COMPREHENSIVE STATE WATER PLAN:

SOUTH FORK BOISE RIVER SUB-BASIN

ADOPTED BY THE

IDAHO WATER RESOURCE BOARD

JUNE 29, 1990

READOPTED
JAN 1996

PREAMBLE

(1988 Idaho Session Laws 1091, c. 370, Section 1)

"The legislature finds and declares that a central component of state sovereignty is the inherent right of the state to regulate and to control the natural resources of this state. In a state such as Idaho, it is essential that the state exercise its full authority to manage its water. To that end, it is the purpose of this act to provide for the full exercise of all the state's rights and responsibilities to manage its water resource."

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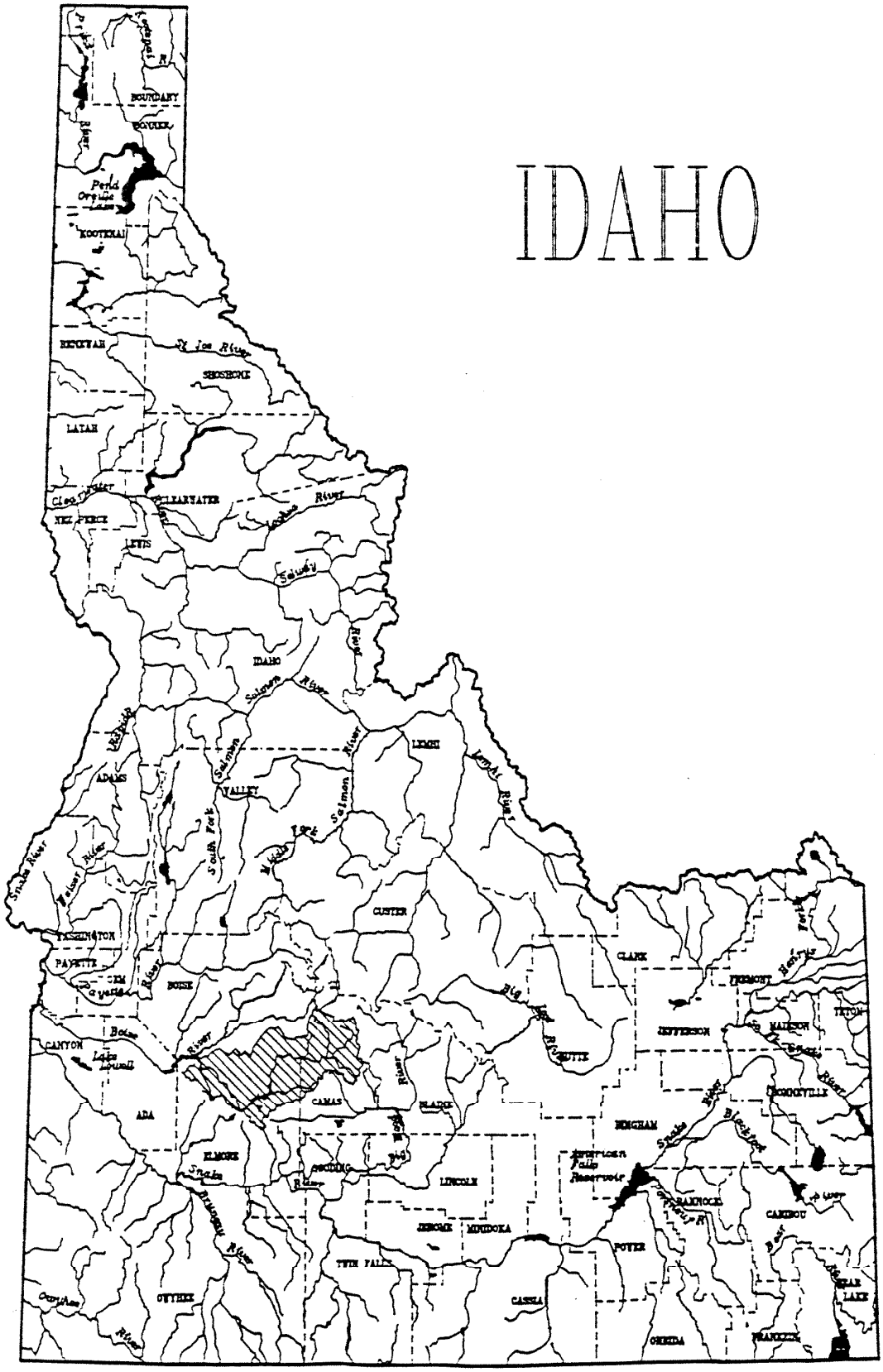


Figure 1. Map of Idaho Showing the Location of the South Fork of the Boise River Basin.

COMPREHENSIVE STATE WATER PLAN: SOUTH FORK BOISE RIVER SUB-BASIN

Executive Summary

The Comprehensive State Water Plan for the South Fork Boise River Sub-Basin, (see Figure 1), was developed in accord with Idaho Code, Chapter 17, Title 42. As directed by the Idaho Water Resource Board Planning Rules and Regulations, an advisory group was formed to provide input relative to local concerns throughout the planning process.

The South Fork Boise River watershed is 1,310 square miles with an average annual yield of 805,600 acre-feet of water (see Appendix G: Figure 2). Major activities in the basin include timber harvest, recreation, and grazing. Two major storage reservoirs exist in the basin. Anderson Ranch and Little Camas reservoirs were constructed to store water of the South Fork Boise River for irrigation. The two reservoirs have a combined total storage capacity of 526,182 acre-feet.

Anderson Ranch Dam has a 40 megawatt (MW) generating plant, consisting of two 20 MW turbines, with provisions for installing a third generator. This is the only hydropower plant in the basin. Anderson Ranch Reservoir is operated in concert with Arrowrock and Lucky Peak Reservoirs to provide for flood control, irrigation, and recreation. This allows for comprehensive use and management of water supplies from the basin.

The confluence of the South Fork with the Boise River is inundated by Arrowrock Reservoir. The reservoir reach extends about ten (10) miles up the South Fork channel. Anderson Ranch Dam is located on the South Fork at river mile 43.5, upstream from its confluence with the Boise River. Summer storage releases from the reservoir sustain popular recreational activities on the South Fork between the Dam and Arrowrock Reservoir backwaters. Summer releases also help maintain the cold water fishery below the Dam. Anderson Ranch Reservoir is one of the more popular kokanee fisheries in southern Idaho, and Little Camas Reservoir provides a good put-and-take rainbow trout fishery.

The South Fork Boise River above Anderson Ranch Dam and all tributary streams (other than Little Camas Creek) are free-flowing streams that provide seasonal fishing and recreational opportunities. The outstanding water quality and natural settings of the Lime Creek and Big Smoky Creek watersheds have been identified in State and federal studies and by local citizens.

The plan acknowledges the existing water rights and uses of the water of the South Fork Boise River sub-basin, and designates various river segments as Natural or Recreational Rivers as follows (see Appendix G: Figure 17):

1. The designation of the South Fork Boise River from Anderson Ranch Dam downstream to Black Canyon Creek as a Recreational River. Pursuant to Idaho Code 42-1734A(6), the following activities are prohibited:

   - Construction or expansion of dams or impoundments
   - Construction of hydropower projects
   - Dredge or placer mining
   - Mineral or sand and gravel extraction within the streambed.

   Stream channel alterations shall be prohibited except for those necessary to maintain existing irrigation facilities, utilities, roadways, stream channel protection, the maintenance of existing access, placement of fishery enhancement structures, or new access for recreational purposes.

   New diversion works shall be limited to pump installations sized to supply water for the standard domestic exemptions or a capacity sufficient for stock water or recreational purposes.

Provision is made for the addition of a third turbine at Anderson Ranch Dam with conditions for protection of fish and recreation values.

2. The designation of the South Fork Boise River from the mouth of Black Canyon Creek downstream to a point 250 yards upstream of Neal Bridge as a Natural River.

Provision is thereby made for the maintenance and future upgrading of Neal Bridge, and the Neal Bridge boat access site.

3. Lime Creek - That Lime Creek from its mouth to its headwaters and all tributaries on the north side of Lime Creek including the North and Middle Forks and all their tributaries from their mouth to their headwaters be designated as Natural Rivers; that all remaining tributaries from their mouth to their headwaters be designated as Recreational Rivers, and pursuant to Idaho Code 42-1734A(6), the following activities are prohibited:

   - Construction or expansion of dams or impoundments
   - Construction of hydropower projects
   - Dredge or placer mining
   - Mineral or sand and gravel extraction within the streambed.

   Stream channel alterations shall be prohibited except for those necessary to maintain existing utilities and roadways.

   New diversion works shall be limited to pump installations sized to supply water for the standard domestic exemptions or a capacity sufficient for stock water or recreational purposes.

4. Big Smoky Creek as a Natural River - That Big Smoky Creek from its confluence with Calf Creek to its headwaters and all tributaries of Big Smoky Creek above and including Calf Creek from their mouth to their headwaters be designated as Natural Rivers.

It is recommended that the Department of Water Resources cooperate with the Department of Fish and Game, and with other appropriate natural resource agencies, in reviewing and evaluating the Protected Areas Designations of the Northwest Power Planning Council relative to the Boise River, South Fork Basin.

A major portion of the watershed is national forest land administered by the U.S. Department of Agriculture, Forest Service. Therefore, the plan supports and urges the U.S. Forest Service to expedite land treatment measures that control soil erosion in the watershed, and protect or re-establish riparian areas along streams in the basin.

It is the intent of the Idaho Water Resource Board that all future actions related to the South Fork Boise River be consistent with goals set forth in this basin plan. Amendments to the plan may be made by the Idaho Water Resource Board as needs arise, and if such changes are deemed to be in the public interest. Every five years the Board is required to review the basin plan and may make amendments to the plan, if such are judged to be in the public interest.

A summary of issue analyses and stream classification for the South Fork Boise River Sub-Basin is shown in Appendix A, Tables I and II.

I. INTRODUCTION

In 1988 the Idaho Legislature passed legislation amending state water planning requirements and providing for the development of a Comprehensive State Water Plan. The plan is to be developed in stages by developing comprehensive plans for each river basin, drainage area, river reach, ground-water aquifer, or other geographic consideration in the State. The resources to be described in each plan are:

Navigation
Energy Conservation
Recreational Opportunities
Flood Control
Timber
Livestock Watering
Natural or Cultural Features
Domestic, Municipal, Commercial, and Industrial Uses
Other Aspects of Environmental Quality and Economic Development
Power Development
Fish and Wildlife
Irrigation
Water Supply
Mining
Scenic Values

A description of the various existing and planned uses of these resources, as well as a discussion of goals, objectives, and recommendations for improving, developing, or conserving water and waterways in relation to these resources, are to be included in the plan. Each of these items are addressed in the following pages as they relate to the South Fork Boise River.

The law also provided that the comprehensive state water plan may designate protected rivers based on a determination by the Idaho Water Resource Board (IWRB) that the value of preserving a waterway for particular uses outweighs that of developing the waterway for beneficial uses. The protected designations provided are either a Natural or Recreational River.

In designating a Natural River, the Board shall prohibit the following activities:

- construction or expansion of dams or impoundments;
- construction of hydropower projects;
- construction of water diversion works;
- dredge or placer mining;
- alteration of the streambed; and
- mineral or sand and gravel extraction within the streambed.

In designating a Recreational River, the Board shall determine which of the activities listed above shall be prohibited and may specify the terms and conditions under which activities that are not prohibited may go forward.

The Board's prohibitions apply to the waterway. State agencies, however, must exercise their duties in a manner consistent with the Comprehensive State Water Plan, meaning some activities on State land adjacent to the river may be affected (See Appendix B).

Prior to the adoption of a comprehensive plan for a waterway, the Idaho Water Resource Board may designate a waterway as an interim protected river. This designation provides protection of the river while basin studies and a plan are completed. Board prohibitions on a protected river apply only to the waterway. However, State agencies must exercise their duties in a manner consistent with the Comprehensive State Water Plan. The plan therefore may have some impact on State lands within the riparian area (see Appendix B).

Designation of a waterway as an interim protected river shall be based upon a determination that:

-It is probable that the waterway would be designated a protected river in the comprehensive state water plan; and

-Interim protected river status is necessary to protect the values that would support such waterway's designation as a protected river in a comprehensive state water plan.

The legislation directed the Idaho Water Resource Board to designate seven river reaches in the state as interim protected rivers. One of these being the "South Fork of the Boise River, from Anderson Ranch Dam to Neal Bridge" in the South Fork of the Boise River Basin. Designation of this river reach is addressed in this basin plan. Also consideration is given to other waterways in the basin that may merit a protected designation.

An effort was made in this study to also identify known potential development opportunities and various beneficial uses the available water resources of the basin could be developed for which are within the constraints of existing uses, water rights, contracts, etc.

II. PLANNING EFFORT

On February 2, 1989 a public meeting was held in Boise announcing the beginning of a river basin planning effort for the Boise River Basin. This planning effort was in response to Idaho Code, Chapter 17, Title 42, directing the Water Board to complete a comprehensive state water plan. The code also provided that the plan could be developed in individual river basin components.

To provide further direction for the river basin planning effort, the Idaho Water Resource Board established Planning Rules and Regulations. One of the provisions included was, "The board shall seek the involvement of volunteers from the geographic area to be affected by a portion of the comprehensive water plan. These volunteers shall constitute a local advisory group which shall inform the Board of local concerns throughout the planning process."

Members chosen to serve on the Boise River Advisory Group were:

Don Brandt - Nampa, Real Estate Broker
Bob Bruce - Boise, Project Development Manager, Morrison Knudsen
Kristen Cheyney - Boise, System Analyst, Simplot Corporation
Ron Davison - Smith Prairie, Farmer and Rancher
Ralph McAdams - Boise, Retired, U.S. West Communications
Ron Platt - Huston, Farmer
Jeff Swanstrum - Boise, Seasonal Govt. Worker and Carpenter

The advisory group met twice during 1989 and once in 1990 to provide input and assistance in meeting the July 1, 1990 deadline for completion of a basin report.

III. RESOURCE SUMMARY

A. Description of the Basin

The South Fork of the Boise River is a major tributary of the Boise River (see Figure 1). Its confluence with the Boise River is at river mile 80.5 of the Boise River. This location is about 5.1 miles above Arrowrock Dam and is now inundated by the Arrowrock Reservoir. An arm of the Arrowrock Reservoir extends about 10 miles up the South Fork of the Boise River.

The northern boundary of the basin extends easterly from the point of confluence with the Boise River, along the divide between the Middle Fork of the Boise River and the South Fork. This divide runs through the Trinity Mountain Range, Steel Mountain, and Bald Mountain, to the Sawtooth Mountain Range, the divide between the Boise River drainage and the Salmon River drainage. The basin boundary then extends in a southeasterly direction along the crest of the Sawtooth and Smoky Mountain ranges, along the Camas County boundary to a point that separates the South Fork of the Boise River and Camas Creek. The boundary then extends in a southwesterly direction along the divide between the South Fork and Camas Creek to Bennett Mountain. From Bennett Mountain the boundary runs northwest along the divide between the South Fork and the Snake River drainage to a point where the Willow Creek and Indian Creek divide begins. The boundary then runs in a northerly direction along the divide between Willow Creek and other Boise River tributaries, to the point of confluence of the South Fork with the Boise River (see Appendix G: Figure 2).

The sub-basin covers an area of 1,310 square miles, and is mountainous with an extensive network of perennial streams. A major portion of the basin is covered by timber. The USDA Forest Service administers over 669,000 acres of federal land in the basin, or 80% of the total area. A small allotment is managed by the Bureau of Land Management (BLM). Other small holdings are by the State of Idaho and private individuals. Figure 3, in Appendix G, is an Ownership map of the South Fork sub-basin. Figure 4 shows vegetative cover or land use in the basin.

B. Water Supply

Average annual precipitation in the South Fork of the Boise River Basin ranges from 18 to 40 inches. Most of the precipitation falls as snow during the winter season. Snow melts during the spring and early summer cause high runoffs. The annual high-water period begins with a gradual increase in discharge during March, culminates with a peak discharge, usually between April 15 and June 15, and terminates with a gradual recession to base flows during August. Low flows then normally prevail from August through February, see Fig 5.

The average annual runoff from the basin is 805,600 acre-feet. Storage reservoirs are used to catch the spring runoff and release water as needed for irrigation, hydropower, and minimum stream flows. There are two reservoirs (storage exceeding 500 ac-ft) that control runoff in the basin. These are Anderson Ranch and Little Camas. They have a combined total storage capacity

of 526,182 acre-feet. An arm of Arrowrock Reservoir on the Boise River also extends into the basin.

Because of downstream development and existing water rights, little or no opportunity exists within the basin for future development using natural flows. There also appear to be limited opportunities for new storage development above Anderson Ranch Dam.

1. Existing Reservoirs

a. Anderson Ranch Reservoir - Anderson Ranch Dam and Reservoir are a multipurpose project constructed by the U.S. Bureau of Reclamation (BOR) at river mile 43.5 on the South Fork of the Boise River. This is about 28 road miles northeast of Mountain Home, or 75 miles southeast of Boise. The project was authorized by the Secretary of the Interior in August, 1940, with the primary purposes being irrigation, hydroelectric power generation, and flood control. Recreation and fish and wildlife purposes were authorized as incidental benefits tied to a minimum pool. Dam construction began in 1941, reservoir storage commenced in 1945 and the project was completed in 1950.

Anderson Ranch Reservoir controls flows from a 980 square-mile watershed and holds 503,682 acre-feet of water. The dead storage space in the reservoir furnishes the required silt control, and sustains a permanent lake which conserves fish life and provides recreation. Reservoir releases at Anderson Ranch Dam are regulated by the U.S. Bureau of Reclamation in conjunction with Lucky Peak and Arrowrock reservoirs on the Boise River, under terms of a Memorandum of Agreement between the Department of the Army (Corps of Engineers) and the Department of the Interior (Bureau of Reclamation). This Agreement commits Arrowrock and Anderson Ranch to flood control operation with Lucky Peak, protects existing irrigation use of Anderson Ranch and Arrowrock reservoirs during flood control operations, and commits space in Lucky Peak Reservoir to irrigation, stream flow maintenance, and flood control use.

There is no federally authorized release requirement from Anderson Ranch Reservoir to provide minimum stream flows in the South Fork of the Boise below the dam. However, a Bureau of Reclamation administrative action, based upon the Anderson Ranch powerplant Third Unit Study, 1982, maintains minimum release flows of 300 cfs from September 16 through March 31 and 600 cfs from April 1 to September 15. Based on analysis of the run-off over the historical period, beginning in 1928, the 300 and 600 cfs minimum stream flows could be met over 90% of the time. Under unusual circumstances, however, it may be necessary to reduce flow releases below the minimum during years of extremely short water supply. Although efforts are made to not exceed 1600 cfs during the irrigation season, flood flow releases as high as 10,000 cfs have occurred in late spring (April-June). For fish conservation in the South Fork below the dam, it is desirable to avert large spring releases to avoid disturbing spawning beds.

Lucky Peak Dam and Reservoir were authorized primarily as a flood control and irrigation facility, with recreation an authorized secondary purpose. According to the U.S. Bureau of Reclamation, congressional authorizations, therefore, placed a higher priority on recreation at Lucky Peak Reservoir than at Anderson Ranch Reservoir. In years when it is not possible to fill the Boise system, the Bureau moves water first from Arrowrock Reservoir to maintain power head at Anderson Ranch Dam and recreation at Lucky Peak Reservoir. Power head at Lucky Peak is not a consideration in water movement with the reservoir system. Anderson Ranch is kept on minimum fish flows as late as possible, and is then put at maximum powerplant capacity in order to deliver contracted irrigation

water. Having to release more water than the powerplant maximum would constitute a loss in power generation.

The Bureau of Reclamation states that the wholesale value of maximum powerplant capacity at Anderson Ranch Dam is about $20,000 per day. According to the Bureau, use of the hollow jet valves in addition to the powerplant, in order to deliver irrigation water later in the summer, is expensive and to be avoided if at all possible. Loss of power generation in order to provide recreation benefits does not meet project authorization and is not acceptable.

At the end of the irrigation season in a dry year, Arrowrock and Lucky Peak are drawn down to minimum fish pools. All water drawn from Anderson Ranch Reservoir during the summer is used for irrigation. Bureau operation strives to maintain reservoir conservation pools of not less than 41,000 acre-feet at Anderson Ranch Reservoir, and 28,700 acre-feet at both Arrowrock and Lucky Peak reservoirs.

b. Little Camas Reservoir - The Little Camas Reservoir watershed is located in the South Fork of the Boise River drainage and collects runoff from the north slope of Bennett Mountain. This reservoir was completed in 1912 and is owned and operated by the Mountain Home Irrigation District. It is located on Little Camas Creek, one to two miles above where the creek empties into an arm of Anderson Ranch Reservoir. All of the 22,500 acre-feet of storage in Little Camas Reservoir is allocated to irrigation. The water from the reservoir is diverted out of the basin through a canal which runs around the mountain side and tunnels through the ridge into Long Tom Creek in the Snake River drainage. Long Tom Reservoir collects and stores this water to serve irrigated land in the Mountain Home area.

