pending for several years and should be processed expeditiously. Dedication of the remaining available water supplies in this reach to higher classes of lands would assist in assuring that the greatest benefits are received from the dedication of those limited supplies.

Potential reservoir sites should be protected against significant land use change. The legislation implementing this policy should recognize rights of existing land owners and should direct the state to acquire lands as they become available for sale. Reservoir sites given this protection should be re-evaluated on ten-year intervals. Funds would be provided from the Water Management Fund created under Policy 31 for this purpose.

**Policy 21
Protection of Potential
Reservoir Sites**

Future economic development and population growth will bring additional demands on Idaho's water resources. In addition many of the environmental objectives of water resource management require reliable, quality flows. Currently, no new major storage is proposed because of economic and environmental standards. In future years criteria and conditions may change as pressures increase and decisions may be necessary that will require the availability of such sites. Potential reservoir sites exist both on and off stream and the key sites need protection. In January, 1976, the Corps of Engineers completed a reconnaissance investigation of pumped-storage potential in the northwest. Forty-five sites were identified in Idaho and these need further consideration for possible site protection. Reservoir sites given protection should be selected carefully, however, the initial list should include but not be limited to:

Potential Reservoir	Stream
Snake River Basin	
<i>Upper Snake</i>	
Lynn Crandall	Snake River
American Falls (Exist.)	Snake River
Clear Lakes	Snake River
Thousand Springs	Snake River
Shoestring	Snake River
Warm River	Henrys Fork
Blackfoot (Exist.)	Blackfoot River
Driggs	Teton River
Medicine Lodge	Medicine Lodge Creek
Birch Creek	Birch Creek
Boulder Flats	Big Wood River
Bliss	Big Wood River
<i>Southwest Idaho</i>	
Grindstone Butte	Snake River (off-stream)
Sailor Creek	Snake River (off-stream)
Guffey (High Alternative)	Snake River
Garden Valley	South Fork Payette River
Gold Fork	Gold Fork Payette River
Twin Springs	Boise River
Lost Valley (Exist.)	Lost Valley Creek
Tamarack	Weiser River
Goodrich	Weiser River
Monday Gulch	Little Weiser River
Lucky Peak (Exist.)	Boise River
<i>Lower Snake</i>	
Challis	Challis Creek

Panhandle Basins

Low Katka

Kootenai River

Bear River Basin

Caribou
Oneida Narrows
Plymouth
Thomas Fork

Bear River
Bear River
Malad River
Thomas Fork

The Department of Water Resources should be directed to inventory, identify and evaluate the adequacy of existing flood control levees. Idaho Code, Section 42-1708, should be amended to implement this policy.

Policy 22 Evaluate Flood Control Levees

Flood control levees built with federal funding are turned over to local entities to maintain. The degree of maintenance varies with the capability and diligence of the responsible organization. Levees built under emergency conditions sometimes have no maintenance provision. This situation creates a potential hazard wherein levees may deteriorate to the point of being unsafe and subject to failure. A false sense of security may result and potential damage may be greater than if the area were unprotected. A program of periodic inspection by the state as an adjunct to its program of dam safety inspection would insure that minimum standards are met. Any necessary remedial action could then be taken early enough to protect against levee failure.

The Idaho Water Resource Board offers to assist Indian tribal representatives in the identification, evaluation and tabulation of water resources on Indian lands.

Policy 23 Assist Indian Tribes in Water Resources Identification

This program would be designed to assist Indians in evaluating water resource uses and needs, with the goal of identifying, for both Indian and non-Indian benefit, Indian claims to water by June 30, 1982. This program recognizes that the Indians are the proper people to identify their own needs and desires. Assistance would be given upon request from the various Indian tribes. The program realizes the potential conflicts between Indian and non-Indian claims but recognizes that solutions probably can be found if adequate information is available. The date of June 30, 1982, corresponds with the date set for all non-Indian claims to be recorded.

**Policy 24
Safety Measures
Program**

A program should be established to assist local units of government in repairing and installing safety structures on or near canals, rivers, lakes and reservoirs. The program should be established as a cost-sharing cooperative program with the state share at 75 percent and local share at 25 percent of each identified project. Funds would be provided from the Water Management Fund created under Policy 31.

Each year, numerous fatal accidents occur in the state's water because of the lack of preventive safety measures. Accidents are not confined to one area of the state nor one segment of the economy but are scattered throughout the state. Most Idaho cities are built on a water course and subsequently are plagued by hazardous canals, rivers or shorelands. Fencing, signing, debris removal, covering and other structures should be installed to provide for human safety. In the absence of safety structures and subsequent accidents, accusations and claims of responsibility cause community unrest. A preventive program could solve this problem. The Department of Water Resources should be directed to work with any unit of government to implement these programs.

Local units of government should be encouraged to conduct annual public awareness campaigns to educate the public on the dangers and hazardous nature of water bodies in their areas. This public awareness campaign could also include boating safety and an expanded learn to swim program.

**Policy 25
Rehabilitation
Program**

A program should be established to identify and evaluate rehabilitation of abandoned mineral extraction and by-product storage areas and other abandoned projects which currently or potentially affect the yield or quality of the state's watersheds, streams and stream channels.

This program would identify hazardous or troublesome areas and recommend solutions. Current mining practices and storage areas would not be evaluated. Problems occur when mines and storage areas are abandoned and no upkeep or maintenance work is performed. Some areas have deteriorated so much that structural failure is occurring causing erosion, sedimentation and heavy metals to enter the state's streams. In years past the mining companies, government agencies and general public tolerated a neglect of environmental quality as a tolerable cost of economic gain. Recently the mining industry has reversed this pattern of neglect and has made substantial and visible progress in controlling water and air pollution incident to its mining operations. The industry has made very substantial expenditures for treatment facilities which have resulted in major reductions in the discharge of pollutants. Leaders in the mining industry have taken the initiative with local government officials to pass bond sewage treatment facilities for control of water pollution throughout the South Fork of the Coeur d'Alene River. The discharge of raw sewage and of mining wastes have ceased. However, the problems of the past remain. Problem areas are scattered and include the Boise, Owyhee, Salmon and Coeur d'Alene rivers.

Numerous early water and related land projects were built and later abandoned. Some of the projects have deteriorated to the extent that public safety is threatened and potential damages would exceed rehabilitation costs by a wide margin. Funding for study and rehabilitation work would come from the Rehabilitation Fund proposed in Policy 31.

A program should be established by the State of Idaho to monitor and regulate radioactive waste disposal at the U.S. Energy Research and Development Administration's Idaho National Engineering Laboratory, and other areas as may be designated.

**Policy 26
Monitor Radioactive
Waste Disposal**

The existing program for radioactive monitoring at the Idaho National Engineering Laboratory (INEL) is conducted by the Health Services Laboratory of the Energy Research and Development Administration. In their comprehensive monitoring program radioactivity released from INEL operations is measured in air, water and soil at both on-site and off-site locations. Radioactivity in some agricultural products from the INEL area also is measured. An annual report on radioactivity monitoring results is prepared by the Health Services Laboratory and an assessment of the radiological impact from nuclear operations is made of that region surrounding the INEL.

Notwithstanding the quality of the current radiation monitoring program carried out by the ERDA and its Health Service Laboratory, it is recommended the state establish an independent program for sampling, analysis, and data interpretation. The INEL area overlies portions of the Snake Plain aquifer and every precaution must be taken to preserve its quality.

A program should be established within the Idaho Department of Fish and Game to prepare and adopt objectives and management criteria for fish, wildlife and all other aquatic resources for all principal streams and wet-lands in the state.

**Policy 27
Fish and Game
Plan**

It is difficult to protect aquatic resources without a clear definition of objectives and management criteria. Fish and wildlife resources and habitat are located in virtually every area of Idaho, however, many habitat areas have other potential uses. Instream habitat will be under increasing pressures as additional diversions are made and as greater numbers of Idahoan use these fish and wildlife resources. Definitions of objectives and management criteria would facilitate decisions necessary to protect those resources.

Policy 28
Tailing Ponds

Encourage the mining industry to work with federal and state agencies to achieve uniform safety standards for the construction of tailing ponds and other similar mine waste storage facilities. If agreement cannot be reached under existing laws and policies then legislation should be adopted placing tailing ponds and other similar mine waste storage facilities under jurisdiction of the Dam Safety Act (I.C. 42-1714 et seq).

In an effort to improve the deteriorated water quality in the South Fork Coeur d'Alene River, and to protect existing water quality in other mining areas throughout the state, numerous tailing settling ponds have been constructed. Presently, regulatory authority for uniform construction standards, maintenance inspection or long-term maintenance responsibility for these ponds does not exist. These deficiencies, combined with the absence of adequate hydrologic study in site selection, have caused failures. These failures destroy fish habitat and cause extensive water quality deterioration as well as place increased stress on similar structures.

Policy 29
Planning Program

A Water Resource Project Feasibility Planning Program should be established to conduct studies required to implement the State Water Plan. Funds would be provided from the Water Management Fund as provided in Policy 31.

The State Water Plan establishes a new direction in water resource management based on existing water authorities, however, implementation of the State Water Plan will require additional study and investigation. Some of the problems requiring further study will be statewide in scope and others will be of a local nature.

Statewide

Statewide investigations include studies of those problems of statewide significance. They may be inventories or feasibility grade studies depending on the intensity of the study effort.

- Review and update information and criteria for use in determining reasonable groundwater pumping lifts in Idaho.
- Complete an inventory of off-stream reservoir sites.
- Investigate potential energy production sites and the potential environmental effects of using each. Such a study should include expansion of existing hydropower and potential new sites, pump-back power sites, and thermal power sites, and associated transmission and transportation network.

- Investigate potential for incorporating flood control storage in existing private and public reservoirs where flood damage reduction is not now a recognized purpose. Such studies should describe fully the possible physical, legal and institutional effects, if any, of such operations on existing uses.
- Identify mineral extraction waste disposal areas that may represent economic alternatives to stream side disposal dumps.
- Evaluate upstream storage alternatives in Idaho as a solution to the rising water levels of Great Salt Lake.

Local

Tributary investigations should encompass all water and related land problems on a local basis and result in specific solutions and feasibility reports consistent with the State Water Plan. Each tributary investigation should be conducted within a two-year period and programmed to allow active public participation as follows:

Snake River Basin (in order of priority)

<u>Upper Snake</u>	<u>Southwest Idaho</u>	<u>Lower Snake</u>
1. Heise-Neely	Boise	Upper Salmon
2. Neely-Milner	Bruneau	Palouse
3. Henrys Fork	Payette	Clearwater
4. Westside Tributaries	Weiser	Lower Salmon
5. South Fork	Owyhee	
6. Northern Stream		

Panhandle River Basins (in order of priority)

1. Spokane
2. Pen Oreille
3. Kootenai

Bear River Basin (in order of priority)

1. Lower Bear
2. Upper Bear
3. Oneida County

Research should be conducted on important water resource topics to augment the State Water Plan.

The current water resources research program in Idaho is limited by manpower and funding limitations. Funding is approximately 60 percent from federal sources, 30 percent from state sources and 10 percent from private sources. An enlarged state contribution would in most cases attract additional federal and private research funds. Research should be organized under the following major categories for identification and prioritization:

1. Availability of quality water and related resources;
2. Planning techniques and methodology;
3. Impacts of water use;
4. Implementation criteria;
5. Management;
6. Public information and education;
7. Energy.

In some cases Idaho will be able to take advantage of research conducted in other states while other topics will require that original research be conducted in Idaho.

Areas of concern identified in the State Water Plan as needing immediate attention are:

- Identify legal and institutional changes necessary to improve water management.
- Investigate and evaluate waste water control measures of existing water uses.
- Investigate and evaluate potential for conservation of energy by existing uses. Estimate possible range of power savings.
- Investigate dry or unsaturated aquifer systems which could be used for long-term water storage and evaluate methods of recharging dry aquifers for water storage for multiple uses including low flow augmentation.
- Develop methods and varieties to increase Idaho crop yields up to amounts indicated by irrigation needs projections.
- Evaluate the effect of various levels of moisture deficiencies on crop yields.
- Evaluate methods of utilizing low temperature steam for electric energy production or other beneficial purposes.

- Evaluate methodology for determining instream water needs for fish and wildlife, and values created or preserved by providing or maintaining such flows.
- Investigate methods for encouraging more efficient use of water.
- Study augmentation of streamflow by use of anti-transpirants.
- Investigate expected frequency of recurrence of drought periods similar to those experienced in the last 70 years.
- Develop more efficient weather modification techniques.
- Investigate need for expanded monitoring program in critical groundwater areas.

Funding Policy

The greatest test confronting the State Water Plan is the commitment of adequate financial resources to insure its timely and orderly implementation. Proposals contained in this report cover virtually all water uses of private, local, state and federal entities. In addition, the proposals provide a framework to coordinate resource management and use with the federal government. Water resource development, conservation, restoration and preservation activities in future years will determine in a large part the quality of life Idahoans have. No one entity should be expected to finance or control all future water resource programs. Private financing will contribute the largest share of money for implementation. The federal government, because of previous commitments, the large federal land base, and extensive resource programs, is expected to finance some major water resource programs, however, federal financing appears to be increasingly difficult to secure and generally has stringent conditions attached to its use. The State of Idaho should invest part of its annual income in resource programs to maximize values. In previous years, the state has relied on the private sector and the federal government as the prime sources of financial responsibility. Without state financing for water resource programs, the people of Idaho can expect problems to intensify and public benefits to decrease.

**Policy 31
Funding Program**

The State of Idaho should establish a major water resource funding program to supplement private and federal monies to develop, preserve, conserve and restore the water and related land resources of Idaho and to implement the State Water Plan. The recommended funds are Water Management Fund, Rehabilitation Fund and Energy Development and Study Fund.

1. Water Management Fund

The Water Management Fund should receive annual appropriations, and be comprised of three subparts.

