IDAHO WATER RESOURCE BOARD

NOTICE AND AGENDA

WATER RESOURCE PLANNING COMMITTEE
MEETING NO. 1-11

Idaho Water Center, 6th Floor
Conference Rooms 602C & D
322 E. Front St., Boise, Idaho

August 19, 2011
9:00 a.m. to 12:00 p.m.

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1. Introductions & Discussion of Committee Purpose and Authority
2. Background
   a. The IWRB state water plan constitutional background
   b. State Water Plan Components
      1. Part A: Policies
      2. Part B: Comprehensive Basin Planning Effort
      3. Comprehensive Aquifer Management Planning Effort
3. Status of Revision Process
   a. History of revision efforts
   b. Status of revision process
   c. Snake River Policies
4. Next Steps & Next Meeting

Committee Members:
Leonard Beck, Chairman, Bob Graham, Roger Chase, Chuck Cuddy, Jeff Raybould

AMERICANS WITH DISABILITIES

The meeting will be held in facilities that meet the accessibility requirements of the Americans with Disabilities Act. If you require special accommodations to attend, participate in, or understand the meeting, please make advance arrangements by contacting Diana Ball, Administrative Assistant, by email diana.ball@idwr.idaho.gov or by phone at (208) 287-4800.

CONSTITUTION OF THE STATE OF IDAHO

ARTICLE XV WATER RIGHTS

SECTION 7.STATE WATER RESOURCE AGENCY. There shall be constituted a Water Resource Agency, composed as the Legislature may now or hereafter prescribe, which shall have power 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. Additionally, the State Water Resource Agency shall have power to formulate and implement a state water plan for optimum development of water resources in the public interest. The Legislature of the State of Idaho shall have the authority to amend or reject the state water plan in a manner provided by law. Thereafter any change in the state water plan shall be submitted to the Legislature of the State of Idaho upon the first day of a regular session following the change and the change shall become effective unless amended or rejected by law within sixty days of its submission to the Legislature.

Idaho Statutes

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TITLE 42
IRRIGATION AND DRAINAGE -- WATER RIGHTS AND RECLAMATION

CHAPTER 17
DEPARTMENT OF WATER RESOURCES -- WATER RESOURCE BOARD

42-1734A.COMPREHENSIVE STATE WATER PLAN. (1) The board shall, subject to legislative approval, progressively formulate, adopt and implement a comprehensive state water plan for conservation, development, management and optimum use of all unappropriated water resources and waterways of this state in the public interest. The comprehensive state water plan shall consist of: Part A -- statewide policies, goals and objectives; and Part B -- component water plans for individual waterways, river basins, drainage areas, river reaches, ground water aquifers or other geographic designations. As part of Part B of the comprehensive state water plan, the board may designate selected waterways as protected rivers as provided in this chapter. The comprehensive state water plan shall be based upon studies and public hearings in affected areas at which all interested parties shall be given the opportunity to appear, or to present written testimony in response to published proposals for such policy programs and proposed designations. A minimum of sixty (60) days shall be allowed between publication of a proposal and the date on which no further testimony on the proposal will be accepted. All comments in writing shall be preserved as a part of the record of the board. In adopting a comprehensive state water plan the board shall be guided by these criteria:

(a) Existing rights, established duties, and the relative priorities of water established in article XV, section 3, of the constitution of the state of Idaho, shall be protected and preserved;

(b) Optimum economic development in the interest of and for the benefit of the state as a whole shall be achieved by integration and coordination of the use of water and the augmentation of existing supplies and by protection of designated waterways for all beneficial purposes;

(c) Adequate and safe water supplies for human consumption and maximum supplies for other beneficial uses shall be preserved and protected;

(d) Subject to prior existing water rights for the beneficial uses now or hereafter prescribed by law, minimum stream flow for aquatic life, recreation and aesthetics and the minimization of pollution and the protection and preservation of waterways in the manner hereafter provided shall be fostered and encouraged and consideration shall be given to the development and protection of water recreation facilities;

(e) Watershed conservation practices consistent with sound engineering and economic principles shall be encouraged.

(2) The board may develop a comprehensive state water plan in stages based upon waterways, river basins, drainage areas, river reaches, groundwater aquifers, or other geographic considerations. The component of the comprehensive state water plan prepared for particular water resources and waterways shall contain, among other things, the following:

(a) A description of the water resources and waterway or waterways that are the subject of the plan, including pertinent maps detailing the geographic area of the plan;

(b) A description of the significant resources of the water resources and waterway or waterways;

(c) A description of the various existing and planned uses for these resources including currently undeveloped areas of the waterway and future plans for those areas, with a discussion of the advantages and disadvantages associated with each planned use; and

(d) A discussion of goals, objectives, and recommendations for improving, developing, or conserving the water resources and waterway or waterways in relation to these resources, including an examination of how different uses will promote the overall public interest, a statement as to the goals the plan expects to achieve, and an analysis of how any specific recommendations further those goals. A description of the methodology used in developing the plan shall be included.

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TITLE 42
IRRIGATION AND DRAINAGE -- WATER RIGHTS AND RECLAMATION

CHAPTER 17
DEPARTMENT OF WATER RESOURCES -- WATER RESOURCE BOARD

42-1734B.BOARD PROCEDURES FOR ADOPTING A COMPREHENSIVE STATE WATER PLAN. (1) Prior to the adoption of the comprehensive state water plan or any component of the comprehensive plan, the board shall conduct hearings in the manner provided in section 42-1734A, Idaho Code.

(2) In the preparation, adoption, and implementation of the comprehensive state water plan, the board shall encourage the cooperation, participation, and assistance of state agencies. The board also shall solicit economic, energy, environmental, and other technical studies and recommendations from state agencies with particular expertise. All agencies of the state of Idaho shall cooperate with the board by providing requested existing information and studies pertaining in any manner to any matters which are the subject of this act. The board shall have discretion to balance all factors relevant to the formulation, adoption and implementation of the comprehensive state water plan and implementation and the designation of protected rivers.

(3) Any state agency may petition the board to amend the comprehensive state water plan. The board shall review any petition filed pursuant to this section within six (6) months after it is filed and shall either commence action to amend the comprehensive plan or set forth its reasons for denying the request in writing.

(4) All state agencies shall exercise their duties in a manner consistent with the comprehensive state water plan. These duties include but are not limited to the issuance of permits, licenses, and certifications; provided, however, that nothing in this chapter shall be construed to affect the authority of any state agency with respect to activities not prohibited by the comprehensive state water plan. The designation of a waterway as a natural or recreation river shall not preclude the department of health and welfare from establishing water quality standards for such waterway.

(5) When a comprehensive state water plan is adopted, copies thereof shall be filed in the office of the governor and director of the department of water resources, and published and distributed generally.

(6) The comprehensive state water plan and any component thereof developed for a particular waterway or waterways is subject to review and amendment by the legislature of the state of Idaho by law at the regular session immediately following the board's adoption of the comprehensive state water plan or component thereof. The board shall submit all subsequent modifications to the legislature in the same manner as provided in this subsection.

(7) The board shall review and reevaluate Part A of the comprehensive state water plan, or any one (1) or more of the component water plans comprising Part B of the comprehensive state water plan, upon the adoption of a concurrent resolution of the legislature directing the review or requesting a specific amendment to the plan. The board also may undertake the review in response to a petition for amendment filed pursuant to subsection (3) of this section, or upon the board's own initiative, as determined necessary by the board. Amendments to Part A or Part B of the comprehensive state water plan shall be adopted in the same manner as the original plan.

(8) A protected river designated by the board shall not become a final part of the comprehensive state water plan until approved by law. If the legislature does not approve a protected river by law at the regular session immediately following the board's designation of such protected river, then the designation of such protected river shall terminate and any prohibition or terms and conditions imposed on such protected river pursuant to subsection (5) or (6) of section 42-1734A, Idaho Code, shall be terminated ten (10) days following the end of the session. The failure to approve a protected river shall not operate to invalidate a comprehensive plan or component thereof. Nothing in this subsection shall prevent the legislature, however, from approving such protected river and reinstituting or modifying such prohibitions or terms and conditions in a subsequent session.

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CHAPTER 17
DEPARTMENT OF WATER RESOURCES -- WATER RESOURCE BOARD

42-1779.STATEWIDE COMPREHENSIVE AQUIFER PLANNING AND MANAGEMENT EFFORT. Pursuant to the provisions of Idaho law and legislative funding approval, the Idaho water resource board and the Idaho department of water resources shall conduct a statewide comprehensive aquifer planning and management effort over a ten (10) year period of time beginning in fiscal year 2009. Funding for the statewide comprehensive aquifer planning and management effort shall be used for technical studies, facilitation services, hydrologic monitoring, measurement and comprehensive plan development as well as for personnel costs, operating expenses and capital outlay associated with the statewide comprehensive aquifer planning and management effort.

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IRRIGATION AND DRAINAGE -- WATER RIGHTS AND RECLAMATION

CHAPTER 17
DEPARTMENT OF WATER RESOURCES -- WATER RESOURCE BOARD

42-1780. AQUIFER PLANNING AND MANAGEMENT FUND -- SECONDARY AQUIFER PLANNING, MANAGEMENT AND IMPLEMENTATION FUND. (1) The aquifer planning and management fund is hereby created in the state treasury. Pursuant to appropriation, moneys in the fund shall be used for technical studies, facilitation services, hydrologic monitoring, measurement and comprehensive plan development as well as for personnel costs, operating expenditures and capital outlay associated with the statewide comprehensive aquifer planning and management effort. The state treasurer shall invest the idle moneys of the fund, and the interest earned on such investments shall be retained by the fund.

(2) There is hereby created in the state treasury, the secondary aquifer planning, management and implementation fund, hereinafter referred to as the secondary fund. The secondary fund shall consist of moneys appropriated to the fund, moneys voluntarily contributed by water users or through water delivery entities or districts having authority to contribute, or through contributions, gifts or grants from any other source, and any other moneys that may hereafter be provided by law. All moneys in the secondary fund shall be used for the purposes for which the moneys were provided through appropriation, contribution or otherwise, and moneys in the secondary fund are appropriated continuously to the water resource board for technical studies, project management services, hydrologic monitoring, measurement and comprehensive plan development, as well as for personnel costs, operating expenditures, capital outlay and water projects associated with the statewide comprehensive aquifer planning and management effort, and shall not be subject to the provisions of the standard appropriations act of 1945 or the provisions of section 67-3516, Idaho Code. The state treasurer shall invest the idle moneys of the fund, and the interest earned on such investments shall be retained by the fund.

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IDAHO STATE WATER PLAN

ADOPTED BY

THE
IDAHO
WATER RESOURCE
BOARD

DECEMBER 1996

"There shall be constituted a Water Resource Agency, composed as the Legislature may now or hereafter prescribe, ... Additionally, the State Water Resource Agency shall have power to formulate and implement a state water plan for optimum development of water resources in the public interest. The Legislature of the State of Idaho shall have the authority to amend or reject the state water plan in a manner provided by law . . . ."

Idaho Constitution, Article XV, Section 7

State of Idaho

THE STATE WATER PLAN

Philip E. Batt, Governor

Idaho Water Resource Board

Clarence Parr
Chairman

F. Dave Rydalch
Vice-Chairman

J. David Erickson
Secretary

Robert Graham
Joseph L. Jordan
Erval Rainey
Jerry R. Rigby
Terry T. Uhling

Adopted December 1996
Ratified by the Idaho Legislature March 1997
Statehouse
Boise, Idaho 83720

Former Members of the Idaho Water Resource Board

Robert M. Bandy, Priest River
Brent J. Bell, Rexburg
Mary T. Brooks, Boise
George L. Crookham, Jr., Caldwell
Sally L. Cupan, Sandpoint
Leonard E. Graham, Rigby
Gene M. Gray, Payette
Robert M. Hammes, St. Maries
M. Reed Hansen, Idaho Falls
Kenneth E. Hungerford, Moscow
Franklin Jones, Boise
Evan M. Kackley, Wayan
Donald R. Kramer, Castleford
Ferris M. Kunz, Montpelier
William J. Lanting, Hollister
Charles J. Marshall, Jerome
Herman J. McDevitt, Pocatello
Joseph H. Nettleton, Murphy
Thomas Olmstead, Twin Falls
Arlie L. Parkins, Marsing
William Platts, Boise
Scott W. Reed, Coeur d'Alene
Edward Reichert, Filer
Mike Satterwhite, Lewiston
Edwin C. Schlender, Malta
James Shawver, Eden
LeRoy Stanger, Idaho Falls
John F. Streiff, Lewiston
Richard W. Wagner, Lewiston
J.D. Williams, Preston
George L. Yost, Emmett

To the Citizens of Idaho:

This is the fourth time the Idaho Water Resource Board has reviewed, reevaluated, and updated the Idaho State Water Plan. Idaho has seen many changes since the plan was first adopted in 1976. These changes point out the need for periodic update of all state plans.

Central to all the Water Board's planning activities is the recognition that many of the streams and aquifers in the state are highly developed and utilized. This simple fact complicates the task of planning for future water use immeasurably. New users will have to rely on legal changes in nature of use, rentals from recognized water banks, or other innovative approaches to the water supply question.

The Idaho Water Resource Board is placing great emphasis on developing comprehensive plans for basins, waterways, or other geographic areas. Comprehensive planning has been a State Water Plan policy since 1976. In 1988 the Idaho Legislature provided direction and authority for this detailed planning effort. Comprehensive basin and waterway plans approved by the legislature are identified in this State Water Plan.

Public input is an important factor in all Idaho Water Resource Board activity. The Board has appreciated the interest and concern shown by you, the citizens, in the past. We hope your active participation in our activities will continue.

Sincerely,

Clarence Parr

Clarence Parr
Chairman

BEFORE THE WATER RESOURCE BOARD
OF THE STATE OF IDAHO

IN THE MATTER OF THE STATE WATER PLAN) A RESOLUTION

WHEREAS, the Idaho Water Resource Board (the Board) conducted scoping meetings to gather public input concerning policies contained in the State Water Plan; and

WHEREAS, the Board, based on input from the scoping meetings, has proposed changes to existing policies and suggested new policies; and

WHEREAS, the Board has circulated these proposed changes; and

WHEREAS, the Board has provided a 60-day public comment period and has conducted public meetings and hearings providing opportunities for public input; and

WHEREAS, the Board has reviewed the public record consisting of oral testimony and written comments, and has modified their proposed changes accordingly.

NOW, THEREFORE, BE IT RESOLVED that, having considered the draft amended Plan and the public record, the Board hereby adopts the changes to the State Water Plan specified in Attachments A and B, and directs that these changes be provided to the Idaho State Legislature for their consideration.

PASSED AND APPROVED this 13th day of December, 1996.

Clarence Parr
CLARENCE PARR, Chairman

ATTEST:

J. David Erickson
J. DAVID ERICKSON, Secretary

ATTACHMENT NO. 7 MEETING 8-96
IDAHO WATER RESOURCE BOARD
December 13, 1996

Table of Contents

List of Tables

List of Figures

List of Figures, Cont.

THE WATER PLANNING PROGRAM

The Idaho State Water Plan was adopted by the Idaho Water Resource Board to guide the development, management, and use of the state's water and related resources. 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 serving the citizens of Idaho. The plan is a dynamic document, subject to change to reflect citizens desires and to be responsive to new opportunities and needs.

Constitutional Authority

Article XV, Section 7 of the Idaho Constitution provides the authority for the preparation of a State Water Plan. This constitutional amendment was adopted in November 1964 following a statewide referendum and states:

> *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 land required for water projects; all under such laws as may be prescribed by the Legislature.*

Article XV, Section 3 of the Idaho Constitution provides for the appropriation and allocation of water. Section 3 provides that:

> *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 have preference over those using the same for manufacturing or agriculture 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.*

Although no legal confrontations have occurred, Section 7 probably tempers Section 3 in that future water development must be guided by the State Water Plan.

Legislative Authority

Article XV, Section 7 of the Idaho Constitution called for the creation of a "Water Resource Agency" but did not establish the agency. In 1965, the 38th Legislature established the Idaho Water Resource Board, and directed that (as amended):

> *The Idaho Water Resource Board shall, subject to legislative approval, progressively formulate, adopt and implement a comprehensive state water plan for conservation, development, manage-*

ment and optimum use of all unappropriated water resources and waterways of this state in the public interest.

Idaho Code 42-1734A(1)

To assist the Idaho Water Resource Board, 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)

Article XV, Section 7 was amended by the electorate during the general election of November 6, 1984. This modification provides that:

The Legislature of the State of Idaho shall have the authority to amend or reject the state water plan in a manner provided by law. Thereafter any change in the state water plan shall be submitted to the Legislature of the State of Idaho upon the first day of a regular session following the change and the change shall become effective unless amended or rejected by law within sixty days of its submission to the Legislature.

Legislation in 1988 provided for the development of a "comprehensive state water plan" and authorized designation of highly-valued waterways as state protected rivers. Each comprehensive basin or water body plan becomes a component of Idaho's State Water Plan.

The board may develop a comprehensive state water plan in stages based upon waterways, river basins, drainage areas, river reaches, ground-water aquifers, or other geographic considerations.

Idaho Code 42-1734A(2)

As part of the comprehensive state water plan, the board may designate selected waterways as protected rivers as provided in this chapter.

Idaho Code 42-1734A(1)

The authority to designate "protected rivers" derives from the state's power to regulate activities within a stream bed including stream channel alterations, water diversions, the extraction of minerals or other commodities, and the construction of impoundments.

State Water Plan Formulation

Formulation of a State Water Plan is a dynamic process. Adoption of The State Water Plan - Part One, *The Objectives*, in 1974, and *The State Water Plan* - Part Two in 1976, provided an initial State water policy. Implementing the policies in Part Two required the combined efforts of government agencies, the legislature, private concerns and the public. Consequently, the report delineated those areas where legislative action was required, identified the programs to be pursued by the Board, and described the areas where cooperation of public and private interests was necessary.

The State Water Plan was updated and readopted in 1982, 1986, and 1992. The Plan continues to evolve as an instrument in the adoption and implementation of policies, projects, and programs that develop, utilize, conserve, and protect the state's water supplies. Changes were made in 1985 to reconcile any differences created by the Swan Falls agreement entered into by the State and the Idaho Power Company. The 1986 and 1992 updates involved changes in objectives and policy reorganization.

Legislation in 1988 directed preparation of comprehensive plans for specific geographic areas as components of the State Water Plan [Idaho Code 42-1734A(2)]. These plans are prepared within the framework of the policies established by the overarching State Water Plan.

PLANNING PROCESS

The planning process encompasses five steps:

1. A comprehensive public involvement program to determine public views and desires regarding resource problems, needs, and potentials;

2. An ongoing evaluation of the water and related resource base and an estimate of probable future conditions;

3. An evaluation of beneficial and adverse effects of protection and development programs and projects;

4. Adoption of the State Water Plan by the Idaho Water Resource Board as required by Article XV, Section 7 of the Idaho Constitution;

5. Approval by the Idaho Legislature as provided by law.

Public involvement is an important part of the planning process, and is necessary in assessing viewpoints and conditions. Scoping meetings and formal hearings provided opportunity for public criticism and suggestions.

Idaho Water Resource Board Programs and Duties

In addition to formulating and implementing the State Water Plan, the Idaho Water Resource Board:

1. Provides financial assistance for water development and conservation projects in the form of revenue bonds, loans, and grants.

2. Provides a mechanism for implementing legislative mandates such as the aquifer recharge program established by the 1995 Idaho Legislature.

3. Adopts rules for:

- Well Construction
- Well Drillers Licenses
- Construction and Use of Injection Wells
- Drilling for Geothermal Resources
- Mine Tailings Impoundment Structures
- Safety of Dams
- Stream Channel Alterations

The Department of Water Resources administers these programs.

4. Hears appeals of Department of Water Resources administrative decisions regarding programs administered under Idaho Water Resource Board rules.

5. Administers the Idaho Water Supply Bank.

6. At the request of the Governor, appears on behalf of and represents the state in proceedings, negotiations, or hearings involving the federal government or other states.

7. May file applications and obtain permits to appropriate, store, or use unappropriated waters, and acquire water rights subject to the provisions of applicable law.

8. May investigate, undertake, or promote water projects deemed to be in the public interest.

9. May cooperate and enter into contracts with federal, state and local governmental agencies for water studies, planning, research, or activities.

10. May study water pollution and advise the State board of health and welfare regarding the establishment of water quality criteria.

11. May formulate and recommend legislation for water resource conservation, development, and utilization.

STATE WATER PLAN

The State Water Plan emerges from a vision of Idaho in which water is used efficiently, and is allocated through laws that fully conform to the prior appropriation doctrine. Water resource planning involves the widespread participation of Idaho citizens.

Objectives

The following objectives of the State Water Plan are formulated for the conservation, development, management and optimum use of all unappropriated water resources and waterways of this state in the public interest [Idaho Code 42-1734A].

1. **Water Management** - Encourage and promote the quantification of water use and all water rights within the state. Encourage and promote integrated, coordinated, and adaptable water resource management, and the prudent stewardship of water resources. Encourage state protection of waterways or water bodies with outstanding fish and wildlife, recreation, geologic or aesthetic values where protection should take precedence over development.

2. **Public Interest** - Ensure that the needs and wishes of the public are appropriately considered in decisions involving water resources of the state.

3. **Economic Development** - Encourage optimum economic development of the water resources, with due regard for prior water rights, that promotes the integration and coordination of the use of water, the augmentation of existing supplies, and the protection of designated waterways [Idaho Code 42-1734A(1)(b)].

4. **Environmental Quality** - Maintain, and where possible enhance water quality and water-related habitats. Study and examine the quality of rivers, streams, lakes and ground water [Idaho Code 42-1734(15)], and assure that due consideration is given to the needs of fish, wildlife, and recreation in managing the water resources of the state.

5. **Public Safety** - Encourage and promote programs that will assure life and property within the state are not threatened by the management or use of our water resources.

Policies

State Water Plan policies are directed toward optimum management and utilization of the state's water resources. The policies provide a framework within which private enterprise and government entities can develop and propose water resource projects and water management scenarios. Specific water resource projects and programs are identified in the comprehensive plans developed for defined geographic areas. The Water Resource Board adopts the following policies for the conservation, development, management and optimum use of all the unappropriated water resources and waterways of this state in the public interest [Idaho Code 42-1734A].

Water Use Group

A goal of the State Water Plan is to secure greater productivity, in both monetary and nonmonetary terms, from existing water supplies. Water Use policies are concerned with improvement in practices, procedures, and laws relating to existing water use.

1A - STATE SOVEREIGNTY

It is the policy of Idaho that the state has sovereignty over decisions affecting the development and use of its water resources, and that the state opposes any attempt by the federal government, its management agencies, any other state, or any other entity to usurp the state's role in these areas.

Comment: The Idaho Water Resource Board is responsible for the formulation of state water policy through the State Water Plan. The state's position on existing and proposed federal policies and actions should be coordinated by the Water Board to ensure the state retains its traditional right to control the water resources of the state.

1B - PUBLIC INTEREST

It is the policy of Idaho that water be managed with due regard for the public interest as established by state law.

Comment: The constitution and statutes of the State of Idaho declare all the waters of the state, when flowing in their natural channels, including ground waters, and the waters of all natural springs and lakes within the boundaries of the state, to be public waters [Idaho Code 42-101]. Water allocation and management decisions must consider the public interest as established by state law. The State Water Plan is an expression of the public interest.

1C - BENEFICIAL USE OF WATER

It is the policy of Idaho that beneficial uses include certain nonconsumptive water uses.

Comment: This policy is affirmed by Idaho Code 42-1501 and is reflected in the policies adopted by the Idaho Water Resource Board that "beneficial use" includes, but is not limited to, water required for the protection of fish and wildlife habitat, aquatic life, recreation, aesthetics, navigation, water quality, and managed ground water recharge as well as the traditional uses for agriculture, manufacturing, mining, hydropower, and human consumption.

1D - TRANSFERABILITY OF USE

It is the policy of Idaho that changes in the nature of use of a water right be allowed, including changes to nonconsumptive uses, provided other water rights are not injured.

Comment: The demand for water increases every year while the volume of unappropriated water within the state continually decreases. The purpose of allowing transferability of water rights is to provide flexibility in water allocation to meet changing conditions. Idaho Code 42-108 and 42-222 provide for changes in place of diversion, place of use, period of use, and nature of use. Provision is made to protect other water users, the agricultural base of an area, and the local public interest. Priority dates are retained if other water right holders are not injured.

In some instances, it is in the public interest to allow changes from traditional uses to instream flow purposes. In highly developed areas, the potential to protect or restore fish and wildlife, water quality, aesthetic, or recreation resources may depend upon the transferability of water rights. To make such transfers substantive, the priority date of the original water right should be retained if other water rights are not injured. Chapter 15, Title 42, Idaho Code needs to be expanded to enable the Idaho Water Resource Board to apply for a change in the nature of use when a water right is acquired that is best used for minimum or instream flow purposes.

1E - WATER MEASUREMENT

It is the policy of Idaho that the water resources of the state should be quantified and their uses should be measured.

Comment: Planning for the optimum use of the water resources of the state and optimal management requires adequate water supply assessment and water use measurement.

Idaho Code 42-1805 lists as a duty of the Director of the Department of Water Resources preparation of a present and continuing inventory of the water resources of this state. However, stream gaging in the state is sparse and many gaging stations have been abandoned due to rising maintenance costs and reductions in agency funding. The existing stream gaging program should be reviewed and enhanced in the most efficient manner to meet water planning and management needs. Many ground water systems have not been adequately studied. Assessment studies are needed to understand and evaluate the state's ground water resources.

Water use quantification is essential for water resource planning. Chapters six and seven, Title 42, Idaho Code, list authorities for water measurement. The State, through the Department of Water Resources, needs to be actively involved in water use measurement and reporting.

1F - CONJUNCTIVE MANAGEMENT

It is the policy of Idaho that where evidence of hydrologic connection exists between ground and surface waters, they are managed conjunctively in recognition of the interconnection.

Comment: Nearly all ground water aquifers in the state discharge to or are recharged by a surface body of water. Surface water seeps through stream beds, lake beds, and channel banks to aquifers. Aquifers, in turn, serve as underground reservoirs, and can stabilize stream discharge during dry periods. Irrigation practices, ground water pumping, and flood flows impact the relationship.

The goal of conjunctive management is to protect the holders of prior water rights while allowing for the optimum development and use of the state's water resources. The approval of new water-use applications and the administration of existing water rights must recognize this relationship.

1G - REASONABLE USE

It is the policy of Idaho to promote the reasonable use of water in accordance with state law.

Comment: As water use efficiencies are increased, reduced requirements in one water use sector could provide available water for new demands or help efforts to improve instream flows. State and local planning should consider water efficiency techniques, together with legislation or ordinances, that may help conserve water resources for drought periods and increase water supplies for other needed uses.

1H - GROUND WATER WITHDRAWAL

It is the policy of Idaho that average withdrawals from an aquifer should not exceed the reasonably anticipated rate of future recharge to that aquifer.

Comment: Excessive withdrawals of ground water may cause economic, environmental, and social problems nearly anywhere in the state. The state should seek to correct withdrawal/recharge imbalances in an orderly fashion, attempting to minimize negative impacts.

Idaho Code 42-226 allows full economic development of the state's underground water resources. The Director of the Department of Water Resources can establish reasonable ground water pumping levels when necessary to protect prior appropriations of ground water. It is important that all beneficial uses, including interdependent spring and surface water uses be considered in evaluating the full economic development potential of an aquifer. Section 42-237a provides that the Director may prohibit or limit the withdrawal of water from a well if withdrawal would result in diversion of the ground water

supply at a rate beyond the reasonable anticipated rate of future natural recharge. The director may allow withdrawals to exceed natural recharge if a program exists to increase recharge or decrease withdrawals and senior ground-water rights are protected.

There are areas within the state where withdrawal/recharge imbalances of the ground water resource have been identified by the Department of Water Resources. Idaho Code 42-233a and 233b give the Director of the Department of Water Resources the authority to designate areas as either Ground Water Management Areas or Critical Ground Water Areas. Designation and its associated management options provide a logical step in arresting excessive withdrawals from an aquifer. The Department of Water Resources should also require water-use reporting and the measuring of water levels.

1I - WATER SUPPLY BANK

It is the policy of Idaho that the sale or lease of water is critical to the efficient management of the state's water resources. Use of the State's Water Supply Bank shall be encouraged.

Comment: As the state approaches the situation where little or no water is available for new appropriations, the Water Supply Bank, established by Idaho Code 42-1761, affords an efficient mechanism for the sale or lease of water. By aggregating water available for lease, rental pools operating under the authority of the Water Supply Bank can supply the water needs of many potential users. The Idaho Water Resource Board has adopted rules and regulations governing the sale or lease of water through the Water Supply Bank. The Idaho Water Resource Board has authorized local entities to manage rental pools in Water Districts 01, 63, and 65. The Shoshone-Bannock Tribes are also authorized pursuant to state law, to operate a rental pool.

1J - RECHARGE

It is the policy of Idaho that managed recharge be encouraged, pursuant to state law.

Comment: Managed aquifer recharge may enhance spring flows and maintain desirable aquifer levels. Managed recharge should be monitored to document the beneficial effects on the state's water resources, and to minimize any concerns or issues.

1K - SPRING FLOWS

It is the policy of Idaho that the hydrogeologic relationships between ground water supplies and spring flows continue to be quantified to allow for the determination of optimal development of the water resources.

Comment: Spring flow is part of the natural discharge from an aquifer. Pumped ground water withdrawals from an aquifer change the original recharge-discharge relationship and affect spring flows. Where this relationship exists, it must be sufficiently quantified to allow for optimal utilization of the ground water supply while protecting established senior rights which depend on spring flows discharging from the aquifer. This requires continued funding for studies, such as the Upper Snake River Basin Study completed by the Department of Water Resources in 1996.

1L - WATER QUALITY

It is the policy of Idaho that water be protected against unreasonable contamination or deterioration in quality, thereby maintaining designated beneficial uses.

Comment: It is essential that the quality of Idaho's water resources be protected for public safety and economic stability and growth. The quality of surface and ground water depend in large degree on land-use practices within watersheds. Land managers and local units of government are urged to adequately consider means of reducing nutrient loading,

bacterial contamination, and soil erosion and deposition to protect water quality. Local units of government and special use districts should participate with Basin Advisory and Watershed Advisory Groups in the preparation of water quality management plans.

The Department of Water Resources administers a statewide ambient ground water quality monitoring network and the Environmental Data Management System. Regional and local monitoring networks are managed by the Division of Environmental Quality. The citizens of Idaho will be most efficiently served by cooperative water quality monitoring programs involving appropriate public and private entities, and establishment of an information distribution system for all water quality data.

1M - POLLUTION CONTROL

It is the policy of Idaho that the use of water to dilute pollution is not a substitute for adequate treatment.

Comment: State and federal water quality programs should provide protection for the current high quality of water associated with streams within the state. In most cases, allocation of water for instream flow use should be directed toward meeting fish, wildlife, and recreational needs and not to the dilution of pollution. One way to ensure sufficient water would be to obtain storage rights for water quality maintenance in reservoirs and stream reaches below impoundments.

Conservation Group

The Conservation policies focus on wise use and careful planning to accommodate important values. The purpose of the policies is to manage the use of water resources for the benefit of all Idaho citizens.

2A - SPECIES OF CONCERN

It is the policy of Idaho that the public interests be considered when decisions are made to maintain sustainable populations of plant and animal species whose existence is threatened by mankind's actions.

Comment: The state and federal government have identified species of concern and species that are listed or are candidates for listing as Threatened or Endangered. In most cases, action at the state level can identify management strategies that will insure sustainable populations of these species. The State will consider the public interest in determining its strategies and will encourage local leadership to this end. Exceptions to this policy will be made for efforts to eliminate noxious weeds and other pests.

2B - FEDERALLY LISTED SPECIES

It is the policy of Idaho to cooperate, insofar as allowed by state law, in efforts to conserve and restore plant and animal species listed by the federal government as Threatened or Endangered.

Comment: Actions taken by federal agencies under authorities created by the Endangered Species Act do not modify state law. Efforts by the citizens and agencies of the state to achieve federal goals may be constrained by existing state law, particularly the protection and preservation of state water rights.

The State should take an active role in the listing process. To the extent allowed by federal law, the State should be involved in developing and administering recovery and habitat management plans for species that are listed.

2C - LAKE AND RESERVOIR MANAGEMENT

It is the policy of Idaho that comprehensive management plans for surface use and water quality protection be developed for lakes and reservoirs in the state.

Comment: Idaho is a land of numerous lakes and reservoirs. Many lakes and reservoirs in the state have experienced declining water quality, surface crowding, losses in scenic values, and physical damage to the shoreline. Comprehensive management plans for surface use, relative to public safety, and water quality protection can address these problems.

Each lake or reservoir has its own set of needs and constraints which must be considered. County and city government, the local public, land managers, and user groups of the lake or reservoir and its watershed, must be involved in plan development and implementation. Where federal or private entities have regulatory control over water storage and releases, these entities are encouraged to cooperate in the development of surface use and water quality management plans.

The Idaho Water Resource Board supports implementation of the Clean Lakes Act passed by the Idaho Legislature in 1989 [Chapter 64, Title 39, Idaho Code]. The law provides for the creation of regional councils empowered to develop lake management plans. It further provides for technical advisory groups to support the council in its planning efforts.

2D - CLIMATE VARIABILITY

It is the policy of Idaho that climate variability be considered in planning for and in the management of the state's water resources.

Comment: Regional climate changes are uncertain, however, climate variability should be expected and planned for by the public and its agencies. Possible consequences of regional climate change are important to recognize. Winter snowpack in the mountains may be significantly affected, with consequent effects on water resources available for agriculture, power generation, forestry and fisheries. Even though uncertainties are considerable, we should not wait to put in place policies and procedures that could provide for flexibility and make use of new understanding as it develops.

Protection Group

The Protection policies deal with water and related resources with outstanding social, economic, and environmental values. The purpose of the policies is to safeguard these values and Idaho's citizens, and to provide for minimum stream flows, and the protection and preservation of waterways in accordance with Idaho Code 42-1734A(1)(d).

3A - INSTREAM FLOW

It is the policy of Idaho that when it is in the public interest the Idaho Water Resource Board should seek to appropriate waters in the state for instream flow purposes.

Comment: Instream flows protect many nonconsumptive uses such as fish and wildlife habitat, aquatic life, recreation, aesthetic beauty, transportation, navigation, hydropower and water quality. Many of these uses have direct effects on the economy while others represent intangible values, and the public interest. Chapter 15, Title 42, Idaho Code, provides the authority and spells out procedures for the Idaho Water Resource Board to appropriate water for minimum stream flows.

The Idaho Water Resource Board supports efforts to obtain storage and natural flow rights to improve and maintain instream flows when in the public interest. Chapter 15, Title 42, Idaho Code, should be expanded to enable the Idaho Water Resource Board to transfer acquired water rights to instream flow water rights. By law [Idaho Code 42-108 and 42-222], provision is made to protect other water users and the agricultural base of an area.

3B - POTENTIAL RESERVOIR SITES

It is the policy of Idaho that potential reservoir sites be protected from significant land use change.

Comment: Future economic development and population growth will bring additional demands on Idaho's water resources. In future years the construction of additional reservoirs may play an important role in managing the water resources of the state. While the State recognizes the rights of existing land owners, improvements and new development within potential reservoir sites, which could increase reservoir costs significantly, should be discouraged.

Table 1 lists current potential reservoir sites which should be protected by the State. Sites will be evaluated or reevaluated for protection during the process of preparing comprehensive plans for basins or waterways.

Table 1. Potential Reservoir Sites

Potential Reservoir	Stream	Size	Purpose
Upper Snake			
Teton	Teton River	236,000 AF	Irrigation, Power, Flood Control
Medicine Lodge	Medicine Lodge	12,000 AF	Irrigation
Birch Creek	Birch Creek	24,000 AF	Irrigation
Boulder Flats	Big Wood River	61,000 AF	Flood Control, Recreation
Southwest Idaho			
Grindstone	Snake River	115,000 AF	Irrigation
Sailor Creek	Snake River	113,000 AF	Irrigation
Gold Fork	Gold Fork Payette River	80,000 AF	Irrigation
Twin Springs	Boise River	410,000 AF	Irrigation, Power, Flood Control
Lost Valley (enlargement)	Lost Valley Creek	30,000 AF	Irrigation
Galloway	Weiser River	1,220,000 AF	Irrigation, Flood Control
Monday Gulch	Little Weiser River	35,000 AF	Irrigation
C. Ben Ross (enlargement)	Little Weiser River	12,450 AF	Irrigation
Goodrich	Weiser River	350,000 AF	Irrigation
Tamarack	Weiser River	30,000 AF	Irrigation
Salmon			
Challis	Challis Creek	10,600 AF	Irrigation
Bear			
Caribou	Bear River	40,000 AF	Irrigation
Plymouth	Malad River	400,000 AF	Irrigation

3C - STATE PROTECTED RIVER SYSTEM

It is the policy of Idaho that a state protected river system be maintained to meet the desires of the citizens of Idaho. The system should provide for the protection of the unique features that exist on various rivers within the state, and should provide the necessary authority and funding to protect such rivers and related lands for recreational, scenic, and natural values.

Comment: Idahoans have expressed a desire to retain some rivers or river reaches in a free-flowing condition. Idaho Code 42-1734A(1) authorizes the Idaho Water Resource Board to protect highly-valued waterways as State protected rivers. The authority to designate "protected rivers" derives from the State's power to regulate the beds of navigable streams and the waters within the state. In 1991 the Idaho Legislature approved the first stream reaches for state protection.

Because of the comprehensive scope of state water planning, the Idaho Water Resource Board encourages the federal government to work within the state water planning process rather than independently pursuing federal protection of waters within Idaho. Federal protection adds another layer of bureaucracy to water planning and limits planning flexibility. State water planning provides a means for ensuring coordinated water planning by both federal and state governments.

3D - RIPARIAN HABITAT AND WETLANDS

It is the policy of Idaho to protect the ecological viability of riparian habitat and wetlands within the state in the public interest.

Comment: Riparian lands and wetlands are important components of a watershed. The State of Idaho encourages protection of public riparian lands and wetlands, and the practice of good stewardship in managing private lands. Riparian and wetland protection above the mean high water elevation should be implemented at the watershed level. The authority to control land use is set out in the Local Planning Act of 1975, as amended. The Idaho Stream Channel Protection Act [Idaho Code 42-3801 thru 3812] regulates alteration of stream bed below the mean high water elevation.

3E - STREAM CHANNEL REHABILITATION

It is the policy of Idaho that the costs and benefits of stream channel rehabilitation be evaluated where past activities currently or potentially affect the yield or quality of the state's watersheds.

Comment: Catastrophic flooding is often the outcome of heavy run-off combined with human disturbances, and may result in the destruction of stream channels. The functional loss of impacted channels may threaten public safety, private property, and the overall quality and quantity of water produced in the affected watershed. It is appropriate for the State to take action to rehabilitate impacted stream channels where public safety may be threatened, or where the remedial costs are less than the potential damages.

Many early mining projects have been built and later abandoned. Some of these projects have deteriorated to the extent that public safety and water resource values are threatened. Where liability cannot be established, and public safety may be threatened, the State should take remedial action.

3F - TAILINGS POND REGULATION

It is the policy of Idaho that the construction, operation, and maintenance of mine tailings impoundment structures be regulated by the state.

Comment: Chapter 17, Title 42, Idaho Code makes the regulation of mine tailings impoundment structures a function of the Idaho Department of Water Resources. The health and safety of the citizens of the state and the quality of the state's water resources in many areas depend on the proper construction, operation and maintenance of mine waste tailings ponds. Chapter 1, Title 39, Idaho Code, provides general water quality authorities to the Board of Health and Welfare.

3G - RADIOACTIVE WASTE MONITORING

It is the policy of Idaho to maintain a state program to monitor and regulate the use, handling, and storage of radioactive wastes.

Comment: The Idaho National Engineering Laboratory (INEL), near Arco, sits on top of the Eastern Snake Plain aquifer, the primary drinking water supply to half the state's population and the irrigation water supply for three million acres. Protection of this vital water supply from radioactive contamination is imperative for both the physical health of the population and the economic health of the state.

The State of Idaho INEL Oversight Program, provides independent information about the Idaho National Engineering Laboratory to the citizens of Idaho. In order to verify and complement the monitoring conducted by the U.S. Department of Energy and it's contractors, the Oversight Program has developed an environmental surveillance program to monitor potential impacts on air, water, soil, and biota resulting from activities at the INEL. Some of the monitoring sites are the same as, or are co-located with, federal monitoring locations, while others have been located so as to provide information that would not otherwise be available. Monitoring results are reported quarterly, with an annual summary and assessment of impact on the environment and people of Idaho.

The Division of Environmental Quality is Idaho's lead agency for regulatory control over the use, handling, storage, and disposal of radioactive materials. Regulatory control is also exercised over clean up of sites contaminated with radioactive materials and transportation of nuclear waste and spent fuel in Idaho.

The Idaho Water Resource Board supports the Governor's agreement on radioactive waste storage and removal at INEL, and supports continued negotiations to restrict further importation to Idaho. The transfer of all radioactive waste from Idaho to a designated national repository at the earliest date possible is strongly encouraged.

3H - SAFETY MEASURES PROGRAM

It is the policy of Idaho that 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.

Comment: Each year, numerous fatal accidents occur in the state's waterways 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 shore lands. Fencing, signing, debris removal, covering and other structures should be installed to provide for human safety.

Local units of government should be encouraged to conduct annual public awareness campaigns concerning the dangers and hazardous nature of water bodies in their areas.

3I - FLOOD PRONE AREAS

It is the policy of Idaho to encourage the protection of flood plains and reliance on management rather than structural alternatives in reducing or preventing flood damages.

Comment: Flood damage can be limited by providing sufficient space in the flood plain to accommodate flood waters. Local government is encouraged to plan for floodways and protect flood plains from further development.

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. Buyers should realize those flood prone areas require special construction provisions to avoid flood losses.

The National Flood Insurance Program should be adopted statewide. This program requires that

local units of government zone and control flood prone areas in order to be eligible for most federal assistance. Floodplain maps prepared for the Federal Emergency Management Agency are available through the Idaho Department of Water Resources.

3J - FLOOD CONTROL LEVEE REGULATION

It is the policy of Idaho that the construction and maintenance of flood control levees be regulated by the State.

Comment: The only standards applicable to the construction of flood control levees in Idaho are in the Rules governing Stream Channel Alterations. These standards apply only when all or part of the levee will be located below the mean high water mark.

Flood control levees are maintained by local entities. There are no maintenance regulations so the degree of maintenance varies with the capability and diligence of the responsible organization. This situation creates a potential hazard in that levees may be deteriorate to the point of being unsafe.

All new flood control levees should be required to be built to standards promulgated by the Department of Water Resources. The Department should also be authorized to develop maintenance criteria for flood control levees and to insure compliance with these criteria through an inspection program.

When a levee is scheduled to be rebuilt, a cost/benefit analysis should be conducted to determine if it is prudent to rebuild the levee in question or buy the property which the levee would protect.

Management Group

The focus of the Management policies is on improvement in the practices, procedures, and laws relating to existing water and energy resource administration and programs. The purpose of the policies is achievement of greater administrative efficiency.

4A - AGENCY CONSOLIDATION

It is the policy of Idaho that the administration of state programs for water allocation, planning, and water quality regulation be consolidated in one agency.

Comment: Planning and administration of water quantity and water quality are presently divided between two state agencies even though they are two directly interrelated properties of the same resource. The Department of Water Resources is primarily responsible for programs relating to water quantity, and the Division of Environmental Quality is responsible for protecting the quality of the state's water. Combining water quantity and water quality programs should reduce confusion and improve service to the public while preserving the goals of both programs.

4B - REVIEW OF FEDERAL RESERVOIR WATER ALLOCATION

It is the policy of Idaho that agreements be established with federal agencies to allow Idaho Water Resource Board review of any proposed water allocation from federal reservoirs in excess of 500 acre-feet annually.

Comment: This policy does not encroach upon the authority of federal agencies to operate their facilities according to congressional authorization, but would help to ensure that their actions occur with state review and concurrence. The Idaho Water Resource Board would be guided in such a review by the conformance of the proposed allocation with the State Water Plan.

Formal agreements are necessary for the State Water Plan to be implemented in a coordinated manner. The Idaho Water Resource Board and the U.S. Bureau of Reclamation reached an agreement in 1988 providing for Board review of proposed reallocations. An agreement should be negotiated with the Corps of Engineers regarding large water releases from their facilities.

4C - ENERGY PLAN

It is the policy of Idaho that the State Energy Plan set forth policies for energy use and development in the state and that the plan be updated at least every five years.

Comment: The Idaho State Energy Plan was finalized in February 1982, and adopted by the Water Resource Board on June 3, 1983. The Idaho Water Resource Board recognized this plan as implementation the original State Water Plan's Policy 13, which called for the formulation of a State Energy Plan.

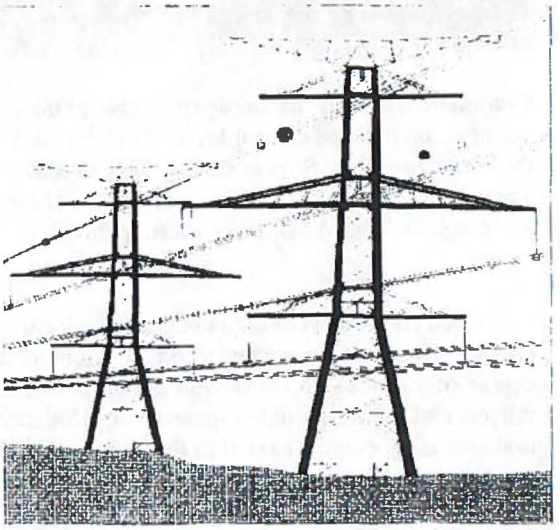
The Energy Plan needs to be updated at least every five years to be effective. This is increasingly important with the current move toward deregulation of the electric utility industry. The Idaho Water Resource Board urges legislative funding for an immediate update of the plan.

4D - HYDROPOWER LICENSING

It is the policy of Idaho to insure that public interest, existing water rights, related settlement agreements, and the future water and energy needs of the State are considered in hydropower licensing.

Comment: Hydropower water rights may be limited to a specific term and subordinated to upstream depletionary uses [Idaho Code, 42-203B(6) and (7)]. Water rights for power purposes may also be defined by agreement as unsubordinated to an established minimum flow [Idaho Code, 42-203B(2)]. Idaho asserts its traditional right to regulate the state's water resources. The federal government, in the hydropower licensing process, must recognize water rights and other constraints on water use established through state law. Hydropower licenses should be compatible with the public interest and outstanding power purchase contracts.

Many hydropower projects in Idaho are or soon will be undergoing relicensing by the Federal Energy Regulatory Commission (FERC). State review of existing water rights should occur in conjunction with the FERC relicensing process.



4E - HYDROPOWER SITING

It is the policy of Idaho that new hydropower developments be in conformance with the State Water Plan and the State Energy Plan.

Comment: The Idaho Water Resource Board is charged with the responsibility for planning for the optimum development of the water resources of the state through policies and water allocations which reflect the public interest. Specific hydropower siting issues are addressed in the Idaho Water Resource Board's comprehensive basin or river plans. The Federal Energy Regulatory Commission must consider State comprehensive plans in making hydropower siting decisions.

As a general policy, the Idaho Water Resource Board believes that energy conservation and efficiency improvements are the most desirable methods

to provide for additional power requirements. The State of Idaho will be best served through conservation and the upgrading of existing energy systems. These measures are attractive because of their low costs, short lead time, and flexibility.

Recognizing the future need for new generating capacity, the Board prefers that new hydropower resources be developed at dams having hydropower potential that do not currently generate power or do not generate at their maximum potential. New structures or projects should be carefully evaluated to insure that the benefits to the state outweigh any negative consequences associated with the proposed development. The Idaho Water Resource Board will evaluate specific hydropower developments in comprehensive plans for river basins or waterways.

4F - CONSERVANCY DISTRICTS

It is the policy of Idaho that where practical, the total water needs of a geographic area be satisfied by a legal entity having the authority and responsibility to address all water needs in a comprehensive manner.

Comment: Under present law the boundaries of irrigation districts, ground water districts, recharge districts, water measurement districts, drainage districts, and flood control districts need not coincide. Since coordinated planning is rarely undertaken, the possibility exists for good faith actions to have adverse impacts or be at cross purposes with the aims of other management entities.

A water conservancy district should have the authority to own and operate storage, diversion, and delivery systems to provide the total water needs of large geographic parts of the state (e.g., river basins, single or multi-county areas). It should have authority to levy taxes on all property benefitted by a program or project 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 ground-water recharge projects, distributing the costs over the affected area. They could also integrate the use of the surface and ground-water resources of a river basin for more efficient use of the total resource.

4G - RESEARCH PROGRAM

It is the policy of Idaho to encourage and conduct research on important water resource topics.

Comment: While water programs in Idaho can incorporate information from research in other states, more research dealing with specific problems in Idaho is needed. Topics that need immediate attention include:

- water use efficiency
- optimum monitoring programs for water use
- ground and surface water relationships specifically with regard to the timing and spacial distribution of pumping and recharge efforts,
- ground water flow models, and
- cooperatively developed system operation modeling techniques for Idaho river basins.

4H - FUNDING PROGRAM

It is the policy of Idaho that state funds be available to support the development, preservation, conservation, and restoration of the water and related resources of the state.

Comment: The Idaho Water Resource Board's Revolving Development Fund, the Water Management Account, and the Conservation and Development Trust are mechanisms for partially achieving the goals of this policy. The funds or accounts rely on the appropriation of moneys from the state's general fund. These programs have provided financial assistance for more than 200 water development, conservation, or system rehabilitation projects and studies. They have not been funded with sufficient moneys to have a highly visible impact on the land, water and related resources of the state.

Idaho Code 42-1734(2) provides that the Idaho Water Resource Board may lend the proceeds of the sale of revenue bonds to a local water project sponsor or sponsors. The issuance of revenue bonds does not constitute a general obligation of the State of Idaho or the Idaho Water Resource Board. Since 1983, $75.7 million has been created by this pro-

gram to fund 147 projects, including $10.6 million to help irrigators switch from flood irrigation to sprinkler irrigation, and $54.3 million to improve municipal water systems. While the revenue bond program was used extensively from 1983 to 1986, the Tax Reform Act of 1986 placed a number of restrictions on the issuance of these bonds, making them practical only for selective large projects. Since 1986, only three projects have been funded through the Revenue Bond program.

The language creating the above funds and accounts should be amended. In most cases it is overly restrictive, providing for the expenditure of moneys primarily for development. Money should be made available for projects that would conserve, preserve, or restore the state's water and related resources

4I - PLANNING PROGRAM

It is the policy of Idaho that water management plans be prepared for the individual river basins.

Comment: Comprehensive planning is necessary to minimize conflicts between competing water uses and to ensure optimal protection of all beneficial uses of water. Detailed water management plans should be prepared for river basins and aquifers within the state to evaluate the specific interrelationship between ground and surface water and provide for the orderly protection and development of the state's water resources.

Idaho Code 42-1734A provides for the development of a "comprehensive state water plan" based upon river basins or other geographic considerations. Each basin or waterway plan becomes a component of the State Water Plan. The following comprehensive plans have been approved by the Idaho Legislature and accepted by the Federal Energy Regulatory Commission:

Priest River Basin
South Fork Boise River Basin
Payette River Reaches
Henrys Fork Basin
Snake River: Milner Dam to King Hill
Upper Boise River Basin
North Fork Clearwater Basin
South Fork Snake River Basin

These plans contain State protected river designations and recommendations concerning other aspects of water use. The positions and policies contained in an approved plan are the State's official position on water use in the affected areas. The plans also assure that the state's interests will be considered in federal management agency decisions.

4J -FEDERAL AND TRIBAL WATER RIGHTS

It is the policy of Idaho to quantify all federal and tribal water rights within the state.

Comment: Federal agency and tribal water rights claims in Idaho must be identified and quantified to plan for continued use of existing water rights and future needs. As a part of each effort to identify and quantify federal agency and tribal water rights, the protection of existing water rights must be considered. The State should seek to negotiate these rights whenever appropriate.

Executive Order No. 91-8 designated the Idaho Water Resource Board as lead agency to coordinate state activities related to the negotiation of reserved water rights with Idaho Tribes. The successful negotiations concluded with the Shoshone-Bannock over the Fort Hall water rights serves as an example of a negotiated settlement.

4K - WATER RESOURCE MANAGEMENT

It is the policy of Idaho that the diversion and use of water occur only in accordance with water rights issued by the state and federal reserved rights established by the courts. Adjudication of water rights through the state courts should be completed where necessary to fully define and quantify the rights.

Comment: The adjudication of water rights is often necessary to sort out overlapping or incomplete claims for the use of surface and ground water resources. These conflicts need to be resolved if the resources are to be managed effectively. Effective programs can then be applied to assure that water is diverted and used in accordance with valid rights.

River Basins Group

The River Basins Group contains resource management policies specific to the state's three major river basin networks: the Snake River Basin, the Bear River Basin in southeast Idaho, and the northern Panhandle river basins.

- *Snake River Basin*

5A - SWAN FALLS AGREEMENT

It is the policy of Idaho that the Swan Falls agreement between the state and Idaho Power Company establishes the framework for water management in the Snake River basin.

Comment: The Swan Falls Agreement was signed in 1985 by the State of Idaho and the Idaho Power Company. The Idaho Water Resource Board is committed to continued implementation of this agreement. Minimum flows in the Snake River are crucial to the Swan Falls Agreement. During portions of low water years, river flows downstream from Milner Dam to Swan Falls Dam consist almost entirely of ground water discharge. The Eastern Snake Plain aquifer which provides this water must therefore be managed conjunctively as an integral part of the river system. This agreement also calls for the adjudication of water rights in the Snake River Basin to enhance the state's water management capabilities.

5B - SNAKE RIVER MINIMUM FLOWS

It is the policy of Idaho that minimum average daily flows at the Murphy gaging station shall meet or exceed 3,900 cfs from April 1 to October 31 and 5,600 cfs from November 1 to March 31. The average daily flow measured at the Weiser gage shall not be less than 4,750 cfs. A minimum average daily flow of 5,000 cfs at Johnson's Bar shall be maintained and an average daily flow of 13,000 cfs shall be maintained at Lime Point (river mile 172) a minimum of 95 percent of the time. The exercise of water rights above Milner Dam has and may reduce flow at the dam to zero.

Comment: In licensing the Milner hydropower project, the Federal Energy Regulatory Commission (FERC) specified "target flows" for the Snake River at Milner. The target flow must be satisfied only when water in excess of prior irrigation rights is available. Water for target flows may be acquired from storage or may be leased from the Upper Snake Rental Pool. The State should seek to acquire water whenever it becomes available in order to mitigate the impacts of low flow below the Dam.

The minimum flows established for the Snake River at the Murphy and Weiser gaging stations are management and permitting constraints; they further insure that the State will be able to assure an adequate hydropower resource base and better protect other values recognized by the State such as fish propagation, recreation, and aesthetic interests, all of which would be adversely impacted by an inadequate stream flow.

The minimum flows established for Johnson's Bar and Lime Point are contained in the original Federal Power Commission (now FERC) license for the Hells Canyon hydropower complex. By adopting these flows, the Idaho Water Resource Board recognizes the importance of minimum flows to downstream uses and makes their maintenance a matter of state water policy. Lower flows may be permitted at Lime Point during the months of July, August, and September, during which time the operation of the Hells Canyon dams shall be in the best interest of power and navigation as determined by the Corps of Engineers and Idaho Power Company as owner of the Hells Canyon power facilities.

The Idaho Water Resource Board recognizes that FERC license requirements relate primarily to the provision of water for navigation and power and not to other instream uses. The Board realizes that the state has no authority to require releases of stored water by the power company, but believes the license conditions serve the public interest. When the Hells Canyon hydropower complex is relicensed, the Water Board will reevaluate the public interest.

Snake River flows above the hydropower right at any Idaho Power facility are considered unappropriated and therefore are not held in trust by the state. This distinction is further addressed in Policy 5C.

5C - SNAKE RIVER TRUST WATER

It is the policy of Idaho that water held in trust by the state pursuant to Idaho Code 42-203B be reallocated to new uses in accordance with the criteria established by Idaho Code 42-203A and 42-203C.

Comment: The agreement between the State of Idaho and Idaho Power Company dated October 25. 1984 provides that Idaho Power's claimed water right of 8,400 cubic feet per second (cfs) at the Swan Falls Dam may be reduced to either 3,900 cfs or 5,600 cfs during set periods of the year. The claimed water right of 8,400 cfs is deemed appropriated and the amount above the minimum flow established in Policy 5B up to the 8,400 cfs is held in trust by the state. The trust water area is defined by Rule 30 in the Idaho Department of Water Resources' Rules for Water Appropriation (see also Fig. 1).

The agreement further provides that Idaho Power's claimed water rights at facilities upstream from Swan Falls shall be considered satisfied when the company receives the minimum flow specified in Policy 5B at the Murphy gaging station. The 8,400 cfs claim of the power company has not historically been available during summer months.

The 8,400 cfs claimed right at Swan Falls is reduced by the agreement to that flow available after satisfying all applications or claims that demonstrate water was beneficially used prior to Oct. 1, 1984, even if such uses would violate the minimum flows established in Policy 5B. Any remaining water above these minimum flows may be reallocated to new uses by the state providing such use satisfies existing Idaho law.

However, due to continued spring flow decline in the Thousand Springs area since the late 1950s, water availability to satisfy additional beneficial uses is limited. A moratorium, as defined in Idaho Code 42-1806, on further water development has been in place since May 15, 1992.

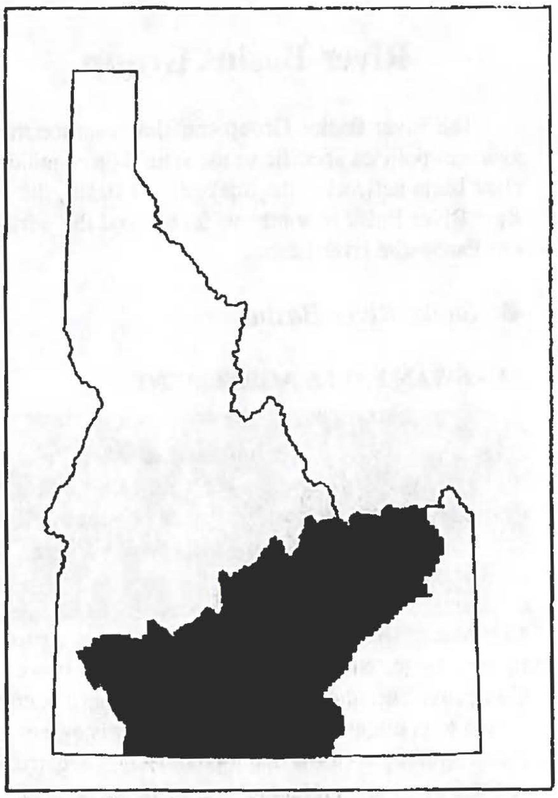


Figure 1. Snake River Basin Trust Water Area.

5D - SNAKE RIVER BASIN DCMI

It is the policy of Idaho that 150 cfs of the water held in trust by the state above Swan Falls Dam pursuant to Policy 5C be reallocated to meet future domestic, commercial, municipal, and industrial consumptive uses in accordance with state law.

Comment: While most DCMI (Domestic, Commercial, Municipal, and Industrial) water uses are negligibly consumptive, future growth in Idaho's population and commercial and industrial expansion will require an assured supply of water.

A continuous flow of 150 cfs provides approximately 108,600 acre-feet of water per year. This volume of water is assigned to consumptive uses within the basin for domestic, commercial, municipal, and other industrial purposes. Industrial purposes include processing, manufacturing, research and development, and cooling.

During the ten-year period from 1985 to 1995, about 120 cfs was developed for DCMI uses within the trust water area. Adequate records should be kept and reviewed so that this allocation can be modified as necessary. Increases in the DCMI allocation, if necessary, will reduce the amount of water available for agricultural uses. The allocation will be reviewed as part of every Water Plan update.

5E - SNAKE RIVER BASIN AGRICULTURE

It is the policy of Idaho that appropriated water held in trust by the state pursuant to Policy 5C, less the amount of water necessary to provide for present and future DCMI uses as set forth in Policy 5D, shall be available for reallocation to meet new and supplemental irrigation requirements which conform to Idaho Code 42-203A, 203B, 203C, and 203D.

Comment: During the ten-year period from 1985 to 1995, about 45,600 acres of new irrigation development occurred within the trust water area. Data are not available to estimate the number of acres that received supplemental water during this period.

Idaho Code Section 42-203C limits the rate of new development in the basin above the Murphy gaging station to 80,000 acres in any four-year period. Impact on existing water rights, mitigation for the impact of diversions on hydropower generation, and criteria placed on the reallocation of hydropower rights, however, limits the rate of new development.

5F - SNAKE RIVER BASIN HYDROPOWER

It is the policy of Idaho that hydropower use be recognized as a beneficial use of water, and that depletion of flows below the minimum average daily flows set forth in Policy 5B is not in the public interest.

Comment: This policy specifically recognizes hydropower generation as a beneficial use of water and acknowledges the public interest in maintaining the minimum river flow at key points.

By establishing minimum daily flows at Murphy and Weiser, stabilized flows are guaranteed for hydropower generation.

5G - SNAKE RIVER NAVIGATION

It is the policy of Idaho that water sufficient for commercial and recreational navigation is provided by the minimum flows established for the Snake River.

Comment: Commercial navigation en route to Lewiston via the Columbia River and Lower Snake River can be accommodated with the flows leaving Idaho in the Snake River at Lewiston. Above Lewiston, commercial and recreational navigation on the river should be accommodated within the protected flows on the Snake River and tributary streams.

5H - SNAKE RIVER BASIN SPRINGS

It is the policy of Idaho to seek to maintain spring flows in the American Falls and Thousand Springs reaches of the Snake River which will sustain beneficial uses of surface and ground water supplies in accordance with state law.

Comment: Spring discharge in the American Falls and Thousand Springs reaches of the Snake River are vital to the Snake River Basin and Idaho economy. The springs near American Falls provide an important part of Snake River flow appropriated by Magic Valley irrigators. In the Thousand Springs reach, spring flow is the only practical source of water for many of the state's aquaculture facilities.

During portions of low-water years, river flows downstream from Milner Dam to the Murphy gaging station consist almost entirely of ground-water discharge from the Thousand Springs reach. Maintaining these discharges should be the goal of water managers. Managed recharge of the aquifers and continued efforts to efficiently use ground water are two strategies for maintaining spring discharges in these reaches.

5I - SNAKE RIVER BASIN NEW STORAGE

It is the policy of Idaho that applications for large surface storage projects upstream from the Murphy gage be approved subject to the requirement that the use is in the public interest.

Comment: "Large surface storage projects" are those which have the potential for significantly impacting existing uses. Projects for which approval is required under Section 42-1737, Idaho Code, would be such projects. This policy addresses the approval of new surface storage in the basin, but does not apply to already approved projects. Approval of new storage projects that would divert water from the main stem of the Snake River between Milner and the Murphy gaging station during the period November 1 to March 31 should be coupled with provisions that mitigate the impact such depletions would have on the generation of hydropower.

5J - STORAGE ACQUISITION

It is the policy of Idaho that reservoir storage be acquired in the name of the Idaho Water Resource Board to provide management flexibility in assuring the minimum flows designated for the Snake River.

Comment: The Idaho Department of Water Resources is expected to allocate the unappropriated waters and the power rights held in trust by the state in such a manner as to assure minimum flows at designated key points on the Snake River. The impacts of ground water use within the basin on the timing of aquifer discharge to the rivers is such that at some time stored surface water may be necessary to maintain the designated minimum flows.

At this time there is little reservoir storage within the basin which could be acquired by the State. The State should act to acquire any available, feasible reservoir storage in order to provide flexibility for management decisions and provide assurance that the established minimum flows can be maintained. Until such time as these waters are needed for management purposes, they shall be credited to the Water Supply Bank and funds obtained from their lease or sale shall accrue to the Water Management Account. The Board should have priority in acquiring water from the Water Bank, if necessary, to meet the minimum flows established by the Swan Falls Agreement.

Flood control space at Brownlee Reservoir should be considered for salmon flow augmentation. If the 500,000 acre-feet evacuated for flood control purposes downstream could be held and released for flow augmentation during downstream salmon migration, this could replace valuable water supplies taken from the upper Snake River Basin.

● *Bear River Basin*

6A - BEAR RIVER COMPACT

It is the policy of Idaho that water use and management in the Bear River Basin conform to the allocations set forth in the Bear River Compact [Idaho Code 42-3402].

Comment: The Bear River Compact has been in effect since 1958, and water allocations for the entire basin were adopted in 1978. The compact must be reviewed at intervals of not less than twenty years and may be amended during the review process.

The goal of Idaho's representatives on the commission should be to urge conjunctive management of ground and surface water resources within the Bear River Basin and to seek as much of the unconsumed flow entering the Great Salt Lake as possible for Idaho while negotiating in good faith with the other states.

6B - INTERSTATE WATER DELIVERY

It is the policy of Idaho that Idaho water users in the Lower Division of the Bear River Basin must be protected from inequitable water allocation in the event of a water emergency and the scheduling of interstate water deliveries.

Comment: Article 4 of the Bear River Compact provides for the Bear River Commission to declare water emergencies and implement interstate water delivery schedules. If a downstream water user believes the flow of water in the Bear River or an interstate tributary is insufficient to satisfy their water right, due to diversions in an upstream state, that user may file a petition requesting water distribution under the direction of the Commission.

Water emergencies must be determined through comprehensive accounting processes and reflect true emergency conditions. Water emergencies should not be declared on an annual basis with the sole intent of advancing interstate water delivery schedules. Unless water accounting models include as many reaches as necessary to account for incremental changes in natural flows, and accurately reflect water rights as well as contractual arrangements, Idaho water users may be adversely impacted by interstate water delivery scheduling.

6C - BEAR LAKE

It is the policy of Idaho to recognize and preserve the outstanding values of Bear Lake while continuing to meet existing allocations for irrigation and hydroelectric power generation.

Comment: Bear Lake is a regional tourist attraction recognized for its unique water coloration and for its fishery. To protect these values, the Idaho Water Resource Board has obtained a minimum lake level water right for Bear Lake. The water right holds the lake elevation at or above 5902 feet.

The State of Idaho also recognizes and supports the Bear Lake Storage Allocation and Recovery Plan. This plan was approved through the Bear Lake Settlement Agreement of April 1995 as the established guideline for the operation of Bear Lake. This document calls for a portion of the active storage in Bear Lake to be voluntarily retained to enhance recreation and water quality values.

Recent information indicates that the major contaminant problem in Bear Lake is suspended sediment. The primary source of suspended sediment is the Bear River during high flow periods when sediment-laden water enters Bear Lake through Mud Lake. The most effective way to further enhance the water quality of Bear Lake is to reduce the sediment load to the Bear River above Bear Lake.

6D - BEAR RIVER BASIN WATER PROJECTS

It is the policy of Idaho to encourage additional projects for the development of the water resources of the basin without regard to state boundaries.

Comment: The Bear River Compact provides for a signatory state to construct storage facilities in another state. In order to obtain the maximum beneficial use of water within the basin, it may be necessary to ignore state boundaries, providing that water rights generated by such projects comply with the basic allocations of the compact. The State of Idaho should participate with Wyoming and Utah in determining the feasibility of headwater storage projects to provide for additional irrigation and other uses in Idaho.