The Little Camas Reservoir provides a good put-and-take rainbow trout fishery and is heavily used for this purpose.

2. Stream Flows

As described above, stream flows follow a general pattern of discharge year after year (Figure 5). However, the intensity of flow varies on a daily, monthly, and annual basis each year. Recording stations established to record flows at various locations on the river are described below. Records of flows at each station are also shown in Appendix C.

No known potential reservoir sites exist in the basin which would alter flow patterns. Only one diversion plan has been proposed that would impact stream flows. This is the inactive Long Tom diversion discussed under Resource Summary for irrigation.

a. Recording Stations - records of flow measurements for many years are available from three major stations on the South Fork of the Boise River. Comparative information on each of these stations is shown in Table III. The map in Appendix G: Figure 2 shows the locations of gaging stations. Other miscellaneous measurements on tributary streams are available but not included in this report (see Appendix D).

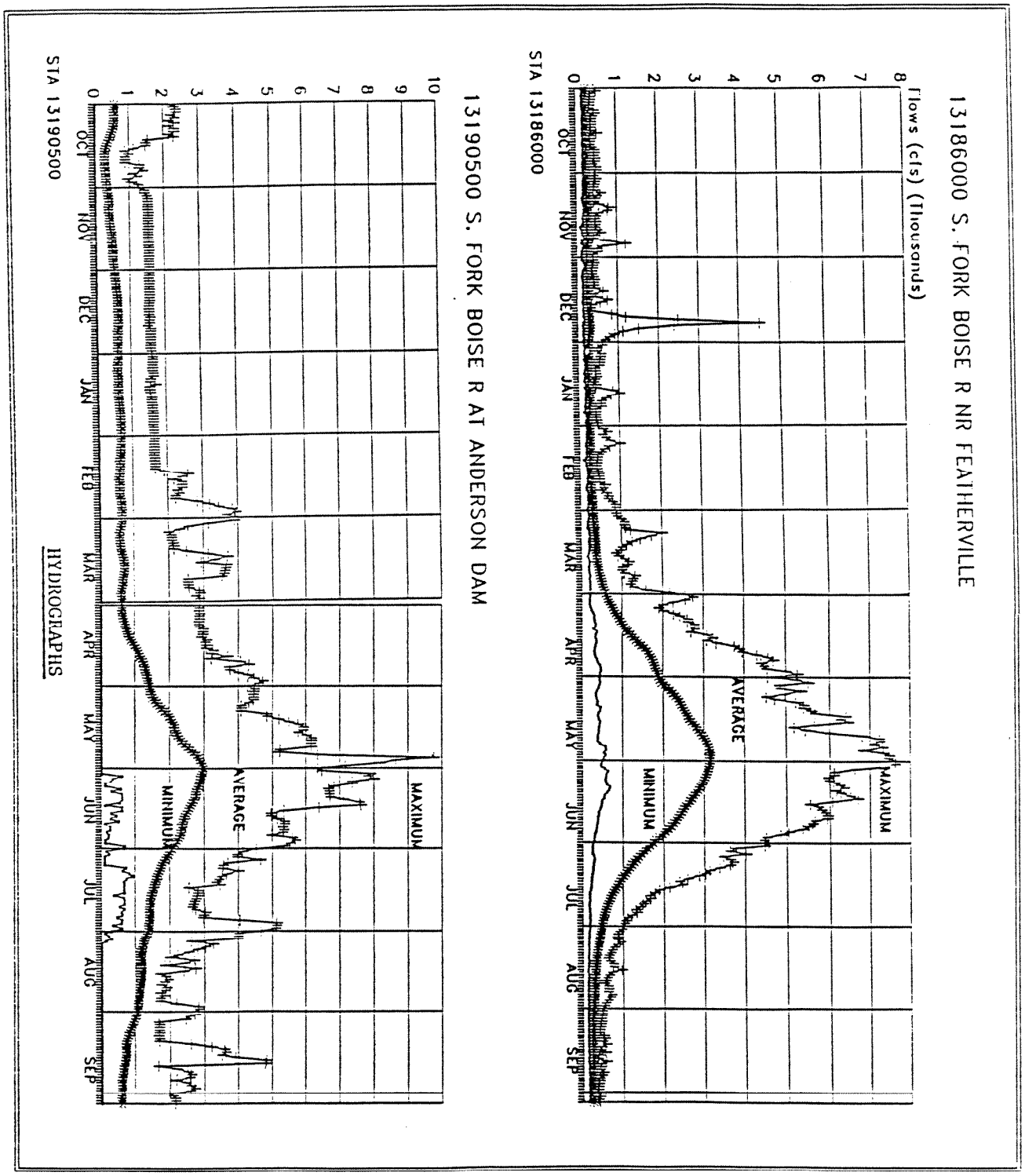
b. Flow Data

(1) Featherville #13186000: South Fork Boise River near Featherville, Elmore County, on right bank 2.5 miles upstream from Deer Creek, 8 miles southwest of Featherville. At the station near Featherville, monthly

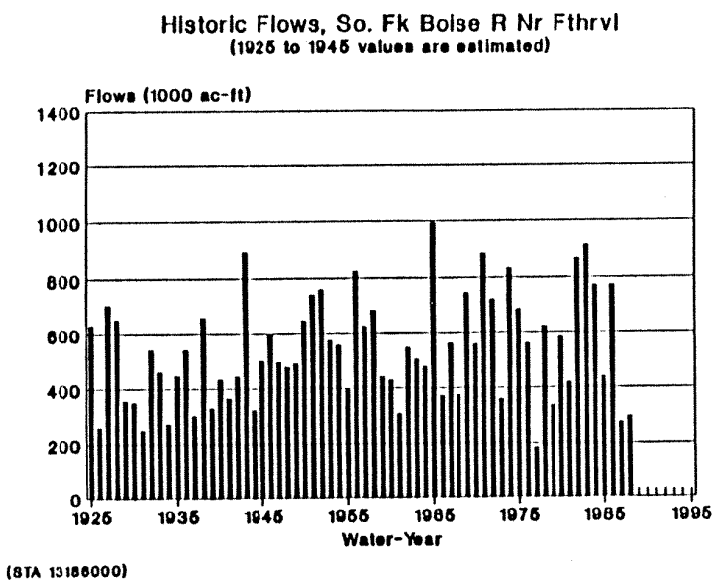
Table III: Key Gaging Stations - South Fork Boise River

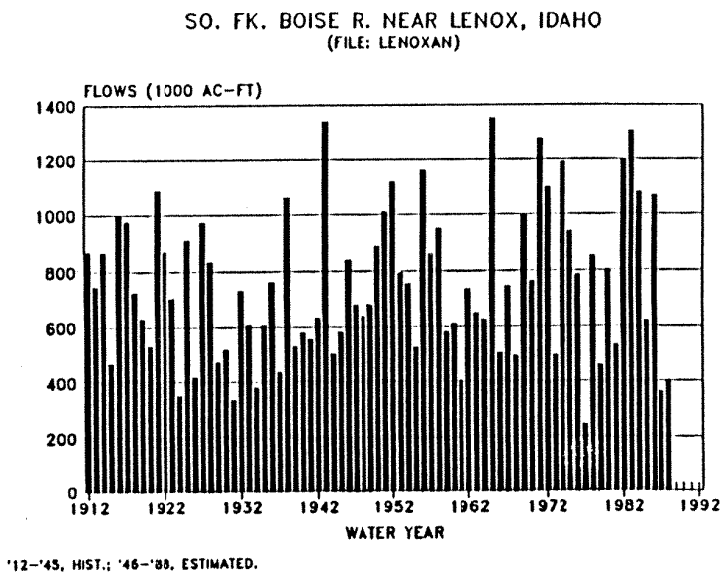
Station	Gage	Period of Record	Average Drainage Area (sq.mi.)	Runoff Volume (ac-ft/yr)	Period of Record (cfs) Avg.	Max.	Min.
#1318600 South Fork Boise River near Featherville	River	Apr. 1945 to Present	635	576,000	795	7,960	30
#13190500 South Fork Boise River below Anderson Ranch Dam	River	Apr. 1943 to Present	982	739,700	1,021	9,850	0.1
#13191500 South Fork Boise River near Lennox, Idaho	River	Mar. 1911 to Nov. 1943	1,090	750,500	1,040	9,550	26

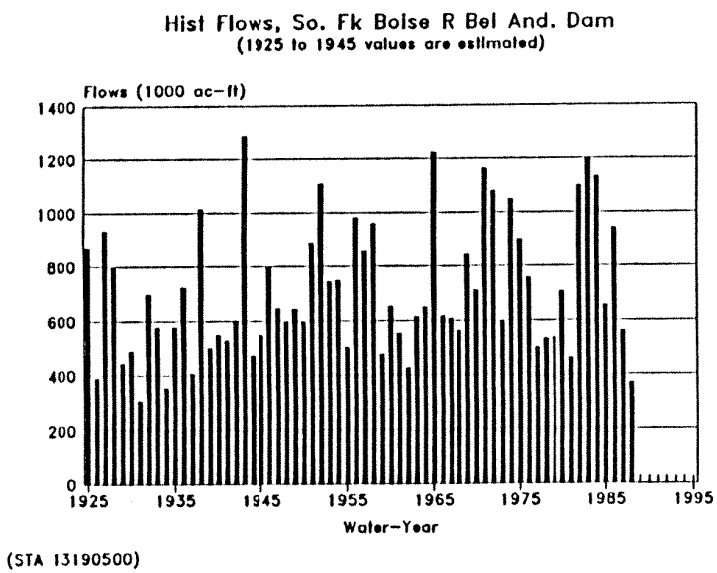
Figure 5


13186000 S. FORK BOISE R NR FEATHERVILLE
flows (cfs) (thousands)
MAXIMUM
AVERAGE
MINIMUM
OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP
STA 13186000
13190500 S. FORK BOISE R AT ANDERSON DAM
MAXIMUM
AVERAGE
MINIMUM
OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP
STA 13190500
HYDROGRAPHS

Figures 6-9


Historic Flows, So. Fk Boise R Nr Fthrvl
(1925 to 1945 values are estimated)
Flows (1000 ac-ft)
1400
1200
1000
800
600
400
200
0
1925
1935
1945
1955
1965
1975
1985
1995
Water-Year
(STA 13186000)


SO. FK. BOISE R. NEAR LENOX, IDAHO
(FILE: LENOXAN)
FLOWS (1000 AC-FT)
1400
1200
1000
800
600
400
200
0
1912
1922
1932
1942
1952
1962
1972
1982
1992
WATER YEAR
'12-'45, HIST.; '46-'88, ESTIMATED.


Hist Flows, So. Fk Boise R Bel And. Dam
(1925 to 1945 values are estimated)
Flows (1000 ac-ft)
1400
1200
1000
800
600
400
200
0
1925
1935
1945
1955
1965
1975
1985
1995
Water-Year
(STA 13190500)

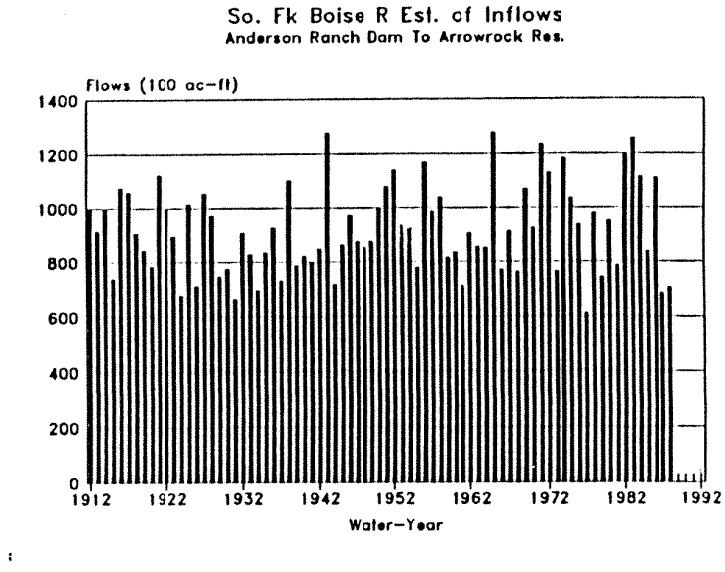

So. Fk Boise R Est. of Inflows
Anderson Ranch Dam To Arrowrock Res.
Flows (100 ac-ft)
1400
1200
1000
800
600
400
200
0
1912
1922
1932
1942
1952
1962
1972
1982
1992
Water-Year

Figure 10

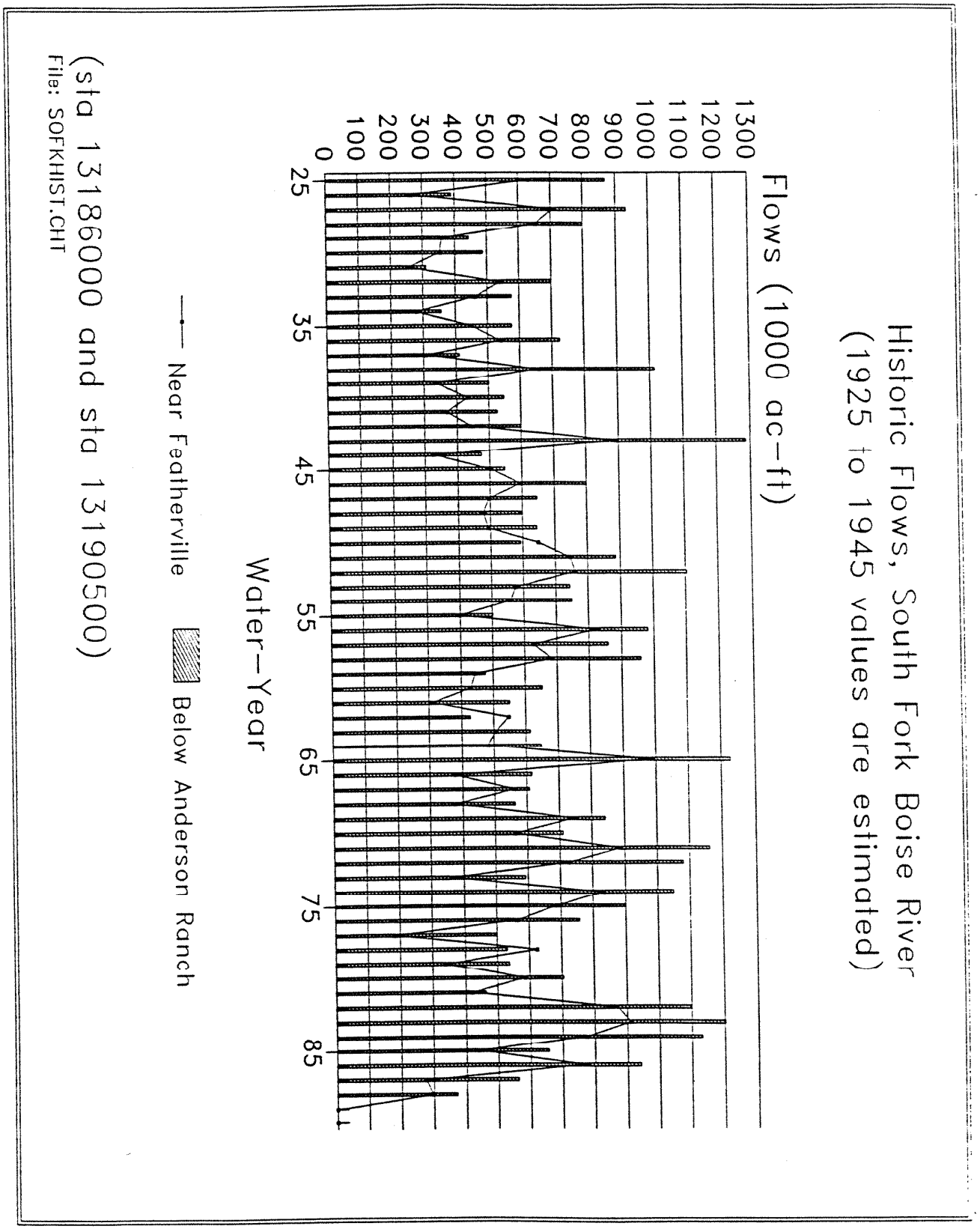

Historic Flows, South Fork Boise River
(1925 to 1945 values are estimated)
Flows (1000 ac-ft)
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
25
35
45
55
65
75
85
Water-Year
Near Featherville
Below Anderson Ranch
(sta 13186000 and sta 13190500)
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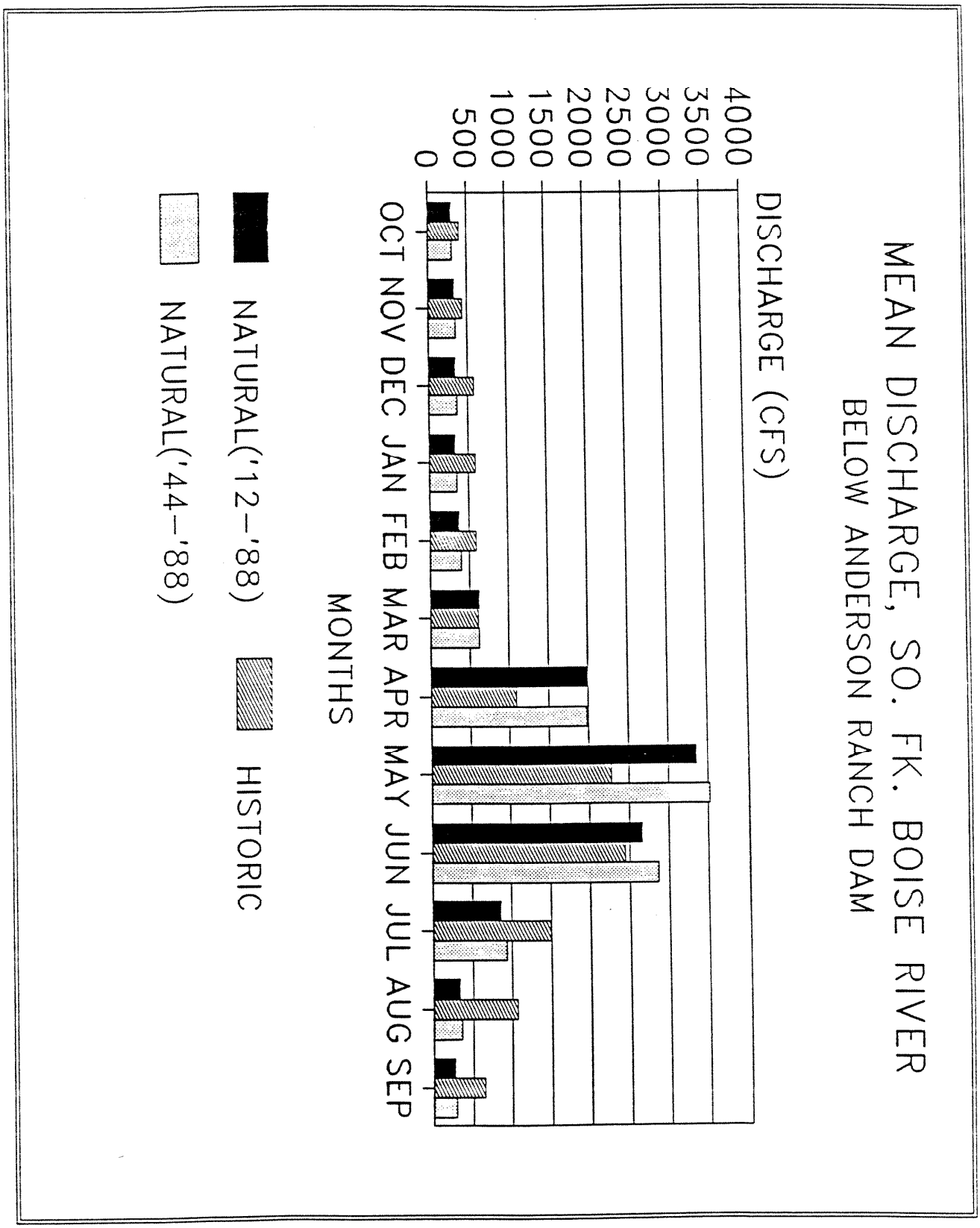
Figure 11


MEAN DISCHARGE, SO. FK. BOISE RIVER
BELOW ANDERSON RANCH DAM
DISCHARGE (CFS)
4000
3500
3000
2500
2000
1500
1000
500
0
OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP
MONTHS
NATURAL('12-'88)
HISTORIC
NATURAL('44-'88)

flows for the period 1946 though 1988 have been recorded, and monthly flows for the 1912 through 1945 period have been calculated. The flows for this combined period, 1912 through 1988 are shown in Table C-1. The annual flows for these years are shown in graph form in Figure 6.