The Water Supply Bank would assist in transfer of excess waters from areas of surplus to areas of need. It would operate by handling water rights on a willing buyer and willing seller basis.

The Development Program would assist in development, study, and research for groundwater recharge, irrigation projects, flood control projects, municipal and industrial water supplies, navigation, watershed protection projects, aquaculture, hydroelectric development, surface storage and water conservation programs.

The Environmental Program would assist preservation, restoration, enhancement of the natural environment, control of pollution, study and research for instream flows, rehabilitation of damaged streambeds, a State Natural and Recreational River System, water quality projects, greenways, greenbelts and other environmental programs affecting water resources.

2. Rehabilitation Fund

The Rehabilitation Fund should receive annual appropriations. These monies would be used to evaluate and rehabilitate abandoned mines and by-product storage areas and other abandoned projects that adversely affect the state's water resources.

The Water management Fund and Rehabilitation Fund would be administered by the Department of Water Resources as prescribed by the legislature and consistent with the State Water Plan.

3. Energy Development and Study Fund

The Energy Development and Study Fund should receive annual appropriations. These monies would be used to expand geothermal energy research and development, solar energy research and development, conservation studies, pumped storage studies and assist other programs affecting the adequacy of electrical and other energy supplies. This fund should be administered by the designated energy agency with water resources components assigned to the Idaho Department of Water Resources.

The available and unappropriated waters of the Snake River Basin are allocated to satisfy existing uses, meet needs for future growth and development, and protect the environment. The allocations recognize and protect existing water uses and rights. The water allocations are made by large regions to allow the widest possible discretion in application.

Policy 32
Snake River Basin

The greatest competition for water in the Snake River Basin exists along the main stem of the Snake River. Existing and potential uses include hydropower generation, irrigation, fish and wildlife, recreation and protection of water quality. The amount of water required for the potential uses exceeds the remaining available supply.

Water Allocation
Criteria

The river flow is regulated by numerous dams, reservoirs, direct diversions and return flows as it crosses the southern half of the state. Existing water rights are principally for irrigation and hydropower generation. Irrigation needs are normally met except during extreme low runoff years. Hydropower generation utilizes water remaining after irrigation diversions even though there are licensed water rights for hydro-generation at several points on the Snake River. Some of these rights are subordinated to upstream diversion and depletions and others are not. The largest unsubordinated right is at Swan Falls Dam (near the Murphy gage) with a flow right of 9,450 cfs (includes 3,300 cfs in claims). Substantial development has occurred above this point, thus reducing flows below the claimed right. Pending applications to divert water could reduce the flows to essentially zero during July, August and September of each year. The resulting impact would substantially reduce electrical energy generation at Swan Falls and at all other points downstream on the main stem Snake River. In the absence of protests from the public and water right holders, the Department of Water Resources has continued to issue permits to develop new water supplies for irrigation from Snake River.

Permits previously issued by the department, if fully developed, would reduce summertime flows in dry years to about 3,300 cfs near Murphy. Sequences of consecutive years of flows of this magnitude would have occurred in the early 1930's and again in the late 1950's and early 1960's if present developments, plus the already issued permits, had been fully developed at that time. These flows were computed in a study of major outstanding permits from the Snake River in southwestern Idaho (Technical Studies Report No. 3) and a preliminary estimate of effects of full development of outstanding groundwater permits in the Upper Snake.

A flow of 3,300 cfs at Swan Falls is about one-third of the flow necessary to meet the entitlement of hydro-generation at that power plant if the recorded water filings are valid. It is also less than the amount identified as needed for fish, wildlife and recreation purposes at Swan Falls or downstream. The potential uses of water in the main stem Snake River have been identified in sufficient detail to determine that remaining water supplies cannot fulfill all identified needs.

The Idaho Water Resource Board concluded, after considering all current and potential uses of water on the main stem Snake River, that depletion of flows below that currently available in the low flow months to maintain water for production of hydropower and other main stem water uses is not in the public interest.

Therefore, main stem Snake River flows will be protected against further appropriations and preserved to provide the following average daily flows at the following U.S. Geological Survey stream gaging stations:

Gaging Station	Protected Flow (Average Daily)
Milner	0 cfs
Murphy	3,300 cfs
Weiser	4,750 cfs

Studies indicate that sufficient water exists in excess of these flows to provide for additional uses if water conserving and storage facilities are constructed.

Water available in excess of the designated flows for development above an average annual flow basis are:

Gaging Station	Water Presently Available for Appropriation (Average Year)
Milner	1,437,000 acre-feet
Murphy	4,218,700 acre-feet
Weiser	7,821,000 acre-feet

The above average daily flows will allow the flow requirements contained in the Federal Power Commission License issued for the Hells Canyon hydropower complex to be met without significantly affecting hydropower production. Article 43 of the license provides the management criteria,

"The project shall be operated in the interest of navigation to maintain 13,000 cfs flow into the Snake River at Lime Point (river mile 172) a minimum of 95 percent of the time, when determined by the Chief of Engineers to be

necessary for navigation. Regulated flows of less than 13,000 cfs will be limited to the months of July, August, and September, during which time operation of the project would be in the best interest of power and navigation, as mutually agreed to by the License and the Corps of Engineers. The minimum flow during periods of low flow or normal minimum plant operations will be 5,000 cfs at Johnson's Bar, at which point the maximum variation in river stage will not exceed one foot per hour. These conditions will be subject to review from time to time as requested by either party."

The Board further finds that this requirement is still in the public interest and should be maintained without change.

Within the above management framework, each future use of water can be considered individually. Water allocations for forestry, flood damage reduction, environmental quality, urban lands, land measures, mining and lake and reservoir management are included as components of other allocations.

Water is allocated for additional new and supplemental irrigation development. A minimum level of irrigation development of 850,000 acres by the year 2020 over that which existed in August 1975 is endorsed. The location of future development is expected to be: Upper Snake - 498,000 acres; Southwest Idaho - 292,000 acres, and Lower Snake - 60,000 acres. In addition, 255,000 acres are expected to receive supplemental irrigation water. At least 1.7 million acre-feet of water will be consumptively used to meet the minimum level of irrigation development. A maximum level of irrigation development is not identified but will be determined as water supplies, economic conditions, environmental standards and protected instream water rights allow. The Water Resource Project Feasibility Planning Program is directed to assist in appropriate studies to help accomplish the identified agricultural development.

Agriculture

Water is allocated for municipal and industrial purposes. It is projected that the basin population will more than double by year 2020 and additional industrialization will occur. Water necessary to process agricultural, forest, minerals, aquaculture and other products are included in this allocation. The plan provides for 830,000 acre-feet of diversion beyond August 1975 levels to meet this growth. The diversion is distributed as follows: Upper Snake - 420,000 acre-feet; Southwest Idaho - 275,000 acre-feet; and Lower Snake - 135,000 acre-feet. The net depletion will be about 105,000 acre-feet.

Municipal and Industrial

Electric Energy

Water is allocated for electric energy. Future electric energy requirements will be largely supplied from thermal plants. The plan provides for 170,000 acre-feet beyond August 1975 levels for consumptive use in cooling thermal power plants. The depletion is distributed as follows: Upper Snake - 75,000 acre-feet; Southwest Idaho - 30,000 acre-feet. In addition, flows in the Snake River will be stabilized for the hydropower generating capability of the river.

Navigation

No specific allocation of water is made for commercial or recreational navigation. Commercial navigation enroute to Lewiston on the Columbia River and Lower Snake River can be accommodated with the flows leaving Idaho in Snake River at Lewiston. Above Lewiston, commercial and recreational navigation should be accommodated within the protected flows on Snake River and the instream flows on tributary streams, however, both commercial and recreational navigation are included as components of the multi-lake and reservoir management program.

Aquaculture

No specific allocation of water is made for aquaculture uses. Water necessary to process aquaculture products is included as a component of the municipal and industrial water allocation. Aquaculture is encouraged to continue to expand when and where water supplies are available and where such uses do not conflict with other public benefits. Future management and development of the Snake Plain aquifer may reduce the present flow of springs tributary to the Snake River. If that situation occurs, adequate water for aquaculture will be protected, however, aquaculture interests may need to construct different water diversion facilities than presently exist.

Recreation

No specific allocation of water is made for recreation. The instream flow program for fish and wildlife will provide water for recreation on tributary streams. Main stem Snake River recreation may be affected because of lower flows than presently exist particularly during summer months. Some existing reservoirs may experience greater seasonal fluctuations from increased use of stored water. The State Natural and Recreational River System and Greenway-Greenbelt System will aid and promote water-oriented recreation in the basin. Recreation is also a component of the multi-use lake and reservoir management program.

Indian Resource Use

No separate allocation of water is made for Indian resource use on the Indian reservations. Indian water needs are included as components of other water uses. Irrigation, municipal, industrial, electric energy and the instream flow program include water for Indian uses. Identification of specific needs is required before water allocations can be made specifically to Indian water uses. Several policies in the plan are designed to assist the Indian tribes in obtaining necessary information and incorporating their needs into the State Water Plan.

Fish and Wildlife

No specific allocation of water on the main stem Snake River is made for fish and wildlife, however, the plan does provide for maintaining flows on selected tributary streams to the Snake River for fish and wildlife.

Additional detailed study should be conducted on the principal streams before setting stream resource maintenance flows for fish and wildlife. Information provided by the Idaho Fish and Game Department in the report, *Stream Resource Maintenance Flow Studies, 1975 and 1976* will serve as a guide until detailed studies are complete. Completion of a State Fish and Game Plan will improve management decisions where fish and wildlife are involved. Flows in the Snake River will be less than identified as needed for fish and wildlife in some months of the year. However, significant habitat will be protected for fish and wildlife as a result of protected flows at Murphy and Weiser in the Snake River to meet other uses.

No specific allocation of water is made for water quality and pollution control. As of this date no assessment has been completed which calls for or identifies flows necessary to maintain water quality. Other policies of the plan are based upon the assumption that the water quality goals established by the Congress in P.L. 92-500, The Federal Water Pollution Control Act Amendments of 1972, will be met in Idaho. The instream flow program is directed towards meeting fish, wildlife and recreation needs, not to dilution of pollution.

*Water Quality and
Pollution Control*

The Snake River Compact, enacted in 1949, establishes the allocation of water between Idaho and Wyoming. No other compacts exist with regard to the allocation of the Snake River flows. The State of Washington has previously expressed its desire to see a minimum flow of 22,000 cfs at the Idaho-Washington boundary on the Snake River. The plan does not provide any minimum flow at that point except that which would result under the provisions of the Federal Power Commission License for Hells Canyon Dam of 5,000 cfs at Johnson's Bar. Flows at the Idaho-Washington border will be less than 22,000 cfs at times.

*Interstate
Considerations*

The major policy action of the State Water Plan is the allocation of the available and unappropriated waters of the state to meet a selected level of future water use. The State Water Plan is the legal and administrative vehicle for reserving the future use of these waters to a selected level for each water use function. The allocation procedure is particularly critical in the Snake River Basin where studies have shown that future water uses will exceed supplies.

*Administration of
State Water Plan*

Periodic reviews at five-year intervals of the amount of water allocated to the various water use functions are to be part of the continuing planning process for updating the State Water Plan to meet current and projected needs. This periodic review will enable any apparent irregularities or discrepancies in the water allocated to any particular use to be identified and needed modifications made to the State Water Plan.

The allocation process as established by the State Water Plan, therefore, is specific for each water use function and will be administratively monitored and enforced. The allocation process is not specific as to where the water uses are to occur other than within the planning region. In this way, flexibility is maintained for the public to develop, use and manage the state's available water resources to meet desirable goals and means.

The impact of future development cannot be fully described at this time. The large number and scattered location of existing permits will have profound impact and could cause beneficial or adverse effects depending on the nature of development. Because the extent to which these permits may ultimately be developed is not known, impacts as a result of the State Water Plan will vary from area to area. The plan is based on development of water authorized by existing permits as the first stage of the allocations. The second stage of development will be based on approval of new permits when and where all economic, environmental and social criteria can be met. The plan does not determine where specific agricultural development must occur nor set instream flows for fish and wildlife, but it does preserve options and provide opportunities throughout the basin. In adopting this State Water Plan there are several actions that should be taken to protect the public interest in water resources. The Department of Water Resources will include in their basic program of water inventories and data collection the following:

1. Expand the data collection program and evaluation studies on water levels and outflow from the Snake Plain aquifer.
2. Maintain and expand the state collection program and evaluation studies of streamflows where needed.
3. Monitor water use efficiency of existing and new water uses throughout the basin.
4. Complete a thorough analysis of existing permits and their impact on the aquifer and streams of the basin.
5. Report to the Idaho Water Resource Board annually (October 1 to September 30) the:
 - a) status of current water permits;
 - b) number of new permits issued, location, quantity of water permitted and impact of diversion and depletion.

In addition to these items, it may also be in the public interest to preserve or cancel permits previously granted for large scale public development. These permits should be reevaluated now and in five years when the State Water Plan is updated.

The available and unappropriated waters of the Spokane, Pend Oreille-Clark Fork and Kootenai river basins are allocated to satisfy existing and potential needs for economic development and environmental quality. This allocation recognizes and protects all existing and potential water uses and private and public rights.

Policy 33
Panhandle Basins

No special criteria are established for allocation and management of the water resources in the Panhandle Basins. Within this policy, each use of water can be considered individually. Water allocation for forestry, damage reduction, environmental quality, urban lands, land measures, mining, and lake and reservoir management are included as components of other allocations.

*Water Allocation
Criteria*

Water is allocated for additional irrigation development as follows: Spokane Basin - 78,000 acre-feet for 26,000 new acres of development; Pend Oreille-Clark Fork Basin - 30,000 acre-feet for 10,000 new acres of development; and Kootenai Basin - 102,000 acre-feet for 34,000 new acres of development and 1,000 supplemental acres. The combined net depletion is 140,000 acre-feet.