● *Panhandle River Basins*

7A - PANHANDLE BASINS

It is the policy of Idaho that the ground and surface waters of the Idaho Panhandle be managed to protect the environmental quality of the region.

Comment: While appearing water rich in comparison to the rest of the state, the water resources of the Idaho Panhandle are finite, and in some areas are fully utilized. Water is the key to the continued economic development in the region. The Water Board places a high priority on maintaining the quality of the water resource base.

7B - PANHANDLE MINIMUM FLOWS

It is the policy of Idaho to provide sufficient water to meet the minimum requirements for aquatic life, fish and wildlife, and to provide for recreation in the Panhandle Basins.

Comment: The minimum stream flow program provides the Idaho Water Resource Board with the authorities necessary to appropriate water for the purposes of this policy. Several streams in the Panhandle Basins have been examined and protected with minimum stream flows claimed by the Idaho Water Resource Board. As water consumption increases in the region, the minimum stream flow program will become increasingly important in the administration of water rights within the Panhandle Basins.

7C - PANHANDLE DCMI

It is the policy of Idaho to provide water for new domestic, commercial, municipal and industrial uses. A depletion of 14 cfs is allocated for these purposes.

Comment: The purpose of this policy is to set aside a significant amount of water for future DCMI (Domestic, Commercial, Municipal, and Industrial) development. The Panhandle population is projected to grow by approximately 2.9 percent annually to more than 200,000 people by 2015. This is a 73 percent increase over 1990 population. Based on current water-use data for the region, an allocation of nine million gallons per day or 14 cfs for consumptive use should be sufficient through the year 2015.

7D - PANHANDLE AGRICULTURAL WATER

It is the policy of Idaho that additional water be made available for irrigated agriculture in the Panhandle. A combined net depletion of 200 cfs is allocated for this purpose.

Comment: Agriculture is a major industry of the state, and Idaho provides an important share of the nation's food production. The Idaho Water Resource Board wishes to insure the availability of water for this purpose.

7E - PANHANDLE NAVIGATION

It is the policy of Idaho that water sufficient for commercial and recreational navigation be maintained in the streams and lakes of the Idaho Panhandle.

Comment: Water for navigation is not a significant problem at this time. If such appropriation appeared necessary, the minimum stream flow program can be used to appropriate water to provide a minimum flow or lake level for the protection of navigation and transportation. Navigation interests are further protected in that all new water appropriations must be in the public interest and an adverse effect on navigation would rarely be in the public interest.

IDAHO'S WATER RESOURCES

Overall, Idaho is rich in water resources with hundreds of square miles of lakes, over ninety-thousand miles of rivers and streams, and one of the largest underground reservoirs of water in the world. However, like most places around the globe, Idaho's water resources may be either excessive or scarce depending on time, place, or human activities.

Climate

Idaho's climatic regime is generally characterized by warm dry summers and cold moist winters. Approximately 500 miles inland from the Pacific Ocean and shouldered against the Continental Divide, the state spans seven degrees of latitude between 42° and 49° north. On the eastern flank, the Rocky Mountains protect much of Idaho from the more severe arctic cold spells and destructive summer storms which are prevalent on the Great Plains. Pacific maritime air masses, brought east by mid-latitude cyclonic storms, are the source of nearly all precipitation. However, the Cascade Range in Oregon and Washington is a major orographic barrier to maritime air masses. Consequently, Idaho receives significantly less precipitation than western Oregon and Washington or comparable inland locations such as Ohio or Michigan. Statewide, an average 22 inches of precipitation annually falls on Idaho. Climatic diversity throughout the state is notable, and is principally attributable to air movement direction with respect to latitude and mountain ranges, and to elevation.

Through June, July, and August, a stationary low pressure trough along the west coast of the United States positions a high-pressure ridge and its associated subtropical air over Idaho. This relatively dry air results in only modest rainfall over the state during most summers (Fig. 2). Occasionally, summer thunderstorms develop as moist air from the Gulf of Mexico or subtropical Pacific Ocean is circulated northward, especially in the southeastern part of the state. Salmon, located in the rain-shadow of Idaho's central mountain mass, derives most of its precipitation from spring and summer thunderstorm activity.

By September, intensification of the upper westerly winds results in a more west-to-east air movement aloft. At the same time, eastward migration of the Pacific longwave trough allows frontal systems to move into the state. November, December, and January are generally the wettest months of the year in most Idaho locations. Southward progression of dry polar air masses often results in decreased mid-winter precipitation. However, in the central and northern half of the state a second cycle of precipitation usually occurs during spring, as the polar front returns northward into Canada.

Orographic lift initiates much of Idaho's precipitation. Average annual precipitation in the central Idaho mountains may be as much as 60 inches, much

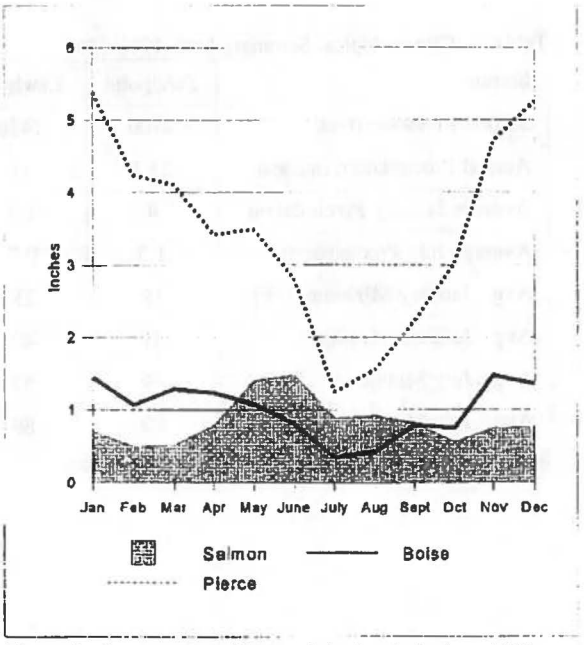


Figure 2. Average monthly precipitation in inches, 1961-1990.

of it as snow, while on the Snake River Plain, in southern Idaho, precipitation averages less than 10 inches (Fig. 3). Winter precipitation is about evenly divided between rain and snow at elevations below 3,000 feet, but above that level most of the precipitation arrives in the form of snow.

Elevations in the state vary from a low of seven hundred feet at Lewiston, where the Snake River leaves the state, to over twelve thousand feet in the Lost River Range. Total winter snowfall ranges from 20 inches or less in southwestern Idaho valleys or in canyon bottoms to perhaps as much as 400 inches in the higher mountains. The greatest normal annual snowfall for which there is actual record is 300 inches at Roland, southwest of Mullan Pass, at an elevation of 4,150 feet.

The highest annual temperature averages are found at the state's lowest elevations. Low altitude stations, such as Riggins and Lewiston, seldom record mean monthly temperatures below 32°F, while monthly means are 32°F or below five months of the year at elevations of 5,000 feet or above. Table 2 summarizes climatological data from several Idaho weather stations.

Lewiston and the valleys of southwestern Idaho have an average frost-free period of more than 140 days, with some of the warmer hillsides reaching 180 to 200 days. In the higher Pocatello-Idaho Falls area and in the lower valleys of extreme northern Idaho, the frost-free period is much shorter — 125 days or less. Frosts and freezes are possible at any time during the growing season in the high mountain valleys.

REFERENCES

Molnau, Myron, and Francis M. Winters, Jr., 1988. Mean Annual Precipitation Map for Idaho. Idaho Water Resources Research Institute, Research Technical Completion Report.

Molnau, Myron, 1992. Mean Annual Precipitation Map for Idaho: a GIS database. Idaho Water Resources Research Institute and the Idaho Agricultural Experiment Station.

U.S. Geological Survey, 1991. National Water Summary 1988-89. United States Geological Survey Water Supply Paper 2375.

Table 2. Climatological Summary Data 1961-1990

Station	Sandpoint	Lewiston	Pierce	Boise	Hailey	Pocatello	Salmon
Station Elevation (feet)	2100	1436	3190	2838	5306	4454	3930
Annual Precipitation (inches)	33.5	11	42	12	16	12	10
Average January Precipitation	4	1.3	5.4	1.4	2.2	1	0.7
Average July Precipitation	1.3	0.7	1.3	0.4	0.7	0.7	0.9
Avg. January Minimum (°F)	19	28	16	22	9	14	11
Avg. January Maximum	31	40	32	36	30	32	30
Avg. July Minimum	49	59	43	58	49	53	51
Avg. July Maximum	80	89	81	90	84	88	88

Source: Univeristy of Idaho, State Climate Services.

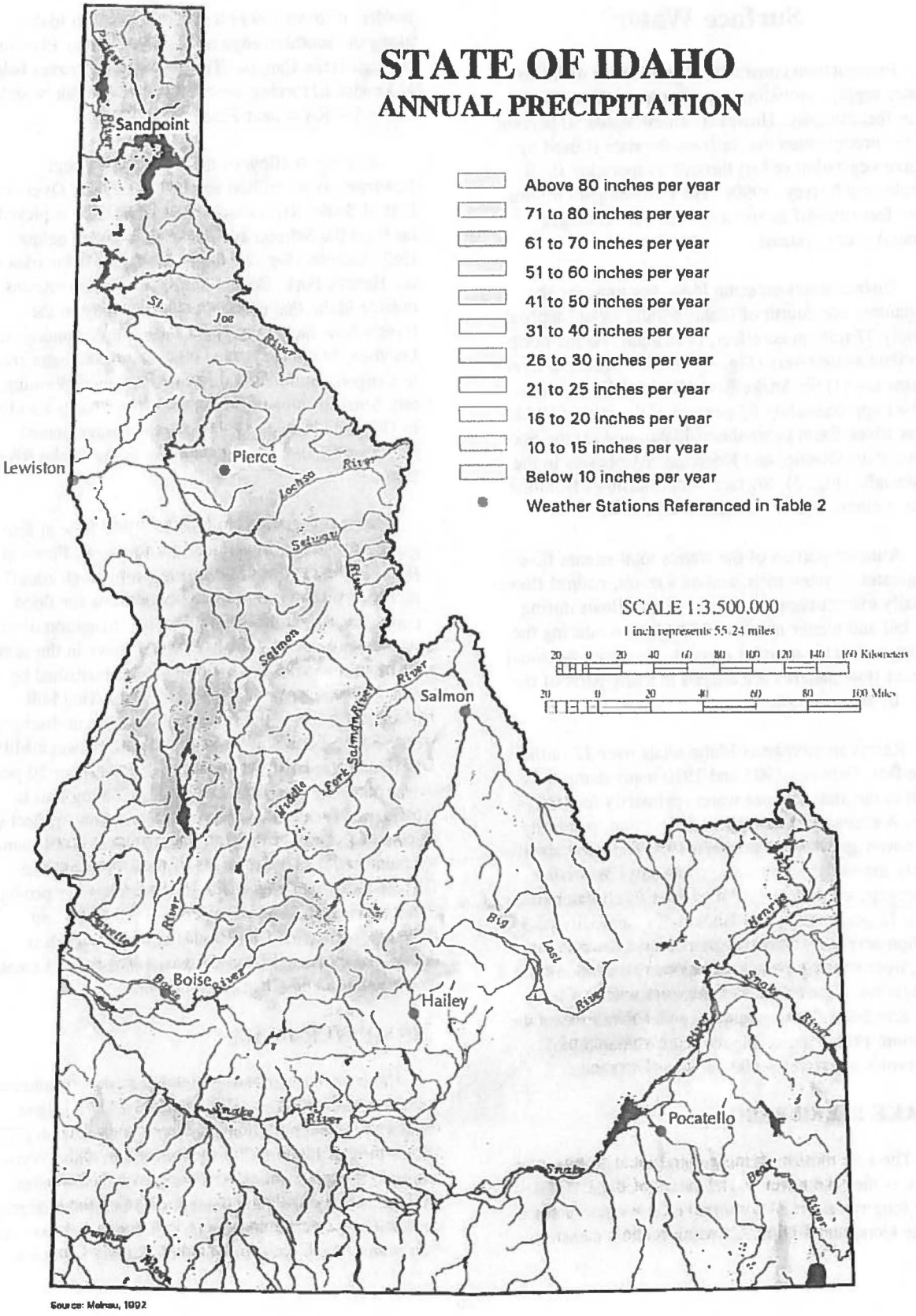


Figure 3. State of Idaho Mean Annual Precipitation

Surface Water

Precipitation constitutes three-fourths of Idaho's water supply, providing approximately 98 million acre-feet annually. However, an estimated 50 percent of the precipitation that falls on the state is used by native vegetation or lost through evaporation (U.S. Geological Survey, 1990). The remaining 49 million acre-feet runs off as surface water, or recharges ground water systems.

Surface water entering Idaho accounts for the remaining one-fourth of Idaho's water input, approximately 37 million acre-feet, principally via the northern Panhandle rivers (Fig. 4). Idaho's principal river basins are (1) the Snake River Basin, which encompasses approximately 87 percent of the state; (2) the Bear River Basin in southeast Idaho; and (3) the Spokane, Pend Oreille, and Kootenai river basins in the Panhandle (Fig. 5). Surface water outflows from the state amount to over 70 million acre-feet.

A major portion of the state's total stream flow originates as snow melt, and as a result, natural flows usually exhibit regular patterns of low flows during the fall and winter months and high flows during the spring and early summer months. However, seasonal stream flow patterns are altered in many parts of the state by storage projects.

Reservoir storage in Idaho totals over 12 million acre-feet. Between 1905 and 1930 many dams were built in the state to store water, primarily for irrigation. A second spurt of dam construction, primarily for power generation, between 1950 and 1969 significantly increased water storage capacity. Dworshak Reservoir, on the North Fork of the Clearwater River, is the largest reservoir in Idaho with a capacity of 3.4 million acre-feet. The reservoir is used for flood control, hydroelectric power generation, recreation, and navigation. Figure 6 locates reservoirs with at least 250 acre-feet of storage capacity and Table 3 lists the location, primary use, capacity and ownership of reservoirs with over 5,000 acre-feet of storage.

SNAKE RIVER BASIN

The single most unifying geographical feature of Idaho is the Snake River. Headwaters of the 1,000 mile long river are in Wyoming on the western slope of the Continental Divide. Crossing Idaho's eastern border, it flows 759 miles across southern Idaho, along the southern edge of the Snake River Plain and through Hells Canyon. The Snake River leaves Idaho at Lewiston, turning westward to its junction with the Columbia River near Pasco, Washington.

Average outflow of the Snake River near Lewiston, is 36 million acre-feet per year. Over one-half of Snake River discharge at its mouth is picked up from the Salmon and Clearwater rivers below Hells Canyon (Fig. 7). Other important tributaries are the Henrys Fork, Boise, and Payette rivers. Basins outside Idaho that contribute significantly to the river's flow include the upper basin in Wyoming, the Owyhee, Malheur, Burnt, Powder, and Imnaha rivers in Oregon, and the Grand Ronde River in Washington. Small portions of the Snake River basin also lie in Utah and Nevada. Table 4 lists average annual runoff at principal gaging stations in the Snake River Basin.

Seasonal variations in Snake River flow at four gaging stations are illustrated by Figure 8. Flows at Heise are the result of late spring snow melt runoff modified by reservoir storage operations for flood control and irrigation. Below Heise, irrigation diversions may completely deplete river flows in the summer months. Snake River flows are replenished between Milner Dam and King Hill. The King Hill hydrograph reflects the relatively consistent discharge of the Snake Plain aquifer in the reach between Milner Dam and King Hill. On an annual basis, over 50 percent of Snake River flow measured at King Hill is from ground water discharge. Weiser flows reflect the effects of storage, diversion, and ground water management in the irrigated areas of the Upper Snake River Basin, river regulation for hydropower production downstream, and inflow from the Boise and Payette systems. At Clarkston, the hydrograph is dominated by runoff from the vast unregulated areas of the Salmon and Clearwater basins.

BEAR RIVER BASIN

The Bear River Basin is situated in the southeast corner of Idaho (Fig. 5). It comprises 7474 square miles and includes portions of three states: Utah (3255 square miles), Idaho (2704 square miles), and Wyoming (1515 square miles). Flowing over 500 miles, the Bear River has the distinction of being the largest river in the western hemisphere that does not flow into an ocean. Deep Creek, in Oneida County's Curlew

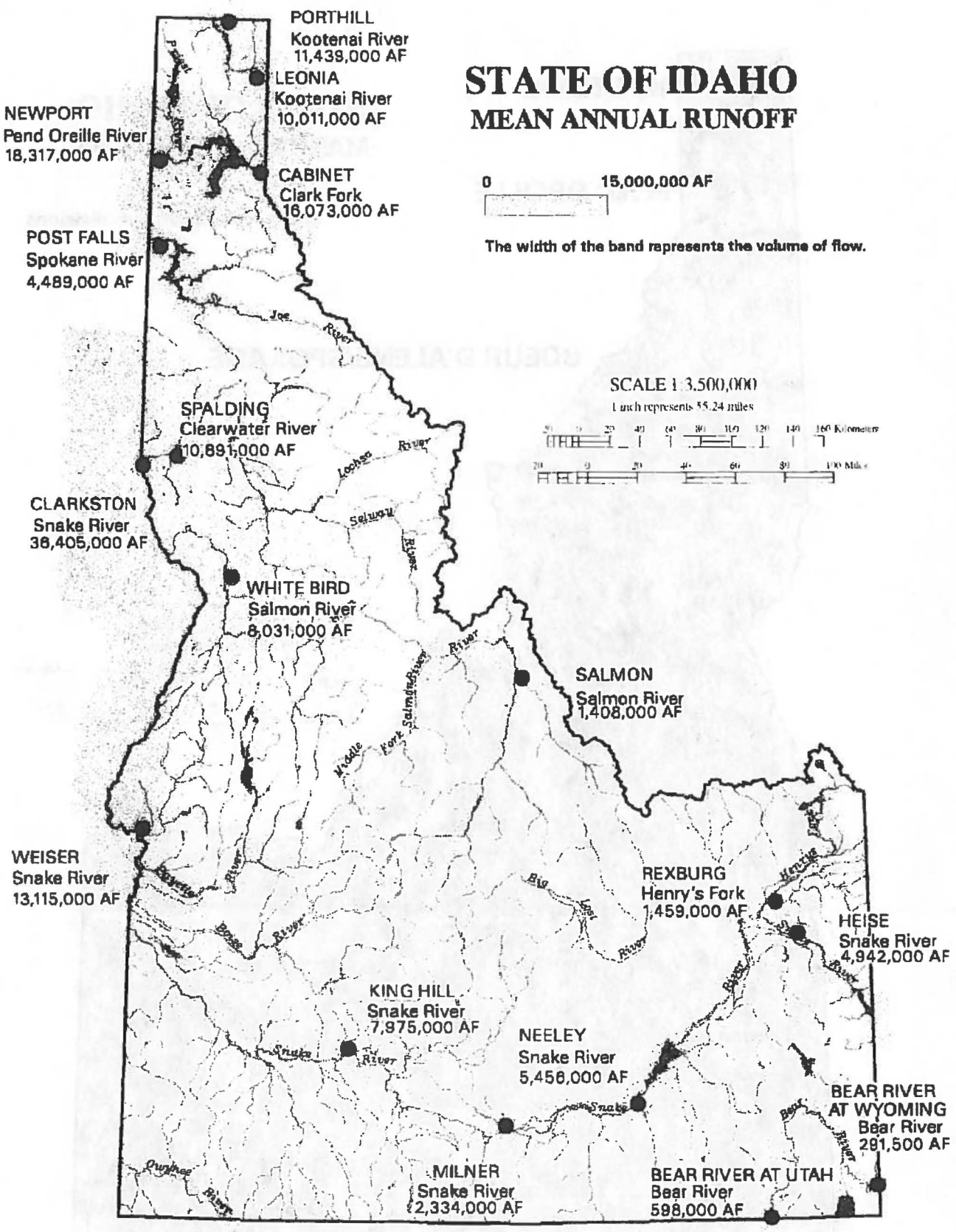


Figure 4. State of Idaho Mean Annual Run-Off

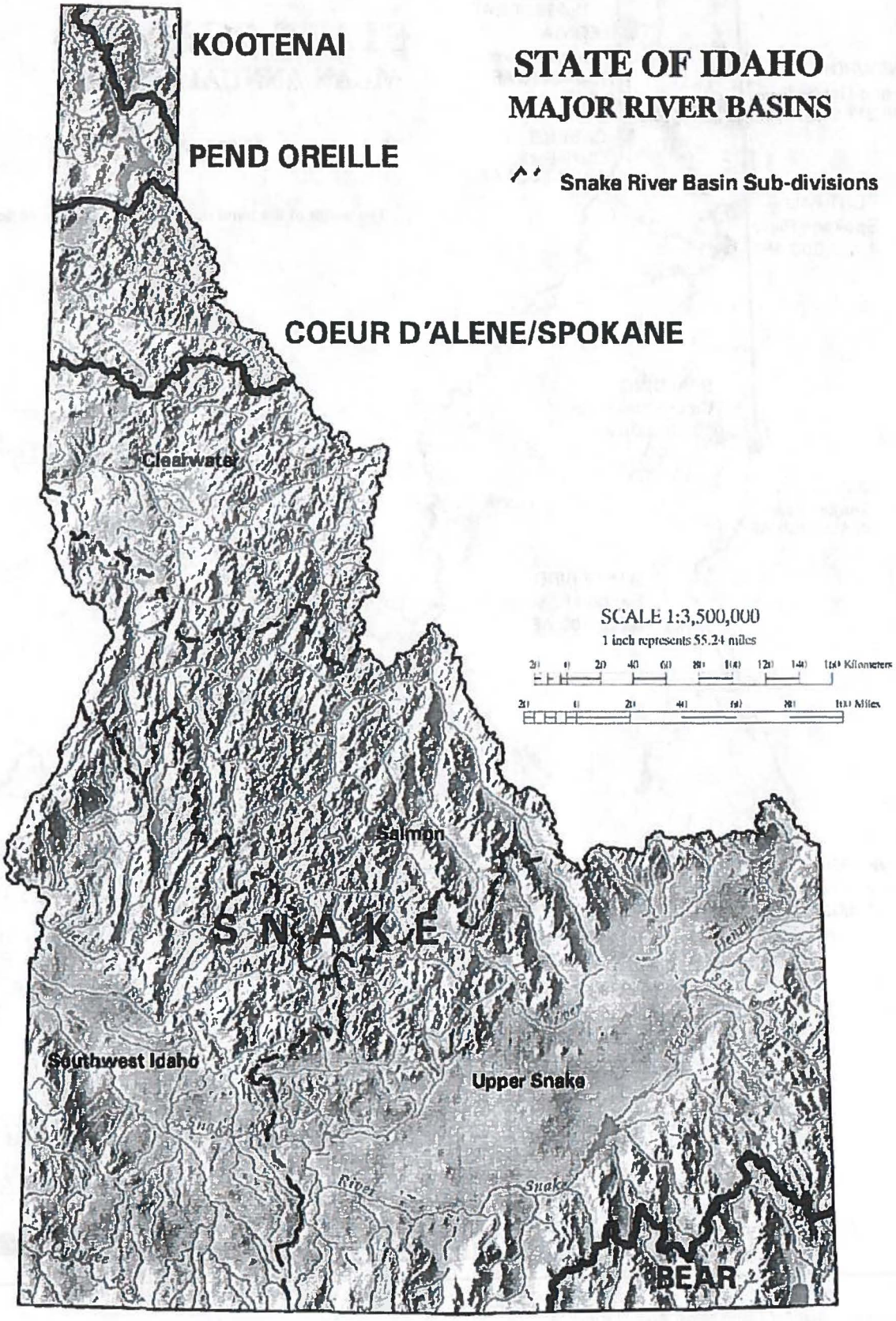


Figure 5. State of Idaho Major River Basins

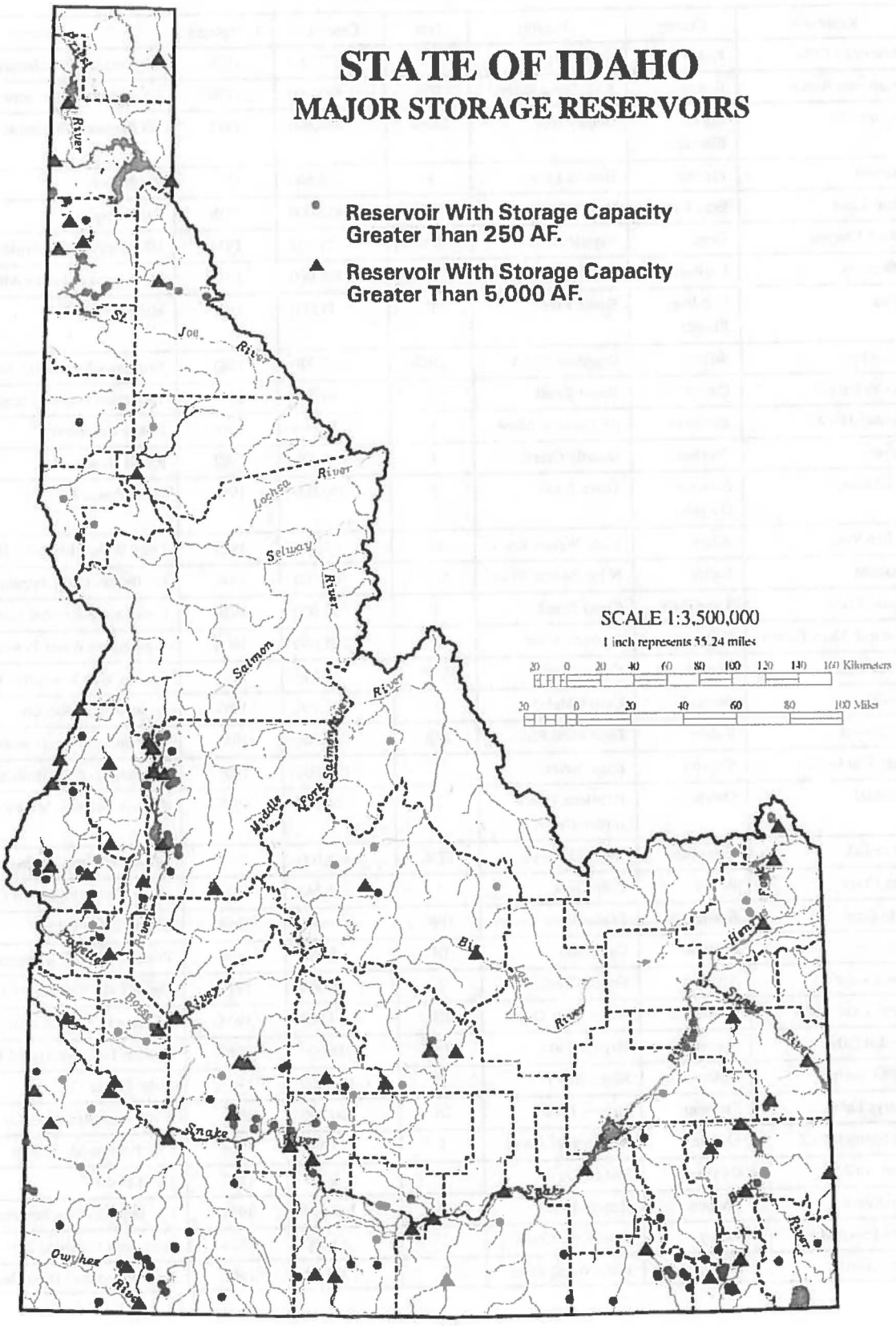


Figure 6. State of Idaho Major Storage Reservoirs

Table 3. Reservoirs in Idaho with Storage Capacity Greater than 5,000 acre feet.

Reservoir	County	Stream	Use	Capacity	Completed	Owner
American Falls	Power	Snake River	IFP	1,671,300	1978	US Bureau of Reclamation
Anderson Ranch	Elmore	S Fk Boise River	IPF	493,200	1950	US Bureau of Reclamation
Arrowrock	Boise-Elmore	Boise River	DIFR	286,600	1915	US Bureau of Reclamation
Ashton	Fremont	Henrys Fork	P	9,800	1913	PacifiCorp
Bear Lake	Bear Lake	Bear River	IPR	1,452,000	1918	PacifiCorp
Black Canyon	Gem	Payette River	IPR	29,822	1924	US Bureau of Reclamation
Blackfoot	Caribou	Blackfoot River	DI	350,000	1911	US Bureau of Indian Affairs
Bliss	Gooding-Elmore	Snake River	P	11,000	1950	Idaho Power Co
Brundage	Adams	Brundage Creek	DIS	7,330	1987	Brundage Waterusers Association
Bruno Creek	Custer	Bruno Creek	T	89,500	1982	Thompson Creek Mining Co
Bunker Hill #3	Shoshone	SF Coeur d'Alene	T	12,000	1926	Pintlar Corporation
Bybee	Owyhee	Shoofly Creek	I	7,970	1987	Riddle Ranches Inc
C J Strike	Elmore-Owyhee	Snake River	P	250,000	1952	Idaho Power Co
C Ben Ross	Adams	Little Weiser River	DI	7,787	1937	Little Weiser River Irr Dist
Cascade	Valley	N Fk Payette River	IFP	703,200	1948	US Bureau of Reclamation
Cedar Creek	Twin Falls	Cedar Creek	I	30,000	1920	Cedar Mesa Res and Canal Co
Coeur d'Alene (Lake)	Kootenai	Spokane River	IP	225,000	1906	Washington Water Power
Crane Creek	Washington	Crane Creek	DIP	56,800	1912	Crane Creek Res Admn Board
Daniels	Oneida	Lower Malad	I	8,700	1967	St. John Irrigation Co
Deadwood	Valley	Deadwood River	IPR	161,900	1931	US Bureau of Reclamation
Deer Flat Lower	Canyon	Boise River	I	190,000	1907	US Bureau of Reclamation
Delamar	Owyhee	Henrietta Gulch-Jordan Creek	T	14,400	1977	Kinross Delamar Mining Company
Dworshak	Clearwater	N Fk Clearwater	PFR	3,453,000	1973	US Army Corps of Engineers
Fish Creek	Blaine	Fish Creek	I	12,743	1923	Carey Valley Reservoir Co
Gem State	Bonneville	Snake River	IPR	5,000	1988	City of Idaho Falls
Glendale	Franklin	Cub River	DI	6,000	1930	Preston-Whitney Irrigation Co
Goose Lake	Adams	Goose Creek	I	6,550	1919	Goose Lake Reservoir Co
Grays Lake Outlet	Bonneville	Grays Lake Outlet	IG	40,000	1924	US Bureau of Indian Affairs
Hayden Lake	Kootenai	Hayden Lake	FI	38,000	1910	Hayden Lake Watershed Improv Dist
Hells Canyon	Adams	Snake River	P	170,000	1967	Idaho Power Co
Henrys Lake	Fremont	Henrys Fork	DI	90,000	1923	North Fork Reservoir Co
Hot Springs No 2	Elmore	Hot Springs Creek	I	5,334	1968	Carl F Reynolds & Sons
Hulet No 2	Owyhee	Sinker Creek	I	6,787	1987	Jay H Hulet
Island Park	Fremont	Henrys Fork	DI	127,646	1938	US Bureau of Reclamation
Little Payette Lake	Valley	Lake Fork Creek	I	10,300	1926	Lake Fork Irrigation Dist
Little Wood	Blaine	Little Wood River	I	30,000	1941	Little Wood Irrigation District

Reservoir	County	Stream	Use	Capacity	Completed	Owner
Little Camas	Elmore	Little Camas Creek	I	18,400	1912	Mountain Home Irrigation Dist
Lost Valley	Adams	Lost Creek	DI	7,100	1910	Lost Valley Reservoir Co
Lucky Peak	Ada	Boise River	IFP	307,000	1954	US Army Corps of Engineers
Mackay	Custer	Big Lost River	IS	45,000	1918	Big Lost River Irrigation Dist
Magic	Blaine	Big Wood River	IP	191,500	1910	Big Wood Canal Co
Mann Creek (Spangler)	Washington	Mann Creek	I	12,950	1967	US Bureau of Reclamation
Milner	Cassia-Jerome	Snake River	I	36,300	1905	Milner Dam Inc
Minidoka (Lake Walcott)	Cassia-Minidoka	Snake River	IP	210,000	1906	US Bureau of Reclamation
Mormon (Twin Lakes)	Camas	Mckinney and Dairy Creeks	DI	19,280	1908	Twin Lakes Res & Irrigation Co
Mountain View	Owyhee	Boyle Creek	RD	5,500	1969	US Bureau of Indian Affairs
Moyie	Boundary	Moyie River	P	16,000	1949	City of Bonners Ferry
Murtaugh Lake	Twin Falls	Snake River	I	7,720	1905	Twin Falls Canal Co
Oakley	Cassia	Goose Creek	I	76,000	1916	Oakley Canal Co
Oneida Narrows	Franklin	Bear River	IP	11,500	1915	PacifiCorp
Paddock Valley	Washington	Little Willow Creek	I	36,400	1949	Little Willow Irrigation Dist
Palisades	Bonneville	Snake River	IFP	1,401,000	1957	US Bureau of Reclamation
Payette Lake	Valley	N Fk Payette River	IR	41,000	1944	Lake Reservoir Co
Pend Oreille (Lake)	Bonner	Pend Oreille River	PFO	1,561,300	1955	US Army Corps of Engineers
Portneuf	Caribou	Portneuf River	DI	23,695	1912	Portneuf-marsh Valley Canal Co
Priest Lake	Bonner	Priest River	PR	82,000	1978	Idaho Department of Water Resources
Ririe	Bonneville	Willow Creek	IF	100,500	1976	US Bureau of Reclamation
Sage Hen	Gem	Sage Hen Creek	DI	5,210	1938	Squaw Creek Irrigation Co
Salmon Falls	Twin Falls	Salmon Falls Creek	DI	230,650	1911	Salmon River Canal Co Ltd
Salmon Falls Lower	Gooding-Twin Falls	Snake River	P	18,500	1949	Idaho Power Co
Slack (Juniper Basin)	Owyhee	Juniper Creek	DI	5,000	1916	Petan Co
Smoky Canyon No 2	Caribou	Tygee Creek	T	20,450	1991	J R Simplot Co
Soda Point	Caribou	Bear River	P	15,500	1925	PacifiCorp
Swan Falls	Ada-Owyhee	Snake River	P	7,500	1901	Idaho Power Co
Texas Basin	Owyhee	Succor Creek	I	6,340	1979	Succor Ck Dist Improvement Co
Twin Lakes	Franklin	Mink Creek	I	12,297	1920	Twin Lakes Canal Co
Twin Lakes	Kootenai	Rathdrum Creek	DI	9,090	1909	Twin Lakes Rathdrum FCD 17

Use Codes:

D = Domestic **F** = Flood Control **G** = Wildlife **H** = Fish Propagation **I** = Irrigation **O** = Other **P** = Power **R** = Recreation **S** = Stockwater **T** = Mine Tailings

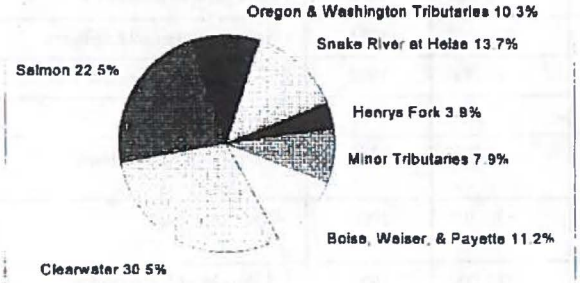


Figure 7. Average annual runoff of Snake River tributaries considered as percentages of the Snake River's average annual runoff at Lewiston.

Table 4. Average Annual Runoff of Major Snake River Basin Rivers at Selected Gages (base period 1928-92).

Gage	Runoff (acre-feet)
Snake River near Heise	4,942,000
Henrys Fork near Rexburg	1,459,000
Snake River at Neeley	5,456,000
Snake River at Milner	2,334,000
Snake River at King Hill	7,975,000
Snake River near Murphy	8,085,000
Boise River near Boise	1,955,300
Boise River near Parma	1,198,000
Payette River near Horseshoe Bend	2,288,000
Payette River near Payette	2,106,000
Snake River at Weiser	13,115,000
Snake River at Hells Canyon Dam	14,188,800
Salmon River at Whitebird	8,031,000
Snake River near Anatone	25,305,000
Clearwater River at Spalding	10,981,000
Snake River near Lewiston	36,405,000

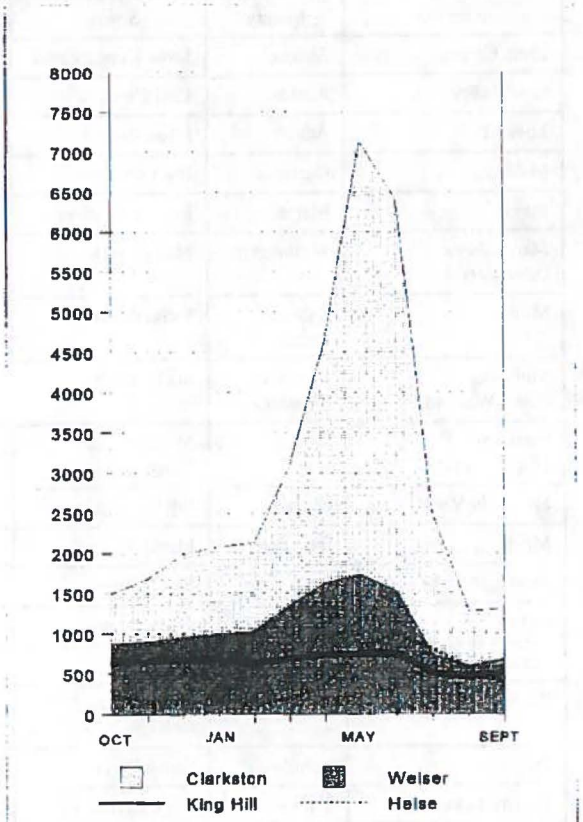


Figure 8. Seasonal distribution of Snake River long term average flows at four gaging stations, in thousand acre-feet.

Valley, is not a Bear River tributary, but like the Bear River flows into Utah and the Great Salt Lake Basin.

Elevations in the Bear River Basin range from 4400 feet in the valleys to over 9000 feet. About one-half of the area is mountainous and lies above 6000 feet. The major valley and mountain ranges trend north-south. Bear River stream flow is primarily the result of snow melt in higher portions of the watershed.

The Bear River enters Idaho near the community of Border, Wyoming. At Border, it has drained a 2500 square mile watershed and has an average annual flow of 291,500 acre-feet (Table 5). Forty-four miles downstream, at Stewart Dam near Dingle, Idaho, water from the Bear River is diverted to Bear Lake. Diverted water first enters Mud Lake, then Bear Lake via canal.

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. The lake is 20 miles long, eight miles wide, 208 feet deep at its maximum depth, and has a total volume of 6.5 million acre-feet. Since the last ice age, it has been isolated from the Bear River, and has acted as an ephemeral tributary. Isolation resulted in a unique water chemistry and the development of four unique fish species. Between 1909 and 1918, a diversion dam, an inlet canal, and an outlet canal were constructed to allow Bear River water to flow in and out of 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 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 5,902.00). Present usable capacity of the lake is 1,421,000 acre-feet.

From Bear Lake, the river flows northwesterly toward the community of Soda Springs, where it turns south 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. Major Idaho tributaries of the Bear River are the Thomas Fork, Cub River and the Malad River. About 50 percent of the Bear River's flow at the Idaho-Utah state line, south of Preston, originates in Idaho.

Monthly flows at the gaging stations are influenced to varying degrees by reservoir regulations, irrigation diversions and return flows. High flows are common in May and June and very low flows in July, August, and September (Fig. 9). The Bear River at Border is regulated by upstream storage, and is depleted by irrigation diversions in Wyoming and Utah. The monthly flow regime in the reach below Preston (State Line) reflects the effects of reservoir releases for power generation, unregulated tributary inflow, and irrigation diversions. The Thomas Fork and the Malad River exhibit monthly flows typical of unregulated streams. Peak runoff occurs during the snow melt season and then declines throughout the summer months.

Table 5. Average Annual Runoff of the Bear River, 1927-1992.

Station	Runoff (acre-feet)
Bear River at Idaho-Wyoming state line	291,500
Bear Lake Outlet	306,100
Bear River at Alexander	533,800
Bear River at Idaho-Utah state line	598,000

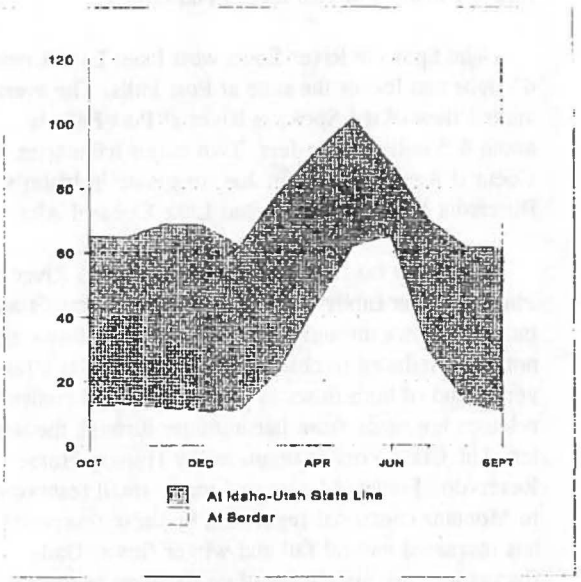


Figure 9. Seasonal distribution of Bear River long term average run-off in thousand acre-feet.

PANHANDLE BASINS

The Panhandle has, relative to other areas of Idaho, abundant water resources. Precipitation and runoff are generally greater than anywhere else in the state. Average annual runoff at principal gaging stations is listed in Table 6. The seasonal distribution of Panhandle river flows is shown in Figure 10.

Kootenai and Clark Fork flows are largely the result of runoff conditions in upstream Montana and British Columbia. The Kootenai River enters Idaho from Montana at Leonia and discharges about 10 million acre-feet per year into British Columbia at Porthill. It gains an average 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 cubic feet per second.

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 18.3 million acre-feet per year. The average gain in Idaho is about 3600 cfs. Principal Idaho tributaries are the Pack River and Priest River. The river flows through Idaho's largest lake, Pend Orelile.

The Spokane River flows west from Lake Coeur d'Alene and leaves the state at Post Falls. The average annual flow of the Spokane River at Post Falls is about 4.5 million acre-feet. Two major tributaries, the Coeur d'Alene and the St. Joe, originate in Idaho's Bitterroot Range and flow into Lake Coeur d'Alene.

There are no reservoirs on the Kootenai River in Idaho, but the Libby Project in Montana controls and modifies flows through Idaho. While flood flows are normally reduced to channel capacity, there is a longer period of high 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 many small reservoirs in Montana. Seasonal regulation by these reservoirs has increased natural fall and winter flows. Daily fluctuations are also imposed on the river by power operations at the Noxon Rapids Dam in Montana and at the Cabinet Gorge Dam in Idaho.

Table 6. Average annual runoff of major rivers in Idaho's Panhandle at selected gages for period of record.

Station	Runoff (acre-feet)
Kootenai River at Leonia	10,011,000
Moyie River at Eastport	502,500
Kootenai River at Porthill	11,439,000
Clark Fork at Whitehorse Rapids	16,073,000
Priest River near Priest River	1,202,000
Pend Oreille River at Newport	18,317,000
St. Joe River at Calder	1,701,400
St. Maries River near Santa	252,700
Spokane River near Post Falls	4,489,000

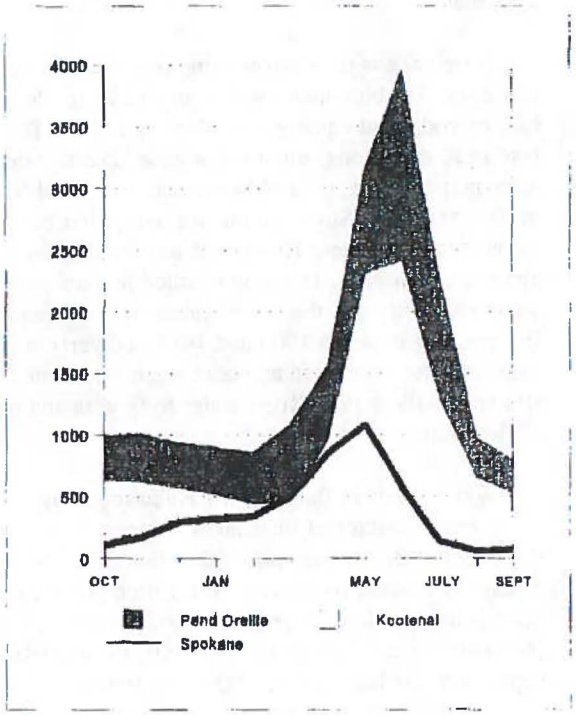


Figure 10. Seasonal distribution of long term average runoff for Idaho Panhandle rivers, in thousand acre-feet.

Panhandle Lakes

The state's largest lakes, Pend Oreille (148 square miles of surface area), Coeur d'Alene (50 square miles), and Priest (37 square miles), gouged out by great ice sheets as much as a mile thick, are located in the northern panhandle. A detailed survey of Pend Oreille Lake made by the U.S. Coast and Geodetic Survey reported the maximum depth at 1,200 feet. Mean depth at Lake Coeur d'Alene is 70 feet, and at Priest Lake 128 feet, with the deepest depths in both lakes lying 200-300 feet below the surface.

The lakes are regulated by dams at their outlets, and thus provide a certain amount of storage water that can be released as desired. Lake Pend Oreille is regulated by Albeni Falls Dam as part of the Columbia River system for downstream power and flood control. The dam has the effect of increasing the length of Lake Pend Oreille, along the river, by 20 miles. Prior to dam construction, the average annual variation between low water in the winter and high water in the spring was 13 to 14 feet.

The normal summer level is now held at elevation 2062.5 feet. Beginning in September, the lake is drafted at a nearly uniform rate to reach elevation 2060 by the end of October. A continuing draft to elevation 2051 may be made until December for system power purposes if needed. Normally, the lake is at winter flood control level by December 1. Between December 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.

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 2128. 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 variable because of inflow fluctuations. Following spring runoff, lake levels decline to elevation 2128, the gates are closed and the dam is operated to hold the lake at that level through the summer.

Priest Lake is controlled by a small dam originally constructed in 1950 and rebuilt in 1978. 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 Idaho Department of Water Resources, owner of the dam.

Regulating the lake elevation for summer recreation use has reduced Priest River flows from July through November. The July and August flows 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.

REFERENCES

United States Geological Survey, 1990. National Water Summary 1987. United States Geological Survey Water-Supply Paper 2350.

Ground Water

Surface waters and ground water in the state are significantly intertwined. In many basins, some water may traverse between an aquifer and a stream several times. Influences which affect the water supply in one environment will likely affect supply in the other.

Aquifer discharge supplies a component of flow to all streams and varies seasonally. Generally the ratio of ground water to surface water in a stream becomes progressively greater as total stream discharge declines. Aquifer recharge is by infiltration of surface runoff. In southern Idaho, seepage from irrigation is a significant source of recharge. Historic rises in ground water levels are recorded in most surface water irrigated areas. The state's principal aquifer systems are mapped in Figure 11.

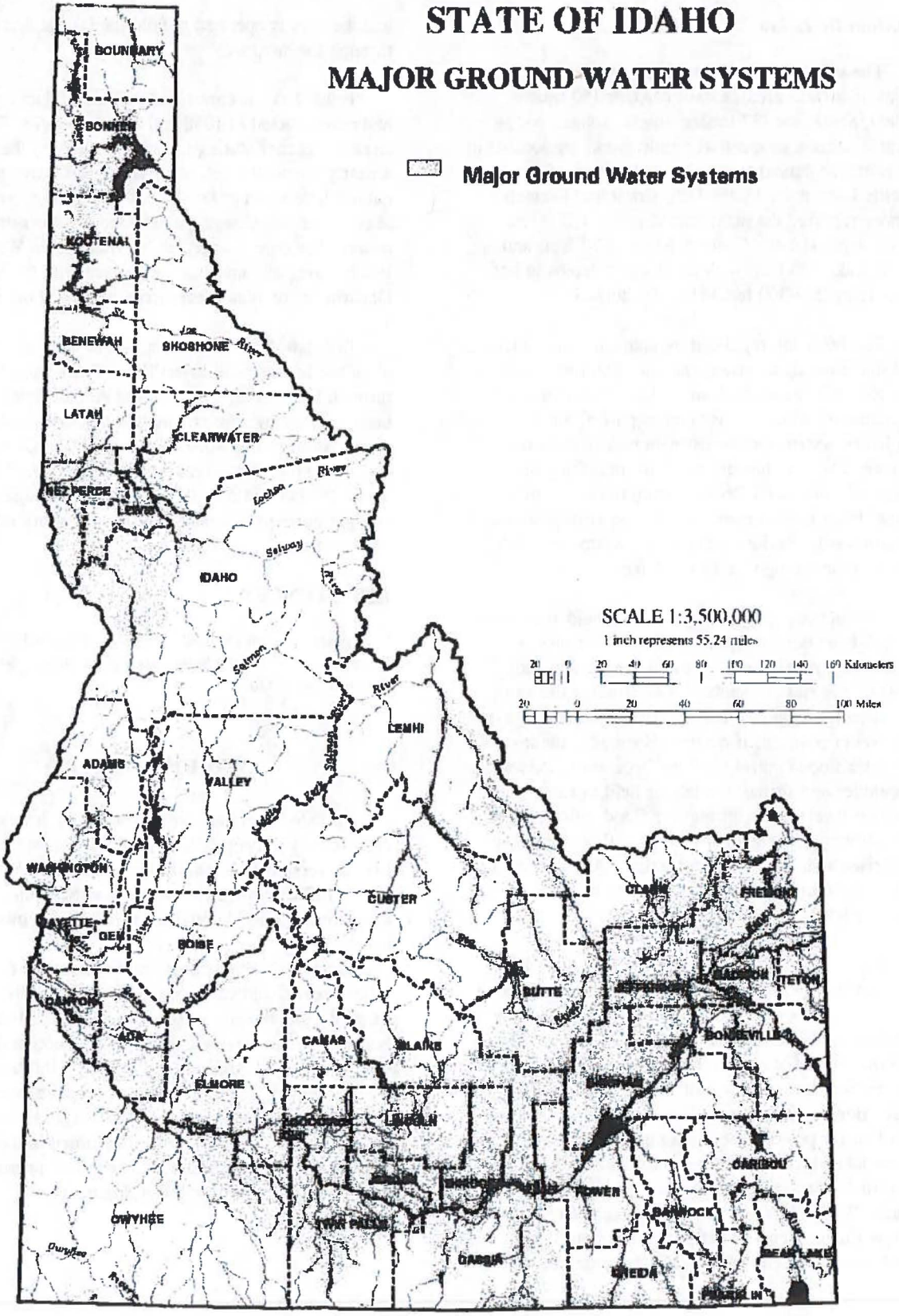


Figure 11. State of Idaho Major Ground Water Systems

SNAKE RIVER BASIN

In the Snake River Basin, significant ground water supplies are found in the alluvium of basin valleys and the Snake River Plain basalts. The mountains of central Idaho are composed largely of granitic rock, consequently, permeability is relatively low.

Rivers, streams, and glaciers have dissected Idaho's mountain ranges, and subsequently deposited the eroded material on valley floors. Alluvial sands and gravels are highly permeable. Unconsolidated alluvium supplies substantial amounts of water for domestic, industrial, and irrigation use in the Snake River Basin.

The Snake River Plain is a down warp filled first by flows of rhyolite, and more recently by flows of Snake River basalt. Contacts between flows are commonly rubble with high porosities and hydraulic conductivities. The Snake Plain aquifer, one of the largest ground water systems in the United States, underlies the Snake River Plain from the vicinity of St. Anthony in Fremont County, to the town of King Hill in Elmore County. It is estimated to contain roughly 250 million acre-feet of water in the fractured zones between successive basalt flows.

Seasonally, aquifer discharge varies only slightly. The highest flows occur in the fall as a result of the cumulative effects of recharge by surface water irrigation. Low flows occur in April or May before the effects of the new irrigation season recharge become significant.

The Snake River alternately contributes water to and receives water from the Snake Plain Aquifer. The aquifer currently discharges about 2,500 cubic feet per second (cfs) of water to the Snake River at American Falls and about 5,000 cfs between Milner and King Hill. Elsewhere, the river channel is above the regional water table and river flow recharges ground water.

Ground water discharge to the Snake River in the Milner-King Hill reach has varied as recharge conditions have changed. From 1902 to the early 1950s ground water discharge in the reach increased (Fig. 12). The gain has been attributed to increased recharge due to surface water irrigation in areas north and east of the springs.

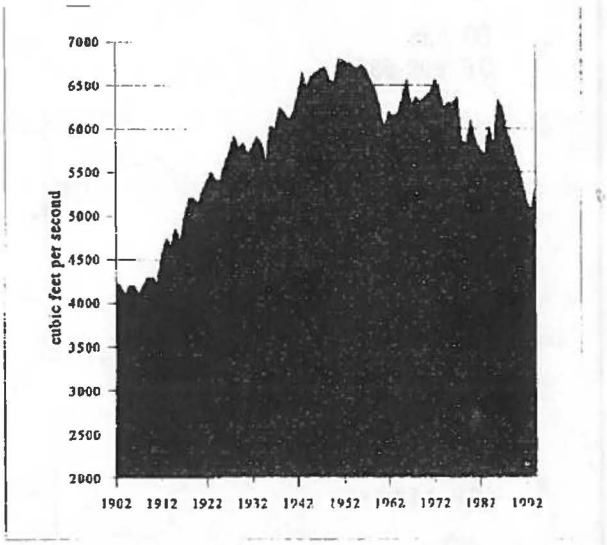


Figure 12. Average annual ground water discharge from the north side of the Snake River between Milner and King Hill. Discharge in cubic-feet per second for years 1902 through 1994.

Spring discharge has been in a state of slow decline since the mid-1950s when it exceeded an estimated 6700 cubic feet per second. Withdrawals from the aquifer and increasing efficiencies in irrigation application by surface water users on the plain are expected to result in continuation of the decline. When these stresses moderate at some relatively fixed level in the future, aquifer outflows will begin to approach equilibrium with inputs and up-gradient withdrawals.

Most wells in the Snake River Basin are located where depth to water is less than 300 feet (Figs. 13-15). Typically, wells on the eastern Snake River Plain have larger yields than wells elsewhere in the Snake River Basin. About 66 percent of wells in the Upper Snake, overlying the Snake Plain, yield more than 1,500 gallons per minute.

BEAR RIVER BASIN

Across southeastern Idaho, the provinces are typified by complexly folded or sub-parallel block-faulted ranges separated by open valleys.

Principal water-bearing deposits in the Bear River Basin are generally limited to the Bear River flood plain. Aquifers are mainly deep, alluvial deposits that consist of alternating layers of gravel, silt, and clay (State of Utah, 1992). Most of the Bear River flood plain has a high water table (Fig. 16).

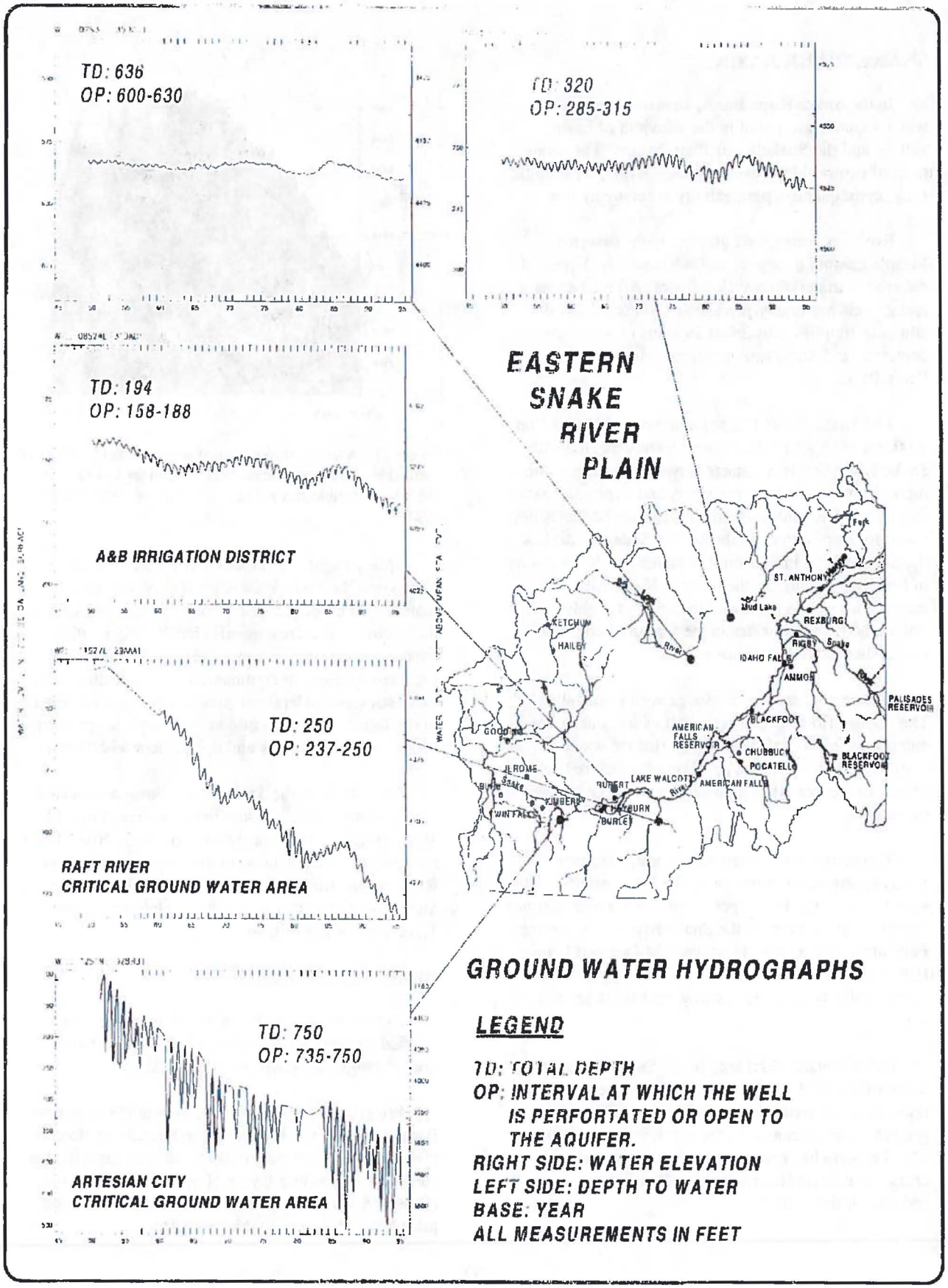


Figure 13. Upper Snake Ground Water Hydrographs

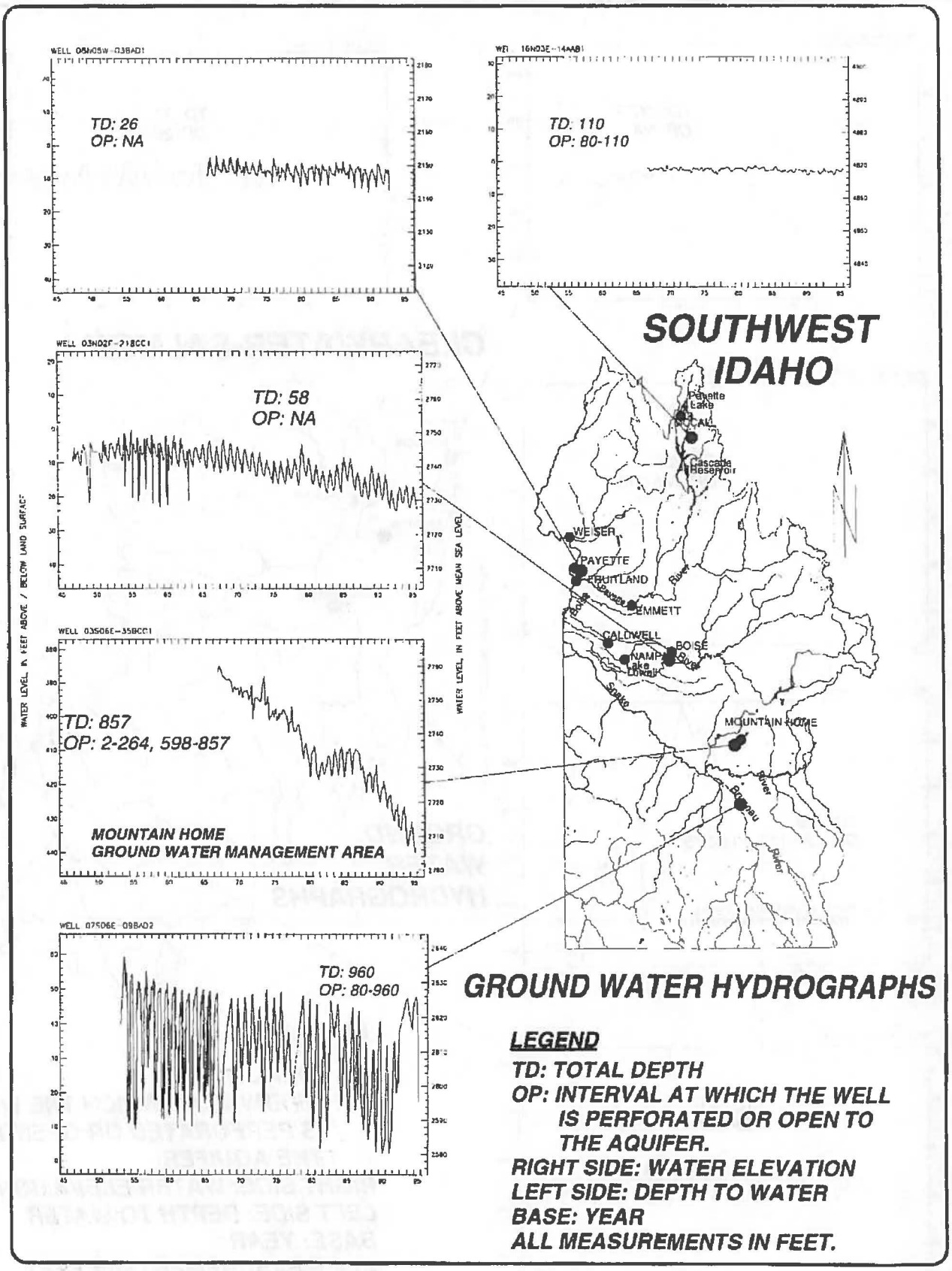


Figure 14. Southwest Idaho Ground Water Hydrographs

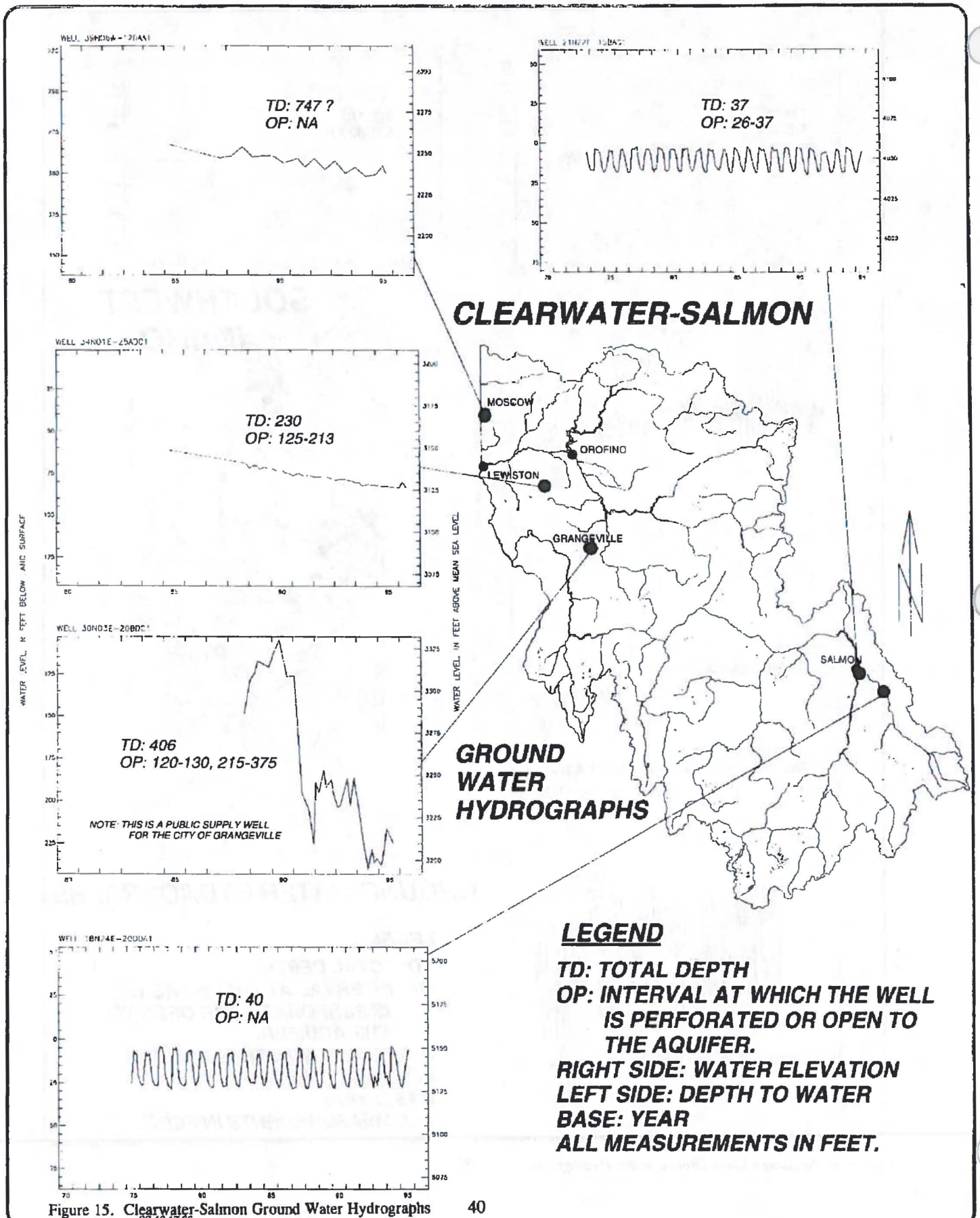


Figure 15. Clearwater-Salmon Ground Water Hydrographs

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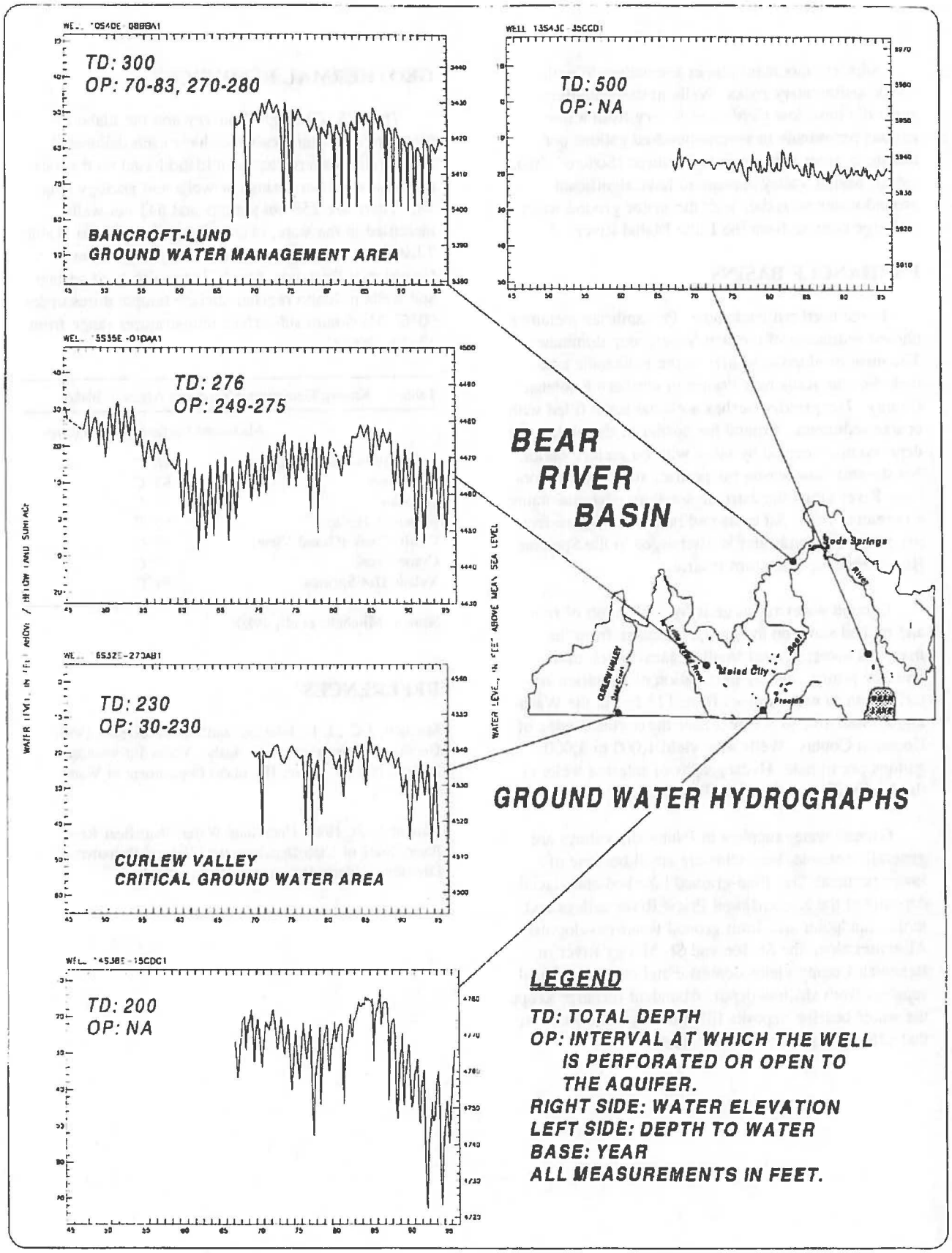

Figure 16. Bear River Basin Ground Water Hydrographs

Adjacent mountain ranges are underlain with clastic sedimentary rocks. Wells in these aquifers generally have low yields which vary from a few gallons per minute to several hundred gallons per minute in areas that are well fractured (State of Utah, 1992). Malad Valley appears to have significant ground water potential, with the major ground water recharge coming from the Little Malad River.