(2) Near Anderson Ranch Dam #13190500: South Fork Boise River at Anderson Ranch Dam, Elmore County, on right bank 600 ft downstream from Dixie Creek, 1.8 miles downstream from Anderson Ranch Dam, 2.2 miles northwest of Bennett. Table C-2 shows estimated natural flows of the South Fork of the Boise River below Anderson Ranch Dam. The 1912 to 1942 period is estimated for a period prior to when the recording station was installed and Anderson Ranch Reservoir began to store water. Estimates were then made for natural flows assuming no influence from Anderson Ranch Reservoir for the 1943 through 1988 period. Figure 7 shows these annual flows for the station in graph form.

Table C-3 lists historic flows below Anderson Ranch Dam for the period 1945 through 1988 with estimate flows from the 1925 to 1945 period. Figure 10 shows the historic and estimated annual flows of Table C-3 in graph form with flows near Featherville super-imposed on the graph for comparison purposes. This shows a high percent of the basin runoff comes from the watershed above Featherville. Figure 11 shows mean monthly discharge flows below Anderson Ranch Dam for both natural and historic conditions. This provides a comparison of natural flows to reservoir releases.

(3) Lenox #13191500: South Fork Boise River Near Lenox, Idaho, on right bank 1.5 miles upstream from Smith Creek, 4 miles upstream from flow line of Arrowrock Reservoir, 4 miles west of discontinued Lenox Post Office, 13 miles from mouth, and 17 miles upstream from Arrowrock Dam. Historic records were kept of the flows at this site from 1911 through 1948. Estimates of the flows for this station have been determined for the 1949 through 1988 period. The historic and estimated flows are given in Table C-4. Figure 8 shows the historic and estimated annual flows in graph form.

(4) Anderson Ranch to Arrowrock Reach Gains - Estimates of reach gains to the South Fork of the Boise River have been made for the river reach from Anderson Ranch Dam to the backwaters of Arrowrock Dam. These estimates cover the period 1912 through 1988 and are shown in Table C-5. The annual flows for the reach and period are also shown in graph form in Figure 9.

3. Ground Water and Geology

The South Fork of the Boise River drainage area is mountainous country. The soil mantle is relatively shallow, and the mountains are steep. Most of the creek and river bottoms where deposition occurs are narrow and provide little opportunity for aquifer formations. One exception is the river bottom in the Pine-Featherville area. The river bottom widens to several hundred feet in this reach and considerable deposition of unconsolidated valley fill material has occurred over time.

This aquifer holds a significant volume of ground water. Specific data on the quality of ground water, and hydrologic and geologic characteristics are unavailable. Major sources of recharge are probably downward percolation of precipitation, snowmelt runoff from surrounding uplands, and seepage from the South Fork Boise River and tributaries. According to Department Well Log records, wells in the area range from 50-250 feet deep producing from 1 to 25 gallons per minute. An estimated 200 people currently rely on this ground-

water system for their domestic and commercial water supply. This number is expected to increase to 280 by the year 2000.

Another area where several domestic wells have been developed is on Smith Prairie. Several domestic wells have been developed at the townsite and also at a number of farmsteads in the area. Wells in this area range from 50 to 300 feet deep and produce up to 40 gallons per minute. Other small ground-water areas exist in the basin such as Dixie and the Little Camas area. These ground-water sources provided a water supply for sparsely located existing and proposed commercial establishments and dwellings in the area.

C. Flood Control

Spring snowmelt and occasional thunderstorm rainfall causes frequent flooding along streams in the basin. The streams beds are steep, resulting in very high run-off velocities. The soil mantle is shallow and most stream channels are armored with rocks and boulders. However, riparian growth along the channels is very important to the control of high runoff flows and the protection of the limited soil mantle. Along reaches where the riparian vegetation has been destroyed, heavy channel erosion occurs causing considerable damage to water quality, and fish and wildlife.

Anderson Ranch Dam controls flooding of the South Fork below the dam. The reservoir is managed in conjunction with Arrowrock and Lucky Peak to control floods in the Lower Boise Basin.

D. Irrigation

Irrigation in the South Fork of the Boise River Basin is very limited. Most irrigation occurs on Smith Prairie where about 1,800 acres are irrigated by diverting water from tributaries of the South Fork. Seven hundred acres in the lower Camas Creek area are irrigated. Other small parcels of land along the river bottom above Anderson Ranch Dam, in the Pine-Featherville reach, are irrigated for pasture, alfalfa hay, and gardens (see Appendix G: Figure 4).

In 1966, a U.S. Bureau of Reclamation "Southwest Idaho Water Development Project" report proposed a project to divert water from the South Fork Boise River to irrigate desert land near Mountain Home under an exchange agreement. The venture involved a diversion dam and tunnel, downstream of Anderson Ranch Dam, to divert 486,000 acre-feet annually out of the basin. The water would irrigate 96,400 acres on the Mountain Home desert. The U.S. Congress did not fund this project and it is inactive. Further consideration of the proposal will not be a part of this sub-basin water plan. However, this does not preclude future consideration of water diversion under an exchange arrangement, should a need for this irrigation project develop.

E. Power Development

There is one hydropower development in the basin, a 40 megawatt (MW) facility at Anderson Ranch Dam. Hydropower generation at this plant is secondary to irrigation and flood control. The powerplant at Anderson Ranch

Dam is owned and operated by the U.S. Bureau of Reclamation, and generates power as releases are made for irrigation and/or flood control. When constructed Anderson Ranch Reservoir had a small, 5,000 acre-feet, exclusive storage right for power operations. However, this storage right has never been used exclusively for that purpose. One-thousand acre-feet of this power right has been marketed to the Boise Water Corporation. Anderson Ranch Dam was designed for a total of three generating units; only two turbines were installed. The two turbines currently have a combined capacity of 40 MW.

Energy generated at the site is added to the federal intertie system and marketed by the Bonneville Power Administration (BPA). Electric power requirements in the basin are supplied through Idaho Power Company (IPC) and the Prairie Power Cooperative. Idaho Power supplies electricity to the area from its private powerplants outside the basin, or through trades with the BPA. The Prairie Power Cooperative buys its power from the BPA.

A number of potential hydro-power sites in the basin have been identified in government and private studies (see Appendix G: Figure 12). There are currently no sites in the South Fork drainage that are actively being studied or developed either through the Federal Energy Regulatory Commission (FERC) or by the federal government.

Installation of a third generating unit at Anderson Ranch Dam is planned. Generation from the third unit would help provide power to meet future energy demands within the region.

F. Energy Conservation

Population in the basin is very sparse. There are no industrial installations, little commercial activity, and limited irrigation development. Therefore, opportunity for extensive energy savings by energy conservation measures in the basin is relatively nonexistent.

G. Fish and Wildlife

The South Fork of the Boise River Basin provides good habitat for a large variety and number of fish and wildlife species, including species of concern. Black bear, mule deer, elk, and mountain goat roam in the forested mountains of the upper South Fork. Native upland game birds: valley quail, mourning doves, and blue, franklin, and ruffed grouse are found throughout the basin. Chukar is prevalent along the drier, lower stretch of the river. The McDonald segment of the Boise River Wildlife Management Area, involving 2,100 acres, is located in the lower end of the basin, roughly along the South Fork between Willow and Rattlesnake creeks.

The South Fork between Anderson Ranch Dam and the backwaters of Arrowrock Reservoir is managed as a quality trout stream by the Idaho Department of Fish and Game. The river below the Dam is famous for its wild rainbow trout. Other game fish found in the reach are bull trout and mountain whitefish. Brook trout may also be found in the lower basin tributaries.

Anderson Ranch Reservoir is a popular kokanee fishery in southern Idaho. Smallmouth bass and rainbow trout also inhabit the reservoir. Fish found in the upper South Fork and tributaries, above Anderson Ranch Reservoir, include:

rainbow, eastern brook, cutthroat, and bull trout, mountain whitefish, and kokanee. Cutthroat trout are found primarily in high mountain lakes, although some migrate into basin streams.

The tributaries of the upper South Fork traverse the Idaho Batholith. These streams exhibit excellent water quality and produce the fine gravels that provide outstanding trout spawning beds. An exception is Feather River, which has a large migration barrier near its mouth and a number of historic mining impacts.

The upper South Fork drainage supplies critical summer habitat for deer, elk, mountain goats and other wildlife species. Most of the elk and goats winter in the area. Forty-three goats were counted during a February 1990 helicopter survey of the South Fork above Bear Creek. A total of 31 goats were counted in the Big Smoky drainage. Deer move to traditional wintering areas along the Boise Front and along the South Fork river corridor. The McDonald segment of the Boise River Wildlife Management Area is managed for 400-600 mule deer as winter range. Bald eagles winter between Anderson Ranch Dam and Featherville. Two active nest sites have been documented along this stretch. Foraging occurs throughout the reach and adjacent tributaries.

Lime Creek and Big Smoky Creek provide excellent fish spawning beds and habitat for wildlife. Public sentiment supports protection of these drainages for their water quality, fishery, and recreation values.

H. Recreation

The South Fork Boise River sub-basin provides abundant recreational opportunities (see Appendix G: Figure 13). There are areas near roads and the river that are developed for picnicking, camping, hunting, fishing, hiking, sight-seeing, or just relaxing. Scenic back country and primitive areas are accessible by foot, horseback, boat, or plane. Opportunities exist in the basin for river rafting, canoeing or boating, fishing, water skiing, and swimming. The U.S. Forest Service estimates recreationists spent 380,000 visitor days in the South Fork basin in 1989, camping, hiking, and participating in water recreation activities. A visitor day is defined as 12 visitor hours, e.g., one visitor spending 12 hours or 12 visitors spending one hour involved in a recreation activity.

Deep water storage releases for irrigation help propagate a celebrated cold water fishery below Anderson Ranch Dam. This lower reach is a nationally recognized fishing stream, rated by Trout magazine as one of the top 100 trout streams in the United States. Sport fishing estimates for 1988 on the South Fork, below the Dam, totaled 100,282 angler hours. This is roughly 2,330 hours per mile for the 43 mile reach.

An Idaho Fish & Game survey conducted in 1988 estimated anglers fished approximately 8200 hours on the South Fork between Featherville and Big Smoky Creek during the late May to mid-October season. This is roughly 370 hours per mile for the 22 mile reach. Wild trout populations on the upper South Fork are supplemented with hatchery trout in over-fished reaches. Fishing effort also occurs on tributary streams, with Little Smoky Creek a popular area because of its accessibility.

Hunting in the basin is estimated at 74,858 hunter days for 1988. Hunting is concentrated in the upper South Fork drainage. Wildlife observation, nature study, and sight-seeing in the basin is estimated at 5,500 visitor hours for 1989.

The South Fork of the Boise River below Anderson Ranch Dam has gained a reputation for whitewater rafting, canoeing, and kayaking. With challenging Class III whitewater and wilderness scenery, the corridor is increasingly used for recreational floating during spring and summer months. Anderson Ranch Reservoir provides for boating, fishing, water skiing, and swimming. Canoeing and tubing are popular water activities on the South Fork above the Reservoir.

Late summer irrigation releases from Anderson Ranch Reservoir extend the boating season on the lower South Fork. Idaho Parks and Recreation (IPR) 1989 surveys on the South Fork, between Anderson Ranch Dam and Neal Bridge, tallied 940 boaters for 23 surveyed days. Summer season (90 day) estimates for the lower South Fork are 3,500 boaters or 1,100 visitor days. The IPR surveys indicate that weekend boating/floating on the South Fork has increased 387 percent over 1983 survey counts. The majority of the launches (87%) occur on weekends or holidays, but weekday use has also grown dramatically, a 289 percent increase over 1983. Boaters responding to the surveys said they chose boating on the South Fork because of its proximity, fishing opportunity, and geologic features or scenery. According to both 1983 and 1989 surveys, 90 percent of the boaters on the South Fork are Idaho residents, and 80 percent of the residents are from the southwest Idaho-Boise-Mountain Home region.

There are many points along the lower South Fork which provide floater access to the river. In response to a perceived increase in recreation demand, the U.S. Forest Service improved boater-launch areas at Reclamation Village, Cow Creek, and Danskin Bridge, and began monitoring site use in 1989. The Forest Service also plans to improve boater access at Neal Bridge. Outfitters have applied for permits for the South Fork below Anderson Ranch Dam, but commercial float trips are currently barred. The U.S. Forest Service, in concert with the Idaho Department of Fish & Game, and through issues identified at public meetings, is developing a management plan for the lower basin stretch due to the dramatically increased recreational pressures in, on, and along the river.

Improved public camping and picnic grounds, administered by the U.S. Forest Service, are concentrated around Anderson Ranch Reservoir and along the South Fork above Anderson Ranch Reservoir. Developed sites are mapped in Appendix G: Figure 13. Some of the more heavily used facilities in the basin and around Anderson Ranch Reservoir are listed in Table IV. Additional use of the basin is made by hikers along 30 trails. Hiking trails frequently follow stream courses in the basin. The Rainbow Basin Trail into the Trinity Mountains, Danskin Mountain, the Big Smoky Trail, and the Lime Creek Trail are particularly popular footpaths for hikers, horseback riders, and hunters.

I. Timber

Timber stands cover 52 percent of the South Fork basin. Most stands are a mix of ponderosa pine and Douglas fir. Stand density and productivity varies with soils and water supply. Along moist stream banks riparian vegetation is prominent, e.g., willows, cottonwood, red alder, and numerous berry-producing bushes. Riparian vegetation slows sediment transport and scouring, helping to modify and alleviate turbidity and bank erosion. In addition, riparian vegetation enhances fishery conditions by providing cover and by shading the water course, thus moderating daytime water temperatures.

Approximately 92 percent of the forest lands of the basin are administered by the federal agencies, 3 percent is under State ownership, and 5 percent is private. Timber harvest has become a complex activity that involves coordination with other resource values. The layout, design, and

Table IV. Anderson Ranch Reservoir Recreational Areas

Area	Facilities	Activities
	CAMPGROUNDS	
Castle Creek	2 units, toilets	Camping, fishing boating
Evans Creek	1 unit, toilets	Camping, fishing
Little Wilson Creek	2 units, toilets	Camping, fishing, boating
	BOATING SITES	
Curlew Creek	Ramp, parking, water, toilet, picnic areas	Boat launching, picnicking un-camping
developed Deer Creek	Ramp, parking, water toilets, picnic areas	Boat launching, picnicking, un-developed camping
Elk Creek	Ramp, parking, toilets	Boat launching
Fall Creek	3 ramps, parking, toilets	Boat launching
Pine Airport	Ramp, parking, toilets	Boat launching, picnicking, un-developed camping
	POINTS OF INTEREST	
Anderson Ranch Dam	Overlook area	Sightseeing

OTHER SOUTH FORK BOISE RIVER BASIN CAMPGROUNDS:

	No. of Sites
Tipton Flat C.G.	10
Curlew Creek	Open Area
Little Wilson Creek	Open Area
Evans Creek	Open Area
Castle Creek	Open Area
Deer Creek	Open Area
Pine Creek	Open Area
Elk Flat	Open Area
Elk Creek	Day Use
Ice Springs C.G.	5
Dog Creek C.G.	13
Big Trinity Lake C.G.	18
Little Trinity C.G.	Day Use
Skeleton Creek C.G.	5
Abbot C.G.	7
Chaparral C.G.	7
Bird Creek C.G.	5
Willow Creek C.G.	5
Baumgartner C.G.	29
Bounds C.G.	12
Canyon C.G.	6

spacing of harvest areas considers the visual impacts on landscape, forage and cover needs of wildlife species, archeological and historical areas, fire hazard, and potential effects on insect and decrease populations. Road construction and harvest activities on steep slopes or highly erosive soils require mitigating measures to reduce erosion and protect water quality. The Idaho Forest Practices Act and Water Quality regulations provide stream and channel protection from erosion and sedimentation associated with timber harvest within the basin.

Timber resources on federal lands are managed by the U.S. Forest Service for a nondeclining yield, i.e., the yield of wood fiber for any decade will not be less than the yield of the previous decade. "Nondeclining yield" also implies that the average annual amount cut cannot exceed the long-term capability of the forest to regenerate wood fiber on a sustained yield basis.

Harvest in the Lime Creek drainage is limited by an agreement between the U.S. Forest Service and the Friends of Lime Creek. In the Big Smoky drainage forest land is managed as semi-primitive.

It is not the intent of the Idaho Water Resource Board that this plan affect harvest of timber or log hauling in the South Fork Boise River sub-basin. The Idaho Forest Practices Act and Water Quality regulations afford protection regarding these activities within the basin.

J. Mining

Portions of the South Fork sub-basin are highly mineralized (see Appendix G: Figure 14). Mining activity in the drainage was at its peak during the 19th century, but has since declined. A number of small mines are presently active. There has been a sharp increase in exploration activities during the past few years due to an increase in gold and silver prices. Most activity has been with placer mining where some gold has been taken out, and a few lead-silver-zinc claims have produced some high-grade ore. Known deposits include: silver, gold, lead, molybdenum, zinc, barite, cooper, tungsten, columbium, tantalum, antimony, tin, and fluorspar. Leasable minerals in the basin include geothermal resources; there is little potential for development of coal, gas, or oil in the basin because no extensive deposits exist.

Mineral resource management is guided primarily by federal laws and regulations. However, several State laws, specific to mining, apply to all lands in Idaho, including federal lands. The Idaho Dredge and Placer Mining Protection Act of 1955 requires reclamation of disturbed areas and adherence to water quality standards. The Idaho Surface Mining Act of 1971 provides measures to reclaim the lands disturbed by surface mining operations.

The State of Idaho Department of Lands administers these two laws with State Land Board direction. A Memorandum of Understanding has been signed by the Department of Lands and the U.S. Forest Service, assuring cooperation in the approval and bonding of mining operations on federal lands. The Idaho State Department of Health and Welfare administers State water quality laws (see also Appendix E).

K. Livestock Water

Livestock grazing began in the South Fork Boise River Basin in 1863 with the coming of the miners to Rocky Bar. The availability of range grasses and water made this an attractive area. By 1905 large numbers of cattle, sheep, and wild horses grazed the area. The mining camps provided a good market for beef. Stages, freight lines, and livery stables were markets for horses. Sheep raising also became big business. In the short span of 40 years, most range suitable for livestock grazing was depleted and soil erosion was common. Due to the extensive number of perennial streams, springs, and lakes, livestock water has not been a limiting resource in the basin. Development and management of the water resources, however, has been found to be of assistance in managing the range resource.

The Forest Service's current livestock management is directed towards resolving three problems: coordination of livestock grazing with reforestation on transitory ranges; preparation and maintenance of Annual Operating Plans for the Forest Service's sheep allotment; and coordination of livestock grazing with the needs of riparian areas, fish habitat, and fish and wildlife indicator species.

L. Scenic Values

The South Fork Boise River sub-basin is 1,310 square miles of scenic mountain ranges and canyons. Elevations range from about 3,200 feet at Arrowrock Reservoir to over 10,000 feet in the jagged Sawtooth and Big Smoky mountains, the northern and eastern boundaries of the basin. Between these extremes in elevation is a wealth of natural resources: timber, forage, minerals, wildlife, recreational opportunity, and splendid vistas of scenery.

The basin is spotted with cascading streams, small sheltered basins near mountain tops, vast rolling high meadows, forested canyons, massive granitic peaks and cliffs, and picturesque hills adjacent to desert valleys. Placid lakes and reservoirs of various shapes and sizes are randomly spotted throughout the basin. Enjoyment of the basin's scenic values is an important component of recreational activity in the basin.

The U.S. Forest Service uses measurable objectives for visual management of federal forest lands. Visual quality objectives include: Preservation, Retention, Partial Retention, Modification, and Maximum Modification. Except for Preservation, which allows for ecological change only, each describes a different degree of acceptable alteration of the natural landscape and is measured in terms of visual contrast with the surrounding natural landscape.

M. Natural and Cultural Features

The South Fork sub-basin, with adjacent areas, has a rich cultural history (Appendix G: Figure 15). Rocky Bar and Featherville were among early mining settlements in the area. Prior to early mining activity, the area was extensively used for hunting and gathering by native American tribes. Research shows that the South Fork sub-basin has been used by native Americans

for the last 10,000 years. The river served as a fishery for the Shoshone and Paiute Tribes and probably their prehistoric ancestors.

Today evidence of these activities is found on the flat, open ground along the river and on the terraces above the drainage. In these sites, ground stone tools and scatters of stone tools and toolmaking debris have been recorded by Forest Service archaeologists. It is possible that fish were dried and processed in this area.