Agriculture

Water is allocated for municipal and industrial purposes. It is projected that the Panhandle population will more than double by year 2020 and that additional industrialization and suburbanization will occur. The plan provides for an additional 80,000 acre-feet of diversion and 10,000 acre-feet of depletion for municipal and industrial uses.

*Municipal and
Industrial*

Water is allocated for electric energy. Future electrical energy requirements will be largely supplied from thermal plants. The plan provides for 18,000 acre-feet of depletion from the Pend Oreille-Clark Fork River system in the Panhandle Basins for evaporative cooling of thermal power plants.

Electric Energy

No specific allocation of water is made for navigation, however, both commercial and recreational navigation are included as components of the multi-use land and reservoir management program. The instream flow program for fish and wildlife will provide water for recreational navigation.

Navigation

No specific allocation of water is made for recreation. The instream flow program for fish and wildlife will provide water for recreation in Panhandle streams. The State Natural and Recreational River System and Greenway-Greenbelt System will aid and promote water-oriented recreation in the Panhandle. Recreation is also a component of the multi-use lake and reservoir management program.

Recreation

*Indian Resource
Use*

No specific allocation of water is made for Indian resource use or the Indian reservation. Indian water needs are incorporated as components of other water uses. Irrigation, municipal, electric energy and the instream flow program include water for Indian uses. Identification of specific needs is required before improved estimates of water allocations can be made. Several policies in the plan are designed to assist the Indian tribes in obtaining necessary information and incorporating their needs into the State Water Plan.

Fish and Wildlife

No specific allocation of water is made for fish and wildlife, however, the plan does include maintaining flows on all streams for fish and wildlife. Additional detailed study should be conducted on the principal streams before setting stream resource maintenance flows for fish and wildlife. Information provided by the Idaho Fish and Game Department in the reports, *Stream Resource Maintenance Flow Studies, 1975 and 1976* shall serve as a guide until the appropriate studies are complete. Completion of a State Fish and Game Plan will improve management decisions where fish and wildlife are involved.

*Water Quality and
Pollution Control*

No specific allocation of water is made for water quality and pollution control. As of this date no assessment has been completed which calls for or identifies flows necessary to maintain water quality. Other policies of the plan are based upon the assumption that the water quality goals established by the National Congress in P.L. 92-500, The Federal Water Pollution Control Act Amendments of 1972, will be met in Idaho. The instream flow program is based on fish, wildlife and recreation needs, not on dilution of pollution. However, the program will provide quality waters throughout the basin.

**Policy 34
Bear River Basin**

The Idaho Water Resource Board supports interstate negotiations efforts to reach basinwide agreement for uniform allocation and development of the Bear River Basin resources.

The Bear River Compact which has been in effect since 1958 did not allocate developable waters below Bear Lake. Utah's potential for establishing first priority on all remaining waters in the Bear River have caused considerable concern among Idaho citizens that no water will be available to meet Idaho's future needs.

As of 1976, 18 years have elapsed since the Compact was ratified. The Bear River Compact specifies that "at intervals not to exceed twenty years, the Commission shall review the provisions of the Compact and after notice and public hearings, may propose amendments to the provisions." Compact review has been initiated by the states of Idaho, Utah and Wyoming. For purposes of guiding the review process, the Idaho Water Resource Board declared as policy that the Idaho negotiation team seek to obtain as much of the unconsumed flow entering the Great Salt Lake as possible for Idaho

while negotiating in good faith with other states. Any recommendations reached by the negotiations team will be reviewed by the citizens of the Bear River Basin and must be formally approved by the legislature, the Governor, and the Congress of the United States before they become law.

In considering possible revisions that would benefit Idaho citizens, Idaho's position is that all present water uses for irrigation be protected and water rights for power generation during spring and winter would either be subordinated or compensated.

Any new water available through the negotiation process as Idaho's entitlement will consider first satisfying areas needing supplemental water where financially feasible and then new lands.

Determination of available water for new uses of the Bear River has to be made so that allocations for future growth and environmental quality protection can be implemented.

The water allocations should be made basinwide so that all interest will be able to receive equal consideration. The allocations for Idaho will be studied and proposed after the negotiations between the states are completed.

Basin Management Policies - Panhandle Basins

The following rivers should be included in the State Natural and Recreational River System initially, based upon information available from Federal Wild and Scenic Rivers studies:

1. *St. Joe - in its entirety;*
2. *Priest - the upper river from the Canadian border down to the large Priest Lake;*
3. *Moyie - in its entirety.*

Policy 35 State Natural River Designation

The St. Joe, Priest and Moyie rivers are under study by the U.S. Forest Service for inclusion in the National Wild and Scenic River System. Available data indicates that these rivers have unique characteristics and values which merit their consideration for preservation in a free-flowing condition. Based on ongoing studies, these rivers should become the initial components of the recommended State Natural and Recreational River System.

Policy 36
St. Joe River

The St. Joe River from St. Joe Lake to Beedle Point should be included in the National Wild and Scenic Rivers System upon failure of the state to adequately protect the river's free-flowing values by July 1, 1978.

The St. Joe River in the Spokane Basin reflects the scenic beauty, historical variety and fish and wildlife quality that forms a large portion of the heritage of Idaho. It is a major waterway within Idaho and the nation, and is worthy of an individual and specific management plan.

The St. Joe River in its entirety should be placed in a State Natural and Recreational River System for management and enhancement of its free-flowing values. However, upon failure of the state to offer adequate protection, or the inability of the state to successfully develop, fund, and operate such a system, the river should be included in the National Wild and Scenic River System.

The entire 132.1 miles of the St. Joe River qualifies for inclusion in the National Wild and Scenic River System. The river is outstandingly remarkable and its free-flowing condition, water quality, scenery and other associated qualities are worthy of protection. National legislation should be enacted that would add the upper 72.8 miles of the St. Joe River from St. Joe Lake downstream to the St. Joe National Forest Boundary to the National Wild and Scenic River System, to be administered by the Secretary of the U.S. Department of Agriculture.

The lower 59.3 miles between the St. Joe National Forest boundary and Beedle Point should become part of the National System and administered under a specific plan developed by the state and local governments. The Wild and Scenic Rivers Act recognizes varying river character and levels of development. Based on these differences, this recommendation proposes that the segments of the St. Joe River within the National Forest be classified as follows:

Wild

St. Joe to Spruce Tree Campground	26.6 miles
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Recreational

Spruce Tree Campground to National Forest Boundary	46.2 miles
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The segments outside the National Forest Boundary should be classified as follows:

Scenic

Falls Creek to Bells Lake	15.1 miles
Mission Point to Beedle Point	<u>6.4 miles</u>
	21.5 miles

Recreational

National Forest Boundary to Falls Creek	25.5 miles
Bells Lake to Mission Point	<u>12.3</u>
	37.8 miles

Funding for development of the Management plan for the lower 59.3 miles of river should be provided by the Water Management Fund as outlined in Policy 31.

The State of Idaho should sponsor a joint federal-state-private stream channel stabilization and revegetation project(s) in the South Fork Coeur d'Alene River drainage. Funds should be provided from the Rehabilitation Fund, discussed in Policy 31 for this project(s).

**Policy 37
South Fork Coeur d'Alene
River Rehabilitation**

The South Fork Coeur d'Alene River drainage has produced a tremendous volume of minerals and contributed greatly to the development of the state and to the Emerald Empire-Panhandle area. However, this has caused significant environmental degradation. The South Fork, due to its location and the severity of environmental problems, should receive immediate attention. Monies should be appropriated from the Rehabilitation Fund as outlined in Policy 31 to insure state participation and be in the amount of \$200,000.000 per year for a period of ten years. This revenue should be used as matching funds for federal, local and private efforts.

Conclusions

The preceding policies constitute the central theme of the State Water Plan. As noted, many of the policies are oriented toward changes in existing law which would result in more efficient management and utilization of state water.

There are numerous other considerations which form a part of the State Water Plan. These considerations are discussed in the functional conclusions and are realistic solutions to identified problems and issues.

These considerations apply to several major subject areas. Some deal principally with economic activity but include significant amounts of social well-being and environmental quality. Other subject areas deal principally with environmental quality. They in turn include a mix of social well-being and economic development.

There are 19 water related and water use subject areas including: forestry, aquaculture, fish and wildlife, agriculture, navigation, flood damage reduction, electric power, environmental quality, municipal and industrial, recreation, Indian resource use, water quality, urban lands, land measures, mining, lakes and reservoir management, interstate considerations, international considerations, and studies and research. Each of these topics is discussed below.

The forestry resource and the public and private lands which support it must continue to be used to meet the uses the land has supported in the past. These uses are timber production, recreation, forage production for wildlife and livestock, fish production in the streams, and water yield for downstream uses. Also, recognition must be given to basic environmental consideration, including aesthetics, water quality, rare and unique species, geological, historical and archaeological resources. In other words, the long-standing multiple-use concept must be continued, and expanded to include recognition of new uses and responsibilities. All of those things must be accomplished in spite of a wide array of problems. Those include a decrease in the forest land base and in areas available for commercial harvest, new constraints on the manner of harvesting, and an apparent trend toward continuation of those conditions.

Forestry

Plan elements which would accomplish those results are summarized in the following paragraphs.

Timber production must be continued, except in areas set aside for preservation as wilderness and primitive areas. Production depends on harvesting methods, reforestation, and rate of growth. Harvesting must be accomplished so as to minimize environmental and resource damage, particularly soil erosion and damage to existing growing stocks. Also, water yield should be maintained or increased by reducing evaporative loss from

snow packs and increasing infiltration of rain snowmelt. Those considerations will require careful planning and construction of access roads, and proper location and extent of harvest areas.

Forest recreation generally involves both the environmental quality of the forest setting and some recreational use or uses of water. Maintenance of environmental quality includes protection of specific areas and road building and harvesting practices, regulation of grazing for retention of ground cover, rotation of use as harvest regrowth occur, and provision of appropriate facilities and regulation of levels of recreation use. Selection and development of areas and facilities for recreation use should take into consideration the location and conditions of access from major population centers and transportation routes used by tourists. Provision should be made, on forest lands, to cover a wide range of uses and use intensities. Facilities should include those appropriate for heavy, concentrated day use near population centers, for overnight camping in more remote and less developed areas, and for trail access and limited to day use development in wilderness and primitive areas.

Both livestock and wildlife depend, in part, or in season, on forest lands and cover for food and shelter. The management practices discussed for timber production generally tend to maintain both habitat aspects, and to provide for access to wildlife populations for consumptive (hunting) and non-consumptive (viewing and photograph) uses. Irrigation of forest lands to increase vegetative and timber growth is a potential, but not considered as a general practice. Instead in those cases where past overgrazing or other uses have damaged or destroyed vegetative cover, ongoing programs of land management and land treatment should be continued and in some cases accelerated.

Fish production needs in forested areas generally respond to measures which are beneficial to water yield and water quality. Additional measures include preservation of a shelter corridor, or forest canopy, along streams and minor tributaries which maintain proper water temperatures, removal of log jams and other barriers to fish passage. Other items are discussed under fish and wildlife.

Aquaculture

Aquaculture is the practice of raising fish and shell fish in closely managed habitats. As considered in this report, aquaculture includes both the raising of fish for commercial purposes and conservation purposes, that is, hatcheries for stream and lake stocking. In 1974 there were 28 commercial fish farms, 1 commercial pond, 3 federal and 17 state hatcheries operating in the Snake River Basin. Most of the commercial operations are located near the Snake River in the Twin Falls-Hagerman area and in the American Falls-Pocatello area. Two of the federal hatcheries are located in the Clearwater River drainage and one in the Hagerman area. The 17 state hatcheries are scattered throughout the Snake River Basin with three in the Twin Falls-Hagerman area and one in the American Falls area. Three additional state hatcheries are located in portions of the state outside of the Snake River Basin.

1973 records indicate that an estimated 19 million pounds of rainbow trout were produced by commercial fish farms in Idaho. This was about 90 percent of the U.S. production of processed rainbow trout. In 1973 over 37 million live fish were distributed to streams and lakes by federal and state hatcheries most of which are located in the Snake River Basin. Projections of future aquaculture production have not been made, but it is assumed that demand will grow at least at the national population growth rate and that Idaho will maintain its present share of the national commercial production while meeting conservation requirements.

The primary considerations for the location of an aquaculture facility appears to be the availability of a large water supply which has the quality and temperature suitable to the desired specie of fish. The availability of such water in the vicinity of the Snake River from Pocatello to Hagerman is the principal reason for the concentration of aquaculture facilities in that area. Because of these requirements, the water conditions in Idaho have categorically met the needs for high quality trout production. The three major sources from present fish farms come from:

1. The Hagerman Aquifer - 1,662 cfs
2. Aquifer located south and west of the Snake River - 113.8 cfs
3. Other sources - 409.1 cfs

Within the "other sources" category is the water that supplies the Caribou Trout Ranch located near Soda Springs. The source of the water is Big Springs Creek, its water temperature is 47 to 57 degrees Fahrenheit and its flow is between 22.7 and 30.0 cfs. The water temperature is slightly cooler than the Hagerman area flows making it an ideal habitat for fish egg production rather than fish production.

Based on commercial fish farm data and present practices of single-pass flows, one cfs can support an annual fish production of approximately 10,000 pounds. Aquaculture is a non-consumptive water use in that nearly all of the water used is passed back into streams or is available for other uses.

Factors affecting future aquaculture growth, particularly the commercial industry are:

1. **Water resource development.** More efficient upstream water use and system management plus additional groundwater pumping will have an effect on the Snake Plain aquifer, the source of most springs along the Snake River. Full impact cannot be projected until development is located on specific sites. Annual reports of the impact of new development will reveal trends on water levels and flows, thereby allowing future decision makers the option of changing development policies.
2. **Federal limitations on effluent quality.** Improvement in pond design and construction and implementation of new practices will be necessary to offset the costs of effluent treatment facilities.