PANHANDLE BASINS

In the northern Panhandle, Precambrian metamorphosed sediments of the Belt Supergroup dominate. The most productive aquifer in the Panhandle area underlies the Rathdrum Prairie in northern Kootenai County. The prairie overlies a glacial basin filled with coarse sediments. Around the border of the prairie are depressions occupied by lakes with no surface outlet. No streams flow across the prairie, and only the Spokane River along the extreme southern edge maintains a perennial flow. An estimated half-million acre-feet per year of groundwater is discharged to the Spokane River from the Rathdrum Prairie.

Ground water recharge is by infiltration of rain and melted snow on the prairie, seepage from the marginal lakes, several small streams which drain onto the prairie, and by percolation of irrigation water. Depth to water ranges from 125 feet at the Washington State line to 500 feet near the northern edge of Kootenai County. Wells may yield 1,000 to 3,000 gallons per minute. Hydrographs of selected wells in the Panhandle are shown in Figure 17.

Ground water supplies in Panhandle valleys are generally reliable, but yields are small because of lower permeability. Fine-grained lake bed and glacial deposits in the Kootenai and Priest River valleys and in the Sandpoint area limit ground water development. Alluvium along the St. Joe and St. Maries River in Benewah County yields domestic and small municipal supplies from shallow depth. Abundant recharge keeps the water-bearing deposits filled during most years so that some areas become water logged.

GEOTHERMAL RESOURCES

The U.S. Geological Survey and the Idaho Department of Water Resources have each delineated geothermal resource areas in Idaho based on the location of known hot springs or wells and geology (Fig. 18). There are 258 hot springs and 641 hot wells identified in the state, chiefly in southern Idaho. Table 7 lists U.S. Geological Survey designated Known Geothermal Resource Areas. The majority of springs and wells in Idaho register surface temperatures under 90°C. Maximum subsurface temperatures range from 125° to 200°C.

Table 7. Known Geothermal Resource Areas in Idaho.

	Measured Surface Temperatures
Yellowstone/Island Park	26°C
Raft River	92°C
Bruneau	47°C
Mountain Home	60°C
Castle Creek (Grand View)	85°C
Crane Creek	92°C
Vulcan Hot Springs	84°C

Source: Mitchell, et al., 1980.

REFERENCES

Mitchell, J.C., L.L. Johnson, and J.E. Anderson, 1980. Geothermal Investigations in Idaho. Water Information Bulletin No. 30. Boise, ID: Idaho Department of Water Resources.

State of Utah, 1992. Utah State Water Plan: Bear River Basin. State of Utah Department of Natural Resources, Division of Water Resources. January 1992.

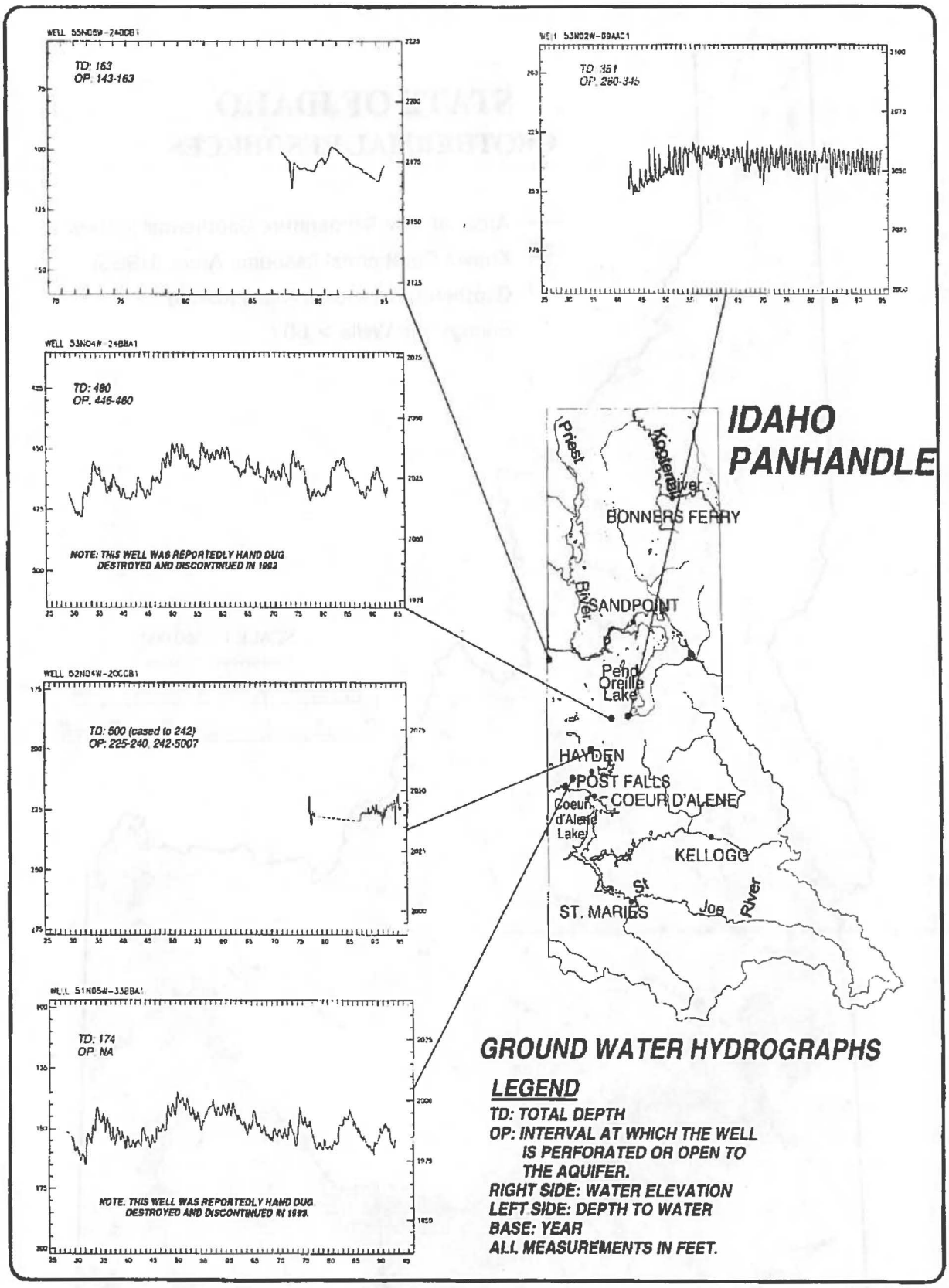

Figure 17. Idaho Panhandle Ground Water Hydrographs

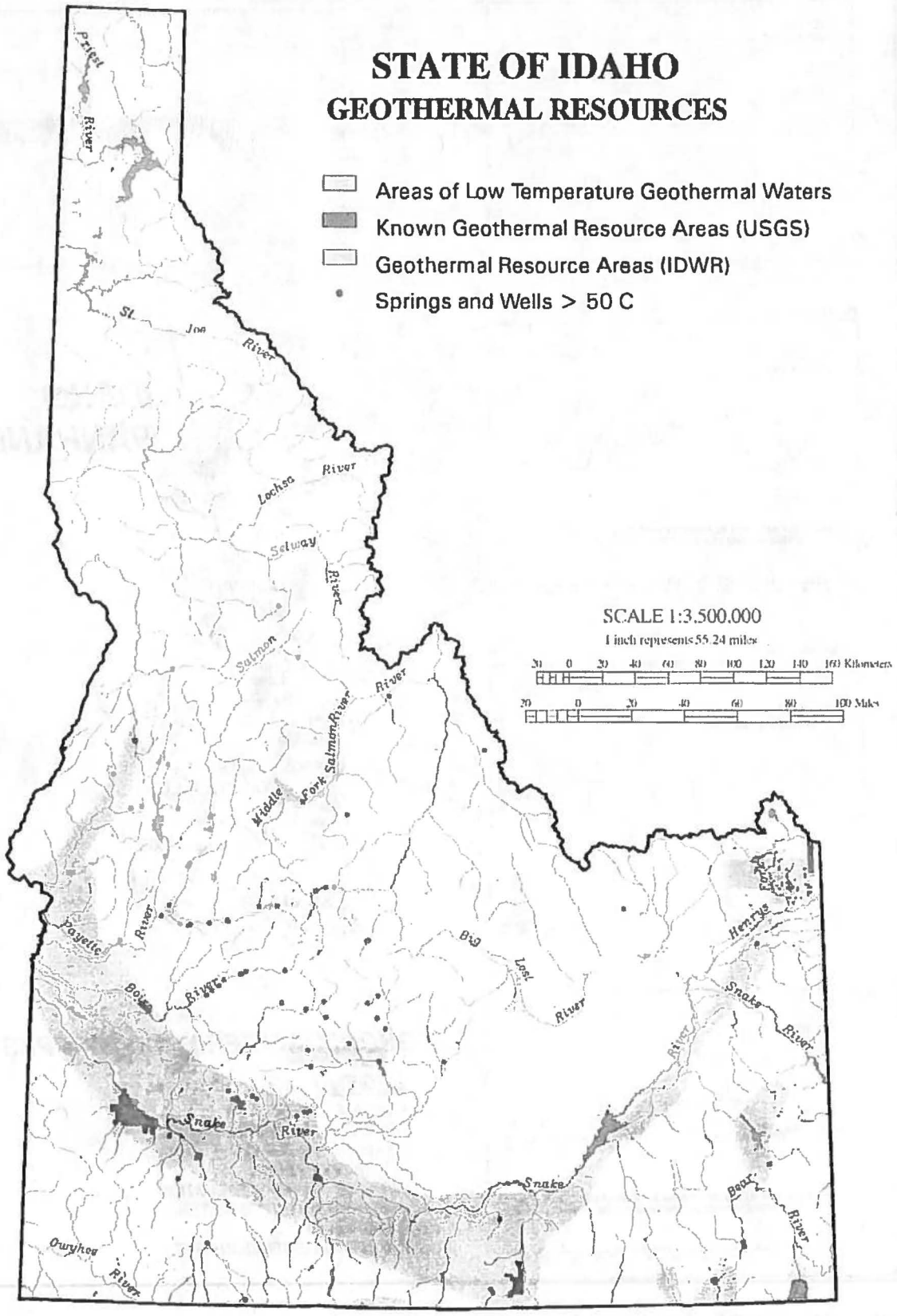

Figure 18. State of Idaho Geothermal Resources

Floods and Drought

Floods have been the most serious, devastating and costly natural hazard to affect Idaho. Most Idaho residents live near rivers which are subject to periodic flooding. Floods occasionally cause loss of lives and frequently damage roads, farmlands, and structures. Flood waters also erode sediments from hill slopes and transport the sediment in the river channel. The resulting siltation decreases the carrying capacity of the channel, decreases reservoir storage capacity, degrades fish habitat, and may change the course of a stream, or introduce chemicals into the stream.

Although the effects of a drought are more subtle than those of a flood, they are of no less concern. Droughts decrease stream flow, the availability of water for storage in reservoirs, and ground water storage. Farmers who rely on natural precipitation or stream flow for irrigation experience crop losses. Another drought concern is water quality degradation. Low stream flow and a subsequent increase in water temperature may cause fish kills. Finally, because most electrical energy in Idaho is generated by hydropower, droughts that cause decreased river flows and storage in reservoirs can result in increased power costs.

IDAHO FLOODS

Floods in Idaho vary greatly in cause, patterns of flow, frequency, and magnitude. A few streams in Idaho are subject to almost annual flooding, but in most areas flooding is much less frequent. Figure 19 shows the most flood susceptible areas in the state. Table 8 briefly summarizes flood events in Idaho.

Idaho floods are caused by frontal system or convective thunderstorm rainfall, spring snow melt, and ice jams in river channels. The major cause of flooding is spring snow melt. Floods caused by spring snow melt tend to last for a period of several days to several weeks, while floods caused by other sources persist for a much shorter duration. Floods that result from rainfall on frozen ground in the winter, or rainfall associated with a warm, regional frontal system that also rapidly melts snow at low and intermediate altitudes, can be the most severe.

Flooding from ice jams is relatively common in Idaho. Ice-jam formation depends on air temperature and physical conditions in the river channel. On small drainages, the most severe floods are usually a result of rainfall on frozen ground. Moderate quantities of warm rainfall on a snowpack, especially for one or more days, can result in rapid runoff and flooding in streams and small rivers.

Table 8. Major Floods in Idaho, 1894-1996.

Year	Area Affected	Recurrence Interval (Years)
1894	Statewide	Unknown
1927	Upper Snake Basin	Unknown
1933	Spokane River Basin	40 to > 100
1943	Boise and Payette basins	Unknown
1948	Northern and western Idaho	20 to 50
1955	Southwest Idaho	Unknown
1959	Boise River Basin	> 100
1962	Southern and eastern Idaho	20 to > 100
1963	Portneuf and Clearwater basins	Unknown
1964	Statewide at low elevations	20 to > 100
1974	(Jan) Northern and central Idaho	25 to > 100
1974	(June) Statewide	40 to > 100
1976	Eastern Idaho	Unknown
1984	Eastern and central Idaho	50 to > 100
1986	Bear River Basin	50 to > 100
1996	Northern Idaho	50 to > 100

Source: U.S. Geological Survey, 1991.

Although meteorological conditions favorable for short-duration warm rainfall are common, conditions favorable for long-duration warm rainfall are relatively rare. Occasionally, however, the polar front becomes situated along a line from Hawaii through Oregon, and a flow of warm, moist, unstable air moves into the region. Most winter floods develop under these conditions as was the case with the northern Idaho floods of 1996.

Snake River

Only a relatively small portion of the Snake River Basin is susceptible to flooding, however, many of the flood-prone areas are intensively populated. Floods seldom cause loss of life, but can extensively damage land and buildings, highways, railroads, irrigation facilities, and utilities. Past flood events indicate that spring snow melt causes the most severe and extensive flooding. However, the largest recorded flood and most extensive flood damage in the basin occurred as

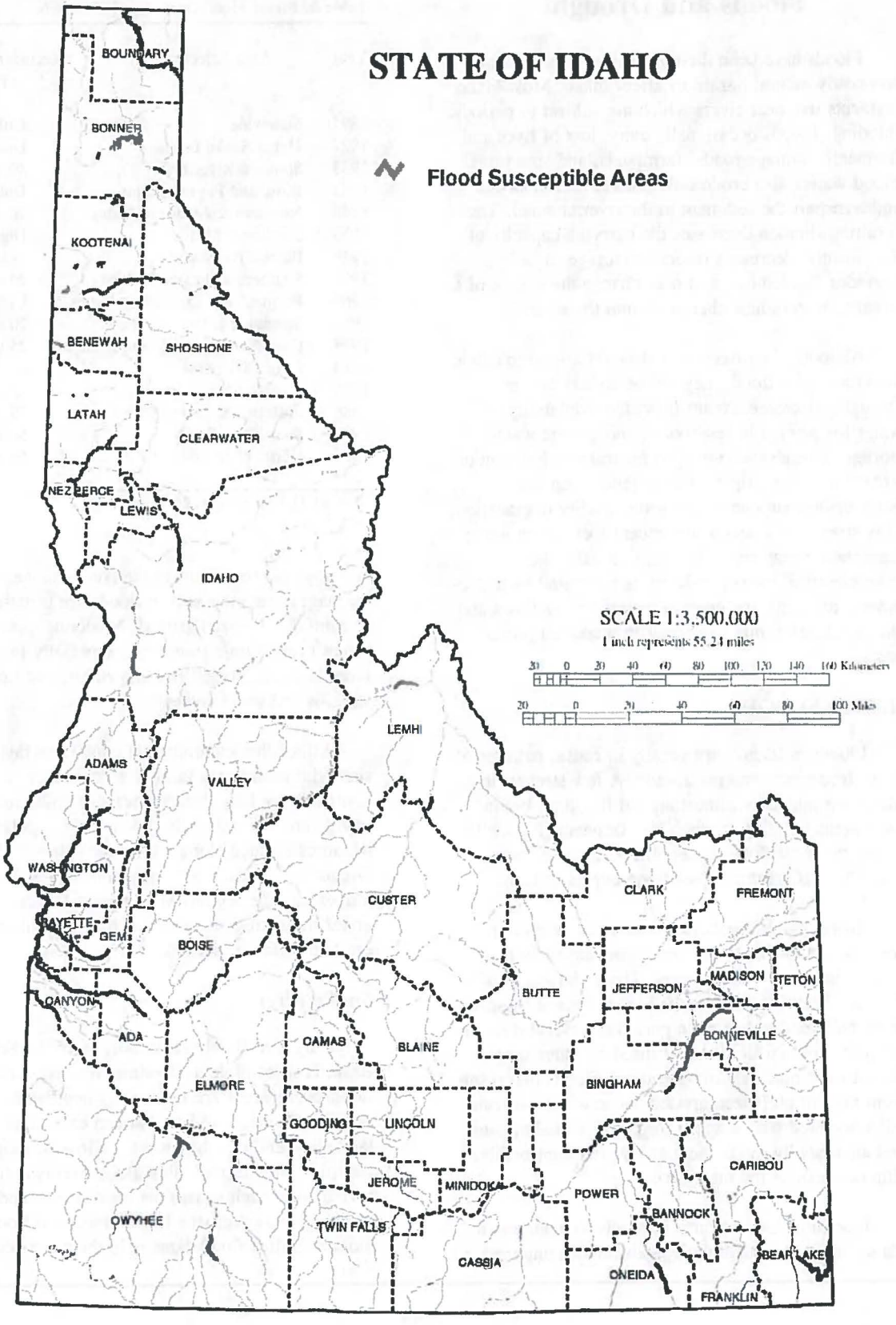

Figure 19. State of Idaho Flood Susceptible Areas

a result of the Teton Dam failure on June 5, 1976. Flood damage along the Snake River, for the most part, is confined to the flood plain between Heise and American Falls Reservoir. The safe channel capacity of the Snake River in this reach varies from 15,000 cfs to 30,000 cfs. Since the completion of Palisades Dam in 1957, flows in excess of 25,000 cubic feet per second at the Heise gauge have occurred on four occasions, with a maximum flow of 27,000 cfs on June 18, 1986. Near Shelley, flows have exceeded 25,000 cfs on eight occasions since 1957, (excluding the Teton Dam flood), with a maximum flow of 30,000 on June 13, 1984.

Snake River floods generally occur in the months April through June, primarily from snow melt in the upper basin. Late spring or summer snow melt floods typically occur as a series of high flows for periods of days or weeks. They can be compounded by warm spring rains that increase snow melt rates and contribute directly to runoff.

Regulation of the Snake River and some tributaries significantly reduces natural flood flows. Jackson Lake Dam, completed in 1909, was the first water project to help reduce flood peaks in the basin. Jackson Lake in Wyoming provides incidental reduction of Snake River flood peaks averaging about 5,500 cubic feet per second, varying from 0 to 8,500 cfs. The combined capacity of reservoirs in the basin is approximately 11 million acre-feet. However, only a few dams were constructed for stated flood management benefits. Reservoirs that function for other purposes reduce flood flows through informal flood control operation or incidental storage of flood waters. These projects have an aggregate storage capacity of 4.1 million acre-feet.

Under a plan formulated by the Bureau of Reclamation, the Corps of Engineers, and other interested groups, all but the larger Snake River floods are regulated to about 20,000 cfs or less near Heise, and the extreme flood will be reduced to the maximum practical extent. Jackson Lake Dam and Palisades Reservoir reduce the estimated 100-year unregulated flood flow of 68,000 cfs at Heise to about 30,000 cfs (U.S. Army Corps of Engineers, 1988). Palisades Dam, completed in 1957, provides flood peak reduction averaging about 16,800 cubic feet per second per year, varying from 0 to 30,000 cfs (Wirkus, 1996).

Levees protect flood-prone land between Heise and Roberts, near Shelley, and near Blackfoot. However, the stream bed materials, low banks, and gradient induce river meanders. Major channel shifts could unpredictably impinge the levees. Localized winter flooding caused by ice jams is also a problem in this reach.

American Falls has afforded major regulation of Snake River flood flows, although little flood damage is experienced from the dam to Milner. This stretch of the river consists of a series of irrigation diversion pools and canyon reaches. The Snake River, between Milner Dam and King Hill, flows through a deep narrow canyon cut in the Snake River Plain. Developed land adjoining the river is generally above the elevation of flood discharge. Idaho Power's reservoirs, or pools, within the reach are for power generation and have no flood storage allocation. There are no levees below American Falls Dam.

Most of the Snake River between King Hill and the Boise River confluence is located in a canyon with little flood plain for development. Storage reservoirs and diversions in the Upper Snake Basin reduce flood flows at the Swan Falls gage by approximately 40,000 cfs. However, major floods have inundated large areas of highly developed agricultural lands along the 65 mile reach between Homedale, and Weiser, Idaho. At the Weiser gage, discharge in excess of 70,000 cfs, which results in overbank stages, has been exceeded three times since 1960.

Major Snake River Tributaries

In the Henrys Fork area, flooding is usually the result of spring snow melt. Flood damage occurs along the lower 22 miles of the Henrys Fork and along the Teton River near Rexburg. Upstream irrigation reservoirs and large irrigation diversions reduce the magnitude of spring and summer flood peaks on the Henrys Fork. However, the bankfull capacity of the lower Henrys Fork is approximately 5,000 cfs, and a flow of 9,000 cfs causes a general inundation of this reach. Flows exceeding 9,000 cfs have occurred on 12 occasions since 1960. A May 1984 flood of 16,400 cfs is the largest recorded flow on the river.

Floods on the Teton River are almost an annual occurrence. The Teton River also has a history of ice jam flooding. With the exception of the Teton Dam failure, flood damage along the Teton River and in

several other smaller basins in eastern Idaho probably was the most severe ever recorded during February 10-14, 1962. Floods flows resulted from prolonged light rainfall, moderate snowpack at low altitudes, warm days and nights and deeply frozen ground.

Camas and Beaver Creeks are sources of surface inflow to Mud Lake, which has no effective outlet other than irrigation canals, evaporation, and seepage. Lands along Camas Creek near the lake and along the south side of the lake have flooded. If the volume of inflow exceeds the available storage capacity of the lake, locally constructed dikes around the lake fail and permit flooding of farm areas south of the lake. The Mud Lake flood plain is principally in crops. Portions of residential and associated developments in the communities of Terreton and Mud Lake, on the fringe of the flood plain, may suffer minor damages under extreme flood conditions.

Flooding occurs in reaches along the entire length of the Portneuf River downstream from Portneuf Reservoir and along Marsh Creek. Upstream floods damage agricultural lands as well as the towns of Bancroft, Lava Hot Springs and Inkom. Protection of the Pocatello area is afforded by a rectangular concrete channel through the city with riveted levees on both ends where development is less extensive. The normal bankfull channel capacity of 1,000 cfs has been exceeded 13 times since 1970, with a maximum flow of 2,870 cfs on May 17, 1984. A 1988 Army Corps of Engineers Preliminary Report on the Portneuf River examined constructing multiple purpose storage reservoirs, and enlarging the river channel. The study found that these proposals were not economically justified.

Flood damages in the Wood River basin have occurred primarily in a reach extending from Ketchum to Bellevue, near Gooding, and at Carey and Shoshone. The agricultural lands subject to flooding in the Big and Little Wood valleys are used primarily for pasture, hay, and grains. The more frequent flood problems and damages in urban areas, particularly at Gooding, have been due to ice in the channel severely constricting flows.

In the Boise River Basin the magnitude of flood flows have been diminished by irrigation diversions and storage reservoirs. However, agricultural lands downstream of Boise and flood plain homesites in the city are still subject to periodic flooding in high runoff years. Additionally, floods that emanate from drainages off the Boise Front can damage industrial, residential, and agricultural properties. Thunderstorms on the foothills north and east of Boise in August and September, 1959, carried large quantities of mud, rocks, and debris into the city. The foothill slopes had been denuded by fires.

Major flooding of the Weiser River has occurred five times since 1953. Fairgrounds at the town of Cambridge and a portion of the area south of town are located in the river's flood plain. However, the majority of the flood damage has been to agricultural enterprises in the lower 13 river miles of the Weiser River from the Galloway Diversion to the mouth of the river near the City of Weiser. Incidental storage in Crane Creek and Lost Valley reservoirs reduces peak flows by an estimated 3,600 cfs.

The largest flood of record on the lower Clearwater River is 177,000 cfs at Spalding on May 29, 1948. Significant flood events occurred in 1972, 1974, the year of greatest total runoff on record, and 1996. The 1974 and 1996 floods were similar; late winter mild weather with heavy rains on relatively low-elevation snowpacks. Ice jams contributed to extensive overbank flooding.

Flood flows In the Clearwater Basin frequently damage residential and commercial buildings in the cities of Orofino, Stites, and Kooskia on the main stem of the Clearwater. Towns on tributary streams, are also subject to damages. Highway and railroad bridges and roadbeds can be undercut and washed out. Lumber operations are frequently damaged and logs are lost.

Flood control is an important function of the Dworshak project on the North Fork Clearwater. The reservoir is managed to alleviate flooding below Ahsahka, and is a part of the regional flood control system of the Columbia River Basin. Dworshak regulation is considered essential in limiting flood waters to 150,000 cfs or less through Lewiston.

Bear River Basin

Flooding has been a common occurrence in the basin for many years, but the resulting damages have been moderate. Spring snow melt flooding in the Bear River Basin periodically exceeds stream channel capacity, and overflows onto adjacent low lands. More

serious damage occurs when heavy rain falls on frozen ground and/or a heavy snow pack. Thunderstorms are common during the summer and fall months. These produce localized cloudburst flooding. The total volume of water produced by this type of storm is relatively small, although the instantaneous runoff rate is high.

The Bear River and several tributaries had record floods in June 1986. The peak discharge of record for the Cub River near Preston on June 4 exceeded the discharge that is likely to occur once in 100 years. The discharge of the Bear River flowing from Idaho into Utah may have been the greatest since 1907.

PacifiCorp's regulation of flows at Bear Lake has reduced the impact of flooding virtually every year on the mainstem of the Bear River below Bear Lake. Bear Lake is operated to provide an annual pre-runoff storage volume equal to twice the average annual runoff. The Corps of Engineers (1991) estimated average annual damages from flooding, and analyzed structural control measures in the basin. Most of the damage from floods has been to agricultural land and property. Damages from thunderstorms are usually in the form of erosion and sediment deposition. Dry cropland areas in the basin are most susceptible to this type of damage.

Panhandle Rivers

Flood prone lands constitute a significant portion of the Panhandle basins. The Spokane, Kootenai, and Pend Oreille basins have a long history of major flood events. However, the greatest potential damage is usually not along major rivers, but along tributary streams. Minor tributaries have steep gradients and damages are generally the result of flash floods. Placer Creek, a tributary of the South Fork Coeur d'Alene River, has flooded the town of Wallace seven times in the last century.

Despite severe flood damage in 1996, the January 1974 flood was the largest of record in the Panhandle basins. Similar to the 1996 flood event, mild temperatures and intense rainfall on low-altitude snowpack caused extreme flooding in northern and central Idaho.

In the Spokane River Basin flooding occurs mainly along the low-lying lands adjacent to tributary streams above Coeur d'Alene Lake in the Coeur d'Alene and St. Joe River valleys. Property damage around Coeur d'Alene Lake has been negligible, but 25,000 acres were inundated in 1933; property in the city of Coeur d'Alene and a number of summer homes and resorts on the lake were damaged.

The Spokane River Basin above Coeur d'Alene Lake is unregulated by storage structures. The maximum flood of record on the St. Joe River occurred in 1933 and in 1974 on the Coeur d'Alene River. About 55 miles of levees along the lower Coeur d'Alene River, the St. Joe River, Pine Creek, and other minor tributaries protect over 4,000 acres of land adjacent to rivers and streams from flood events. However, levees in the vicinity of St. Maries failed in 1948, 1956, and 1996. A levee at Coeur d'Alene protects the city against high lake levels.

Major flooding on the Kootenai River is usually the result of melting snow pack. Libby Dam regulation controls all but about one percent of floods originating from the Kootenai River. A 100-year flood can be controlled by the dam to a 27-foot stage at Bonners Ferry. Levees have been constructed at many locations on both major and minor streams in the basin. Over 95 miles of levees protect 32,000 acres along 51 river miles in the Idaho portion of the basin. Levees protecting Kootenai Flats are effective up to a river stage of 35 feet at Bonners Ferry.

Flooding in the Pend Oreille Basin occurs along the river lowlands and tributaries. Damages have been largely to grain crops and pasture land with some low lying road and buildings affected around Lake Pend Oreille. Calispell Creek, a tributary of the Pend Oreille, had major flooding in 1948, 1951, 1952, 1956, and 1996.

FLOOD MANAGEMENT

There are a number of structural and nonstructural measures in place to reduce flood caused damages. Structural measures refer to structures or facilities constructed to reduce or divert flood flows, while nonstructural measures refer to programs that do not rely on structures or facilities. Structural projects for flood damage reduction in Idaho consist of reservoirs, levees, and stream channel alteration. Storage projects and levees in the state protect an estimated 250,000 acres from damage by a 100-year flood event (PNRBC, 1971).

Thirteen Flood Control Districts exist in the state (Table 9). Flood Control District goals include (1) constructing or proposing projects to reduce flooding, (2) protecting and maintain present flood works, and (3) discouraging development in the flood plain. The first Flood Control District, No. 1, was organized in Jefferson and Madison counties in 1946. More recently Flood Control Districts have been established for the Raft and Goose Creek drainages.

Table 9. State of Idaho Flood Control Districts, 1996.

#	Stream	Counties
1	Snake River	Madison, Jefferson Bonneville, Bingham
2	Little Wood River	Blaine
3	Weiser River	Adams, Washington
4	Abolished	
5	Mud Lake	Jefferson
6	Whitebird Creek	Idaho
7	Blackfoot River	Bingham
8	Abolished	
9	Wood River	Blaine
10	Boise River	Ada, Canyon
11	Boise River	Canyon
12	Thomas Fork	Bear Lake
13	Dissolved	
14	Does not exist	
15	Raft River	Cassia
16	Goose Creek	Cassia
17	Twin Lakes-Rathdrum	Kootenai

Nonstructural flood damage reduction measures do not attempt to control flood flows, but try to reduce damage in other ways. Projects include flood forecasting, watershed improvement, land use zoning within flood plains, and the national Flood Insurance Program. Land use zoning within the flood plain is perhaps the most cost-effective method of reducing flood damages. By prohibiting inappropriate construction within flood plains, local communities can prevent future flood damages.

Watershed improvement projects experiment with land mangement methods and small water projects to reduce surface runoff and slow peak flood flows on rangeland, farmland, and forest land. The Natural Resources Conservation Service is currently undertaking a number of these projects.

Communities must adopt Federal Emergency Management Agency (FEMA) acceptable flood plain zoing regulations to participate in the National Flood Insurance Program. Most counties and incorporated cities with the state participate in this program (FEMA, 1996).

LANDSLIDES

In Idaho, landslides and debris flows related to flood events may damage property and infrastructure more than inundation by flood waters. Landslides in 1996 and 1997 destroyed numerous road sections along state highways and many other roads. Landslides and debris flows moving down side canyons also caused a considerable amount of damage to public and private property. Water plays an important role in landslides and debris flows; it is often the critical factor that triggers the downslope movement.

The role of water in causing landslides and debris flows needs to be studied. The Idaho Landslide Task Force, formed in 1997, will gather information on recent landslides, review this information, prepare maps of slide-prone areas, and develop a summary report containing recommendations to minimize future landslide damage.

DROUGHT

Droughts are less frequent than floods, but can be far more devastating to the economy of the state as a whole. The Palmer Drought Index shows that a meteorological drought has existed in the state during one-third of the period from 1931 through 1982 (Karl et al., 1983). Major droughts during the past several decades generally were the result of an unseasonable northward displacement of the Pacific high-pressure system or the positioning of a polar front at much lower latitudes than usual. Principal droughts in Idaho, indicated by stream flow records, occurred during 1929-41, 1944-45, 1959-61, 1977, and 1987-92. Table 10 summarizes major drought events in Idaho.

The most prolonged drought in Idaho was in the 1930s. Runoff in the Snake River at Weiser was less than average from 1931 to 1937. For most of the State the 1929-41 drought lasted for 11 years despite greater than average stream flows in 1932 and 1938. However, in northern Idaho, the drought was interrupted by greater than average stream flows from 1932 until

Table 10. Major Droughts in Idaho, 1894-1996.

Years	Area Affected	Recurrence Interval (Years)
1929-41	Statewide	>50
1944-45	Northern and central Idaho	10 to >25
1959-61	Southern and central Idaho	10 to >25
1977	Statewide	10 to >25
1987-92	Statewide	25 to >50

Source: U.S. Geological Survey, 1991.

1937. The drought ended in most of the State in 1942 but continued in northern Idaho until 1946.

Figure 20 illustrates the general sequence of wet and dry periods in the eastern portion of the Snake River 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 selected because of their relatively long period of record. In each hydrograph the sequence of years of lowest runoff generally occurred between 1929 and 1942. Using the record of the Columbia River at The Dalles, Oregon, the longest record of stream flow data in the Columbia basin, it appears probable that the period in the 1930s was the driest in the past 100 years.

A mild drought during 1959-61 occurred in southern and central Idaho. A period of above normal runoff began in 1965 and continued through water-year 1976. Runoff in 1977 was the lowest of record at most gages in the state. Although the 1977 drought lasted only one year, water supplies were significantly affected. Snake River flow at Weiser on July 1 was 4,570 cfs, the smallest in 68 years of record. The Weiser gage minimum flow was not met on two days in 1977 due to large diversions from the Snake River and very low outflows from the Boise and Payette basins. Domestic wells in the Big and Little Wood River basins became dry early in April 1977, and many shallow wells in six western Idaho counties became dry in June.

Stream flows were again generally below normal from 1979 to 1981; wet conditions returned from 1982-86. From 1987 through 1992 water supplies were much below normal throughout the state. In southwestern and central Idaho, this six year drought was more severe than the 1930s drought. Scant winter

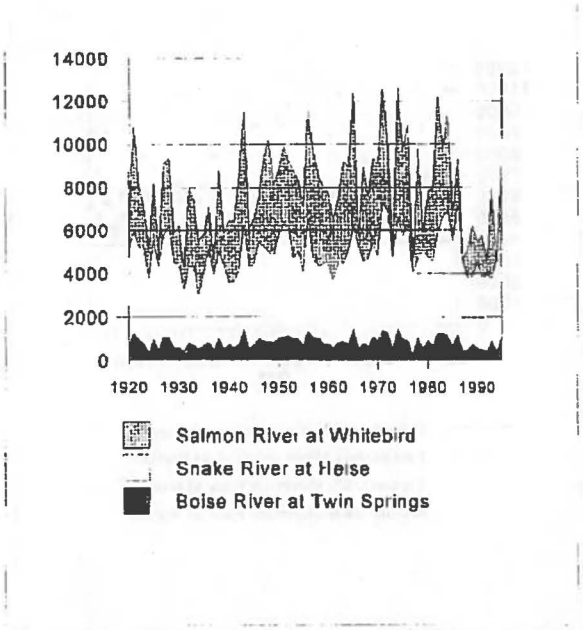

Figure 20. Snake River Basin: annual runoff of Snake River at Heise, Boise River near Twin Springs, and Salmon River at Whitebird, 1920-1995. Runoff in thousand acre-feet.

snowpacks and prolonged periods of greater than average temperatures resulted in unseasonable early snow melt, high water demands, and the lowest stream flows since 1977. Low-flow records were set for many days during the summer of 1987 and again in 1992 at long-term gages on the Boise River at Twin Springs and on the Salmon River at White Bird.

Summertime flows in 1992 at the Weiser gage were below the established minimum on two occasions totaling three days. The Department of Water Resources issued orders curtailing water use by appropriators junior to the 1976 Weiser minimum flow. Minimum annual flows at Weiser are affected by the outflows from the Boise and Payette rivers, which are usually large when Snake River diversions are near their maximums (Fig. 21). However, the 1977 and 1992 events demonstrate that flows can fall below established minimum stream flows in dry years.

Conditions in the Boise River drainage for the 1987 through 1992 period were drier than any other six-year sequence in the basin's hydrologic record. Reservoir contents in the Boise River reservoirs on June 30, 1992 were lower than historic or simulated contents for any June 30th in the record. Conditions in the Upper Snake reservoirs were nearly as bad.

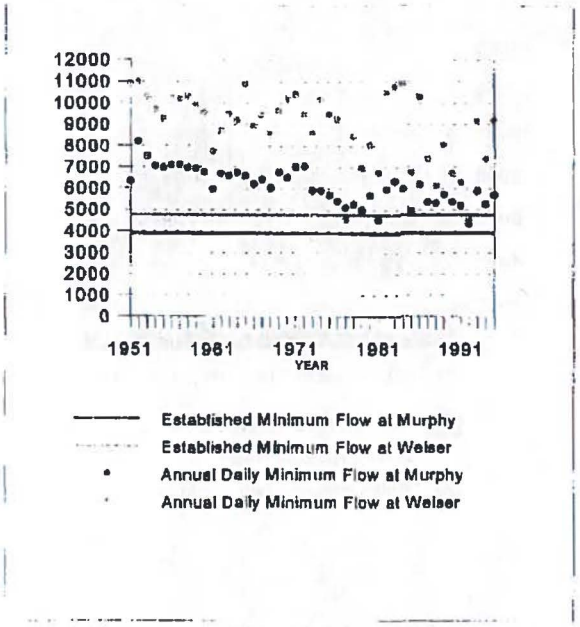

Figure 21. Annual minimum daily discharge of the Snake River near Murphy and Weiser, Idaho, 1951-1995. Flows in cubic feet per second.

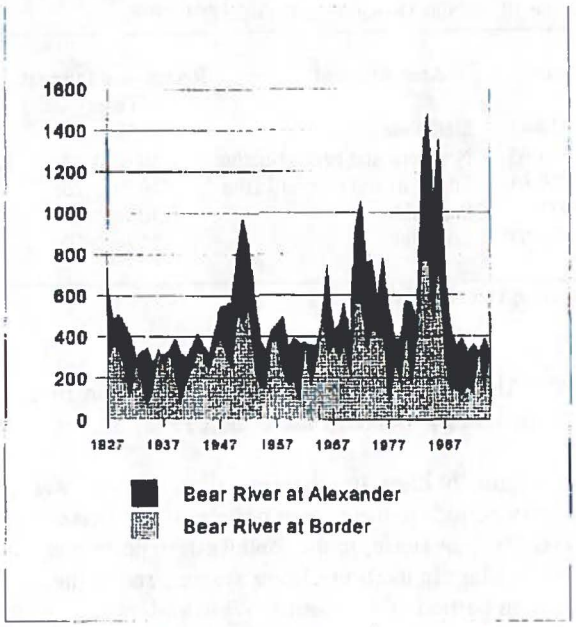

Figure 22. Annual runoff of the Bear River at the Border and Alexander gaging stations, 1927 - 1995. Runoff in thousand acre-feet.

Simulations suggest that in most cases reservoir contents on June 30, 1934 would have been lower than 1992 when current conditions of development are applied to the stream flow record. However, there was little or no carryover storage at the end of the 1992 irrigation season.

Annual runoff for two locations on the Bear River is shown in Figure 22. The period 1931 through 1945 represents one of below average stream flow. Runoff during the period 1966-76 was generally above normal but 1977 was extremely dry. Variable conditions occurred in the following two years, but these were generally also below normal. In 1980 through 1985 stream flows again exceeded the long-term average.

Some areas of the state have a greater potential for drought than other areas. Horn (1987) mapped drought potential for the state based on stream flow regression analysis (Fig. 23). There is a much greater potential for persistent, severe stream flow deficits in areas with larger Drought Potential Index values. Southwestern Idaho and the upper portions of the Snake River Plain appear to have the highest probability for persistent, severe stream flow deficits.

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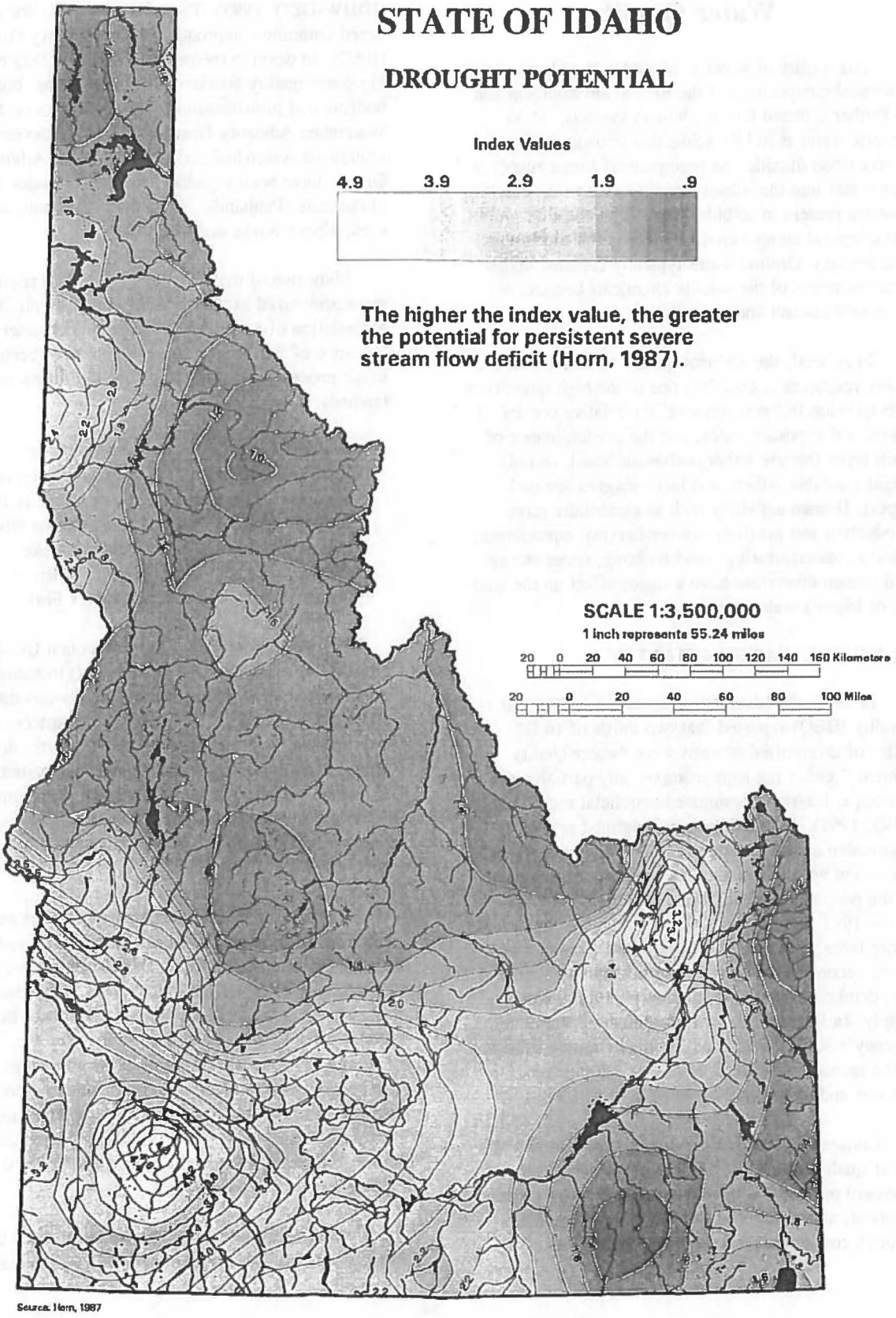


Figure 23. State of Idaho Drought Potential

Water Quality

The quality of water is related to the physical and chemical composition of the natural environment and is further affected through human impacts. Atmospheric water is mildly acidic due to airborne contact with carbon dioxide. As precipitation forms runoff or percolates into the subsurface, it dissolves minerals that are present in soluble forms. The natural or ambient chemical composition of water is formed through this process. Ground water typically contains higher concentrations of the soluble chemicals because of increased contact and travel time.

In general, the ambient quality of Idaho's natural water resources is excellent due to the high quantity of precipitation in the mountains, the relative brevity of travel and exposure times, and the predominance of rock types that are either carbonate-based, or only slightly soluble (silicic and ferro-magnesium rock types). Human activities such as agriculture (crop production and grazing), timber harvest, aquaculture, mining, manufacturing, road building, water storage and stream diversions have a major affect on the quality of Idaho's water resources.

SURFACE-WATER QUALITY

In 1992, the Idaho Division of Environmental Quality (DEQ) reported that two thirds of 16,000 miles of inventoried streams were "water quality limited," either not supporting or only partially supporting at least one designated beneficial use (IDHW-DEQ, 1992). A beneficial use is defined as, "The reasonable and appropriate use of water for a purpose consistent with Idaho state laws and the best interest of the people." Beneficial uses listed in Appendix A of the 1992 Water Quality Status Report include: Cold water biota, warm water biota, primary contact recreation, secondary contact recreation, salmonid spawning, drinking water supply, and agricultural water supply. In 1994, the U.S. Environmental Protection Agency's 303(d) water-quality limited streams list for Idaho included 962 water bodies, 10,700 miles of streams and 357 square miles of lakes (Fig. 24).

Consequently, the Idaho Legislature adopted new water quality statutes in 1995 that implement processes to prioritize watersheds needing pollution management, and to develop water quality action plans through community-based advisory committees (IDHW-DEQ, 1995). The legislation calls for a two-tiered committee approach: Basin Advisory Groups (BAGs) to develop recommendations to DEQ regarding water quality standards and monitoring, pollution budgets and prioritization of impaired waters; and Watershed Advisory Groups (WAGs) to develop and implement watershed action plans. Basin Advisory Groups have been organized for the six major basins of the state (Panhandle, Clearwater, Salmon, Southwest, Upper Snake and Bear River).

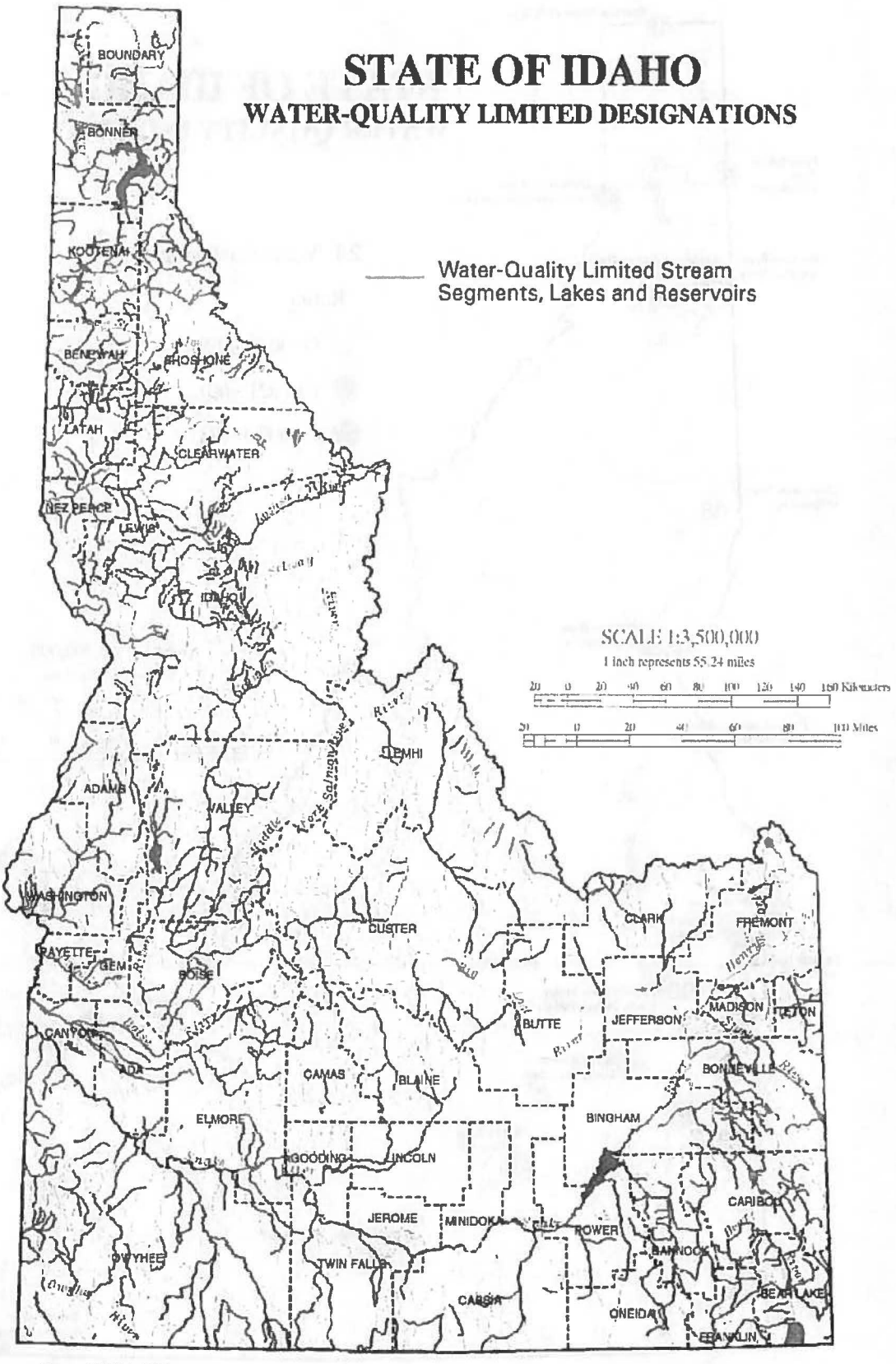
Sixty-two of the water-quality limited reaches were prioritized as high by DEQ, and are eligible for formulation of water quality action plans under the guidance of WAGs. To date, WAGs have been, or are in the process of being formed for the following watersheds:

Priest Lake	Payette Lake
Lake Pend Oreille	Cascade Reservoir
Lake Coeur d' Alene	Lower Payette River
Paradise Creek	Lower Boise River
Potlatch River	Middle Snake
Winchester Lake	Portneuf River
Lemhi River	Henry's Fork

The Idaho Division of Environmental Quality developed a water quality index (WQI) to measure the overall quality of surface waters at the watershed level (IDHW-DEQ, 1988). Constituents or indices of pollution included in the index are temperature, dissolved oxygen, pH, bacteria, trophic status (for system reservoirs), aesthetics, solids, metal toxicity and ammonia toxicity. Based on all station conditions, an overall rating of 0-20 is good, 21-60 is fair and 61-100 is poor (Fig. 25).

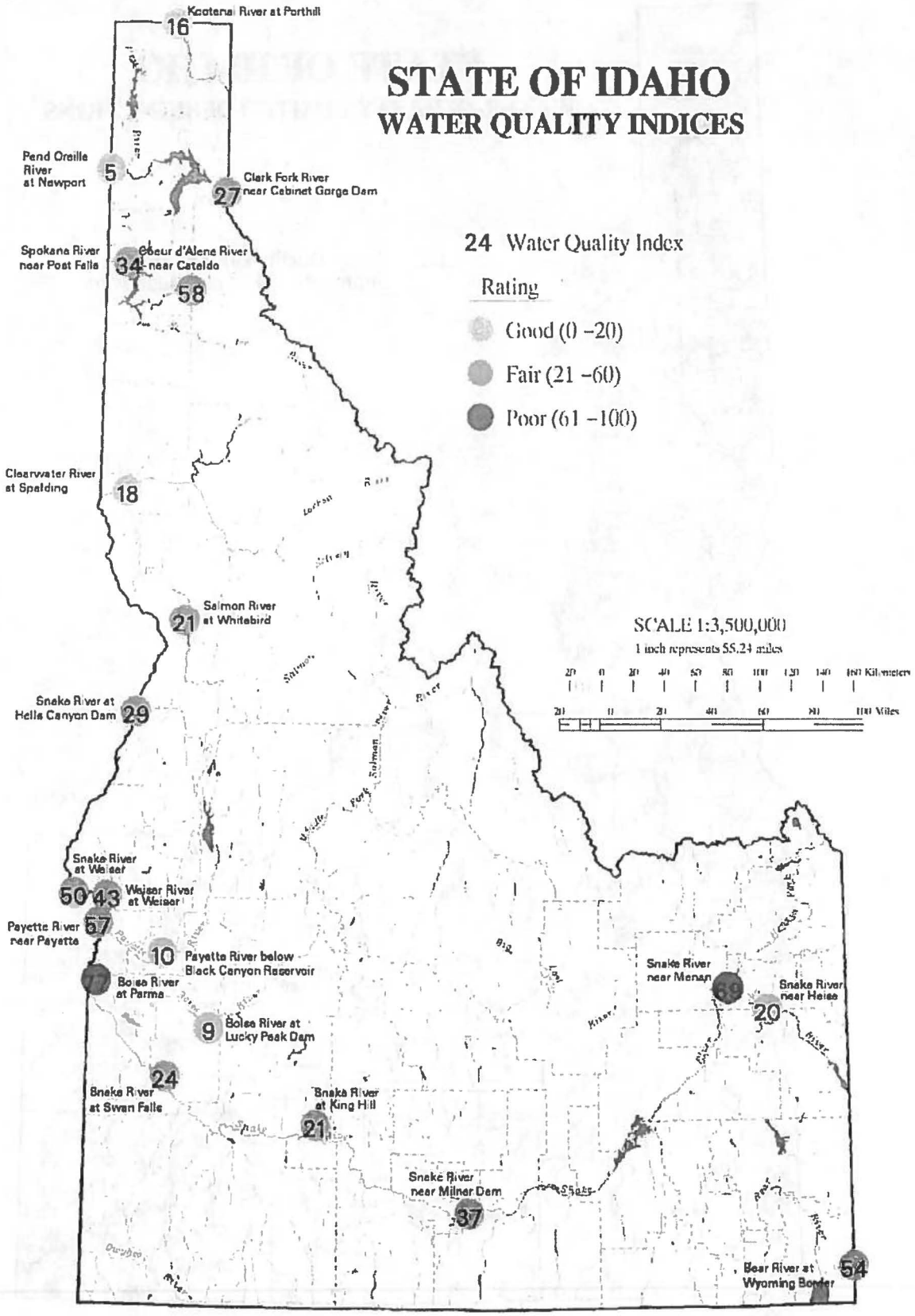
The WQI ratings illustrate surface water quality conditions for major basins and watersheds, and illustrate important spatial trends. In general, the quality of water in streams leaving mountainous headwater areas is rated good (Snake River near Heise, Boise River at Lucky Peak, and Clearwater River at Spalding). As streams then move through areas with a high level of human activities, water quality conditions are substantially degraded (Snake River near Menan, Snake River at Weiser, Boise River near Parma, Payette River near Payette and Coeur d' Alene River near Cataldo).

Water-Quality Index ratings also illustrate the effect of large lakes and impoundments on stream



Source: USEPA, 1996.

Figure 24. State of Idaho Water Quality Limited Designations



Source: IDHWDEQ, 1988; IDHWDEQ, 1992

Figure 25. State of Idaho Water Quality Indices

water quality. Lakes and reservoirs retard river flow and reduce or eliminate sediment load capacity allowing substantial quantities of suspended material to accumulate in the influent reaches. Large lakes and reservoirs can have stream retention times of weeks or even months. As streams move slowly through these water bodies, nutrients are removed by biological activity and retained in the bottom sediments. The overall result is improved WQI ratings (Snake River at King Hill, Snake River at Hells Canyon Dam, and Pend Oreille River at Newport).

GROUND WATER QUALITY

The quality of ground water is generally suitable as a source of drinking water. However, pollution concerns have been identified within many of the hydrogeologic subareas of Idaho (Fig 26).

Natural constituents in ground water causing health concerns include arsenic, fluoride, uranium and selenium. Crockett (1995) reports routine observations of elevated arsenic concentrations in the North Owyhee, Twin Falls, Weiser, Payette, Boise Valley Deep and the Boise Valley Shallow subareas; elevated fluoride concentrations in the Payette, Mountain Home, North Owyhee, Salmon, Bear River and Boise Mountain subareas; elevated levels of gross alpha and radon radioactivity, both believed to be byproducts of uranium, in the Boise Valley Shallow, Boise Valley Deep, North Owyhee and Twin Falls subareas; and elevated concentrations of selenium in the North Owyhee subarea.

Constituents causing health concerns and related at least in part to human impacts include nitrate, volatile organic compounds, pesticides, cadmium and bacteria. Hydrogeologic subareas most affected by elevated nitrate concentrations were North Owyhee, Twin Falls, Boise Valley Shallow and the eastern portion of the Snake River Plain Alluvium. Subareas most affected by volatile organic compounds and pesticides were Boise Valley Shallow, Portneuf, Snake River Plain Alluvium, Payette and Twin Falls. Elevated levels of cadmium were observed in Silver Valley of the North Idaho subarea, and in one well from the Snake River Plain Basalt subarea. Fecal coliform bacteria, an indicator of warm-blooded fecal contamination, were detected throughout the State. Highest occurrences of fecal coliforms were in the Boise Mountains, Weiser, Boise Valley Shallow, Cassia/Power and Payette subareas.

Ground water vulnerability maps were prepared for two areas containing Idaho's major underground drinking water sources. The maps rate the relative ground-water pollution potential utilizing data layers characterizing depth-to-water, recharge and soil landscape characteristics (Rupert, *et al.*, 1991). The vulnerability maps were generated by merging the three data layers into one map and accumulating the point ratings from each layer to develop the total vulnerability rating. The final vulnerability map depicts four classes of relative vulnerability; low, moderate, high and very high. Areas of very high pollution potential overlie primarily shallow alluvial aquifers, while areas of high pollution potential are associated with deeper aquifers in permeable materials with little protection from downward-moving contaminants other than depth to water (Fig. 27).

The U.S. Environmental Protection Agency has designated three aquifers in Idaho as Sole Source Aquifers. A Sole Source Aquifer is defined as the sole or principal source of drinking water, and is to be managed to protect the ground water for that purpose. The designated systems in Idaho are the Rathdrum Prairie, Lewiston and Snake Plain Aquifers (Fig 28). A sole source designation may restrict federal supported activities within the area overlying the aquifer and its tributary sources.

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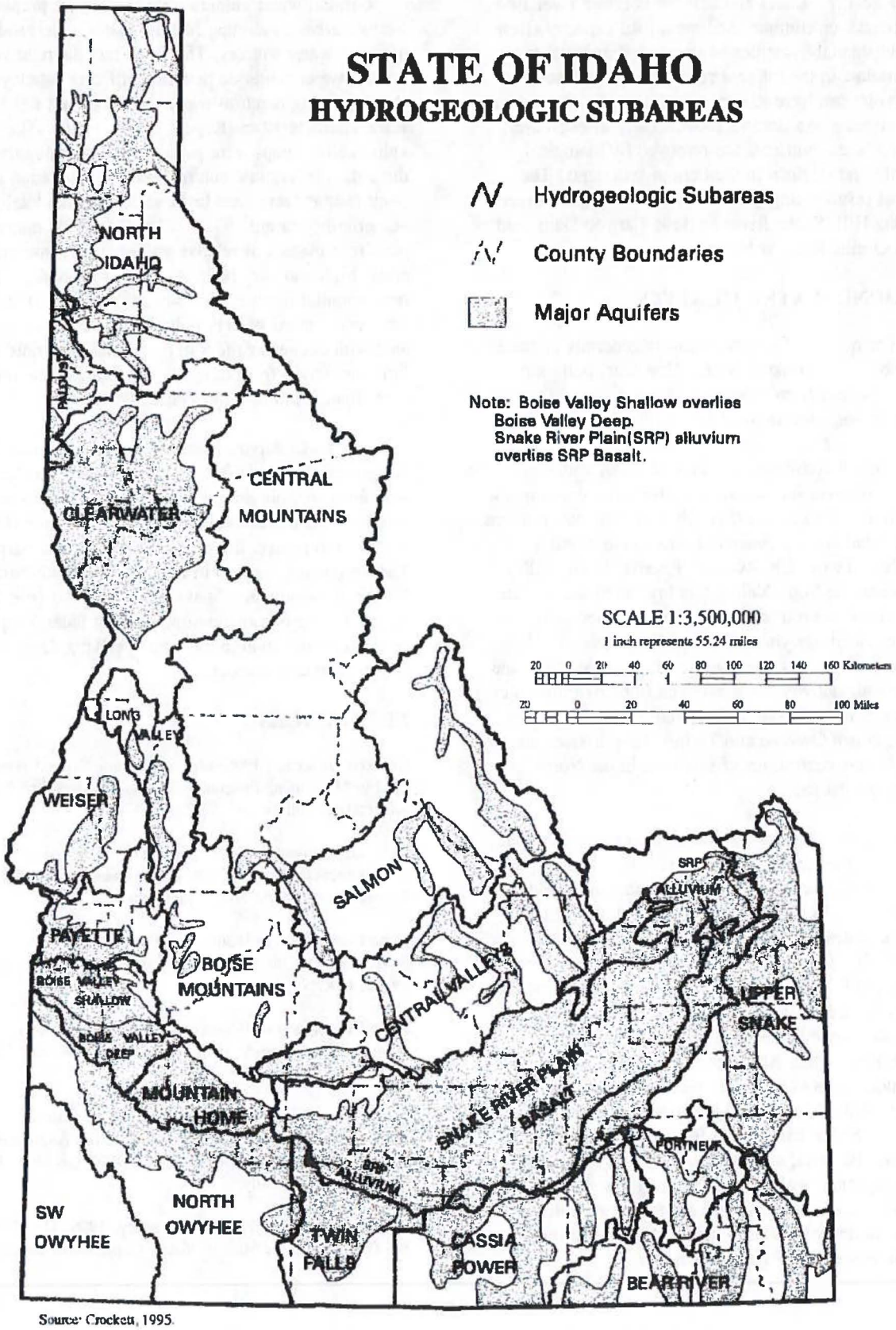
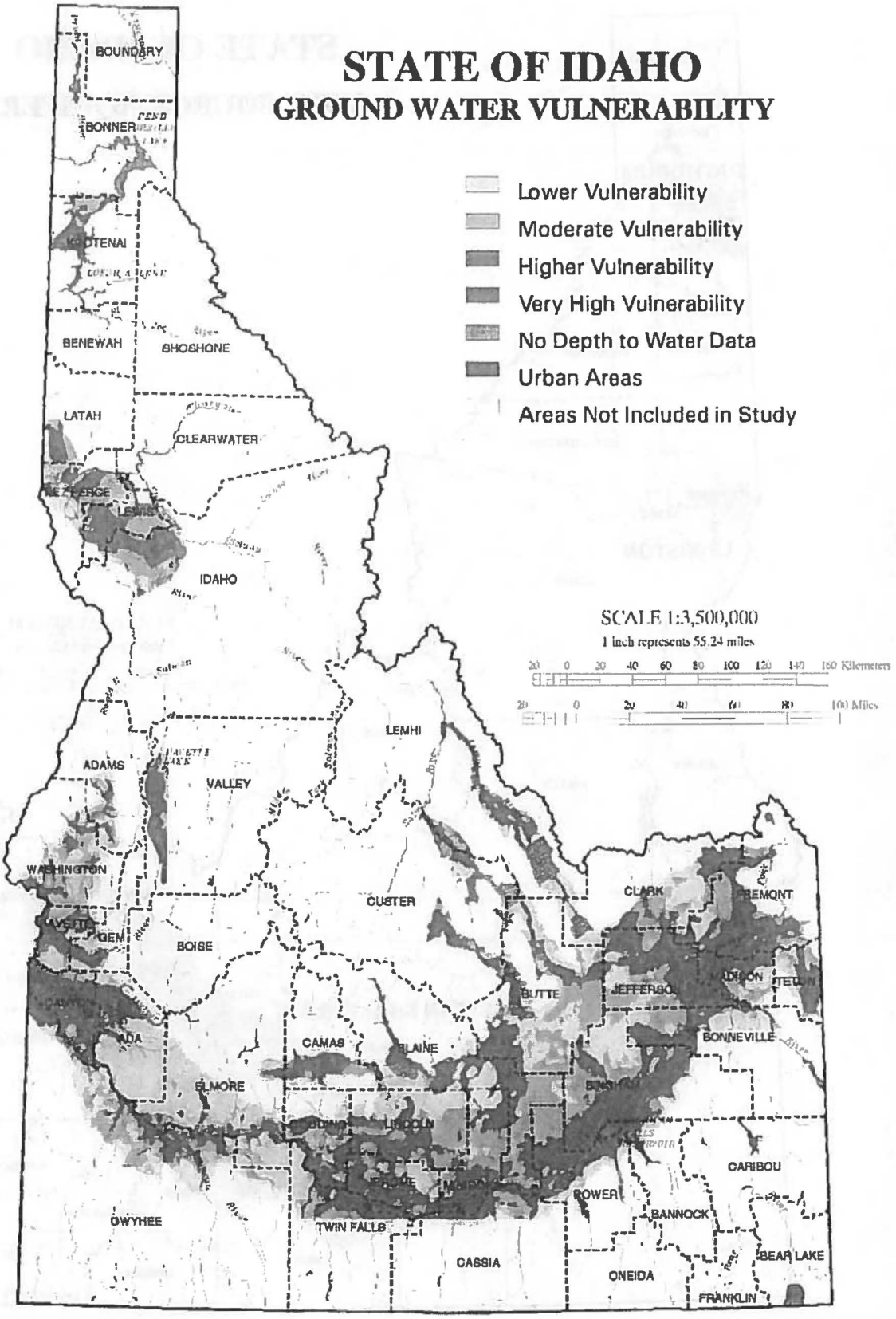


Source: Crockett, 1995.