At Danskin Rockshelter, some well preserved pictographs are found inside the shelter. The rockshelter also contains artifacts and burned bones of large mammals as well as a dense accumulation of mussel shells. This site may have functioned as a seasonal camp for Shoshone bands when they were hunting and fishing in this area.

Fur trappers and traders entered the area in the early 1810's. The Northwest's first gold rush occurred near Idaho City in the Moores Creek tributary of the Boise River in 1862. Evidence of early development in the basin includes old mines, pack trails, sheep camps, homesteads, and roads. The old mining area known as Rocky Bar is listed in the National Register of Historic Places.

Active cultural resource management on federal lands is a relatively new program. Lands are being inventoried for archeological resources and historic sites. Cultural resources include: campsites, rock shelters, lithic quarries, mines, town sites, ranches, Forest Service Administration sites, and trails.

The Wild and Scenic River Act, passed by Congress on October 2, 1968, states that ". . . certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreation, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environment shall be protected for the benefit and enjoyment of present and future generations."

After assessing the river qualities in the basin, five river segments have been recommended by the U.S. Forest Service for further study:

Wild - South Fork Boise River, Trail Creek to Neal Bridge (Arrowrock Reservoir).
Wild - Lime Creek, Anderson Ranch Reservoir to BNF boundary.
Scenic - South Fork Boise River, Danskin Bridge to Trail Creek.
Recreational - South Fork Boise River, Anderson Ranch Dam to Danskin Bridge.
Recreational - South Fork Boise River, BNF boundary near Featherville to Anderson Ranch Reservoir.

N. Domestic, Municipal, Commercial and Industrial Uses

At the present time the small communities in the basin rely on ground water for municipal purposes as do residents for their domestic needs. There is no need for domestic, municipal, commercial or industrial allocation of surface water at this time.

O. Navigation

No commercial navigation occurs in the basin. Boating that occurs is recreational. Interest exists in establishing outfitters and guide service on the South Fork Boise River below Anderson Ranch Dam. See the following discussion of constraints on water rights for more pertinent information.

P. Water Quality

Tributaries to the South Fork of the Boise River are reported to be affected by rangeland activities, forest practice activities including road building or maintenance, and dredge mining. Sediment is the primary pollutant in these waters. Cold water biota and salmonid spawning are potentially at risk, except on Wood Creek where they are believed to be only partially supported. Anderson Ranch Reservoir is impacted by rangeland activities, but no pollutants or impacts on beneficial uses are reported. Similarly, the South Fork has non-irrigated crop production and rangeland activities, but no pollutants are reported nor are any beneficial uses considered to be impacted.

IV. CONSTRAINTS AND GOALS

A. Constraints

Goal setting for the future use of water in the basin is limited by a number of existing constraints and rights. These include the following:

1. Water Rights

Early settlers to Idaho were attracted by the abundant water and undeveloped land resource of the State. As water was diverted to irrigate land or used for mining or power generation, a beneficial use was created.

When the State constitution was established, it included in Article 15, Section 3: "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 purpose 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 1 of this Constitution."

Since January 1980, the Idaho Department of Water Resources has issued no water right permits for consumptive use of water during the period June 15 to November 1 on the Boise River and its tributaries above Lucky Peak Reservoir. Water in the affected area has been judged to be fully appropriated, and therefore no additional consumptive uses can be permitted.

Under Idaho Codes, Section 42-1734F, no provision of the statutes or regulations administering formulation and implementation of the Comprehensive State Water Plan shall in any way limit, restrict, or conflict with approved applications for the appropriation of water, or with other existing vested property rights. Other activities not to be limited through the provisions of the planning statutes and regulations include:

(1) Cleaning, maintaining, or replacing a water diversion structure existing on or before the date a river is designated as protected.

(2) Relicensing of existing hydropower projects that have been previously licensed by the FERC, and which have generated electricity.

(3) Expansion of capacity of existing hydropower projects if the existing boundaries or project impoundments are not expanded, and the project was previously licensed by the FERC, and the project generated electricity on or before the date of designation.

Vested property rights are likely established whenever any structure or facility, such as a dam, bridge, road fill, pipeline crossing, dike, boat ramp, float or dock, has been constructed under approved authorities. Similarly, when permits, licenses, claims or leases are issued providing the necessary authorities to construct any of these facilities, or to conduct activities related to mining, or for diversion or storage of water, they may establish vested property rights.

Under these requirements, designations of waterways as protected rivers, cannot interfere with any of these rights or activities that were either approved or in existence prior to the date of designation (see also Appendix B). Within the Boise River, South Fork sub-basin, this could apply to:

(1) Maintenance and replacement of existing water diversion structures.

(2) Construction of new water diversion structures authorized under approved water right permits.

(3) Development of active mine claims or leases, or approved sand and gravel operations.

2. Water Contracts

a. November 20, 1953 Agreement - With the development of reservoirs in the Boise Basin (including Anderson Ranch in the South Fork sub-basin) by the Bureau of Reclamation and the Army Corps of Engineers, it was necessary that an agreement be entered into between these agencies to provide for and control the operation of these reservoirs to maximize the benefits for which they were constructed. This was done after consultation with the State of Idaho. The Agreement was entered into on November 20, 1953. In 1985 a Memorandum of Understanding was also written as a supplement to the Agreement. The primary purpose for the construction of the Anderson Ranch Reservoir is noted in the Bureau of Reclamation water right filing: 493,161

acre-feet for power and irrigation. It lists 275,766 acres of land to be served and a powerplant with a head of 324 feet and 20,000 KW capacity.

Arrowrock Dam, previously constructed, was also built to provide irrigation water to the Boise Valley. The Corps of Engineers then built Lucky Peak Dam as a multipurpose project, authorized primarily for flood control. The water and storage rights within each project have evolved with the projects. Under the agreement entered into, which operates these projects as one, the irrigation reservoirs (Arrowrock and Anderson Ranch) are committed to flood control operation with Lucky Peak Reservoir. However, the agreement also commits Lucky Peak to protection of the existing irrigation use of Anderson Ranch and Arrowrock reservoirs during flood control regulation, and commits space in Lucky Peak to irrigation and stream flow maintenance as well as flood control.

b. Owner and Operator Contract - The Bureau of Reclamation owns and operates the Anderson Ranch, Arrowrock, and Diversion Dam projects and facilities. The Bureau also owns the New York Canal project and facilities. The Boise Project Board of Control operates the three projects under an operation and maintenance contract with the Bureau of Reclamation, that involves flow regulation at Anderson Ranch Dam.

3. Water Quality

The South Fork Boise River has been designated a Special Resource Water from source to mouth by the Idaho Department of Health and Welfare. The water is of outstandingly high quality and meets or exceeds the criteria established for primary contact recreation and cold water biota. No permits for point source discharges to Special Resource Waters are to be issued by the State.

No existing point pollution source is known to occur in the basin. No point-source permits have been issued. Nonpoint source pollution, however, may be a matter of concern. Activities such as road construction and maintenance, skidding or dragging logs, and mechanical brush removal, cause soil disturbance. The application of chemicals to increase growth, to control undesirable growth, or control pests is another potential source of pollution in the basin. In some areas, the removal of shade from streams can increase the water temperature to levels harmful to fish.

The State of Idaho has established regulations aimed at control of nonpoint source pollution. These regulations require:

- application of approved Best Management Practices (BMPs) or, in their absence, knowledgeable and reasonable effort to minimize adverse water quality impacts; and

- protection of designated or protected beneficial uses from serious injury.

Stream-water quality in the basin is monitored by the U.S. Forest Service, U.S. Geological Survey, and Idaho Department of Health and Welfare.

4. Stream Protection

a. State Water Plan

Chapter 17, Section 42-1734A, provides for the state protection of rivers as either a "natural" or a "recreational" river. The Idaho Water Resource Board is to designate those rivers which are to be protected in

the comprehensive state water plan. In designating a Natural River, the Board shall prohibit the following activities:

- construction or expansion of dams or impoundments;
- construction of hydropower projects;
- construction of water diversions works;
- dredge or placer mining;
- alteration of stream bed; and
- mineral or sand and gravel extraction within the steam bed.

In designating a Recreational River, the Board shall determine which of the activities listed in subsection (5) of this section shall be prohibited and may specify the terms and conditions under which activities that are not prohibited may go forward.

The legislation which authorizes the Idaho Water Resource Board to designate the protective status of rivers as part of a Comprehensive State Water Plan does not grant to the Board any eminent domain powers which would authorize the Board to acquire any property along the rivers. The only property contiguous to rivers which would be affected by this plan is property owned by the State of Idaho.

b. Northwest Power Planning Council

In 1988 the Power Council protected 12,000 miles of streams in Idaho from hydropower development, in an effort to preserve existing fish and/or wildlife habitat. There are 358 miles of streams designated as Protected Areas for resident fish and/or wildlife in the Boise River, South Fork Basin. The Federal Energy Regulatory Commission (FERC) has agreed to consider the Power Council's Protected Areas Designations when evaluating applications for hydro-power development.

The Idaho Legislature recognized in part, that Designations made by the Power Council were based solely on fish and wildlife values. In 1988 the State Comprehensive Water Plan bill (HB 780) directed the Idaho Water Resource Board to develop basin plans that consider a comprehensive list of resource values and criteria to determine the optimum uses of Idaho's water resources. When completed, the Northwest Power Planning Council and FERC will be asked to adopt the actions and recommendations of the Comprehensive State Water Plan.

c. Wild and Scenic Rivers

The Wild and Scenic River Act, passed by Congress on October 2, 1968, states that ". . . certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreation, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environment shall be protected for the benefit and enjoyment of present and future generations."

After assessing the river qualities in the basin, five river segments have been recommended by the U.S. Forest Service for further study:

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Scenic	- South Fork Boise River, Danskin Bridge to Trail Creek.
Recreational	- South Fork Boise River, Anderson Ranch Dam to Danskin Bridge.
Recreational	- South Fork Boise River, BNF boundary near Featherville to Anderson Ranch Reservoir.

5. Forest Service Plan

National forest lands under the management of the USDA Forest Service make up 81 percent of the basin. About 30 percent is in the Boise National Forest and 50 percent in the Sawtooth National Forest. The U.S. Forest Service has completed Land and Resource Management Plans for both Forests. Management practices in the plan apply to the South Fork sub-basin and impact water resources.

B. Goals

The Goals of the Comprehensive State Water Plan seek to ensure that future water resource use will compliment and supplement State goals directed toward achieving "a quality of life" for the citizens of Idaho. The plan recognizes past actions and addresses present conflicts relative to water resources. It also recognizes land ownership and management plans that depend on or impact the water resources. In the Boise River, South Fork basin, the USDA Forest Service manages a major portion of the land area. Their Land and Resource Management Plans apply to the watershed area. Practices applied in the watershed which help protect the water resources and stream flows from degradation, support the goals of the Comprehensive State Water Plan.

1. Supporting Forest Service Land and Resource Management Plans

A major portion of the South Fork sub-basin is national forest land. Private and state lands are scattered through the lower basin area with concentrations in Smith Prairie, Anderson Ranch Reservoir, and around the communities of Pine, Featherville, and Rocky Bar. Land and resource management plans have been developed by the USDA Forest Service for the long-term direction and management of the National Forest lands. The management plans are established to achieve multiple use goals. Goals listed along with a statement that they are "not all inclusive" are as follows:

a. <u>Recreation</u>

- Provide a system of trails necessary to meet expected demand considering user safety, convenience, and resource protection.
- Provide a variety of recreational opportunities in accordance with identified demand.
- Provide protection of most inventoried recreation sites with potential for development.
- Maintain or improve the visual quality of the forest.
- Provide OHV opportunities in areas where such use will not create unacceptable damage or conflict.

b. <u>Wilderness</u>

- Manage to protect wilderness values in designated wildernesses.
- Recommend roadless areas for wilderness that have significant wilderness values.

c. <u>Fish and Wildlife</u>

- Reduce conflicts between wildlife and fish habitat, timber, and livestock resource use, seeking solutions to minimize or eliminate those conflicts.
- Protect and enhance wildlife and fish habitat diversity.

- Manage the forest to maintain or improve aquatic habitats.
- Protect, manage, and improve riparian areas while conducting multiple use activities on them.
- Provide for adequate year-round instream flow in streams associated with Class I Riparian Areas.
- Provide habitat and management access needed to achieve State wildlife agencies' population goals.
- Prevent sensitive plant species becoming threatened or endangered.

d. Range

- Provide for efficient utilization and management of range on a sustained yield basis to meet demand.
- Improve range condition on suitable grazing lands in unsatisfactory condition.

e. Timber

- Enhance the growth and utilization of wood fiber.
- Cooperate with research organizations in trial applications of new practices designed to increase yields, when commensurate with costs.
- Manage the timber resource in a manner that is sensitive to economic efficiency.
- Provide opportunities for firewood cutting and gathering.
- Reduce man-made fuels to acceptable levels.

f. Water, Soil, and Air

- Maintain and/or improve water quality.
- Conserve soil and water resources.
- Maintain and/or improve riparian area vegetation.
- Meet air quality standards.
- Protect, manage, and improve riparian areas while implementing land and resource management activities.

g. Minerals

- Provide opportunities for mineral and energy exploration, development, and extraction consistent with management of surface resources, laws, and regulations.

h. Human and Community Development

- Provide the opportunity for economic growth of industries and communities dependent upon forest outputs.
- Provide for community stability and cohesion through forest programs.
- Encourage the use of volunteers in the National Forest programs to help achieve natural resource goals and to provide opportunities for individuals and groups to become involved in management and protection of the Forest.
- Encourage equal opportunity employment.

i. Lands

- Exchange lands where desirable to block up ownership and increase management efficiency.
- Assure public access to National Forest System lands.

j. Facilities

- Maintain the transportation system necessary to support resource use and protection of forest resources and investments considering user safety, convenience, and user vehicle maintenance costs.
- Provide the administrative facilities necessary for efficient management and public service.

k. Protection

- Provide a cost-effective fire protection and use program.
- Provide for insect and disease considerations to be an integral part of vegetation management activities.
- Prevent or reduce serious long-lasting hazards and damage from pest organisms, utilizing principles of integrated pest management.

l. Other goals

- Provide a program that achieves a high calculated present net value.

2. State Water Plan

Formulation of a Comprehensive State Water Plan is a dynamic process. Every five years a formal review of the plan is made, and the plan is subject to change to reflect citizens desires and to be responsive to new opportunities and needs, which are in keeping with water law. The following goals are established to direct future planning and management of the water resources of the South Fork sub-basin in keeping with that which is determined to be in the greatest public interest.

a. Recreation - Recreation and tourism are expanding rapidly as a major state industry. The goal of the state is to protect the quantity and quality of water where possible to maintain and to enhance recreational experiences and opportunities in the basin.

b. Fish and Wildlife - Where needed and where adequate stream flow exists, it is a goal of the state to provide minimum stream flows sufficient and necessary to meet the minimum requirements for aquatic life, fish, and wildlife in the basin.

Riparian areas along the streams are important to both fish and wildlife. These areas are to be protected. When water projects are developed in the basin, mitigation for fish and wildlife losses must be provided.

c. Irrigation - Irrigation in the basin is limited in magnitude and very little opportunity for future expansion exists. Proposals for inter-basin water diversion for irrigation are inactive at this time. It is the goal of the state to encourage orderly and efficient growth in food and fiber production within the basin and state where possible. This goal will not interfere with, limit, or conflict with vested property and water rights.

d. Power Development - In keeping with the State Energy Plan, it is the goal of the State to encourage development of hydropower sites that are economically feasible and environmentally acceptable.

e. Energy Conservation - The use of electrical energy in the basin is limited primarily to a small amount of commercial and to residential purposes. In keeping with the State Energy Plan, it is the goal of the State to give high priority to the more efficient use of energy in residential and commercial structures in the basin through cost-effective retrofits and new design.

f. Flood Control - Flooding along the South Fork of the Boise River and basin tributaries is not a major problem. However, it is a goal of the State to minimize and further limit damages in the basin by encouraging protection of the riparian areas along all stream reaches.

g. Water Supply - The major water storage facility in the basin is Anderson Ranch Reservoir. Other water supply sources are natural stream diversions for irrigation and ground water pumped for domestic use. It is goal of the state that the quality and quantity of these water supply sources be protected for existing uses and for future expanded uses.

h. Timber - The State supports harvest of an annual sustained yield with protection of riparian areas along the streams and application of best management practices to guard against soil erosion and the entrance of sediment into streams. This goal will not interfere with or regulate timber harvest or log hauling activities within the Basin. These activities are governed by existing Idaho law and regulations.

i. Mining - It is the goal of the State to provide water supply needs for mining enterprises that are environmentally acceptable and that do not degrade water quality in streams with return flows. However, recreational and fishery resources in the Lime Creek and Big Smoky Creek drainages, and the South Fork Boise River, below Anderson Ranch Dam are highly valued and mining opportunities should be limited in these areas.

j. Domestic, Municipal, Commercial, and Industrial Uses - It is the goal of the Water Resource Board to encourage and support economic development in the state. Although domestic, municipal, commercial, and industrial uses are limited in the basin, an adequate supply of good quality water will be maintained for present and planned future uses.

k. Natural and Cultural Features - The State of Idaho has many outstanding natural features that need to be protected and preserved for the enjoyment of present and future generations. It is, therefore, a goal of the State to provide for, where appropriate, the protection of rivers as either Natural or Recreational rivers; to provide for instream flows for the needs of fish and wildlife, power production, and recreation; to protect lake and reservoir shorelands; and to protect the riparian areas of rivers and streams.

   Cultural sites in the state are also significant features that need to be protected for the benefit of present and future generations. It is the goal of the State to identify and preserve these sites where possible and feasible.

l. Scenic - Water provides for and enhances many State scenic attractions. This includes free flowing streams, and placid lakes and reservoirs nestled in canyons, valleys, and mountain basins. It is the goal of the State to support projects and activities that preserve and enhance the scenic values of the State.

m. Livestock Water - Livestock water is a vital component of use and management of the rangelands of the State. It is a goal of the State to support livestock water development and good grazing practices in the South Fork basin in a manner which maintains a high quality range, controls erosion, and provides the greatest long-range economic benefit from range lands in the basin. Idaho law provides that prior vested property and water rights are not affected by any designation of the water resources within the South Fork Boise River sub-basin as protected rivers. It is not a goal of this plan to interfere with, limit or restrain vested property and water rights of any kind which are utilized for stock watering purposes.

n. Environmental Quality and Economic Development - It is the goal of the State to encourage and support projects and activities which protect and enhance environmental quality and provide for economic development. When conflicts occur, those actions which provide the greatest public benefit will be supported.

V. CONCLUSIONS

Based on the Board findings from existing studies, data, and public oral and written input, the following conclusions are made:

1. Streams and river reaches of the South Fork Boise River Basin posses a combination of outstanding fish and wildlife, recreation, geologic or aesthetic values which are worthy of protection.

2. The present qualities of the basin's river and streams could be disrupted by hydropower development, present FERC policies, water diversions, impoundments, dredge and placer mining, alteration of stream beds or sand and gravel extraction within the streambed, and the recent Supreme Court ruling in the Rock Creek vs California case supporting the FERC conclusion that it has exclusive jurisdiction to determine minimum stream flows for FERC licensed projects.

3. A protected river designation will prohibit construction of projects in the streambed, dredge or placer mining, and mineral or sand and gravel extraction or diversion works which would detract from the outstanding qualities of selected streams and river reaches. Future modification or exceptions can be made to this plan if conditions change to where development needs outweigh the protected recreational, biological, aesthetic, and environmental values of these river reaches, or if protection of other streams or river reaches are needed, and if such action is deemed to be in the public interest of the state.

   Amendments to the water plan can be made by the Board whenever it is deemed to be in the public interest and following the public hearing process as required for the adoption of the plan, Section 42-1734A, Idaho Code. Also, "The Board shall review and reevaluate the comprehensive state water plan at least every five (5) years . . . ." (Section 42-1734(B)(7)).

4. Protection of the outstanding features of the streams of the South Fork Boise River Basin are deemed to be in the public interest and can be provided without interfering with existing water rights and agricultural needs; stockwater needs; present and future timber harvest programs on federal, state and private lands; domestic, commercial, municipal and industrial water needs; recreational activities; and other existing multiple river uses in the basin and river corridor areas.

5. Some streams in Idaho have been designated as federal wild and scenic rivers, and others are being considered for federal designation, including reaches of the South Fork Boise River. It is the policy of Idaho that the state has sovereignty over decisions affecting its water resources. In designating protected rivers in Idaho, a state system would be more responsive to the needs and desires of Idahoans. Federal designation should only be made at the request of the state so as to comply with the state water plan.