3. **Management practices.** Except for the more recently constructed fish farms, the industry in Idaho is operating in much the same way as 20 years ago. Changes to effect more modern practices would result in a better product at less cost of production.

As the aquaculture industry expands, it probably will be necessary to locate in areas not served by existing suitable spring flows. Water for such expansion would probably be obtained from groundwater sources. This presents several problems: added facility and operations cost, treatment of effluent prior to discharge back to a stream or the aquifer, and necessity for standby pumping equipment to provide water in the event of power failures. With proper location and with adequate soils and terrain, an aquaculture facility may be combined with an agricultural development to the benefit of both. Fish water effluent would be stored or effluent treatment provided during nonirrigation seasons.

Aquaculture is important to Idaho. Water supply problems will increase in future years as the Snake Plain aquifer is developed for other purposes. State sponsored aquacultural research programs would be of benefit and would assist in alleviating some of the design, management, sales promotion and other problems that now occur. Research programs would also be beneficial in formulation and implementation of multi-purpose aquaculture-agriculture projects.

Fish and Wildlife

The state contains large mountainous areas that are generally forested, large expanses of irrigated and dry-farmed agriculture lands and considerable areas of rangeland. Streams, rivers, lakes and reservoirs are scattered throughout the basins. Under these conditions, even though development for other uses has resulted in loss and deterioration of habitat, significant fishery, upland game, big game and waterfowl resources are available. In 1974, about 850,000 fishing and hunting licenses were sold in Idaho, many to out-of-state residents. Also, in 1975 it is estimated that people participated in approximately 10,400,000 activity days fishing and hunting within the state. That level is projected to increase approximately 50 percent by the year 2020.

A principal problem so far as protection and preservation of water resources for fish and wildlife is the lack of authority to do so. The recent Malad Canyon decision of the Idaho Supreme Court in December, 1974, answered three important questions regarding instream flows. Among other findings the court held that: (1) there could be beneficial uses other than those listed in the Constitution; (2) that in the specific case before them, the Idaho legislature had considered scenic and recreational uses to be beneficial uses of water; and (3) the actual diversion of water is not required in establishing a beneficial use of water when so provided by the legislature. Since this decision of the Idaho Supreme Court no additional legislation has been enacted.

In recent years the Idaho Fish and Game Department has negotiated minimum flow releases from several reservoirs. However, these flow releases are stop-gap measures and only provide a partial solution on streams below reservoirs. As additional development occurs, and the state's population grows, additional pressures will be put on water supplies needed for fish and wildlife resources. Under these conditions, fish populations and the fisherman's success will decline. Preservation or restoration of instream flows to maintain fish and wildlife resources would be an essential step at the state level to solve fishery and other instream flow problems. Regardless of establishment of streamflows, more intense management will be required to fully utilize the remaining resources.

The primary water resource considerations for fish and wildlife encompass the following:

1. Protection and restoration of anadromous fish runs;
2. Maintenance of streamflow for warmwater and coldwater fish;
3. Maintenance of streamflow to protect wildlife resources in and near streams;
4. Protection of critical big game winter habitat.

Anadromous fish runs in Idaho have been limited by dam construction to part of the Clearwater River drainage, the Salmon River drainage, and the Snake River up to Hells Canyon Dam. The salmon and steelhead migrating to this area encounter many problems including the passage downstream over dams, the commercial fishery of Oregon and Washington in the Pacific Ocean and lower Columbia River, the Indian fishery pressures in the lower Columbia River, and the sport fishery in the states of Oregon and Washington. The anadromous fishery resource is important economically and provides an attraction to tourists and fishermen. The Idaho Fish and Game Department closed the sport season to Idaho fishermen for salmon during the 1975 season due principally to the low number of returning adult fish. Biologists are optimistic that a downstream passage problem over dams is near solution, and Idaho can expect larger and more stable returns in the near future. Resource maintenance flow estimates for anadromous fish in Idaho are limited to the Snake River and releases from Hells Canyon Dam. In a recent interagency study, the range of flows necessary for the desired salmonid fishery in Hells Canyon was estimated to be from 12,000 cfs to 23,425 cfs. Flows of this magnitude conflict with existing as well as additional upstream development. Flows below Hells Canyon Dam will continue to fluctuate and decline as upstream agricultural development continues. The apparent most significant water management objective for anadromous fish is the maintenance of a freshet flow at Lewiston. Flows as large as 85,000 cfs for a 60 day period are believed necessary to move smolt

Anadromous Fish Runs

downstream. Storage at Brownlee Reservoir on the Snake River and Dworshak Reservoir on the North Fork Clearwater River could be used to help achieve the desired flow. Because of more natural streamflow conditions, the Salmon and Clearwater rivers will probably sustain natural propagation whereas the Middle Snake flows will require artificial propagation. Mitigation of fishery losses on the Lower Snake River were authorized in 1976. The principal features of the mitigation plan are oriented to reestablishing viable anadromous fish runs into Idaho. The plan provides \$58 million for 4 new hatcheries to return to Idaho 48,000 spring and summer Chinook Salmon. Also the hatcheries will provide for returning 41,000 summer Steelhead to the Clearwater and Salmon River Basin.

*Maintenance of Stream-
flow for Warmwater and
Coldwater Fish*

Virtually all waters of the state contain some fishery resource. Principal problems in utilizing the resource for natural reproduction is loss of habitat due to dewatering of streams or fluctuating reservoirs. In recent years, public opinion polls in Idaho demonstrated there is a great public concern for maintenance and protection of fish and wildlife resources. Principally, flows are required for fish, however, there are some upland game and wildlife that require instream flows to protect their use of stream resources during critical periods in life cycles. The Idaho Department of Fish and Game in the report, *Stream Resource Maintenance Flows, 1975*, provided a statewide assessment of water requirements for fish and wildlife.

Water supply for instream flows is more readily provided on tributary streams than on the large rivers of the state. The instream flows estimated for the large rivers are so large that they cannot be met under existing conditions and thus will be further stressed as additional development occurs.

*Maintenance of Stream-
flows to Protect Wildlife
Resources in and Near
Streams*

Some classes of wildlife utilize stream resources in the life cycle, including upland game during the spring nesting season. Flows have been estimated for these periods and are identified in the report entitled, *Stream Resource Maintenance Flows, 1975* with the instream flows required for fish. More intense management may overcome deficiencies in protecting wildlife resources when streamflows are not available.

*Protection of Critical
Big Game Winter
Range*

Hunter pressures for big game have increased throughout the state. Big game winter habitat is becoming increasingly important. Future development such as reservoirs, recreation, and agricultural should be cognizant of the fact that big game inhabit much of Idaho's lowlands during winter months and adequate habitat should be left for that purpose. An Idaho Fish and Game Department inventory of big game winter range would greatly assist in protection of the resource.

Fish and wildlife aspects of water resource planning are limited due to a lack of methodology to determine specific water requirements for fish and wildlife at various periods of the life cycle and on large and small streams. A statewide plan providing management objectives for fish and game in relation to the state's streams would be helpful in protecting critical habitat. However, the Clearwater and Salmon rivers should be maintained free-flowing and all efforts be extended to improve the anadromous fish runs into Idaho. While anadromous fish and sturgeon utilize the Snake River below Hell's Canyon Dam, no minimum flows are recommended for fish and wildlife. However, the present minimum releases from Hell's Canyon should be continued at 5,000 cfs and additional study be conducted to refine fishery needs. The Idaho Fish and Game Department is encouraged to prepare a statewide fishery and wildlife resource plan by stream reach so that water resources can be protected if determined to be necessary and other agencies and private citizens can cooperate in this endeavor. It is concluded that Idaho should maintain and restore tributary instream flows rather than concentrate on the Snake River main stem flows. Information available reveals that the range of flows identified for the main stem if adopted would essentially eliminate all future agricultural development in the basins. An important consideration, however, is to adopt a procedure for the establishment of streamflows by the Idaho Water Resource Board.

In addition to the primary fish and wildlife considerations discussed above there are other aspects that should be considered in the near future. These are:

1. **Protection of existing marsh lands.** In several areas throughout the basins there are marsh lands that provide outstanding wildlife habitat when properly managed and protected. In many cases most of the land is privately owned, public access is severely restricted and the possibility exists that water flows creating these marshes may in the future be diverted for other uses. These marsh lands should be protected to maintain the wildlife habitat and access to the public should be provided. This could be accomplished by land acquisition, obtaining easements, or, in some cases, the establishment of greenways or greenbelts.
2. **Wildlife considerations on existing and future agricultural developments.** In recent years the trend toward "clean farming" the elimination of fenced rows and other wildlife cover areas, has resulted in a decrease in gamebird populations. It is proposed that blocks or strips of land adjacent to irrigated areas be set aside and managed exclusively for wildlife purposes. Future irrigation of federal or state lands should provide for set-aside areas for this purpose. On existing irrigated areas acquisition of land could provide the desired wildlife strips. Other proposals suggest that open drains, seep areas or constructed ponds adjacent to waterways be dedicated to enhancing wildlife.
3. **Minimum pool levels for fish in private reservoirs.** In many privately owned reservoirs there is an existing fishery that can be

severely damaged by drawdowns to a nearly empty condition. This recommendation proposes agreements be made with reservoir owners to provide minimum pool levels which will permit survival of the fish population. Compensation of one type or another would probably be required in most cases to accomplish this.

4. **Greater public access.** Throughout the basins there are many areas that could provide excellent fishing and hunting except that public access is limited. The recommendation is made that greater public access be provided in such areas, either through acquisition of lands, easements, or establishment of greenways or greenbelts.
5. **Fish screens at diversion structures.** Many irrigation diversions from streams and rivers do not have screens to prevent entry of fish into waterways that become dry after the irrigation season ends. Although actions are now being taken to prevent fish losses by installation of screens, the recommendation is made that this program be accelerated.

Agriculture

Irrigated agriculture uses 7 percent of the state's land and produces 85 percent of the total agricultural returns. One-third of the irrigated land is sprinkled and one-fourth of the land is irrigated from groundwater. Conversions to more efficient systems are also occurring in the older irrigated areas which make water available for other uses.

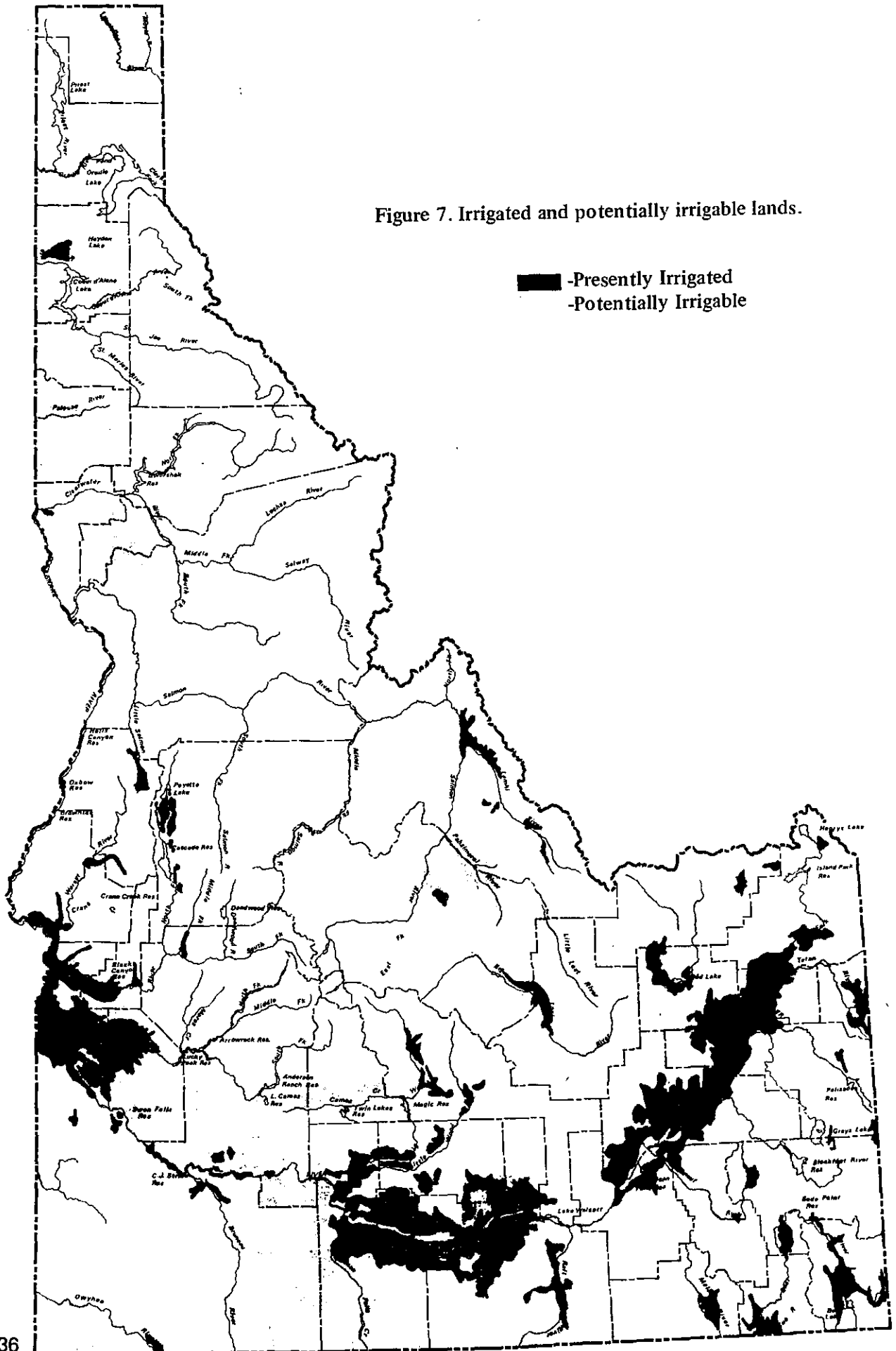
There are approximately 8 million acres of land within the state presently without a water supply which have been classified as having a potential for irrigation. Figure 7 shows the general location of existing and potentially irrigable lands.