Figure 26. State of Idaho Hydrogeologic Subareas



Source: Rupert et al., 1991

Figure 27. State of Idaho Ground Water Vulnerability

Figure 28. State of Idaho Sole Source Aquifers

WATER USE AND ALLOCATION

Idaho's water resources have been developed extensively for irrigation, power generation, aquaculture, and municipal and industrial supply. The primary water committment is to the production of agricultural crops. Although irrigation is by far the largest use of available water in the state, other offstream and instream uses are important to the economy. Idaho industries depend on an ample supply of good quality water. Hydroelectric power generation, aquaculture, and the recreation/tourism industry are dependent on river flows, spring flows, reservoir levels and good quality water. Though small relative to other uses, domestic, commercial, and municipal water use are indispensable.

Total water withdrawals for offstream use are an estimated 22.1 million acre-feet of which 5 million acre-feet is consumptively used. Surface water diversions are approximately 13.6 million acre-feet, and ground water withdrawals total an estimated 8.5 million acre feet. Agriculture is the largest offstream water use – 97 percent of total withdrawals and 99 percent of total consumptive use. Most instream water uses are not quantified, however, aquaculture and hydroelectric power generation use approximately 100 million acre-feet per year in Idaho.

Land Use and Ownership

Idaho is the 14th largest state in the United States with a land area of 52.9 million acres (Idaho Statistical Abstract, 1996). Topography, climatic conditions and soil are major influences on land cover and land use. Range land and forest are the dominant land covers in Idaho (Fig. 29). Range land covers most of southern Idaho where land is not irrigated or developed. Sagebrush, bunch and annual grasses are the predominant vegetation. Pine and spruce forests claim the state's higher elevations. Sixty-three percent of the state's forests lie north of the Salmon River. Agricultural land accounted for about 13 percent of the state's land in 1992. Agricultural land includes land in crops, both irrigated and non-irrigated, and identified pasture. Land in urban areas totaled 223,000 acres in 1992, up from 154,000 acres in 1980. Urban areas absorbed an average of 5,750 acres per year from other land uses during the 1980s. Table 11 lists acreage for each classified land use.

Ownership also affects land use and management. About 70 percent of Idaho is publicly owned. Federal agencies manage over 33 million acres; state and local governments oversee 2.7 million acres. The U.S. Forest Service and the U.S. Bureau of Land Management are the largest land managers in Idaho. Other federal agencies managing land in Idaho include the U.S. Bureau of Reclamation, U.S. Park Service, U.S. Fish and Wildlife Service, the U.S. Department of Defense and the U.S. Department of Energy. Private interests own and manage over 16 million acres in Idaho or about 31 percent of the total land area. Figure 30 delineates land ownership and management throughout Idaho.

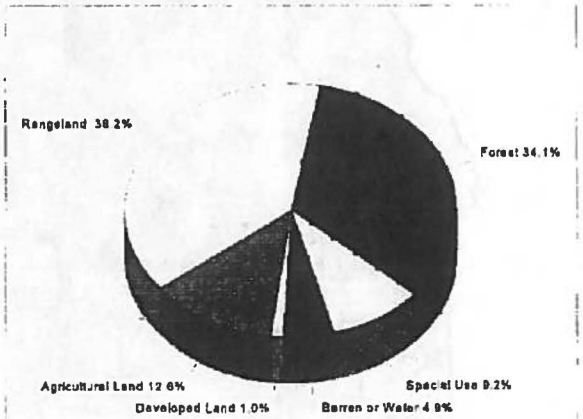


Figure 29. Land use in Idaho, 1992. Developed Land includes urban and built-up areas in units of 10 acres or greater, highways, railroads, and airports. Special Use includes State parks, national monuments, wilderness areas, wildlife management areas, and land administered by the U.S. Department of Defense and the U.S. Department of Energy.

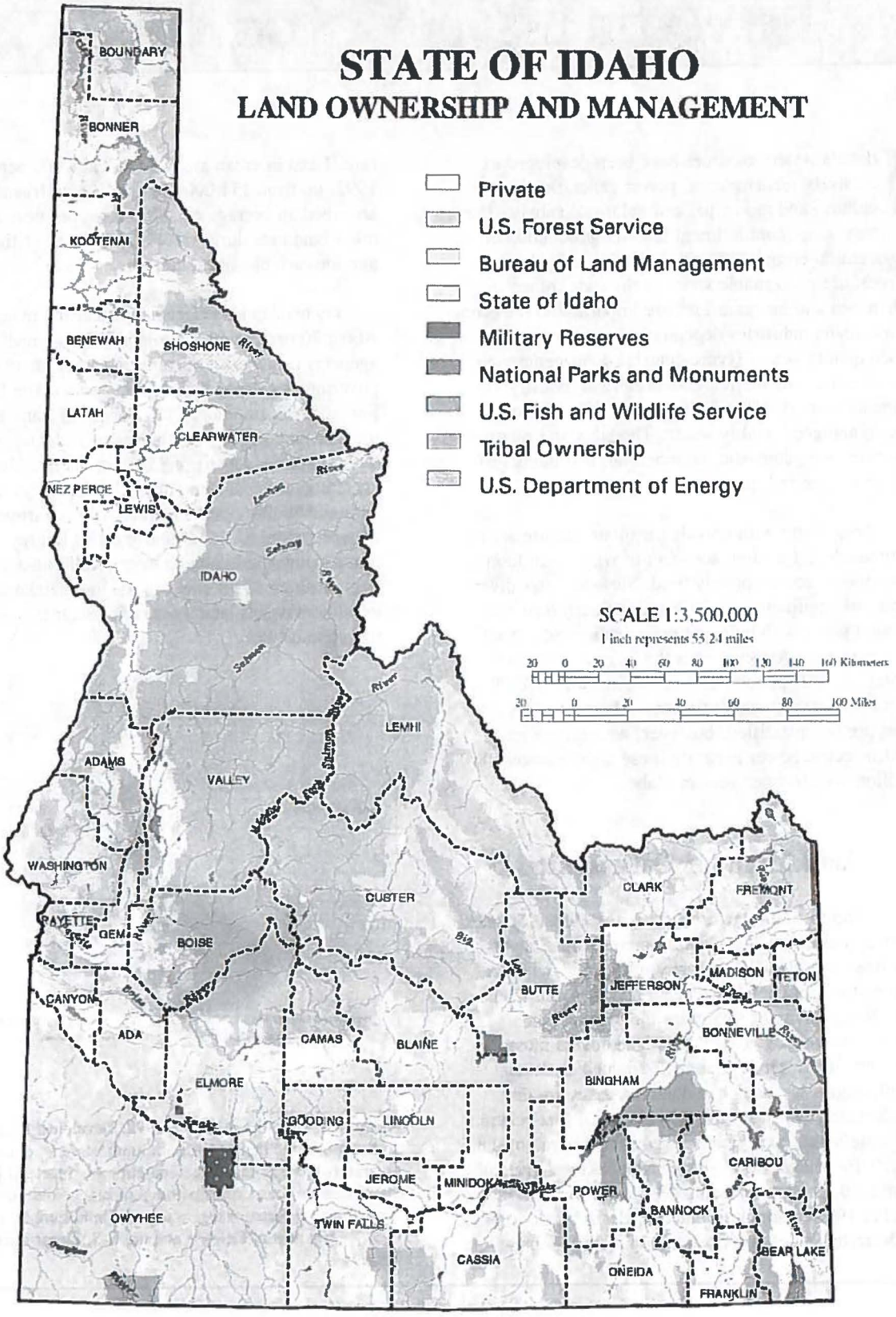


Figure 30. State of Idaho Land Ownership and Management 62

Table 11. Land and Water Area, Land Use, Ownership and Management in Idaho, 1992.

Land Area (square miles)	82,751
Land Area (acres)	52,961,000
Water Area (square miles)	823
Water Area (acres)	525,600
Urban or Built-up Land (acres)	223,000
Agricultural Land (acres)	6,677,000
Range (acres)	20,219,000
Forest (acres)	21,621,000
Wetland (acres)	262,100
Barren land (acres)	2,308,500
Tundra (acres)	11,400
Percentage of Land Managed by Federal Govt.	64%
Percentage of Land Managed by State	5%
Percentage of Land Privately Owned	31%
Percentage of Land Managed by City/County	0.2%

Source: U.S. Dept. of Agriculture, Economic Research Service, 1995.

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Water Allocations

Water allocations in Idaho follow the Prior Appropriation Doctrine, best described as "first in time is first in right." Water rights are administered by the Idaho Department of Water Resources. They are issued by date of appropriation, for specific quantities, diversion points, places of use, and purposes. Figure 31 identifies and juxtaposes U.S. Geological Survey surface water hydrologic units and Idaho Department of Water Resources administrative basins.

In most parts of southern Idaho, surface water resources are fully utilized, and ground water development is administratively limited where significant water level declines are evident. The Swan Falls agreement, 1984, between the State of Idaho and the Idaho Power Company, establishes certain rights and policies concerning water use in the Snake River Basin above the Swan Falls Dam upstream of Murphy, Idaho. The State agreed to assert that the Snake River is fully appropriated above Swan Falls Dam except for trust water held by the state and occasional flood waters. Consequently, the Idaho Legislature determined that an adjudication of the entire Snake River Basin was in the public interest, and should proceed subject to stated constraints regarding federal reserved right claims [Idaho Code 42-1406A].

The solicitation of water right claims began in February, 1988. The Idaho Department of Water Resources is presently ascertaining both surface and ground water rights for the Snake River Basin. This process is expected to determine approximately 135,000 claims to water rights.

A moratorium on further consumptive appropriations, from both ground and surface water, was established for the Snake and the Bear River basins in 1992. The order was tied to existing drought conditions when issued. Moratoriums were later rescinded for the Bear River Basin and the Boise, Payette, and Weiser drainages, Owyhee County, and the Mountain Home area in the Snake River Basin. In the Upper Snake, the moratorium was extended through December 31, 1997, by legislation (Fig. 32).

Water resources in northern Idaho are generally available for appropriation. The primary water uses in northern Idaho are non-consumptive. A moratorium in the Clearwater and Salmon River drainages is in effect to protect salmon spawning grounds. The moratorium does not apply to applications for domestic use or applications to use ground water.

Agriculture Water Use

As of 1992, Idaho had over 13 million acres in farms (U.S. Census of Agriculture). About one third of farm acreage is cropland - 4.2 million acres, 6.6 million acres are in pasture or range, and over 3 million acres are woodland or other minor classifications. Precipitation in northern Idaho is generally adequate for agriculture without irrigation, but cooler growing season temperatures generally limit crop production to

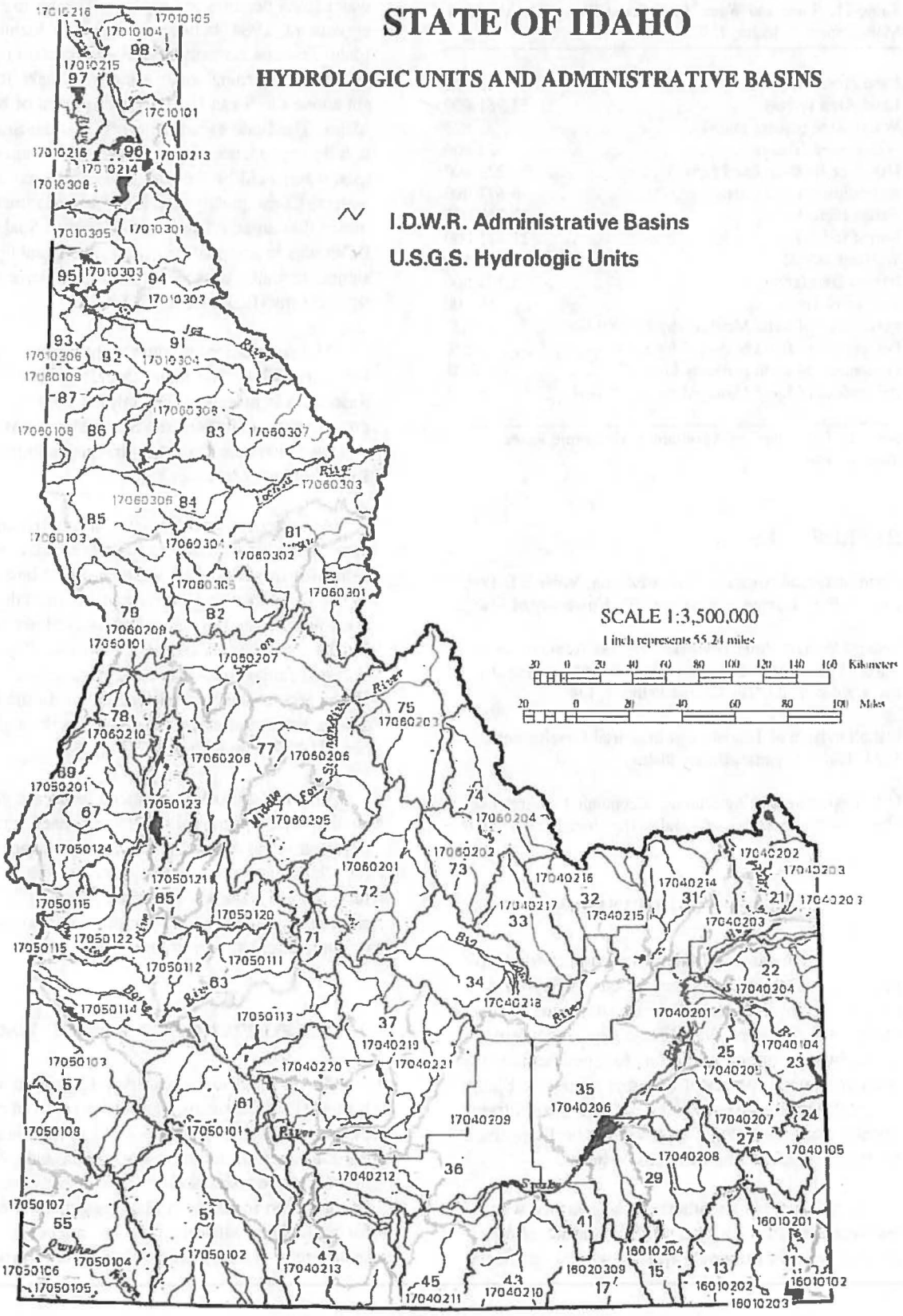

Figure 31. U.S. Geological Survey Hydrologic Units and Dept. of Water Resources Administrative Units

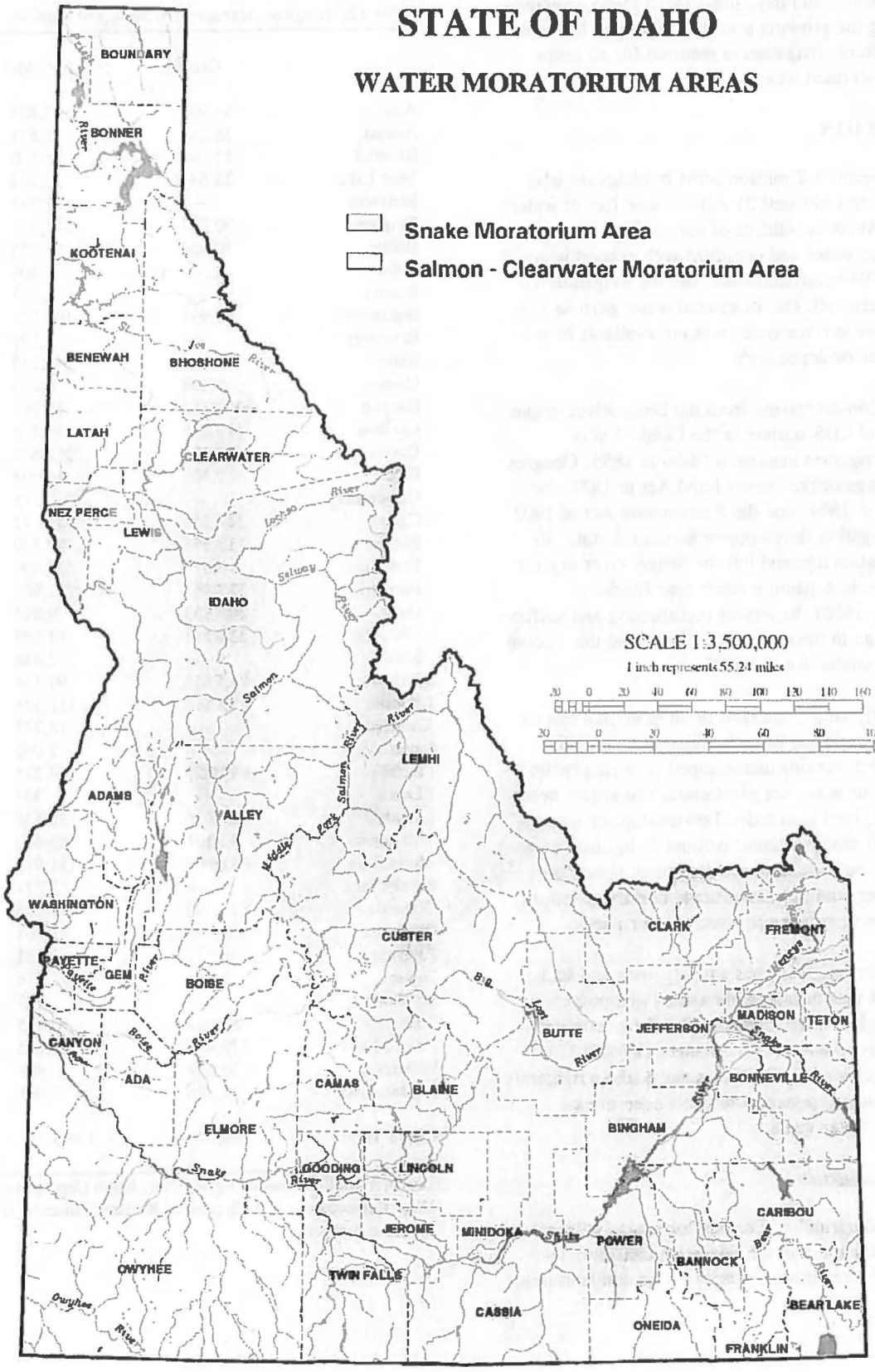

Figure 32. State of Idaho Water Moratorium Areas

grains, pasture, and hay. In southern Idaho, precipitation during the growing season is generally inadequate for agriculture. Irrigation is required for all crops except dry-farmed wheat.

IRRIGATION

At present, 3.2 million acres in Idaho are irrigated with an estimated 21 million acre-feet of water (Fig 33). About two-thirds of that acreage is irrigated with surface water and one-third with ground water. Since the 1940s, ground water use for irrigation has steadily increased. Use of ground water permits irrigation where surface water was not available or was not adequate or dependable.

Irrigation diversions from the Boise River began in 1843, and LDS settlers in the Lemhi Valley launched irrigation in eastern Idaho in 1855. Congressional passage of the Desert Land Act in 1877, the Carey Act in 1894, and the Reclamation Act in 1902 spurred irrigation development across the state. By 1905, irrigation demand left the Snake River dry for several days in a 10-mile reach near Blackfoot (Kjelstrom, 1986). Reservoir construction and surface water storage in the early 1900s increased the amount of water available for seasonal use.

Virtually all private land in the state that can be feasibly irrigated has been developed. Potentially irrigable land remains undeveloped because plausible financial returns are not great enough to attract necessary capital, land is in federal ownership, or water available for new irrigation is limited. In many areas of the state, new irrigation is dependent upon either ground water pumping, new storage construction, or the purchase of existing upstream water rights.

Sprinkler irrigation has steadily grown in Idaho with ground water development and in response to recent droughts. Today, about half of the state's irrigated acreage is watered by sprinklers (Table 12). Water application efficiency has aided Idaho irrigators in maintaining crop production levels even in extremely short water years.

Snake River Basin

Irrigated agriculture accounts for nearly 99 percent of all water use in the Snake River Basin. Two thirds of the three million acres of irrigated land in the

Table 12. Irrigated Acreage by County and Method.

	Gravity	Sprinkler
Ada	55,956	17,838
Adams	38,347	2,823
Bannock	12,664	26,910
Bear Lake	25,544	17,073
Benewah	----	1,293
Bingham	30,781	277,031
Blaine	10,928	53,355
Boise	2,345	609
Bonner	----	2,617
Bonneville	45,994	107,320
Boundary	----	1,399
Butte	7,891	48,243
Camas	1,198	6,288
Canyon	189,362	25,917
Caribou	14,665	55,536
Cassia	40,322	211,690
Clark	2,420	46,008
Clearwater	----	316
Custer	24,284	34,142
Elmore	15,556	59,552
Franklin	16,992	33,090
Fremont	37,945	92,900
Gem	28,783	9,894
Gooding	32,311	83,087
Idaho	----	2,418
Jefferson	93,818	90,138
Jerome	39,116	111,328
Kootenai	----	18,723
Latah	----	2,060
Lemhi	46,025	24,275
Lewis	----	337
Lincoln	28,056	31,638
Madison	42,101	85,660
Minidoka	42,604	134,912
Nez Perce	----	2,277
Oneida	13,300	15,606
Owyhee	59,388	41,061
Payette	46,541	10,051
Power	4,116	98,776
Shoshone	----	217
Teton	20,543	30,815
Twin Falls	179,496	51,855
Valley	20,259	884
Washington	31,186	9,041
State Total	1,266,393	1,996,394

Source: 1992 Census of Agriculture, Idaho Department of Water Resources, U.S. Bureau of Reclamation and Farm Service Agency.

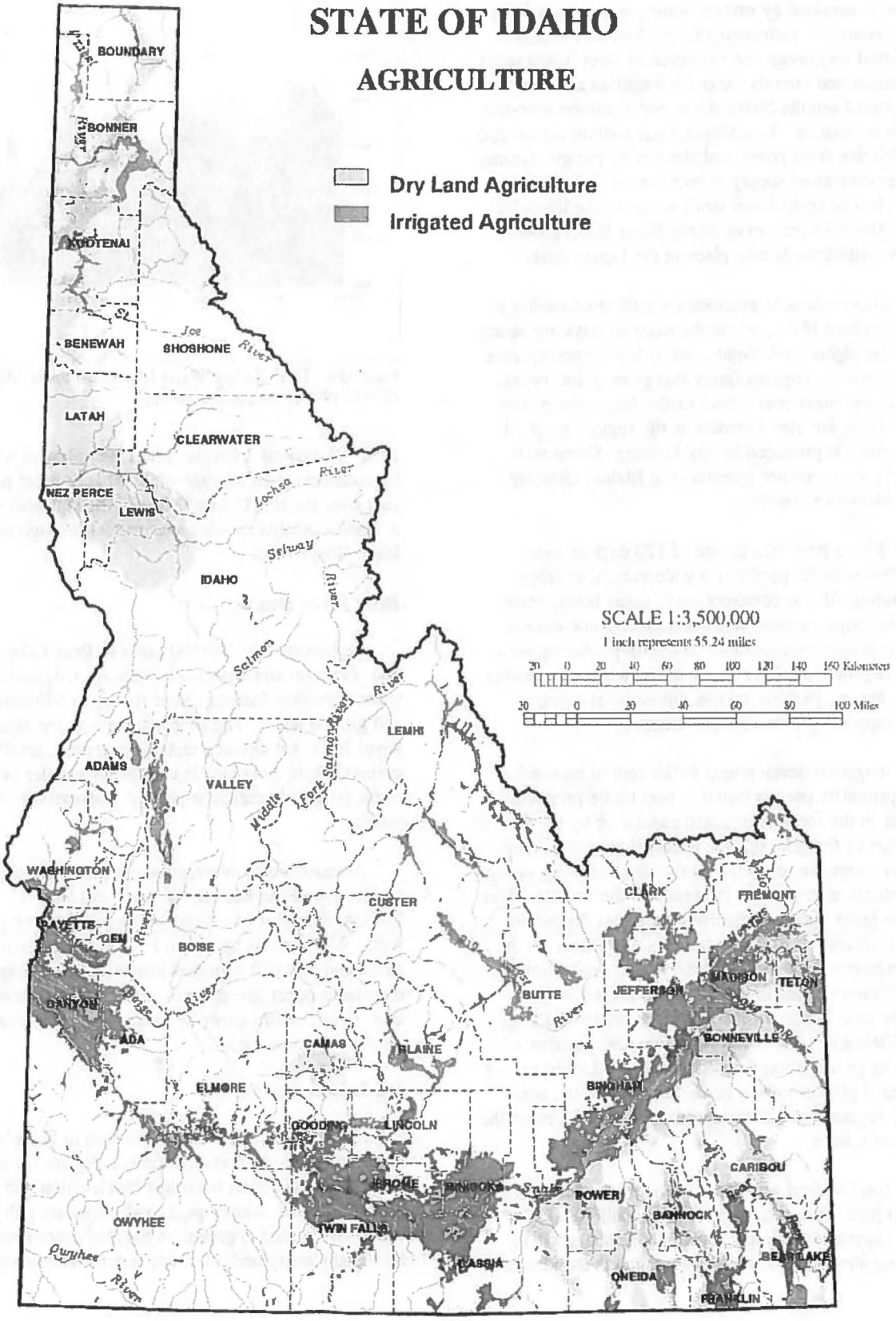

Figure 33. State of Idaho Agricultural Areas

basin is supplied by surface water, mostly by gravity diversions. An estimated 16.5 million acre-feet is diverted by gravity and conveyed by over 3,000 miles of canals and laterals. About 9.5 million acre-feet is diverted from the Snake River and 6 million acre-feet from tributaries. An additional one million acre-feet is withdrawn from rivers and streams by pumps. Ground water diversions supply approximately 3.5 million acre-feet to agricultural lands in the Snake River Basin. About 85 percent of Snake River Basin ground water withdrawals take place in the Upper Snake.

Idaho's famous potatoes are cultivated mostly in southeastern Idaho, where the summer days are sunny and the nights cool. South-central Idaho encompasses thousands of irrigated farms that grow grain, beans, corn, and sugar beets. Beef cattle, hogs, sheep, hay and wheat are also abundant in the region; much of the wheat is produced by dry farming. Sheep and wool production are prominent in Blaine, Gooding, and Minidoka counties.

With a frost-free period of 120 days or more, southwest Idaho produces a wide variety of crops including alfalfa, corn, potatoes, sugar beets, small grains, hops, onions, mint, and seed. Southwestern Idaho is also a major cattle and milk producing area. The region is significant in fruit growing - sweet cherries, apples, peaches, plums, apricots, and grapes, and supports a thriving wine industry.

Irrigation development in the central mountains has primarily been oriented to beef cattle production, either in the form of irrigated pasture or by the production of forage crops for winter livestock feeding. Other crops are restricted by the short growing season and distance to market. Irrigation in the Salmon River Basin relies almost exclusively on direct diversions from streams and small reservoirs. Dry farms in the basin have excellent soft winter wheat production. In the Clearwater Basin irrigation has played only a minor role. Aside from small tracts scattered along the Clearwater River and its tributaries, the area's only large irrigation development is the Lewiston Orchard project in Nez Perce County. Fruits, potatoes, vegetables, and forage crops are produced on the project's acres.

Total surface water diversions from the Snake River have been declining since the mid 1970s (Fig. 34). Currently irrigators in the Upper Snake are diverting about 800,000 acre-feet less than they did in

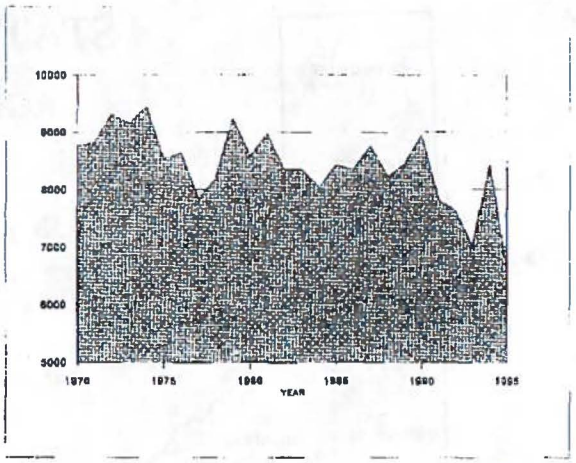

Figure 34. Total Surface Water Diversions above Milner 1970 to 1995 in thousand acre-feet.

1977. Diversions from the Snake River above Milner have decreased an average of 40,000 acre-feet per year over the last 15 years. Most of the surplus water is made available to other water users through the Idaho Water Bank.

Bear River Basin

Approximately 190,000 acres in Bear Lake, Caribou, Franklin and Oneida counties are irrigated with water diversion from the Bear River, its tributaries, and ground water. The irrigated lands in the Bear River Basin are devoted mainly to pasture, small grains, alfalfa and other hay crops. A smaller portion of the irrigated acreage is planted in sugarbeets and potatoes.

An estimate of average annual withdrawals for the portion of the Bear River Basin in Idaho is 230,000 acre-feet based on 1990 level of development. Withdrawals upstream from Idaho amount to an additional 100,000 acre-feet annually. Since irrigation diversions occur along almost the whole length of the Bear River, return flows are important in affecting the overall water resource.

Panhandle Basins

Irrigation is not a major water use in Idaho's Panhandle because precipitation is adequate for most crops. Crop selection is limited by elevation and growing season; wheat, peas, and lentils are cultivated. Grass seed is grown on the Rathdrum Prairie in Kootenai County and the western part of Benewah

County; wild rice is raised along the St. Joe and Coeur d'Alene rivers.

There are approximately 26,000 acres of irrigated land in the Panhandle. Irrigated acreage represents less than 10 percent of total cropland in the region; nearly all of it is on Rathdrum Prairie in Kootenai County. Approximately half of the irrigated land in Kootenai County is supplied by groundwater with the remaining portion supplied by pumping water from the Spokane river or Hayden Lake. Water application is almost entirely by sprinklers.

LIVESTOCK WATER

A cattle, calf, sheep and hog inventory for the state totals more than two million head. Fourteen percent of the cattle are dairy cows (Idaho Agricultural Statistics Service, 1996). Livestock enterprises are important in all parts of the state, but they are relatively more important in the high valley areas. In these areas, practically all agricultural activities are associated with livestock production, with hay and pasture produced on private lands, and grazing on public lands.

Livestock water use in Idaho is an estimated 50,000 acre-feet per year (Solley, et al., 1993). Dairy industry withdrawals are an estimated 11,000 acre-feet of that total. Livestock water use includes water for both stock watering and other on-farm needs aside from irrigation.

Livestock water supplies are usually developed by private individuals. However, in the Henrys Fork, Fall River, and Teton River basins, irrigation canals divert surface water throughout the year for stock water; average annual canal diversions from December through March total 100 acre-feet. On the range and in the mountains, livestock usually water freely at streams or springs unless watering stations have been developed.

AQUACULTURE

Aquaculture in Idaho uses, non-consumptively, an estimated three million acre-feet of water per year. There are 160 licensed commercial fish producers in Idaho with over 2,000 ponds or raceways. Additionally, 23 federal, state, and tribal hatcheries in the state raise trout and salmon for release in Idaho's streams, lakes, and reservoirs (University of Idaho, 1991; Idaho Department of Agriculture, 1996).

No two individual fish raising facilities are alike in pond design, water utilization, fish density per unit of water volume, or fish husbandry methods. However, most of the fish hatcheries are a series of flow-through raceways that continuously pass water through the units.

Devils' Corral Spring, near Shoshone Falls in Jerome County, was the site of the first commercial fish farm in Idaho. Started in 1909, the fish farming operations were discontinued one year later. In 1928 the Snake River Trout Farm at Clear Lake, the first modern raceway farm, began operation. Four trout farms were in production by 1935 and eight in 1950. The early 1970s saw an explosion in aquaculture facilities development and expansion.

The Idaho aquaculture industry ranks as the third largest food-animal producing business in the state (Brannon and Klontz, 1989). Most of the commercial aquaculture operations in the state are located in the Twin Falls-Buhl area and in the American Falls-Pocatello area, because of the presence of high quality spring water issuing from the Snake Plain aquifer. The constant flow of clean, cool (59°F) spring water, tributary to the Snake River in the Thousand Springs reach and the American Falls area makes these locations ideal for raising trout. It is estimated that 50 percent of the spring flow along the Snake River between Milner Dam and Bliss Reservoir is utilized for fish production.

Rainbow trout are the dominant commercial fish stock, but sources of cooler water and geothermal waters have been used to raise cutthroat trout, coho salmon, catfish, tilapia, and alligators. The hot water is mixed with cooler spring water for alligator, catfish and tilapia culture.

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Domestic, Commercial, Municipal and Industrial Water Use

Domestic, commercial, municipal and industrial (DCMI) water use is relatively small, but essential to human life and economic development. Domestic and commercial water use includes drinking, food preparation, washing, and lawn and garden watering. Municipalities supply water not only to residences and commercial enterprises, but also to schools, fire departments, and municipal parks. Industrial water use incorporates manufacturing processes, cooling, and employee sanitation.

At present, withdrawals for domestic, commercial, municipal, and industrial water use in Idaho total an estimated 800,000 acre-feet per year. Of that amount, approximately 150,000 acre-feet is consumptively used and the balance is returned to streams or ground water. Ground water supplies about 86 percent of DCMI water demand in the state. In the Panhandle, however, surface water supplies about 85 percent of DCMI water demand. Exact DCMI water use quantities are difficult to define because most individuals, businesses, and communities do not have water meters. Estimates are based on population, average water use per day, water measurements where they exist, and water rights.

The industrial water requirement in Idaho is approximately one-half of the total DCMI demand, 400,000 acre-feet. Industries in the state with high annual withdrawals include food processing, lumber, fertilizer, and concrete manufacturing. Food-processing industries withdraw relatively large volumes of water for meat packing; fruit, vegetable, and fish preparation and preservation; and beet sugar refining.

The INEL withdraws approximately 7,500 acre-feet per year from ground water. Ninety percent of the water used is pumped in Butte County and ten percent is withdrawn in Bingham County (Lindholm and Goodell, 1986). The INEL uses most of the water for cooling purposes.

Withdrawals for food processing have a distinct seasonal pattern. Water use for sugar refining and potato processing is highest from September through March. Water use for canning and freezing of fruits and vegetables peaks from July through October. Water use for milk- and meat/fish-processing industries is relatively constant throughout the year.

The forest products industry requires water for pulp and paper fabricating, lumber and wood products manufacturing and storing and moving logs. The primary use of water by the mining industry is in mineral processing. The mining industry diverts less than 10,000 acre-feet annually and recycles the same water several times (Solley, et al., 1993).

Most large industrial water users have developed independent ground water supplies, although approximately two percent of industrial water withdrawals were delivered by municipal or public-supply systems. The food processing, timber and mining industries are the primary industrial water users in the state.

Municipal water systems provide 70 percent of domestic and commercial water in Idaho (1990 U.S. Census). Many communities need to expand and up-

grade their water systems. Improvements range from new wells to storage tanks and pipelines. Some communities have paid for these improvements without outside help, but most have made use of public funding programs.

Domestic, commercial, municipal, and industrial water demand is increasing due to population growth. Idaho's population has increased over 40 percent in the twenty years between 1970 and 1990. The cities, which are the fastest growing areas, may require new water supplies to provide for additional people. As the industrial potential of the area is developed, water requirements for industrial use will also increase.

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Power Generation

Electricity is vital to almost all sectors of Idaho's economy. Idaho's emerging "high-tech" industries are especially dependent on the resource. Idaho's irrigators depend on electricity to pump ground water and pressurize sprinkler systems. About fifty percent of all electricity consumed in Idaho is generated by the state's waters.

Idaho has relied almost exclusively on hydroelectric facilities to supply electric power. The first electricity in Idaho was produced by hydropower during the 1880's in the Wood River Valley. With the exception of a small internal combustion generation facility near Hailey and some limited cogeneration applications, all electricity generation facilities within Idaho are hydroelectric.

Today, hydropower facilities on Idaho rivers and canals have an installed capacity of 2,998 MW and use approximately 100 million acre-feet of water annually to produce on average eight million mega-watt hours (IDWR, 1996). Approximately 90 percent of Idaho's hydropower electricity generation is produced in the Snake River Basin. The distribution of hydropower facilities in Idaho with installed capacities of at least 5 mega-watts is depicted in Fig. 35. Table 13 lists the owner, installed capacity, and the average annual generation for these facilities.

Hydroelectric generation facilities are owned by private utilities, the federal government, municipal utilities, electric cooperatives, and private corporations, partnerships, or individuals that sell power to the private utilities. The majority of the hydroelectric generation capacity within the state is owned and operated by three private utilities: Idaho Power Company, Washington Water Power Company, and PacifiCorp Utah Power and Light Division.

Idaho Power Company hydropower generation facilities are located, for the most part, on the Snake River between American Falls and Hells Canyon and have a total installed capacity of 1,588 MW (IDWR, 1996). This figure includes the three Hells Canyon dams which straddle the Idaho-Oregon border and have a combined capacity of 1,167 MW. Most of the remaining capacity, is located between Milner Dam and Bliss.

The Washington Water Power hydropower facilities are located in the northern part of the state on the Spokane and Clark Fork Rivers. Washington Water Power also owns and operates hydroelectric facilities on these rivers both upstream and downstream of Idaho. The PacifiCorp-Utah Power and Light hydropower facilities are all located in eastern Idaho. Two projects are located on the Henrys Fork, and four are located on the Bear River.

Federal powerplants, operated by either the U.S. Bureau of Reclamation or the U.S. Army Corps of Engineers, located within the state have a combined installed capacity of 753 MW. In addition, there are four powerplants owned by other entities that are located at federal dams. The largest federal hydropower facility in Idaho is Dworshak Dam and power plant, which is located on the North Fork Clearwater River near Orofino, with an installed capacity of 400 MW (U.S. Army Corps of Engineers, 1996).

Many municipalities within the state own hydroelectric generation facilities. These include Idaho

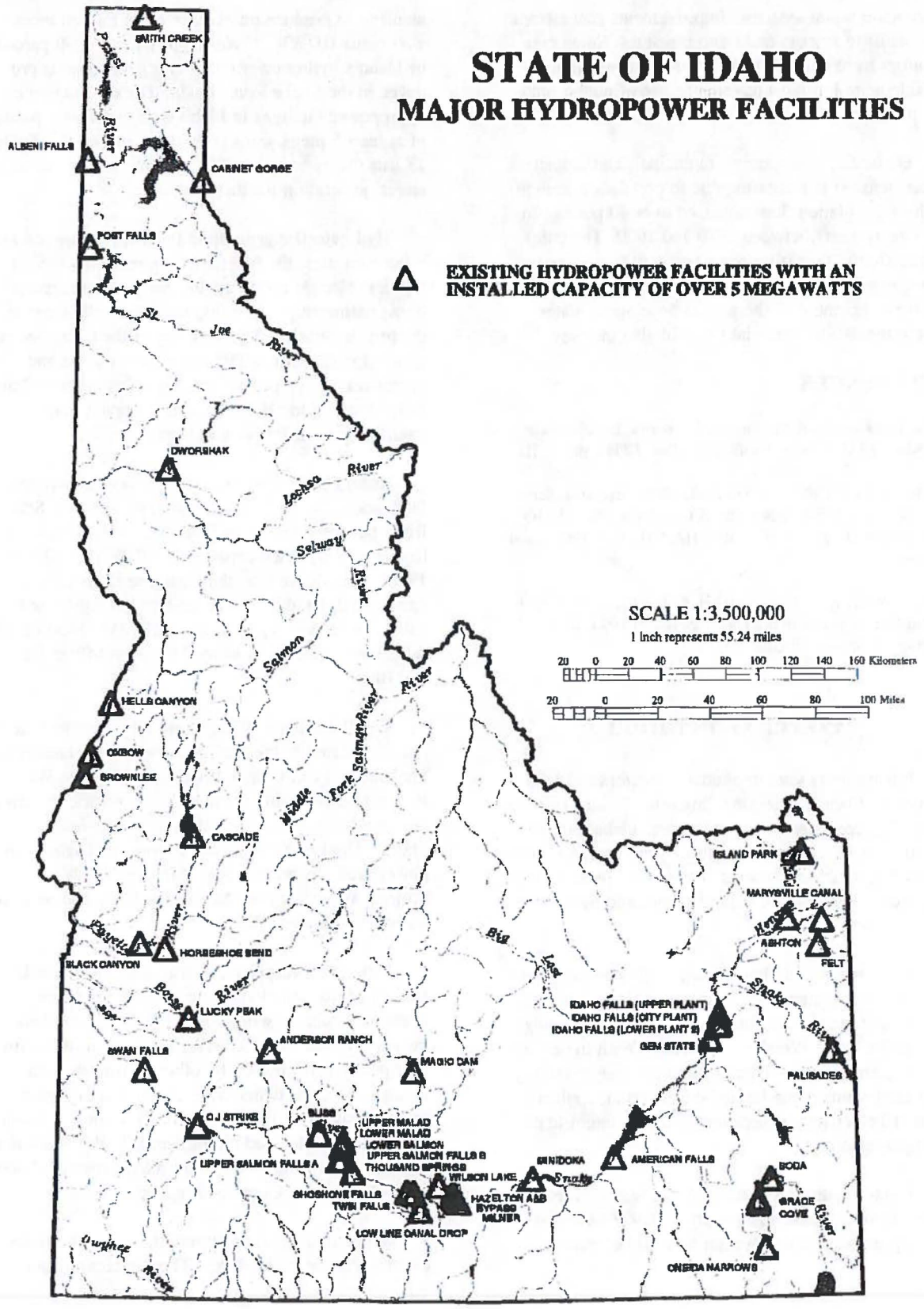

Figure 35. State of Idaho Hydropower Facilities

Table 13 Hydropower Facilities with Installed Capacities Greater than Five Mega-watts.

Power Plant	Stream	Owner	Installed Capacity (MW)	Average Annual Generation (MWH)
Albeni Falls	Pend Oreille	Federal government	45.0	201,000
American Falls	Snake River	Idaho Power Company	92.3	400,000
Anderson Ranch	South Fk. Boise	Federal governement	40.0	44,000
Ashton	Henry's Fork	PacifiCorp	5.8	36,200
Black Canyon	Payette River	Federal governement	8.0	46,000
Bliss	Snake River	Idaho Power Company	75.0	379,300
Brownlee	Snake River	Idaho Power Company	585.4	1,400,000
C.J. Strike	Snake River	Idaho Power Company	82.8	350,000
Cabinet Gorge	Clark Fork	Washington Water Power	230.0	1,050,000
Cascade	North Fk Payette	Idaho Power Company	12.4	30,000
City	Snake River	City of Idaho Falls	8.0	50,328
Cove	Bear River	PacifiCorp	7.5	33,000
Dworshak	NF Clearwater	Federal governement	400.0	1,000,000
Felt	Teton River	Fall River Electric Co-Op	7.45	26,500
Gem State	Snake River	City of Idaho Falls	23.4	125,000
Grace	Bear River	PacifiCorp	33	160,000
Hazelton A&B	Northside Canal	Northside Canal Company	16.2	55,000
Hells Canyon	Snake River	Idaho Power Company	392.0	1,200,000
Horseshoe Bend	Payette River	LB Industries	9.6	59,200
Island Park	Henrys Fork	Fall River Electric Co-Op	6.5	11,800
Low Line	Low Line Canal	Twin Falls Canal Company	8	46,800
Lower Hydro	Snake River	City of Idaho Falls	11.0	69,270
Lower Salmon	Snake River	Idaho Power Company	60.0	270,000
Lucky Peak	Boise River	Boise Project Board of Control	101.25	282,000
Magic Dam	Big Wood	J.R. Simplot Company	9.0	31,200
Malad	Malad River	Idaho Power Company	21.7	180,000
Marysville	Falls River	Marysville Hydro Partners	9.1	51,500
Milner	Snake River	Ida West-Northside Canal Co-Twin Falls Canal Co	50.0	180,000
Minidoka	Snake River	Federal government	12.4	94,000
Oneida	Bear River	PacifiCorp	30.0	73,000
Oxbow	Snake River	Idaho Power Company	190.0	600,000
Palisades	Snake River	Federal government	176.0	610,000
Post Falls	Spokane River	Washington Water Power	15.0	85,000
Shoshone Falls	Snake River	Idaho Power Company	12.5	102,000
Smith Creek	Smith Creek	Smith Creek Hydropower	37.8	85,500
Soda	Bear River	PacifiCorp	14.0	36,000
Swan Falls	Snake River	Idaho Power Company	9.47	77,000

Power Plant	Stream	Owner	Installed Capacity (MW)	Average Annual Generation (MWH)
Thousand Springs	Springs	Idaho Power Company	8.8	61,500
Twin Falls	Snake River	Idaho Power Company	51.9	275,000
Upper Hydro	Snake River	City of Idaho Falls	8.0	50,328
Upper Salmon	Snake River	Idaho Power Company	34.5	312,700
Wilson Lake	Northside Canal	Northside Canal Company	6.3	27,500

Installed capacity increased in 1995; figure represents potential generation
Sources: Idaho Department of Water Resources - Energy Division, 1994, Idaho Department of Water Resources, 1996.

Falls, Bonners Ferry, Preston, Hailey, and Soda Springs. Some municipalities use their hydropower facilities to supply their citizens with electricity, while others sell the electricity to the utility that services their area. The municipality owned hydropower facilities have a combined capacity of about 53 MW (IDWR, 1996).

The passage of the federal Public Utilities Regulatory Policies Act (PURPA) in 1978 mandated that all electric utilities purchase cost-effective independently produced power. This has led to the development of small hydroelectric projects in Idaho that contribute about 183 MW of capacity (IDWR, 1996).

Water used in hydropower generation is not consumptively used, after passing through a power generation plant, the water is available for downstream use. Consumptive water use upstream from a power generating facility may reduce the amount of water available for generation facilities at dams that previously lacked power generation. Continued instream flows are necessary to generate electricity at current levels.

FUTURE DEVELOPMENTS

Power generation facilities not owned by the federal government are regulated by the Federal Energy Regulatory Commission (FERC). Within the next ten years many hydroelectric projects in Idaho will be undergoing the FERC re-licencing process. The re licencing process allows for public and agency comment and has the potential to change the way that many of the facilities are operated.

A large amount of new hydropower capacity development will come from capacity upgrades at existing facilities. Capacity upgrades result from improved turbine and/or generator efficiencies that make better use of the flowing water than the old components. Another trend in recent years has been to construct hydropower hydropower facilities. It is not feasible to install power facilities at all dams, however. In the case of many dams, water releases are constrained by irrigation demands and have the potential to produce electricity only for short periods of time during the irrigation season.

Another energy trend that will affect future hydropower development is the production of electricity by natural gas fired combined-cycle turbines. Because of the "economies of scale," the natural gas turbines can produce electricity at a cost that currently rivals hydropower. Natural gas turbine generation is subject to the variability in the price of natural gas, which will likely affect production costs in the future.

Utility deregulation may have a significant effect on electrical power generation. FERC orders have allowed for bulk power users (such as manufacturing facilities) to purchase power from any willing supplier and require local utilities to transmit the power over their line. Deregulation would allow for "retail wheeling" if states choose to implement it. This would allow power purchasers at any level to buy power from whomever they choose. If fully implemented, deregulation will likely have an overall "equalizing" effect on power costs across the country, lowering power costs in high rate areas and raising power costs in low rate areas. This could result in higher electrical energy costs for Idaho.

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U.S. Army Corps of Engineers, 1996. Pacific Northwest Hydropower Database and Analysis System.

Navigation

Idaho has two areas of significant commercial navigation: the lower St. Joe River and Coeur d'Alene Lake, and the Port of Lewiston. Sight-seeing boats cruise Coeur d'Alene Lake and the lower St. Joe, and logs are towed to mill on the lower river and across the lake. From the Port of Lewiston, barge navigation to and from Portland, Oregon and coastal points is possible. The Port of Lewiston handles about two million tons of goods annually.

Geothermal Water Use

Geothermal energy has been used in Idaho since human occupation. Uses range from power generation to catfish farming. Geothermal energy has been used for space heating in Boise since 1893. Irrigation has been a long-standing use of thermal water in the state, although it must be cooled before being applied to crops. Greenhouse operations using geothermal energy are located at Boise, Weiser, Grand View, Bliss, the Hagerman Valley, the Raft River valley, and on the South Fork Payette River. Aquaculture operations tap geothermal waters to raise warm water fish and reptiles. Stock watering in winter is another beneficial use, and hot spring resorts are numerous in Idaho.

Present geothermal water use in Idaho is summarized in Table 14. Potential uses for geothermal water in the state are many and varied. The greatest potential, as far as present knowledge of the resource in Idaho is concerned, is for space heating and greenhouses. Space heating is the most common geothermal development in the state. Aquaculture uses the greatest amount of geothermal water.

Table 14. Estimated Geothermal Water Use in Idaho, 1995.

Use	Developments	Est. Annual Use
Space Heating	300	8,600 AF
Greenhouse	10	6,200 AF
Resort/Devel. Recreation	38	14,200 AF
Aquaculture	25	40,000 AF
Stock Water	13	230 AF

Source: Idaho Department of Water Resources, 1996. Water Right database and Adjudication claim database.

Fish and Wildlife

Idaho's fish and wildlife attributes are well known; hunters, fishermen, wildlife watchers and photographers come from all over the world to take advantage of the state's natural wealth. Rivers and streams and their associated riparian communities are the home, whether permanent or temporary, for the majority of Idaho's fish and wildlife.

Populations of 83 different species of fish occur throughout almost 100,000 miles of rivers and streams and 464,000 acres of lakes and reservoirs in Idaho (Idaho Department of Fish and Game, 1995). The upper portions of most watersheds in Idaho are classified as *wild trout* habitat based on the natural reproduction potential of streams with good to excellent trout habitat.

Many of Idaho's aquatic and riparian species' habitats have deteriorated from their original natural state. Deterioration and loss of habitat are often the result of development. Agricultural development has reduced the forage base for many species, eliminated wintering grounds for big game, displaced species like sage grouse, eliminated raptor habitats in the vicinity of the Snake River Birds of Prey Natural Area, and contributed to spring flow decline in Bruneau snail

habitat. Urban development has displaced riparian habitat and winter ranges along the Boise River. Water withdrawal for domestic, commercial, municipal, and industrial use has impacted Boise Valley ground water levels which in turn may ultimately threaten instream flows for fish and wildlife in the Boise River. Governor Batt's *Bull Trout Conservation Plan* (June 24, 1996) maintains that threats to bull trout persistence are linked to habitat modifications caused by timber harvest, road building, grazing, mining, dams, hydroelectric development, and irrigation diversions.

Idaho does have several aquatic, riparian, or wetland species that have stable or expanding, but sometimes localized, native populations, including the cutthroat trout, Canada goose, river otter, moose, and bald eagle. In 1993, more than 60 pairs of bald eagles nested in Idaho. About 700 individuals wintered on the large Panhandle lakes, and the Clearwater, Kootenai, and Snake river systems, up significantly in the last few years (Idaho Department of Fish and Game, 1993). Non-native but popular species, such as the small-mouth bass and brook trout, have been successful either because new habitats have been created or native species have been displaced. Future trends for Idaho's wildlife will depend on the solutions to declining populations and habitat loss.

The Idaho Department of Fish and Game (IDFG) is charged with the preservation and protection of all wildlife in the state (Idaho Code 36-103). The department maintains lists of threatened or endangered plants and wildlife, protected nongame species, and species of special concern. IDFG also provides consultation to land management agencies and private landowners on habitat protection and improvement.

Twenty fish species have been identified by the Idaho Department of Fish and Game in their Fisheries Management Plan 1996-2000, as Species of Special Concern. These are native species or subspecies, which are either low in number, limited in distribution, or have suffered significant reductions due to habitat losses (Table 15). Fifteen priority terrestrial Species of Special Concern have also been identified including three species of amphibians, nine birds, and three mammals, eight of which are associated with aquatic, riparian, or wetland habitats (Table 16).

Table 15. Fish Species or Subspecies of Special Concern.

Snake River white sturgeon *(Acipenser transmontanus)*
Burbot *(Oncorhynchus mykiss gairdneri)*
Bonneville cutthroat trout *(Oncorhynchus clarki utah)*
Westslope cutthroatt *(Oncorhynchus clarki lewisi)*
Yellowstone cutthroat *(Oncorhynchus clarki bouvieri)*
Bear Lake cutthroat *(Oncorhynchus clarki ssp.)*
Fine-spotted cutthroat *(Oncorhynchus clarki ssp.)*
Bull trout *(Salvelinus confluentus)*
Bear Lake whitefish *(Prosopium abyssicola)*
Bonneville whitefish *(Prosopium spilonotus)*
Bonneville cisco *(Prosopium gemmiferum)*
Bear Lake sculpin *(Cottus extensus)*
Shoshone sculpin *(Cottus greenei)*
Wood River sculpin *(Cottus leiopomus)*
Leatherside chub *(Gila copei)*
Sand roller *(Percopsis transmontana)*
Pacific lamprey *(Lampetra tridentata)*

Source: Idaho Department of Fish and Game, 1995.

Table 16. Terrestrial Species of Special Concern in Idaho associated with aquatic, riparian, or wetland habitat.

Coeur d'Alene salamander *(Plethodon idahoensis)*
Spotted frog--south of Snake River (*Rana pretiosa*)
Northern leopard frog (*Rana pipiens*)
Common loon (*Gavia immer*)
American white pelican (*Pelecanus erythrorhynchos*)
Black tern (*Chlindonias niger*)
Trumpeter swan (*Cygnus buccinator*)
Harlequin duck (*Histrionicus histrionicus*)

Source: Idaho Department of Fish and Game, 1994.

The Endangered Species Act of 1973 as amended provides general responsibilities to the U.S. Departments of Interior and Commerce to implement a federal program to conserve species whose existence is threatened or endangered. The U.S. Department of Agriculture is given specific authorities relating to plants. Agencies with the most visibility in Idaho are the U.S. Fish and Wildlife Service and the National Marine Fisheries Service. Of the 17 species in the state of Idaho that are currently federally-listed as threatened or endangered, 12 are associated with aquatic, riparian or wetland habitats (Table 17).

Table 17. Federal Threatened and Endangered Species in Idaho associated with aquatic, riparian, or wetland habitat.

Bald Eagle (*Haliaeetus leucocephalus*)
Whooping Crane (*Gus americana*)
Sockeye Salmon (*Oncorhynchus nerka*)
Chinook Salmon (*Oncorhynchus tschawytscha*)
Kootenai River white Sturgeon (*Acipenser transmontanus*)
Valvata Snail (*Valvata utahensis*)
Bliss Rapids Snail (undescribed species)
Bruneau Hot Springs Snail (*Pyrgulopsis bruneauensis*)
Idaho Springsnail (*Pyrgulopsis idahoensis*)
Banbury Springs Limpet (*Lanx sp.*)
Snake River Physa Snail (*Physa natricina*)
Water Howellia (*Howellia aquatilis*)

The state has attempted to cooperate with federal efforts to protect and recover endangered or threatened species. Federal recovery requirements frequently have negative social and economic impacts or are in conflict with state law. Each federal listing has resulted in specific responses from the state.

Salmon - Snake River spring/summer chinook, fall chinook, and Snake River sockeye are all listed as endangered species. The state has pledged to support continued data collection and analysis. There is a clear need to better identify: (1) the best out-migration route for juveniles (i.e. in-river or barging), (2) the quality and availability of spawning habitat, (3) the impact of hatchery supplementation, and (4) the degree of ocean survival for salmon.

One proposed method to lessen the impact of dams and reservoirs on outward migrating juveniles is to increase water velocity by flow augmentation. Idaho does not support this practice as a long-term solution. The Idaho Legislature in 1996 passed a joint resolution opposing the use of Idaho water for flow augmentation. The Legislature has agreed to not oppose the use of up to 427,000 acre-feet from the Snake River above Brownlee Reservoir through 1999 (Idaho Code 42-1763B). The Governor has implemented a procedure which structures Idaho's recovery efforts on a yearly basis depending on water availability rather than subscribing to a rigid policy. The National Marine Fisheries Service has developed a recovery plan for Snake River Salmon and has issued a biological opinion governing operation of the Federal Columbia River Power System. The biological opinion specifies several studies to be completed in or prior to 1999. Recovery efforts and operation of the federal hydropower system are likely to change starting in the year 2000.

Bruneau Snail - Prior to listing as endangered, the Bruneau Snail was a little known species occupying a very small area in Owyhee County. At the time of listing it occurred in a narrow band of thermal springs and seeps along a 5.28-mile stretch of the Bruneau River and a tributary, Hot Creek. One of the largest springs had ceased to flow year round thereby eliminating a portion of the habitat and population. There is a general concern that continued lowering of the water table in the area will reduce the habitat even further. The aquifer was closed to all new consumptive uses except domestic and stockwater in 1992. The regional water table has continued to decline. Some of the decline may be attributed to the precipitation patterns of the late 1980's and early 1990's. It is assumed that the aquifer will stabilize at some level tied to the approved pumping amounts with fluctuations related to precipitation cycles.

Idaho law does not provide for protection of the snail. Therefore there is no opportunity to take express action for the protection or restoration of the snail under state law. As a federally listed species, the federal government has several options to maintain the snail population including the purchase of land and water rights.

Sturgeon - Isolated populations of white sturgeon exist in the Snake and Kootenai rivers in Idaho. The Kootenai River population of white sturgeon was listed as a federal endangered species on September 6, 1994.

The Kootenai River sturgeon range 168 miles from Cora Linn Dam at the outlet of Kootenay Lake, British Columbia to Kootenai Falls which is located 31 miles downstream from Libby Dam in Montana. This population is believed to have been isolated for approximately 10,000 years. Changes in stream habitat and water quality are likely having an impact on the population. The change in the stream flow pattern caused by operations at Libby Dam since its construction in 1972 is believed to have a direct impact on spawning and egg survival. Efforts are underway to modify the timing and size of releases from Libby Dam to provide a more suitable environment for natural reproduction. The Kootenai Tribe has a hatchery

supplementation program underway that will help maintain the population in the short term.

Snake River Mollusks - On December 14, 1992 five aquatic snails from the Snake River were listed as threatened or endangered species according to provisions of the federal Endangered Species Act. The Idaho Spring snail, the Utah valvata snail, the Snake River physa snail and the Banbury Springs lanx are listed as endangered, while the Bliss Rapids snail is considered to be threatened.

The U.S. Fish and Wildlife Service's recovery plan for the species takes an ecosystem approach to their habitat. Individual ranges when aggregated cover the river reach from American Falls Dam downstream to the C.J. Strike Reservoir, a distance of approximately 200 miles. The recovery plan is keyed to improving water quality, maintaining or increasing spring flows in the reach, and establishing minimum flows in the river at levels necessary to restore and maintain essential aquatic habitats. The expectation is that these actions will improve habitat for all riverine species.

Bull Trout - While not listed as a threatened or endangered species, bull trout are a candidate for listing. The U.S. Fish and Wildlife Service has stated that it warrants listing, but that the agency has other higher priority species to deal with. Once considered a nuisance fish because of its piscivorous feeding habits, the bull trout was widely distributed in the Pacific Northwest. Effective efforts at the state level to maintain and restore bull trout populations in Idaho, Montana, Washington, and Oregon might forestall federal listing.

The Governor of Idaho has formulated a plan for the state that seeks to maintain and where possible improve bull trout habitat. The Governor's plan takes advantage of existing authorities to establish land-use practices at the watershed level. Watershed Advisory Groups consisting of local residents are empowered to develop plans which hopefully will address the needs of the trout and the local populace.

The future for Species of Special Concern and federally-listed threatened and endangered aquatic and riparian species, including fish, amphibians, and molluscs, is uncertain. The Governor's *Bull Trout Conservation Plan* calls for additional water in streams for fish. Although a new concept, the Idaho Soil Conservation Commission's *Model Watershed Plan: Lemhi, Pahsimeroi, and East Fork of the Salmon River* is an excellent model for the future, giving attention to the total watershed, as well as riparian habitats and instream flows (Idaho Soil Conservation Commission, 1995). Another approach is through the Idaho Water Resource Board's individual basin planning process, which provides the opportunity to protect streams through the state river protection system, designating minimum stream flows, and offering specific recommendations for stream and riparian rehabilitation. The emphasis in all of these approaches is on the watershed or ecosystem rather than a single at-risk species.

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Recreation

The Idaho Department of Commerce estimates that recreation and tourism contribute $2 billion to Idaho's economy, serving 23 million travelers. An estimated 3.7 million nonresident motor vehicle parties visited Idaho for pleasure in 1993 and spent approximately $1.3 billion (Hunt et al, 1994). Residents recreating in the state expended another $972 million (Parrish et al., 1996).

Much of the recreation activity in the state is associated with water, occurring on or along waterways. People are attracted to streams, rivers, lakes and reservoirs when seeking recreation opportunities. Additionally, in a state covered with rugged, mountainous terrain, river canyons are often the transportation corridor. Roads, trails, campgrounds, and picnic areas are usually located along watercourses.

Idaho's water resources are an important resource base for the outfitting and guiding industry which earned more than $22 million in gross revenues for 1993 (Leidner and Krumpe, 1995). The combined revenue for boating and fishing trips comprised almost $14 million. Fishing comprised almost $3 million of the revenues, serving 54,246 clients. The remaining $11 million was generated from serving 95,073 boating clients. Fifty-seven percent of the clients took float trips and 43 percent took power boat trips. The boating segment of the industry has seen a steady increase in clients.

Studies conducted in 1993 and 1994 surveyed recreation use patterns and activities for resident and non-resident travelers while in Idaho. Water-based recreation comprised about 16 percent of outdoor recreation activity for residents and 21 percent for non-residents. Figures 36-38 summarize outdoor recreation survey data for residents and non-residents.

FISHING

Fishing resources in Idaho are significant, including more than 26,000 miles of fishable streams and 202 major lowland lakes and reservoirs (IDFG, 1995). Over 400,000 fishing licenses were purchased in 1995. Forty percent were nonresident licenses (Kochert, 1996).

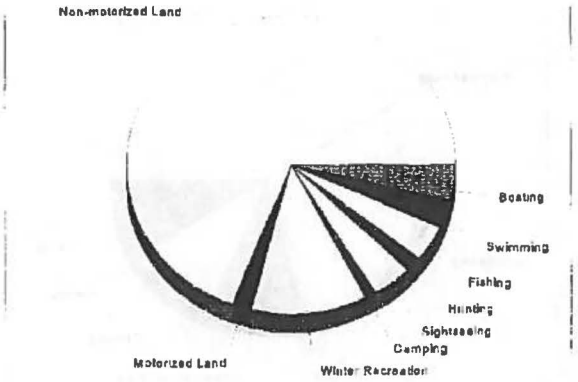

Figure 36. Idaho Resident Participation in Outdoor Recreation Activities within their communities. Non-motorized land recreation activities include biking, picnicking, hiking, horseback riding, backpacking, berry picking, nature observation and urban activities such as walking. Motorized land recreation activities include off-road vehicle use. Source: Parrish et al., 1996.

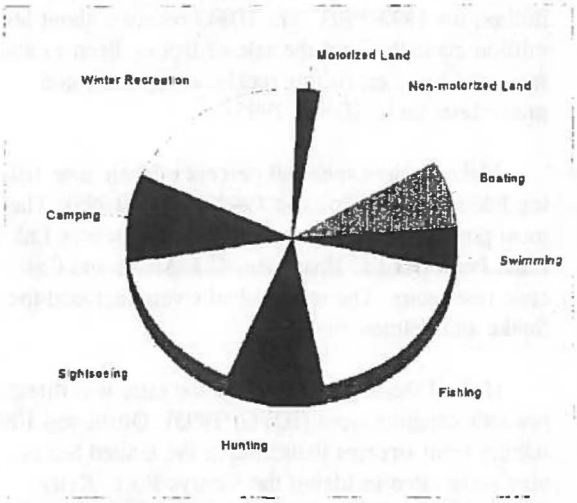

Figure 37. Idaho Resident Participation in Outdoor Recreation Activities outside their communities. Non-motorized land recreation activities include biking, picnicking, hiking, horseback riding, backpacking, berry picking, nature observation and urban activities such as walking. Motorized land recreation activities include off-road vehicle use. Source: Parrish et al., 1996.

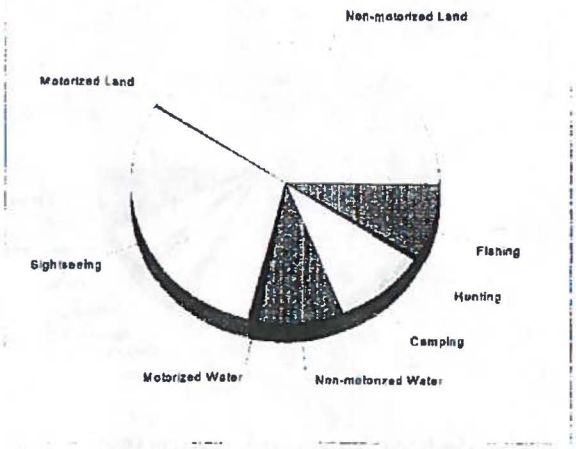

Figure 38. Non-resident Participation in Outdoor Recreation Activities. Non-motorized water activities include float boating, sailing, tubing, canoeing, kayaking, and rafting. Motorized water activities consist of motor boating and water skiing. Source: Hunt et. al., 1994.

Fishing license sales have increased about 8 percent over the past five years, but the ratio of resident to nonresident licenses has remained fairly constant (Idaho Statistical Abstract, 1996). Sport fishing contributed $400 million to Idaho's economy in 1995. The steelhead fishery alone generated $52 to $98 million for 1992-1993. The IDFG receives about $6.6 million annually from the sale of fishing licenses and fees, and taxes on fishing tackle, equipment, and motor boat fuels (IDFG, 1995).

Idaho anglers spent 60 percent of their time fishing lakes and reservoirs in 1994 (IDFG, 1995). The most popular lakes and reservoirs were Henrys Lake, Lake Pend Oreille, Brownlee, C.J. Strike and Cascade reservoirs. The most fished rivers included the Snake and Salmon rivers.

Half of the angling effort in the state was directed towards catching trout (IDFG, 1995). Of the top 100 fishing trout streams identified in the United States, nine were cited in Idaho: the Henrys Fork, Kelly Creek, Lemhi Creek, Lochsa River, Middle Fork of the Salmon, Silver Creek, South Fork Boise River, South Fork Snake River, and Wood River (Pero and Yuskavitch, 1989).

Boating and fishing access in the state was quantified from a 1995 inventory of recreation facilities managed by federal, state, local and private entities. Table 18 lists the number for each travel region. The Idaho Department of Parks and Recreation has determined 405 developed boating facilities are accessible to motorized boats (Brandt, 1996).

Table 18. Recreation Facilities for Water-Based Recreation Activities by Region

	Boat Ramps	Boat Docks	Fishing Access
Panhandle	816	1850	95
Clearwater	102	105	91
SW Idaho	649	415	24
So. Central	52	64	165
SE Idaho	107	183	11
Upper Snake	39	53	70
Upper Salmon	107	15	48
TOTAL	1872	2685	504

Source: Sanyal, 1996.