6. The interim protected reach of the South Fork Boise River from Anderson Ranch Dam to Neal Bridge has outstanding features which warrant protection. Man-made developments in the riparian area of the upper reach of the river limits this protected designation to a Recreational River. The lower reach, however, is free of man-made developments in the riparian area and meets the characteristics of a Natural River.

7. Lime Creek and Big Smoky Creek have been identified as streams which need protection to maintain the existing fish and wildlife, recreation, geologic, and aesthetic values. These streams are free of existing man-made developments within the streambeds and riparian areas which would qualify them as Natural Rivers. However, most of the southern tributaries of Lime Creek enter into or pass through private grazing lands. Designating these streams as Recreational Rivers would provide for needed protection and still allow for future stockwater developments or other future domestic needs for these private grazing lands.

8. A protected designation of the river reaches will not have an economic impact on present or future timber harvest programs, or existing farming operations.

9. The economic trade-off to be considered is returns from development projects versus returns from maintaining and increasing recreational activities resulting from the protected status of selected streams and river reaches. The Idaho Water Resource Board encourages hydropower projects sponsored by State interests.

   The economic benefits to the area from the attraction of a work force who enjoys the recreational opportunities of the area, the increase of jobs from recreational activities, the increase of sales and services due to recreation and tourism, and the potential growth of economic benefits from these attractions have not been measured at this time. It is evident, however, that they are of such magnitude that a comparison to the benefits from limited development opportunities are not required, to arrive at a decision that is in the public interest to protect the present qualities of selected streams and river reaches.

10. The Forest Service Land and Resource Management Plan will have a positive impact on the watershed areas of the basin's stream system. This will reduce erosion, siltation, and destruction of riparian areas, which in turn improves water quality and runoff flow conditions.

11. Water quality standards established by the Department of Health and Welfare have a positive impact on the multiple uses of the water resources in this system.

12. The Fisheries Management Plan of the Idaho Department of Fish and Game improves the recreational quality and quantity of stream use in the planning reaches.

VI. ACTIONS AND RECOMMENDATIONS

The goals of the South Fork sub-basin plan serve as a guide for actions taken by the Idaho Water Resource Board and other land and water management agencies. All local, state, and federal resource agencies are encouraged to assist in achieving the goals of the Comprehensive State Water Plan for the Boise River, South Fork Sub-Basin. Formulation of the Comprehensive State Water Plan is a dynamic process. Every five years a formal review of the plan

is made and the plan is subject to change to reflect citizens desires, and be responsive to new opportunities and needs which are in keeping with water law.

A. Actions

Consistent with the goals and objectives of this plan which recognize that all vested property and water rights in effect as of July 1, 1988 are not affected, limited, or restricted in any manner by this plan, the Idaho Water Resource Board takes the following action regarding protection and management of the water resources within the South Fork Boise River Basin:

1. Designation of Protected Rivers

The South Fork of the Boise River from Anderson Ranch Dam to Neal Bridge has been designated by the Idaho Legislature and Idaho Water Resource Board as an Interim Protected Stream.

2. Federal Wild and Scenic Rivers

The U.S. Forest Service has evaluated eligibility of streams in the South Fork sub-basin, for inclusion in the federal Wild and Scenic Rivers program. Stream segments that meet criteria for study under provisions of the Wild and Scenic Rivers Act are:

Wild - South Fork Boise River, Trail Creek to Neal Bridge (Arrowrock Reservoir).
Wild - Lime Creek, Anderson Ranch Reservoir to BNF boundary.
Scenic - South Fork Boise River, Danskin Bridge to Trail Creek.
Recreational - South Fork Boise River, Anderson Ranch Dam to Danskin Bridge.
Recreational - South Fork Boise River, BNF boundary near Featherville to Anderson Ranch Reservoir.

3. Water Quality Standards

The Department of Health and Welfare have established water quality standards for the State of Idaho.

4. Boise River Reservoirs Water Control Manual

Anderson Ranch is a multipurpose project which provides irrigation water, flood control, power generation, and recreation. Operation of this reservoir is coordinated with Arrowrock and Lucky Peak reservoirs to maximize utility of the available storage for the purposes for which they were constructed.

In May 1974, the Governor of Idaho requested that the Idaho Department of Water Resources review Boise River flood control management, etc., and present recommendations for improved operations. This lead to the preparation of a Water Control Manual for the Boise River Reservoirs. The Bureau of Reclamation and the Army Corps of Engineers jointly regulate the Boise River reservoirs according to the Water Control Manual through a Memorandum of Agreement.

5. U.S. Forest Service Land and Resource Management Plans: Sawtooth and Boise National Forests

The U.S. Forest Service has completed Land and Resource Management Plans for management of the Boise and Sawtooth National Forest lands in the basin. Watersheds on the forest lands provide a continuous supply of high quality water for agriculture, power generation, fish, wildlife, and a variety of recreational activities. The Land and Resource Management Plans provide measures for control of soil and stream channel erosion and improving riparian zones and watershed conditions.

6. Fisheries Management Plan

The Idaho Department of Fish and Game has a Fisheries Management Plan which describes the Department's management program for fish populations and fishing opportunities in the sub-basin (see Appendix F).

B. Protected River Designations and Recommendations

Consistent with the goals and objectives of this plan, the Idaho Water Resource Board makes the following designations regarding protection and management of the water resources within the South Fork Boise River Basin:

1. South Fork Segment - Recreational River

The designation of the South Fork of the Boise River from Anderson Ranch Dam downstream to Black Canyon Creek as a Recreational River. Pursuant to Idaho Code 42-1734A(6), the following activities are prohibited:

- Construction or expansion of dams or impoundments
- Construction of hydropower projects
- Dredge or placer mining
- Mineral or sand and gravel extraction within the streambed.

Stream channel alterations shall be prohibited except for those necessary to maintain existing irrigation facilities, utilities, roadways, stream channel protection, the maintenance of existing access, placement of fishery enhancement structures, or new access for recreational purposes.

New diversion works shall be limited to pump installations sized to supply water for the standard domestic exemption or of a capacity sufficient for stock water or developed recreational purposes.

While not prohibited by law, specific authorization is provided for the eventual addition of a third generating unit at Anderson Ranch Dam with the provision that the fish and recreational values of the river be protected.

2. South Fork Segment - Natural River

The designation of the South Fork Boise River from the mouth of Black Canyon Creek downstream to a point of 250 yards upstream of Neal Bridge as a Natural River. Provision is made, thereby, for the maintenance and future upgrading of Neal Bridge, and the Neal Bridge Float Boat Access site.

3. Lime Creek Drainage - Natural Rivers and Recreational Rivers

That Lime Creek from its mouth to its confluence with the North and Middle Forks and all tributaries on the north side of Lime Creek including the North and Middle Forks and all their tributaries from their mouth to their headwaters, be designated as Natural Rivers.

The term headwaters, as used in this plan, means a natural water course in perceptible extent with definite beds and banks which confines and conducts continuously and intermittently flowing waters (from Rules and Regulations Pertaining to the Idaho Forest Practices Act, IDL, 1988).

All remaining tributaries of Lime Creek, from their mouths to their headwaters be designated as Recreational Rivers. Pursuant to Idaho Code 42-1734A(6), the following activities are prohibited:

- Construction or expansion of dams or impoundments
- Construction of hydropower projects
- Dredge or placer mining
- Mineral or sand and gravel extraction within the streambed.

Stream channel alterations shall be prohibited except for those necessary to maintain existing access, utilities, and roadways, the placement of fishery enhancement structures, or new access for recreational purposes.

New diversion works shall be limited to pump installations sized to supply water for the standard domestic exemption or of a capacity sufficient for stock water or developed recreational purposes.

4. Big Smoky Creek Drainage - Natural Rivers

That Big Smoky Creek from its confluence with Calf Creek to its headwaters and all tributaries to Big Smoky Creek above and including Calf Creek from their mouth to their headwaters be designated as Natural Rivers.

The term headwaters, as used in this plan, means a natural water course in perceptible extent with definite beds and banks which confines and conducts continuously and intermittently flowing waters (from Rules and Regulations Pertaining to the Idaho Forest Practices Act, IDL, 1988).

C. Recommendations

1. Northwest Power Planning Council Protected Areas Designations

It is recommended that the Department of Water Resources cooperate with the Department of Fish and Game, and with other appropriate natural resource agencies, in reviewing and evaluating the Protected Areas Designations of the

Northwest Power Planning Council relative to the South Fork Boise River Sub-Basin.

2. Forest Service Action

It is recommended that the Forest Service expedite land treatment measures that control soil erosion on the watershed area and protects and/or re-establishes riparian areas along the streams in the basin.

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Appendix A

Issue Analyses and Stream Classification Summaries

Table I: ISSUE ANALYSIS

**Recreational River:* South Fork Boise, Anderson Ranch Dam to Black Canyon

	RESOURCES	*POTENTIAL IMPACT ON:*	*RECREATIONAL CLASSIFICATION*
Navigation	——	——	——
Hydropower	Add turbine at Anderson Dam; One identified hydropower site	——	Exempted
		Fish and wildlife; boating	Prohibits
Energy Conservation	——	——	——
Fish & Wildlife	Quality trout fishery; mule deer winter range; game birds	Impoundments; major diversions; dredge mining	Stream channel conditionally protected
Recreation	Fishing; boating; sight-seeing	Major diversions; impoundments	Stream channel conditionally protected
Irrigation	Local potential limited; diversion to Mtn. Home	Diversion may impact fishery and recreation	Prohibits new diversions
Flood Control	Regulated by Anderson Ranch Dam	Structural controls may impact fishery and sight-seeing	Prohibits new structural controls
Timber	Area not harvested	Channel alteration may impact fishery	Channel alteration allowed with conditions
Dredge Mining	No commercial operations	Fish and wildlife; recreation; cultural features	Prohibits
Livestock Water	Seasonal use	Fish and wildlife	Pumping exempted
Scenic Values	River canyon; sight-seeing	Impoundments; major diversions	Stream channel conditionally protected
Nat or Cult Features	River canyon; Archeological sites; Historical sites	Impoundments; dredge mining	Stream channel conditionally protected
Do, Com, Ind Uses	Minimal use	Fish and wildlife; recreation	Domestic exempted Prohibits new Comm, Indus diversions

*The designation of any river as having a protective status as part of a Comprehensive State Water Plan is subject to all prior vested property and water rights and does not affect any activities which occurred prior to July 1, 1988 and which were based on vested property and water rights.

Table I : ISSUE ANALYSIS (Cont.)

*Natural River: South Fork of the Boise River - Black Canyon to Neal Bridge

	RESOURCES	POTENTIAL IMPACT ON:	NATURAL CLASSIFICATION
Navigation	——	——	——
Hydropower	Two identified sites	Fish and wildlife; boating	Prohibits
Energy Conservation	——	——	——
Fish & Wildlife	Quality trout fishery; mule deer winter range; game birds	Impoundments; major diversions; dredge mining	Protects
Recreation	Fishing; boating	Major diversions; impoundments	Protects
Irrigation	Limited potential;	Fish and wildlife; recreation	Prohibits new diversions
Flood Control	Regulated by Anderson Ranch Dam	Structural control may impact fishery	Prohibits new structural controls
Timber	Area not harvested	Channel alteration may impact fishery	Prohibits stream channel alteration
Dredge Mining	No commercial operations	Fish and wildlife; recreation	Prohibits
Livestock Water	——	Fish and wildlife	Prohibits new diversions
Scenic Values	Isolated river canyon	Impoundments; major diversions	Protects
Nat or Cult Features	River canyon; Archeological sites;	Impoundments; dredge mining	Protects
Do, Com, Ind Uses	——	Fish and wildlife; recreation	Prohibits diversions

*The designation of any river as having a protective status as part of a Comprehensive State Water Plan is subject to all prior vested property and water rights and does not affect any activities which occurred prior to July 1, 1988 and which were based on vested property and water rights.

Table I: ISSUE ANALYSIS (Cont.)

**Natural River:* Lime Creek and North and Middle Fork Tributaries

	RESOURCES	*POTENTIAL IMPACT ON:*	*NATURAL CLASSIFICATION*
Navigation	——	——	——
Power	Two identified sites	Fish and wildlife, boating	Prohibits
Energy Conservation	——	——	——
Fish & Wildlife	Trout fishery; spawning beds; wildlife habitat	Impoundments; major diversions; dredge mining	Protects
Recreation	Trails/Hunting	Major diversions; impoundments	Protects
Irrigation	Limited potential	Fish and wildlife; recreation	Prohibits new diversions
Flood Control	Not a problem locally	Structural control may impact fishery	Prohibits new structural controls
Timber	Limited harvest	Channel alteration may impact fishery	Prohibits stream channel alteration
Dredge Mining	No commercial operations	Fish and wildlife; recreation	Prohibits
Livestock Water	——	Fish and wildlife	Prohibits new diversions
Scenic Values	Proposed wilderness	Impoundments; major diversions	Protects
Nat or Cult Features	Proposed wilderness; pristine watershed	Impoundments; dredge mining	Protects
Do, Com, Ind Uses	——	Fish and wildlife; recreation	Prohibits new diversions

*The designation of any river as having a protective status as part of a Comprehensive State Water Plan is subject to all prior vested property and water rights and does not affect any activities which occurred prior to July 1, 1988 and which were based on vested property and water rights.

Table I: ISSUE ANALYSIS (Cont.)

*Recreational River: Southern Tributaries to Lime Creek

	RESOURCES	POTENTIAL IMPACT ON:	RECREATIONAL CLASSIFICATION
Navigation	—	—	—
Power	No identified sites	Fish and wildlife, boating	Prohibits
Energy Conservation	—	—	—
Fish & Wildlife	Trout fishery; spawning beds; wildlife habitat	Impoundments; major diversions; dredge mining	Stream channel conditionally protected
Recreation	Trails/Hunting	Major diversions; impoundments	Stream channel conditionally protected
Irrigation	Limited potential	Fish and wildlife; recreation	Prohibits new diversions
Flood Control	Not a problem locally	Structural control may impact fishery	Prohibits new structural controls
Timber	Limited harvest	Channel alteration may impact fishery	Channel alterations allowed with conditions
Dredge Mining	No commercial operations	Fish and wildlife; recreation	Prohibits
Livestock Water	—	Fish and wildlife	Pumping exempted
Scenic Values	Proposed wilderness	Impoundments; major diversions	Stream channel conditionally protected
Nat or Cult Features	Proposed wilderness; pristine watershed	Impoundments; dredge mining	Stream channel conditionally protected
Do, Com, Ind Uses	—	Fish and wildlife; recreation	Prohibits new diversions

*The designation of any river as having a protective status as part of a Comprehensive State Water Plan is subject to all prior vested property and water rights and does not affect any activities which occurred prior to July 1, 1988 and which were based on vested property and water rights.

Table I: ISSUE ANALYSIS (Cont.)

**Natural River:* Big Smoky Creek and Tributaries above Calf Creek

	RESOURCES	*POTENTIAL IMPACT ON:*	*NATURAL CLASSIFICATION*
Navigation	——	——	——
Power	No identified sites	Fish and wildlife habitat	Prohibits
Energy Conservation	——	——	——
Fish & Wildlife	Excellent spawning beds; wildlife habitat	Impoundments; major diversions; dredge mining	Protects
Recreation	Trails/Camping; fishing	Major diversions; impoundments	Protects
Irrigation	Limited potential;	Fish and wildlife; recreation	Prohibits new diversions
Flood Control	Not a problem locally	Structural control may impact fish and wildlife	Prohibits new structural controls
Timber	Semi-Primitive Mngt designation, no sales proposed	Channel alterations may impact fishery	Prohibits stream channel alteration
Dredge Mining	No commercial operations	Fish and wildlife; recreation	Prohibits
Livestock Water	——	Fish and wildlife habitat	Prohibits new diversions
Scenic Values	Intermontaine meadows	Impoundments; major diversions	Protects
Nat or Cult Features	Vegetation zones, watershed	Impoundments; dredge mining	Protects
Do, Com, Ind Uses	——	Fish and wildlife; recreation	Prohibits new diversions

*The designation of any river as having a protective status as part of a Comprehensive State Water Plan is subject to all prior vested property and water rights and does not affect any activities which occurred prior to July 1, 1988 and which were based on vested property and water rights.

Table II: RIVER CLASSIFICATION SUMMARY
South Fork Boise River Sub-Basin

	Recreational	*Natural*	*Natural*
	S. F. from Anderson Ranch Dam to Black Canyon	**S.F. from Black Canyon to Neal Bridge**	**Lime Creek and Northern Tributaries**
Values to be Protected			
Fish & Wildlife	Quality Trout Stream	Quality Trout Stream	Quality Fishery/Spawning
Recreation	Heavy Fishing/Boater Use	Heavy Fishing/Boater Use	Trailhead/Hunting
Aesthetic	Desert Hills-River Canyon	Isolated River Canyon	Prop Wildns/Pristine Wshd
Historic	Mining/Archeol Sites	Mining/Archeol Sites	None Identified
Natural Geologic	None	Deep Basalt Canyon	None Identified Spngs
Riparian Area			
Man Made Structures	Roads, Utilities, Fences	None	None
Access/Trail or Road	Two Roads, Side Trails	Side Trails	Trails
Prohibited Activities			
Const./Exp. Dams	Prohibited	Prohibited	Prohibited
Const. of Hydro	Prohibited	Prohibited	Prohibited
Const. of Diversions	Domestic & Recreation Pumps Allowed	Prohibited	Prohibited
Dredge/Placer Mining	Prohibited	Prohibited	Prohibited
Stream Bed Alterations	Exist Util, Road, Project Maintenance Allowed	Prohibited	Prohibited
Min/Sand/Gravel Ext.	Prohibited	Prohibited	Prohibited

Table II: RIVER CLASSIFICATION SUMMARY
South Fork Boise River Sub-Basin

	Recreational	*Natural*
	Southern Tributaries to Lime Creek	**Big Smoky Creek Drainage from Calf Creek**
Values to be Protected		
Fish & Wildlife	Trout Spawning/Wildlife	Excellent Spawning Stream
Recreation	Trails/Hunting	Trails/Camping
Aesthetic	Pristine Watershed	Intermontaine Meadows
Historic	None Identified	None Identified
Natural Geologic	None Identified	Hot Springs
Riparian Area		
Man Made Structures	None	None
Access/Trail or Road	Trails	Trails
Prohibited Activities		
Const./Exp. Dams	Prohibited	Prohibited
Const. of Hydro	Prohibited	Prohibited
Const. of Diversions	Domestic & Recreation Pumps Allowed	Prohibited
Dredge/Placer Mining	Prohibited	Prohibited
Stream Bed Alterations	Exist Util, Road, Project Maintenance Allowed	Prohibited
Min/Sand/Gravel Ext.	Prohibited	Prohibited

Appendix B
Idaho Water Resource Board Authority

The Idaho Code (42-1731) defines Natural River, Recreational River, and riparian area. The essential difference between Natural and Recreational rivers is the degree of man-made development within the waterway and riparian zone.

Riparian area is defined as the area within 100 feet of the mean highwater mark on either side of the waterway. State agencies must exercise their duties in a manner consistent with the Comprehensive State Water Plan. The plan therefore may have some impact on State lands within the riparian area.

Other governmental or private landowners are under no requirement to modify existing or future practices, nor are they required to recognize the plan in any other way. If the construction of diversion works is prohibited or conditioned, or if the alteration of the streambed is prohibited or conditioned, future development along the waterway will be limited to activities not restricted by such conditions.

The Idaho Code (42-1734) provides the Water Resource Board with eminent domain authority for the construction of projects, both land and water. HB 780, the legislation which created the State protected rivers system, and provided for comprehensive state water planning, does not include eminent domain language. Since protected river status can not be construed as a land or water project, the eminent domain authorities of the Board do not apply.