The projected need for agricultural land to fill the national demands for additional food production have been made. The national projections were then disaggregated to states based on historical shares of the market and available land and water resources. These projections are based on (1) the current U.S. population birth rate which will result in zero population growth between the year 2030 and 2040, and (2) an increasing export demand. Also included in the projection is a 40 percent increase in per acre crop yield for rangeland, dry-farm land and irrigated land. A part of the projection assumptions is the maintenance of current diet level and per capita consumption.

The projected new irrigated land area demands within Idaho are 987,000 acres between 1974 and 2020. Farm building areas, roads, ditches and waste areas that receive some water will reduce cropped acreage to about 860,000 acres. The proposed plan also includes furnishing water to 379,000 acres of the 656,000 acres needing supplemental water. The distribution of these lands by basin is estimated in acres:

Snake River Basin		
Subarea	New Land (acres)	Supplemental Water Land (acres)
<i>Upper Snake</i>		
South Fork	-	-
Henry's Fork	82,000	34,000
Heise-Neeley	141,400	6,800
Neeley-Milner	72,000	20,100
Northside		
Streams	108,600	36,700
Westside	94,000	67,400
Subtotal	498,000	165,000
<i>Southwest Idaho</i>		
Bruneau	166,000	-
Boise	98,000	-
Payette	10,000	23,000
Weiser	8,000	7,000
Owyhee	10,000	-
Subtotal	292,000	30,000
<i>Lower Snake Idaho</i>		
Upper Salmon	24,400	54,400
Salmon	-	5,000
Clearwater	18,800	600
Palouse-Lower		
Snake	16,800	-
Subtotal	60,000	60,000
Total	850,000	255,000
Panhandle Basins		
Spokane	26,000	-
Pend Oreille-Clark Fork	10,000	-
Kootenai	34,000	1,000
Total	70,000	1,000
Bear River Basin		
Bear River	67,000	123,000
Idaho Total	987,000	379,000

■ -Presently Irrigated
■ -Potentially Irrigable



The subareas are shown on Figure 8. Groundwater will be the primary source for the development of one-half of the projected lands. Large government-sponsored project developments are anticipated to be used only in the period 2000 to 2020, except for major projects to provide supplemental water to the Salmon Falls and Oakley Fan areas near Twin Falls plus development on the Fort Hall Indian Reservation of 15,000 acres.

New water right permits diverting in the Murphy reach would be limited in the low flow months of July and August so as not to cause reduction in flows at the Murphy gage to be below those which would result from the plan in order to protect hydropower water rights. Because this flow is only about 40 percent of identified fish and wildlife flow needs, no instream flow designation for fish and wildlife is proposed.

The limiting of future appropriations from this reach during the lowest flow months, however, will still allow the level of development described in the State Water Plan. Studies indicate that sufficient water can be obtained from existing water supplies made available through the Water Bank, from off-stream storage, upstream water conservation, and from groundwater pumping to support the additional consumptive water uses. To allow development to deplete the river at Murphy would decrease electrical energy production from the Snake River hydropower facilities beyond that reduction identified in the plan. The proposed limit in new diversion during low flow months is designed to encourage the development and/or use of other available water supplies first.

There is concern in the Kootenai River Basin regarding possible problems in adapting to the changed flows caused by the Libby Project in Montana. Agricultural drainage systems within diked areas in Kootenai Valley may need modification to handle local runoff and river seepage when river flows are high because of power and flood control releases. Portions of the valley may lose some of the sub-irrigation which now results from high river stages during the spring and early summer. New or additional water supplies may be needed. This problem should be given further study in light of other proposed dam and reservoir facilities on the Kootenai system.

The water supply of the Bear River Basin for agricultural use is limited. Additional storage is possible, but it would be costly. The U.S. Bureau of Reclamation has studied several sites throughout the entire length of the Bear River and its tributaries. Most projects would require interstate cooperation and support before construction could begin. Negotiations between the three states should be completed before a final plan can be determined. It is presently estimated that 67,000 acres of new land and 123,000 acres of supplemental land should be developed.

Agricultural expansion problems are numerous and all must be solved before effective and efficient development can occur. The principal problems are:

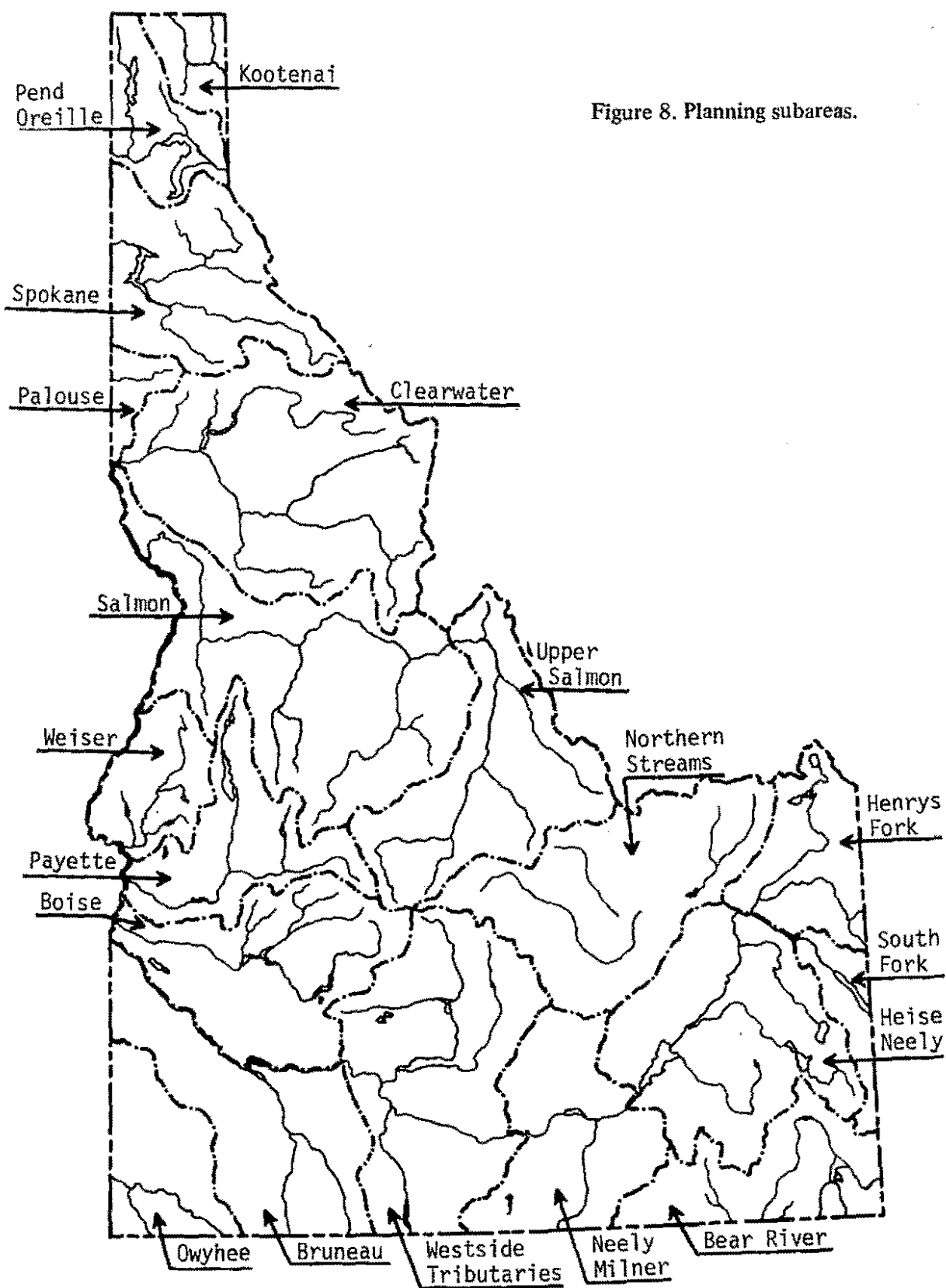


Figure 8. Planning subareas.

1. Availability of water
2. Availability of land
3. Availability of energy
4. Environmental effects
5. Availability of funding

Water supplies for agriculture must be dependable and readily available. Historically, Idaho irrigated agriculture encountered numerous supply deficiency problems during the 1930's and all water supplies are now measured against the possibility of that dry period reoccurring.

*Availability
of Water*

There are approximately 8,500,000 acres capable of irrigation development in the state. Ownership of the potentially irrigable lands is mostly federal with small state and private holdings. Lands exceed water supplies in the Snake and Bear River basins and the problem then becomes how to transfer lands from public to private ownership. The most effective method is the Desert Land Entry program. About 1,500,000 acres have been developed under this Act and 200,000 acres are presently filed on. The Carey Act of 1894 which allows 160 acres to an adult individual is currently the most intensely sought after land program in Idaho. There are 141 active project applications encompassing 600,000 acres under review by state and federal authorities. Reclamation homesteads will be limited to large or isolated project actions. Idaho should seek to preserve all current federal land programs in order to maintain reasonable development opportunities.

*Availability
of Land*

New agricultural development in the state will require large amounts of electrical energy. Since 1950, electric energy consumption for irrigation has increased at a rapid rate, and is presently about 10 percent of the total electrical energy sales in the basin. It is estimated that 2,000 MW of new capacity will be required to meet the projected 2020 irrigation development. Agricultural energy requirements will be needed for:

*Availability
of Energy*

1. Pumping of groundwater
2. Pumping directly from the river
3. Conservation programs
4. Replacement for power loss at hydro-dams

The majority of new agricultural land development will involve high water use efficiencies with little waste land within field boundaries. Water savings projects could reduce wildlife habitat because of lowering of water levels and removal of current waste lands from fields. Development will need to take place under carefully planned criteria to insure that environmental values are maintained.

*Environmental
Effects*

Availability of Funding

Financing new agricultural development to year 2020 could require as much as 1 billion to 1.2 billion dollars. Conservation programs could require as much as a 500 million dollar investment by 2020. It is expected that the bulk of monetary needs will be supplied by private investors if a reasonable agricultural market continues. Public financing will be needed for research, pilot projects, efficiency programs and for large multi-purpose projects.

Idaho has the option to capture a larger share of the agricultural market. If that decision is made, additional management alternatives and large projects would need to be considered. Alternatives to consider for higher acreage alternatives include:

1. Groundwater should receive first priority as a water source for new development as the direct impact upon river flow is much less.
2. The groundwater development priority includes an agricultural land lease program to be initiated within the boundary of the Idaho National Engineering Laboratory (INEL). These trial leases would be for ten years on fringe areas where grazing is presently allowed. The trial area should be limited to those better boundary lands located approximately in the northern half of the INEL. Criteria would not allow permanent buildings or building of any fences to hinder wildlife. Areas needed for wildlife migration would be left open and the leasee would provide and maintain certain wildlife cover and feed areas. Other conditions may be needed.
3. Groundwater wells would be constructed over portions of the Snake River Plain aquifer and pumps installed for use on a standby basis for low water runoff years.
4. Sale of contracts for existing reservoir-stored water should be allowed. If the transfer of these contracts held by the Bureau of Reclamation is allowed and encouraged, users of water will tend to become more efficient. Removing transfer restraints will speed movement into other uses including environmental uses.

Navigation

Commercial navigation, as it applies to the Snake River and Idaho, is primarily concerned with that on the Snake River in the vicinity of Lewiston. With completion of the Lower Granite Dam and Lock on the Snake River in 1975, an inland waterway extending 465 miles from the Pacific Ocean to Lewiston was completed. At the present time barges with about 1,400-ton capacity utilize this waterway but it is expected that in the future most barges will have capacity for about 2,400 tons. The present small plan dimensions of the Bonneville Dam Lock now makes use of the larger barges more time consuming and difficult. Port facilities are being constructed at Lewiston and at nearby areas in Washington. It is possible to construct navigational facilities further up the Clearwater and Snake rivers from Lewiston, but it is not considered probable that they would be warranted in the near future.

There is presently a minor amount of commercial navigation and an increasing amount of recreational navigation on the Snake River from Lewiston upstream to Hells Canyon Dam. The greatest problem affecting navigation is probably the variations in streamflow caused by upstream peaking operations during summer months. At the present time, the Federal Power Commission license for the Hells Canyon Complex requires a minimum release of 5,000 cubic feet per second (cfs) during periods of low flow or normal minimum plant operations provided that the stipulated minimum flow of 13,000 cfs at Lime Point (located about 15 miles downstream from the mouth of the Salmon River) is not violated more than 5 per cent of the time if needed for navigation. Although definitive studies of flow requirements for navigation in the Hells Canyon reach of the Snake River have not been made, it has been estimated that flows ranging from 5,000 cfs to 10,000 cfs, depending upon the type of boat, are required. Upstream consumptive water use will not be constrained to provide minimum flow for navigation below Hells Canyon Dam. With the recommended plan it is anticipated that flows less than what appears necessary for navigation could occur in extremely low runoff years.

There have been boating accidents and loss of life in the Snake River below Hells Canyon Dam, and an interest expressed to improve the river channel in the more dangerous reaches of the river. Such action would create safer navigation under conditions of low flow. Another suggestion for improvement of navigation in this segment of the river is the construction of a regulating reservoir to smooth out river fluctuations caused by power peaking operations.