BOATING

Boating opportunities are numerous in Idaho. The state has more than 650,000 surface acres of boatable waters encompassing rivers, lakes and reservoirs. Table 19 summarizes surface acres for each region in the state. Idaho has the largest number of registered boats per capita in the West. Over 80,000 registered motor boats and sailboats used Idaho waters in 1995 (Hiatt, 1996). This is a 25 percent increase from 1990. The most popular boating areas, based on county designations by registered boaters, are Lake Coeur d'Alene, Pend Oreille, Priest Lake, Lucky Peak Reservoir, and Cascade Reservoir. Residents of the Idaho Panhandle are more likely to boat and swim in lakes than residents of any other region (Parrish, et al., 1996).

More than 3100 miles of whitewater occurs in the state on over 67 rivers and streams. Opportunities for all skill levels are available. Many of these rivers attract people from around the country and world. Popular whitewater runs include several reaches of the Salmon River, Payette and Snake River. Other whitewater opportunities are pursued on the Owyhee,

Bruneau, Jarbidge, Lochsa, Selway, Boise, Saint Joe, Teton, Fall, and Clearwater rivers and tributaries.

Table 19. Boatable Surface Acres in Idaho by Region.

	Surface Acres	Percent of State Total
Panhandle	167,856	25.7 %
Clearwater	61,004	9.4
SW Idaho	135,520	20.8
So. Central	29,635	4.6
SE Idaho	134,355	20.7
Upper Snake	80,075	12.2
Upper Salmon	42,812	6.6
TOTAL	651,257	100.0

Source: Murphey, 1996.

WATER MANAGEMENT

Recreation activities are affected by water management. Direct effects include the quality of boating and fishing, and the perceived scenic quality of the river for shoreline recreational use (Brown et al., 1991; Brown and Daniel, 1991). Instream flows determine boating craft size and type, required boating skills, length of trip, and safety of floating a river reach. For fishing, flows determine angler carrying capacity, habitat conditions and fishery quality (Brown, et al., 1991). Picnicking, camping, sightseeing and hiking are some of the recreation activities indirectly affected by changes in scenic quality along river corridors.

Water management can affect boating activities on reservoirs and lakes. Many are managed for irrigation, flood control and energy production, resulting in fluctuating lake levels. Drawdowns can restrict access to the reservoir when boat ramps become unusable at certain lake levels. Scenic quality effects are also experienced when bands of bare soils are exposed around the perimeter of the reservoir.

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Protection Programs

MINIMUM STREAM FLOW

A minimum stream flow, also called an instream flow, is a minimum flow necessary to preserve stream or lake values. Water is not diverted and used, as is the case with most other water rights in Idaho. Instead, the water remains in a given reach of a river channel or in a lake to protect fish and wildlife habitat, aquatic life or the water quality of the stream, or for navigation, transportation, recreation, or aesthetic beauty.

As early as 1925, the Idaho Legislature declared that the preservation of water in certain lakes for scenic beauty, health, and recreation purposes was a beneficial use of water. A statutory appropriation of water in Payette Lake, Lake Coeur d'Alene, Pend Oreille and Priest Lake, was made in trust for the people of the State of Idaho. The water right was issued to the Governor [Idaho Code 67-4301 to 67-4312].

Instream appropriations did not become an issue again in Idaho until the 1970s. In 1976 the Idaho Water Resource Board's first State Water Plan called for a statewide instream flow program. The Idaho Legislature adopted the State Water Plan in 1978 which established minimum flows on the Snake River at Murphy and Weiser. The Legislature also authorized the Idaho Water Resource Board to hold minimum stream flow water rights in trust for the citizens of the State of Idaho.

The State of Idaho holds 76 minimum stream flow water rights on stream segments, springs, or lakes, totaling 445 stream miles and over 4 million acre-feet in lakes. An additional 26 applications for minimum stream flow water rights have yet to be approved. Figure 39 displays the current distribution of minimum stream flow appropriations in Idaho. Minimum stream flow appropriations are also listed in Table 20.

If a pattern or relationship is to be discerned from the distribution of instream flow water rights within Idaho, it is a close association with popular recreation areas, and concern for the Snake River canyon springs below Milner Dam. The appropriations for springs in the Thousand Spring area are particularly conspicuous along the Snake River in south-central Idaho. Much of the outflow from the Snake Plain aquifer occurs in this area.

STATE PROTECTED RIVERS

Legislation in 1988 provided for the development of a "comprehensive state water plan" based upon river basins or other geographic considerations. Each basin or waterway plan becomes a component of the State Water Plan. The 1988 legislation also authorized the Water Resource Board to preserve highly-valued waterways as state protected rivers. River segments with outstanding fish and wildlife, recreational, aesthetic or geologic value, as identified in components of the Comprehensive State Water Plan, may be designated for state protection.

If the Board decides that the values of preserving an outstanding waterway in its existing condition outweigh the values of continued development, it can, subject to legislative approval, designate that waterway either a Natural or a Recreational River to protect existing resources and use. Designation may prohibit (a) construction or expansion of dams or impoundments; (b) construction of hydropower projects; (c) construction of water diversion works; (d) dredge or placer mining; (e) alterations of the stream bed; and (f) mineral or sand and gravel extraction within the stream bed.

Over 1,700 miles of Idaho's rivers are protected by the State (Table 21). Figure 40 shows designated stream segments in Idaho.

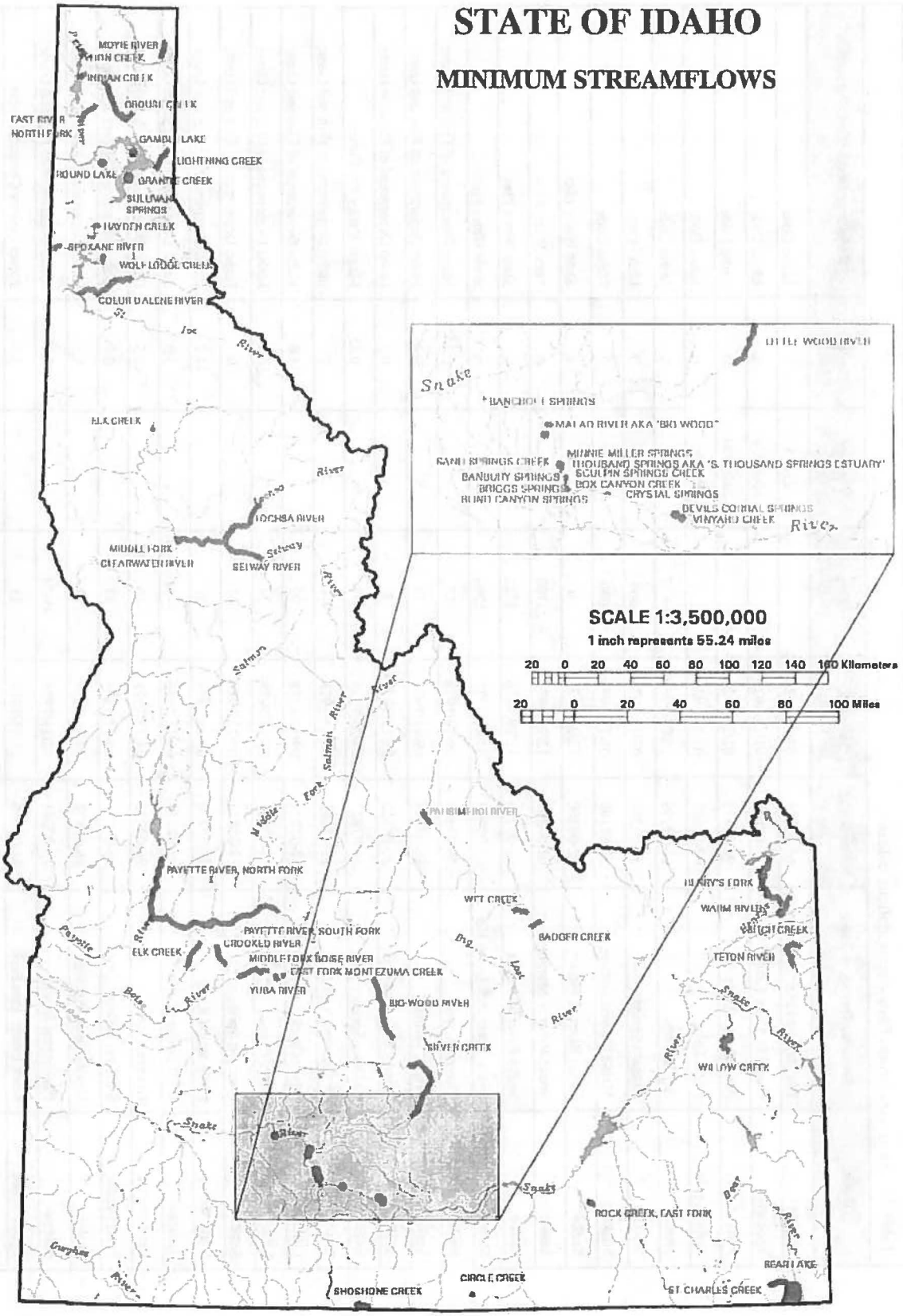

Figure 39. State of Idaho Minimum Stream Flow Appropriations

Table 20. Minimum Stream Flow Appropriations in Idaho.

Basin	Stream, Spring, or Lake	Water Right No.	Priority Date	Flow (cfs)	Volume (acre-feet)	Distance (miles)	Requestor or Authorizing Action
Payette	Big Payette Lake	65-02333	03/05/1925		25495	0	Idaho Code
Spokane	Coeur D Alene Lake	95-02067	01/24/1927		1000000	0	Idaho Code
Pend Oreille	Pend Oreille Lake	96-02118	01/24/1927		2400000	0	Idaho Code
Pend Oreille	Priest Lake	97-02020	01/24/1927		800000	0	Idaho Code
Snake	Big Springs	36-07199	12/07/1971	66.57		0	Idaho Code
Snake	Niagara Springs	36-07200	07/12/1971	264		0	Idaho Code
Snake	Malad Canyon Springs	37-07108	07/12/1971	900		0	Idaho Code
Snake	Snake River at Milner	02-00200	12/29/1976	0		0	State Water Plan
Snake	Snake River at Murphy	02-00201	12/29/1976	3300		0	State Water Plan
Snake	Snake River at Weiser	03-00006	12/29/1976	4750		0	State Water Plan
Snake	Snake River at Johnson Bar	03-00007	07/01/1978	5000		0	State Water Plan
Snake	Vinyard Creek	36-07818	09/13/1978	17		0.25	Idaho Department of Fish and Game
Snake	Briggs Springs	36-07819	09/13/1978	30		0.25	Idaho Department of Fish and Game
Snake	Blind Canyon Springs	36-07820	09/13/1978	8		0.5	Idaho Department of Fish and Game
Snake	Banbury Springs	36-07822	09/13/1978	97		0.25	Magic Valley Fly Fishers
Bear	St. Charles Creek	11-07152	09/13/1978	9-17		7	Idaho Department of Fish and Game
Little Wood	Silver Creek	37-07727	09/13/1978	99		11.0	Idaho Department of Fish and Game
Little Wood	Silver Creek	37-07728	09/13/1978	74		10.0	Idaho Department of Fish and Game
Snake	Bancroft Springs	37-07734	09/13/1978	17		0.1	Idaho Department of Fish and Game
Little Wood	Little Wood River	37-07739	09/29/1978	39		14.0	Idaho Department of Fish and Game
Spokane	Wolf Lodge Creek	95-07874	09/13/1978	7-30		3.0	Idaho Department of Fish and Game
Pend Oreille	Granite Creek	96-07771	04/17/1979	10		0.5	Idaho Department of Fish and Game
Pend Oreille	Sullivan Springs	96-07772	04/17/1979	45		0.1	Idaho Department of Fish and Game
Snake	Devils Corral Springs	36-07872	09/21/1979	48		0.5	Idaho Department of Fish and Game
Salmon	Pahsimeroi River	73-07045	12/19/1979	45-74		7.0	Idaho Department of Fish and Game
Upper Snake	Rock Creek, East Fork	41-07046	01/16/1980	11		3.0	Power County Commissioners
Little Wood	Silver Creek	37-07849	08/26/1980	74		13.0	Idaho Department of Fish and Game

Table 20 Minimum Stream Flow Appropriations in Idaho

Basin	Stream, Spring, or Lake	Water Right No.	Priority Date	Flow (cfs)	Volume (acre-feet)	Distance (miles)	Requestor or Authorizing Action
Upper Snake	Henrys Fork	21-07282	06/19/1981	300-1000		24.0	Idaho Department of Parks & Recreation
Henrys Fork	Warm River	21-07283	06/19/1981	141		0.5	Idaho Department of Fish and Game
Henrys Fork	Teton River	22-07369	06/19/1981	106		9.0	Idaho Department of Fish and Game
Teton	Bitch Creek	22-07370	06/19/1981	28		7.5	Idaho Department of Fish and Game
Big Wood	Big Wood River	37-07919	06/19/1981	70		18.0	Idaho Department of Fish and Game
Snake	Malad River	37-07920	06/19/1981	39		1.0	Idaho Department of Fish and Game
Pend Oreille	Lightning Creek	96-07979	06/19/1981	49-84		8.0	Idaho Department of Fish and Game
Pend Oreille	Grouse Creek	96-07980	06/19/1981	14-85		5.0	Idaho Department of Fish and Game
Upper Snake	Rock Creek, East Fork	41-07074	09/12/1984	11		1.0	Idaho Water Resource Board
Henrys Fork	Warm River	21-07355	09/27/1984	141		8.0	Idaho Department of Fish and Game
Priest	Indian Creek	97-07274	04/26/1985	26		3.0	Idaho Department of Parks & Recreation
Priest	Lion Creek	97-07275	04/26/1985	22		2.0	Idaho Department of Parks & Recreation
Payette	Payette River and SF Payette	65-12733	04/26/1985	212-1350		54.0	Idaho Department of Parks & Recreation
Snake	Snake River at Murphy	02-00223	07/01/1985	600		0	State Water Plan - Swan Falls Agreement
Snake	Snake River at Murphy	02-00224	07/01/1985	2300		0	State Water Plan - Swan Falls Agreement
Snake at Lime Point	Snake River	03-00008	07/01/1985	13000		0	State Water Plan - Swan Falls Agreement
Big Wood	Big Wood River	37-08258	01/16/1986	150-200		9.0	Blaine County Planning & Zoning
Snake	Minnie Miller Springs	36-08307	03/19/1986	200-450		0.5	Idaho Department of Parks & Recreation
Snake	Crystal Springs	36-08330	07/27/1987	50		0.25	Idaho Department of Fish and Game
Snake	Box Canyon Creek	36-08337	10/16/1987	75-162		0.25	U.S. Bureau of Land Management
Salmon Falls	Shoshone Creek	47-08073	10/16/1987	5-7		10.0	Idaho Department of Fish and Game
Spokane	Hayden Creek	95-08560	10/16/1987	4-20		3.0	Idaho Department of Fish and Game
Pend Oreille	Round Lake	96-08503	10/16/1987		EL. 2125.09	0	Idaho Department of Parks & Recreation
Big Wood	Big Wood River	37-08307	10/26/1987	119		0	Idaho Water Resource Board
Payette	Payette River, North Fork	65-12822	12/17/1987	106-1400		10.0	Idaho Department of Parks & Recreation
Payette	Payette River, North Fork	65-12839	04/15/1988	100-294		0	Idaho Water Resource Board
Payette	Payette River, North Fork	65-12840	04/05/1988	1300-1800		17.0	Idaho Department of Parks & Recreation

Table 20. Minimum Stream Flow Appropriations in Idaho.

Basin	Stream, Spring, or Lake	Water Right No.	Priority Date	Flow (cfs)	Volume (acre-feet)	Distance (miles)	Requestor or Authorizing Action
Snake	Crystal Springs	36-08374	07/01/1988	25		0.25	Idaho Department of Parks & Recreation
Raft	Circle Creek	43-07295	07/01/1988	0.5-1.5		6.5	Idaho Department of Parks & Recreation
Clearwater	Elk Creek	83-07099	02/10/1989	40-120		1.5	Idaho Department of Parks & Recreation
Payette	Payette River, North Fork	65-13059	05/16/1989	400		0	Idaho Department of Fish and Game
Payette	Payette River, South Fork	65-13060	05/16/1989	700-763		0	Idaho Water Resource Board
Snake	S. Thousand Springs Estuary	36-08556	08/03/1990	500		0.5	Idaho Department of Parks & Recreation
Snake	Sculpin Springs Creek	36-08557	08/03/1990	33		0.5	Idaho Department of Parks & Recreation
Snake	Sand Springs Creek	36-08558	08/03/1990	34		0.4	Idaho Department of Parks & Recreation
Priest	East River, North Fork	97-07308	11/09/1990	18-70		9.25	Idaho Water Resource Board
Snake	Crystal Springs	36-08600	03/22/1991	59		0	Idaho Department of Parks & Recreation
Upper Snake	Willow Creek	25-07597	06/24/1991	22-50		18.0	Idaho Department of Fish and Game
Little Lost	Wet Creek	33-07207	10/03/1991	4-15		6.5	Idaho Department of Fish and Game
Little Lost	Badger Creek	33-07206	05/14/1992	5.5-3.0		5.25	Idaho Department of Fish and Game
Spokane	Coeur d'Alene River	94-07341	06/15/1992	413-1018		35.0	Idaho Water Resource Board
Spokane	Spokane River	95-08780	06/15/1992	951-2495		5.0	Idaho Water Resource Board
Pend Oreille	Pack River	96-08717	06/15/1992	54-129		22.0	Idaho Water Resource Board
Kootenai	Moyie River	98-07704	06/15/1992	149-354		6.9	Idaho Water Resource Board
Clearwater	Selway River	81-07160	07/30/1992	760-1500		19.0	Idaho Water Resource Board
Clearwater	Lochsa River	81-07161	07/30/1992	563-1140		24.0	Idaho Water Resource Board
Clearwater	Clearwater River, Middle Fork	81-07162	07/30/1992	1323-2640		23.0	Idaho Water Resource Board
Bear	Bear Lake	11-07406	05/13/1993		EL 5902.0	0	Bear Lake County Commissioners
Pend Oreille	Gamble Lake	96-08764	06/24/1993		EL 2081.8	0	U.S. Bureau of Land Management

Table 21. Streams in Idaho Designated for State Protection, 1996.

Basin	Reach	Designation	Length in Miles	Date Designated
Priest	Upper Priest River	Natural	19.6	1990
	Upper Priest Lake	Natural	5.9	1990
	Hughes Fork	Recreational	14.1	1990
	Rock Creek	Recreational	3.8	1990
	Lime Creek	Recreational	3.9	1990
	Cedar Creek	Recreational	4.2	1990
	Trapper Creek	Recreational	7.9	1990
	Granite Creek	Recreational	11.1	1990
	Priest River	Recreational	43.7	1990
	Lion Creek	Recreational	11.1	1995
	Two-Mouth Creek	Recreational	10.6	1995
	Indian Creek	Recreational	10.5	1995
Payette	South Fork	Recreational	57.5	1991
	North Fork	Recreational	27.3	1991
	Main	Recreational	14.8	1991
Boise	South Fork	Natural	10.0	1990
		Recreational	18.0	1990
	Lime Creek Drainage	Natural	104.0	1990
		Recreational	128.0	1990
	Big Smoky Creek Drainage	Natural	125.0	1990
	Boise River	Recreational	13.2	1992
	Sheep Creek	Natural	17.8	1992
	Middle Fork Boise River	Recreational	14.5	1992
	Roaring River	Recreational	5.6	1992
		Natural	17.0	1992
	North Fork Boise River	Natural	37.7	1992
		Recreational	17.5	1992
	Crooked River	Recreational	10.1	1992
	Bear River	Recreational	30.0	1992
	Johnson Creek	Natural	7.9	1992
Henrys Fork	Targhee Creek	Natural	12.5	1992
	Henrys Fork	Recreational	41.0	1992
		Natural	17.0	1992
	Golden Lake	Recreational	4.0	1992
	Buffalo River	Recreational	1.0	1992
	Warm River	Natural	14.5	1992
	Robinson Creek	Natural	10.0	1992
		Recreational	4.0	1992
	Rock Creek	Recreational	9.0	1992
	Falls River	Natural	7.0	1992
		Recreational	11.0	1992
	Boone Creek	Natural	4.0	1992
	Conant Creek	Natural	6.0	1992
		Recreational	3.0	1992
	Teton River	Recreational	25.0	1992
	Teton Creek	Recreational	11.0	1992
	Fox Creek	Recreational	2.5	1992
	Badger Creek	Recreational	3.0	1992
	Bitch Creek	Natural	12.5	1992
		Recreational	2.0	1992

Table 21. Streams in Idaho Designated for State Protection, 1996. Cont.

Basin	Reach	Designation	Length in Miles	Date Designated
Snake River	Palisades Dam to Henrys Fk	Recreational	63.9	1996
	Milner to Murtaugh	Recreational	7.0	1993
	Murtaugh to Twin Falls	Natural	9.5	1993
	Twin Falls to Hagerman	Recreational	35.0	1993
	Hagerman to King Hill	Recreational	20.0	1993
North Fork Clearwater	Isabella Creek	Natural	5.4	1996
		Recreational	3.1	1996
	Weitas Creek	Natural	27.7	1996
	Kelly Creek	Natural	31.6	1996
		Recreational	11.0	1996
	Cayuse Creek	Natural	34.9	1996
	Little North Fork	Natural	28.6	1996
		Recreational	11.2	1996
	North Fork Clearwater	Natural	15.0	1996
		Recreational	64.0	1996
	Reeds Creek	Recreational	13.5	1996
	Beaver Creek	Recreational	1.8	1996
	Elk Creek	Recreational	17.5	1996
South Fork Snake	Bear Creek Drainage	Natural	36.1	1996
		Recreational	16.4	1996
	Big Elk Creek	Natural	4.5	1996
		Recreational	0.4	1996
	Black Canyon	Recreational	9.1	1996
	Burns Creek Drainage	Natural	17.3	1996
		Recreational	0.6	1996
	Burns Creek (Reservoir)	Recreational	4.7	1996
	Cress Creek	Recreational	0.1	1996
	Fall Creek Drainage	Natural	13.1	1996
		Recreational	39.3	1996
	Fish Creek	Natural	5.2	1996
	Indian Creek (Reservoir)	Recreational	1.8	1996
	Indian Creek	Recreational	5.9	1996
	Little Elk Creek	Natural	3.5	1996
		Recreational	1.1	1996
	McCoy Creek Drainage	Recreational	62.9	1996
	Palisades Creek Drainage	Natural	29.7	1996
		Recreational	8.2	1996
	Pine Creek Drainage	Natural	2.8	1996
		Recreational	20.8	1996
	NFk Pine Creek Drainage	Natural	15.0	1996
		Recreational	8.1	1996
	West Fk Pine Creek Drainage	Natural	5.2	1996
		Recreational	0.8	1996
	Pritchard Creek	Recreational	6.5	1996
	Rainey Creek Drainage	Recreational	25.1	1996
	Sheep Creek	Recreational	5.4	1996
	Trout Creek	Recreational	4.6	1996
	Warm Springs	Recreational	0.2	1996
	Wolverine Creek	Recreational	3.4	1996

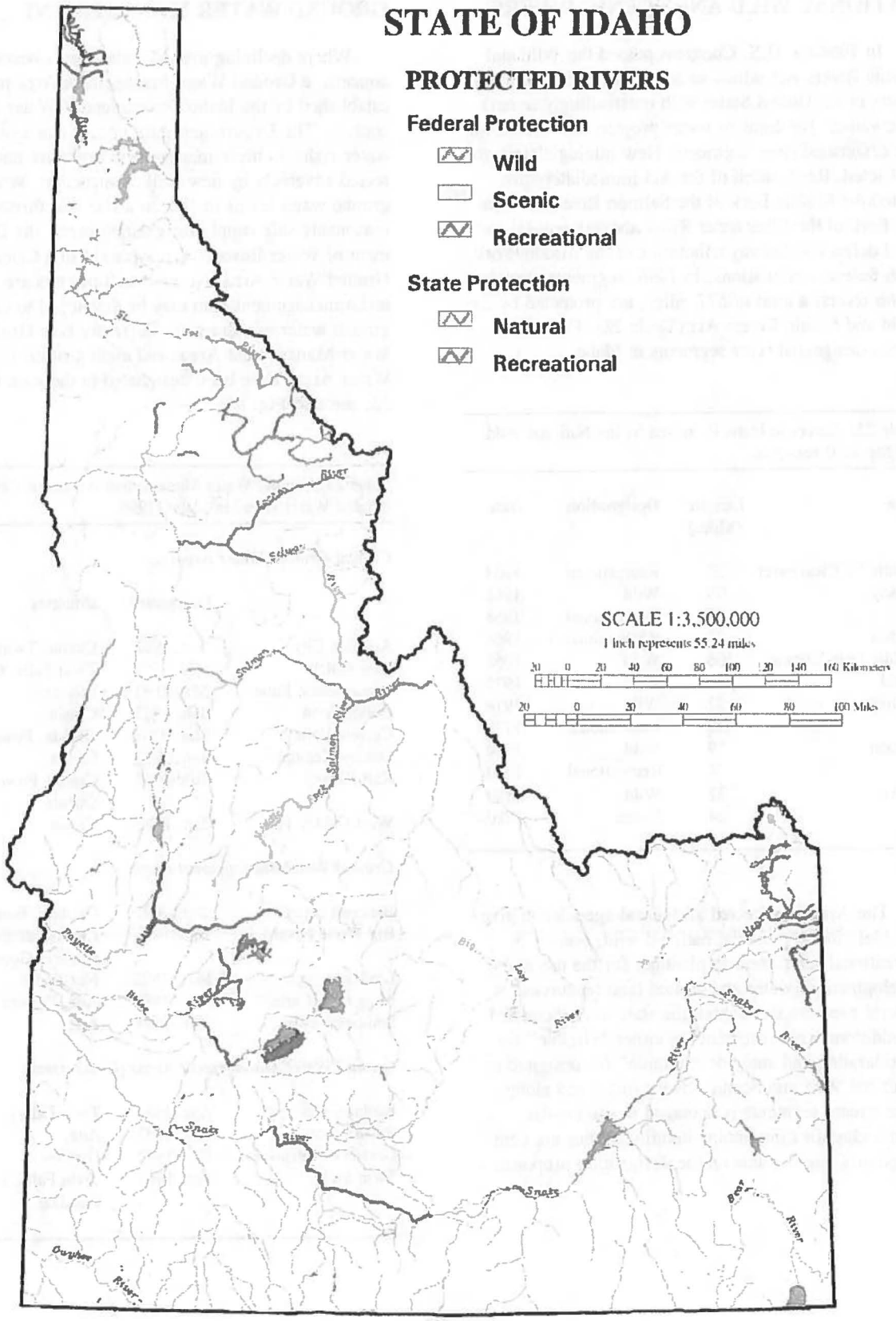

Figure 40. State of Idaho Protected Rivers

NATIONAL WILD AND SCENIC RIVERS

In 1968 the U.S. Congress passed the Wild and Scenic Rivers Act which seeks to protect free flowing rivers in the United States with outstandingly remarkable values. No dams or water projects can be built on the designated river segments. New mining claims are restricted. Ratification of the Act immediately protected the Middle Fork of the Salmon River, the Middle Fork of the Clearwater River above Kooskia, and the Lochsa and Selway tributaries of the Middle Fork with federal designations. In 1996, segments of eight Idaho rivers, a total of 577 miles, are protected by the Wild and Scenic Rivers Act (Table 22). Figure 40 shows designated river segments in Idaho.

Table 22. Rivers in Idaho Protected by the National Wild and Scenic Rivers Act.

River	Length (Miles)	Designation	Date
Middle Fk Clearwater	23	Recreational	1968
Selway	79	Wild	1968
	20	Recreational	1968
Lochsa	70	Recreational	1968
Middle Fork Salmon	106	Wild	1968
Rapid	24	Wild	1975
St. Joe	27	Wild	1978
	40	Recreational	1978
Salmon	79	Wild	1980
	16	Recreational	1980
Snake	32	Wild	1980
	24	Scenic	1980

The Act also directed all federal agencies to give consideration to potential national wild, scenic, or recreational river areas in planning for the use and development of water and related land resources. Federal agencies throughout the state have identified 75 additional river segments as either "eligible" for consideration and study or "suitable" for designation under the Wild and Scenic Rivers Act. Land along these stream segments is managed to protect the river's classification until suitability studies are completed or Congress acts on the designation proposal.

GROUND WATER MANAGEMENT

Where declining ground water levels become a concern, a Ground Water Management Area may be established by the Idaho Department of Water Resources. The Department must ensure that existing water rights in these management areas are not affected adversely by new well construction. Where ground water levels decline at a rate that threatens a reasonably safe supply for existing users, the Department of Water Resources may establish a Critical Ground Water Area. No new well permits are issued and a management plan may be developed to decrease ground water withdrawals. Currently nine Ground Water Management Areas and eight Critical Ground Water Areas have been designated in the state (Table 23; see also Fig. 41).

Table 23. Ground Water Management Areas and Critical Ground Water Areas in Idaho, 1996.

	Designated	Counties
Critical Ground Water Areas		
Artesian City	Jan. 1962	Cassia, Twin Falls
Blue Gulch	Dec. 1970	Twin Falls, Owyhee
Cinder Cone Butte	May 1981	Elmore
Cottonwood	Jan. 1962	Cassia
Curlew Valley	Mar. 1976	Oneida, Power
Oakley-Kenyon	Jan. 1962	Cassia
Raft River	July 1963	Cassia, Power, Oneida
West Oakley Fan	Jan. 1982	Cassia
Ground Water Management Areas		
Bancroft Lund	Oct. 1991	Caribou, Bannock
Big Wood River	June 1991	Camas, Blaine, Elmore, Gooding
Lindsay Creek	Mar. 1992	Nez Perce
Mountain Home	Nov. 1982	Ada, Elmore
Southeast Boise	Oct. 1994	Ada
Ground Water Management Areas (Geothermal)		
Banbury Hot Spgs	Apr. 1983	Twin Falls
Boise Front	June 1987	Ada
Grandview-Bruneau	Oct. 1982	Owyhee
Twin Falls	Jan. 1984	Twin Falls, Jerome, Gooding

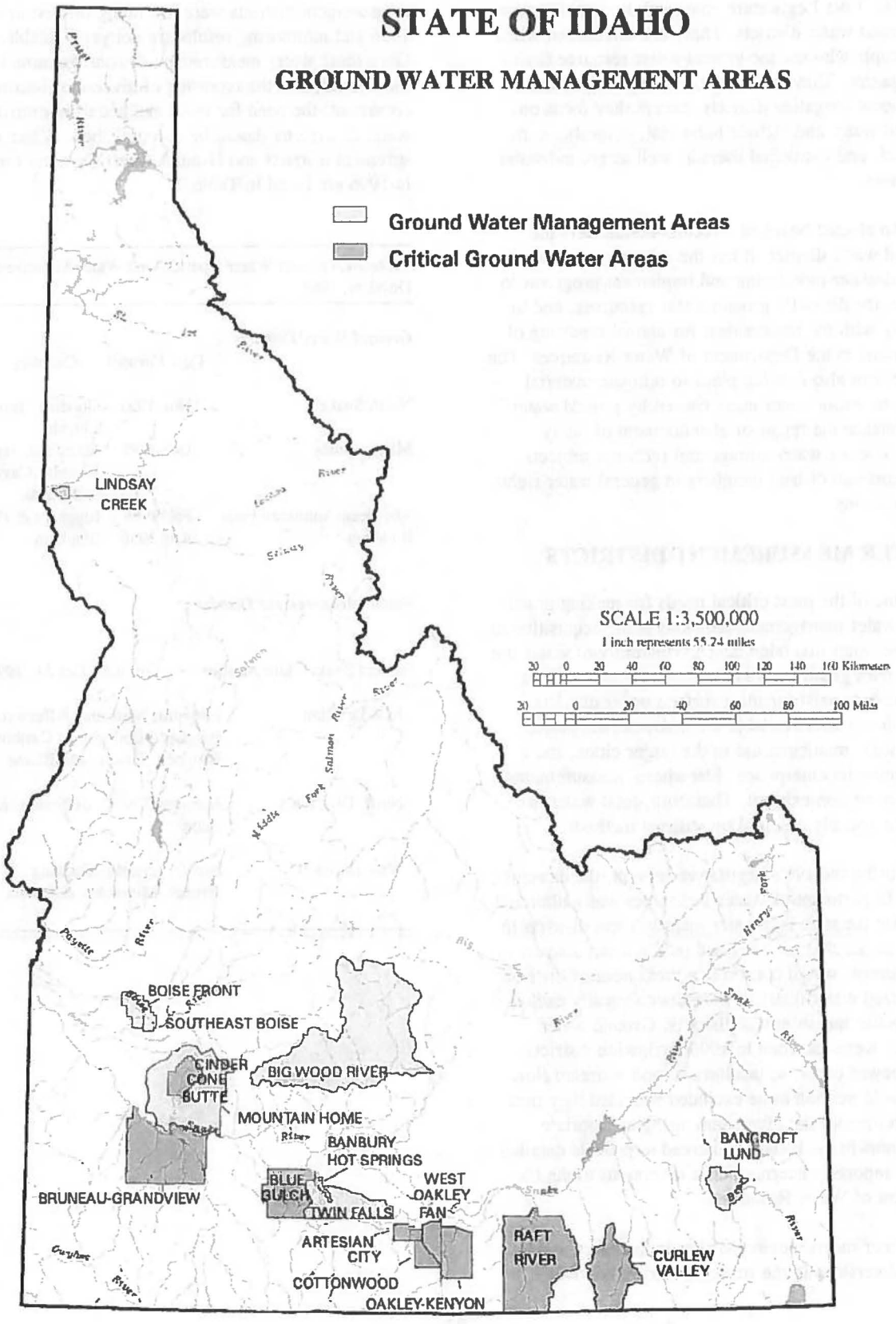

Figure 41. State of Idaho Special Ground Water Area Designations

The 1995 Legislature approved the establishment of ground water districts. These are established when the people who use the ground water resource desire to organize. They are much the same as the older, traditional irrigation districts, except they focus on ground water and include industrial, domestic, commercial, and municipal users as well as ground water irrigators.

An elected board of directors administers the ground water district. It has the authority to conduct ground water monitoring and implement programs to protect the district's ground water resources, and to comply with the requirement for annual reporting of diversions to the Department of Water Resources. The district can also develop plans to mitigate material injury to senior water users caused by ground water use, finance the repair or abandonment of faulty wells, operate water storage and recharge projects, and represent district members in general water rights adjudications.

WATER MEASUREMENT DISTRICTS

One of the most critical needs for making practicable water management decisions is the acquisition of reliable water diversion data. Availability of water use data varies greatly within the state. Irrigation diversion records exist for most surface water districts. Records are also available for hydroelectric project diversions, municipal use in the larger cities, and a few industrial enterprises. Elsewhere, measurements are poor or non-existent. Therefore, total water use must be roughly assessed by indirect methods.

During the 1995 Legislative session, the director of the Department of Water Resources was authorized to divide the state into water measurement districts in such manner that each defined public water source, or part thereof, would constitute a measurement district. Organized water districts were unequivocally excluded from water measurement districts. Ground water districts were excluded in 1996. Irrigation districts, hydropower users, aquaculturists, and instream flow uses could petition to be excluded provided they measure and record the diversions, using appropriate measurement methods, and agreed to provide detailed annual reports concerning their diversions to the Department of Water Resources.

Water measurement districts help ensure that all water diversions in the state are monitored. Water measurement districts were just being formed in late 1996 and monitoring results are not yet available. Once these water measurement districts become better established, and the reporting of diversions becomes consistent, the need for more and better monitoring of water diversions should be accomplished. Water measurement districts and Ground Water Districts formed in 1996 are listed in Table 24.

Table 24. Ground Water Districts and Water Measurement Districts, 1996.

Ground Water Districts	Date Formed	Counties
North Snake	Nov 1995	Gooding, Jerome, Lincoln
Magic Valley	Dec 1995	Minidoka, Jerome, Lincoln, Cassia, and Blaine
Aberdeen-American Falls	Feb 1996	Bingham & Power
Bingham	Aug 1996	Bingham

Water Measurement Districts		
Eastern Snake Plain Aquifer	Formed: Oct 24, 1996	
East Division		Fremont, Madison, Jefferson, Bingham, Bonneville, Caribou, Bannock, Power, and Blaine
North Division		Fremont, Clark, Jefferson, & Butte
West Division		Blaine, Lincoln, Gooding, Jerome, Minidoka, & Cassia

IDAHO'S DEMOGRAPHICS AND ECONOMY

Idaho's economic and cultural diversity is partly a product of its contrasting geography. The state's principal industries are agriculture, manufacturing, tourism, lumber, mining and electronics. The output of Idaho producers is largely exported out of state and the items consumed are largely imported (Holley, 1986; Arrington, 1994).

The 1970s saw Idaho become one of the nation's fastest growing states in population, employment, and income. The annual growth rate of Idaho's non agri cultural employment between 1970 and 1980 was almost twice the U.S. rate. In the 1980s, economic recession slowed population growth and cut employ ment. Economic gains in the last five years have again boosted income, employment and the state's population.

Population Growth

Idaho's population surpassed one million in the 1990 census and continued to grow faster than the national rate through 1995 (Table 25). From 1990 to 1995 Idaho's total population increased 15 percent, from 1.01 million to 1.16 million. Idaho's population density was 19.8 persons per square mile, compared with 70.3 persons for the nation (Idaho Department of Commerce, 1994; U.S. Bureau of the Census, 1993).

Idaho's population is expected to continue to increase (Fig. 42). In-migration will continue to be a large contributor to population growth because: (1) Idaho has a favorable overall quality of life, (2) costs of living are lower than in major population areas, and (3) unemployment rates are relatively low. In the remaining years of the decade, Idaho's population is expected to grow between 1.9 to 2.3 percent per year.

Idaho remains one of the least densely populated of the 50 states. However, sometime during the 1960s, Idaho changed from a state where most of its citizens lived in a rural setting, to a state of primarily urban or town dwellers (Table 26). The 1990 census identified only 44,869 people living on farms and ranches in Idaho. Forty eight cities in the state have populations of more than 2,000 residents. Smaller cities and towns enjoyed widespread population gains in the early 1990s. Rural growth is depending primarily on commuters, retirees, vacationers, and manufacturers.

Employment and Income

As in any economy, employment growth in the state is uneven. Some industries have experienced strong growth; some remain unchanged; some have experienced declines in employment.

AGRICULTURE

Much of the state's activity is geared to agricultural production and related service industries. Idaho is a major national producer. The state ranks first in potato production — about 100 million hundred-pound sacks annually or 30 percent of total U.S. volume. The state also ranks first in barley production, third among the states in the production of sugar beets, hops, mint, and onions. Idaho is recognized for many livestock products. The state ranks number one in trout, fifth in American cheese, eleventh in honey, sheep and lambs, and wool. Cattle, potatoes, milk, wheat, barley, sugar beets, and hay, in that order, account for about 85 percent of all agricultural income (Arrington, 1994). Total agricultural income from all sources exceeded $2 billion in 1990.

The vast majority of Idaho's 24,000 farms are small and operated by families. About 40 percent of all Idaho farmer heads-of-households have non-farm occupations. Idaho relies more heavily than many states on non-family labor, partly because of the large number of farms along the Snake River that require labor to irrigate and cultivate row crops.

Table 25. Population Census and Projections, 1990-2000

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Population											
Idaho (1000)	1,011	1,038	1,068	1,098	1,131	1,160	1,186	1,212	1,238	1,262	1,289
% Change	1.4%	2.6%	3.0%	2.8%	3.0%	2.6%	2.3%	2.2%	2.1%	1.9%	2.1%
Births											
Idaho (1000)	16.42	16.74	17.20	17.58	18.25	18.81	19.21	19.60	19.98	20.28	20.67
% Change	3.5%	1.9%	2.7%	2.2%	3.9%	3.0%	2.1%	2.0%	1.9%	1.5%	1.9%
Deaths											
Idaho (1000)	7.36	7.64	7.89	8.28	8.53	8.74	8.93	9.11	9.30	9.48	9.67
% Change	-0.4%	3.9%	3.2%	4.9%	3.1%	2.4%	2.2%	2.1%	2.1%	1.9%	2.1%
Net Migration											
Idaho (1000)	4.98	17.63	21.37	20.98	22.90	18.85	16.03	15.63	15.18	13.19	12.1

Source: Idaho Economic Forecast, Vol. XVIII, No.1, Division of Financial Management, Jan. 1996; 1996 Economic Forecast, Idaho Power Company.

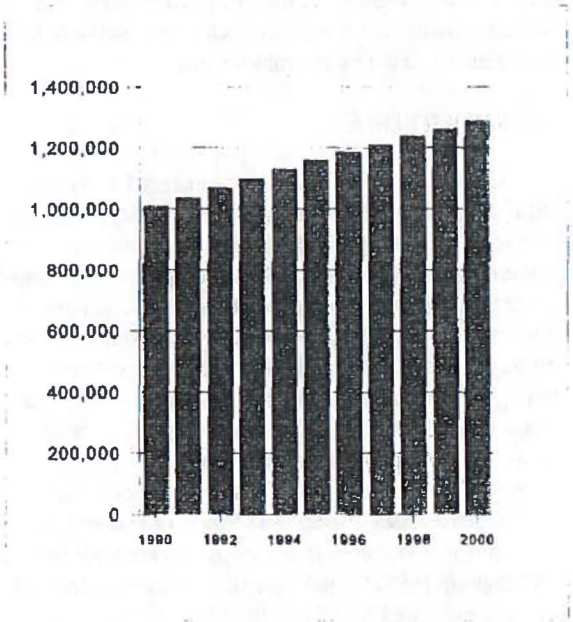

Figure 42. State of Idaho population (1990) and population projections, 1991-2000.

Table 26. Urban and Rural Population in Idaho

	Urban	Percent	Rural	Percent
1950	252,549	42.9	336,088	57.1
1960	317,097	47.5	350,094	52.5
1970	385,434	54.1	327,133	45.9
1980	509,805	54.0	434,233	46.0
1990	578,376	57.4	428,373	42.6

Source: Idaho Blue Book; 1990 U.S. Census

Farm employment declined 23.5 percent in Idaho over the period 1980 to 1992, posting a loss of 10,408 jobs. Productivity gains by more efficient machinery is the largest factor for this decline. Labor costs and an overall shortage of labor encourage agricultural producers to automate as much as possible. While farm employment declined, jobs in the agricultural services, forestry and fisheries sector increased 108.6 percent, posting a gain of 7,571 jobs in Idaho.

NON-AGRICULTURAL EMPLOYMENT

Recent population growth and net in-migration are responses to the opportunities offered in the re gion's labor market. Growth in non-agricultural employment has been positive in recent years (Table 27). From 1990 to 1995, Idaho's non-agricultural jobs increased by 91,600, or by 23.8 percent. In 1995, the number of non agricultural jobs totaled an estimated 476,900. Throughout the past five years, most sectors have experienced growth.

Idaho mining employment is predicted to peak in 1996 then decline as the U.S. economy slows. Since the discovery of gold along the Clearwater in 1860, Idaho has been a leading national producer of metallic minerals. Idaho's mineral production, which varies from $200 to $500 million annually, depends on prices, foreign production, the value of the dollar, and technological developments (Arrington, 1994). Idaho is the leading U.S. producer of newly mined silver, accounting for almost half of national production, and the state is the second largest producer of rock phosphate. After suffering three years of decline (1991-93), mining employment, boosted by metals mining, grew 10.0 percent in 1994 and 12.5 percent in 1995. Mining employment is projected to be 2,732 in 1995 and 2,580 in 2000.

Population growth has had a major impact on Idaho's construction industry. Population inflows to Idaho helped drive the construction industry with demand for housing, commercial facilities, and infrastructure. Between 1990 to 1994, employment in this sector jumped 55.0 percent, and more than 10,000 jobs were added. This has been Idaho's fastest growing industry in the last five years. However, the rate of growth slowed in 1995. Idaho construction employment is projected to decline gradually between 1995 and the year 2000.

A predicted combination of less-than-favorable demand and supply factors is projected to check employment in Idaho's lumber and wood products sector. In the transportation, communication, and public utility industries, trucking was the area of greatest change. Several warehouse facilities have been built in Idaho resulting in more truck traffic and employment. The growth in this area has balanced the losses due to downsizing in the railroad, communication, and public utility sectors.

Employment has boomed in the retail trade sector in the last five years, with 24,400 new jobs added (25.1% of total non-agricultural employment; see also Figure 43). More than 28,100 jobs have been added in the service industry. The strongest area of growth was eating and drinking establishments.

Government employment will probably show growth but primarily in the education sector as federal and state budgets are tightened. The federal government employs approximately 12,000 people in Idaho and spends about 30 percent more in the state than it collects in taxes. Additional expenditures by the Department of Defense and the Department of Energy support Gowen Field, a National Guard training facility, Mountain Home Air Force Base, and the Idaho National Engineering Laboratory. State and local governments employ approximately 56,000 people in Idaho.

In recent years travel and tourism have become a significant contributor to the state's economy. Lodging, entertainment, restaurant and beverage establishments, sports facilities, transportation services, and consumer retail businesses have expanded and earn a substantial proportion of their total income from resident and non-resident recreation and tourism. Special events, such as the Boise River Festival, the Teton Hot Air Balloon Rally, or the Weiser National Old Time Fiddler's Festival bring large numbers of visitors to the state. Camping, boating, fishing, backpacking, and hunting attract thousands of people to visit Idaho. Professional river-runners operate on 22 of Idaho's rivers. Expenditures for travel and tourism were estimated to be $1.5 billion in 1990, $2 billion in 1994, and employment approached 30,000 workers (Arrington, 1994; Hunt et al, 1994; Parrish et al., 1996).

Table 27. Idaho Non-farm Employment (Thousands)

	1990	1995	(%)	2000	90-95%	95-00%
Total Non-farm	385.3	475.1	100.0%	546.6	23.3%	15.0%
Manufacturing	62.9	70.6	14.9%	78.9	12.2%	11.8%
Mining	3.9	2.7	0.6%	2.58	-30.8%	-4.4%
Construction	18.7	29.0	6.1%	27.0	55.1%	-6.9%
Fin., Ins., Real Estate	19.8	24.0	5.1%	25.0	21.2%	4.2%
Trans., Com., Utilities	19.8	22.3	4.7%	24.1	12.6%	8.1%
Trade	97.1	121.5	25.6%	143.9	25.1%	18.4%
Services	81.8	109.9	23.1%	141.6	34.4%	28.8%
State, Local Government	68.3	81.7	17.2%	91.7	19.6%	12.2%
Federal Government	13.1	13.2	2.8%	12.3	0.8%	-6.1%

Source: Idaho Economic Forecast, Idaho Department of Commerce, January 1996.

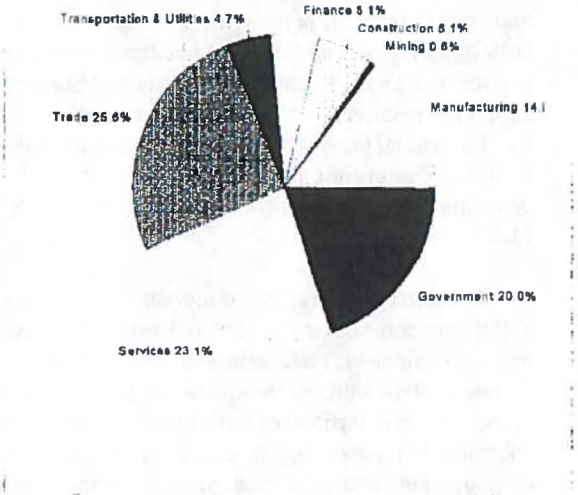

Figure 43. Distribution of Non-Agricultural Employment in Idaho, 1995.

Non-agricultural employment grew 3.4 percent in 1995, compared with 5.6 percent in 1994. Idaho experienced some high profile problems in 1995. Downsizing in the technology sector and bank mergers resulted in employment reduction. The employment outlook for 1996 is continued growth at a rate similar to 1995. Construction employment is showing signs of strong growth again in 1996.

Trade and service employment will most likely continue to expand. New establishments, large and small, across the state suggests that employers have confidence in the economy and the customer base. In the remaining years of the decade, Idaho's non-agricultural employment is forecast to advance 2.1 percent to 3.3 percent annually.

UNEMPLOYMENT AND INCOME

Table 28 provides a comparison of the annual average labor force and unemployment rates for 1990 through 1995. Since 1990, Idaho has added 105,100 people to the state's labor force. In 1994, Idaho added 41,700 people to the labor force, the largest growth in any one year period. In 1995, Idaho's labor force grew by only 1.4 percent (8,300 people), slower than any of the previous five years. Unemployment has gone up and down with the largest number of jobless in 1992, a record 34,700 people. Idaho's annual average unemployment rate decreased steadily from 6.5 percent in 1992 to 5.4 percent in 1995.

In 1995, the Idaho median family income of $32,900 per year, was lower than the national median of $39,700. Idaho's per capita personal income in 1995 was $19,144, an increase of 3.8 percent over 1994. The U.S. per capita personal income average is $22,957 with a national average growth rate of 5.1 percent. Historically, Idaho's per capita personal income has been below the U.S. average, partly due

to larger family size, but the gap has closed in recent years.

Total personal income in Idaho grew 7.5 percent per year during 1990-95, to total $22 billion in 1995. Personal income and per capita personal income are projected to grow 5.7 (to $29,353 million) and 3.5 percent per year (to $22,768) respectively, over the 1995 to 2000 period. In the remaining years of the decade, Idaho's personal income is predicted to grow between 5.1 percent and 6.3 percent per year.

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Table 28. Civilian Labor Force and Unemployment Rate, 1991-1995

	1990	1991	1992	1993	1994	1995
Idaho Labor Force	492,600	508,600	532,000	547,700	589,400	597,700
Idaho Unemployed	29,100	31,600	34,700	34,000	32,800	32,200
Unemployment Rate	5.9%	6.2%	6.5%	6.2%	5.6%	5.4%
U.S. Unemployment	5.5%	6.7%	7.4%	6.8%	6.1%	5.6%

Source: Idaho Employment, Table 2: Labor Force Data for the State of Idaho, Idaho Department of Employment, February 1996.

Cost records for this publication are available from the Department of Water Resources in accordance with Section 60-602, Idaho Code.
IDWR-2100-500-9/97

IDAHO STATE WATER PLAN - 2010 DRAFT POLICIES (5/27/2010)			
1996 SWP Policy Number	2010 Revisions		Ready for IWRB Final Review of Draft Policy
OPTIMUM USE POLICIES			
1A	1A	State Sovereignty	✓
1C	1B	Beneficial Use of Water	✓
1D	1C	Transferability of Use	✓
1I	1D	Water Supply Bank	✓
1F	1E	Conjunctive Management	✓
1H	1F	Ground Water Withdrawal	✓
NEW	1G	Interstate Aquifers	✓
1E	1H	Quantification & Measurement of Water Resources	✓
1J	1I	Aquifer Recharge	✓ w/subcom. Review
1L	*1J*	*Water Quality*	*Not included; Pending revision*
	1K	CAMP	✓
3B	1L	Surface Water Supply Enhancement	✓
NEW	1M	Weather Modification	✓
4D	*1N*	*Hydropower*	*Not included; Pending revision*
CONSERVATION			
1G	2A	Water Use Efficiency	✓
& 2B	2B	Federally Listed Species and State Species of Greatest Conservation Need	✓
	2C	Instream Flow	✓
3C	2D	State Protected River System	✓
3D	2E	Riparian Habitat and Wetlands	✓
3E	2F	Stream Channel Rehabilitation	✓
3H	2G	Safety Measures Program	✓
3I	2H	Flood Hazard Areas	✓ w/subcom. Review
3J	2I	Flood Control Levee Regulation	For discussion
MANAGEMENT			
4B	*3A*	*Review of Federal Reservoir Water Allocation*	*Not included; Pending revision*
4E	*3B*	*Hydropower Siting*	*Not included; Pending revision*
4G	3C	Research Program	✓
4H	3D	Funding Program	✓
4I	3E	Water Planning Program	✓
4J & 44K	3F	Water Rights Adjudication	✓
2D	3G	Climate Variability	✓

SNAKE RIVER BASIN - pending revision & renumbering (Group 4)			
BEAR RIVER BASIN			
6A	5A	Bear River Compact	✓
	5B	Bear River Basin Water Management	✓
6B	5C	Interstate Water Delivery	✓
6C	5D	Bear Lake	✓
SALMON-CLEARWATER BASINS			
	6A	Habitat Conservation Plans	✓
	6B	Instream Flow	✓
PANHANDLE BASINS			
	7A	Interstate Aquifers	✓
7B	7B	Minimum Flows	✓
7E+	7C	Navigation, Fisheries, and Recreation	✓
1996 Policies Eliminated from current draft			
1B		*Public Interest*	
1K		*Spring Flows*	
1M		*Pollution Control*	
2C		*Lake and Reservoir Management*	
3F		*Tailings Pond Regulation*	
3G		*Radioactive Waste Monitoring*	
4A		*Agency Consolidation*	
4C		*Energy Plan*	
4F		*Conservancy Districts*	
6D		*Bear River Basin Water Projects*	

THE WATER PLANNING PROGRAM

The Idaho Comprehensive State Water Plan ("State Water Plan" or "Plan") was adopted by the Idaho Water Resource Board ("Idaho Water Resource Board" or "Board") to guide the development, management, and use of the state's water and related resources. The wise use and management of the state's water is critical to the state's economy and to the welfare of its citizens. The Plan seeks to ensure that through cooperation, conservation, and good management, future conflicts will be minimized and the optimum use of the state's water resources will benefit the citizens of Idaho. The Plan is subject to change so as to be responsive to new opportunities and needs.

Constitutional Authority

Article XV, section 7 of the Idaho Constitution provides the authority for the preparation of a Comprehensive State Water Plan. This constitutional amendment was adopted in November 1964 following a statewide referendum and states:

> *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 land required for water projects; all under such laws as may be prescribed by the Legislature.*

Article XV, section 3 of the Idaho Constitution provides for the appropriation and allocation of water. Section 3 provides that:

> *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 have preference over those using the same for manufacturing or agriculture 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.

Legislative Authority

Article XV, section 7 of the Idaho Constitution provided for the creation of a "Water Resource Agency" but did not establish the agency. In 1965, the 38th Legislature established the Idaho Water Resource Board, and directed that (as amended):

The Idaho Water Resource Board shall, subject to legislative approval, progressively formulate, adopt and implement a comprehensive state water plan for conservation, development, management and optimum use of all unappropriated water resources and waterways of this state in the public interest.

Idaho Code section 42-1734A(1).

To assist the Board, the Legislature provided for the director of the Department of Water Resources ("Department"):

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 section 42-1805(6).

Article XV, section 7 was amended by the electorate during the general election of November 6, 1984. The amendment provides that:

The Legislature of the State of Idaho shall have the authority to amend or reject the state water plan in a manner provided by law. Thereafter any change in the state water plan shall be submitted to the Legislature of the State of Idaho upon the first day of a regular session following the change and the change shall become effective unless amended or rejected by law within sixty days of its submission to the Legislature.

Chapter 17 of title 42, Idaho Code, was amended in 1988 to designate the Plan as the Comprehensive State Water Plan Part A. Plans developed for specific geographic areas became components of the Comprehensive State Water Plan Part B.

The board may develop a comprehensive state water plan in stages based upon waterways, river basins, drainage areas, river reaches, ground-water aquifers, or other geographic considerations.

Idaho Code section 42-1734A(2).

> *As part of the comprehensive state water plan, the board may designate selected waterways as protected rivers as provided in this chapter.*

Idaho Code section 42-1734A(1).

The authority to designate "protected rivers" derives from the state's power to regulate activities within a stream bed including stream channel alterations, water diversions, the extraction of minerals or other commodities, and the construction of impoundments.

Legislation in 2008 provided for the development of a statewide comprehensive aquifer management planning and management effort and fund. Idaho Code sections 42-1779 and 42-1780.

> *Pursuant to the provisions of Idaho law and legislative funding approval, the Idaho water resource board and the Idaho department of water resources shall conduct a statewide comprehensive aquifer planning and management effort over a ten (10) year period of time beginning in fiscal year 2009.*

Idaho Code section 42-1779.

Idaho Water Resource Board Programs

Pursuant to its constitutional and statutory authorities, the Board:

1. Formulates, adopts, and implements the State Water Plan, River Basin Plans, and Comprehensive Aquifer Management Plans.

2. Designates natural and protected rivers and files applications for and holds minimum stream flow water rights.

3. Provides financial assistance for water development and conservation projects in the form of revenue bonds, loans, and grants.

4. Establishes programs that address specific water resource issues at the direction of the Idaho Legislature.

5. Adopts rules governing:

   * Well Construction
   * Well Driller Licensing
   * Construction and Use of Injection Wells
   * Drilling for Geothermal Resources
   * Mine Tailings Impoundment Structures

* Safety of Dams
* Stream Channel Alteration

The Department administers these programs.

6. Hears appeals challenging the Department's administrative decisions pursuant to programs administered under the Board's administrative rules.

7. Administers the Idaho Water Supply Bank.

8. At the request of the Governor, appears on behalf of and represents the state in proceedings, negotiations, or hearings involving the federal government, Indian tribes, or other states.

9. Files applications and obtains permits to appropriate, store, or use unappropriated waters, and acquires water rights subject to the provisions of applicable law.

10. Investigates, undertakes, and promotes water resource projects deemed to be in the public interest.

11. Cooperates and enters into contracts with federal, state, and local governmental agencies and private entities for water studies, planning, research, and activities.

12. Studies water pollution and advises the Idaho State Board of Environmental Quality regarding the establishment of water quality criteria in the context of the optimum development of the state's water resources.

13. Formulates and recommends legislation for water resource conservation, development, and utilization.

Comprehensive State Water Plan Formulation

Formulation of the State Water Plan is a dynamic process. Adoption of The State Water Plan - Part One, The Objectives, in 1974, and The State Water Plan - Part Two, in 1976, provided an initial state water policy. The purpose of Part One was to identify and define policies and objectives adopted by the Board to govern the planning, development, and conservation of the state's water and related lands. Part Two identified and evaluated projects and programs necessary to implement the objectives of Part One and delineated those areas where legislative action was required, identified the programs to be implemented by the Board, and described programs requiring the cooperation of public and private interests. The Plan was updated and re-adopted in 1982 and was amended in 1985 in connection with the Swan Falls settlement. The Plan was revised in 1986, 1992, and 1996 to reflect changing social and economic conditions and water resource needs. The Plan continues to evolve and provides a framework for the adoption and implementation of policies, programs, and projects that develop, utilize, conserve, and protect the state's water supplies.

PLANNING PROCESS

The planning process encompasses five steps:

1. A comprehensive public involvement program to determine public views and interests regarding resource problems, needs, and opportunities as they relate to water use and management;

2. An ongoing evaluation of the state's water resources and uses and estimation of the future availability and demands on the resource;

3. A comprehensive evaluation of the effects resulting from the development and protection of the state's water resources;

4. Adoption of the Plan by the Board as required by article XV, section 7 of the Idaho Constitution; and

5. Approval by the Idaho Legislature as provided by law.

Public involvement is an essential part of the planning process. Scoping meetings, comment periods, and formal hearings provide opportunity for public input during plan development. After adoption and approval, public comment on the effectiveness of the Plan is encouraged.

COMPREHENSIVE STATE WATER PLAN

The State Water Plan represents the state's position on water development, allocation, and conservation. Accommodating Idaho's growing and changing water needs and the increasing demands on both surface and ground water presents a significant challenge. The Plan seeks to meet that challenge through the allocation of the state's water resources under the prior appropriation doctrine, as established by law, the establishment of policies on water development and conservation, and, as funding allows, the implementation of programs and projects designed to address water supply needs for all beneficial uses.

Objectives

The following objectives of the State Water Plan are formulated for the conservation, development, management and optimum use of all unappropriated water resources and waterways of this state in the public interest [Idaho Code section 42-1734A].

1. **Water Management** - Encourage the quantification of water supplies, water uses and water demands for all water rights within the state. Encourage integrated, coordinated, and adaptable water resource management and the prudent stewardship of water resources.

2. **Public Interest** - Ensure that the needs and interests of the public are appropriately considered in decisions involving the water resources of the state.

3. **Economic Development** - Encourage and support economic development through the optimum use of water resources, in accordance with the prior appropriation doctrine as established by law. Promote the integration and coordination of the use of water, the augmentation of existing supplies, and the protection of designated waterways for all beneficial purposes. [Idaho Code Section 42-1734A(1)(b)].

5. **Environmental Quality** - Maintain, and where possible enhance water quality and water-related habitats. Study and examine the quality of rivers, streams, lakes and ground water [Idaho Code section 42-1734(15)], and ensuree that due consideration is given to the needs of fish, wildlife, and recreation in managing the water resources of the state. Where appropriate, initiate state protection of waterways or water bodies with outstanding fish and wildlife, recreation, geologic or aesthetic values.

6. **Public Safety** - Encourage programs ensuring that life and property within the state are not threatened by the management or use of the state's water resources.

Policies

A main goal of this document is to help water managers, planners, and users formulate management strategies and policies needed to meet growing and changing water-use needs. The Board adopts the following policies for the conservation, development, management and optimum use of all the unappropriated water resources and waterways of this state in the public interest [Idaho Code Section 42-1734A].

1. Optimum Use

It is in the public interest to establish policies, initiatives, and programs that lead to optimum use of the water resources of the state. Water is essential to the vitality and prosperity of the state. All the waters of the state, when flowing in their natural channels, including the waters of all natural springs and lakes within the boundaries of the state are the property of the state. Idaho Code § 42-101. The state, through the Department of Water Resources, supervises the appropriation and allocation of the right to use the state waters for beneficial purposes.

1A - STATE SOVEREIGNTY

All waters, whether surface or ground water, are owned by the state as public property and the state asserts its sovereign right to regulate all waters within the state of Idaho for the benefit of its citizens. Thus, the state opposes any attempt by the federal government or other states, or any other entity to usurp the state's control over Idaho's water resources.

Discussion:
The Idaho Water Resource Board is responsible for the formulation of state water policy through the State Water Plan. The state's position on existing and proposed federal policies and actions affecting the state's waters shall be coordinated by the Idaho Water Resource Board to ensure the state retains its sovereign right to control its water resources. Idaho Code § 42-1734B(4). The State Water Plan shall be submitted to the Federal Energy Regulatory Commission, the Pacific Northwest Electric Power and Conservation Planning Council, and other federal agencies as Idaho's plan for the conservation, development, management and optimum use of the state's water resources. Idaho Code § 42-1734C.

The state should pursue cooperative agreements and partnerships with other states, Indian tribes, and the federal government to address water resource and management issues in a manner that benefits the citizens of Idaho.

Implementation Strategies:

- Take legal action when necessary to protect the state's sovereignty over its water resources.
- Implement and maintain cooperative water resource agreements and partnerships with neighboring states, the federal government, and Indian tribes.
- Work with the office of the Governor, state agencies, and the legislature to ensure the development and implementation of a unified state position on water resource issues.

Milestones:

- Partnerships established with neighboring states, federal agencies, and Indian tribes to anticipate and plan for water resource conflicts that may occur.
- Protocols established ensuring coordination of the state's position on water resource issues.

1B - BENEFICIAL USE OF WATER

The concept of beneficial use must necessarily evolve with changing conditions.

Discussion:
The concept of beneficial use is defined broadly, providing for the optimum use of the state's water resources. Except for the constitutionally protected beneficial uses, the concept of what constitutes a beneficial use of water evolves over time based upon societal needs. For example, use of water for the protection of fish and wildlife habitat, aquatic life, recreation, aesthetics, municipalities, navigation, water quality, and managed ground water recharge are recognized as beneficial uses.

Implementation Strategies:

- Review existing state policies and programs to ensure that traditional and emerging water use needs are recognized as beneficial uses of water.
- Establish or participate in local and regional advisory groups to formulate recommendations regarding traditional and emerging water use needs and priorities.

Milestones:

- Policies and rules revised to accommodate emerging water use needs.
- Reports submitted on advisory group recommendations.
- Statutory and/or regulatory changes made to accommodate emerging beneficial uses of water.

1C - TRANSFERABILITY OF USE

Changes in the nature of use of a water right should be allowed to meet emerging needs and to provide for optimum use of the state's water resources.

Discussion:
The demand for water increases every year while the volume of unappropriated water within the state continually decreases and many basins are at or near full appropriation. Allowing for transferability of water rights provides flexibility in water allocation to meet changing conditions. Idaho Code §§ 42-108 and 42-222 provide for changes in place of diversion, place of use, and period of use, while also providing for the protection of other water users, the agricultural base of a region, and the local public interest. Pursuant to state law, priority dates are retained where other water right holders are not injured.

Implementation Strategies:

- Review Department of Water Resources policies and procedures and revise as necessary to implement a more efficient water right transfer process.
- Review existing statutes and regulations and propose revisions to establish a more efficient water right transfer process.

Milestones:

- Number of transfers processed.

1D -WATER SUPPLY BANK

The sale or lease of water is critical to the efficient management and optimal use of the state's water resources. Thus, use of the state's Water Supply Bank should be expanded to meet traditional and emerging needs for water.

Discussion:
As the state approaches the time when there is little or no unappropriated water, the Water Supply Bank, established by Idaho Code § 42-1761, provides an efficient mechanism for the sale or lease of water from natural flow and storage. The purpose of the Water Supply Bank is to obtain the highest duty of water, provide a source of adequate water supplies to benefit new and supplemental water users, and provide a source of funding for improving water use facilities and efficiencies. By aggregating water available for lease, rental pools operating under the authority of the Water Supply Bank can supply the water needs of many users.

The Idaho Water Resource Board has adopted rules governing the sale or lease of water through the Water Supply Bank. Pursuant to state law, the Idaho Water Resource Board has authorized local entities to operate storage and natural flow rental pools in numerous water districts that meet regional needs. The Shoshone-Bannock Tribes are also authorized by the state to operate a storage water rental pool.

The scope of existing and future water use needs requires further development of flexible water banking systems that address local water use needs and ensure the optimum use of the state's water resources. The Water Supply Bank should provide for efficient mechanisms that are responsive to traditional and emerging needs for water.

Implementation Strategies:
- Review existing statutes, rules, and Water Supply Bank procedures to identify revisions needed to meet current and future water use demands.
- Propose statutory, regulatory, and procedural changes that provide the Idaho Water Resource Board authority and flexibility to establish local rental pools adapted to the unique needs of a local area.
- Establish natural flow and storage rental pools in basins where local water users have identified the need for rental pools.
- Develop a public information and education program to promote use of the Water Supply Bank.

Milestones:
- Increased use of the Water Supply Bank.
- New storage and natural flow rental pools established.
- Efficient mechanisms in place that facilitate the optimum use of water.

1E - CONJUNCTIVE MANAGEMENT

Where a hydraulic connection exists between ground and surface waters, including spring flow, they are to be managed and administered conjunctively to ensure a sustainable water supply, in accordance with the prior appropriation doctrine as established by law.

Discussion:
Irrigation practices, ground water pumping, and climate variability impact the available supply of ground and surface water and effect changes in regional water budgets. This can result in insufficient water supplies to satisfy beneficial uses and increased administrative curtailment, conflict among water users, and litigation.

The goal of conjunctive management of ground and surface water is to protect the holders of senior water rights while allowing for the optimum development and use of the state's water resources.

Quantification and monitoring of the hydraulic relationship between ground water and surface water, including spring flow, is required to allow for optimal utilization of the water supply and to ensure the protection of senior water rights in accordance with the prior appropriation doctrine as established by Idaho law. Quantification and monitoring is also necessary for the development of plans and projects designed to maintain a stable balance between supply and demand.