Appendix C
Stream Flow Records

Table C-1

18600G DISCH., BOISE RIVER NEAR FEATHERVILLE, IDAHO (1912-45 GNRTD)(1000 AC-FT)

W-YR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANN
12	14.7	13.7	13.6	15.5	13.1	16.0	64.5	188.5	233.2	57.5	24.9	18.4	673.6
13	16.2	15.7	12.8	12.9	12.4	16.6	85.0	182.2	142.4	50.0	25.0	15.9	587.1
14	17.1	18.5	13.9	14.5	13.6	32.1	106.8	174.4	106.1	36.2	14.9	15.2	563.3
15	19.1	14.6	11.5	12.2	11.9	16.9	47.8	72.9	51.9	25.2	12.5	11.7	308.2
16	12.5	12.1	13.1	12.2	11.6	27.6	111.5	162.7	209.5	105.0	26.2	16.5	720.5
17	16.1	12.2	12.0	11.7	11.2	13.4	44.3	186.2	223.0	84.0	18.7	12.3	645.1
18	12.5	12.2	21.6	18.0	13.7	28.3	92.3	134.6	193.8	32.8	16.4	13.2	589.4
19	15.1	13.1	12.0	11.5	10.9	17.9	87.0	169.0	72.1	18.1	10.5	9.3	446.5
20	12.7	14.1	11.8	14.3	11.1	13.6	32.9	163.5	130.6	36.7	15.3	15.1	471.7
21	17.5	18.1	15.8	16.7	15.5	34.4	83.0	271.3	254.6	52.9	19.7	16.2	815.7
22	14.8	17.1	16.7	13.3	12.0	17.3	51.3	195.5	221.4	42.9	17.5	11.8	631.6
23	12.5	12.7	13.2	13.3	11.9	16.3	52.1	140.9	118.7	58.3	17.0	12.0	478.9
24	14.4	13.0	12.7	12.5	13.6	12.8	30.1	76.0	12.1	8.0	7.6	7.8	220.6
25	12.0	14.3	12.1	12.5	17.0	27.4	111.5	226.8	120.3	47.1	17.4	13.6	632.0
26	14.7	13.0	13.6	13.4	12.4	21.4	55.7	70.6	20.6	9.8	8.7	8.5	262.4
27	10.9	16.4	17.0	13.9	14.8	24.1	74.4	179.1	244.3	73.8	21.0	16.6	706.3
28	17.2	30.1	19.2	17.4	15.1	35.6	64.5	290.8	100.6	33.5	15.4	11.9	651.3
29	13.5	12.7	12.3	12.0	11.1	17.4	31.3	104.9	95.8	27.3	11.4	9.7	359.4
30	11.7	10.9	15.2	12.0	14.1	18.5	71.7	83.1	74.5	19.0	11.9	10.2	352.8
31	15.0	11.9	11.4	12.0	11.3	16.9	43.9	79.9	27.5	8.3	7.1	7.6	252.8
32	10.8	10.9	11.4	11.9	11.2	19.7	65.1	183.0	150.3	40.4	14.8	10.8	540.3
33	12.3	12.9	11.5	12.4	11.2	13.6	47.4	92.4	193.8	30.1	12.5	9.8	459.9
34	12.2	12.3	13.2	14.9	14.5	31.0	75.5	64.6	15.7	8.4	7.1	7.2	276.6
35	11.9	13.9	13.0	13.2	12.8	15.6	67.3	131.5	121.3	27.2	11.5	8.6	447.8
36	11.0	11.3	11.3	11.9	11.3	15.8	128.7	197.4	97.5	21.2	12.0	10.2	539.6
37	11.2	10.7	11.8	11.6	11.0	15.2	36.0	116.5	50.3	14.6	8.5	7.6	305.0
38	11.1	12.7	20.9	14.8	13.2	24.2	95.4	196.5	181.4	56.9	18.8	12.8	658.7
39	15.0	14.5	14.0	13.0	11.8	25.6	73.2	101.8	31.1	15.2	8.7	8.6	332.5
40	12.0	11.0	13.0	13.3	14.3	33.4	86.5	144.0	70.3	16.9	9.3	11.2	435.2
41	14.4	14.6	13.3	13.1	12.9	19.0	39.0	106.9	82.7	23.0	15.3	12.8	367.0
42	13.4	17.0	20.7	14.5	13.0	16.1	78.0	90.8	115.7	41.8	14.0	10.4	445.4
43	11.7	15.6	15.4	20.2	16.6	30.8	213.2	206.0	199.2	118.4	31.4	16.7	895.2
44	16.8	16.9	13.5	13.1	12.3	13.8	34.1	83.2	69.5	28.8	12.6	10.1	324.7
45	11.7	14.0	12.2	13.3	13.4	17.2	42.8	150.6	148.0	49.5	16.8	12.3	501.8
46	12.2	13.2	14.8	14.4	11.8	24.5	131.6	185.5	120.8	38.3	16.2	12.6	595.9
47	17.1	15.8	17.1	13.3	14.2	32.0	77.9	163.5	88.0	32.2	13.5	11.1	495.7
48	15.5	13.7	12.2	13.7	11.9	13.2	50.0	142.0	145.1	33.7	14.9	11.9	477.8
49	13.7	13.6	13.0	12.8	11.1	19.3	88.9	174.1	95.4	27.7	12.6	10.3	492.5
50	13.1	14.8	12.5	13.9	12.9	18.2	83.1	171.6	189.7	77.5	22.6	17.9	647.8
51	19.1	23.9	19.0	16.3	18.6	22.1	139.9	230.7	151.0	65.2	24.8	15.1	745.7
52	19.4	16.7	18.2	17.1	15.0	17.5	125.0	271.0	175.6	52.8	20.9	13.6	762.8
53	13.6	12.6	14.1	16.4	13.5	23.8	80.7	109.3	179.9	78.2	20.1	13.0	575.2
54	12.6	14.0	12.7	14.2	15.1	23.1	87.0	193.2	106.2	50.8	17.1	12.4	558.4
55	13.0	12.8	11.3	11.8	9.8	11.8	24.3	101.9	137.5	37.4	13.1	10.2	394.9
56	12.7	15.6	27.4	21.8	15.5	28.5	150.3	269.2	195.9	54.7	20.2	13.6	825.4
57	16.2	14.9	15.3	13.4	14.5	22.5	63.2	212.8	178.0	46.4	16.5	12.7	626.4
58	15.0	13.1	14.3	14.1	14.9	17.7	53.0	299.7	167.8	43.2	19.3	13.8	685.9
59	14.1	16.0	18.6	15.7	12.9	17.7	72.0	98.2	118.8	29.0	13.9	16.9	443.8
60	21.4	15.6	12.5	13.6	11.6	24.3	75.5	107.5	101.3	22.2	12.3	11.3	429.1
61	11.9	12.6	11.0	11.6	13.0	17.6	41.3	90.4	65.8	14.6	9.6	10.4	309.8
62	12.2	12.3	11.9	12.0	13.0	14.3	98.8	130.2	160.7	48.6	19.4	13.1	546.5
63	16.6	15.0	14.6	12.4	24.2	20.5	39.0	149.8	136.5	45.2	17.2	14.5	505.5
64	14.0	16.2	13.7	13.2	12.2	14.6	54.7	132.4	134.9	45.4	15.6	12.3	479.2
65	12.4	12.8	42.0	27.3	23.2	28.2	128.4	248.2	285.7	119.6	39.5	23.6	990.9
66	19.2	17.3	14.6	14.8	12.2	20.4	67.4	113.0	57.5	19.2	10.3	8.9	374.8
67	10.5	11.3	10.8	12.9	11.4	17.7	32.3	163.4	197.9	61.0	19.1	13.7	562.0
68	15.9	14.3	13.4	12.9	16.1	25.8	41.1	81.2	94.2	25.4	20.5	14.8	375.6
69	16.9	18.6	15.8	20.0	16.0	24.8	154.4	267.6	143.6	40.1	16.7	13.7	748.2
70	14.6	12.3	12.7	15.5	14.8	24.3	41.2	159.1	181.3	51.7	18.4	14.6	560.5
71	14.7	19.9	17.2	21.0	22.0	25.2	97.2	275.1	249.2	98.2	28.5	19.4	887.6
72	19.1	17.3	16.7	17.5	15.7	46.2	70.3	194.0	227.2	61.6	23.0	16.7	725.3
73	17.8	16.1	15.4	14.7	12.7	18.1	43.7	107.3	68.5	24.6	11.5	11.2	361.6
74	12.2	21.4	16.8	23.4	15.9	40.8	129.7	217.5	247.9	70.3	22.9	14.6	833.4
75	15.4	14.7	13.4	14.9	15.1	26.6	29.1	159.4	233.8	120.0	27.7	16.7	686.8
76	18.0	18.2	19.3	16.8	15.8	18.5	75.4	191.7	109.5	36.8	22.5	19.5	562.0
77	16.9	13.5	12.3	11.8	11.2	12.5	20.6	25.8	29.3	13.2	8.5	8.4	184.0
78	9.9	10.6	15.7	12.5	12.0	35.2	83.8	155.8	171.7	74.8	22.4	18.9	623.3
79	14.8	13.4	13.1	12.7	12.6	19.7	32.4	111.9	65.3	19.3	13.3	10.3	338.8
80	12.8	11.5	11.8	13.9	13.7	18.8	91.2	174.0	138.0	61.6	20.3	17.3	584.9
81	14.9	14.6	16.7	15.0	15.5	23.9	58.2	114.9	96.5	25.7	13.6	10.6	420.1
82	13.5	17.3	19.8	16.3	19.7	28.8	72.2	263.3	263.1	108.7	27.1	18.8	868.6
83	20.0	17.9	17.3	19.0	16.6	35.9	80.9	259.3	277.2	114.1	33.8	20.8	912.8
84	22.5	25.8	20.7	18.9	18.7	29.6	84.5	216.4	208.7	80.9	26.8	19.3	772.8
85	17.9	16.8	15.0	13.8	12.9	17.8	84.1	137.3	71.3	21.6	14.4	16.9	439.8
86	17.7	16.9	14.9	16.6	24.6	76.5	143.6	186.3	192.6	43.9	20.7	19.2	773.5
87	19.2	17.4	13.6	12.7	12.8	21.7	48.2	68.6	27.2	15.4	10.3	8.8	275.8
88	9.7	9.9	11.4	10.4	10.7	18.8	54.7	82.0	56.6	16.1	8.7	8.1	297.0
AVE 1912-88:	14.6	14.9	15.0	14.5	14.0	22.8	74.3	158.8	136.7	45.3	17.0	13.2	541.0

Table C-2

NATFLO EST.- NAT. FLOWS, SO. FK. BOISE R NR ANDERSON RANCH DAMSITE (1000 AC-FT)

W-YR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANN
12	21.0	23.4	21.8	24.4	22.0	27.4	105.8	233.6	237.5	61.5	29.0	24.0	831.4
13	23.9	22.5	17.5	15.7	17.4	26.3	116.5	207.3	159.5	60.2	28.6	19.6	715.0
14	23.5	26.8	20.5	22.7	22.4	66.3	194.6	240.4	120.4	48.5	23.0	20.6	829.7
15	26.4	21.9	17.6	17.8	19.9	34.6	77.4	94.5	69.3	30.3	14.7	14.5	438.9
16	15.9	16.0	18.4	19.1	21.2	59.0	202.4	231.7	225.8	100.9	29.0	19.8	959.2
17	22.8	19.7	21.6	17.7	15.7	25.7	75.6	287.3	297.0	104.8	27.3	19.1	934.3
18	18.7	19.8	32.0	29.6	20.9	48.5	120.4	148.7	171.2	40.2	21.4	21.0	692.4
19	25.5	19.6	16.7	17.7	17.3	31.2	139.0	201.4	76.8	23.2	14.7	13.7	596.8
20	17.6	19.4	15.9	21.6	19.2	25.4	57.7	152.6	109.7	34.2	15.0	14.0	502.3
21	18.4	22.7	21.0	27.2	23.2	66.3	141.9	339.0	265.8	72.8	24.7	18.7	1041.7
22	18.6	22.8	23.3	18.2	15.6	27.0	97.0	273.6	234.6	58.0	27.3	17.3	833.3
23	18.7	19.1	19.9	19.7	17.0	29.7	100.9	187.7	143.8	72.2	25.7	17.6	672.0
24	23.7	19.4	19.0	17.6	23.0	22.5	52.5	90.9	29.1	12.4	8.1	8.3	326.5
25	13.3	16.0	13.8	15.8	27.1	54.2	188.7	295.1	146.8	57.9	23.7	17.9	870.3
26	21.3	18.5	18.5	16.6	17.7	49.2	87.8	90.9	37.1	14.8	9.0	9.7	391.1
27	12.6	18.6	23.2	18.3	20.7	42.0	122.4	256.1	277.5	91.4	28.4	21.0	932.2
28	23.8	41.4	31.5	29.7	22.3	63.2	97.0	309.7	109.7	36.5	17.6	13.7	796.1
29	16.3	15.1	13.5	13.5	13.9	30.8	59.4	125.3	102.9	29.3	12.4	11.3	443.7
30	13.7	13.2	21.7	12.1	18.2	30.9	98.0	117.5	102.9	28.4	16.8	13.1	486.5
31	19.5	15.6	13.5	15.0	14.7	24.7	54.6	90.9	36.8	11.0	7.3	7.3	310.9
32	10.6	10.8	11.7	13.2	11.8	31.0	102.9	224.8	189.7	57.5	18.5	14.2	696.7
33	16.8	18.4	13.6	16.0	14.0	20.0	80.3	138.0	195.6	36.7	14.6	12.6	576.6
34	14.7	17.5	17.6	20.4	24.2	52.3	85.4	71.0	28.4	11.3	6.2	7.2	356.2
35	12.2	15.1	15.9	15.9	16.9	24.5	99.8	172.3	145.8	35.2	12.4	9.7	575.7
36	12.3	13.4	12.3	14.0	13.8	28.4	200.2	256.7	115.3	29.4	15.6	13.2	724.6
37	13.9	13.9	15.3	13.5	13.6	26.7	69.8	141.8	64.4	20.4	8.6	8.0	409.9
38	12.6	16.0	39.9	21.7	19.3	44.9	198.0	315.1	231.4	74.9	24.2	17.2	1015.2
39	23.8	23.6	22.5	20.4	17.1	51.1	125.1	128.3	47.8	20.0	10.3	10.4	500.4
40	13.8	13.3	15.3	15.7	17.3	53.0	125.7	169.8	80.4	20.0	9.7	13.4	547.4
41	18.0	19.4	18.6	17.4	17.9	38.6	70.3	155.7	102.7	31.1	21.2	15.6	526.5
42	17.1	19.9	29.5	20.1	18.2	26.8	133.6	127.2	133.4	45.8	16.6	12.5	600.7
43	15.0	20.5	23.2	34.8	26.0	55.7	367.7	308.5	249.4	134.5	34.3	18.4	1288.0
44	21.5	24.2	19.6	21.0	17.8	23.1	59.6	121.7	97.7	38.6	16.4	13.2	474.4
45	15.1	18.6	15.4	17.3	18.4	26.1	67.8	152.7	135.2	49.4	17.5	14.2	547.7
46	16.2	17.9	9.2	3.0	17.6	46.5	211.8	253.6	143.7	44.8	20.5	17.6	802.4
47	23.3	21.9	26.0	20.0	23.1	50.6	106.1	205.4	104.7	39.3	13.4	14.0	647.8
48	19.7	18.1	18.0	18.8	17.4	19.2	77.3	179.8	166.5	42.2	16.4	12.8	606.2
49	17.0	18.8	17.2	16.8	19.2	24.3	139.4	221.7	111.7	33.7	14.1	13.3	647.2
50	17.5	20.0	17.0	19.6	18.5	28.9	130.5	236.6	220.7	94.5	22.4	23.3	849.5
51	20.8	30.0	27.4	22.9	29.3	31.6	216.0	292.0	175.9	72.7	28.1	20.4	967.1
52	24.7	21.4	24.8	24.7	20.4	24.0	207.7	402.9	207.9	66.6	26.4	20.3	1071.8
53	16.2	18.7	19.2	26.7	20.0	35.4	121.5	147.9	210.2	91.1	28.6	18.1	753.6
54	15.0	21.3	19.5	19.2	21.7	37.2	127.7	235.1	125.4	60.4	23.0	16.0	721.5
55	13.2	17.8	15.6	15.1	16.2	17.6	37.5	136.6	153.9	45.5	16.1	10.0	495.1
56	14.4	21.5	50.4	36.5	26.7	50.6	230.9	349.3	226.9	65.0	26.8	15.0	1114.0
57	21.7	23.9	24.9	22.2	22.5	39.7	100.9	273.9	204.5	56.7	20.8	13.1	824.8
58	20.2	17.9	23.0	20.0	25.4	28.3	91.4	392.2	193.7	53.4	26.7	18.0	910.2
59	15.7	21.8	26.2	22.7	18.6	27.8	98.0	118.5	131.9	36.0	14.8	21.0	553.0
60	25.9	20.9	15.7	17.8	18.0	36.9	121.4	141.3	120.0	30.7	15.1	14.1	577.8
61	13.6	17.5	15.2	16.5	19.0	26.0	58.4	102.4	72.7	15.9	10.0	11.9	379.1
62	17.5	17.0	15.1	18.1	20.5	22.8	150.0	166.0	179.6	57.8	22.2	14.6	701.2
63	17.8	18.5	17.3	14.2	43.1	28.1	54.5	177.4	161.4	51.1	18.6	15.4	617.4
64	15.3	21.5	18.1	19.1	17.1	21.2	83.4	168.3	152.4	49.7	16.4	13.6	596.1
65	14.1	17.8	64.3	32.4	26.4	38.7	211.1	334.9	341.2	138.7	46.5	33.7	1299.8
66	23.5	23.8	19.4	20.4	15.6	30.4	93.1	140.8	65.1	22.3	13.4	9.4	477.2
67	12.1	15.0	17.0	22.3	18.6	29.5	53.4	209.0	233.2	66.6	19.7	14.5	710.9
68	18.0	19.3	19.1	17.4	26.4	38.8	53.8	97.2	105.5	28.9	25.3	15.6	465.3
69	21.2	27.0	22.4	31.0	21.4	34.0	236.8	323.2	157.8	43.1	18.1	16.3	952.3
70	18.0	16.1	19.0	24.8	20.6	37.5	66.9	218.1	211.4	62.1	19.5	16.1	730.1
71	19.2	31.4	26.2	32.3	38.5	46.2	190.0	388.4	292.3	111.4	29.9	21.1	1226.9
72	24.2	23.7	24.2	28.1	28.7	90.2	131.2	282.3	298.1	73.5	26.4	22.3	1052.9
73	24.5	20.8	23.1	21.6	19.4	28.9	69.8	131.8	76.8	25.5	12.7	13.4	468.3
74	16.1	29.4	23.8	28.4	21.8	66.8	217.3	312.0	308.6	77.0	24.3	15.1	1140.6
75	19.9	19.7	19.9	19.5	19.5	29.5	49.3	244.4	291.2	133.4	32.7	19.9	898.9
76	24.1	23.8	27.2	25.9	24.3	30.6	122.6	241.8	125.5	47.5	30.5	24.5	748.3
77	20.8	17.5	15.7	15.7	14.2	16.6	25.9	32.9	35.0	13.7	7.0	9.1	224.1
78	13.5	15.1	25.3	19.3	17.9	57.5	136.5	192.7	199.3	84.9	28.1	23.5	813.6
79	18.3	16.3	17.2	19.7	16.2	31.0	47.6	131.7	76.3	27.4	19.7	8.9	430.3
80	14.2	14.8	16.9	21.8	23.2	31.4	138.5	228.7	165.3	69.6	22.5	19.7	766.6
81	17.3	17.7	23.0	19.3	22.2	35.3	69.5	140.3	108.3	28.1	13.5	10.0	504.5
82	15.8	23.2	29.4	22.0	27.0	48.3	121.9	382.3	299.2	123.0	34.9	25.8	1152.8
83	27.9	26.4	27.1	30.9	26.8	73.9	142.2	369.6	331.6	124.4	45.6	26.8	1253.2
84	25.4	30.5	28.7	25.1	26.2	50.1	146.7	302.1	245.1	94.7	34.2	25.8	1034.6
85	25.7	27.1	23.4	20.2	18.8	30.3	130.7	165.4	81.7	28.5	16.9	22.6	591.3
86	23.9	23.0	19.2	22.1	46.6	134.6	214.7	229.4	216.4	48.9	21.0	21.7	1021.5
87	24.1	20.8	19.3	19.3	18.4	34.4	59.6	75.3	31.5	16.2	9.6	9.7	338.2
88	11.6	13.3	16.3	15.0	15.3	29.8	77.9	98.4	65.9	11.9	10.1	9.8	375.3
AVE 1912-88:	18.6	20.2	21.3	20.5	20.8	38.4	118.8	206.9	158.4	53.3	20.4	16.1	713.7