Recently, the federal government has extended additional management and control of the state's water resources through the Federal Water Pollution Control Act Amendments of 1972 and a redefinition of the Refuse Act of 1899. Under provisions of these Acts, the Corps of Engineers has been given authority to regulate disposal of dredged or fill material in the waters of the United States. Principal concern of the state is the definition of waters that are determined to be navigable and the rules and regulations that the Corps and the Environmental Protection Agency will establish. In addition, the question of navigational servitude is untested and unknown in terms of impact on the state's water resources. Historically, in the eastern United States, courts have held that sufficient waters must be maintained in streams and appropriate facilities provided if a river is determined to be navigable. However, this question has not been determined in Idaho, and the most critical area for consideration is the Hells Canyon area of the Snake River.

As a consequence of admission to statehood under the equal footing with original states doctrine, Idaho gained title to the beds of all navigable waters which existed on July 3, 1890, subject to the laws and Constitution of the United States, and Indian rights of property recognized but not extinguished by treaty with the United States. This was further clarified by passage of the Submerged Lands Act of 1953, wherein Congress confirmed title to the beds and natural resources of all inland navigable waters to the state, subject only to the constitutional authority of the federal government

to use lands and waters for navigation, flood control, and power production. This servitude, as expressed by law, was not deemed to include "proprietary rights of ownership, or the rights of management, administration, leasing, use and development of the lands and natural resources" which are assigned to the states. Numerous court decisions have upheld this doctrine.

Given this legal precedent, the policy of the state is that the title to all bodies of water which were used, are presently being used, or were capable of being used for navigation remains with the state. This title includes the rights of management and administration as well as property and ownership. The State of Idaho should take action to determine the limits of federal administrative authority. Implementation of this recommendation should enable the state to do what it wishes with the beds and resources of navigable waters. It also should establish a basis for the payment of compensation to the state for property lost to federal purposes for uses other than those allowed by the U.S. Constitution.

Flood Damage Reduction

Some type of flooding occurs throughout the basins nearly every year with only the degree of damage varying from year to year. Flooding normally occurs because of spring snowmelt, many times with rain, winter rain on frozen ground, and summer storms. Many of the flood plain areas subject to flooding are urban and the potential for damage is high while other areas are essentially agricultural lands, or the flood frequency is less. Other facilities often damaged are highways and roads and occasionally portions of irrigation distribution systems. The principal areas affected by existing or potential flood damages are shown in Table 18.

Feasibility studies should be completed and corrective measures implemented to reduce potential flood damages.

The growing overall flood problems of the nation prompted Congress to enact the Flood Disaster Protection Act of 1973. Local units of government must zone and control identified flood prone areas in order to be eligible for most federal assistance programs including mortgage loan insurance. This program regulates construction of buildings and related facilities within areas subject to flooding from the 100-year flood. Along with zoning and control of flood plain areas is the opportunity to purchase federal flood plain insurance. Such insurance only protects existing facilities and would require that their replacement comply with zoning regulations the same as new facilities.

Greater understanding of the state's flood damage potential would result if, when property is located in an identified flood plain, that fact was recorded so it would be identified on the title report and title insurance. Also the buyer should sign an acknowledgement that he understands the area is located in a flood plain. A person owning or purchasing land may be unaware that such land is in a flood plain. The hazards of flood plain occupancy and the obligations that may be imposed by restrictions on construction on flood plains are pertinent information to property owners

Table 18. Rivers with Flood Problems and Average Annual Damages.

River	Average Annual Damages
1. Big and Little Wood Rivers	\$600,000
2. Lower Boise River	400,000
3. Mud Lake area	400,000
4. Clearwater Tributaries and Main Stem	300,000
5. Placer and Pine Creeks and Coeur d'Alene River	200,000
6. Portneuf River	200,000
7. Sand and Willow Creeks	200,000
8. Boise Front Streams	200,000
9. Heise-Roberts area of Snake River	200,000
10. Weiser River	100,000
11. Coeur d'Alene Lake	100,000
12. Pend Oreille Lake	100,000
13. Blackfoot River	100,000

and potential purchasers. Recording flood plain information will insure that the owner or buyer is adequately informed.

A number of private irrigation reservoirs may possibly be operated to reduce flood damages in downstream areas. Examples are Mackay Reservoir on the Big Lost River, Portneuf Reservoir on the Portneuf River and Magic Reservoir on the Big Wood River. Studies of the feasibility of altering the operation of these reservoirs to achieve greater flood control should be completed, and a list of priority projects prepared. Compensation to cover additional costs or adverse effects would be considered during each individual study effort.

Flood control levees built with federal funding are normally turned over to local entities to maintain. The degree of maintenance varies with the capability and diligence of the responsible organization. Levees built under emergency conditions sometimes have no provision for maintenance and deteriorate to the point of being unsafe and subject to failure at high water. A false sense of security may result for those with property behind such levees and the potential damage may be greater than if the areas were unprotected. A program of periodic inspection by the state as an adjunct to its program of dam safety inspection would insure that levees are inspected periodically and a minimum set of safety standards are met.

The two normally considered methods of reducing flood damages are referred to as structural and non-structural. Structural methods include construction of flood storage, levees, and by-pass channels, and non-structural methods involve flood plain zoning and flood insurance. It is recommended that non-structural methods over structural where possible be given priority.

Electric Power

Electric power use will continue to grow the next 50 years. The Idaho electric energy growth rate is projected to be about 4.5 percent per year during that time. The past growth rate between 1950 and 1973 has been about 8.3 percent. The 1973 average generation requirement for the state was about 1,300 megawatts and electricity used was nearly 12 billion kilowatt hours. The projected average generation requirement for the year 2020 is about 10,630 megawatts with a use of approximately 93 billion kilowatt hours.

In contrast, 1973 power generation within the state averaged only about 855 megawatts with a production of only about 7½ billion kilowatt hours. The balance of the 1973 power requirements was imported from sources outside of Idaho. Installed capacity is normally about 20 percent higher than the peak load in order to provide service during maintenance time and generator failure.

The additional water uses contemplated in the plan will reduce the average annual hydropower generation in the Snake River in Idaho, including Hells Canyon, by 824,400 megawatt hours, or about 9 percent. Average hydropower generation during August would be reduced by about 127,000 megawatt hours, or about 21 percent.

Projected power needs are planning guidelines to insure that water is available rather than goals which must be met. To meet the state's objective of reducing reliance on imported electric power, however, considerable in-state sources of power will be needed in the future. If those sources are not developed, reliance will have to continue to be placed on imported power or some of the projected load will not be met.

Three potentials for meeting electrical power needs have been analyzed:

1. Hydroelectric power plants,
2. Thermal power plants, and
3. A mix of hydroelectric and thermal power plants.

There is a physical potential to develop significant additional water power resources in the state. During the critical low flow period, major new dam and power plant sites within the state could generate, along with the present hydroelectric plants, 1,900 average megawatts of electric energy. These sites include dams on the Lower Salmon and Lower Snake in Idaho. Only one-half of the Snake River power production on Oregon border is included. The entire hydroelectric potential in the state, including the present production, is 7,000 average megawatts. This potential, however, will not meet the state's projected added needs of 9,775 megawatts through the 50-year planning period.

In the thermal-only alternative, thermal power plants would provide the entire 9,775 megawatts of new facilities. The maximum generation capability would be about 16,500 megawatts. The total statewide consumptive use water requirement would be 200,000 acre-feet or an average flow of 275 cubic feet per second. The water requirement is based

on consumptive use water cooling. A combination of air cooling (dry-tower) and consumptive use cooling (wet-tower) would use about one-fourth the amount of water needed for total wet-tower cooling or 50,000 acre-feet per year.

A hydroelectric-thermal mix could include the development of some or all of the major hydroelectric sites in the state which in total would produce 1,044 megawatts of average energy, or 11 percent of the new generation needed by the year 2020. These sites include those on the Snake River from Hell's Canyon Dam to Lewiston. This area has recently been designated a National Recreation Area which prevents any dams from being constructed. If projected energy loads are to be met in 2020, the thermal plants for this alternative would produce 8,700 megawatts or 89 percent of the total new energy generation by 2020. The total statewide consumptive use water requirement for evaporative cooling would be 160,000 acre-feet per year or an average flow of about 220 cubic feet per second.

In view of the environmental impact of additional large dams and reservoirs, the varied public opinion regarding construction of more large dams, the policy to maintain the Salmon River as a free-flowing stream, and the creation of the National Recreation Area in Hells Canyon, it has been concluded that future power generation in Idaho will come largely from thermal sources.

Projections of electric energy consumption could change dramatically if other fuel sources are limited or substantially reduced. Since Idaho, like the rest of the nation, relies on imports of some fuels such as natural gas, the impact on substituting electric energy is unknown. The greatest unknown in future years is consumer reaction to higher rates. If the price of electricity increases at rates greater than inflation or the consumer's ability to pay, consumption and growth tend to slow. However, the plan has not analyzed effects of increased electrical energy rates on future growth and development.

There are other methods of producing electrical energy which have not been considered in the present planning study but which in the future may have an important role in Idaho's power picture. Those include geothermal, nuclear fission, solar, wind, and other more exotic types. Geothermal is presently being given strong consideration in parts of the state and studies and tests are now underway to evaluate this resource. Among research studies being made or planned are those pertaining to methods to utilize low temperature steam for energy production.

Because electrical power is so vitally important to the state as well as the region and nation, the policy has been adopted that preparation of a state electrical energy plan be authorized. Such a plan would consider conservation programs, inventory and reservation of potential energy production sites, plant siting, downstream effects, research and development of new energy sources and information and education programs.

Other recommendations concerned with electric power include:

1. Encourage the use of dry-tower cooling in thermal plants, possibly augmented by water cooling where possible to reduce the consumptive use of water.
2. Encourage the installation of additional hydroelectric units at existing dams or installation of units at existing dams that have no power features.
3. Encourage the development of pump-back storage and power facilities to provide peaking power. Pump-back storage would not increase the total energy available, but would make more power available during periods of greatest demand.
4. Review rate structures so users of power are paying their appropriate costs.

Environmental Quality

This planning consideration reflects society's concern for and emphasis on the values of the natural environment. It includes preservation, restoration, enhancement of resources as a source of present enjoyment and as a heritage for future generations. Public awareness of the nation's natural environment resulted in the passage of the National Environmental Policy Act of 1969 (P.L. 91-190). This legislation authorizes and directs federal agencies to give appropriate consideration to environmental amenities and values along with economic and technical considerations when conducting natural resource studies. There are many other pieces of legislation that provide authorities, guidelines and policy guidance in evaluating environmental considerations.

Preserving Idaho's Environmental Resources

Idaho is a young state in many ways, without vast intensive development. The population base is small but growing and much of the land is in state and federal ownership. Idaho is in a unique position to make a contribution to preservation of environmental quality in this nation. Many streams are still free-flowing and relatively clean. Much of the land base is still in a natural condition and offers outstanding opportunity for research areas and sightseeing. Other aspects of Idaho have been developed, but should be preserved to contribute to the cultural heritage of mankind. Many of the resources, land and water, have been developed in desirable combinations and should be preserved in their present uses. Some air sheds in Idaho, such as Stanley Basin area, have exceptionally clean characteristics and every effort should be made toward maintenance in perpetuity. Specific elements to be considered for preservation include:

1. **Areas of Natural Beauty.** There are large acreages of Idaho in relative natural conditions. Approximately 40 areas in Idaho, totaling something in excess of four million acres, have been

identified for wilderness and primitive attributes. Many streams are in comparatively natural settings and as many as 81 segments totaling about 3,100 miles, in addition to the National Wild and Scenic River System, could be preserved for their natural beauty.

2. **Areas of Human Enjoyment.** Areas of Idaho such as rivers, lakes, beaches and shores, mountainous areas, and estuaries are valued by man for many purposes. Approximately thirteen areas totaling about 61,000 acres have been identified for their research potential and education values.
3. **Historical, Archeological, and Geological Resources.** At least 4,446 sites in the state have been identified as having importance for historical, archeological and geological considerations. Many of these are closely related and tied to major water supplies. The Oregon Trail and Lewis and Clark Trail followed water courses; campsites and other evidences are still in existence and should be preserved. These areas are well known and have already received a large amount of public use and consideration, and 89 sites have been placed on the National Register of Historic Places. Geological formations such as The Great Rift, City of Rocks, Balanced Rock, Craters of the Moon, and others are important and should continue to be protected; others should be added.
4. **Biological Resources.** Biological resources deal principally with existing land uses and their preservation. Wildlife has often adapted to new land uses and many species have been introduced to Idaho that were not here under natural conditions. However, with increasing pressures to utilize more of the landscape and land and water resources for a variety of uses, biological resources are coming under increasing pressures. Many may need special protection. As recently as 1971, the Birds of Prey Natural Area was established to protect the Peregrine Falcon and other birds of prey that are endangered. Idaho should carefully evaluate biological resources and develop a rare and endangered species list and move to protect those species.
5. **Ecological Resources.** Each characteristic of a natural area such as a watershed, vegetation, soil type, marsh, swamp, lake or a stream complex represents, or supports, an ecological system. These systems are interdependent physical and living environments that function as a continuing unit. Such units not only possess intrinsic values but also contribute to the enrichment of the general quality of life in a variety of ways. Conversely, when such natural areas are lost, or otherwise diminished in size or quality, there are corresponding adverse environmental effects borne by society. Pressures for shoreline developments on lakes and reservoirs, conversion of desertland to irrigated farmlands and manipulation of natural river flows have significant effects on various ecological systems. As a consequence, some systems may be near extinction or out of balance.

*Restoring and
Enhancing Idaho's
Environment*

Restoration and enhancement of environmental assets which are at less than desirable levels of quality cover a wide range of problems and potential actions. Most environmental restoration projects include land use improvements as well as water supply and quality. Every consideration listed previously categorizes potential opportunities for enhancing Idaho's environment. Projects should be selected and studied on a priority basis until current problems are corrected.