Implementation Strategies:

- Continue to quantify the hydraulic relationship between ground water supplies, surface water supplies, and spring flows in designated river basins.
- Develop prioritized list of basins where additional technical information is needed to assess ground and surface water interaction.
- Develop enhanced technical tools for evaluating the interaction between surface and ground water resources for use in planning and administration.
- Increase measurement and monitoring of spring flow and promote cooperative efforts to better quantify spring flow hydraulics.
- On a continuing basis, assess conditions and trends of ground water levels in primary aquifers to estimate the rate of future aquifer recharge and withdrawal under various climatic conditions.
- Procure funding for studies.

Milestones:

- Number of studies initiated and completed to quantify ground water/surface water relationships.
- Increased effectiveness of technical tools used to evaluate the hydraulic relationship between ground water and surface water and other water supply data.

1F - GROUND WATER WITHDRAWAL

Average withdrawals from an aquifer should not exceed the reasonably anticipated rate of future natural recharge to that aquifer.

Discussion:
Idaho Code § 42-226 allows for the full economic development of the state's underground water resources. Declining ground water levels, however, may result in insufficient water supplies to satisfy beneficial uses, impaired economic development, water quality problems, and conflicts between water users. All beneficial uses, including interdependent spring and surface water uses, should be considered in evaluating the full economic development potential of the state's ground water resources.

The Director of the Department of Water Resources is authorized to establish reasonable ground water pumping levels when necessary to protect prior appropriations of ground water. Idaho Code § 42-237a provides that the Director may prohibit or limit the withdrawal of water from a well if withdrawal would result in diversion of the ground water supply at a rate beyond the reasonable anticipated rate of future natural recharge. The Director may allow withdrawals to exceed natural recharge if a program exists to increase recharge or decrease withdrawals and senior water rights are protected. Idaho Code §§ 42-233a and 42-233b authorize the Director to designate areas as either Critical Ground Water Areas or Ground Water Management Areas. Designating a ground water basin as a Critical Ground Water Area or Ground Water Management Area provides management options to prevent excessive withdrawals from an aquifer. Where such designations are made, the Department requires additional measurement and reporting to determine available ground water supplies and use.

The comprehensive aquifer management planning initiated by the Idaho Water Resource Board provides opportunities for stakeholder participation in ground water management. Local advisory committees help the Idaho Water Resource Board establish goals, objectives, and strategies to maximize available water supplies and assist with plan implementation. Public participation is key to the development of innovative approaches for meeting current and future demands on the state's ground water resources.

Implementation Strategies:

- Monitor ground water levels to estimate the rate of future natural aquifer recharge and withdrawal under various climate conditions.
- Develop water budgets for aquifers.
- Establish local advisory committees and solicit recommendations for ground water management.
- Identify opportunities for conducting cooperative ground water studies with state, federal and local agencies.
- Implement management strategies to maximize available water supply.

Milestones:

- Number of water budgets developed.
- Number of advisory committees active in ground water management and critical ground water areas.
- Number of ground water management plans adopted for all administratively designated areas.
- Number of basins with adequate monitoring networks.

1G - INTERSTATE AQUIFERS

Cooperative arrangements with neighboring states should be developed for shared aquifers to avoid water supply conflicts and to optimize utilization of the resource.

Discussion:
The growing demand for water increases competition between states with shared aquifers. Cooperative agreements to jointly develop, manage, and protect shared aquifers are necessary to avoid water supply conflicts, to ensure economic development, and to provide a mechanism for the exchange of technical information.

Implementation Strategies:

- Establish cooperative agreements with neighboring states to gather data and conduct studies to assess ground water conditions and trends.
- Develop coordinated aquifer management plans with neighboring states that resolve interstate conflict and address Idaho's water supply needs.

Milestones:

- Approval and implementation of cooperative agreements, which may include coordinated aquifer management plans, that ensure Idaho's water supply meets current and future needs.
- Cooperative technical studies conducted.

1H – QUANTIFICATION AND MEASUREMENT OF WATER RESOURCES

Quantification and measurement of Idaho's water supply and use is essential for sound water resource planning, management, and administration.

Discussion:
The Director of the Department of Water Resources is required to maintain an inventory of the state's water resources. Idaho Code § 42-1815. The measurement of water availability and use is necessary to administer and regulate existing water uses and to promote optimal water resource planning and management.

Chapters 6 and 7, title 42, Idaho Code, provide for water use measurement and reporting throughout the state. New instrument technologies for the measurement of water availability and use will continue to improve the accessibility and reliability of data collection and interpretation. These new technologies, such as automated electronic data recording equipment and transfer of data through wireless systems, provide transparency and instantaneous access to data, improve calibration of models used for administration and planning, and educate the public about water use by region and throughout the state.

Implementation Strategies:

- Assess existing measurement network and facilities and develop plan for improving data collection and reporting.
- Prioritize projects for conversion to automated electronic data collection and reporting systems.
- Provide technical assistance and participate in securing funding for improved measurement and reporting systems.

Milestones:

- Number of assessments completed.
- Number of automated data collection systems in use.
- Number of improved measurement and reporting strategies implemented.

1I - AQUIFER RECHARGE

Aquifer recharge should be promoted and encouraged, pursuant to state law.

Discussion:

Managed aquifer recharge: Managed recharge projects may be an appropriate means for enhancing spring flows, providing mitigation for junior ground water depletions, or to help maintain desirable aquifer levels. In addition, managed recharge may help optimize existing water supplies by changing the timing and availability of water supplies to meet demand. Managed recharge may also be used as an adaptive mechanism for minimizing the impacts of variability in climate conditions. Monitoring and evaluation of managed recharge projects is essential to document hydrologic effects and effects on surface and ground water quality. All water use needs affected by managed recharge projects should be considered. Projects involving the diversion of natural flow water appropriated pursuant to Idaho Code § 42-234 for managed recharge in excess of ten thousand (10,000) acre-feet on an average annual basis must be submitted to the Idaho Water Resource Board for approval prior to construction. Idaho Code § 42-1737. The Idaho Water Resource Board supports and will assist in the development of managed recharge projects that further water conservation and increase water available for beneficial use, consistent with state law.

Aquifer storage and recovery: The use of managed recharge to store surface water in a confined underground area could be an important element in meeting future water use needs. Further understanding of the economic, legal, ecological, and technical feasibility of using confined underground aquifers for water storage in Idaho is required for the purpose of policy development and planning and to avoid injury to existing water rights.

Incidental aquifer recharge: The incidental recharge of aquifers occurring "as a result of water diversion and use that does not exceed the vested water right of water right holders is in the public interest." Idaho Code § 42-234(5). Incidental recharge may be an important component of some aquifer water budgets.

Implementation Strategies:

- Cooperate with public and private entities to develop, implement, and evaluate managed recharge projects.
- Identify and propose changes to statutes, rules, and policies that will assist the development and implementation of managed recharge projects.
- Identify river basins where the use of managed recharge projects should be evaluated as a potential strategy for addressing increased demand on water supplies.
- Monitor and evaluate recharge projects to document effects on water supply and water quality.
- Appoint an Aquifer Storage and Recovery Task Force.

Milestones:

- Managed recharge projects that optimize water supplies implemented.
- Effects of managed recharge projects on water supply and water quality documented.
- Aquifer Storage and Recovery Task Force recommendations submitted.

1K COMPREHENSIVE AQUIFER MANAGEMENT PLANS

The Idaho Water Resource Board will complete and implement comprehensive aquifer management plans to address the increasing demands on the state's water supply.

Discussion:
Idaho Code § 42-1779 established the Statewide Comprehensive Aquifer Planning and Management Program, which is designed to provide the Idaho Water Resource Board and the Department of Water Resources with the necessary information to develop aquifer management plans throughout the state. The program will be implemented in three phases. First, technical information describing the hydrology of the ground and surface water systems and the relationship between surface and ground water in a designated basin will be compiled. Second, the Idaho Water Resource Board, with the assistance of an advisory committee, will develop a management plan, based on an assessment of current and projected water uses and constraints, to address water supply and demand issues specific to each basin. Finally, the Idaho Water Resource Board will be responsible for implementing the plan to obtain sustainable water supplies and provide for the optimum use of a region's water resources.

Idaho's first Comprehensive Aquifer Management Plan was developed for the Eastern Snake River Plain Aquifer ("ESPA CAMP"). The ESPA CAMP was adopted by the Idaho Water Resource Board and approved by the legislature in 2009. The ESPA CAMP sets forth actions designed to stabilize and improve spring flows, aquifer levels, and river flows across the Eastern Snake River Plain. The ESPA CAMP uses a phased approach to achieve a designated water budget change through a mix of management actions, including but not limited to, aquifer recharge, ground-to-surface water conversions, and demand reduction strategies. The Idaho Water Resource Board is responsible for implementation of the plan with the assistance of an advisory committee made up of representatives of stakeholders who rely upon the Eastern Snake River Plain aquifer to supply water for beneficial use.

Comprehensive aquifer planning was initiated in 2008 and will be completed for the following aquifers as funding allows: Treasure Valley, Rathdrum Prairie, Palouse, Big Wood, Mountain Home, Bear, Teton, Big Lost, Portneuf, and Blackfoot.

Implementation Strategies:

- Develop and implement comprehensive aquifer management plans for selected basins that establish goals, objectives, and implementation strategies to maximize available water supplies.

Milestones:

- Number of comprehensive aquifer management plans completed.
- Number of comprehensive aquifer management plans implemented.

1L – SURFACE WATER SUPPLY ENHANCEMENT

Surface water development will continue to play an important role in meeting Idaho's future water needs.

Discussion:
Future economic development, population growth, and evolving priorities will bring additional demands on Idaho's water resources, and surface water development will continue to play an important role in the state's future. The construction of new reservoirs, enlargement of existing reservoirs, and development of off-stream storage sites could increase water supplies necessary to meet increased demand. These strategies are also important for flood management, hydropower generation, and recreation use.

Engineering, economic, legal, political, and environmental issues associated with water development projects affect decisions concerning the construction of reservoir facilities. In addition, changes in climate conditions will likely be an important factor in determining the costs and benefits of additional storage facilities. As required by Idaho Code § 42-1736B(c), the Idaho Water Resource Board maintains an inventory of potential storage sites. An inventory of reservoir sites with apparent high potential for development is set forth in Table 1.

Table 1. Reservoir Sites with Apparent High Potential for Development

Potential Reservoir	Stream	Reservoir Capacity	Potential Purpose
Upper Snake Minidoka (enlargement)	Snake River	50,000 AF	Irrigation, Power, Flood Control, Flow Augmentation, Recharge, Recreation
Teton (or alternative)	Teton River	300,000 AF	Irrigation, Power, Flood Control, Flow Augmentation, Recreation
Southwest Idaho Twin Springs (or alternative)	Boise River	400,000 AF	Irrigation, Power, Flood Control, Flow Augmentation, Recreation
Lost Valley (enlargement)	Lost Valley Creek	20,000 AF (increase)	Irrigation, Recreation
Galloway	Weiser River	900,000 AF	Irrigation, Power, Flood Control, Flow Augmentation, Recreation
Bear Caribou	Bear River	48,000 AF	Irrigation, Power, Flood Control, Recreation

Implementation Strategies:

- Concentrate assessment and evaluation of potential storage facilities on projects with the highest potential for development. Major considerations in defining high-potential projects are: cost per unit of storage, extent of public support, environmental considerations, adequacy of existing information and studies, extent and availability of funding sources for evaluation and assessment, and expected benefits that would accrue from the construction and operation of the facility.
- Review inventory and prioritize potential projects annually.
- Initiate feasibility/construction design studies for sites determined to be high priority.
- Identify potential funding sources for project evaluation and construction.
- Develop partnerships with private entities, local governments, and federal agencies to evaluate, design, and construct water storage projects.
- Provide recommendations regarding potential storage sites to private and public entities to ensure that land and resource development associated with these sites is consistent with the State Water Plan.

Milestones:

- Complete annual review of potential storage site inventory and revise as appropriate.
- By 2010, initiate studies of Teton, Galloway, Minidoka, and Twin Springs sites.
- Initiate construction of additional storage facility for approximately 600 thousand acre-feet by 2025.

1M – WEATHER MODIFICATION

Weather modification offers the possibility of augmenting water supplies.

Discussion:
Weather modification, primarily winter cloud seeding to increase snowpack, has been practiced in Idaho and across the western states for many years. Increasing challenges, including a changing climate, growing population, and water allocation conflicts related to the presence of threatened and endangered species magnify pressures on a variable water supply. While the specific water quantities resulting from weather modification remain unknown, additional investigation should be conducted and pilot projects implemented to determine where and under what circumstances weather modification is a feasible strategy for increasing water supplies. A number of cloud seeding programs and studies have been conducted in Idaho with positive overall results, including programs funded by the Idaho Water Resource Board and Idaho Power Company.

Weather modification has the potential to raise legal issues related to the effect of weather modification activities outside state boundaries, potential adverse environmental effects, and intergovernmental conflicts where projects occur on or near public lands. Addressing these issues through legislation, rulemaking, and interstate agreements will help avoid future conflicts and litigation.

Under Idaho law, any person who intends to conduct weather modification activities is required to register with the Department of Agriculture and file a log of activities upon completion of the program. Idaho Code §§ 22-3201, 22-3202. Idaho law also provides for the creation of weather modification districts. Idaho Code §§ 22-4301, 22-4302.

Implementation Strategies:
- Support the continued evaluation of existing weather modification projects.
- Develop criteria for the development and implementation of additional weather modification projects.
- Collect baseline data and continue effectiveness research.
- Coordinate weather modification research and pilot projects with neighboring states.
- Ensure that state-funded projects are scientifically sound and include robust monitoring and evaluation component.

Milestones:
- Number of weather modification projects implemented that increase water supply.
- Increase in annual runoff resulting from weather modification projects.
- Increase in baseline data and effectiveness research.
- Agreements in place with neighboring states and federal agencies addressing research and implementation of weather modification projects.

2. Conservation

The Conservation policies focus on careful planning and prudent management of Idaho's water. The purpose of the policies is to encourage water conservation practices and manage the use of water resources for the benefit of Idaho citizens, consistent with the prior appropriation doctrine, as established by law. Conservation and water efficiency practices should be implemented through voluntary, market based programs, when economically feasible.

2A - WATER USE EFFICIENCY

The efficient use of water should be promoted in accordance with state water law.

Discussion:
Water conservation focuses on the reduction in water demand, and water efficiency focuses on reducing waste. As water efficiencies increase, conserved water may be available to supply existing uses, new demands, or improve instream flows. Conservation and water efficiency practices may offset the need for new water supply enhancement projects. Policies that promote water conservation and efficiency should be encouraged, where such practices do not result in adverse consequences to other users of the resource.

Implementation Strategies:

- Review existing laws and regulations and identify inconsistencies or constraints to implementing water efficiency practices.
- Develop partnerships with local, state, and federal governments and non-governmental organizations to coordinate and support water conservation programs.
- Establish a public information program and conservation guidelines for a range of water uses.
- Evaluate opportunities for conservation and water efficiency practices in conjunction with the evaluation of new water supply enhancement facilities.
- Identify localized opportunities for water conservation.

Milestones:

- Number of conservation guidelines implemented.
- Number of partnerships developed to coordinate water conservation.
- Number of water use efficiency practices implemented.
- Effects of conservation efforts quantified.

2B - FEDERALLY LISTED SPECIES AND STATE SPECIES OF GREATEST CONSERVATION NEED.

Voluntary community-based conservation programs that benefit species listed under the Endangered Species Act ("ESA") and Species of Greatest Conservation Need ("SGCN") and resolve water resource issues should be the primary strategy for achieving species protection and recovery.

Discussion:
The intersection between state water rights and the ESA requires development of integrated solutions to water allocation conflicts. In enacting the ESA, Congress contemplated a state-federal alliance to advance the recovery of listed species and provided for the development of state-led recovery efforts. Congress has directed federal agencies to "cooperate with State and local agencies to resolve water resource issues in concert with conservation of endangered species." 16 U.S.C. § 1531(c)(2). Cooperative community-based conservation programs are more effective in providing on-the-ground habitat benefits than enforcement actions. With site-specific information about water and land use practices and habitat requirements, targeted and effective conservation strategies can be developed and implemented that protect private property rights and assure state primacy over water resources while, at the same time, providing natural resource protection.

The Idaho Water Resource Board holds minimum stream flow water rights for 205 river reaches important to ESA-listed species and established as part of the Snake River Water Rights Settlement Act of 2004 ("2004 Water Rights Agreement"). The minimum stream flow water rights provide significant protection for ESA-listed species in the Salmon and Clearwater River Basins. The water rights for streams in watersheds with substantial private land ownership and private water use were established after consultation with local communities. Where the minimum stream flow water rights are higher than existing flows, the state works with water users on a voluntary basis to rent or otherwise acquire water to return to the streams. The Water Supply Bank and Idaho Water Transactions Program are used to achieve these objectives. In conjunction with the minimum stream flows, the state agreed to work with local stakeholders and communities to address habitat concerns on a limited number of streams with degraded habitat. The work plans include measures to remove barriers to fish passage, revegetate stream banks, and restore wetlands to proper functioning.

The 2004 Water Rights Agreement also provides for the development of long-term habitat conservation plans to assist in the recovery of ESA-listed species, under section 6 of the ESA. The plans are to be developed in collaboration with local landowners and water users, affected Indian tribes, and state and federal natural resource agencies. Section 6 agreements will provide incentives for conservation through the granting of incidental take coverage to participants in the program. Such agreements would provide participating water users with protection against uncertainty and regulatory delays while contributing to the recovery of listed species. Section 6 of the ESA may also provide opportunities for the implementation of voluntary conservation plans developed in collaboration with local water users and stakeholders in other regions of the

state. It is in the interest of the public for the Idaho Water Resource Board to take a leadership role in the development of local and regional conservation strategies that contribute to the recovery of ESA-listed species and SGCN.

Implementation Strategies:

- Participate in the development and implementation of habitat conservation plans pursuant to section 6 of the ESA.
- Collaborate with Office of Species Conservation, state and federal agencies, affected Indian tribes, and local stakeholders to develop and implement habitat conservation programs that preclude the need for listing of species and contribute to listed species' recovery.
- Coordinate with Office of Species Conservation to integrate water resource programs with species protection and recovery, including the establishment of minimum stream flows, and state designation of protected rivers.

Milestones:

- Number of section 6 agreements implemented.
- Number of voluntary conservation agreements and measures implemented.
- Number of strategies implemented that preclude the need for listing under the ESA and result in listed species' recovery.

2D- STATE PROTECTED RIVER SYSTEM

The Idaho Water Resource Board will exercise its authority to protect the unique features of rivers where it is in the public interest to protect recreational, scenic, and natural values.

Discussion:
Idaho Code § 42-1734A(1) authorizes the Idaho Water Resource Board to protect highly-valued waterways as state protected rivers. The authority to designate "protected rivers" derives from the state's ownership of the beds of navigable streams and the state's right to regulate all waters within the state. The Idaho Water Resource Board has consistently recognized the value of free-flowing waterways by designating specific streams and rivers as natural or recreational rivers.

Although rivers can be protected under the federal Wild and Scenic Rivers Act, the Idaho Water Resource Board encourages federal officials to seek protection of streams and rivers through the Comprehensive State Water Planning process. The state planning process ensures coordinated and efficient water planning for Idaho rivers and streams and avoids potential state/federal sovereignty conflicts.

Implementation Strategies:
- Coordinate with local governments and federal agencies to identify specific waterways for consideration as protected rivers.
- Develop priority list of potential rivers for consideration in comprehensive basin planning
- Establish agency policy and procedures to ensure requirements of protected rivers program are addressed when the Department of Water Resources reviews water right permit applications and stream channel alteration permits.
- Ensure that permits issued include provisions for the protection, restoration or enhancement of designated river reaches.

Milestones:
- Ongoing review of state rivers and streams for determination of whether they should be designated as part of the protected river system.
- Number of state/federal agreements to coordinate river planning implemented.
- Designation of streams or rivers determined to warrant protected status.

2E- RIPARIAN HABITAT AND WETLANDS

Protecting the ecological viability of riparian habitat and wetlands within the state is a critical component of watershed planning.

Discussion:
Functional riparian zones and wetlands contribute to water quality protection, storm water control, and ground water protection and provide important habitat for fish and wildlife. Riparian and wetlands areas cover approximately 20% of the state and support 80% of the species in the state. Riparian zones and wetlands should be protected to preserve their ecological values.

The integration of water resource and land use planning activities that affect riparian zones and wetlands requires coordination among various local, regional, and state authorities. The Idaho Department of Water Resources has exclusive authority over the appropriation of the public surface waters and ground waters of the state. The Department of Water Resources also regulates the alteration of stream channels and stream beds below the mean high watermark. Idaho Code §§ 42-3801 thru 42-3812. Local governments are authorized to regulate land use and development. The Idaho Department of Environmental Quality administers the state's Nonpoint Source Management Program which is based upon strong working partnerships and collaboration with state, tribal, regional, and local entities, private sector groups, citizens' groups, and federal agencies and the recognition that a successful program must be driven by local wisdom and experience.

In 2008, the Idaho Wetlands Working Group developed a Draft Wetlands Conservation Strategy that sets out a framework for protecting, restoring, and enhancing wetlands through collaborative, voluntary approaches. The Idaho Water Resource Board supports voluntary watershed-based conservation strategies for the protection of riparian and wetland areas above the mean high watermark developed and implemented through collaboration with water users, land managers, local governments, and state and federal agencies.

Implementation Strategies:
- Support collaborative watershed planning and the implementation of voluntary strategies to protect Idaho's wetlands and riparian areas.
- Support the development of guidelines and strategies to assist in the implementation of projects that protect, restore, and enhance wetlands and riparian areas.
- Evaluate whether the Stream Channel Protection Act, Idaho Code §§ 42-3801 thru 42-3812 adequately assists in the protection of wetlands and riparian areas and propose statutory changes as appropriate.
- Assist state and federal agencies and stakeholders in the acquisition of funding for project implementation.

Milestones:
- Project and funding proposals submitted.
- Projects implemented.

2F- STREAM CHANNEL REHABILITATION

The Idaho Water Resource Board will support cost effective stream channel rehabilitation where past activities adversely affect or could affect the ecological goods and services of the state's watersheds.

Discussion:
Functional stream channels provide ecological goods and services desired by the public. Ecological goods are those qualities that have economic value, such as timber resources, habitat that supports fishing and hunting, and aesthetic qualities of landscapes that would attract tourists. Ecological services include systems that best manage water resources, such as the regulation of runoff and flood waters, or the stabilization of landscapes to prevent erosion. Damage and destruction of stream channels can result from natural and human-caused changes and disturbances. Where current practices, legacy effects of past activities, or natural disturbances threaten public safety, private property, or the overall quality and quantity of water produced in the affected watershed, it is in the state's interest to take remedial action in a cost-effective manner. In many instances, historical targets for restoration are not practical and therefore restoration efforts should be designed to be sustainable in a rapidly-changing environment. Preventing damage to a stream channel and adjacent property is more cost effective than restoration. It is in the state's interest to ensure that the stream channels of the state and their environments be protected.

Implementation Strategies:

- Conduct a statewide inventory of streams where natural events or human activities have altered channels and the disturbances threaten the public safety, private property, or other water resource values.
- Conduct cost/benefit analyses for rehabilitation of affected streams.
- Prioritize projects.
- Obtain funding for restoration of prioritized streams.

Milestones:

- Inventory conducted.
- Cost/benefit analyses conducted and priorities established.
- Funding obtained.
- Projects implemented.

2G - SAFETY MEASURES PROGRAM

Owners of water distribution and storage facilities are encouraged to establish or continue safety initiatives including construction and maintenance of safety features and development of public awareness programs to educate residents about hazards associated with these facilities.

Discussion:
Fatal accidents occur in waterways at or near water distribution and storage facilities in Idaho because of the inherent dangers of these facilities. Canals and irrigation distribution structures are increasingly located near or in residential areas and as a result, there has been a greater effort to provide public awareness programs and, where feasible, implement measures designed to prevent such occurrences. The Idaho Water Resource Board supports these initiatives.

Implementation Strategies:

- Secure and provide funding for the construction and maintenance of safety features at water distribution and storage facilities.
- Encourage the implementation of public safety awareness programs.

Milestones:

- Reduced number of accidents associated with water distribution and storage facilities.

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2H - FLOOD HAZARD AREAS

Protection of floodplains through effective floodplain management and pre-disaster mitigation is essential to reducing and preventing flood damages.

Discussion:

Floods are the most frequent and costly disasters in Idaho and can occur in most any area of the state. With population growth, there will be increased interest in the development of lands subject to periodic flooding. The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program (NFIP), which 166 Idaho communities have joined by adopting and enforcing flood damage prevention ordinances. Although FEMA has prepared Flood Insurance Rate Maps (FIRMS) for some of the waterways within Idaho, the majority of FIRMs are more than 20 years old and required updating. In order to create safer communities and reduce the loss of life and property due to flood events, local governments are encouraged to use land use controls, building practices, and other tools to protect the natural function of floodplains. ~~The Federal Emergency Management Agency's Flood Map Modernization Program provides updated maps and data for local decision making and enables the end user to more accurately assess the level of flood risk within a community and take appropriate measures to mitigate their physical and financial vulnerability to flooding. The Federal Emergency Management Agency has prepared Flood Insurance Rate Maps for some, but not all of the waterways within Idaho.~~ ~~???????~~**~~Over 160 communities have adopted the National Flood Insurance Program.~~** ~~Communities can use this information to develop a more comprehensive approach to flood disaster mitigation planning.~~

~~In order to provide maximum opportunity for the citizens of Idaho to obtain improved and more reliable flood insurance, the National Flood Insurance Program should be adopted.~~

Implementation Strategies:

- ~~Coordinate with the U.S. Army Corps of Engineers, Federal Emergency Management Agency, and the Idaho Bureau of Homeland Security to develop a comprehensive overview of flood prone areas across the state.~~
- Assist local governments~~, state, and federal agencies~~ in securing funding to update or develop Digital ~~and complete~~ Flood Insurance Rate Maps~~ for all regions of the state.~~
- Provide technical information on flood plain management and flood risk to elected officials, ~~to~~ public and private organizations, and land developers. ~~involved in land development.~~

3C - RESEARCH PROGRAM

Focused research is necessary to support water resource planning and collaborative solutions that address the increasing demands on the state's water supplies.

Discussion:
Research and data gathering are essential to the state's efforts to meet future water challenges in a sustainable way. Adequate data on water availability, use and efficiencies, surface and ground water interaction and relationships, and emerging water management technologies is needed to help water managers and end-users make sound decisions and develop adaptive strategies for responding to the impacts of climate variability. Data collection and research is conducted by numerous public and private entities. A cooperative exchange of information contributes to more efficient use of limited financial resources for research and monitoring necessary to further the state's water supply objectives. Research priorities include: water use efficiency; water use monitoring; ground and surface water relationships, specifically the timing and spatial distribution of pumping and recharge efforts; ground water flow models; and system operation modeling methods for Idaho river basins. Environmental considerations should be addressed as studies are designed and implemented.

Implementation Strategies:

- Facilitate coordination and dissemination of research and data among state and federal agencies, universities, and private entities.
- Identify and prioritize research needs.
- Identify dedicated funding sources for basic and applied research.

Milestones:

- Cooperative research activities implemented.
- Completed research projects.
- Application of research results to planning and management

3D - FUNDING PROGRAM

Funding mechanisms to support the development, preservation, conservation, and restoration of the water resources of the state should be based on flexible strategies that provide equitable benefits.

Discussion:
The water resources of the state are essential to Idaho's economy and its citizens. There is no single strategy for successfully financing water resource projects. Instead, funding mechanisms for water planning and management should be based on flexible strategies that are broad-based and provide equitable benefits. Strategies for financing water resource programs include state appropriations, the establishment of water management improvement or conservancy districts, targeted user fees, the development of a state water fund supported by power franchise fees, targeted sales, property, or special product and services taxes, and revenue bonds. While the existing institutional and legal framework may be adequate for some projects, it is important to develop innovative approaches that are responsive to future needs. Transparency and clarity about the intent and limitations of any particular funding strategy will help ensure that a strategy is used and evaluated appropriately. Projects proposed for funding must be in the public interest and in compliance with the State Water Plan.

The Idaho Water Resource Board's Revolving Development Fund and the Water Management Account are supported by the appropriation of moneys from the state's general fund, federal funds, and other revenue sources. These programs have and will continue to provide financial assistance to project sponsors for water development and conservation, system rehabilitation, and treatment projects. The Idaho Water Resource Board is also authorized to finance water projects with revenue bonds. The issuance of revenue bonds does not constitute a general obligation of the State of Idaho or the Idaho Water Resource Board.

Sources of funding for programs focused on the protection and restoration of species listed under the federal Endangered Species Act include Snake River Water Rights Act of 2004 appropriations, the Columbia Basin Water Transaction Program, the Pacific Coast Salmon Restoration Fund, and the 2008 Columbia Basin Fish Accords.

The Eastern Snake River Aquifer Comprehensive Management Plan calls for a water-user fee in conjunction with state appropriations. Implementation of strategies for addressing regional water use issues on the Eastern Snake River Plain Aquifer will assist in the development of comprehensive aquifer management implementation plans in other areas of the state.

The Idaho Water Resource Board will continue to pursue opportunities for partnerships with the federal government and private entities to determine the feasibility of increasing water supplies through development of additional storage capacity. At the direction of the legislature, the Idaho Water Resource Board has entered into agreements with the U.S. Army Corps of Engineers and the Bureau of Reclamation for studies in the Boise River and Snake River basins. As demands increase

on Idaho's water storage and delivery systems, the need for additional water storage feasibility studies and funding partnerships will be assessed.

Implementation Strategies:

- Review existing authorities and identify changes needed to optimize financing for water resource projects.
- Evaluate Idaho Water Resource Board financial program procedures to determine whether revisions are needed to improve efficiency and accessibility.
- Pursue opportunities for private funding partnerships.
- Pursue opportunities for local, federal, and intra-state funding partnerships and projects.

Milestones:

- Financial programs and funding strategies meet the future water resource needs of the state.

3E – WATER RESOURCE PLANNING PROGRAM

Comprehensive water planning will help ensure sufficient water supplies to satisfy Idaho's future water needs.

Discussion:
Idaho Code § 42-1734A(1) directs the Idaho Water Resource Board to formulate and adopt a comprehensive state water plan for conservation, development, management and optimum use of all unappropriated water resources and waterways of the state. The legislature also authorized the Idaho Water Resource Board to develop plans for specific geographical areas. Comprehensive plans for individual hydrologic river basins include state protected river designations and basin-specific recommendations concerning water use and resource values. Basin plans also assure that the state's interests will be considered in federal management agency decisions. Public review and comment ensures that the state water plan serves the public interest. Article XV, section 7 of the Idaho Constitution authorizes the legislature to amend or reject the state water plan, as provided by law.

Adoption of The State Water Plan - Part One, The Objectives, in 1974, and The State Water Plan - Part Two in 1976, provided a comprehensive water plan, based upon an initial resource inventory, and provided a basis for more detailed planning for the hydrologic river basin plan areas. Implementing the policies in Part Two required the combined efforts of government agencies, the legislature, private concerns and the public. Consequently, the Plan delineated those areas where legislative action was required, identified the programs to be implemented by the Idaho Water Resource Board, and described programs requiring the cooperation of public and private interests. The Plan was revised and re-adopted in 1982, 1985, 1986, 1992, and 1996.

In 2008, the Idaho Legislature adopted Idaho Code Section 42-1779 and 42-1780, establishing the Comprehensive Aquifer Planning and Management Program (CAMP) and Aquifer Planning and Management Fund, which authorize the development of aquifer management plans throughout the state for hydraulically connected ground and surface water resources. As funding allows, the Idaho Water Resource Board will undertake comprehensive aquifer management planning in prioritized basins. CAMP development provides opportunities for addressing existing and future water-use disputes through a public process involving affected water users, state and federal agencies, and other stakeholders.

In exercising its responsibilities for water resource planning, the Idaho Water Resource Board will focus on the coordination of local, state and federal planning activities to minimize duplication and to promote the optimum use of Idaho's water resources.

Implementation Strategies:

- Review and update existing agreements for coordinated water resource planning.
- Develop new cooperative planning agreements.
- Secure funding to complete CAMPs for priority aquifers consistent with schedule established by the Idaho Water Resource Board.

Milestones:

- Cooperative planning agreements executed and implemented.
- Adoption of Treasure Valley and Rathdrum Prairie CAMP.
- Completion and adoption of CAMPs for remaining priority aquifers.

3F - WATER RIGHTS ADJUDICATION

Adjudication of water rights through the state courts should be completed to fully define and quantify all state, tribal and federal water rights.

Discussion:
The purpose of a general stream adjudication is to provide certainty and predictability in the administration and distribution of water diverting from hydraulically connected water sources. The need for a general adjudication of water rights in the Snake River Basin became apparent as the spring flows in the Thousand Springs reach began to decline and disputes arose over the availability of water supplies on the Snake River Plain. As part of the 1984 Swan Falls Agreement, the State agreed to commence the Snake River Basin Adjudication ("SRBA"), the largest legal proceeding in the history of the state. The SRBA is the cornerstone for the long-term management of the Snake River Basin within Idaho. At the conclusion of the SRBA, the state will have a listing of all water rights within the basin, which is the predicate for establishing water districts to administer all water rights in accordance with the prior appropriation doctrine, as established by law.

Pursuant to Idaho Code § 42-1734(3), the Idaho Water Resource Board is authorized to represent the state, when requested to do so by the Governor, in proceedings, negotiations, and hearings involving the federal government. In the SRBA, the Idaho Water Resource Board coordinated state participation in the negotiation of federal reserved water rights, including tribal claims. The Idaho Water Resource Board successfully negotiated agreements resolving federal reserved right claims including those filed by the Shoshone-Bannock, Nez Perce, and Shoshone-Paiute tribes as well as the claims of numerous federal agencies. The final settlement of the Nez Perce Tribe's claims reflected the tribe's and the state's shared interest in addressing environmental concerns and addressed the conflicting demands for consumptive and nonconsumptive uses. Consistent with state law, the Idaho Water Resource Board should serve as the lead agency for coordinating state participation in all general stream adjudications.

On November 12, 2008, the district court ordered the commencement of an adjudication in the Coeur d'Alene Spokane River water system. Like the SRBA, the determination of all existing water rights from the water basins in Northern Idaho will provide the basis for administration of water rights in accordance with the prior appropriation doctrine, as established by law.

Implementation Strategies:

Milestones:

3G - CLIMATE VARIABILITY

Preparedness strategies should be developed to account for the impact of climate variability on the state's water supplies.

Discussion:
Evidence suggests that currently the Earth's climate is warming and that warming may continue into the foreseeable future. While recognizing the uncertainties inherent in climate prediction, it is important to anticipate how a warming climate can potentially affect water supplies and plan accordingly.

Climate experts are less confident about how continued warming will affect the overall amount of precipitation Idaho receives, but changes in seasonal stream flows and increased annual variability have been documented. It is expected that seasonal flows in snowmelt-fed rivers will occur earlier, summer and fall stream flows will be reduced, and water temperatures will increase. Increased precipitation in the form of rain and fewer, but more intense, storm events are expected to result in more severe droughts and greater flooding. Potential impacts could also include more evaporation, reduced ground water recharge, water quality challenges, reduced productivity of hydropower facilities, and irreversible impacts on natural ecosystems. Water resource managers must evaluate and plan for these possibilities.

Planning for the potential impacts of climate variability requires increased flexibility in water administration and the identification of existing tools that can be adapted to address climate-induced changes in water supplies. Increased monitoring and data collection as well as conducting an initial vulnerability analysis for watersheds will help managers develop adaptive approaches to changes in the hydrologic regime that may accompany an increase in climate variability. Increasing public awareness and strengthening community and regional partnerships to manage shared water resources are proactive steps that should be taken now to provide for the optimum use of Idaho's water resources.

Implementation Strategies:

- Evaluate existing legal and institutional tools and constraints that can be adapted to provide flexibility for water resource managers.
- Implement a collaborative approach to the analysis of reservoir operation rule curves that adequately considers more recent hydrologic data.
- Pursue expansion and diversification of water supplies, including increased surface and ground water storage.
- Develop and update flood-risk assessments and environmental impact mitigation measures.
- Identify and implement adaptive mechanisms to address the impact of climate variability on water supplies.
- Establish stakeholder forums involving state and local water supply managers, scientists, state and federal agencies, and water users to enhance understanding about the science of climate variability, to share information about existing and potential tools for ameliorating the impact

of climate variability, and to increase understanding of the challenges facing water users and managers.

Milestones:

- Completion and implementation of updated flood control rule curves.
- Construction or expansion of water supply projects.
- Finalization of risk assessment studies.
- Documentation of legal and institutional framework and water management tools that anticipate and respond to climate variability.
- Establishment of regional forums that encourage the development of collaborative programs and decision making.
- Funding mechanisms in place for climate variability preparedness and risk assessment.

5A - BEAR RIVER COMPACT

Water use and management in the Bear River Basin shall conform to the allocations agreed to in the Bear River Compact.

Discussion:
The original Bear River Compact was signed into law on March 17, 1958, and amended on February 8, 1980. Idaho Code § 42-3402. The Compact was negotiated to provide for the efficient use of water for multiple purposes, to permit additional development, to promote interstate comity, and to accomplish the equitable apportionment of the waters of the Bear River among Idaho, Utah, and Wyoming. Water allocations for the Bear River Basin were adopted in 1978. The Compact is administered by an interstate administrative agency, the Bear River Commission, which is comprised of three members from each state and a non-voting federal chairman. The Bear River Commission must review the Compact at intervals of not less than twenty years and may propose amendments.

The Compact divides the Bear River into three divisions and treats allocation differently in each. The Upper Division of the river extends from its source in the Uinta Mountains, to and including Pixley Dam Wyoming. The Central Division includes the portion of the Bear River from Pixley Dam to, and including Stewart Dam. The Lower Division of the Bear River includes the flow from Stewart Dam to the Great Salt Lake and encompasses Bear Lake and its tributary drainage. The Compact makes allocations for the diversions of surface water, the storage of water above Bear Lake, ground water depletion, and future development. The allocation provisions for the three divisions of the Bear River apply only during times of shortage.

Idaho and Utah are implementing conjunctive management of surface and ground water. Idaho's Bear River Conjunctive Management Plan guides the development of ground water in the Bear River Ground Water Management Area. Although initial estimates of ground water depletions in the Lower Division indicate equal depletions in Idaho and Utah, the Idaho Water Resource Board encourages the Bear River Commission to prioritize additional studies to determine the effects of ground water use on the Bear River system.

Implementation Strategies:

- Encourage and assist the Bear River Commission to initiate further study and consideration of the effects of ground water use on Bear River surface flow.
- Ongoing review of Bear River Compact implementation and related issues, including depletion calculation procedures.

Milestones:

- Studies completed on the interaction between ground water and surface water in the Bear River Basin.

5B - BEAR RIVER BASIN WATER MANAGEMENT

The Idaho Water Resource Board supports enhancing water supplies, increasing water use efficiency, and implementing water supply bank mechanisms to help meet future water needs in the Bear River Basin.

Discussion:
The Bear River Compact designates how the undeveloped water supplies of the Bear River are to be allocated among Idaho, Utah, and Wyoming. The Compact allocates a first right to development and depletion of water not currently allocated in the Lower Division to Idaho, in the amount of 125,000 acre feet. In addition to the efficient use of existing developed water supplies, the state should move forward with the development of Idaho's depletion allocations as provided for in the Compact.

Ground water is available for development, but its development cannot injure existing senior water rights. In 2001, the Department of Water Resources established the Bear River Ground Water Management Area and created an advisory committee to provide guidance in the preparation of a ground water management plan. The Bear River Ground Water Management Plan, adopted in 2003, provides for managing the effects of ground water withdrawals to accommodate projected growth and water demand in the Bear River Basin, while protecting senior priority surface and ground water rights from injury. In addition to the use of mitigation plans that protect existing rights, the plan encourages flexible strategies for making water available for new development including new surface storage, ground water recharge projects, and transfers of existing rights through water banking and other marketing mechanisms. The ground water management plan encourages the wise use of available water supplies and continues the involvement of a local advisory committee in the development of management policies for the area. To address declining ground water levels, the Bear River Basin has been designated as a priority basin for the development and implementation of a comprehensive aquifer management plan.

Idaho Code § 42-1765 authorizes the Idaho Water Resource Board to create a local rental pool to facilitate marketing of stored water. A Bear River rental pool would provide the advantage of being locally managed and controlled, with the flexibility to develop specific procedures designed to address special conditions existing in the basin. Use of water supply banks also provides protection from forfeiture for unused water rights in Idaho and a source of funding for improving water management. Cooperation between Idaho, Utah, and PacifiCorp will be required to establish a storage rental pool for Bear Lake.

Implementation Strategies:
- Initiate further discussion concerning the development of a Bear River storage water rental pool with the Bear River Commission, Utah, and PacifiCorp.
- Develop strategies to improve water supplies and reduce demand through the implementation of a comprehensive aquifer management plan, in coordination with Utah, Wyoming, and PacifiCorp.

Milestones:
- Bear River Basin comprehensive aquifer management planning underway.

5C - INTERSTATE WATER DELIVERY

Idaho water users in the Lower Division of the Bear River Basin must be protected from inequitable water allocation in the event of a water emergency and the scheduling of interstate water deliveries.

Discussion:
The Bear River Compact authorizes the Bear River Commission to implement a water delivery schedule in the Lower Division without regard to state boundaries if the Bear River Commission finds that a "water emergency" exists. Idaho Code section 42-3402. This provision was intended to apply only to true emergency conditions which must be determined using comprehensive accounting processes. Idaho and Utah have developed separate, but similar water accounting models that incorporate the rights identified in the Commission Approved Lower Division Water Delivery Schedule. Absent a water emergency, Idaho water users are not required to accept delivery based upon interstate accounting allocation. Both states, however, have worked to reconcile their respective accounting models to reduce conflict over water delivery.

The "Bear Lake Settlement Agreement" was signed and voluntarily adopted by Lower Division water users and PacifiCorp in 1995 and amended in 2003. The agreement established, among other things, an "Irrigation Water Allocation and Lake Recovery Proposal" for Bear Lake. The proposal provides for an "Annual Allocation" which represents the total, estimated quantity of water available to be delivered to storage contract holders. This agreement and the state water accounting models have resulted in a process by which Lower Division water users have voluntarily agreed to water delivery by water right priority without regard to state boundaries.

Implementation Strategies:
- Continue work with Utah and Lower Division water users to improve water right accounting models.
- Facilitate and promote improved water delivery and measurement, including gage and diversion automation.

Milestones:
- Continued cooperation in interstate water administration.
- Completion of technical upgrades to water delivery and measurement infrastructure.

- Strategies developed to meet future water needs.
- Local storage rental pool established.
- Development of Idaho's depletion allocation.

5D - BEAR LAKE

The outstanding recreational, aesthetic, and fish and wildlife resource values of Bear Lake should be preserved, while recognizing the existing storage allocations for irrigation and hydroelectric power generation.

Discussion:
Bear Lake, noted for its unique coloration and endemic fish species, provides an abundance of recreational opportunities. To protect these values, the Idaho Water Resource Board obtained a minimum lake level water right for Bear Lake of 5902 feet.

The 2003 Bear Lake Settlement Agreement between Idaho, Utah, Wyoming, and PacifiCorp confirmed that Bear Lake must be operated primarily as a storage reservoir to satisfy contracts for existing irrigation uses and flood control needs in the three states, with the use of water for hydropower generation being incidental to other purposes. Bear Lake storage is allocated based on lake elevation with reduced allocations occurring when Bear Lake falls below the irrigation reserve of 5914.7 feet. The settlement agreement also provides for a portion of the active storage in Bear Lake to be voluntarily retained to enhance recreation and water quality values.

Pursuant to the 2002 Settlement Agreement Resolving the Relicensing of the Bear River Hydroelectric Projects and the Federal Energy Regulatory Commission licenses issued for PacifiCorp's Bear River projects, protection, mitigation, and enhancement measures are being implemented to benefit fish and wildlife and recreational resources in the Bear River Basin. The settlement agreement established a committee to guide implementation of these measures, with a primary focus on protecting and improving habitat for Bonneville Cutthroat Trout. The settlement agreement confirms that PacifiCorp's ability to regulate Bear Lake reservoir levels and provide instream flows at the projects for these purposes is restricted by and subject to historic practices, water rights, and flood control responsibilities that are memorialized in water contracts, water agreements, and judicial decrees and opinions.

The Bear River Compact provides for cooperation with state and federal agencies in matters relating to water pollution of interstate significance. The Idaho Water Resource Board supports the Bear River Commission's efforts to develop opportunities for more integrated watershed management throughout the basin.

Implementation Strategies:

- Cooperate with the Bear River Commission to address interstate issues of concern related to Bear Lake, including water quality, threatened or endangered species and species of special concern, and recreation.

Milestones:

- Bear Lake operations are consistent with 2003 Bear Lake Settlement Agreement.
- Cooperative programs addressing interstate issues of concern related to water quality, recreation, and sensitive species implemented.

SALMON/CLEARWATER RIVER BASINS

6A - HABITAT CONSERVATION PLANS

Voluntary, community-based conservation plans and strategies for the benefit of ESA-listed species and other species of concern are key components of water planning and management in the Salmon and Clearwater River Basins.

Discussion:
The Salmon and Clearwater River basins support a thriving agricultural industry and significant tourism. Because a number of fish species in the Salmon and Clearwater River basins have been listed as threatened or endangered under the ESA, numerous programs are being implemented to improve fish habitat, while protecting existing water rights. A significant portion of freshwater habitat important to ESA-listed fish is located on private lands. As a consequence, local support is key to implementing conservation measures that advance species' recovery. Federal agencies are encouraged to cooperate with state and local landowners to develop voluntary, incentive-based conservation plans. Any water required for instream uses must be obtained in compliance with state law.

In the Snake River Basin Adjudication, the state entered into two agreements that provide for water management within the basin that supports agricultural-based communities, while encouraging the voluntary implementation of flow-related conservation measures that improve instream conditions for ESA-listed fish. The agreements are based upon improving instream flow conditions pursuant to state law.

- **Snake River Water Rights Agreement of 2004**

The Snake River Water Rights Agreement of 2004 resolved all of the issues related to the Nez Perce Tribe's water right claims in the Snake River Basin Adjudication. In the Salmon and Clearwater basins, the primary goal of the settlement agreement provisions is to conserve and enhance fish habitat in order to address ESA concerns. There are three cornerstones to such efforts: the establishment of state minimum flows, the establishment of a voluntary forestry program with standards to improve fish habitat, and the establishment of voluntary programs by irrigators and other water users to improve instream flow.

The state and local water users are working with the federal agencies, tribes, and other stakeholders to advance the recovery of listed species through the development of conservation agreements under Section 6 of the ESA. In coordination with the Office of Species Conservation, the state has begun early implementation of voluntary conservation measures that provide immediate benefits to ESA-listed fish and provide the foundation for implementation of long-range plans.

As a result of the Snake River Water Rights Agreement, the Idaho Water Resource Board holds minimum stream flow water rights on 205 streams that provide significant protection for steelhead, salmon, and bull trout. Most of the streams flow through federal public lands and have minimal use. Twenty-four streams, however, are in basins with substantial private ownership and significant private water use. The flows for those streams were established after consultation with local communities. Where the minimum stream flow water rights are higher than existing flows, the Idaho Water Resource Board works with water users on a voluntary basis to rent or otherwise acquire water to return to streams, in accordance with state law.

- **Wild and Scenic Rivers Agreement**

The Wild and Scenic Rivers Agreement resolved issues related to federal reserved water right claims filed by the federal government under the Wild and Scenic Rivers Act. The agreement provides for the quantification of the wild and scenic federal reserved water rights and state administration of those rights. To protect existing rights and allow for some future development, the United States agreed to subordinate the federal rights to certain junior priority state and private rights and to a sum certain of future junior rights.

Implementation Strategies

- Ensure that the water right application review process considers basin conservation plans and limiting factors for ESA-listed fish.
- Ensure that the stream channel alteration permit process considers basin conservation plans and limiting factors for ESA-listed fish.
- Develop flow-limited reach GIS maps for use in water administration.
- Continue early implementation of conservation measures.
- Develop and implement conservation projects and plans based on local problem-solving and support.

Milestones

- Conservation measures implemented.
- Conservation plans approved pursuant to Section 6 of the ESA and implemented.
- Approved water right transfers address limiting factors for ESA-listed fish.
- Water right permits address limiting factors for ESA-listed fish.
- Flow-limited reach GIS maps completed and in use.

6B - INSTREAM FLOW

The Idaho Water Resource Board will promote, provide, and where possible, expand opportunities for voluntary, market-based transactions to improve instream flow for the benefit of ESA-listed aquatic species.

Discussion:
The Idaho Water Resource Board administers and participates in a variety of programs to improve instream flows throughout the Salmon and Clearwater River basins. This programmatic approach to addressing the needs of ESA-listed and other sensitive species includes a suite of water supply acquisition tools including short and long-term leases, permanent purchases, partial season leases, diversion reduction agreements, and water use efficiency measures, all of which are market-based and voluntary. The Idaho Water Resource Board works collaboratively with organizations committed to voluntary, market-based conservation strategies, such as conservation easements, to maximize instream flow programs. These partnerships benefit targeted fish species and support local economies.

- **Columbia Basin Water Transaction Program**

The Columbia Basin Water Transactions Program was initiated in 2002 to support innovative, voluntary, grassroots strategies to improve flows in the Columbia River Basin's streams and rivers. The majority of funding is provided by the Bonneville Power Administration in cooperation with the Northwest Power and Conservation Council. It is in the public interest to continue implementation of the Columbia Basin Water Transactions Program in the Salmon and Clearwater basins to keep agriculture productive and improve instream flows for ESA-listed and other sensitive fish species.

- **Section 6 Habitat Conservation Fund**

Section 6 of the ESA directs "that Federal agencies shall cooperate with State and local agencies to resolve water resource issues in concert with conservation of endangered species." 16 U.S.C.A. § 1531(C)(2). Pursuant to the Snake River Water Rights Agreement of 2004, in addition to the establishment of minimum stream flow water rights, the state agreed to work with local stakeholders and communities to develop work plans for addressing limiting factors for fish on streams with degraded habitat. The state also agreed to develop cooperative agreements under Section 6 of the ESA with the assistance of local land owners, federal agencies, and tribes to establish long-term conservation goals and conservation measures that will contribute to the recovery of anadromous and resident fish in the Upper Salmon River Basin. The Idaho Water Resource Board's instream flow programs are central to the development and implementation of Section 6 Conservation Plans.

- **Pacific Coast Salmon Restoration Fund**

The Pacific Coast Salmon Restoration Fund provides grants to state agencies and treaty Indian tribes for salmon recovery efforts. The Idaho Water Resource Board works with agencies, tribes, and stakeholders to use Pacific Coast Salmon Restoration Fund monies for early implementation of conservation measures in the basins.

- **2008 Columbia Basin Fish Accords**

The Columbia Basin Fish Accords are designed to supplement biological opinions for listed salmon and steelhead and the Northwest Power and Conservation Council's fish and wildlife program. The agreement between the State of Idaho, the Bonneville Power Administration, the U.S. Army Corps of Engineers, and the U.S. Bureau of Reclamation addresses issues associated with the direct and indirect effects of construction, inundation, operation and maintenance of the Federal Columbia River Power System, and Reclamation's Upper Snake River Project on the fish and wildlife resources in the Columbia River Basin.

Under the agreement, the Bonneville Power Administration committed to funding a suite of habitat quality improvement projects designed to address limiting factors within the basins affecting ESA-listed salmon and steelhead. The Idaho Water Resource Board uses these funds to develop projects that improve instream flow and freshwater survival of ESA-listed salmon and steelhead. The program targets flow-related projects that reconnect tributaries and increase flow in the mainstem Lemhi and Pashimeroi Rivers to improve fish passage conditions and increase the quantity and quality of fish habitat.

Implementation Strategies:

- Continue implementation of programs to improve instream flows in the Salmon and Clearwater River basins.
- Pursue opportunities for partnerships with local water users and other stakeholders to implement programs that improve instream flows and support local economies.

Milestones:

- Number and scope of instream flow improvement projects implemented.
- Number of participants in instream flow improvement projects.
- Degree of habitat improvement resulting from instream flow programs.

PANHANDLE RIVER BASINS

7A - INTERSTATE AQUIFERS

Completion of comprehensive aquifer management plans and the Northern Idaho Adjudication and implementation of interstate agreements are central to the optimum use of the Panhandle Basin's water resources.

Discussion:
The Panhandle's rivers and lakes are key to continued economic development and provide for multiple uses of water including irrigation, domestic supplies, mining, and commercial uses. These lakes and rivers also provide significant recreation, fish and wildlife, and aesthetic resources important for the region's economy. In average water years, Idaho's Panhandle region has an abundant water supply. A growing population and the urbanization of agricultural lands, however, have resulted in increased ground water use which has resulted in conflicts over water quantity and quality within the region and across state boundaries.

- **Spokane Valley-Rathdrum Prairie Aquifer**

The Rathdrum Prairie Aquifer (RPA) extends south from Bonner County through Kootenai County toward the cities of Coeur d'Alene and Post Falls and west to the Idaho-Washington state line. The aquifer extends into Washington and becomes part of the larger Spokane Valley-Rathdrum Prairie (SVRP) Aquifer. The area includes the rapidly growing cities of Spokane, Washington and Coeur d'Alene and Post Falls, Idaho. The SVRP Aquifer was designated a "Sole Source Aquifer" by the U.S. Environmental Protection Agency in 1978 and a sensitive source aquifer by the state of Idaho.

In 2002, the Director of the Idaho Department of Water Resources , pursuant to Idaho Code § 42-233b, designated the Rathdrum Prairie Ground Water Management Area and created the Rathdrum Prairie Ground Water Management Area Advisory Committee, composed of members representing the interests of citizen groups, municipalities, counties, and other irrigation, commercial, and industrial water users within the designated area. On September 15, 2005, the Director issued a final order adopting the Ground Water Management Plan for the Rathdrum Prairie Ground Water Management Area. The plan, based in large part on the recommendations of the advisory committee, sets forth goals, strategies, and actions for managing the ground water resources of the SVRP Aquifer. Goals include obtaining adequate technical data and quantification of water availability and water use, managing the ground water resource efficiently and fairly for all users, and encouraging planning and water conservation efforts.

Although the states of Idaho and Washington have primary responsibility for water allocation and water quality, local governments are increasingly being called upon to consider water supply and water quality implications in land use planning. To address these challenges, a study of the SVRP Aquifer was conducted jointly by the Idaho Department of Water Resources, the Washington State Department of Ecology, and the United States Geological Service. Begun in 2003 with broad community support, the purpose of the project is to provide a scientific foundation to assist the states

in water administration. The SVRP Aquifer study established a collaborative modeling committee of experts from both states. Significant new information from the study refined earlier estimates of hydrologic information. The data, computer model, water budget, and other information are available to the public and provide a detailed, up-to-date basis for assessing all aspects of ground water use, including water development, establishing well head protection zones, and local and regional land use planning. A 2007 agreement between the Idaho Department of Water Resources and the Washington State Department of Ecology establishes a collaborative framework to maintain and enhance the model to inform state management decisions.

Pursuant to Idaho Code § 42-1779, which established the Statewide Comprehensive Aquifer Planning and Management Program, a comprehensive aquifer management plan is being developed for the Rathdrum Prairie Aquifer. The Idaho Water Resource Board has appointed an advisory committee to develop and recommend an aquifer management plan that addresses future water supplies and demands. Once adopted, the Idaho Water Resource Board will be responsible for implementing the plan to obtain sustainable water supplies and optimum use of the region's water resources.

- **Palouse Basin Aquifers**

The development of a comprehensive aquifer management plan for the Palouse Basin is also a priority. The Grande Ronde and Wanapum aquifers underlie the Palouse Basin. The Pullman-Moscow area of eastern Washington and northern Idaho relies almost entirely on ground water for its supply of municipal, institutional, and domestic water. The Palouse Basin Aquifer Committee consists of representatives from the cities of Moscow, Pullman, Colfax, Latah, and Whitman counties, the University of Idaho and Washington State University and was formed to address concerns about declining ground water levels and coordinate studies to further inform water management decisions. In 1992, with the assistance of the states and pursuant to several intergovernmental agreements, a Pullman-Moscow Ground Water Management Plan was completed. The plan provides technical information about the general response of the Wanapum and Grande Ronde aquifers to pumping withdrawals and recommendations for future use that limit ground water depletion and protect water quality through conservation practices and other measures. Additional studies are needed to better understand the hydrology of the aquifers.

Managing cross-boundary conflicts requires an accounting of the state's water resources. Adjudication of water rights in the Panhandle region should therefore be completed to fully define and quantify existing water rights. The determination of all existing water rights from the river basins in northern Idaho will provide the basis for administration of water rights in accordance with the prior appropriation doctrine, as established by law, and for interstate cooperation. Pursuant to Idaho Code § 42-1406B, the Director of the Idaho Department of Water Resources filed a petition in the district court to commence an adjudication for northern Idaho. On November 12, 2008, the district court ordered the commencement of adjudication in the Coeur d'Alene Spokane River water system. The estimated date for completion of the adjudication is 2012.

Idaho Code § 42-1734(3) authorizes the Idaho Water Resource Board to appear on behalf of the state in negotiations with the federal government. Consistent with state law, the Idaho Water Resource Board should serve as the lead agency for coordinating state participation in the Northern Idaho Adjudication.

Implementation Strategies:

- Complete and implement comprehensive aquifer management plans for the Rathdrum Prairie and Palouse River basins that establish goals, objectives, and strategies to address the increasing demand on water supplies, reduce cross-boundary conflicts, and provide for effective conjunctive management of hydraulically connected water resources.
- Complete the Northern Idaho Adjudication.
- Implement and maintain the cooperative agreement between Idaho and Washington for maintenance of the SVRP Aquifer ground water model.
- Advise and provide technical support to Palouse Basin Aquifer Committee and other stakeholders to promote the wise use of the region's water supply.
- Provide technical support for the completion of aquifer studies that will assist in water management.

Milestones:

- Cooperative agreements approved and implemented by Idaho and Washington.
- Rathdrum Prairie and Palouse comprehensive aquifer management plans completed and implemented.
- Northern Idaho Adjudication completed.
- Aquifer studies completed.

7B - MINIMUM STREAM FLOWS

The Idaho Water Resource Board will establish and protect minimum stream flow and lake level water rights to preserve the scenic and recreational water bodies in the Panhandle river basins.

Discussion:
The Panhandle contains some of the most significant scenic and recreational water bodies in the state. The Idaho Water Resource Board holds 19 minimum stream flow water rights on reaches of the Pend Oreille, St. Maries, Pack, Moyie, St. Joe, Coeur d'Alene, and Spokane rivers that protect approximately 17,600 cfs total flow. In 1927, the state established minimum lake levels for Priest, Pend Oreille and Coeur d'Alene lakes. These water rights protect and support many beneficial uses of water such as fish and wildlife habitat, aquatic life, recreation and aesthetic values, and navigation in the Panhandle basins and make a significant contribution to the economy of the region and the state.

Population growth and new water demands may increase the need to obtain additional minimum stream flows in the Panhandle region. The establishment and use of local water supply banks and rental pools should be considered as a strategy for addressing the need for meeting minimum stream flow water rights or new rights in the Panhandle region, including minimum lake levels for the protection of navigation and transportation, fish and aquatic resources, and aesthetic and recreational values.

Implementation Strategies:
- Coordinate with state and federal agencies and stakeholders to identify potential minimum stream flow needs.
- Submit applications for minimum stream flow water rights that are in the public interest.
- Monitor activities that could impair minimum stream flows.
- Evaluate the need for establishment of local water supply banks.

Milestones:
- Minimum stream flow water rights established.

7C - NAVIGATION, FISHERIES, AND RECREATION

Water management decisions in the Panhandle Region should minimize, where feasible, adverse effects on navigation, fisheries, and recreation.

Discussion:
The Panhandle's lakes and rivers provide for commercial and recreational navigation and important habitat for numerous fish and wildlife species. These resources are also affected by the operation of private and federal hydropower projects. Avista's Clark Fork projects, located in Montana and Idaho, are operated pursuant to a Federal Energy Regulatory Commission license based upon a comprehensive settlement agreement executed by Idaho, Montana, federal agencies and Indian tribes, and other stakeholders. The Post Falls project license is also based, in part, upon a settlement agreement between Avista, the Idaho Department of Fish and Game and the Idaho Department of Parks and Recreation. The Post Falls license requires a summer full-pool elevation and fall draw-down protocol for Lake Couer d'Alene that is protective of fishery needs, while providing adequate lake levels for summer recreation activities and navigation.

On the Pend Oreille River, the U.S. Army Corp of Engineers operates Albeni Falls Dam, which controls the level of Lake Pend Oreille. Lake Pend Oreille has been designated a Special Resource Water, a special body of water recognized by the state as needing intensive protection. Since 1996, consistent with a U.S. Fish and Wildlife Service Biological Opinion on the operation of the Federal Columbia River Power System, winter lake levels have been managed for the protection of the lake's kokanee population, an important forage base for ESA-listed bull trout. Winter lake level management also directly affects the amount of erosion and sedimentation that occurs, waterfowl habitat, water quality, navigation, and shoreline infrastructure. Cooperation between the state and federal government and community stakeholders is essential for making sound management decisions regarding the operation of Albeni Falls Dam.

In 2003, the Idaho legislature created the Lake Pend Oreille, Pend Oreille River, Priest Lake and Priest River Commission (Lakes Commission) to address water quantity and water quality issues affecting the state's and local communities' interests, while recognizing existing authorities. The Idaho Water Resource Board supports the Lakes Commission's participation in regional water management decisions and efforts to minimize adverse effects on navigation, water quality, and fish, wildlife, and recreational resources.

Implementation Strategies:

- Identify proposed actions that may affect navigation, water quality, and fish, wildlife, and recreation resources, in coordination with state and federal agencies and stakeholders.

- Provide technical assistance to assist the Lake Commission's participation in regional water management decisions.

Milestones:

- Collaborative water management decisions made that minimize adverse effects on navigation, water quality, and fish, wildlife, and recreational resources.

STATE WATER PLAN – SNAKE RIVER POLICY

4 - SNAKE RIVER BASIN

4 – SNAKE RIVER BASIN WATER MANAGEMENT FRAMEWORK

The Idaho Water Resource Board's Snake River minimum stream flows establish the framework for water management in the Snake River basin.

Discussion:

Approximately 87% of the surface area of the State of Idaho is within the Snake River drainage basin. The waters of the Snake River form the backbone of Idaho's economy. Effective management of this resource is essential to protecting existing water rights, sustaining economic growth, maintaining low-cost power rates, and preserving fish, wildlife and other environmental values.

At the core of Snake River water management is the state policy of managing the Snake River to meet or exceed minimum stream flows established at the Milner, Murphy, Weiser, Johnson Bar and Lime Point gaging stations. These minimum stream flows establish, as a matter of state policy, a balance between diversion of water out of stream for consumptive uses and preservation of flows for instream uses. This policy of managing reaches of the Snake River to meet or exceed designated instream flows evolved over the course of the 20th Century and was incorporated into the 1976 State Water Plan. A brief overview of the evolution of the instream flow management policy is provided to give context for the individual river reach policies that follow.

Throughout the first half of the 20th Century the dynamic tension between diversion of water for consumptive uses and retention of flows for instream uses was manifested in the context of the simultaneous development of the irrigable lands within the Snake River Basin and the development of the hydropower potential of the main stem Snake River.

Initially, the conflict was resolved through the development of the Milner Policy in 1920, which dedicated the flow of the Snake River above Milner Dam for future agricultural development. The Milner Policy was based upon the physical character of the river. Upstream from the Milner Dam the relatively flat landscape facilitated water diversions from the main stem Snake River into canal systems with technology available at the time. Below Milner Dam, the Snake River enters a deep canyon and was largely inaccessible for agricultural development in the first half of the 20th century. The decent of the Snake River into the canyon below Milner, however, made the downstream reach of the river ideally suited for hydropower development. Thus, the State adopted the Milner Policy, which subordinated hydropower development below Milner to future upstream development. As discussed more fully below, the Milner Policy as it evolved does not mandate a zero flow at the Milner gage but rather prevents holders of water rights using water below Milner Dam from calling for the delivery of water above Milner Dam.

The advent of high lift pumping technology in the 1950s precipitated the next phase of the Snake minimum stream flow policy. Pumping made irrigation of vast expanses of desert land lying above the Eastern Snake Plain Aquifer possible. Additional power to turn the pumps was to come from

development of the hydropower potential of the Hells Canyon reach of the Snake River. Concern that hydropower development might monopolize the flows of the Snake River, however, led to an agreement between the State of Idaho and Idaho Power Company that subordinated its hydropower water rights for the Hells Canyon complex to all future upstream consumptive uses. The subordination provision in the Hells Canyon complex license, like the Milner Policy, precludes hydropower uses from interfering with future upstream development.

The FPC license for the Hells Canyon complex provided for operational flows at Johnson Bar and Lime Point to provide for navigation. As discussed more fully in the Below Weiser reach policy, these operational flows form the basis for the Johnson Bar and Lime Point state minimum stream flows, which were first recognized in the 1976 Idaho State Water Plan.

In the latter part of the 20th Century, the dynamic tension between consumptive and instream flow uses expanded beyond the irrigation/hydropower context to include water quality, fish and wildlife and other instream uses. Studies conducted by the Idaho Department of Fish and Game suggested that further depletions of the flows of the Snake River in the reach between Milner and Weiser would be detrimental to fish and wildlife. Thus, the 1976 Idaho State Water Plan determined it was not in the public interest to allow depletion of the average daily flow of the Snake River below 3,300 cfs at the Murphy gage and below 4,750 cfs at the Weiser gage. These minimum flows were established to "maintain water for production of hydropower and other main stem water uses. . . "

The Swan Falls Controversy brought the need for maintaining minimum flows into greater focus and led to a comprehensive settlement balancing instream uses with upstream development. The average minimum daily flow at the Murphy gage was increased to 3,900 cfs during the irrigation season and 5,600 cfs during the non-irrigation season and the State Water Plan directed "that ground water and surface water of the Snake River basin would be managed to meet or exceed the state minimum average daily flow at Milner, Murphy, and Weiser. The Murphy and Weiser minimum flows were designated as management constraints.

The State of Idaho, as part of the 2004 Snake River Water Rights Agreement, established a flow augmentation program that supplements the main stem Snake River state minimum stream flows. The program consists of two tiers. Tier 1 recognizes the Milner and Murphy minimum stream flows as base flows. Tier 2 provides for the rental of storage water in accordance with the provisions of Idaho Code § 42-1763B and the Snake River flow component of the 2004 Snake River Water Rights Agreement and for the acquisition of up to 60,000 acre-feet of natural flow water rights within the Milner to Murphy reach of the Snake River.

The minimum stream flows that evolved over the last century form an integrated plan for management of the Snake River as a whole. Each minimum stream flow was established to address specific management objectives for the Snake River above its ending point. The State Water Plan, beginning with the first plan in 1976 and continuing though each successive plan, has recognized this framework as a means of ensuring an equitable allocation of the flows of the Snake River between consumptive and instream uses and as a means of ensuring an equitable allocation of the flows of the Snake River for future development throughout the basin. While this framework allows for the development of future uses of water within each reach, localized decisions must take into account the potential impact of such development on water supplies in other reaches.