Table C-3

13190500 HIST & EST(1928-43) DISCH S F BOISE R AT ANDERSON R DAM (1000 AC-FT)

W-YR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANN
28	23.4	39.6	30.5	28.8	22.0	59.8	97.0	306.2	109.4	37.4	17.6	14.0	785.7
29	16.5	15.4	13.9	13.9	14.2	29.8	60.0	124.8	102.7	30.3	12.9	11.9	446.3
30	14.0	13.6	21.4	12.6	18.2	30.0	97.9	117.1	102.7	29.5	16.9	13.5	487.4
31	19.4	15.8	13.9	15.3	15.0	24.2	55.2	90.9	37.7	12.4	8.2	8.1	316.1
32	11.2	11.4	12.2	13.6	12.3	30.1	102.7	222.7	188.2	58.1	18.4	14.5	695.4
33	16.9	18.4	14.0	16.2	14.3	19.9	80.5	137.3	193.9	37.6	14.8	13.0	576.8
34	15.0	17.6	17.6	20.2	23.8	49.7	85.5	71.4	29.5	12.6	7.1	8.1	358.1
35	12.7	15.4	16.1	16.0	17.0	24.1	99.7	171.1	145.0	36.2	12.9	10.4	576.6
36	12.9	13.8	12.8	14.3	14.2	27.6	198.5	254.1	115.0	30.4	15.8	13.7	723.1
37	14.2	14.3	15.6	13.9	14.0	26.0	70.2	141.0	64.9	21.6	9.4	8.8	413.9
38	13.0	16.2	38.2	21.4	19.2	42.8	196.3	311.5	229.2	75.3	23.8	17.3	1004.2
39	23.3	23.2	22.1	20.2	17.2	48.6	124.6	127.8	48.6	21.2	11.0	11.0	498.8
40	14.2	13.8	15.6	15.9	17.5	50.3	125.2	168.6	80.6	21.2	10.4	13.8	547.1
41	18.0	19.4	18.5	17.5	18.0	37.0	70.7	154.8	102.5	32.2	21.0	15.8	525.4
42	17.2	19.8	28.6	20.0	18.2	26.2	133.0	126.6	132.8	46.6	16.7	13.0	598.7
43	15.3	20.3	22.8	33.6	25.4	52.8	363.3	296.4	241.4	129.0	33.3	17.9	1251.5
44	21.5	24.2	19.7	21.0	17.8	23.1	59.6	121.7	97.7	38.6	16.4	13.2	474.5
45	15.1	18.6	15.5	17.3	18.4	26.2	67.8	152.7	135.2	49.4	17.5	14.2	547.9
46	16.1	17.9	9.2	0.3	0.3	33.5	225.8	236.4	105.0	115.7	21.0	17.6	798.8
47	22.8	21.5	24.2	0.2	0.1	0.5	130.9	148.6	96.5	96.0	90.7	14.0	646.0
48	19.0	3.7	0.1	0.2	0.2	14.0	72.6	130.8	154.5	77.0	114.5	7.7	594.3
49	0.1	0.1	0.1	0.1	65.4	46.5	88.9	163.8	91.8	126.5	58.9	2.5	644.7
50	0.1	0.1	0.1	0.1	0.1	0.2	0.4	255.0	159.2	156.6	3.9	16.7	592.5
51	29.3	0.9	15.2	20.4	18.5	14.7	118.5	281.9	146.0	88.9	63.9	88.2	886.4
52	56.3	72.0	72.1	68.5	42.6	102.7	41.1	184.4	193.3	89.8	80.0	103.6	1106.4
53	72.7	23.8	45.4	35.1	6.6	7.8	24.6	81.2	160.6	113.2	99.0	73.4	743.4
54	42.3	20.1	61.8	41.3	13.1	11.8	45.5	108.1	122.9	88.3	96.1	98.0	749.8
55	63.8	8.4	20.2	20.6	23.8	7.5	7.4	80.6	34.1	73.2	93.5	69.3	502.4
56	35.0	22.7	52.2	60.9	76.7	70.4	76.1	186.6	233.7	71.8	65.3	30.7	982.1
57	9.9	54.7	87.0	93.4	46.9	17.0	47.9	135.8	178.4	92.1	91.7	3.2	858.0
58	11.1	58.7	53.5	85.5	30.0	54.7	43.8	201.3	173.8	91.2	95.5	60.8	959.9
59	6.5	6.1	28.9	23.4	9.9	39.3	55.7	37.9	122.9	91.6	36.8	16.3	475.3
60	15.1	14.6	35.0	38.0	34.1	22.3	26.2	135.2	128.3	78.7	76.8	49.5	653.8
61	36.0	36.8	35.6	37.8	45.4	39.0	3.2	33.7	91.2	85.0	42.2	65.8	551.7
62	37.2	49.2	33.0	13.9	9.6	0.7	0.3	0.2	129.7	75.4	47.6	29.3	426.1
63	20.4	68.8	28.0	33.3	20.8	17.3	14.2	105.6	163.0	66.6	50.3	26.2	614.5
64	32.0	27.2	54.5	65.7	34.5	15.4	2.5	87.1	138.3	81.5	84.0	26.9	649.6
65	12.2	12.9	14.3	39.2	105.1	133.3	134.6	275.7	236.7	141.3	48.6	72.2	1226.1
66	2.0	16.0	26.6	45.5	38.6	30.2	47.3	116.8	86.2	92.8	82.6	31.7	616.3
67	23.8	34.4	44.5	34.0	31.3	35.6	9.8	80.2	129.3	76.6	67.1	42.0	608.6
68	33.1	24.2	39.7	20.5	43.2	31.0	25.5	64.2	82.5	95.3	61.4	42.6	563.2
69	63.3	30.8	27.8	28.0	22.2	39.3	137.0	203.0	136.0	63.1	67.0	24.3	841.8
70	26.8	23.4	32.9	33.9	47.1	51.4	67.6	112.8	154.4	73.7	36.6	51.8	712.4
71	22.8	14.9	51.1	67.2	83.7	109.4	180.3	259.7	204.8	122.5	32.3	13.4	1162.1
72	35.5	52.1	56.6	83.3	96.3	33.0	159.5	227.1	182.3	79.3	44.8	30.9	1080.7
73	13.1	37.6	85.9	46.0	25.6	18.0	56.3	42.0	64.3	78.9	92.4	31.9	592.0
74	14.8	14.9	65.6	52.5	57.7	69.1	93.9	263.1	232.4	96.8	61.9	26.0	1048.7
75	17.4	23.8	77.4	32.3	28.6	45.4	55.7	185.3	209.5	111.4	83.5	28.7	899.0
76	16.2	30.9	50.5	75.1	42.8	43.0	43.1	163.7	107.2	96.1	66.2	23.3	758.1
77	16.0	14.3	15.1	29.4	15.3	14.9	16.1	81.6	90.4	91.7	84.2	30.9	499.9
78	12.9	12.3	13.7	16.3	13.7	26.2	14.3	70.7	129.9	104.6	93.0	23.6	531.2
79	12.8	13.7	16.6	26.4	35.5	23.6	31.9	50.6	94.7	95.7	101.2	33.9	536.6
80	24.4	19.5	20.5	20.8	19.8	21.2	36.2	130.9	164.6	97.5	91.3	60.0	706.7
81	17.7	17.4	19.0	19.6	17.3	7.8	6.9	95.1	117.4	56.7	58.6	29.0	462.5
82	17.6	19.1	20.4	37.7	82.6	99.8	94.1	210.5	279.1	135.1	63.6	40.1	1099.7
83	21.1	33.6	48.8	55.7	63.1	128.0	161.3	187.2	307.7	123.9	44.4	28.0	1202.8
84	24.2	89.5	95.7	94.1	33.2	20.1	120.5	181.7	213.6	98.0	62.6	99.4	1132.6
85	52.6	21.1	32.4	42.2	21.8	21.3	54.4	93.0	103.2	101.8	85.3	28.3	657.4
86	19.6	18.6	18.7	19.5	17.3	73.3	161.5	213.2	217.3	52.4	62.0	67.3	940.7
87	23.8	21.3	19.3	19.6	17.8	19.7	27.3	96.1	99.9	102.8	87.2	26.9	561.7
88	18.8	17.9	18.9	18.7	17.5	18.5	32.2	36.9	40.3	90.5	37.1	24.1	371.5
MEAN	22.3	23.8	31.4	31.6	29.1	37.0	80.0	149.7	138.8	78.0	52.6	31.8	706.2

Table C-4

HIST. DISCH., SO. FK. BOISE RIVER NEAR LENOX, IDAHO (1000 AC-FT)

191500 W-YR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANN
12	23.1	25.6	23.9	26.6	24.2	29.7	110.0	241.0	245.0	64.6	31.3	26.2	871.2
13	26.1	24.6	19.5	17.7	19.4	28.5	121.0	214.0	165.0	63.3	30.9	21.7	751.7
14	25.7	29.1	22.6	24.8	24.5	69.5	201.0	248.0	125.0	51.3	25.2	22.7	869.4
15	28.6	24.0	19.6	19.8	22.0	37.0	80.9	98.4	72.6	32.6	16.7	16.4	468.6
16	17.9	18.0	20.4	21.2	23.4	62.1	209.0	239.0	233.0	105.0	31.3	21.9	1002.2
17	25.0	21.8	23.7	19.7	17.7	27.9	79.1	296.0	306.0	109.0	29.6	21.2	976.7
18	20.8	21.9	34.4	31.9	23.0	51.3	125.0	154.0	177.0	42.8	23.5	23.1	728.7
19	27.7	21.7	18.7	19.7	19.3	33.6	144.0	208.0	80.3	25.4	16.6	15.6	630.6
20	19.6	21.5	17.9	23.7	21.3	27.6	60.7	158.0	114.0	36.6	17.0	15.9	533.3
21	20.4	24.8	23.1	29.5	25.4	69.5	147.0	349.0	274.0	76.2	26.9	20.8	1086.6
22	20.6	25.0	25.5	20.2	17.6	29.3	101.0	282.0	242.0	61.0	29.6	19.3	873.1
23	20.8	21.2	22.0	21.8	19.0	32.0	105.0	194.0	149.0	75.6	27.9	19.6	707.9
24	25.9	21.5	21.1	19.6	25.2	24.6	55.4	94.7	31.4	14.3	9.9	10.1	353.7
25	15.2	18.0	15.7	17.8	29.4	57.1	195.0	304.0	152.0	60.9	25.9	19.9	910.9
26	23.4	20.5	20.5	18.6	19.7	52.0	91.6	94.7	39.6	16.8	10.8	11.5	419.7
27	14.5	20.6	25.4	20.3	22.8	44.6	127.0	264.0	286.0	95.3	30.7	23.1	974.3
28	26.0	44.0	33.9	32.0	24.5	66.4	101.0	319.0	114.0	39.0	19.6	15.6	835.0
29	18.3	17.1	15.4	15.4	15.8	33.1	62.5	130.0	107.0	31.6	14.3	13.2	473.7
30	15.6	15.1	23.8	14.0	20.2	33.3	102.0	122.0	107.0	30.7	18.8	15.0	517.5
31	21.6	17.6	15.4	17.0	16.7	26.9	57.5	94.7	39.3	12.9	9.0	9.0	337.7
32	12.4	12.7	13.6	15.1	13.7	33.4	107.0	232.0	196.0	60.5	20.5	16.1	733.0
33	18.8	20.4	15.5	18.0	15.9	22.1	83.9	143.0	202.0	39.2	16.5	14.5	609.8
34	16.7	19.5	19.6	22.5	26.4	55.2	89.1	74.4	30.6	13.1	7.9	9.0	384.1
35	14.1	17.1	17.9	17.8	18.9	26.7	103.9	178.2	151.0	37.7	14.3	11.5	609.2
36	14.2	15.3	14.2	15.9	15.8	30.7	206.8	264.7	119.8	31.7	17.6	15.1	762.0
37	15.9	15.9	17.3	15.4	15.6	28.9	73.1	146.9	67.6	22.5	10.4	9.8	439.1
38	14.4	18.0	42.5	23.8	21.3	47.6	204.5	324.5	238.7	78.4	26.4	19.2	1059.4
39	26.0	25.8	24.6	22.5	19.1	54.0	129.8	133.1	50.6	22.1	12.2	12.2	531.9
40	15.8	15.3	17.3	17.7	19.4	55.9	130.4	175.6	84.0	22.1	11.5	15.4	580.3
41	20.0	21.5	20.6	19.4	20.0	41.1	73.7	161.2	106.8	33.5	23.3	17.6	558.6
42	19.1	22.0	31.8	22.2	20.2	29.0	138.5	131.9	138.3	48.5	18.6	14.4	634.6
43	17.0	22.5	25.3	37.3	28.2	58.7	378.4	317.8	257.2	139.4	36.7	20.5	1339.0
44	25.4	27.1	21.4	22.0	20.1	26.7	62.4	125.8	99.7	41.3	17.6	13.6	503.2
45	16.0	19.6	16.4	19.2	22.8	31.5	72.9	158.4	140.7	51.0	18.9	14.9	582.4
46	18.2	19.9	11.0	4.7	19.6	49.2	218.6	261.5	148.9	47.5	22.6	19.6	841.3
47	25.5	24.0	28.2	22.1	25.3	53.4	110.3	212.1	108.9	41.9	15.3	15.9	682.9
48	21.8	20.1	20.0	20.9	19.5	21.3	80.8	185.9	172.2	44.8	18.4	14.7	640.4
49	19.0	20.9	19.2	18.8	21.3	26.5	144.4	228.8	116.1	36.1	16.0	15.2	682.3
50	19.5	22.1	19.0	21.7	20.5	31.2	135.3	244.1	227.8	98.4	24.5	25.5	889.6
51	22.9	32.3	29.7	25.1	31.6	34.0	223.0	300.8	181.9	76.1	30.4	22.5	1010.3
52	26.9	23.5	27.0	26.9	22.5	26.2	214.4	414.5	214.7	69.8	28.6	22.4	1117.4
53	18.2	20.7	21.3	28.9	22.1	37.9	126.1	153.2	217.0	94.9	30.9	20.1	791.3
54	17.0	23.4	21.6	21.3	23.8	39.7	132.5	242.5	130.1	63.5	25.2	18.0	758.6
55	15.1	19.8	17.6	17.1	18.2	19.6	40.0	141.6	159.3	48.2	18.1	11.8	526.4
56	16.3	23.6	53.2	39.0	29.0	53.4	238.2	359.6	234.1	68.2	29.1	17.0	1160.7
57	23.8	26.1	27.1	24.3	24.6	42.3	105.0	282.3	211.2	59.7	22.9	15.0	864.3
58	22.3	19.9	25.2	22.1	27.6	30.6	95.3	403.5	200.1	56.3	28.9	20.0	951.8
59	17.7	23.9	28.4	24.8	20.6	30.1	102.0	123.0	136.8	38.5	16.8	23.1	585.7
60	28.1	23.0	17.7	19.8	20.1	39.4	126.0	146.4	124.6	33.0	17.1	16.0	611.2
61	15.5	19.5	17.2	18.5	21.1	28.2	61.4	106.5	76.1	17.9	11.8	13.8	407.5
62	19.5	19.0	17.1	20.1	22.6	25.0	155.3	171.7	185.6	60.8	24.3	16.5	737.5
63	19.8	20.5	19.3	16.1	45.8	30.4	57.4	183.4	167.0	54.0	20.6	17.4	651.7
64	17.3	23.6	20.1	21.2	19.2	23.3	87.1	174.1	157.8	52.5	18.4	15.5	630.1
65	16.0	19.8	67.5	34.8	28.6	41.2	217.9	344.8	351.3	143.7	49.2	36.1	1350.9
66	25.7	26.0	21.5	22.5	17.6	32.7	97.0	145.9	68.3	24.4	15.3	11.2	508.1
67	14.0	17.0	19.0	24.4	20.6	31.8	56.3	215.8	240.6	69.8	21.8	16.4	747.5
68	20.0	21.4	21.2	19.4	28.7	41.3	56.7	101.2	109.7	31.2	27.5	17.6	495.9
69	23.3	29.3	24.5	33.4	23.5	36.4	244.3	332.8	163.3	45.8	20.1	18.3	995.0
70	20.0	18.1	21.1	27.0	22.7	40.0	70.1	225.1	218.2	65.2	21.6	18.1	767.2
71	21.3	33.8	28.4	34.7	41.0	48.9	196.3	399.6	301.1	115.8	32.2	23.2	1276.3
72	26.4	25.9	26.4	30.4	31.1	94.0	136.0	290.9	307.1	76.9	28.6	24.4	1098.1
73	26.7	22.9	25.3	23.7	21.5	31.2	73.1	136.7	80.3	27.7	14.6	15.3	499.0
74	18.1	31.7	26.0	30.7	23.9	70.0	224.3	321.3	317.9	80.5	26.5	17.1	1188.0
75	22.0	21.8	22.0	21.6	21.6	31.8	52.1	252.1	300.0	138.3	35.1	22.0	940.4
76	26.3	26.0	29.5	28.1	26.5	32.9	127.2	249.4	130.2	50.3	32.8	26.7	785.9
77	22.9	19.5	17.7	17.7	16.1	18.6	28.1	35.3	37.5	15.6	8.8	10.9	248.7
78	15.4	17.1	27.5	21.4	19.9	60.5	141.5	199.1	205.8	88.6	30.4	25.7	852.9
79	20.3	18.3	19.2	21.8	18.2	33.4	50.4	136.6	79.8	29.7	21.8	10.7	460.2
80	16.1	16.8	18.9	23.9	25.4	33.8	143.5	236.0	171.0	72.9	24.6	21.8	804.7
81	19.3	19.7	25.2	21.4	24.3	37.8	72.8	145.4	112.6	30.4	15.4	11.8	536.1
82	17.8	25.4	31.7	24.1	29.3	51.1	126.5	393.4	308.2	127.6	37.4	28.0	1200.5
83	30.2	28.6	29.4	33.3	29.1	77.3	147.3	380.4	341.4	129.1	48.3	29.1	1303.5
84	27.6	32.8	31.0	27.3	28.5	52.9	151.9	311.2	252.8	98.6	36.6	28.0	1079.2
85	27.9	29.4	25.6	22.3	20.9	32.6	135.5	171.1	85.3	30.8	18.9	24.7	625.0
86	26.1	25.2	21.3	24.2	49.3	139.5	221.6	236.7	223.4	51.7	23.1	23.8	1065.9
87	26.3	22.9	21.4	21.4	20.4	36.8	62.7	78.8	33.9	18.2	11.4	11.5	365.7
88	13.5	15.2	18.3	17.0	17.3	32.1	81.4	102.4	69.1	13.8	11.9	11.6	403.6
AVE 1912-88:	20.7	22.3	23.4	22.6	23.0	41.0	123.3	213.6	163.9	56.2	22.5	18.0	750.5

Table C-5

RGNEST EST. OF REACH GAINS, S. F. BOISE R. ANDERSON R TO ARROWROCK (1000 AC-FT)