*Criteria to Guide
Future Resource
Use*

Additional economic growth and development can be beneficial to the economy and the communities of Idaho. However, there is potential for severely damaging the social and environmental structure of communities in and near development zones. From a standpoint of avoiding irreversible commitments of resources, adequate planning and consideration with public participation should precede final decisions. While all forms of development and use affect and sometimes change the tenuous balance of fragile aquatic and terrestrial eco-systems, the implication of all possible effects and changes on such systems is imperfectly understood at the present time. In the absence of reliability predicting ecological change, Idaho should take a precautionary approach in meeting development and use objectives in order to minimize or preclude the possibility of undesirable and possible irreversible changes in the natural environment.

Many resource decisions are made without giving adequate consideration to the resultant environmental and social effects. It is not the intent to propose additional regulations or criteria, but it is believed desirable to measure and provide for public analysis the effects of all resource decisions whether economically or environmentally based. Idaho can no longer afford single-purpose decisions being made without public participation and public interest considerations.

**Municipal and
Industrial**

Water for municipal and industrial purposes encompasses domestic, commercial, lawn sprinkling, fire protection, public, livestock and industrial use. The municipal grouping also includes rural domestic water supply and small scale garden irrigation. Industrial water is that used in manufacturing, food processing, lumber and wood production, chemical processing and other industrial concerns. The water required for cooling in thermal power generation is not included.

Throughout the state, the principal source of municipal and industrial water is groundwater. A few communities obtain their supply from nearby streams, springs or lakes. Some cities use surface water supplies to supplement the groundwater source. In rural areas, domestic water is almost entirely obtained from individual groundwater wells. In cities, systems are owned both publicly and private. Industrial water users, especially the large concerns, provide their own source generally from groundwater.

The current population of Idaho is about 837,000 of which approximately 85 percent live in the Snake River Basin. By the year 2020, the state is estimated to have a population of about 1,800,000. At present, the total municipal and industrial water use in the state is about 450,000 acre-feet per year. Of that amount, approximately 70,000 acre-feet is consumptively used and the balance is returned to streams or groundwater. By the year 2020, the total municipal and industrial water use is estimated to be between 760,000 and 950,000 acre-feet of which consumptive use would be about 100,000 to 125,000 acre-feet.

Regardless of the type of full utilization of the resources, it is expected that water for future municipal and industrial needs will be available and will be produced as needed.

Throughout the state considerable study and construction is underway to upgrade water systems and to provide for current needs and future demands. In 1973, the *Comprehensive Rural Water and Sewerage Planning* studies, financed by the Farmers Home Administration, were completed. Those studies were conducted for all the counties and for communities with populations of less than 5,500 persons. Likewise, larger communities maintain ongoing or have recently completed large scale complex studies for municipal and industrial water supplies.

Protection of the quality of the state's municipal and industrial water is currently receiving greater attention. Public Law 93-523, the Safe Drinking Water Act providing control and regulation of injection wells, is focusing new efforts to protect the quality of drinking water. Future planning and implementation of new systems and rehabilitation should provide utilization of the best quality if there is a choice of water source.

Recreation is a major industry; residents participate in the opportunities available and large numbers of non-residents visit Idaho each year for recreational reasons. The population of the United States is expected to increase by about 100 million by year 2020. Of that amount it is projected that about 37 million will reside in the western United States. Idaho's portion of this increase is estimated to be about 800,000. Recreational activity days in Idaho were about 75 million in 1970. This is expected to almost double to about 136 million in the year 2020. The principal recreational uses affecting water resources are swimming, floating of free-flowing streams, boating, water skiing, fishing and some types of hunting. Projecting activity days by use is difficult; best estimates of the year 2000 are: approximately 9 million days, for fishing by in-state residents; 14 million swimming; and 6 million, boating, water skiing, and river floating. The significance of these figures demonstrates water supplies must be reserved for these uses.

Recreation

Many other types of recreation available are enhanced by the presence of a high quality supply of water. Among these are hiking, sightseeing, picnicking, big-game hunting, camping, photography, and winter sports.

The recreational pressures of the future will not be limited to any single location or specific area. The combination of land and water in natural settings are attractive resources upon which Idaho can capitalize. State action is needed to reserve water for recreational development. Further, Idaho could develop the necessary administrative and management programs for their protection and utilization.

Residents and non-residents have created a very active second home development market on the major streams and lakes. While this satisfies the needs of second home owners, it often prohibits access to the water resource. Shoreland planning would reduce land use conflicts and insure public access and use. Management options include enacting legislation to protect lake shores and planning surface water use of the lakes and reservoirs in the state.

The state should seek a state natural and recreation river system to complement and supplement the federal wild and scenic river system. A state system should contain many of the basic provisions of the federal wild and scenic legislation but retain the management within the state. Stream reaches considered as having potential for inclusion in a State Natural and Recreation River System include:

1. Salmon River - North Fork to Mouth
2. Salmon River - Headwaters to North Fork
3. South Fork of Salmon River including the East Fork of South Fork and Johnson Creek
4. Bruneau River - Stateline to Bruneau Valley including Sheep Creek and Jarbidge River
5. Owyhee River
6. Henrys Fork - Warm River to Big Springs
7. Teton River - Headwaters to confluence with North Fork Teton River
8. Payette River - North Fork
9. Payette River - South Fork
10. North Fork Coeur d'Alene River
11. Lower Priest River
12. St. Maries River
13. Kootenai River
14. North Fork St. Joe River
15. Pack River
16. Cub River

Much of the stream bank mileage could be managed by local government and private enterprise to establish effective recreational developments. A state Greenbelt and Greenway Act with local options should consider these water resources:

1. Snake River
2. Boise River
3. Big Wood River
4. Payette River
5. Blackfoot River
6. Portneuf River
7. Teton River
8. Big Lost River
9. Henrys Fork
10. Rock Creek at Twin Falls
11. Kootenai River
12. South Fork Coeur d'Alene - Mullan to Enaville
13. St. Joe - through St. Maries
14. Priest River - McCabe Falls to Pend Oreille Lake
15. Bear River

There are numerous other streams and stream segments that could be included in this concept. Portions of a State Natural and Recreational River System could be greenways rather than recreational rivers.

The State of Idaho should seek cooperative management of federal wild and scenic rivers. At the present time, there are four river segments in Idaho that are included in the federal Wild and Scenic River System totaling 360 miles. Seven additional river segments are being studied for inclusion in the federal system totaling 660 miles. The classified rivers include the Middle Fork Clearwater, Lochsa, Selway, Middle Fork Salmon, Middle Snake and Rapid rivers. Study rivers are the Salmon, Bruneau, Owyhee, St. Joe, Moyie, and Priest rivers. The federal law encourages state cooperation and participation in the planning and administration of rivers in the federal system which adjoin state or county-owned lands. State involvement in management would permit closer liaison between the two governmental bodies and would be more in line with views expressed by Idaho citizens.

The demand for recreational boating has increased tremendously in the past five years, with major emphasis on white water boating. This has resulted in an increase in the occurrence of accidents and drownings and placed financial burdens upon local governments for search and rescue activities. All water normally utilized for recreational boating should be classified as to degree of difficulty and danger.

There are scenic and recreational areas within the Snake River Basin that are heavily utilized. Some contain federal and state facilities, but many do not have the facilities needed for the concentration of people involved. With the proper incentive the private sector could provide facilities which would meet the public's needs. In capitalizing on recreational resources within the state, it is important that sufficient revenue and funding be established to insure that protection and management of the resources is consistent with the potential of the resource.

Indian Resource Use

Present Indian use of water resources is principally for a small amount of irrigation and for fish and wildlife production. Although resources are being inventoried and resource plans are being developed by consultants to the tribes under Housing and Urban Development grants, it appears that there will be a continuing tendency for the rate of development of Indian resource use to lag behind that on non-Indian lands. Also, pending resolution of questions about Indian water needs, claims, and rights, there will be continuing problems and constraints involving both Indian and non-Indian uses of water and related lands.

Identification of Indian water claims, technical assistance, and allocation of water for irrigation development would help to meet needs and resolve problems between now and year 2020. The technical assistance program could be used, at the discretion, of the Tribal Council, individual Indians or both, and could be arranged to provide substantially any needed form of expertise. However, pending completion of any actions which may be taken by the tribes, or by the tribes and the Bureau of Indian Affairs in concerted action to restore or enlarge the land resource base, there will remain questions about the magnitude of Indian water needs for irrigation and other purposes. Also, a final resolution of the question of Indian rights to hunt and fish on non-reservation lands will be needed as a basis for determining management plans, and consequent land and water needs for fish and wildlife.

Water Quality and Pollution Control

Degradation of water quality continues to be a threat to the value of the resource. It is the subject of comprehensive local, state, and federal water pollution abatement programs. Water quality goals and objectives are principally established at the national level. The Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500) established national goals on improving water quality. The objective of the Act is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. Principal goals of the Act are:

1. The discharge of pollutants into navigable waters be eliminated by 1985;
2. Wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the waters be achieved by July 1, 1983.

The Act also prohibits the discharge of pollutants in toxic amounts; and, provides federal financial assistance to construct public waste treatment works, to develop and implement waste treatment management planning, and to develop a major research and demonstration effort to eliminate discharges of pollutants. The State Water Plan calls for strong support of meeting the goals and objectives of P.L. 92-500.

Recently the Safe Drinking Water Act (Public Law 93-523) established goals for the protection of drinking water. The objective of this act is to protect and improve drinking water and protect groundwater quality. The objective will be accomplished primarily by monitoring all public water systems and control of all artificial injection of materials that might affect groundwater quality.

The abatement of water pollution in Idaho is guided by the three basic principles:

1. The pollution discharges must comply with minimum state and federal waste water treatment requirements. In general these requirements reflect what is considered the best practical treatment and control of waste waters for each category of discharges.
2. Pollution must not cause violations of state standards for surface water quality. The state determines the uses to be protected for the various streams and lakes and then adopts minimum quality standards to protect these uses.
3. Discharges to the state's groundwater aquifers must not contaminate present or future drinking water supplies.

Water quality programs conducted by local state and federal agencies to improve and ensure good water quality in Idaho include:

1. Municipal construction grants,
2. State pollution source permits,
3. National Pollutant Discharge Elimination System (NPDES),
4. Waste water treatment facility operator training and certification,
5. Surface water quality monitoring,
6. Septic tank permits,
7. Sanitary restrictions on subdivisions,
8. Review of plans and specifications for waste water treatment management planning,
9. Areawide waste water treatment management planning,
10. Waste water treatment facilities planning,
11. Environmental Impact Statement (EIS) review,
12. Disposal well permits, and
13. Stream alteration permits.

Continuation of these programs is considered essential to the preservation and enhancement of water quality for economic and environmental purposes. Many programs are only in the initial stages of implementation and the full value and effects cannot be determined.

Some portion of the state's water quality planning and enforcement program is presently assigned to both the Idaho Department of Health and Welfare and the Idaho Department of Water Resources. Water supply planning is assigned to the Idaho Department of Water Resources. Each

agency is required to perform certain functions that sometimes appears to overlap in detail and jurisdiction. Idaho should consider combining water quality planning and water supply planning into one agency.

Radioactive wastes are presently being stored at the Idaho National Engineering Laboratory (INEL) located above the Snake Plain aquifer near Idaho Falls, and additional major storages may take place at this site in the future. Fears have been expressed that contamination of the aquifer could occur in the event of a mishap at the storage sites. Federal programs to monitor and protect against such occurrences are now in effect at INEL. Also an agreement between the state and INEL concerning environmental radiation surveillance is now being formulated. The recommended action would provide for greater state participation in research programs for additional monitoring, determination of adverse effects that could occur, and means to reduce the chances of such mishaps occurring.

Urban Lands

There are 11 urban growth centers that contain two-thirds of the state's population. These centers are Lewiston, Nampa-Caldwell, Boise, Twin Falls-Jerome, Ketchum-Hailey, Pocatello, Idaho Falls, Moscow, Payette-Fruitland, Burley-Rupert, Rexburg, Hayden Lake-Coeur d'Alene-Post Falls and Soda Springs.

Idaho population on June 30, 1976, is estimated at 837,000. The year 2000 population is estimated at 1,500,000, and the year 2020 population estimate is 1,800,000. Ninety percent of the growth expected will take place in the urban centers unless outside forces encourage a balancing of the growth between the cities and the rural areas and towns.

The water problems directly connected to urban centers and growth relate to the haphazard and "leap-frog" expansion of cities onto irrigated lands and other agricultural land; the construction of subdivisions on irrigated land without provisions for utilizing the irrigation water for which the resident is taxed; the lack of park areas and water course greenways; municipal and industrial systems; waste water treatment; and declining population in rural towns. Water safety is also a major problem in the urban areas. All the other subject areas discussed in these conclusions have effects that indirectly and directly impact environmental enjoyment of the non-urban area, social well being, and economic return of the urban community.

Allowing growth of urban centers while reducing conflicts and providing a better quality of life is a major challenge. Rural subdivision development disrupts irrigation canals and drainage systems and complicates their management. Influences that will help control urbanization of rural lands are the installation of public water supplies and sewers.

An additional water related need is to allow water rights to be removed from lands in towns and subdivisions, if construction costs are paid and the water is no longer used. Requiring water delivery systems to be constructed as a part of the subdivision development on land irrigated from water delivered by canals would also help insure that those entitled to water are

able to obtain it. There are many suburban subdivisions that have been placed on previously irrigated land, but do not receive irrigation water because distribution systems for the water are not available. Homeowners are still required to pay for the irrigation water even though it is not available to them. The problem is not limited to urban homeowners, but also extends to the canal company and having to maintain a canal through a densely populated area.

The proposed Water Supply Bank would provide a mechanism for recovering investment costs on waters removed from urban lands and making it available to other lands.

Land measures would preserve quality and usability and reduce erosion while the land is used for food and fiber production. Both private and public lands are considered in discussing land measures. Effective control of erosion of the state's land resource base is needed. Although progress has been made, erosion is still a serious problem in many areas. Valuable top soil is being eroded from the land and deposited as sediment in lakes, reservoirs, streams, along roads, and on low-lying farm land. The rate at which erosion can be controlled is determined by political, social, and economic factors, as well as individual interest and dedication.