STATE WATER PLAN – SNAKE RIVER POLICY

SNAKE RIVER ABOVE MILNER DAM
OUTLINE

4 - SNAKE RIVER BASIN

4B- SNAKE RIVER ABOVE MILNER DAM

Water resource policy, planning and practice should continue to optimize water use and provide for full development of the Snake River above Milner Dam recognizing that the exercise of water rights above Milner Dam has and may reduce flow at the Dam to zero.

Discussion:

Milner Policy: The formulation and implementation of a plan for the optimum development and use of the water resources of the Snake River above Milner Dam must be consistent with the so called "Milner Policy" set forth in Idaho Code § 42-203B(2), which provides that no portion of the waters of the Snake River upstream from Milner Dam shall be considered for the purposes of the determination and administration of rights to the use of the waters downstream from Milner dam. The exercise of water rights above Milner Dam may reduce the flow of the Snake River at Milner Dam to zero.

The Milner Policy evolved from a 1920 report prepared by a Board of Engineers convened by the Governor and the United States for the purpose of preparing a plan for the future development of irrigation and hydropower in the Upper Snake River Basin. As described by the Board of Engineers, the Milner Policy was founded upon the physical divide in the Snake River at Milner Dam. Above Milner Dam, the waters were easily diverted and used for irrigation and other consumptive uses. Below Milner Dam the river descended into a deep canyon and was unavailable for agricultural development with technology available at the time. The Board recommended, therefore, that in order to make optimum use of the water resources the entire flow of the Snake River above Milner should be dedicated to the extent economically feasible for upstream irrigation. Over the past century, the Milner Policy guided the economic growth and the development within the Snake River basin and is inextricably intertwined with the overall management of the water resources of the basin.

The Milner Policy envisioned that while development of the flows above Milner Dam would have some impact on hydropower generation, the increased spring flows resulting from the upstream development would sustain hydropower production downstream from Milner Dam. In order to ensure that hydropower development didn't interfere with development above Milner, however, the Board advised that in "granting power rights in the future the Federal Government and the State should so far as possible provide restrictions requiring [their] eventual surrender ..." This policy of subordinating hydropower development to upstream consumptive uses was affirmed by the 1984 Swan Falls Settlement and 2009 Swan Falls Reaffirmation Agreement between the State and Idaho Power Company.

Consistent with the Milner Policy and the Swan Falls Settlement, the primary long-term water planning objective for the Snake River above Milner Dam is to ensure that unappropriated flows tributary to the Snake River above Milner Dam are available to supply existing and future beneficial uses in this reach of the Snake River.

Conjunctive Administration of Spring Flow and GW Rights: On January 6, 1993, the Director of the Idaho Department of Water Resources issued an Amended Moratorium Order against the issuance of permits to divert water from the Snake River and all tributary sources above Milner Dam in the non-trust water area (1993 Non-Trust Water Moratorium). The Moratorium seeks to protect the status quo while moving forward with the implementation of the conjunctive administration of surface and ground water rights. Resolution of the surface/ground water conflict is essential to the implementation of the long-term water planning objectives for this reach of the Snake River.

ESPA CAMP: Consistent with Milner Policy and the intent to optimize use of water in a heavily developed basin, as well as the need to address concerns about water supply and conflicts between surface and ground water use in the Eastern Snake Plain, the Idaho Water Resource Board adopted the Eastern Snake Plan (ESPA) Comprehensive Aquifer Management Plan (CAMP) to "Sustain the economic viability and social and environmental health of the Eastern Snake Plain by adaptively managing the balance between water use and supplies." The objectives of the plan are to increase predictability for water users by managing the water resources to provide for a reliable water supply for existing and future uses. The plan established long-term strategies to incrementally achieve a net water budget change in the ESPA of 600 thousand acre-feet (kaf) annually by the year 2030 through a suite of water management actions.

The ESPA CAMP uses a phased approach to achieving the long-term change in the water budget. The goal of Phase 1 of ESPA CAMP is to implement measures over a ten year period that will result in a target hydrologic water budget change of between 200 kaf and 300 kaf. The recommended measures to achieve this target include ground water to surface water conversions, managed aquifer recharge, demand reduction, and weather modification.

Fully implementing the ESPA CAMP will improve the opportunities to adaptively manage and optimize water supplies across the ESPA by: increasing gains in some river reaches, improving storage carryover; increasing aquifer levels; decreasing the need for litigation, mitigation and administrative activities; allowing for municipal and industrial growth; reducing overall demand; and increasing and sustaining spring flow. The ESPA CAMP anticipates implementation of Phase I strategies by 2018 with ongoing monitoring and evaluation of the intended and unintended effects of the strategies. The monitoring and evaluation studies will be used to select and design Phase II strategies.

As part of the 2009 Swan Falls Reaffirmation Agreement, the State and the Board entered into a Memorandum of Agreement with Idaho Power Company that requires the Board to obtain legislative approval to increase the Phase 1 ESPA CAMP managed recharge goal of 100,000 af by more than 75,000 af prior to January 1, 2019. "The purpose of this memorandum of agreement is to recognize that implementation of managed recharge will have an effect on the flow characteristics of the Snake River above and below Milner Dam and to confirm that the relative merits of recharge proposals in addition to or different than that provided in Phase 1 of ESPA CAMP will be considered through the adaptive management process set forth in Section 4 of ESPA CAMP." The Memorandum of Agreement also requires that a change to the ESPA CAMP long-term hydrologic target for managed recharge target must be accomplished through an amendment of the State Water Plan. Finally, the Memorandum of

Agreement recognizes that it is the mutual interest of the State and the Company to work cooperatively to explore and develop a managed recharge program for the Snake River Basin above the Swan Falls Dam that achieves to the extent possible benefits for all uses including hydropower.

Upper Snake River Optimum Use Policy: Except for winter flows in excess of the storage capacity of existing reservoirs, the reliable water supply of the Snake River Basin above Milner Dam is nearly developed. Thus, future development of the water resources in the Snake River Basin upstream of Milner Dam consistent with the State Water Plan and the ESPA CAMP will require measures that augment and enhance available water supplies, such as the development and efficient use of existing on-stream, off-stream, and aquifer storage, development of new storage, and water right acquisitions and exchanges. Implementation of such actions, however, will result in a change in flows passing Milner. Therefore, as discussed in the Milner to Murphy Reach section, a process must be in place to identify and account for impacts that development above Milner will have on the water supply available to meet management objectives in the Milner to Murphy reach of the Snake River.

Coordinated management of the water resource development with the federal reservoir system above Milner Dam will provide an opportunity to optimize the use of the available water supply above Milner Dam. Therefore, the following Upper Snake River Optimum Use Policy is established:

1. It is in the public interest to manage the water resources above Milner Dam in a coordinated manner consistent with state law and the State Water Plan to provide a reliable supply of water for existing and future beneficial uses.

2. The Bureau of Reclamation is encouraged to manage the federal reservoir system above Milner Dam in a manner compatible with this policy, to the extent consistent with federal reclamation law and project purposes. To facilitate this effort, the Board will implement a process to openly address water management and reservoir operation needs through a standing advisory subcommittee. The subcommittee will be a collaborative forum where relevant information may be exchanged and reviewed on how the state and the Bureau of Reclamation, in the exercise of their respective authorities, can optimize the management of the water resources and the reservoir system above Milner Dam consistent with the policy set forth in paragraph 1. The Board shall request that the Bureau of Reclamationand the Committee of Nine, designate representatives as standing members of this subcommittee and shall invite other parties that may be interested in the management of affected water resources to also participate. This subcommittee may periodically submit advisory recommendations to the Board and the Bureau of Reclamation, but shall have no power or authority to affect vested water rights or to prescribe the manner in which the federal reservoir system or the water resources above Milner Dam shall be managed.

In the early 1990s the Idaho Legislature at the request of the Bureau of Reclamation provided authorization for the rental of up to 427,000 af of storage water on a willing buyer-willing seller basis for augmenting flows for ESA-listed fish in the Lower Snake River. Despite continuing concerns about the efficacy of flow augmentation, the 2004 Snake River Water Rights Agreement resolving the Nez Perce Tribe's water right claims in the SRBA extended the flow augmentation program for a period of thirty years. All storage water released for flow augmentation must be rented through the Idaho Water Resource Board's water bank or through local water rental committees on a willing buyer-willing seller

basis. In addition, the State acquired 60,000 af of natural flow water rights that it has rented to the Bureau of Reclamation as part of the flow augmentation program. While the total amount of water provided in any particular year varies based upon water available for rental and market conditions there is an annual cap of 427,000 af. This annual cap may be increased to 487,000 af under certain conditions provided for in Idaho Code § 42-1763B and the 2004 Snake River Water Rights Agreement. The program is coupled with a biological opinion, which provides incidental take coverage for the Bureau of Reclamation's operation and maintenance of the Upper Snake Projects and related private uses of storage water.

As part of the 1990 Fort Hall Water Rights Agreement, the Board approved the creation of the Shoshone-Bannock water bank. The Shoshone-Bannock Water Bank accrues water in American Falls reservoir and is authorized to rent and deliver storage water anywhere in Idaho.

The effect of the flow augmentation program and the Shoshone-Bannock water bank is to allow water that would otherwise be available for use above Milner Dam to be released to meet water use needs below Milner Dam. To the extent feasible, strategies should be pursued to encourage the exchange flow augmentation water and water rented through the Shoshone-Bannock Water Bank with water downstream of Milner Dam in order to meet demands above Milner Dam. Strategies may include new storage within the Snake River Basin, water right acquisitions, and exchanges with existing storage spaceholders.

Water Transfer Policy: As a result of the limited water supplies above Milner Dam, future domestic, commercial, municipal, and industrial and other water supply needs likely will have to be met through the transfer of existing water rights to meet these new demands. Therefore some provision must be made to facilitate approval of acquisition and use of water rights for new uses on a willing buyer/willing seller basis. Any changes in water right acquisition policy, however, should include measures to protect against unreasonable hydrologic, economic, and/or social impacts.

Cooperation and Appraisal of Management the Water Resources: Ongoing appraisal of actions implemented to sustain existing water resources and support new water uses above Milner Dam is necessary to determine the efficacy of specific strategies and to ensure consistency with the Milner Policy, objectives of the Swan Falls Agreement, and implementation of the ESPA CAMP and the Optimum Use Policy. Monitoring and administrative strategies shall be evaluated in the collaborative forum addressed herein.

Implementation Strategies:

1. Identify where existing new surface water storage sites can be built that are safe, environmentally sound and economical to secure new water supplies, provide flexibility in reservoir operations, and offset flow augmentation demands on supplies above Milner Dam.
2. Implement actions recommended in the ESPA CAMP Phase I to accomplish hydrologic targets including groundwater to surface water conversions, managed aquifer recharge, demand reduction, and weather modification.
3. Monitor and evaluate the results of each of the ESPA CAMP actions on water supply conditions above Milner Dam to assist with development and implementation of future actions, and determination of the efficacy of implementation of the ESPA CAMP Phase II.

4. Manage the water resources above Milner Dam in accordance with the Milner Policy and Upper Snake River Optimum Use Policy.
5. Establish a standing subcommittee for the purpose of supporting the Upper Snake River Optimum Use Policy and collaborating on the management of the water resources and the reservoir system above Milner Dam with representatives from the U.S. Bureau of Reclamation and other stakeholders. The subcommittee shall have no power or authority to affect vested water rights or to prescribe the manner in which the reservoir system or the water resources above Milner Dam shall be managed, but shall develop, through a collaborative effort, recommendations and policies for the efficient and effective management of the water resources and the reservoir system above Milner Dam.
6. Opportunistically acquire Snake River water below Milner Dam, or from other tributary basins, to be exchanged for flow augmentation water with consideration of potential third party impacts including but not limited to impacts on water quality, aquatic resources, and hydropower. In addition, acquire storage water or surface water rights on flow-limited streams upstream of Milner Dam for transfer downstream to support conversions and stream flow restoration.
7. Measurement and Monitoring Implementation Strategy:
    a. Continue to support and update the Eastern Snake River Plain Aquifer Model Version 1.1 (ESPAM1.1), the Snake River Planning Model (SRPM), and the Snake River Accounting system. Promote linkage of the models and their use in evaluation of impacts of various management decisions on Snake River flows, aquifer levels and reservoir operations.
    b. Undertake measurement and monitoring of the combined river and aquifer system to facilitate water management and planning in the Snake River Basin above Milner Dam.
    c. Evaluate the utility of System dynamic modeling techniques to facilitate decision making on optimizing the use of water resources above Milner Dam.
8. Work with the office of the Governor, state agencies, and the legislature to ensure that state management programs are consistent with the State Water Plan and the ESPA CAMP.
9. Implement and maintain cooperative water resource agreements and partnerships with neighboring states, the federal government, and Indian tribes in managing the water resources of the Snake River above Milner Dam.
10. Propose statutory, regulatory, and procedural changes that provide the Idaho Water Resource Board authority and flexibility to use the Water Supply Bank to adaptively manage and optimize water resources of the Snake River above Milner Dam.
11. Enhance water transferability to ensure a water supply for DCMI and other emerging needs while protecting against unreasonable impacts.

Milestones:

1. Evaluate the efficacy of the ESPA CAMP Phase I strategies by 2018 and identify how and whether to proceed with Phase II to meet long-term ESPA CAMP hydrologic targets.
2. Complete necessary actions to implement water supply enhancement projects.

Additional milestones will be developed.

STATE WATER PLAN – SNAKE RIVER POLICY

SNAKE RIVER FROM MILNER DAM TO MURPHY GAGE

4 - SNAKE RIVER BASIN

SNAKE RIVER FROM MILNER DAM TO MURPHY GAGE

Water resources tributary to the Snake River in the Milner to Murphy reach will be managed to meet or exceed the minimum stream flow of 3,900 cfs from April 1 to October 31 and 5,600 cfs from November 1 to March 31 at Murphy gage/Swan Falls.

Discussion:

Swan Falls Minimum Flow Policy: The Swan Falls Settlement between Idaho Power Company and the State established a minimum average daily flow of 3,900 cfs from April 1 to October 31 and 5,600 cfs from November 1 to March 31 at the Murphy gage to assure an adequate hydropower resource base and to protect other instream values such as fish propagation, recreation, aesthetics and water quality. These minimum flows are management and permitting constraints.

As a consequence of the "Milner Policy" set forth in Idaho Code § 42-203B(2) river flows over Milner Dam may be reduced overtime and consequently river flows from the Milner to Murphy gage may consist, at times, almost entirely of ground water discharges from the aquifer into springs and surface water returns. Therefore, the Eastern Snake Plain Aquifer must be managed as an integral part of this reach of the Snake River.

The State of Idaho, by and through the Governor, holds legal title to the hydropower water rights for the Idaho Power Company hydroelectric plants in this reach of the Snake River in excess of the Swan Falls minimum flows in trust for the benefit of Idaho Power Company and the people of the State of Idaho. Pursuant to Idaho Code § 42-203B, the hydropower water rights held in trust by the State are subordinate to new water rights that are acquired pursuant to state law

As contemplated by the parties to the Swan Falls Settlement, the State of Idaho approved applications for the appropriation of water from sources tributary to the Snake River below Milner Dam. These new depletions in combination with changes in irrigation practices and climate variability have led to declines in spring flows in this reach of the Snake River to the point that in dry years the flows are beginning to approach the 3,900 cfs minimum flow.

Conjunctive Administration of Spring Flow and Ground Water Rights: On April 30, 1993, the Director of the Idaho Department of Water Resources issued an Amended Moratorium Order against the issuance of permits to divert water from the Eastern Snake River Plain Area (1993 Trust Water Moratorium). The Moratorium precludes the processing of applications for the appropriation of water pending resolution of the surface and ground water rights water supply conflict. Resolution of the this conflict is an

essential step in the implementation of the long-term water planning objectives for this reach of the Snake River.

ESPA CAMP: In 2009, the Board adopted the ESPA CAMP to address the declining water supplies of the ESPA and the Snake River. The plan, among other things, seeks to stabilize and enhance the spring flows in this reach of the Snake River through implementation of a suite of measures, including managed and incidental recharge, groundwater to surface water conversions, demand reduction, additional surface water storage and weather modification. While the ESPA CAMP measures are expected to lead to stabilization of spring flows, the ESPA CAMP will not result in a return to the historic high spring flow conditions that developed as a result of large scale gravity irrigation diversions in the early part of the last century.

Milner to Murphy Optimum Use Policy: The water management objectives for the Milner to Murphy reach of the Snake River is to adaptively manage water resources in this reach to achieve a balance between existing water use and supplies and to thereby satisfy the Swan Falls minimum flows and increase the reliability of the water supply available to satisfy existing water rights.. The primary tool for achieving these objectives will be the implementation of the ESPA CAMP.

In order to achieve a balance between water use and supplies and to prevent new conflicts between spring and ground water users all new permits and licenses to divert spring flows should be subordinated to upstream consumptive uses within this reach and conditioned on providing mitigation to offset any depletionary impacts on flows at the Murphy gage. Nothing in this policy, however, is shall be construed to affect or change in anyway the legal rights of any current water right holder under the prior appropriation doctrine as established by Idaho law.

A number of the water rights diverting trust water contain a 20 year term limit. In light of the declining spring flows, the State should examine these term permits as they expire to determine whether those permits should be conditioned upon providing mitigation to offset any depletionary impacts on the flows at the Murphy Gage.

As provided for in the Swan Falls Settlement, approval of new storage projects that seek to divert water from sources tributary to the Snake River below Milner Dam and above the Murphy Gaging station should be coupled with a requirement to mitigate for any impacts of such storage on hydropower generation.

Need direction from the Board on how to reconcile State Water Plan Part B for the Milner to King Hill Reach of the Snake River with "Milner Policy."

Water Transfer Policy: As a result of the limited water supplies in the Milner to Murphy reach of the Snake River, the day is fast approaching when there will be no unappropriated water available for future DCMI (domestic, commercial, municipal, and industrial) and other water supply needs. Therefore some provision must be made to facilitate approval of the acquisition and use of water rights for new uses on a willing buyer/willing seller basis. Any changes in water right acquisition policy, however, should include measures to protect against unreasonable hydrologic, economic, and/or social impacts.

Swan Falls Minimum Flow Adaptive Management Policy: The impact from the use of ground water within the basin on the timing of aquifer discharge to the Snake River is such that curtailment of water rights when the flow of the Snake River approaches the Swan Falls minimum flows is not an effective remedy. Therefore, a long-term monitoring and adaptive management plan to proactively administer water sources tributary to the Snake River below Milner Dam is essential to prevent depletion of the flow of the Snake River at Murphy gage below the Swan Falls minimums. The plan should establish an agreed upon measurement and monitoring protocol for determining the average daily flow at the Murphy gaging station consistent with terms of the Swan Falls Agreement. In addition, the plan should identify adaptive management strategies for managing the water sources tributary to the Snake River below Milner Dam to satisfy the Swan Falls minimum flows.

Implementation Strategies:

1) Initiate a review of water right permits and licenses containing a term limitation.

2) Support the development of an enhanced spring water measurement program as a mechanism for facilitating adaptive management measures to achieve ESPA CAMP and Swan Falls minimum flow objectives.

3) Implementation of a Swan Falls monitoring and adaptive management program to provide for the administration of water sources tributary to the Snake River below Milner Dam to achieve the minimum average daily flows at the Murphy Gauge.

4) Develop streamlined policy for processing transfers to meet the water supply needs for DCMI and other future water uses...

5) Implement ESPA CAMP to accomplish goals and objectives to sustain and enhance spring flows within this reach to improve the reliability of water supply for hydropower generation and other instream values above the Murphy gage.

Milestones:

To be developed...

STATE WATER PLAN – SNAKE RIVER POLICY

SNAKE RIVER FROM MURPHY GAGE TO WEISER GAGE

4 - SNAKE RIVER BASIN

SNAKE RIVER FROM MURPHY GAGE TO WEISER GAGE

Water resources tributary to the Snake River from Murphy Gage to Weiser Gage reach will be managed to meet or exceed an average daily flow of 4,750 cfs at the Weiser Gage.

Discussion:

Management and Permitting Constraints: The minimum stream flow water right of 4,750 cfs (year round) is held by the Idaho Water Resource Board. This water right has a priority date of 1976 and was established by legislative approval of the State Water plan in 1976. The flow of the Snake River at the Weiser gage is a management and permitting constraint. This minimum flow was established to assure an adequate hydropower resource base and protect other instream flow values such as fish habitat, recreation, aesthetics, and water quality.

Background: Large-scale organized irrigation came to the lower Boise River in the 1860's and 1870's. At that time, the greatest need was for a water storage system to supplement river flows during the late summer months when irrigation demands exceeded natural river supplies.

The Boise Project began in 1906 by extending the New York Canal 40 miles to convey water from the Boise River Diversion to Lake Lowell. Since then, the Boise Project has evolved to provide full irrigation water supply to approximately 224,000 acres and a supplemental supply to some 173,000 acres.

Storage facilities tributary to the Murphy to Weiser reach of the Snake River consist of Anderson Ranch Reservoir, Arrowrock Reservoir, Lucky Peak Reservoir, Lake Lowell, Deadwood Reservoir, Cascade Reservoir, and Black Canyon Reservoir. In the Boise River basin all three reservoir facilities (Anderson Ranch, Arrowrock, and Lucky Peak) are operated in a coordinated manner to provide water for irrigation within the Boise River basin and flood control. To the extent possible, water is stored high in the system for operational flexibility. During the irrigation season, Lucky Peak is held at or near full through the summer and Arrowrock and Anderson Ranch Reservoirs are drafted for irrigation. In the fall, Lucky Peak is drafted to meet late-season irrigation needs. Storage water that is not used is credited as carryover into the next year.

Background and challenges on Payette, Weiser, Owyhee being developed.

Urban Growth in Boise River Basin: The lower Boise River flows approximately 64 miles through Ada and Canyon counties, from Lucky Peak Dam to its confluence with the Snake River. This area has experienced rapid population growth over the past several decades with land-use changing from agricultural to urban use. As a result, there are increasing demands on water supplies for domestic use.

This change in land and water use not only requires water management strategies to meet demand, but also requires methods for protecting water quality and effective flood risk management. These issues are best addressed through a regional planning process.

Treasure Valley CAMP: In 2008 the Idaho Legislature passed House Bills (HB) 428 and 644 which directed the Idaho Water Resource Board to conduct a statewide comprehensive aquifer planning and management effort (CAMP). The Idaho Water Resource Board began developing the framework for a comprehensive management plan (CAMP) for the Treasure Valley basin in Fiscal Year 2008. The process is anticipated to take four years. The Treasure Valley CAMP will provide the framework for water planning and management for the next 50 years.

The specific goals of the CAMP program are to:

- Provide reliable sources of water, projecting 50 years in to the future
- Develop strategies to avoid conflicts over water resources
- Prioritize future state investments in water
- Bridge the gaps between future water needs and supply

During the first phase of the project, technical studies and planning activities will be undertaken. The technical studies will focus on refining the understanding of the ground and surface water system and developing a water budget. The planning process will undertake studies to estimate future water needs and identify tools to meet those needs.

A few of the components to be addressed in the Treasure Valley CAMP are:

1. **Conjunctive Management:** Over the years, surface water and ground water development and management in the Boise basin has evolved to a point where Conjunctive Management must be implemented to satisfy both ground water and surface water demands. A few of the drivers of this change are:

    - Reduced deep percolation of water as a result of improved irrigation efficiencies
    - Increasing urbanization
    - Increased interest in maintenance of instream flows
    - Water needs for energy production
    - Impacts of climate variability

2. **Additional DCMI for Growth:** In addition to surface water supplies, water users in the Boise River basin rely on groundwater. In recent years, increasing population and droughts have led to localized declines in shallow groundwater levels in the Boise River basin. Water supply for DCMI uses is forecasted to be one of the most pressing water supply issues for this reach of the Snake River. In 2000, 175,000 acre-feet of groundwater was pumped in the Boise River basin, of which 30 percent was used for irrigation (53,000 AF) and 70 percent was used for DCMI (122,000 AF [IDWR, 2000]). Most large municipal water suppliers draw from the deeper regional aquifer. Analysis suggests that groundwater levels in the deeper aquifer are relatively stable, in contrast

with shallow water table levels that appear to be locally declining in areas where residential development is replacing flood-irrigated farmland (IWRRI, 2004).

In 2001, an IDWR study "predicted that there will be a significant increase in DCMI water demand during the next 25 years [in Ada and Canyon Counties] and that between 76,000 and 96,000 additional acre-feet of water will be needed to accommodate the additional demand. As part of the Treasure Valley CAMP, a future demand study will estimate future water for various categories, including DCMI, over the next 50 years.

Additional DCMI demands are particularly pressing upstream of Star [located on the Boise River], where much of the population of the Treasure Valley is located, and where the only surface water available for new appropriation occurs during the spring run-off. In order to utilize the unappropriated spring run-off water for additional DCMI demand, new surface water storage or aquifer recharge projects will be needed.

3. **Studies for Additional Storage:** A 1994 U.S. Army Corps of Engineers, *Technical Report on Additional Snake River Basin Storage, Phase 1* concluded that additional upstream storage, including the Galloway Project, could benefit fall Chinook salmon, from the confluence of the Salmon River to Lower Granite Dam during critical low flow years by allowing for flow augmentation in the Snake River. Additionally, the report concluded "the feasibility of transferring the flood control storage space from the Brownlee Project to the Galloway Project could improve the effectiveness of upstream storage and should be considered."

   In conjunction with the Treasury Valley CAMP, House Joint Memorial (HJM) 8 encouraged the Idaho Water Resource Board, in coordination with other public and private entities, to initiate and complete the study of additional water storage projects for water supply and flood control in the state of Idaho, including, but not limited to, the study of Twin Springs Dam in the Boise River drainage. Completion of the interim feasibility study is anticipated in 2012, subject to congressional funding.

   The CAMP will also evaluate the potential for managed recharge in the Treasure Valley as a method of water storage.

Municipal Water Use and Development Policy: As a result of the limited water supplies in the Murphy Gage to Weiser reach of the Snake River, the day is fast approaching when there will be no unappropriated water available for future DCMI (domestic, commercial, municipal, and industrial) and other water supply needs. The Board therefore adopts a Municipal Water Use Policy with the following components:

1. Continuation of dual-use residential systems to preserve incidental recharge throughout Treasure Valley where appropriate.
2. Development of flexible water marketing tools to facilitate rental or acquisition of water rights for new uses on a willing buyer/willing seller basis. Water acquisition strategies should account for adverse hydrologic, economic, and/or social impacts.
3. Improved hydrologic monitoring programs to inform policy decisions.
4. Evaluation and implementation of water supply enhancement measures, including but not limited to, groundwater conservation, additional storage, and water re-use.

5. Protection of surface water and ground water quality for beneficial uses.

Flow Augmentation: In the early 1990's the Idaho Legislature at the request of the Bureau of Reclamation provided authorization for the rental of up to 427,000 acre-feet of storage water on a willing buyer-willing seller basis for augmenting flows for ESA-listed fish in the Lower Snake River. Despite continuing concerns about the efficacy of flow augmentation, the 2004 Snake River Water Rights Agreement resolving the Nez Perce Tribe's water right claims in the SRBA extended the flow augmentation program for a period of thirty years. All storage water released for flow augmentation must be rented through the Idaho Water Resource Board's water supply bank or through local water rental committees on a willing buyer-willing seller basis. In addition, the State of Idaho acquired 60,000 acre-feet of natural flow water rights that it has rented to the Bureau of Reclamation as part of the flow augmentation program. While the total amount of water provided in any particular year varies based upon water available for rental and market conditions, there is an annual cap of 427,000 acre-feet. This annual cap may be increased to 487,000 acre-feet under certain conditions proved for in Idaho Code 42-1763B and the 2004 Snake River Water Rights Agreement.

The Snake River basin augmentation flows are supplied in part from the Boise Project, and in part from other upper Snake River Projects. Currently the Boise/Payette reservoir system is able to provide approximately 136,000 acre-feet (in total from Lucky Peak Reservoir, Deadwood Reservoir, and Cascade Reservoir) of water to be used for flow augmentation.

Additional items that may need to be addressed in this reach of the Snake River

Use of storage water to maintain flows/winter flows (includes aspects of water quality)

Implementation Strategies:

1) *Complete and implement Treasure Valley CAMP*
2) *Complete evaluation of new surface water storage sites in the Boise and Weiser River Basins*
3) *Evaluate managed recharge as a water storage strategy for meeting increasing DCMI needs.*

Milestones:
1)

STATE WATER PLAN – SNAKE RIVER POLICY

SNAKE RIVER BELOW WEISER

4 - SNAKE RIVER BASIN

4D- SNAKE RIVER BELOW WEISER

The minimum stream flows at Johnson Bar and Lime Point are not permitting and management constraints for water right administration above the Hells Canyon Complex. These minimum stream flows will be maintained through operational releases from the Hells Canyon Complex and tributary inflows to this reach.

Discussion:
The Snake River near Weiser runs north for approximately two miles before flowing into the headwaters of the Hells Canyon Complex (HCC). A USGS gage near Weiser Idaho defines the beginning of the reach and measures inflows into the HCC; the reach ends at the Idaho/Washington State Line. The river defines the Idaho-Oregon state border, which flows through Brownlee, Oxbow, and Hell's Canyon Reservoirs and into Hells Canyon, a steep and spectacular gorge that cuts through the Salmon River Mountains and Blue Mountains of Idaho and Oregon. Hells Canyon is one of the most rugged and treacherous portions of the course of the Snake River. The river plunges 8,000 feet below the He Devil Peak of Idaho's Seven Devils Mountains. The Salmon and Clearwater Rivers are major tributaries in this reach of the Snake River (See Policies 6A and 6B).

Hells Canyon Complex: In the late 1940s and early 1950s, Idaho Power Company and federal agencies competed for the right to construct hydropower facilities in the Hells Canyon reach of the Snake River. At the center of the conflict between public and private development was the question of which project would ensure the opportunity for future upstream development. Ultimately, Idaho Power prevailed, based upon its voluntary agreement to subordinate its hydropower water rights to all future upstream consumptive uses. The Federal Energy Regulatory Commission (formerly Federal Power Commission) , at the request of Idaho Power Company, included Article 41 of the FERC license which provides that the project will "be operated in such a manner as [to] not conflict with the future depletion in flows of the waters of the Snake River and its tributaries, or prevent or interfere with the future upstream diversion and use of such water above the backwater created by the project, for the irrigation of lands and other beneficial consumptive uses in the Snake River [watershed]." The Idaho Supreme Court in 1983 held that this provision constituted a subordination of the Company's hydropower water rights for the Hells Canyon Complex.

While the hydropower water rights for the Hells Canyon Complex are subordinated to all future upstream consumptive uses, the Federal Power Commission as part of the FPC license required minimum flows be maintained for navigation.
Article 43 of the power license provides that:

"The project shall be operated in the interest of navigation to maintain 13,000 cfs flow in 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 mutually agreed to by the Licensee 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..."

The 1976 State Water Plan recognized the importance of these minimum flows to downstream uses, and the 1986 State Water Plan made their maintenance a matter of state water policy. The plan, however, also made clear that "Snake River flows above the hydropower right at any Idaho Power facility are considered unappropriated and therefore are not held in trust by the state." Accordingly, the state minimum flows at Johnson Bar and Lime Point are not permitting or management constraints.

Hells Canyon National Recreation Area: The Hells Canyon controversy gave rise to emerging concerns about the preservation of the region's natural features and ultimately led to enactment of the Hells Canyon National Recreation Area Act of 1975 which precluded future hydropower development in the Hells Canyon reach of the Snake River. The Act also designated the Snake River as "wild" (Hells Canyon Dam to Pittsburg Landing) and "scenic" (Pittsburg Landing to 37 miles south of Lewiston) to preserve the free-flowing character and unique environment while providing for continued public use. The Act provided that no flow requirements of any kind may be imposed on the waters of the Snake River below Hells Canyon Dam. The United States' federal reserved water rights are limited to the tributary streams of the Snake River within the HCNRA. The decrees quantifying the tributary federal reserved water rights contain subordination provisions that protect existing rights and allow for a limited amount of future development on the tributary streams.

Endangered Species Act: The Snake River below Hells Canyon Dam provides habitat for fish species that have been listed as endangered or threatened under the Endangered Species Act, including sockeye salmon, spring/summer Chinook salmon, fall Chinook salmon, steelhead trout, and bull trout.

Flow augmentation is a strategy currently used as mitigation for the effects of hydropower operations on ESA-listed species. Flow augmentation is intended to enhance migration of ESA-listed fish species. Flow augmentation from the upper Snake River has proven to be controversial because of the inability to demonstrate the specific benefits of the program. Evaluation of the efficacy of flow augmentation should be conducted in conjunction and/or cooperation with other State and Federal agencies and regional interests.

Port of Lewiston - Placeholder

Optimum Use Policy: Existing hydropower uses should be preserved while protecting the natural characteristics of the Hells Canyon and Snake River downstream of the Hells Canyon Complex.

The Hells Canyon Complex represents the majority of Idaho Power's hydropower generation capacity. The HCC FERC license expired in 2005. The relicensing of this complex is critical to the Company's ability

to continue to provide low-cost power for Idaho. The relicensing will also address the protection and enhancement of recreational, aesthetic, and fish and wildlife resources in this reach. The Board finds that it is in the public interest that any operational requirements in the FERC license should be consistent with the state-established minimum stream flows.

The Hells Canyon National Recreation Area provides unique recreational opportunities. Traditional Recreation Area activities like hiking, backpacking, rafting, and fishing occur along-side commercial jet boat excursions in the Canyon. The area is a tourist destination that positively contributes to the local economy. It is therefore in the public interest to preserve these unique resources below the Hells Canyon Complex. The State minimum stream flows are permitting and management constraints below the HCC.

Implementation Strategies:

1) Collaborate with state and federal agencies in FERC relicensing proceedings to ensure consistency with SWP.

2) Support collaborative efforts to address water quality and ESA issues while sustaining low cost hydropower for the State.

Milestones:

1) FERC relicensing in accordance with SWP.

1J - WATER QUALITY **Comment – subcommittee recommends further discussion by the Board regarding this policy – prior policy statement stated that water should be protected agains "unreasonable" contamination or deterioration." What does unreasonable mean? Recommend further discussion. Check IDEQ policy statement that might be incorporated – be consistent**

The citizens of Idaho will be best served by a cooperative effort involving public and private entities to assure that the state's surface and ground water sources meet state water quality standards and maintain designated beneficial uses.

Discussion:
It is essential that the quality of Idaho's water resources be protected for public safety and economic stability and growth. The Idaho Department of Environmental Quality (IDEQ) is the lead state agency for protecting water quality. IDEQ's Surface Water Program measures and assesses the levels of pollutants in surface waters. Pursuant to the Ground Water Quality Plan, adopted by the Legislature in 1992, the Department of Water Resources administers a statewide ambient ground water quality monitoring network and the Environmental Data Management System. The system collects, and makes available to the public, data obtained from ground water monitoring networks across the state.

When water quality fails to meet state standards, IDEQ works with communities, industry, agricultural interests, and other stakeholders to develop water quality improvement plans. These plans outline actions needed to restore impaired water bodies so that they support designated uses. Where the quality of surface and ground water depends on land and water-use practices within a watershed, water users, land managers, and local units of government are working together to implement best management practices and other strategies that reduce impairments to beneficial uses.

The use of water flow to dilute pollution is not a substitute for adequate water quality treatment. Instead, the allocation of water for instream flow use should be directed toward meeting fish, wildlife, and recreational needs and not to the dilution of pollution. It is through the collaborative efforts of the Board, IDEQ, other state agencies, municipalities, water users, land managers, and other stakeholders that projects should be implemented to protect and improve the water quality of the state's surface and ground water.

Implementation Strategies:
- Coordination and integration of monitoring programs with public and private entities.
- Ongoing analysis of statewide water quality monitoring program to identify need for modifications.
- Participate with IDEQ and other state agencies to integrate water management programs and policies.
- Ongoing monitoring of baseline conditions and trends.

Recommendations

- Formulate strategy to collaborate with agencies that have water quality authorities and to establish enhanced linkage of water quality and quantity programs.

1N – HYDROPOWER

Appropriation of water for hydropower purposes shall be subordinated to all subsequent upstream depletionary beneficial uses.

The relationship of hydropower water rights to future upstream uses was the subject of an ongoing debate from statehood until 1985, when the Idaho legislature enacted Idaho Code § 42-203B to resolve the debate. Pursuant to section 3 of article XV of the Idaho Constitution, the legislature determined that it was in the public interest to specifically implement the state's power to regulate and limit the use of water for power purposes. Idaho Code § 42-203B directs that hydropower water rights in excess of state-established minimum stream flows are subordinated to future depletionary beneficial uses. In order to effectuate section 42-203B, all applications, permits and licenses for use of water for hydropower production shall be subordinated to future depletionary beneficial uses.

Implementation Strategies:

- Ensure that all future applications, permits and licenses for use of water for hydropower purposes contain a subordination clause.
- Establish minimum stream flows to protect base flows for existing hydropower users.
- Define, through agreements with the holders of existing hydropower water rights, the relationship between such rights and existing and future depletionary water rights.

Milestones:

- Execution of subordination agreements and/or implementation of minimum stream flows for existing hydropower facilities.

2C - INSTREAM FLOW

The Idaho Water Resource Board will exercise its authority to establish and to protect minimum stream flow water rights on those water bodies where it is in the public interest to protect and support instream uses.

Discussion:
Instream flows protect and support many nonconsumptive, beneficial uses of water such as fish and wildlife habitat, aquatic life, recreation and aesthetic values, transportation, navigation, hydropower generation, and water quality. These uses contribute to Idaho's economy and the well being of its citizens.

In 1971, the legislature authorized the first formal appropriation of minimum stream flows by directing the Idaho Department of Parks and Recreation to appropriate a specific reach of Niagara Springs in the Malad Canyon area for instream flow purposes. The 1976 State Water Plan called for, and eventually legislation was enacted, creating a state-wide minimum stream flow program. The ability to obtain state-based minimum stream flow water rights in Idaho lies exclusively with the Idaho Water Resource Board. Chapter 15, title 42, authorizes the Idaho Water Resource Board to appropriate the minimum flow of water required to protect designated uses if the appropriation is in the public interest and will not interfere with any vested water right, permit, or water right application with a senior priority. Idaho currently has 297 licensed or permitted water rights for minimum stream flow purposes, including 3 minimum lake level water rights. At the legislature's direction, 205 of the minimum stream flow water rights were adopted pursuant to the Snake River Water Rights Agreement which, as discussed more fully in Policy 6B, provided a programmatic approach to addressing the needs of species listed under the federal Endangered Species Act. Similarly, the legislature has authorized the Idaho Water Resource Board to appropriate minimum stream flow water rights in the Lemhi and Wood River basins where the rights are maintained through operation of a Water Supply Bank. These locally managed programs are used to maintain or enhance instream flow in a manner that respects water use practices and addresses community concerns.

The Idaho Water Resource Board supports efforts to obtain storage and natural flow rights to improve and maintain instream flows when in the public interest. The Water Supply Bank and local rental pools are tools that can be used to improve instream flows through voluntary cooperation and to meet local needs. To facilitate their use throughout the state for use in improving and sustaining minimum stream flows, statutory changes are needed authorizing the Idaho Water Resource Board to establish local rental pools at the request and in cooperation with local communities. ~~Statutory changes are also needed to authorize the Idaho Water Resource Board to apply for a change in the nature of use of an acquired right, where it has been determined that a minimum stream flow water right is in the best interest of the state.~~

Implementation Strategies:

- Establish local rental pools to meet instream flow needs as requested.

- Submit applications for minimum stream flow water rights that are in the public interest.
- Coordinate with state and federal agencies and stakeholders to identify potential minimum stream flow needs.
- Revise chapter 15, title 42 to authorize the Idaho Water Resource Board to establish local natural flow rental pools on a case-by-case basis as need is demonstrated.
- ~~Revise chapter 15, title 42 to authorize the Idaho Water Resource Board to transfer acquired water rights to minimum stream flow water rights.~~

Milestones:

- Minimum stream flow water rights established.
- Annual inventories of instream flow water rights completed.
- Statutory changes authorize the Idaho Water Resource Board to establish local natural flow rental pools on a case-by-case basis as need is demonstrated.
- ~~Statutory changes authorize the Idaho Water Resource Board to transfer acquired water rights to minimum stream flow water rights.~~

2I - FLOOD DAMAGE REDUCTION LEVEE REGULATION

Levees should be designed, constructed and maintained to meet the intended purpose of reducing flood damage for the useful life of the levee.

Discussion:
Pursuant to Idaho Code § 42-1717, the Department of Water Resources regulates nearly 600 water storage dams and more than 20 mine tailing impoundment structures throughout the state. Levees are not regulated as dams, however, and the construction, maintenance, and safety of levees is, for the most part, left to local entities.

The Idaho Water Resource Board supports the development of a comprehensive state program governing the construction and maintenance of new flood reduction levees. A state flood reduction levee program should focus on the use of sound technical practices in levee design, construction, and operation and include safety programs that ensure public awareness of the risks involved in levees.

Implementation Strategies:

- Develop a state safety program to regulate the construction and maintenance of new flood reduction levees.
- Propose legislation authorizing the Department to implement a state levee safety program.
- Identify and incorporate components of the Draft National Levee Safety Program that would benefit Idaho citizens.
- Participate in the development of a National Levee Safety Program with other state and federal agencies.
- In the event a National Levee Safety Program is adopted, obtain certification as a state levee safety program and assist with development of levee criteria for use by the states and the federal government.

Milestones:

- State levee safety program established.
- Trends in levee failures in Idaho decreased.

3A - REVIEW OF FEDERAL RESERVOIR WATER ALLOCATION

It is in the state's and the federal government's interest that federal reservoir allocations be consistent with the Comprehensive State Water Plan.

Discussion:
Historically, the Idaho Water Resource Board has reviewed federal water allocations proposed by the United States Bureau of Reclamation to determine whether the proposed allocations are consistent with state water resource planning and management objectives. In 1988, this cooperative arrangement was formalized through an agreement providing for Idaho Water Resource Board review of allocations of water in excess of 500 acre-feet annually within an existing approved water right not otherwise reviewable by the Idaho Department of Water Resources. This state and federal partnership ensures that water resource and management issues are addressed in a comprehensive way, thereby providing for optimal use of the state's resources. It will become even more important to coordinate state and federal management strategies as demands on the state's water supply increase. The Idaho Water Resource Board will pursue additional opportunities for review of proposed allocations to determine if they would be consistent with the Comprehensive State Water Plan.

Implementation Strategies:

- Review status of existing cooperative agreements related to review of proposed allocations and revise accordingly.
- Identify opportunities for additional agreements providing for review of proposed allocations.
- Work with the United States Army Corps of Engineers to determine if cooperative agreements addressing allocations at the Albeni Falls and Dworshak facilities would be in the state's interest.

Milestones:

- Existing agreements maintained and revised accordingly.
- Additional cooperative agreements executed that promote optimal use of the state's water resources.

3B - HYDROPOWER SITING

NOTE: Needs further discussion about hydropower policy and surface water supply.

The expansion of hydropower capacity and generation consistent with the state water plan can help meet the need for affordable and renewable energy resources.

Discussion:

Hydropower provides a clean, efficient, and renewable energy source. Historically, hydropower has supplied the bulk of Idaho's power. The state and region's power demand is expected to increase substantially over the next several decades as the population continues to grow. Opportunities for increasing capacity, while preserving environmental protection, include enhancing incremental capacity at existing sites through new technologies that yield greater energy efficiency, adding generation capacity at existing non-powered dams, and the development of generation capacity in conjunction with the construction of new water storage projects.

The IWRB supports the promotion of a more efficient use of energy throughout Idaho's economy, implementation of efficiency improvements at existing sites, and retro-fitting non-power sites. Feasibility studies for new water storage projects should include evaluation of the costs, benefits, and adverse consequences of hydropower generation. Add language that Board strongly supports hydropower development at new storage projects.

Under 16 U.S.C. §803, the Federal Energy Regulatory Commission must determine that proposed projects are consistent with Idaho's comprehensive water plans when making licensing decisions. The IWRB will review hydropower development proposals to determine whether they are consistent with the state water plan, including the comprehensive basin and river plans which address region-specific siting issues. Consistent with (the policies on hydropower and surface water enhancement) Policy 1P, all applications, permits, and licenses for the use of water for hydropower production shall be subordinated to future depletionary beneficial uses. Any base flows for hydropower generation should be established by the Board under the minimum stream flow statute, chapter 15, title 42.

Implementation Strategies:

Establish procedures for coordinating review and oversight of hydropower siting proposals with the Idaho Office of Energy Resources, state and federal agencies, and stakeholders.

- Include evaluation of hydropower potential in feasibility studies for water storage projects.

Milestones:

- Hydropower siting proposals comply with the Comprehensive State Water Plan.

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- Include evaluation of hydropower potential in feasibility studies for water storage projects.

Milestones:

- Hydropower siting proposals comply with the Comprehensive State Water Plan.

STATE WATER PLAN – SNAKE RIVER POLICY

4 - SNAKE RIVER BASIN

4 – SNAKE RIVER BASIN WATER MANAGEMENT FRAMEWORK

The Idaho Water Resource Board's Snake River minimum stream flows establish the framework for water management in the Snake River basin.

Discussion:

Approximately 87% of the surface area of the State of Idaho is within the Snake River drainage basin. The waters of the Snake River form the backbone of Idaho's economy. Effective management of this resource is essential to protecting existing water rights, sustaining economic growth, maintaining low-cost power rates, and preserving fish, wildlife and other environmental values.

At the core of Snake River water management is the state policy of managing the Snake River to meet or exceed minimum stream flows established at the Milner, Murphy, Weiser, Johnson Bar and Lime Point gaging stations. These minimum stream flows establish, as a matter of state policy, a balance between diversion of water out of stream for consumptive uses and preservation of flows for instream uses. This policy of managing reaches of the Snake River to meet or exceed designated instream flows evolved over the course of the 20th Century and was incorporated into the 1976 State Water Plan. A brief overview of the evolution of the instream flow management policy is provided to give context for the individual river reach policies that follow.

Throughout the first half of the 20th Century the dynamic tension between diversion of water for consumptive uses and retention of flows for instream uses was manifested in the context of the simultaneous development of the irrigable lands within the Snake River Basin and the development of the hydropower potential of the main stem Snake River.

Initially, the conflict was resolved through the development of the Milner Policy in 1920, which dedicated the flow of the Snake River above Milner Dam for future agricultural development. The Milner Policy was based upon the physical character of the river. Upstream from the Milner Dam the relatively flat landscape facilitated water diversions from the main stem Snake River into canal systems with technology available at the time. Below Milner Dam, the Snake River enters a deep canyon and was largely inaccessible for agricultural development in the first half of the 20th century. The decent of the Snake River into the canyon below Milner, however, made the downstream reach of the river ideally suited for hydropower development. Thus, the State adopted the Milner Policy, which subordinated hydropower development below Milner to future upstream development. As discussed more fully below, the Milner Policy as it evolved does not mandate a zero flow at the Milner gage but rather prevents holders of water rights using water below Milner Dam from calling for the delivery of water above Milner Dam.

The advent of high lift pumping technology in the 1950s precipitated the next phase of the Snake minimum stream flow policy. Pumping made irrigation of vast expanses of desert land lying above the Eastern Snake Plain Aquifer possible. Additional power to turn the pumps was to come from

development of the hydropower potential of the Hells Canyon reach of the Snake River. Concern that hydropower development might monopolize the flows of the Snake River, however, led to an agreement between the State of Idaho and Idaho Power Company that subordinated its hydropower water rights for the Hells Canyon complex to all future upstream consumptive uses. The subordination provision in the Hells Canyon complex license, like the Milner Policy, precludes hydropower uses from interfering with future upstream development.

The FPC license for the Hells Canyon complex provided for operational flows at Johnson Bar and Lime Point to provide for navigation. As discussed more fully in the Below Weiser reach policy, these operational flows form the basis for the Johnson Bar and Lime Point state minimum stream flows, which were first recognized in the 1976 Idaho State Water Plan.

In the latter part of the 20th Century, the dynamic tension between consumptive and instream flow uses expanded beyond the irrigation/hydropower context to include water quality, fish and wildlife and other instream uses. Studies conducted by the Idaho Department of Fish and Game suggested that further depletions of the flows of the Snake River in the reach between Milner and Weiser would be detrimental to fish and wildlife. Thus, the 1976 Idaho State Water Plan determined it was not in the public interest to allow depletion of the average daily flow of the Snake River below 3,300 cfs at the Murphy gage and below 4,750 cfs at the Weiser gage. These minimum flows were established to "maintain water for production of hydropower and other main stem water uses. . . "

The Swan Falls Controversy brought the need for maintaining minimum flows into greater focus and led to a comprehensive settlement balancing instream uses with upstream development. The average minimum daily flow at the Murphy gage was increased to 3,900 cfs during the irrigation season and 5,600 cfs during the non-irrigation season and the State Water Plan directed "that ground water and surface water of the Snake River basin would be managed to meet or exceed the state minimum average daily flow at Milner, Murphy, and Weiser. The Murphy and Weiser minimum flows were designated as management constraints.

The State of Idaho, as part of the 2004 Snake River Water Rights Agreement, established a flow augmentation program that supplements the main stem Snake River state minimum stream flows. The program consists of two tiers. Tier 1 recognizes the Milner and Murphy minimum stream flows as base flows. Tier 2 provides for the rental of storage water in accordance with the provisions of Idaho Code § 42-1763B and the Snake River flow component of the 2004 Snake River Water Rights Agreement and for the acquisition of up to 60,000 acre-feet of natural flow water rights within the Milner to Murphy reach of the Snake River.

The minimum stream flows that evolved over the last century form an integrated plan for management of the Snake River as a whole. Each minimum stream flow was established to address specific management objectives for the Snake River above its ending point. The State Water Plan, beginning with the first plan in 1976 and continuing though each successive plan, has recognized this framework as a means of ensuring an equitable allocation of the flows of the Snake River between consumptive and instream uses and as a means of ensuring an equitable allocation of the flows of the Snake River for future development throughout the basin. While this framework allows for the development of future uses of water within each reach, localized decisions must take into account the potential impact of such development on water supplies in other reaches.

STATE WATER PLAN – SNAKE RIVER POLICY

SNAKE RIVER ABOVE MILNER DAM
OUTLINE

4 - SNAKE RIVER BASIN

4B- SNAKE RIVER ABOVE MILNER DAM

Water resource policy, planning and practice should continue to optimize water use and provide for full development of the Snake River above Milner Dam recognizing that the exercise of water rights above Milner Dam has and may reduce flow at the Dam to zero.

Discussion:

Milner Policy: The formulation and implementation of a plan for the optimum development and use of the water resources of the Snake River above Milner Dam must be consistent with the so called "Milner Policy" set forth in Idaho Code § 42-203B(2), which provides that no portion of the waters of the Snake River upstream from Milner Dam shall be considered for the purposes of the determination and administration of rights to the use of the waters downstream from Milner dam. The exercise of water rights above Milner Dam may reduce the flow of the Snake River at Milner Dam to zero.

The Milner Policy evolved from a 1920 report prepared by a Board of Engineers convened by the Governor and the United States for the purpose of preparing a plan for the future development of irrigation and hydropower in the Upper Snake River Basin. As described by the Board of Engineers, the Milner Policy was founded upon the physical divide in the Snake River at Milner Dam. Above Milner Dam, the waters were easily diverted and used for irrigation and other consumptive uses. Below Milner Dam the river descended into a deep canyon and was unavailable for agricultural development with technology available at the time. The Board recommended, therefore, that in order to make optimum use of the water resources the entire flow of the Snake River above Milner should be dedicated to the extent economically feasible for upstream irrigation. Over the past century, the Milner Policy guided the economic growth and the development within the Snake River basin and is inextricably intertwined with the overall management of the water resources of the basin.

The Milner Policy envisioned that while development of the flows above Milner Dam would have some impact on hydropower generation, the increased spring flows resulting from the upstream development would sustain hydropower production downstream from Milner Dam. In order to ensure that hydropower development didn't interfere with development above Milner, however, the Board advised that in "granting power rights in the future the Federal Government and the State should so far as possible provide restrictions requiring [their] eventual surrender ..." This policy of subordinating hydropower development to upstream consumptive uses was affirmed by the 1984 Swan Falls Settlement and 2009 Swan Falls Reaffirmation Agreement between the State and Idaho Power Company.

Consistent with the Milner Policy and the Swan Falls Settlement, the primary long-term water planning objective for the Snake River above Milner Dam is to ensure that unappropriated flows tributary to the Snake River above Milner Dam are available to supply existing and future beneficial uses in this reach of the Snake River.

Conjunctive Administration of Spring Flow and GW Rights: On January 6, 1993, the Director of the Idaho Department of Water Resources issued an Amended Moratorium Order against the issuance of permits to divert water from the Snake River and all tributary sources above Milner Dam in the non-trust water area (1993 Non-Trust Water Moratorium). The Moratorium seeks to protect the status quo while moving forward with the implementation of the conjunctive administration of surface and ground water rights. Resolution of the surface/ground water conflict is essential to the implementation of the long-term water planning objectives for this reach of the Snake River.

ESPA CAMP: Consistent with Milner Policy and the intent to optimize use of water in a heavily developed basin, as well as the need to address concerns about water supply and conflicts between surface and ground water use in the Eastern Snake Plain, the Idaho Water Resource Board adopted the Eastern Snake Plan (ESPA) Comprehensive Aquifer Management Plan (CAMP) to "Sustain the economic viability and social and environmental health of the Eastern Snake Plain by adaptively managing the balance between water use and supplies." The objectives of the plan are to increase predictability for water users by managing the water resources to provide for a reliable water supply for existing and future uses. The plan established long-term strategies to incrementally achieve a net water budget change in the ESPA of 600 thousand acre-feet (kaf) annually by the year 2030 through a suite of water management actions.

The ESPA CAMP uses a phased approach to achieving the long-term change in the water budget. The goal of Phase 1 of ESPA CAMP is to implement measures over a ten year period that will result in a target hydrologic water budget change of between 200 kaf and 300 kaf. The recommended measures to achieve this target include ground water to surface water conversions, managed aquifer recharge, demand reduction, and weather modification.

Fully implementing the ESPA CAMP will improve the opportunities to adaptively manage and optimize water supplies across the ESPA by: increasing gains in some river reaches, improving storage carryover; increasing aquifer levels; decreasing the need for litigation, mitigation and administrative activities; allowing for municipal and industrial growth; reducing overall demand; and increasing and sustaining spring flow. The ESPA CAMP anticipates implementation of Phase I strategies by 2018 with ongoing monitoring and evaluation of the intended and unintended effects of the strategies. The monitoring and evaluation studies will be used to select and design Phase II strategies.

As part of the 2009 Swan Falls Reaffirmation Agreement, the State and the Board entered into a Memorandum of Agreement with Idaho Power Company that requires the Board to obtain legislative approval to increase the Phase 1 ESPA CAMP managed recharge goal of 100,000 af by more than 75,000 af prior to January 1, 2019. "The purpose of this memorandum of agreement is to recognize that implementation of managed recharge will have an effect on the flow characteristics of the Snake River above and below Milner Dam and to confirm that the relative merits of recharge proposals in addition to or different than that provided in Phase 1 of ESPA CAMP will be considered through the adaptive management process set forth in Section 4 of ESPA CAMP." The Memorandum of Agreement also requires that a change to the ESPA CAMP long-term hydrologic target for managed recharge target must be accomplished through an amendment of the State Water Plan. Finally, the Memorandum of

Agreement recognizes that it is the mutual interest of the State and the Company to work cooperatively to explore and develop a managed recharge program for the Snake River Basin above the Swan Falls Dam that achieves to the extent possible benefits for all uses including hydropower.

Upper Snake River Optimum Use Policy: Except for winter flows in excess of the storage capacity of existing reservoirs, the reliable water supply of the Snake River Basin above Milner Dam is nearly developed. Thus, future development of the water resources in the Snake River Basin upstream of Milner Dam consistent with the State Water Plan and the ESPA CAMP will require measures that augment and enhance available water supplies, such as the development and efficient use of existing on-stream, off-stream, and aquifer storage, development of new storage, and water right acquisitions and exchanges. Implementation of such actions, however, will result in a change in flows passing Milner. Therefore, as discussed in the Milner to Murphy Reach section, a process must be in place to identify and account for impacts that development above Milner will have on the water supply available to meet management objectives in the Milner to Murphy reach of the Snake River.

Coordinated management of the water resource development with the federal reservoir system above Milner Dam will provide an opportunity to optimize the use of the available water supply above Milner Dam. Therefore, the following Upper Snake River Optimum Use Policy is established:

1. It is in the public interest to manage the water resources above Milner Dam in a coordinated manner consistent with state law and the State Water Plan to provide a reliable supply of water for existing and future beneficial uses.

2. The Bureau of Reclamation is encouraged to manage the federal reservoir system above Milner Dam in a manner compatible with this policy, to the extent consistent with federal reclamation law and project purposes. To facilitate this effort, the Board will implement a process to openly address water management and reservoir operation needs through a standing advisory subcommittee. The subcommittee will be a collaborative forum where relevant information may be exchanged and reviewed on how the state and the Bureau of Reclamation, in the exercise of their respective authorities, can optimize the management of the water resources and the reservoir system above Milner Dam consistent with the policy set forth in paragraph 1. The Board shall request that the Bureau of Reclamationand the Committee of Nine, designate representatives as standing members of this subcommittee and shall invite other parties that may be interested in the management of affected water resources to also participate. This subcommittee may periodically submit advisory recommendations to the Board and the Bureau of Reclamation, but shall have no power or authority to affect vested water rights or to prescribe the manner in which the federal reservoir system or the water resources above Milner Dam shall be managed.

In the early 1990s the Idaho Legislature at the request of the Bureau of Reclamation provided authorization for the rental of up to 427,000 af of storage water on a willing buyer-willing seller basis for augmenting flows for ESA-listed fish in the Lower Snake River. Despite continuing concerns about the efficacy of flow augmentation, the 2004 Snake River Water Rights Agreement resolving the Nez Perce Tribe's water right claims in the SRBA extended the flow augmentation program for a period of thirty years. All storage water released for flow augmentation must be rented through the Idaho Water Resource Board's water bank or through local water rental committees on a willing buyer-willing seller

basis. In addition, the State acquired 60,000 af of natural flow water rights that it has rented to the Bureau of Reclamation as part of the flow augmentation program. While the total amount of water provided in any particular year varies based upon water available for rental and market conditions there is an annual cap of 427,000 af. This annual cap may be increased to 487,000 af under certain conditions provided for in Idaho Code § 42-1763B and the 2004 Snake River Water Rights Agreement. The program is coupled with a biological opinion, which provides incidental take coverage for the Bureau of Reclamation's operation and maintenance of the Upper Snake Projects and related private uses of storage water.

As part of the 1990 Fort Hall Water Rights Agreement, the Board approved the creation of the Shoshone-Bannock water bank. The Shoshone-Bannock Water Bank accrues water in American Falls reservoir and is authorized to rent and deliver storage water anywhere in Idaho.

The effect of the flow augmentation program and the Shoshone-Bannock water bank is to allow water that would otherwise be available for use above Milner Dam to be released to meet water use needs below Milner Dam. To the extent feasible, strategies should be pursued to encourage the exchange flow augmentation water and water rented through the Shoshone-Bannock Water Bank with water downstream of Milner Dam in order to meet demands above Milner Dam. Strategies may include new storage within the Snake River Basin, water right acquisitions, and exchanges with existing storage spaceholders.

Water Transfer Policy: As a result of the limited water supplies above Milner Dam, future domestic, commercial, municipal, and industrial and other water supply needs likely will have to be met through the transfer of existing water rights to meet these new demands. Therefore some provision must be made to facilitate approval of acquisition and use of water rights for new uses on a willing buyer/willing seller basis. Any changes in water right acquisition policy, however, should include measures to protect against unreasonable hydrologic, economic, and/or social impacts.

Cooperation and Appraisal of Management the Water Resources: Ongoing appraisal of actions implemented to sustain existing water resources and support new water uses above Milner Dam is necessary to determine the efficacy of specific strategies and to ensure consistency with the Milner Policy, objectives of the Swan Falls Agreement, and implementation of the ESPA CAMP and the Optimum Use Policy. Monitoring and administrative strategies shall be evaluated in the collaborative forum addressed herein.

Implementation Strategies:

1. Identify where existing new surface water storage sites can be built that are safe, environmentally sound and economical to secure new water supplies, provide flexibility in reservoir operations, and offset flow augmentation demands on supplies above Milner Dam.
2. Implement actions recommended in the ESPA CAMP Phase I to accomplish hydrologic targets including groundwater to surface water conversions, managed aquifer recharge, demand reduction, and weather modification.
3. Monitor and evaluate the results of each of the ESPA CAMP actions on water supply conditions above Milner Dam to assist with development and implementation of future actions, and determination of the efficacy of implementation of the ESPA CAMP Phase II.

4. Manage the water resources above Milner Dam in accordance with the Milner Policy and Upper Snake River Optimum Use Policy.
5. Establish a standing subcommittee for the purpose of supporting the Upper Snake River Optimum Use Policy and collaborating on the management of the water resources and the reservoir system above Milner Dam with representatives from the U.S. Bureau of Reclamation and other stakeholders. The subcommittee shall have no power or authority to affect vested water rights or to prescribe the manner in which the reservoir system or the water resources above Milner Dam shall be managed, but shall develop, through a collaborative effort, recommendations and policies for the efficient and effective management of the water resources and the reservoir system above Milner Dam.
6. Opportunistically acquire Snake River water below Milner Dam, or from other tributary basins, to be exchanged for flow augmentation water with consideration of potential third party impacts including but not limited to impacts on water quality, aquatic resources, and hydropower. In addition, acquire storage water or surface water rights on flow-limited streams upstream of Milner Dam for transfer downstream to support conversions and stream flow restoration.
7. Measurement and Monitoring Implementation Strategy:
    a. Continue to support and update the Eastern Snake River Plain Aquifer Model Version 1.1 (ESPAM1.1), the Snake River Planning Model (SRPM), and the Snake River Accounting system. Promote linkage of the models and their use in evaluation of impacts of various management decisions on Snake River flows, aquifer levels and reservoir operations.
    b. Undertake measurement and monitoring of the combined river and aquifer system to facilitate water management and planning in the Snake River Basin above Milner Dam.
    c. Evaluate the utility of System dynamic modeling techniques to facilitate decision making on optimizing the use of water resources above Milner Dam.
8. Work with the office of the Governor, state agencies, and the legislature to ensure that state management programs are consistent with the State Water Plan and the ESPA CAMP.
9. Implement and maintain cooperative water resource agreements and partnerships with neighboring states, the federal government, and Indian tribes in managing the water resources of the Snake River above Milner Dam.
10. Propose statutory, regulatory, and procedural changes that provide the Idaho Water Resource Board authority and flexibility to use the Water Supply Bank to adaptively manage and optimize water resources of the Snake River above Milner Dam.
11. Enhance water transferability to ensure a water supply for DCMI and other emerging needs while protecting against unreasonable impacts.

Milestones:

1. Evaluate the efficacy of the ESPA CAMP Phase I strategies by 2018 and identify how and whether to proceed with Phase II to meet long-term ESPA CAMP hydrologic targets.
2. Complete necessary actions to implement water supply enhancement projects.

Additional milestones will be developed.

STATE WATER PLAN – SNAKE RIVER POLICY

SNAKE RIVER FROM MILNER DAM TO MURPHY GAGE

4 - SNAKE RIVER BASIN

SNAKE RIVER FROM MILNER DAM TO MURPHY GAGE

Water resources tributary to the Snake River in the Milner to Murphy reach will be managed to meet or exceed the minimum stream flow of 3,900 cfs from April 1 to October 31 and 5,600 cfs from November 1 to March 31 at Murphy gage/Swan Falls.

Discussion:

Swan Falls Minimum Flow Policy: The Swan Falls Settlement between Idaho Power Company and the State established a minimum average daily flow of 3,900 cfs from April 1 to October 31 and 5,600 cfs from November 1 to March 31 at the Murphy gage to assure an adequate hydropower resource base and to protect other instream values such as fish propagation, recreation, aesthetics and water quality. These minimum flows are management and permitting constraints.

As a consequence of the "Milner Policy" set forth in Idaho Code § 42-203B(2) river flows over Milner Dam may be reduced overtime and consequently river flows from the Milner to Murphy gage may consist, at times, almost entirely of ground water discharges from the aquifer into springs and surface water returns. Therefore, the Eastern Snake Plain Aquifer must be managed as an integral part of this reach of the Snake River.

The State of Idaho, by and through the Governor, holds legal title to the hydropower water rights for the Idaho Power Company hydroelectric plants in this reach of the Snake River in excess of the Swan Falls minimum flows in trust for the benefit of Idaho Power Company and the people of the State of Idaho. Pursuant to Idaho Code § 42-203B, the hydropower water rights held in trust by the State are subordinate to new water rights that are acquired pursuant to state law

As contemplated by the parties to the Swan Falls Settlement, the State of Idaho approved applications for the appropriation of water from sources tributary to the Snake River below Milner Dam. These new depletions in combination with changes in irrigation practices and climate variability have led to declines in spring flows in this reach of the Snake River to the point that in dry years the flows are beginning to approach the 3,900 cfs minimum flow.

Conjunctive Administration of Spring Flow and Ground Water Rights: On April 30, 1993, the Director of the Idaho Department of Water Resources issued an Amended Moratorium Order against the issuance of permits to divert water from the Eastern Snake River Plain Area (1993 Trust Water Moratorium). The Moratorium precludes the processing of applications for the appropriation of water pending resolution of the surface and ground water rights water supply conflict. Resolution of the this conflict is an

essential step in the implementation of the long-term water planning objectives for this reach of the Snake River.

ESPA CAMP: In 2009, the Board adopted the ESPA CAMP to address the declining water supplies of the ESPA and the Snake River. The plan, among other things, seeks to stabilize and enhance the spring flows in this reach of the Snake River through implementation of a suite of measures, including managed and incidental recharge, groundwater to surface water conversions, demand reduction, additional surface water storage and weather modification. While the ESPA CAMP measures are expected to lead to stabilization of spring flows, the ESPA CAMP will not result in a return to the historic high spring flow conditions that developed as a result of large scale gravity irrigation diversions in the early part of the last century.

Milner to Murphy Optimum Use Policy: The water management objectives for the Milner to Murphy reach of the Snake River is to adaptively manage water resources in this reach to achieve a balance between existing water use and supplies and to thereby satisfy the Swan Falls minimum flows and increase the reliability of the water supply available to satisfy existing water rights.. The primary tool for achieving these objectives will be the implementation of the ESPA CAMP.

In order to achieve a balance between water use and supplies and to prevent new conflicts between spring and ground water users all new permits and licenses to divert spring flows should be subordinated to upstream consumptive uses within this reach and conditioned on providing mitigation to offset any depletionary impacts on flows at the Murphy gage. Nothing in this policy, however, is shall be construed to affect or change in anyway the legal rights of any current water right holder under the prior appropriation doctrine as established by Idaho law.

A number of the water rights diverting trust water contain a 20 year term limit. In light of the declining spring flows, the State should examine these term permits as they expire to determine whether those permits should be conditioned upon providing mitigation to offset any depletionary impacts on the flows at the Murphy Gage.

As provided for in the Swan Falls Settlement, approval of new storage projects that seek to divert water from sources tributary to the Snake River below Milner Dam and above the Murphy Gaging station should be coupled with a requirement to mitigate for any impacts of such storage on hydropower generation.

Need direction from the Board on how to reconcile State Water Plan Part B for the Milner to King Hill Reach of the Snake River with "Milner Policy."

Water Transfer Policy: As a result of the limited water supplies in the Milner to Murphy reach of the Snake River, the day is fast approaching when there will be no unappropriated water available for future DCMI (domestic, commercial, municipal, and industrial) and other water supply needs. Therefore some provision must be made to facilitate approval of the acquisition and use of water rights for new uses on a willing buyer/willing seller basis. Any changes in water right acquisition policy, however, should include measures to protect against unreasonable hydrologic, economic, and/or social impacts.

Swan Falls Minimum Flow Adaptive Management Policy: The impact from the use of ground water within the basin on the timing of aquifer discharge to the Snake River is such that curtailment of water rights when the flow of the Snake River approaches the Swan Falls minimum flows is not an effective remedy. Therefore, a long-term monitoring and adaptive management plan to proactively administer water sources tributary to the Snake River below Milner Dam is essential to prevent depletion of the flow of the Snake River at Murphy gage below the Swan Falls minimums. The plan should establish an agreed upon measurement and monitoring protocol for determining the average daily flow at the Murphy gaging station consistent with terms of the Swan Falls Agreement. In addition, the plan should identify adaptive management strategies for managing the water sources tributary to the Snake River below Milner Dam to satisfy the Swan Falls minimum flows.

Implementation Strategies:

1) Initiate a review of water right permits and licenses containing a term limitation.

2) Support the development of an enhanced spring water measurement program as a mechanism for facilitating adaptive management measures to achieve ESPA CAMP and Swan Falls minimum flow objectives.

3) Implementation of a Swan Falls monitoring and adaptive management program to provide for the administration of water sources tributary to the Snake River below Milner Dam to achieve the minimum average daily flows at the Murphy Gauge.

4) Develop streamlined policy for processing transfers to meet the water supply needs for DCMI and other future water uses...

5) Implement ESPA CAMP to accomplish goals and objectives to sustain and enhance spring flows within this reach to improve the reliability of water supply for hydropower generation and other instream values above the Murphy gage.

Milestones:

To be developed...

STATE WATER PLAN – SNAKE RIVER POLICY

SNAKE RIVER FROM MURPHY GAGE TO WEISER GAGE

4 - SNAKE RIVER BASIN

SNAKE RIVER FROM MURPHY GAGE TO WEISER GAGE

Water resources tributary to the Snake River from Murphy Gage to Weiser Gage reach will be managed to meet or exceed an average daily flow of 4,750 cfs at the Weiser Gage.

Discussion:

Management and Permitting Constraints: The minimum stream flow water right of 4,750 cfs (year round) is held by the Idaho Water Resource Board. This water right has a priority date of 1976 and was established by legislative approval of the State Water plan in 1976. The flow of the Snake River at the Weiser gage is a management and permitting constraint. This minimum flow was established to assure an adequate hydropower resource base and protect other instream flow values such as fish habitat, recreation, aesthetics, and water quality.

Background: Large-scale organized irrigation came to the lower Boise River in the 1860's and 1870's. At that time, the greatest need was for a water storage system to supplement river flows during the late summer months when irrigation demands exceeded natural river supplies.

The Boise Project began in 1906 by extending the New York Canal 40 miles to convey water from the Boise River Diversion to Lake Lowell. Since then, the Boise Project has evolved to provide full irrigation water supply to approximately 224,000 acres and a supplemental supply to some 173,000 acres.

Storage facilities tributary to the Murphy to Weiser reach of the Snake River consist of Anderson Ranch Reservoir, Arrowrock Reservoir, Lucky Peak Reservoir, Lake Lowell, Deadwood Reservoir, Cascade Reservoir, and Black Canyon Reservoir. In the Boise River basin all three reservoir facilities (Anderson Ranch, Arrowrock, and Lucky Peak) are operated in a coordinated manner to provide water for irrigation within the Boise River basin and flood control. To the extent possible, water is stored high in the system for operational flexibility. During the irrigation season, Lucky Peak is held at or near full through the summer and Arrowrock and Anderson Ranch Reservoirs are drafted for irrigation. In the fall, Lucky Peak is drafted to meet late-season irrigation needs. Storage water that is not used is credited as carryover into the next year.

Background and challenges on Payette, Weiser, Owyhee being developed.

Urban Growth in Boise River Basin: The lower Boise River flows approximately 64 miles through Ada and Canyon counties, from Lucky Peak Dam to its confluence with the Snake River. This area has experienced rapid population growth over the past several decades with land-use changing from agricultural to urban use. As a result, there are increasing demands on water supplies for domestic use.

This change in land and water use not only requires water management strategies to meet demand, but also requires methods for protecting water quality and effective flood risk management. These issues are best addressed through a regional planning process.

Treasure Valley CAMP: In 2008 the Idaho Legislature passed House Bills (HB) 428 and 644 which directed the Idaho Water Resource Board to conduct a statewide comprehensive aquifer planning and management effort (CAMP). The Idaho Water Resource Board began developing the framework for a comprehensive management plan (CAMP) for the Treasure Valley basin in Fiscal Year 2008. The process is anticipated to take four years. The Treasure Valley CAMP will provide the framework for water planning and management for the next 50 years.

The specific goals of the CAMP program are to:

- Provide reliable sources of water, projecting 50 years in to the future
- Develop strategies to avoid conflicts over water resources
- Prioritize future state investments in water
- Bridge the gaps between future water needs and supply

During the first phase of the project, technical studies and planning activities will be undertaken. The technical studies will focus on refining the understanding of the ground and surface water system and developing a water budget. The planning process will undertake studies to estimate future water needs and identify tools to meet those needs.

A few of the components to be addressed in the Treasure Valley CAMP are:

1. **Conjunctive Management:** Over the years, surface water and ground water development and management in the Boise basin has evolved to a point where Conjunctive Management must be implemented to satisfy both ground water and surface water demands. A few of the drivers of this change are:

    - Reduced deep percolation of water as a result of improved irrigation efficiencies
    - Increasing urbanization
    - Increased interest in maintenance of instream flows
    - Water needs for energy production
    - Impacts of climate variability

2. **Additional DCMI for Growth:** In addition to surface water supplies, water users in the Boise River basin rely on groundwater. In recent years, increasing population and droughts have led to localized declines in shallow groundwater levels in the Boise River basin. Water supply for DCMI uses is forecasted to be one of the most pressing water supply issues for this reach of the Snake River. In 2000, 175,000 acre-feet of groundwater was pumped in the Boise River basin, of which 30 percent was used for irrigation (53,000 AF) and 70 percent was used for DCMI (122,000 AF [IDWR, 2000]). Most large municipal water suppliers draw from the deeper regional aquifer. Analysis suggests that groundwater levels in the deeper aquifer are relatively stable, in contrast

with shallow water table levels that appear to be locally declining in areas where residential development is replacing flood-irrigated farmland (IWRRI, 2004).

In 2001, an IDWR study "predicted that there will be a significant increase in DCMI water demand during the next 25 years [in Ada and Canyon Counties] and that between 76,000 and 96,000 additional acre-feet of water will be needed to accommodate the additional demand. As part of the Treasure Valley CAMP, a future demand study will estimate future water for various categories, including DCMI, over the next 50 years.

Additional DCMI demands are particularly pressing upstream of Star [located on the Boise River], where much of the population of the Treasure Valley is located, and where the only surface water available for new appropriation occurs during the spring run-off. In order to utilize the unappropriated spring run-off water for additional DCMI demand, new surface water storage or aquifer recharge projects will be needed.

3. **Studies for Additional Storage:** A 1994 U.S. Army Corps of Engineers, *Technical Report on Additional Snake River Basin Storage, Phase 1* concluded that additional upstream storage, including the Galloway Project, could benefit fall Chinook salmon, from the confluence of the Salmon River to Lower Granite Dam during critical low flow years by allowing for flow augmentation in the Snake River. Additionally, the report concluded "the feasibility of transferring the flood control storage space from the Brownlee Project to the Galloway Project could improve the effectiveness of upstream storage and should be considered."

   In conjunction with the Treasury Valley CAMP, House Joint Memorial (HJM) 8 encouraged the Idaho Water Resource Board, in coordination with other public and private entities, to initiate and complete the study of additional water storage projects for water supply and flood control in the state of Idaho, including, but not limited to, the study of Twin Springs Dam in the Boise River drainage. Completion of the interim feasibility study is anticipated in 2012, subject to congressional funding.

   The CAMP will also evaluate the potential for managed recharge in the Treasure Valley as a method of water storage.

Municipal Water Use and Development Policy: As a result of the limited water supplies in the Murphy Gage to Weiser reach of the Snake River, the day is fast approaching when there will be no unappropriated water available for future DCMI (domestic, commercial, municipal, and industrial) and other water supply needs. The Board therefore adopts a Municipal Water Use Policy with the following components:

1. Continuation of dual-use residential systems to preserve incidental recharge throughout Treasure Valley where appropriate.
2. Development of flexible water marketing tools to facilitate rental or acquisition of water rights for new uses on a willing buyer/willing seller basis. Water acquisition strategies should account for adverse hydrologic, economic, and/or social impacts.
3. Improved hydrologic monitoring programs to inform policy decisions.
4. Evaluation and implementation of water supply enhancement measures, including but not limited to, groundwater conservation, additional storage, and water re-use.

5. Protection of surface water and ground water quality for beneficial uses.

Flow Augmentation: In the early 1990's the Idaho Legislature at the request of the Bureau of Reclamation provided authorization for the rental of up to 427,000 acre-feet of storage water on a willing buyer-willing seller basis for augmenting flows for ESA-listed fish in the Lower Snake River. Despite continuing concerns about the efficacy of flow augmentation, the 2004 Snake River Water Rights Agreement resolving the Nez Perce Tribe's water right claims in the SRBA extended the flow augmentation program for a period of thirty years. All storage water released for flow augmentation must be rented through the Idaho Water Resource Board's water supply bank or through local water rental committees on a willing buyer-willing seller basis. In addition, the State of Idaho acquired 60,000 acre-feet of natural flow water rights that it has rented to the Bureau of Reclamation as part of the flow augmentation program. While the total amount of water provided in any particular year varies based upon water available for rental and market conditions, there is an annual cap of 427,000 acre-feet. This annual cap may be increased to 487,000 acre-feet under certain conditions proved for in Idaho Code 42-1763B and the 2004 Snake River Water Rights Agreement.

The Snake River basin augmentation flows are supplied in part from the Boise Project, and in part from other upper Snake River Projects. Currently the Boise/Payette reservoir system is able to provide approximately 136,000 acre-feet (in total from Lucky Peak Reservoir, Deadwood Reservoir, and Cascade Reservoir) of water to be used for flow augmentation.

Additional items that may need to be addressed in this reach of the Snake River

Use of storage water to maintain flows/winter flows (includes aspects of water quality)

Implementation Strategies:

1) *Complete and implement Treasure Valley CAMP*
2) *Complete evaluation of new surface water storage sites in the Boise and Weiser River Basins*
3) *Evaluate managed recharge as a water storage strategy for meeting increasing DCMI needs.*

Milestones:

1)

STATE WATER PLAN – SNAKE RIVER POLICY

4 - SNAKE RIVER BASIN

4 – SNAKE RIVER BASIN WATER MANAGEMENT FRAMEWORK

The Idaho Water Resource Board's Snake River minimum stream flows establish the framework for water management in the Snake River basin.

Discussion:

Approximately 87% of the surface area of the State of Idaho is within the Snake River drainage basin. The waters of the Snake River form the backbone of Idaho's economy. Effective management of this resource is essential to protecting existing water rights, sustaining economic growth, maintaining low-cost power rates, and preserving fish, wildlife and other environmental values.

At the core of Snake River water management is the state policy of managing the Snake River to meet or exceed minimum stream flows established at the Milner, Murphy, Weiser, Johnson Bar and Lime Point gaging stations. These minimum stream flows establish, as a matter of state policy, a balance between diversion of water out of stream for consumptive uses and preservation of flows for instream uses. This policy of managing reaches of the Snake River to meet or exceed designated instream flows evolved over the course of the 20th Century and was incorporated into the 1976 State Water Plan. A brief overview of the evolution of the instream flow management policy is provided to give context for the individual river reach policies that follow.

Throughout the first half of the 20th Century the dynamic tension between diversion of water for consumptive uses and retention of flows for instream uses was manifested in the context of the simultaneous development of the irrigable lands within the Snake River Basin and the development of the hydropower potential of the main stem Snake River.

Initially, the conflict was resolved through the development of the Milner Policy in 1920, which dedicated the flow of the Snake River above Milner Dam for future agricultural development. The Milner Policy was based upon the physical character of the river. Upstream from the Milner Dam the relatively flat landscape facilitated water diversions from the main stem Snake River into canal systems with technology available at the time. Below Milner Dam, the Snake River enters a deep canyon and was largely inaccessible for agricultural development in the first half of the 20th century. The decent of the Snake River into the canyon below Milner, however, made the downstream reach of the river ideally suited for hydropower development. Thus, the State adopted the Milner Policy, which subordinated hydropower development below Milner to future upstream development. As discussed more fully below, the Milner Policy as it evolved does not mandate a zero flow at the Milner gage but rather prevents holders of water rights using water below Milner Dam from calling for the delivery of water above Milner Dam.

The advent of high lift pumping technology in the 1950s precipitated the next phase of the Snake minimum stream flow policy. Pumping made irrigation of vast expanses of desert land lying above the Eastern Snake Plain Aquifer possible. Additional power to turn the pumps was to come from

development of the hydropower potential of the Hells Canyon reach of the Snake River. Concern that hydropower development might monopolize the flows of the Snake River, however, led to an agreement between the State of Idaho and Idaho Power Company that subordinated its hydropower water rights for the Hells Canyon complex to all future upstream consumptive uses. The subordination provision in the Hells Canyon complex license, like the Milner Policy, precludes hydropower uses from interfering with future upstream development.

The FPC license for the Hells Canyon complex provided for operational flows at Johnson Bar and Lime Point to provide for navigation. As discussed more fully in the Below Weiser reach policy, these operational flows form the basis for the Johnson Bar and Lime Point state minimum stream flows, which were first recognized in the 1976 Idaho State Water Plan.

In the latter part of the 20th Century, the dynamic tension between consumptive and instream flow uses expanded beyond the irrigation/hydropower context to include water quality, fish and wildlife and other instream uses. Studies conducted by the Idaho Department of Fish and Game suggested that further depletions of the flows of the Snake River in the reach between Milner and Weiser would be detrimental to fish and wildlife. Thus, the 1976 Idaho State Water Plan determined it was not in the public interest to allow depletion of the average daily flow of the Snake River below 3,300 cfs at the Murphy gage and below 4,750 cfs at the Weiser gage. These minimum flows were established to "maintain water for production of hydropower and other main stem water uses. . . "

The Swan Falls Controversy brought the need for maintaining minimum flows into greater focus and led to a comprehensive settlement balancing instream uses with upstream development. The average minimum daily flow at the Murphy gage was increased to 3,900 cfs during the irrigation season and 5,600 cfs during the non-irrigation season and the State Water Plan directed "that ground water and surface water of the Snake River basin would be managed to meet or exceed the state minimum average daily flow at Milner, Murphy, and Weiser. The Murphy and Weiser minimum flows were designated as management constraints.

The State of Idaho, as part of the 2004 Snake River Water Rights Agreement, established a flow augmentation program that supplements the main stem Snake River state minimum stream flows. The program consists of two tiers. Tier 1 recognizes the Milner and Murphy minimum stream flows as base flows. Tier 2 provides for the rental of storage water in accordance with the provisions of Idaho Code § 42-1763B and the Snake River flow component of the 2004 Snake River Water Rights Agreement and for the acquisition of up to 60,000 acre-feet of natural flow water rights within the Milner to Murphy reach of the Snake River.

The minimum stream flows that evolved over the last century form an integrated plan for management of the Snake River as a whole. Each minimum stream flow was established to address specific management objectives for the Snake River above its ending point. The State Water Plan, beginning with the first plan in 1976 and continuing though each successive plan, has recognized this framework as a means of ensuring an equitable allocation of the flows of the Snake River between consumptive and instream uses and as a means of ensuring an equitable allocation of the flows of the Snake River for future development throughout the basin. While this framework allows for the development of future uses of water within each reach, localized decisions must take into account the potential impact of such development on water supplies in other reaches.

STATE WATER PLAN – SNAKE RIVER POLICY

SNAKE RIVER ABOVE MILNER DAM
OUTLINE

4 - SNAKE RIVER BASIN

4B- SNAKE RIVER ABOVE MILNER DAM

Water resource policy, planning and practice should continue to optimize water use and provide for full development of the Snake River above Milner Dam recognizing that the exercise of water rights above Milner Dam has and may reduce flow at the Dam to zero.

Discussion:

Milner Policy: The formulation and implementation of a plan for the optimum development and use of the water resources of the Snake River above Milner Dam must be consistent with the so called "Milner Policy" set forth in Idaho Code § 42-203B(2), which provides that no portion of the waters of the Snake River upstream from Milner Dam shall be considered for the purposes of the determination and administration of rights to the use of the waters downstream from Milner dam. The exercise of water rights above Milner Dam may reduce the flow of the Snake River at Milner Dam to zero.

The Milner Policy evolved from a 1920 report prepared by a Board of Engineers convened by the Governor and the United States for the purpose of preparing a plan for the future development of irrigation and hydropower in the Upper Snake River Basin. As described by the Board of Engineers, the Milner Policy was founded upon the physical divide in the Snake River at Milner Dam. Above Milner Dam, the waters were easily diverted and used for irrigation and other consumptive uses. Below Milner Dam the river descended into a deep canyon and was unavailable for agricultural development with technology available at the time. The Board recommended, therefore, that in order to make optimum use of the water resources the entire flow of the Snake River above Milner should be dedicated to the extent economically feasible for upstream irrigation. Over the past century, the Milner Policy guided the economic growth and the development within the Snake River basin and is inextricably intertwined with the overall management of the water resources of the basin.

The Milner Policy envisioned that while development of the flows above Milner Dam would have some impact on hydropower generation, the increased spring flows resulting from the upstream development would sustain hydropower production downstream from Milner Dam. In order to ensure that hydropower development didn't interfere with development above Milner, however, the Board advised that in "granting power rights in the future the Federal Government and the State should so far as possible provide restrictions requiring [their] eventual surrender ..." This policy of subordinating hydropower development to upstream consumptive uses was affirmed by the 1984 Swan Falls Settlement and 2009 Swan Falls Reaffirmation Agreement between the State and Idaho Power Company.

Consistent with the Milner Policy and the Swan Falls Settlement, the primary long-term water planning objective for the Snake River above Milner Dam is to ensure that unappropriated flows tributary to the Snake River above Milner Dam are available to supply existing and future beneficial uses in this reach of the Snake River.

Conjunctive Administration of Spring Flow and GW Rights: On January 6, 1993, the Director of the Idaho Department of Water Resources issued an Amended Moratorium Order against the issuance of permits to divert water from the Snake River and all tributary sources above Milner Dam in the non-trust water area (1993 Non-Trust Water Moratorium). The Moratorium seeks to protect the status quo while moving forward with the implementation of the conjunctive administration of surface and ground water rights. Resolution of the surface/ground water conflict is essential to the implementation of the long-term water planning objectives for this reach of the Snake River.

ESPA CAMP: Consistent with Milner Policy and the intent to optimize use of water in a heavily developed basin, as well as the need to address concerns about water supply and conflicts between surface and ground water use in the Eastern Snake Plain, the Idaho Water Resource Board adopted the Eastern Snake Plan (ESPA) Comprehensive Aquifer Management Plan (CAMP) to "Sustain the economic viability and social and environmental health of the Eastern Snake Plain by adaptively managing the balance between water use and supplies." The objectives of the plan are to increase predictability for water users by managing the water resources to provide for a reliable water supply for existing and future uses. The plan established long-term strategies to incrementally achieve a net water budget change in the ESPA of 600 thousand acre-feet (kaf) annually by the year 2030 through a suite of water management actions.

The ESPA CAMP uses a phased approach to achieving the long-term change in the water budget. The goal of Phase 1 of ESPA CAMP is to implement measures over a ten year period that will result in a target hydrologic water budget change of between 200 kaf and 300 kaf. The recommended measures to achieve this target include ground water to surface water conversions, managed aquifer recharge, demand reduction, and weather modification.

Fully implementing the ESPA CAMP will improve the opportunities to adaptively manage and optimize water supplies across the ESPA by: increasing gains in some river reaches, improving storage carryover; increasing aquifer levels; decreasing the need for litigation, mitigation and administrative activities; allowing for municipal and industrial growth; reducing overall demand; and increasing and sustaining spring flow. The ESPA CAMP anticipates implementation of Phase I strategies by 2018 with ongoing monitoring and evaluation of the intended and unintended effects of the strategies. The monitoring and evaluation studies will be used to select and design Phase II strategies.

As part of the 2009 Swan Falls Reaffirmation Agreement, the State and the Board entered into a Memorandum of Agreement with Idaho Power Company that requires the Board to obtain legislative approval to increase the Phase 1 ESPA CAMP managed recharge goal of 100,000 af by more than 75,000 af prior to January 1, 2019. "The purpose of this memorandum of agreement is to recognize that implementation of managed recharge will have an effect on the flow characteristics of the Snake River above and below Milner Dam and to confirm that the relative merits of recharge proposals in addition to or different than that provided in Phase 1 of ESPA CAMP will be considered through the adaptive management process set forth in Section 4 of ESPA CAMP." The Memorandum of Agreement also requires that a change to the ESPA CAMP long-term hydrologic target for managed recharge target must be accomplished through an amendment of the State Water Plan. Finally, the Memorandum of

Agreement recognizes that it is the mutual interest of the State and the Company to work cooperatively to explore and develop a managed recharge program for the Snake River Basin above the Swan Falls Dam that achieves to the extent possible benefits for all uses including hydropower.

Upper Snake River Optimum Use Policy: Except for winter flows in excess of the storage capacity of existing reservoirs, the reliable water supply of the Snake River Basin above Milner Dam is nearly developed. Thus, future development of the water resources in the Snake River Basin upstream of Milner Dam consistent with the State Water Plan and the ESPA CAMP will require measures that augment and enhance available water supplies, such as the development and efficient use of existing on-stream, off-stream, and aquifer storage, development of new storage, and water right acquisitions and exchanges. Implementation of such actions, however, will result in a change in flows passing Milner. Therefore, as discussed in the Milner to Murphy Reach section, a process must be in place to identify and account for impacts that development above Milner will have on the water supply available to meet management objectives in the Milner to Murphy reach of the Snake River.

Coordinated management of the water resource development with the federal reservoir system above Milner Dam will provide an opportunity to optimize the use of the available water supply above Milner Dam. Therefore, the following Upper Snake River Optimum Use Policy is established:

1. It is in the public interest to manage the water resources above Milner Dam in a coordinated manner consistent with state law and the State Water Plan to provide a reliable supply of water for existing and future beneficial uses.

2. The Bureau of Reclamation is encouraged to manage the federal reservoir system above Milner Dam in a manner compatible with this policy, to the extent consistent with federal reclamation law and project purposes. To facilitate this effort, the Board will implement a process to openly address water management and reservoir operation needs through a standing advisory subcommittee. The subcommittee will be a collaborative forum where relevant information may be exchanged and reviewed on how the state and the Bureau of Reclamation, in the exercise of their respective authorities, can optimize the management of the water resources and the reservoir system above Milner Dam consistent with the policy set forth in paragraph 1. The Board shall request that the Bureau of Reclamationand the Committee of Nine, designate representatives as standing members of this subcommittee and shall invite other parties that may be interested in the management of affected water resources to also participate. This subcommittee may periodically submit advisory recommendations to the Board and the Bureau of Reclamation, but shall have no power or authority to affect vested water rights or to prescribe the manner in which the federal reservoir system or the water resources above Milner Dam shall be managed.

In the early 1990s the Idaho Legislature at the request of the Bureau of Reclamation provided authorization for the rental of up to 427,000 af of storage water on a willing buyer-willing seller basis for augmenting flows for ESA-listed fish in the Lower Snake River. Despite continuing concerns about the efficacy of flow augmentation, the 2004 Snake River Water Rights Agreement resolving the Nez Perce Tribe's water right claims in the SRBA extended the flow augmentation program for a period of thirty years. All storage water released for flow augmentation must be rented through the Idaho Water Resource Board's water bank or through local water rental committees on a willing buyer-willing seller

basis. In addition, the State acquired 60,000 af of natural flow water rights that it has rented to the Bureau of Reclamation as part of the flow augmentation program. While the total amount of water provided in any particular year varies based upon water available for rental and market conditions there is an annual cap of 427,000 af. This annual cap may be increased to 487,000 af under certain conditions provided for in Idaho Code § 42-1763B and the 2004 Snake River Water Rights Agreement. The program is coupled with a biological opinion, which provides incidental take coverage for the Bureau of Reclamation's operation and maintenance of the Upper Snake Projects and related private uses of storage water.

As part of the 1990 Fort Hall Water Rights Agreement, the Board approved the creation of the Shoshone-Bannock water bank. The Shoshone-Bannock Water Bank accrues water in American Falls reservoir and is authorized to rent and deliver storage water anywhere in Idaho.

The effect of the flow augmentation program and the Shoshone-Bannock water bank is to allow water that would otherwise be available for use above Milner Dam to be released to meet water use needs below Milner Dam. To the extent feasible, strategies should be pursued to encourage the exchange flow augmentation water and water rented through the Shoshone-Bannock Water Bank with water downstream of Milner Dam in order to meet demands above Milner Dam. Strategies may include new storage within the Snake River Basin, water right acquisitions, and exchanges with existing storage spaceholders.

Water Transfer Policy: As a result of the limited water supplies above Milner Dam, future domestic, commercial, municipal, and industrial and other water supply needs likely will have to be met through the transfer of existing water rights to meet these new demands. Therefore some provision must be made to facilitate approval of acquisition and use of water rights for new uses on a willing buyer/willing seller basis. Any changes in water right acquisition policy, however, should include measures to protect against unreasonable hydrologic, economic, and/or social impacts.

Cooperation and Appraisal of Management the Water Resources: Ongoing appraisal of actions implemented to sustain existing water resources and support new water uses above Milner Dam is necessary to determine the efficacy of specific strategies and to ensure consistency with the Milner Policy, objectives of the Swan Falls Agreement, and implementation of the ESPA CAMP and the Optimum Use Policy. Monitoring and administrative strategies shall be evaluated in the collaborative forum addressed herein.

Implementation Strategies:

1. Identify where existing new surface water storage sites can be built that are safe, environmentally sound and economical to secure new water supplies, provide flexibility in reservoir operations, and offset flow augmentation demands on supplies above Milner Dam.
2. Implement actions recommended in the ESPA CAMP Phase I to accomplish hydrologic targets including groundwater to surface water conversions, managed aquifer recharge, demand reduction, and weather modification.
3. Monitor and evaluate the results of each of the ESPA CAMP actions on water supply conditions above Milner Dam to assist with development and implementation of future actions, and determination of the efficacy of implementation of the ESPA CAMP Phase II.

4. Manage the water resources above Milner Dam in accordance with the Milner Policy and Upper Snake River Optimum Use Policy.
5. Establish a standing subcommittee for the purpose of supporting the Upper Snake River Optimum Use Policy and collaborating on the management of the water resources and the reservoir system above Milner Dam with representatives from the U.S. Bureau of Reclamation and other stakeholders. The subcommittee shall have no power or authority to affect vested water rights or to prescribe the manner in which the reservoir system or the water resources above Milner Dam shall be managed, but shall develop, through a collaborative effort, recommendations and policies for the efficient and effective management of the water resources and the reservoir system above Milner Dam.
6. Opportunistically acquire Snake River water below Milner Dam, or from other tributary basins, to be exchanged for flow augmentation water with consideration of potential third party impacts including but not limited to impacts on water quality, aquatic resources, and hydropower. In addition, acquire storage water or surface water rights on flow-limited streams upstream of Milner Dam for transfer downstream to support conversions and stream flow restoration.
7. Measurement and Monitoring Implementation Strategy:
    a. Continue to support and update the Eastern Snake River Plain Aquifer Model Version 1.1 (ESPAM1.1), the Snake River Planning Model (SRPM), and the Snake River Accounting system. Promote linkage of the models and their use in evaluation of impacts of various management decisions on Snake River flows, aquifer levels and reservoir operations.
    b. Undertake measurement and monitoring of the combined river and aquifer system to facilitate water management and planning in the Snake River Basin above Milner Dam.
    c. Evaluate the utility of System dynamic modeling techniques to facilitate decision making on optimizing the use of water resources above Milner Dam.
8. Work with the office of the Governor, state agencies, and the legislature to ensure that state management programs are consistent with the State Water Plan and the ESPA CAMP.
9. Implement and maintain cooperative water resource agreements and partnerships with neighboring states, the federal government, and Indian tribes in managing the water resources of the Snake River above Milner Dam.
10. Propose statutory, regulatory, and procedural changes that provide the Idaho Water Resource Board authority and flexibility to use the Water Supply Bank to adaptively manage and optimize water resources of the Snake River above Milner Dam.
11. Enhance water transferability to ensure a water supply for DCMI and other emerging needs while protecting against unreasonable impacts.

Milestones:

1. Evaluate the efficacy of the ESPA CAMP Phase I strategies by 2018 and identify how and whether to proceed with Phase II to meet long-term ESPA CAMP hydrologic targets.
2. Complete necessary actions to implement water supply enhancement projects.

Additional milestones will be developed.

STATE WATER PLAN – SNAKE RIVER POLICY

SNAKE RIVER BELOW WEISER

4 - SNAKE RIVER BASIN

4D- SNAKE RIVER BELOW WEISER

The minimum stream flows at Johnson Bar and Lime Point are not permitting and management constraints for water right administration above the Hells Canyon Complex. These minimum stream flows will be maintained through operational releases from the Hells Canyon Complex and tributary inflows to this reach.

Discussion:
The Snake River near Weiser runs north for approximately two miles before flowing into the headwaters of the Hells Canyon Complex (HCC). A USGS gage near Weiser Idaho defines the beginning of the reach and measures inflows into the HCC; the reach ends at the Idaho/Washington State Line. The river defines the Idaho-Oregon state border, which flows through Brownlee, Oxbow, and Hell's Canyon Reservoirs and into Hells Canyon, a steep and spectacular gorge that cuts through the Salmon River Mountains and Blue Mountains of Idaho and Oregon. Hells Canyon is one of the most rugged and treacherous portions of the course of the Snake River. The river plunges 8,000 feet below the He Devil Peak of Idaho's Seven Devils Mountains. The Salmon and Clearwater Rivers are major tributaries in this reach of the Snake River (See Policies 6A and 6B).

Hells Canyon Complex: In the late 1940s and early 1950s, Idaho Power Company and federal agencies competed for the right to construct hydropower facilities in the Hells Canyon reach of the Snake River. At the center of the conflict between public and private development was the question of which project would ensure the opportunity for future upstream development. Ultimately, Idaho Power prevailed, based upon its voluntary agreement to subordinate its hydropower water rights to all future upstream consumptive uses. The Federal Energy Regulatory Commission (formerly Federal Power Commission) , at the request of Idaho Power Company, included Article 41 of the FERC license which provides that the project will "be operated in such a manner as [to] not conflict with the future depletion in flows of the waters of the Snake River and its tributaries, or prevent or interfere with the future upstream diversion and use of such water above the backwater created by the project, for the irrigation of lands and other beneficial consumptive uses in the Snake River [watershed]." The Idaho Supreme Court in 1983 held that this provision constituted a subordination of the Company's hydropower water rights for the Hells Canyon Complex.

While the hydropower water rights for the Hells Canyon Complex are subordinated to all future upstream consumptive uses, the Federal Power Commission as part of the FPC license required minimum flows be maintained for navigation.
Article 43 of the power license provides that:

"The project shall be operated in the interest of navigation to maintain 13,000 cfs flow in 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 mutually agreed to by the Licensee 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..."

The 1976 State Water Plan recognized the importance of these minimum flows to downstream uses, and the 1986 State Water Plan made their maintenance a matter of state water policy. The plan, however, also made clear that "Snake River flows above the hydropower right at any Idaho Power facility are considered unappropriated and therefore are not held in trust by the state." Accordingly, the state minimum flows at Johnson Bar and Lime Point are not permitting or management constraints.

Hells Canyon National Recreation Area: The Hells Canyon controversy gave rise to emerging concerns about the preservation of the region's natural features and ultimately led to enactment of the Hells Canyon National Recreation Area Act of 1975 which precluded future hydropower development in the Hells Canyon reach of the Snake River. The Act also designated the Snake River as "wild" (Hells Canyon Dam to Pittsburg Landing) and "scenic" (Pittsburg Landing to 37 miles south of Lewiston) to preserve the free-flowing character and unique environment while providing for continued public use. The Act provided that no flow requirements of any kind may be imposed on the waters of the Snake River below Hells Canyon Dam. The United States' federal reserved water rights are limited to the tributary streams of the Snake River within the HCNRA. The decrees quantifying the tributary federal reserved water rights contain subordination provisions that protect existing rights and allow for a limited amount of future development on the tributary streams.

Endangered Species Act: The Snake River below Hells Canyon Dam provides habitat for fish species that have been listed as endangered or threatened under the Endangered Species Act, including sockeye salmon, spring/summer Chinook salmon, fall Chinook salmon, steelhead trout, and bull trout.

Flow augmentation is a strategy currently used as mitigation for the effects of hydropower operations on ESA-listed species. Flow augmentation is intended to enhance migration of ESA-listed fish species. Flow augmentation from the upper Snake River has proven to be controversial because of the inability to demonstrate the specific benefits of the program. Evaluation of the efficacy of flow augmentation should be conducted in conjunction and/or cooperation with other State and Federal agencies and regional interests.

Port of Lewiston - Placeholder

Optimum Use Policy: Existing hydropower uses should be preserved while protecting the natural characteristics of the Hells Canyon and Snake River downstream of the Hells Canyon Complex.

The Hells Canyon Complex represents the majority of Idaho Power's hydropower generation capacity. The HCC FERC license expired in 2005. The relicensing of this complex is critical to the Company's ability

to continue to provide low-cost power for Idaho. The relicensing will also address the protection and enhancement of recreational, aesthetic, and fish and wildlife resources in this reach. The Board finds that it is in the public interest that any operational requirements in the FERC license should be consistent with the state-established minimum stream flows.

The Hells Canyon National Recreation Area provides unique recreational opportunities. Traditional Recreation Area activities like hiking, backpacking, rafting, and fishing occur along-side commercial jet boat excursions in the Canyon. The area is a tourist destination that positively contributes to the local economy. It is therefore in the public interest to preserve these unique resources below the Hells Canyon Complex. The State minimum stream flows are permitting and management constraints below the HCC.

Implementation Strategies:

1) Collaborate with state and federal agencies in FERC relicensing proceedings to ensure consistency with SWP.

2) Support collaborative efforts to address water quality and ESA issues while sustaining low cost hydropower for the State.

Milestones:

1) FERC relicensing in accordance with SWP.

Comprehensive State Water Plan – Part B

http://www.idwr.idaho.gov/waterboard/WaterPlanning/CompBasinPlanning/Comp_Basin_Plans.htm

In 1988, the Idaho State Legislature directed the Idaho Water Resource Board to develop a "comprehensive state water plan" (Idaho Code 5 42-1734A). This "Part B" of the state water plan explains issues, goals, and recommendations that are specific to the individual waterways, river basins, drainage areas, river reaches, aquifers, or other geographic designations. These geographically specific Comprehensive State Water Plans are commonly known as Comprehensive Basin Plans (CBP). Each plan that is adopted by the Idaho Legislature becomes part of the state water plan. The attachment shows the locations of the CBP the years they were adopted.

The criteria for developing CBP include:

1. Preserve and protect existing water rights and their relative priorities
2. Achieve optimum economic development for the benefit of the state by augmenting supplies and protecting designated waterways for all beneficial purposes.
3. Ensure adequate and safe water supplies for human consumption
4. Encourage minimum stream flows for aquatic life, recreation, aesthetics, water quality, and the protection and preservation of waterways. Consideration will be given to the development and protection of water recreation facilities.
5. Encourage watershed conservation practices that are consistent with sound engineering and economic principles

The comprehensive state water planning process involves five steps:

1. Developing an inventory of resource attributes
2. Assessing current and potential water uses and constraints
3. Identifying local issues, concerns, and goals specific to water use
4. Formulating development, improvement and/or conservation policy alternatives
5. Guided by public interest, setting forth actions and recommendations relative to improving, developing, and conserving the water resources of the basin.

State Protected Rivers

As part of the CBP planning process the Board may decide that the values of preserving an outstanding waterway in its existing condition outweigh the values of continued development. With legislative approval the Board may designate a waterway as either a Natural or Recreational River. Natural rivers are free of substantial man-made development in the waterway, and the riparian area is largely undeveloped. There are 2,268 miles of protected rivers in Idaho, 790 miles of Natural Rivers and 1,478 miles of Recreational Rivers.

The following activities are prohibited on Natural Rivers:

- Construction or expansion of dams or impoundments
- Construction of hydropower projects
- Construction of water diversion works
- Dredge or placer mining
- Alterations of the stream bed
- Mineral or sand and gravel extraction within the stream bed

In the case of recreational rivers the Board has the flexibility to determine which of the above activities were to be prohibited and the conditions under which they may be allowed.

ID-273
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MEMORANDUM OF UNDERSTANDING
between the
Governor, State of Idaho
and
Regional Foresters
Northern and Intermountain Regions
Forest Service
and
State Director, Idaho
Bureau of Land Management

The purpose of this Memorandum of Understanding (MOU) is to formalize a cooperative relationship for conducting river planning efforts and Wild and Scenic Rivers Studies of Idaho's rivers; among the State of Idaho, the Forest Service, and Bureau of Land Management. It affirms commitments to: prioritize Federal Wild and Scenic Rivers Studies and coordinate Federal studies with State planning activities; share data and planning resources between State and Federal water resource planning agencies; and coordinate public education and information outreach programs.

THE UNDERSIGNED PARTIES MUTUALLY AGREE THAT:

1. The Idaho Department of Water Resources is designated as the lead State agency for water planning activities covered by this agreement. For any particular Federal planning area, the Forest Service and Bureau of Land Management shall agree as to which agency would serve as the lead Federal agency for cooperative studies and so inform the State.

2. The Idaho Department of Water Resources shall coordinate among State and local government agencies.

3. Coordination of the efforts needed to complete studies and/or management plans will be conducted by the lead agencies for each river.

4. A general study plan and schedule will be prepared by the lead agencies.

5. Coordination will include prioritizing State and Federal river studies, collecting basic data, developing public involvement activities, determination of potential protected river status, eligibility determination, determination of potential designation, suitability analysis, boundary delineation, and management plans.

6. Lead agencies will collectively consider the cooperating agencies' comments and recommendations and notify the cooperating agencies of resultant changes prior to issuing final plans or reports.

7. Work provided by each agency is subject to availability of funds. Transfer of funds will occur under appropriate separate agreement.

8. There will be at least one meeting per year to review this MOU and progress on planned studies.

9. Nothing herein shall be considered as obligating any of the parties to expend funds or involving the parties in contracts or other obligations for future payment of money in excess of funds authorized by law and administratively allocated for that work.

10. The rights and benefits conferred by this agreement shall be subject to the laws of the United States and the State of Idaho and to the rules and regulations promulgated thereunder, whether now in force or hereafter enacted or provided; and the mention of specific restrictions; conditions, and stipulations herein shall not be construed as in any way impairing the general powers of supervision, regulation, and control of any of the parties to this agreement.

This memorandum will become effective as soon as it is signed by all parties and shall continue in force unless terminated by any party upon providing 90 days written notice to the other parties.

Cecil D. Andrus — 2-14-91
Governor — Date
State of Idaho

for Christopher Risbrudt — 12/31/90
Regional Forester — Date
Northern Region
USDA, Forest Service

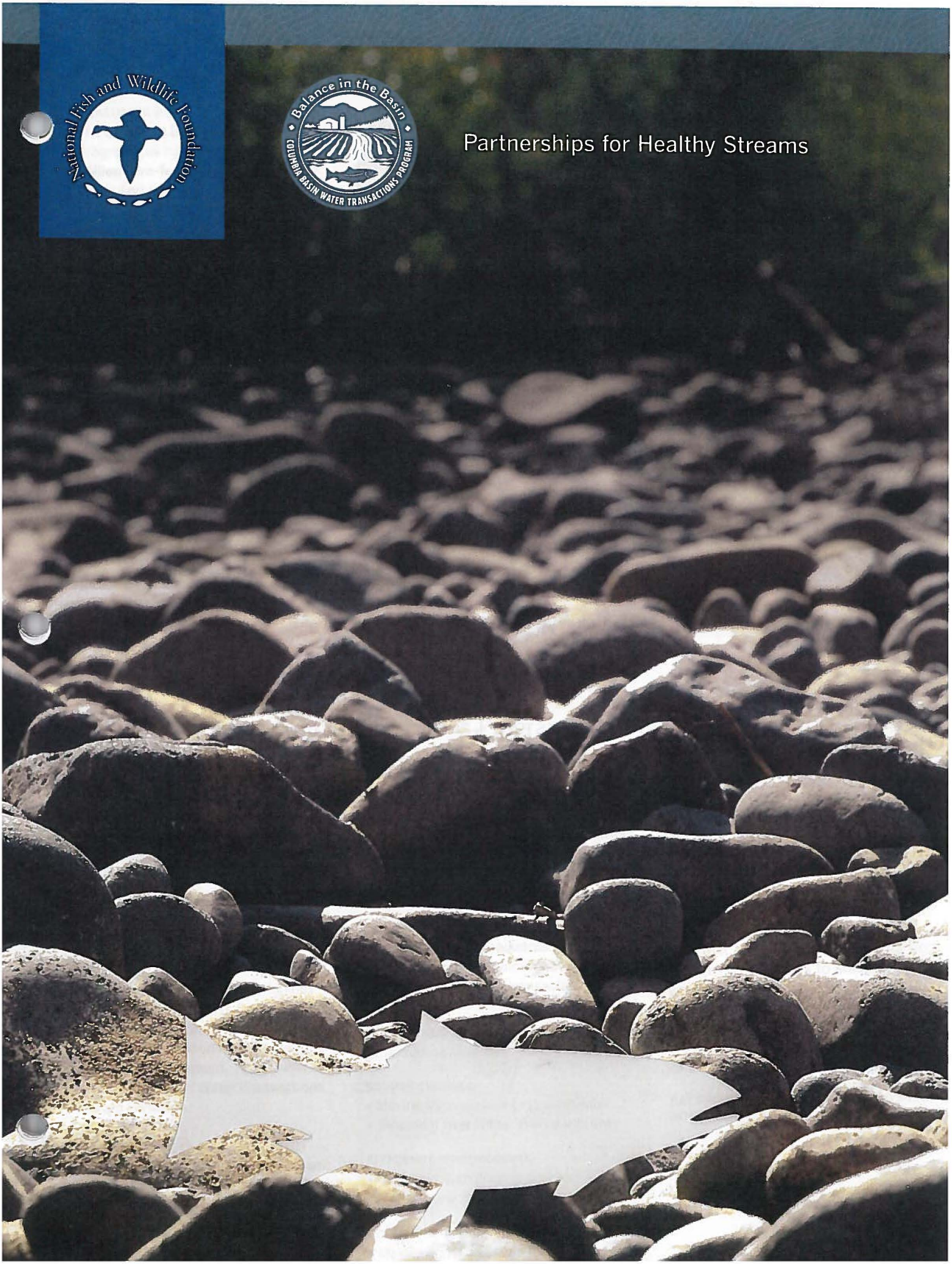
Clair C. Bean — 12/18/90 — AS-R
Regional Forester — Date
Intermountain Region
USDA, Forest Service

Delano E. Vail — 1-7-91
Director — Date
State of Idaho
USDI, Bureau of Land Management

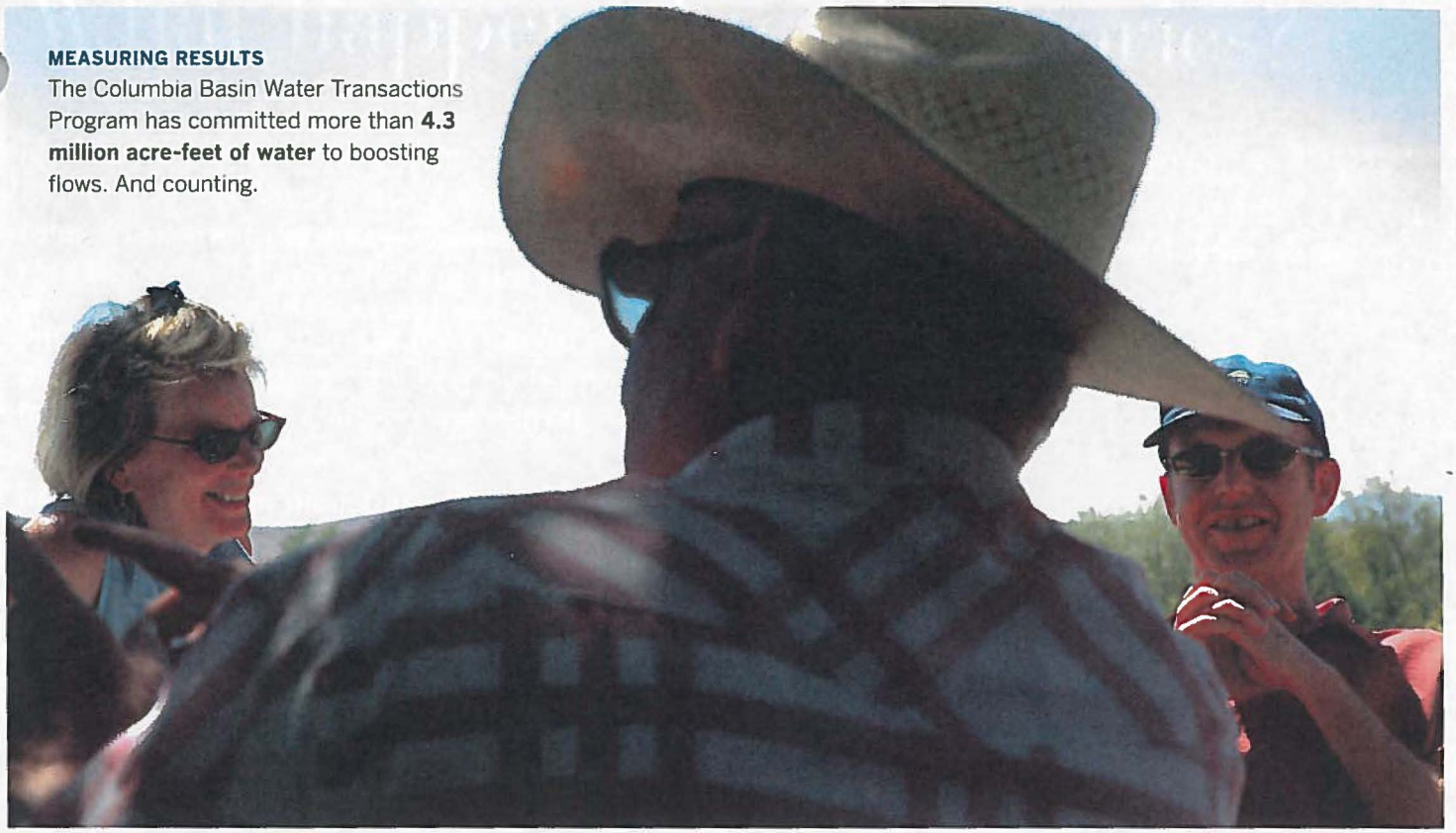
National Fish and Wildlife Foundation

Balance in the Basin
COLUMBIA BASIN WATER TRANSACTIONS PROGRAM

Partnerships for Healthy Streams



MEASURING RESULTS
The Columbia Basin Water Transactions Program has committed more than **4.3 million acre-feet of water** to boosting flows. And counting.



How we work together

The Columbia Basin Water Transactions Program is the first and only effort in the United States to restore the health of tributaries on a regional scale.

We provide financial and technical support for a partnership of nonprofit water trusts, state water agencies and tribes. Together, we work with ranchers, farmers and irrigation districts leading a voluntary movement to rebalance water use so rivers stay wet and landscapes remain productive.

Water transactions offer opportunities for agricultural producers to change land management practices in ways that respect their livelihoods and benefit the streams they care about. That's where the Columbia Basin Water Transactions Program comes in.

"If we can work out ways to keep the streams flowing and agriculture productive, we're going to avoid some big government hammers and stay in business. As a rancher, I don't need any more rules and regulations..."

Leaving more water in streams while keeping agriculture viable is no easy endeavor. It requires the kind of trust that's built over time—in fields and around kitchen tables, where learning starts with listening.

Our water trust partners are building the relationships for a marketplace that renews habitats with clean, cold water. Innovative tools tailored for each transaction include:

ACQUISITIONS AND AUCTIONS:
- Purchasing or leasing water rights

SOURCE CHANGES:
- Moving from surface to groundwater
- Tapping a river rather than a tributary

EFFICIENCY IMPROVEMENTS:
- Switching from flood to sprinkler irrigation
- Modernizing ditches and headgates

POOLS AND BANKS:
- Making water available through

This partnership approach is changing the way people think about water and helping create a new story of abundance in the communities of the Columbia Basin.

"We're real pleased to be working with local irrigators in planning for the next seven generations. It's best to work as partners to solve the issues we face as a region. We're going after strategies that support both fisheries and agriculture. And the Columbia Basin Water Transactions Program is a big help to us."

KAT BRIGHAM, MEMBER, COLUMBIA RIVER INTERTRIBAL FISH COMMISSION

What happened to the stories?

Most second- and third-generation ranchers in the Columbia Basin states of Idaho, Oregon, Washington and Montana can tell a good fishing story. They heard tales from their parents, who heard them from their parents. But many of these ranchers don't have a fishing story of their own.

Nearly half of the habitat for salmon and steelhead in the region has disappeared as a result of impacts caused by humans. Although the Columbia River and its tributaries were once teeming with fish and other wildlife, times have changed.

WATER CHALLENGES IN THE COLUMBIA BASIN

For generations, families and communities dedicated themselves to making the Columbia Basin a "breadbasket."

Billions of taxpayer dollars were invested in dams and irrigation systems to tap the region's water and send it to thirsty lands. That water was provided to farmers and ranchers through a system of legal rights created in the late nineteenth century, when nature's abundance seemed limitless.

Today, rivers are overdrawn. In many places, more rights are assigned than there is water to meet them. As a result, during the irrigation season, stretches of many streams run low and hot. Some run dry. In years with below-average precipitation, shortages are even more severe.

And climate change is magnifying the challenge.

Between 1984 and 2004, the Columbia River's flow dropped by about 14 percent due primarily to reduced precipitation and higher water usage.* Researchers expect that by the 2040s, snowpack in the Cascades will have declined by up to 40 percent, dramatically reducing the runoff that feeds the region's tributaries.**

Streams with unnaturally low flows and warm water degrade habitats for imperiled fish, compromising the economy and quality of life in our communities.

*Source: American Meteorological Society's *Journal of Climate*, May 15, 2009.
**Source: Federal report on Global Climate Change Impacts in the United States, 2009.

PHOTO: Chinook spawns in Idaho's Iron Creek after water transactions. Photo by Paddy Murphy.

restore *the* stories

NEAR THE HEADWATERS OF THE MIDDLE FORK

"The Voigt family and the Oregon Water Trust have proven that ranching and natural resource protection can go hand in hand. They've also proven it's possible to reach solutions in a dignified, respectful manner."

THE EDITORS, *EAST OREGONIAN,* AUGUST 2, 2006

In exchange for major support from the Columbia Basin Water Transactions Program, he decided to sell a portion of his water rights. Now, every year, from late July until the irrigation season ends in September, up to 10 cubic feet per second of high-quality water flows into the Middle Fork just below its headwaters.

The boost of about 6.5 million gallons a day benefits the entire 70-mile reach at the driest time of the year. That's no small matter, according to Tim Unterwegner, a state fish biologist in John Day.

"You need high-quality water to produce fish," says Unterwegner. "This is the final piece of the puzzle to complement improvements in the watershed. Oregonians should be very proud of the outcome."

Three years later, Pat has no regrets. "I can still irrigate, and I can still run cattle just like I always did. I just can't irrigate the full season, and I can't run quite as many cattle on that part of the property," he says.

Meanwhile, his neighbors are paying attention. Pat recently learned that other transactions are in the works.

"This deal's working for us, and I believe that the Freshwater Trust thinks it's working for them," he says. "How does it get better than that?"

www.CBWTP.org

OUR PROGRAM PARTNERS

Deschutes River Conservancy
Bend, OR
541.382.4077
www.deschutesriver.org
Contact: Scott McCaulou
scott@deschutesriver.org

The Freshwater Trust (Oregon Water Trust)
Portland, OR
503.222.9091
www.thefreshwatertrust.org
Contact: Brett Brownscombe
brett@thefreshwatertrust.org

Idaho Department of Water Resources
Boise, ID
208.287.4838
www.idwr.idaho.gov
Contact: Morgan Case
morgan.case@idwr.idaho.gov

Montana Water Project – Trout Unlimited
Helena, MT
406.449.9922
www.montanatu.org
Contact: Stan Bradshaw
sbradshaw@tu.org

Montana Water Resources Division
Helena, MT
406.721.4284
www.dnrc.mt.gov/wrd
Contact: Ethan Mace
emace@mt.gov

Montana Water Trust
Missoula, MT
406.721.0476
www.montanawatertrust.org
Contact: Barbara Hall
barbara.hall@montanawatertrust.org

Oregon Water Resources Department
Salem, OR
503.986.0878
www.wrd.state.or.us
Contact: Debbie Colbert
debbie.l.colbert@wrd.state.or.us

Walla Walla Watershed Alliance
Walla Walla, WA
509.524.5208
www.wwwalliance.org
Contact: Mike Bireley
mike.bireley@wwcc.edu

Washington Department of Ecology
Yakima, WA
509.457.7140
www.ecy.wa.gov
Contact: Bob Barwin
rbar461@ecy.wa.gov

Washington Water Project – Trout Unlimited
Wenatchee, WA
509.888.0970
www.warivers.org
Contact: Lisa Pelly
lisa@warivers.org

Washington Water Trust
Seattle, WA
206.675.1585
www.washingtonwatertrust.org
Contact: Susan Adams
susan@washingtonwatertrust.org

OUR MISSION

Supporting voluntary, grassroots water transactions that improve the health of rivers and streams in the communities of the Columbia Basin.

Beyond the Basin

"The Columbia Basin Water Transactions Program is a leading pioneer of the water trust movement. We've been learning from them for years, and now we're eager for their help in bringing the model to other significant river systems in the North American West."

LUTHER PROPST, EXECUTIVE DIRECTOR, SONORAN INSTITUTE

At the request of agricultural producers and natural resource managers outside of the Columbia Basin, we are actively exploring ways to advance river restoration in other major watersheds across the American West, including the Colorado, the Russian, the Klamath, the Walker and the Rio Grande rivers. **We hope you'll join us.**

ABOUT THE PROGRAM MANAGERS

In 2002, the National Fish and Wildlife Foundation (www.nfwf.org) and the Bonneville Power Administration (BPA) established a partnership to manage the Columbia Basin Water Transactions Program. The program is funded primarily by the BPA in cooperation with the Northwest Power and Conservation Council.

Columbia Basin Water Transactions Program
National Fish and Wildlife Foundation

Andrew Purkey | Program Director | Andrew.Purkey@nfwf.org

Molly Whitney | Assistant Program Director | Molly.Whitney@nfwf.org

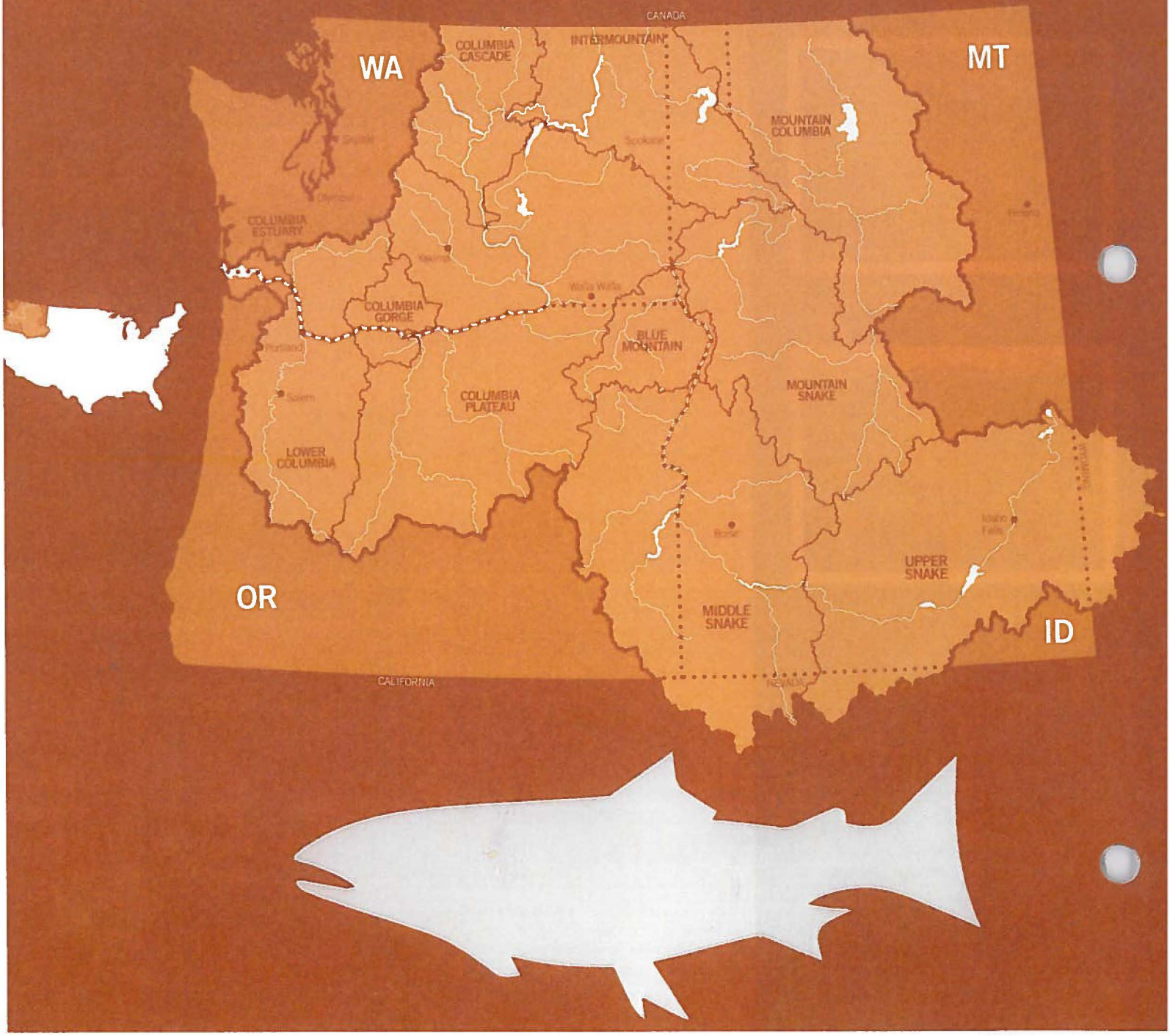
Morgan Snyder | Program Coordinator | Morgan.Snyder@nfwf.org

806 SW Broadway, Suite 750
Portland, OR 97205
503.417.8700

re-storying

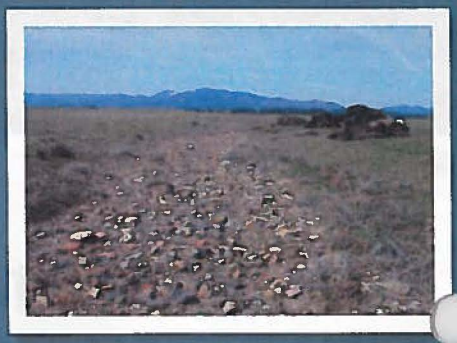
With committed partners around the region, the **Columbia Basin Water Transactions Program** is restoring water to our streams and rivers, revitalizing the habitats that imperiled salmon, steelhead and native trout need for survival and recovery, and building resilience in tributaries facing a changing climate.

We're also putting new stewardship tools into the hands of local communities so fishing stories can be part of the Columbia Basin's future.

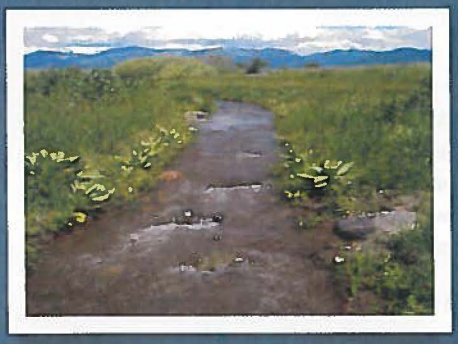


"For recovering salmon, one of our best investments is putting water back in streams—fish need water. And the Columbia Basin Water Transactions Program is getting the job done. I'm very impressed."

JIM YOST, IDAHO COUNCIL MEMBER, NORTHWEST POWER AND CONSERVATION COUNCIL



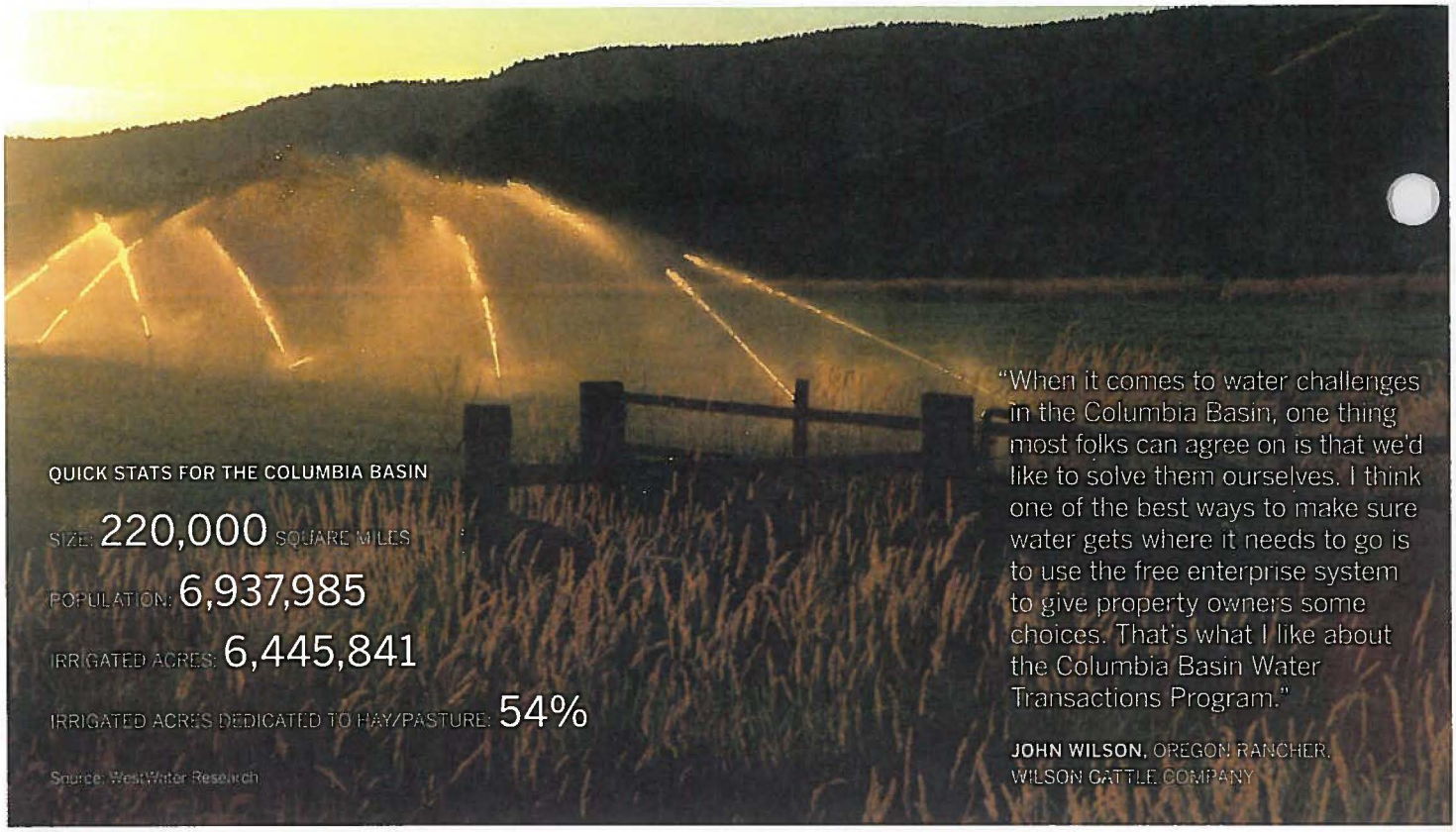
ROCK CREEK | Before Restoration



ROCK CREEK | After Restoration

"Improving habitat without sufficient flows is like making a hotel no one can get to—it just doesn't make sense. The CBWTP is a critical partner in the restoration framework, bringing cold, clean water to high-priority salmon streams."

JULIE MORGAN, EXECUTIVE DIRECTOR, UPPER COLUMBIA SALMON RECOVERY BOARD



QUICK STATS FOR THE COLUMBIA BASIN

SIZE: 220,000 SQUARE MILES

POPULATION: 6,937,985

IRRIGATED ACRES: 6,445,841

IRRIGATED ACRES DEDICATED TO HAY/PASTURE: 54%

Source: WestWater Research

"When it comes to water challenges in the Columbia Basin, one thing most folks can agree on is that we'd like to solve them ourselves. I think one of the best ways to make sure water gets where it needs to go is to use the free enterprise system to give property owners some choices. That's what I like about the Columbia Basin Water Transactions Program."

JOHN WILSON, OREGON RANCHER, WILSON CATTLE COMPANY

Pat Voigt: portrait of a transaction

Pat Voigt's thousand-acre Austin Ranch in the Blue Mountains of Eastern Oregon was on the leading edge of the push to recover the John Day River's endangered fish.

The second-longest undammed river in the contiguous United States, the John Day is home to one of the largest and last remaining wild populations of spring chinook and summer steelhead in the lower 48. Over 15 years, tribes, landowners, agencies and nonprofits had spent some $10 million restoring its Middle Fork, critical to fish reproduction.

That effort, however, was missing one vital component—water—a fact that caused unease among landowners counting on the Middle Fork to irrigate their pastures. Pat thought a clash about who was most entitled to water—fish or farms—could be rolling his way.

His family had irrigated for generations. Though legally theirs to use, water from the Middle Fork was also deemed critical for fish, especially during late summer and early fall. Pat wanted to do the right thing by the fish. But he didn't want to go out of business in the process. Absent water, his livelihood could dry up.

He began talking with the Oregon Water Trust, a program of the Freshwater Trust and a partner of the Columbia Basin Water Transactions Program. "They always had the right attitude, as far as I'm concerned. They didn't come in here trying to coerce anybody," he says. "It was always, 'How can we improve the resource and still make your ranch viable?'"

There were ways. Pat believed the land could spare a little water. When the previous generation irrigated full season, some areas were so swampy you couldn't ride a horse across them. Pat thought it might be good for the ranch to dry out in places. And he knew that, in most years, snow and rain would keep it green until spring.

In 2000, Pat agreed to try a short-term water lease and to continue the conversation with the Freshwater Trust. After five additional years of leases, the habitat improvements were clear. Pat was ready to do more.

"This is a great case study for what the Columbia Basin Water Transactions Program was designed to do—find what works on the ground and under existing law that benefits the stream and the landowner."

DEBBIE COLBERT, SENIOR POLICY COORDINATOR, OREGON DEPARTMENT OF WATER RESOURCES