Land Measures

The following programs are needed to control erosion to a tolerable level within 20 years:

1. Accelerate and improve the educational approaches to soil and water conservation,
2. Accelerate and improve the technical assistance available to land owners and operators in planning and applying sound soil and water conservation measures,
3. Accelerate and improve federal cost sharing programs on long-term erosion control measures,
4. Encourage state legislation that would require a local planning process directed toward the control of erosion and sediment from private land,
5. Carry out a monitoring program to determine the success of various erosion control measures,
6. Increase funding to public land administration agencies for erosion control.

The land measure recommendations cover the following four major land use categories:

1. **Irrigated Cropland.** Accelerate erosion and sediment control program in irrigated areas to reduce damage to the land and streams.

Improve irrigation water management, establish grass filter strips, and construct pumpback systems and settling ponds to reduce the amount of sediment leaving the farms.

Construct settling basins in the wastewater systems before they discharge into streams or other irrigation systems to reduce the sediment load to the streams and rivers.

Construct storage near the end of those waterways which also serve as delivery channels. More of the unavoidable field tailwater, nutrients and its sediment could then be reused.

2. **Dry Cropland.** Accelerate erosion and sediment control programs in dry farm areas to reduce damage to the land and streams. Erosion is reducing the productivity of all the dry farm areas of Idaho. Sediment from those areas is polluting streams and rivers and damaging property. The problem is especially serious in the steep silt loam soils of the Palouse and the dry farm areas in southeast Idaho.

Proper tillage, improved cropping systems, terraces, debris basins, and grassed waterways will reduce sediment leaving the farms.

3. **Rangeland.** Accelerate present erosion and sediment control programs on publicly and privately owned rangeland.

Most of Idaho's rangeland is slowly returning from past excessive use. Proper grazing management, road bank stabilization, gulley stabilization, and other specialized treatment of unstable sites will reduce sediment leaving the rangeland areas.

4. **Forest Land.** Accelerate present erosion and sedimentation control programs on public and privately owned forest land.

Forest land normally produces very little sediment, but it can produce very large amounts when disturbed by road construction, surface logging, residential development, or other similar activities. Soil on the granite mountains of Elmore, Boise, Valley, and Idaho counties is especially sensitive to disturbance. Many scattered sites are unstable because of fires or past human use.

Proper forest management, road design, harvesting practices, and other specialized treatment of unstable sites will reduce sediment leaving forested areas.

There are presently ongoing programs for improvement of the state's land. With these programs, considerable progress will be made over a period of years, but not to the degree desired and recommended to produce the best quality conditions.

Idaho leads the nation in the production of silver and ranks second in the output of lead and zinc. The Coeur d'Alene district of Shoshone County produces most of this metal. From 1884 to 1965 metal production from this district totaled approximately 2.09 billion dollars. 54.7 million dollars of ore was produced in 1972.

Known reserves are sufficient to maintain the current annual rate of production of silver, lead and zinc for many years. The Coeur d'Alene district contains over 90 percent of Idaho's estimated silver reserves, enough for a minimum of 10 years production at the current annual rate.

The Clark Fork-Pend Oreille Basin and the Moyie-Yaak-Porthill District of the Kootenai Basin, contain large deposits of cobalt-nickel, molybdenum, copper, gold, silver-lead, and thorium. The Hall Mountain thorite deposits have significant future potential. There are reserves of garnet sand and gem stones along Emerald Creek in the Spokane Basin.

The Bear River Basin lies within a phosphate resource field which contains about 45 percent of the nation's phosphate reserves. This area supplies about 14 percent of the current U.S. production. Florida and North Carolina supply about 81 percent and Tennessee supplies about 5 percent. The Florida production is expected to peak in the next 5 years and decline thereafter. Then a shift to the Bear River area will likely occur. Although phosphate deposits extend into Wyoming and Utah, there is relatively little current mining there, nor is there any strong indication of expanded mining in the near future.

In the past, little consideration was given to the damage caused by mining activities. Tailing ponds and waste material storage areas were left without steps taken to prevent damage to the stream channels, water sheds, or surface water quality. In many cases ownership is difficult to define. Legislation is needed which would provide a means of restoring and reclaiming these areas. Such legislation should include requirements for comprehensive sediment and erosion control management plans, restoration of damaged areas, posting of liability bonds, and provide for regulation of future tailing ponds and waste material storage areas.

It is expected that water and air quality will be improved through application of various state and federal laws. However, there is a need to restore and enhance many of the areas having undergone mining in the past. Problems involve stabilization and revegetation of some disturbed watersheds and streams. This type of work is needed on the South Fork of the Coeur d'Alene River and should utilize the joint efforts of the mining industry, local government, and state and federal agencies.

In an effort to improve and protect existing water quality in the mining areas, numerous tailing settling ponds have been constructed. Presently, there is no authority for uniform construction standards, maintenance inspection or long-term maintenance responsibility for such ponds. These deficiencies combined with the absence of adequate hydrological analysis in

site selection have caused failures which have destroyed fish habitat and caused extensive flood damages in downstream areas.

A major problem confronting the mining industry is that of finding suitable waste disposal sites that are economical alternatives to streamside disposal dumps. It is recommended that priority be given to planning studies which would define standards and identify areas for the establishment of mine waste disposal sites. This should be done for areas susceptible to future mining activity and on a level with the planning studies for utilization of other resources of the state.

Lakes and Reservoir Management

Idaho is a land of many lakes. Portions of these lakes and numerous reservoirs in the state have experienced declining water quality, surface crowding and losses in scenic values and along shorelines.

As demand for lake recreation increases, problems intensify and lead to conflicts among uses and user groups. In some instances serious safety questions have surfaced as the carrying capacity for certain uses is reached. In many cases, this has allowed physical damages to occur to the lake and lake users. In addition to losses in economic development, environmental quality is damaged.

Each lake is an individual entity with its own set of needs and constraints. Foremost is that each lake be considered separately with a master plan prepared to protect its resources.

Shoreland use has had a direct impact upon water quality. Careless shoreland uses in many cases has increased the amount of eroded material that enters and pollutes the lake. Pollution from septic tanks and surface runoff has impaired water quality. Scenic values which enrich the quality of the lake's environments have been disturbed and in many cases destroyed. In many cases, this has occurred as a result of the lakeshore appeal as sites for permanent homes and seasonal use dwellings.

On many lakes the surface carrying capacity has been exceeded causing conflicts to rise among various types of water users: swimmers, water skiers, skin divers, fishermen, and boaters. This has caused physical and economic damage to all classes of users. User mixing occurs, and docks and piers jut far out into the lake and remove valuable water space.

Comprehensive lake management plans should be prepared. These guidelines covering shorelands and surface uses require separate legislation and should cover the following:

1. Lake Shoreland Management Act

- The model standards and criteria should be prepared for subdivision, use, and development of shorelands.
- The standards should contain criteria for minimum lot size and water frontage, designation of adjacent public waters, and the preservation of natural shorelands.
- Provide for local county governments to adopt shoreland conservation and management ordinances which are at least equal to the model standard.
- Provide for local government administration, utilizing partial state funding.
- Give the state authority to adopt the model standards to the county upon failure of the county to act.

2. Lake Surface Management and Use Act

- Require studies on surface uses relative to the conservation, development and protection of lake resources.
- Require the preparation of criteria and guidelines regulating surface uses by area and timing, allowable speed, motor, or non-motorized boat use and houseboats.
- Require local county governments to plan, zone, and administer control over surface uses subject to guidelines and criteria.
- Provide state technical and financial assistance to local governments to aid in administration.

The State of Idaho has a definite interest in continuing its involvement in interstate considerations. Benefits to Idaho citizens cover several topical areas:

Interstate Considerations

1. Protect and preserve Idaho interests,
2. Guard against diversion of water out of region,
3. Provide for coordination and cooperation with neighboring states,
4. Provide for study and solution of regional problems,
5. Provide for preparing state and regional views on proposed national water policy.

The water resources of Idaho are its greatest natural asset and should be managed to provide the maximum benefit for her citizens. Since the water planning program started in 1965, Idaho has developed independent capability to study, review and comment on comprehensive, multi-purpose

water and related land resource proposals. This capability definitely should be maintained within the state to monitor, inventory, update and prepare special studies as needed. This capability will allow for effective representation in the Pacific Northwest River Basins Commission and Western States Water Council. It is believed Idaho will be more effective participating in debate and discussion rather than reacting to decisions of others. At the national level, the initiation and adoption of water policy appears to be gaining momentum. With the completion of the National Water Commission Report in June, 1973, there is a concerted move to establish and set forth new national policies for water resources. Many of the topical discussions and recommendations in the National Water Commission Report would benefit Idaho and should be supported, however, some may significantly alter state water policies and need further study before a position is taken. The trend appears to be for the federal government to establish broad water policy and then seek joint implementation with the states. New policies emerging on cost sharing, interest rates, and cost allocation will emphasize joint state-federal actions. What this means to the northwest states and directly to Idaho is the need to maintain regional cooperative programs so future water decisions can be implemented promptly. The intertie of upstream-downstream relationships is defined adequately for each state to participate effectively in matters of regional concern. With expiration of the ten-year moratorium on diversion studies from the northwest to the southwest, on September 20, 1978, Idaho will see renewed efforts to divert Snake River water. In some cases the proposals will be shallow and without justification, however, if substantial national benefits are derived from such a program, it will undoubtedly receive consideration from the Congress. Other northwest states share the same dilemma of protecting water supplies for future uses. Idaho can best be served by maintaining a continued interest in interstate considerations.

The individual desires of other states will not always be compatible. Idaho should continue to maintain close relationships with adjacent states to insure that effects of plans in one state are understood by others and that a mechanism exists for discussing differences and seeking solutions.

International Considerations

The Boundary Waters Treaty of 1909 established the International Joint Commission to answer questions relating to waters that cross the international boundary. This Commission developed a step-by-step approach to planning the development of the Columbia River System which resulted in the "Treaty between Canada and the United States of America Relating to Cooperative Development of the Water Resources of the Columbia River Basin." Ratified in 1964, the Columbia River Treaty contained several items with potential impact to the Kootenai River Basin in Idaho:

1. Canada has the right at any time after 1984 to divert up to 1.5 million acre-feet annually from the Kootenai River to the Columbia River in the vicinity of the Canal Flats, provided that

the flows on the Kootenai River downstream from the point of diversion are not reduced to less than 200 cfs or natural flows, whichever is the least.

2. The United States must account to Canada for downstream benefits at all downstream dams regardless of ownership on a formula which assures that all dams be operated as though under single ownership.
3. After the first 60 years (2003), Canada will continue to operate its storage in the Columbia River Basin to control floods when asked to do so by the United States. The United States will pay Canada the operating cost incurred in providing the flood control and compensation for economic losses from foregoing alternative uses of the storage.
4. Canada is assigned one-half the hydroelectric power benefits that accrues in the United States from designated storage capacity in three dams constructed in Canada on the Columbia River system. This power cannot be taken by the U.S. until after year 2024. The benefits consist of the original dam system capacity and energy generated with Canadian storage during critical flow periods minus capacity and energy generated during critical flow periods without Canadian storage; plus other energy made available with the Canadian storage and used to replace northwest system thermal generation; plus 40 percent of the remaining useable energy made available. The Canadian downstream energy benefits have been sold until September 16, 2003, to the Columbia Storage Power Exchange (CSPE). This CSPE is a group of northwest electric utilities. About two percent of the CSPE power is allocated to Idaho.

Possible long-range effects of this treaty are unknown at this time. However, the existence of possible constraints to use options advanced by Idaho is recognized.

In addition to monitoring the water quantity impacts associated with the Canadian portion of the Kootenai system, there is a need to develop close cooperation relative to water quality management. This is especially significant in considering dedication to free-flowing use for high quality rivers such as the Upper Priest and Moyie.

Idaho should work closely through the Pacific Northwest River Basins Commission to develop communications with Canada relative to compatible management of these international streams. Consideration should be given to protection and enhancement of the several internationally spawning species of fish, and the internationally migrating mountain caribou which utilize the Kootenai River drainage. This is needed in addition to the international management considerations of hydropower and flood control.

Studies and Research

The State of Idaho is complex with widely contrasting natural features, extensive developed and undeveloped resources, large needs, and many conflicts and problems to be resolved. Because of this situation, many of the recommendations identified in the State Water Plan require further study and findings to determine optimum solutions, plans, and programs. Accordingly, interdisciplinary studies are recommended for several areas to further identify alternative methods, programs, projects, and uses of water and related land resources, to consider multiple-purpose features of each project or program, to evaluate the impacts of alternative resource uses and projects on people and the environment, and to select the proper alternatives and methods for implementation.

Present water resource study efforts should be reviewed and revised in light of the State Water Plan. Future study efforts should be built on what has been done and not attempt to recreate each piece of data. With completion of the State Water Plan, state and federal agencies will have priority study considerations to investigate. Each resource study effort should make every effort to let others know of the study, purpose of the study and expected completion dates so results will have widespread utility. Studies should be completed as expeditiously as possible and, if planning oriented, include an active public participation program.

An active research program would contribute much to the quality of life in Idaho. There are many questions concerning resource use that have not been studied or researched. As Idaho's population grows there will be expanded need to adapt research results to Idaho or fund new research programs. It would be to Idaho's advantage to coordinate research monies and manpower in order to achieve maximum results. This does not mean limiting or centralizing research programs, but rather improved communication will permit Idahoans to be better served.

Likewise, planning and study activities would cost less and contribute more if communication were improved between state, federal, local and private interests. Idaho can no longer afford independent isolated actions dealing with resource planning. The water supply in the State of Idaho is such that coordination and communication are a must.