W-YR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANN
12	5.3	5.5	5.3	5.5	5.5	5.8	10.5	18.5	18.8	7.8	5.8	5.5	99.8
13	5.5	5.3	5.0	5.0	5.0	5.5	11.3	16.8	13.8	7.8	5.8	5.3	92.1
14	5.5	5.8	5.3	5.3	5.3	8.0	16.0	19.0	11.5	7.0	5.5	5.3	99.5
15	5.5	5.3	5.0	5.0	5.3	6.0	8.8	9.8	8.3	5.8	5.0	4.8	74.6
16	5.0	5.0	5.0	5.3	5.5	7.8	16.5	18.3	18.0	10.3	5.8	5.3	107.8
17	5.5	5.3	5.3	5.0	5.0	5.5	8.8	21.8	22.5	10.5	5.8	5.3	106.3
18	5.3	5.3	6.0	5.8	5.3	7.0	11.5	13.3	14.5	6.5	5.3	5.3	91.1
19	5.5	5.3	5.0	5.0	5.0	6.0	12.5	16.5	8.8	5.5	4.8	4.8	84.7
20	5.0	5.3	5.0	5.3	5.3	5.5	7.5	13.5	10.8	6.0	5.0	4.8	79.0
21	5.0	5.3	5.3	5.8	5.5	8.0	12.8	25.0	20.5	8.5	5.5	5.3	112.5
22	5.0	5.5	5.5	5.0	5.0	5.8	10.0	21.0	18.5	7.5	5.8	5.0	99.6
23	5.3	5.3	5.3	5.3	5.0	5.8	10.3	15.8	13.0	8.5	5.5	5.0	90.1
24	5.5	5.3	5.3	5.0	5.5	5.3	7.3	9.5	5.8	4.8	4.5	4.5	68.3
25	4.8	5.0	4.8	5.0	5.8	7.3	15.8	22.3	13.0	7.5	5.5	5.0	101.8
26	5.3	5.0	5.0	5.0	5.0	7.0	9.5	9.5	6.3	5.0	4.5	4.5	71.6
27	4.8	5.0	5.5	5.0	5.3	6.5	11.5	19.8	21.3	9.8	5.8	5.3	105.6
28	5.5	6.5	6.0	5.8	5.5	8.0	10.0	23.3	10.8	6.3	5.0	4.8	97.5
29	5.0	5.0	4.8	4.8	4.8	5.8	7.8	11.8	10.3	5.8	4.8	4.8	75.5
30	4.8	4.8	5.3	4.8	5.0	6.0	10.0	11.3	10.3	5.8	5.0	4.8	77.9
31	5.3	5.0	4.8	5.0	5.0	5.5	7.3	9.5	6.3	4.8	4.3	4.3	67.1
32	4.5	4.8	4.8	4.8	4.8	6.0	10.3	18.0	15.8	7.5	5.0	4.8	91.1
33	5.0	5.0	4.8	5.0	4.8	5.3	9.0	12.5	16.0	6.3	4.8	4.8	83.3
34	5.0	5.0	5.0	5.3	5.5	7.3	9.3	8.5	5.8	4.5	4.3	4.5	70.0
35	4.8	5.0	5.0	4.8	5.0	5.5	10.3	14.8	13.0	6.3	4.8	4.5	83.8
36	4.8	4.8	4.8	4.8	5.0	5.8	16.5	20.0	11.3	5.8	5.0	4.8	93.4
37	5.0	5.0	5.0	4.8	4.8	5.5	8.3	12.8	8.0	5.3	4.5	4.5	73.5
38	4.5	5.0	6.5	5.3	5.0	6.8	16.3	23.5	18.3	8.8	5.5	5.0	110.5
39	5.5	5.5	5.3	5.3	5.0	7.3	11.8	12.0	7.0	5.3	4.8	4.5	79.3
40	4.8	5.0	5.0	5.0	5.3	7.3	11.8	14.5	9.0	5.3	4.5	5.0	82.5
41	5.0	5.3	5.0	5.0	5.3	6.3	8.3	13.8	10.3	6.0	5.3	5.0	80.6
42	5.0	5.3	5.8	5.3	5.0	5.8	12.3	11.8	12.3	6.8	5.0	4.8	85.2
43	5.0	5.0	5.3	6.3	5.5	7.5	26.8	23.3	19.5	12.3	6.0	5.3	127.8
44	9.8	7.3	4.5	2.5	5.8	9.0	7.0	10.3	5.0	6.8	3.3	1.0	72.3
45	2.5	2.5	2.3	4.8	11.0	13.3	13.0	14.3	13.8	4.0	3.5	1.8	86.8
46	5.0	5.0	4.5	4.3	5.0	6.8	17.0	19.8	13.0	6.8	5.3	5.0	97.5
47	5.5	5.3	5.5	5.3	5.5	7.0	10.5	16.8	10.5	6.5	4.8	4.8	88.0
48	5.3	5.0	5.0	5.3	5.3	5.3	8.8	15.3	14.3	6.5	5.0	4.8	85.9
49	5.0	5.3	5.0	5.0	5.3	5.5	12.5	17.8	11.0	6.0	4.8	4.8	88.0
50	5.0	5.3	5.0	5.3	5.0	5.8	12.0	18.8	17.8	9.8	5.3	5.5	100.6
51	5.3	5.8	5.8	5.5	5.8	6.0	17.5	22.0	15.0	8.5	5.8	5.3	108.3
52	5.5	5.3	5.5	5.5	5.3	5.5	16.8	29.0	17.0	8.0	5.5	5.3	114.2
53	5.0	5.0	5.3	5.5	5.3	6.3	11.5	13.3	17.0	9.5	5.8	5.0	94.5
54	5.0	5.3	5.3	5.3	5.3	6.3	12.0	18.5	11.8	7.8	5.5	5.0	93.1
55	4.8	5.0	5.0	5.0	5.0	5.0	6.3	12.5	13.5	6.8	5.0	4.5	78.4
56	4.8	5.3	7.0	6.3	5.8	7.0	18.3	25.8	18.0	8.0	5.8	5.0	117.1
57	5.3	5.5	5.5	5.3	5.3	6.5	10.3	21.0	16.8	7.5	5.3	4.8	99.1
58	5.3	5.0	5.5	5.3	5.5	5.8	9.8	28.3	16.0	7.3	5.5	5.0	104.3
59	5.0	5.3	5.5	5.3	5.0	5.8	10.0	11.3	12.3	6.3	5.0	5.3	82.1
60	5.5	5.3	5.0	5.0	5.3	6.3	11.5	12.8	11.5	5.8	5.0	4.8	83.8
61	4.8	5.0	5.0	5.0	5.3	5.5	7.5	10.3	8.5	5.0	4.5	4.8	71.2
62	5.0	5.0	5.0	5.0	5.3	5.5	13.3	14.3	15.0	7.5	5.3	4.8	91.0
63	5.0	5.0	5.0	4.8	6.8	5.8	7.3	15.0	14.0	7.3	5.0	5.0	86.0
64	5.0	5.3	5.0	5.3	5.3	5.3	9.3	14.5	13.5	7.0	5.0	4.8	85.3
65	4.8	5.0	8.0	6.0	5.5	6.3	17.0	24.8	25.3	12.5	6.8	6.0	128.0
66	5.5	5.5	5.3	5.3	5.0	5.8	9.8	12.8	8.0	5.3	4.8	4.5	77.6
67	4.8	5.0	5.0	5.3	5.0	5.8	7.3	17.0	18.5	8.0	5.3	4.8	91.8
68	5.0	5.3	5.3	5.0	5.8	6.3	7.3	10.0	10.5	5.8	5.5	5.0	76.8
69	5.3	5.8	5.3	6.0	5.3	6.0	18.8	24.0	13.8	6.8	5.0	5.0	107.1
70	5.0	5.0	5.3	5.5	5.3	6.3	8.0	17.5	17.0	7.8	5.3	5.0	93.0
71	5.3	6.0	5.5	6.0	6.3	6.8	15.8	28.0	22.0	11.0	5.8	5.3	123.8
72	5.5	5.5	5.5	5.8	6.0	9.5	12.0	21.5	22.5	8.5	5.5	5.3	113.1
73	5.5	5.3	5.5	5.3	5.3	5.8	8.3	12.3	8.8	5.5	4.8	4.8	77.2
74	5.0	5.8	5.5	5.8	5.3	8.0	17.5	23.3	23.3	8.8	5.5	5.0	118.8
75	5.3	5.3	5.3	5.3	5.3	5.8	7.0	19.3	22.0	12.3	6.0	5.3	104.2
76	5.5	5.5	5.8	5.5	5.5	5.8	11.5	19.0	11.8	7.0	5.8	5.5	94.2
77	5.3	5.0	5.0	5.0	4.8	5.0	5.5	6.0	6.3	4.8	4.5	4.5	61.7
78	4.8	5.0	5.5	5.3	5.0	7.5	12.5	16.0	16.3	9.3	5.8	5.5	98.5
79	5.0	5.0	5.0	5.3	5.0	6.0	7.0	12.3	8.8	5.8	5.3	4.5	75.0
80	4.8	5.0	5.0	5.3	5.5	6.0	12.5	18.3	14.3	8.3	5.3	5.3	95.6
81	5.0	5.0	5.5	5.3	5.3	6.3	8.3	12.8	10.8	5.8	4.8	4.5	79.4
82	5.0	5.5	5.8	5.3	5.8	7.0	11.5	27.8	22.5	11.5	6.3	5.5	119.5
83	5.8	5.5	5.8	6.0	5.8	8.5	12.8	27.0	24.5	11.8	6.8	5.8	126.1
84	5.5	5.8	5.8	5.5	5.8	7.0	13.0	22.8	19.3	9.8	6.0	5.5	111.8
85	5.5	5.8	5.5	5.3	5.3	5.8	12.0	14.3	9.0	5.8	5.0	5.3	84.6
86	5.5	5.5	5.3	5.3	6.8	12.3	17.3	18.3	17.5	7.0	5.3	5.3	111.4
87	5.5	5.3	5.3	5.3	5.0	6.0	7.8	8.8	6.0	5.0	4.5	4.5	69.0
88	4.8	4.8	5.0	5.0	5.0	5.8	8.8	10.0	8.0	4.8	4.5	4.5	71.0
AVE 1912-88:	5.2	5.2	5.3	5.2	5.4	6.5	11.4	16.8	13.8	7.3	5.2	4.9	92.2

Appendix D
Miscellaneous Gaging Stations

(a) Smith Creek near Lenox, Idaho
Sec. 12, T. 2 N., R. 6 E.
1916 to 1917.
Drainage area. - 50.3 square miles.

(b) Long Gulch Creek near Lenox, Idaho
Sec. 2, T. 2 N., R. 6 E.
1916.
Drainage area. - 10.5 square miles.

(c) Rattlesnake Creek near Lenox, Idaho
Sec. 27, T. 3 N., R. E.
1916 to 1917.
Drainage area. - 46.0 square miles.

(d) Willow Creek near Lenox, Idaho
Sec. 1. T. 2 N., R. 5 E.
1916 to 1917.
Drainage area. - 55.1 square miles

(e) Grouse Creek near Arrowrock, Idaho
Sec. 19, T. 3 N., R. 5 E.
1939 to 1942
Drainage area. - 8.0 square miles.

Appendix E
Mining

The General Mining Law of 1872, as amended, gives citizens the right to enter public lands to locate and claim valuable minerals, and upon discovery, to receive title to the land. The major distinction between the mineral resource and other resources on public land is that valuable mineral discovery conveys a property right to the mineral and, through the patent process, to the surface. The minerals managed under this law are called "locatables." Locatable minerals primarily include gold and silver.

The 1872 Surface Use Act regulations provide for federal land management that minimizes mining-related environmental impacts to surface resources. The 1897 Organic Act specifies that these mining regulations apply to National Forests. These laws authorize the present surface management program for mining claims which requires written operating plans, reasonable environmental protection measures, reclamation plans, and bonds.

The Mineral Leasing Act of 1920 authorizes the Secretary of the Interior to lease land for oil, gas, and certain other nonlocatable minerals. These minerals are called "leasables." Federal agencies have considerable discretion whether or not to lease and whether to attach special stipulations, on federal lands to assure protection of other resources.

The Mineral Materials Act of 1947 states that common variety minerals on National Forests are subject to disposal by the Secretary of Agriculture, and are not subject to mining and leasing laws. These mineral materials are commonly called "saleable." The U.S. Forest Service has discretion whether and how common variety mineral materials should be developed on National Forest land. Stone, clay, and road materials account for most of the mineral materials reported each year. Most of this material was supplied to the Federal Highway Administration for road construction projects.

Although most of the South Fork basin is capable of energy/mineral exploration and development, not all areas are suitable. In areas that are very sensitive to surface disturbance, protective stipulations/constraints can be made to insure that unnecessary surface disturbance does not take place. Constraints are generally based on wildlife, fisheries, soils, water, or visual resource considerations. Mining may be restricted or prohibited during elk calving seasons, or reclamation activities may be modified to meet a suggested visual quality objective. The type and extent of mining constraints are different for each situation.

Appendix F
Idaho Fisheries Draft Management Plan 1990-1995

The Boise River basin lies in southwestern Idaho and contains about 4,100 square miles of land. The headwaters of the Boise River originate in the Sawtooth Mountains at elevations in excess of 10,000 ft. It flows in a westerly direction for about 200 miles before emptying into the Snake River near Parma at an elevation of 2,100 ft. Major tributaries to the Boise River include the North Fork Boise River (382 square miles), the South Fork Boise River (1,314 square miles) and Mores Creek (426 square miles). This basin has an average annual runoff of 2,005,000 acre-feet of water.

The Boise River has three major instream impoundments. Anderson Ranch, Arrowrock and Lucky Peak Reservoirs, and one large off-stream impoundment, Lake Lowell. The four large reservoirs have a combined storage capacity of 2,276,940 acre-feet of water. The Boise River reservoirs supply water storage for irrigation flood control, recreation, hydropower and instream flows.

Because of the wide range in elevations, geographic features and water uses, the Boise River has a great variety of habitat types and fish species. The drainage includes the major population center in the state, has over 250,000 acres of irrigated cropland and some of Idaho's earliest mining, logging and hydroelectric developments. Man caused impacts have severely degraded most habitats over a long period of time creating severe limitation on fishery productivities.

From the mouth of the Boise River upstream to Star, low summer flows and poor water quality limit fishery production. This section of river supports a fair fishery for largemouth bass, smallmouth bass and channel catfish. From Star upstream to Lucky Peak Dam, the river changes from a warmwater to a coldwater fishery. Mountain whitefish make up the bulk of the game fish biomass, with hatchery reared rainbow trout, wild rainbow trout and fingerling brown trout plants supporting the bulk of the fishing pressure. Upstream from Lucky Peak and Arrowrock reservoirs, rivers and streams contain excellent populations of wild rainbow trout, mountain whitefish and bull trout. Brook trout, redband trout and cutthroat trout occur in some tributary streams. Due to the heavy angling pressure exerted on these streams, catchable-size hatchery rainbow trout supplement wild populations in selected heavy use areas of the streams except for the South Fork Boise River between Arrowrock Reservoir and Anderson Ranch Dam.

The South Fork Boise River between Arrowrock Reservoir and Anderson Ranch Dam was the first designated quality trout stream segment in southwestern Idaho. Wild rainbow trout and mountain whitefish make up the majority of the fish caught in the South Fork. The rainbow trout fishery there is managed with limit, size, and tackle restrictions. In 1978, anglers caught an estimated 19,150 rainbow trout and released 18,059

(94 percent). In 1988, anglers caught an estimated 18,400 rainbow trout and released 99 percent.

A 1988 creel survey of the South Fork Boise River between Featherville and Big Smokey Creek estimated effort at 228 hours/km. Hatchery rainbow trout made up over 80% of fish checked in anglers creels but the overall return total creel rate was only 21%, indicating hatchery fish need to be more efficiently utilized.

Popular reservoir fishing within the Boise River drainage exists at Lake Lowell, Lucky Peak, Arrowrock, Anderson Ranch and Little Camas. The Lake Lowell fishery consists primarily of largemouth bass, smallmouth bass, yellow perch, black crappie, bullhead, bluegill, and channel catfish. Lucky Peak and Anderson Ranch reservoirs provide "two-story" fisheries with smallmouth bass occupying the warm, inshore waters and rainbow trout and kokanee dominating the cold, mid-water fishery. The rainbow trout fishery in these reservoirs depends heavily on stocked catchable or fingerling size fish. Little Camas and Arrowrock reservoirs also provide excellent fishing for rainbow trout stocked as catchables and/or fingerlings. Neither of these two reservoirs has a conservation pool and both have a history of total water evacuation.

Good spawning conditions in tributary streams provide a continuous supply of kokanee in Anderson Ranch Reservoir, but maintenance stocking is required in Lucky Peak and Arrowrock. At Anderson Ranch Reservoir, one of the more popular kokanee fisheries in southern Idaho, anglers harvested an estimated 40,000+ kokanee in 1979 and 34,000 in 1985. Kokanee populations in the reservoir have fluctuated significantly from 1983 through 1989 due to extreme high and low water conditions in the drainage. Ongoing studies of kokanee populations are being used to develop models to reduce population fluctuations through stocking in low number years. Fall chinook salmon will be used to crop excess kokanee numbers and to provide a trophy fishery.

Alpine lakes within the Boise River drainage provide anglers with a variety of fishing opportunity. Rainbow, cutthroat and brook trout are abundant with lesser numbers of golden trout. There are 224 alpine lakes in the Boise drainage. Most of these lakes are too small to support a fishery. The Department presently stocks 68 of the alpine lakes in the Boise River system.

Objectives and Programs

1. Objective: Provide a diversity of fishing opportunities within the Boise River drainage.

   Program: Zone the stream areas to concentrate hatchery catchable stocking in the locations where the highest return to the creel will occur.

   Program: Manage for wild trout where habitat and fish populations will sustain acceptable fisheries.

Program: Manage for increase catch rates and fish size in selected stream reaches with quality and trophy trout regulations.

Program: Stock appropriate strains of trout in natural production areas to better utilize the rearing capacity and provide larger and more desirable fish.

Program: Manage warmwater fisheries to provide a wide variety of sizes and species readily available to the large population of the Treasure Valley area.

2. Objective: Seek better land management practices that significantly improve fishery habitats.

Program: Provide sediment objectives/standards to land management agencies where sediment is the limiting factor in aquatic habitats.

Program: Provide riparian vegetation objectives to land management agencies where grazing, development, or other activities have degraded riparian zones.

3. Objective: Monitor effects of land management activities, fishery regulations, and other fishery management activities on fish habitat and fish populations.

Program: Collect common data base information on habitat and fish populations throughout the Boise River drainage.

Program: Examine changes and trends in common data base information and attempt to determine causes for any changes that are noted.

4. Objective: Seek improved reservoir management and stream flows.

Program: Pursue development of a minimum pool in Arrowrock Reservoir.

Program: Study water management at Lake Lowell to determine the relationship between fish production and water levels.

DRAINAGE: Boise River

Water	Miles/acre	Fishery: Type	Fishery: Species present	Management	Management Direction
Mouth to Star	34/510	Mixed		General	Work with state and federal regulatory agencies to improve water quality and habitat condition. Evaluate and stock with fingerling brown trout and catchable rainbows (vicinity of Caldwell, fall and winter).
Star to Eagle Road		Coldwater	Rainbow trout Whitefish Brown trout	Put-and-take trout	Work with state and federal regulatory agencies to improve water quality and habitat condition. Stock with fingerling brown trout catchables (year-round) to supply.
Eagle Road to Head of of Eagle Island		Coldwater	Rainbow trout Whitefish Brown trout	Trophy	Manage both channels for high catch rates (3/hr) on large fish. Stock with large trout that are salvaged from other waters. Improve access to both channels.
Head of Eagle Island to Barber Dam		Coldwater	Rainbow trout Steelhead Brown trout Whitefish	Put-and-take trout	Work with regulatory agencies to enhance habitat. Stock with fingerling brown and adult steelhead seasonally. Stock catchable rainbow year-round. Screen diversions to prevent loss of large fish. Manage for high density of anglers.
Barber Dam to Lucky Peak		Coldwater	Rainbow trout Brown trout Whitefish	General	Evaluate potential trophy trout management. Stock with predatory trout, bull trout, brown trout, and rainbow trout that would be collected from other waters. Work with Bureau of Reclamation to screen large diversions.

Rabbit Creek to Deer Park		Coldwater	Rainbow trout Bull trout Whitefish	Put-and-take trout	Manage for high yield and moderate angler densities.
Deer Park to headwaters all tributaries		Coldwater	Rainbow trout Bull trout Whitefish	Wild trout	Manage for high catch rates (3/h) and low angler densities
Lucky Peak Reservoir	/2,850	Mixed	Smallmouth bass Perch	General	Evaluate status of smallmouth bass fishery. Provide an attractive kokanee fishery for large fish by managing spawning escapement at Mores Creek weir to select four (4) four-year-old spawners and by stocking fingerling kokanee in Mores Creek arm at levels that will return spawners to the weir at a mean length of sixteen (16) inches or greater.
			Rainbow trout Kokanee Bull trout Whitefish		Investigate feasibility of providing a trout fishery by stocking large numbers of fingerling rainbow in Lucky Peak Reservoir to avoid excessive competition for plankton and jeopardizing quality of kokanee fishery. Continue to stock catchable rainbow.
Arrowrock Reservoir	/4,000	Mixed	Smallmouth bass Perch Rainbow trout Bull trout Whitefish	General	Seek minimum pool through Federal Government. Stock annually with fingerling rainbow.

Boise River Drains	92/70	Coldwater	Rainbow trout Brown trout	General	Work with communities and regulatory to improve water quality and habitat conditions. Improve angler access. Stock with fingerling brown trout and catchable rainbow.
Middle Fork Boise River from Arrowrock Reservoir to North Fork Boise River		Coldwater	Rainbow trout Bull trout Whitefish	Put and Take	Stock with catchable rainbow following high water period until Labor Day.
From North Fork to Atlanta Power Dam	32	Coldwater	Rainbow trout Bull trout Cutthroat trout Whitefish Brook trout	General	Manage for high catch rates on wild fish.
From Atlanta Power Dam to Sawtooth Wilderness Boundary		Coldwater	Rainbow trout Bull trout Cutthroat trout Whitefish Brook trout	Hatchery Supported	Stock with catchable rainbow following high water period until Labor Day.
Upstream of Sawtooth Wilderness boundary and all tributaries		Coldwater	Rainbow trout Bull trout Cutthroat trout Whitefish Brook trout	Wild Trout	Manage for high catch rates and low angler densities. Manage for wild fish.
South Fork Boise River from Arrowrock Reservoir to Danskin Bridge		Coldwater	Rainbow trout Whitefish Bull trout	Trophy	Work with Forest Service to preserve low density angling experience. Manage for high catch rates for large fish.
South Fork Boise River from Danskin to Anderson Dam		Coldwater	Rainbow trout Whitefish Bull trout	Trophy	Work with Forest Service to restrict boating at lower flows. Manage for high catch rates for large fish.

So. Fork Boise - Anderson Ranch Reservoir to Pine Bridge	0.6/3.0	Coldwater	Fall chinook salmon Rainbow trout Kokanee Bull trout Mountain whitefish	General	Annual river closure to protect spawning kokanee to trap site. Monitor fall chinook runs, target fish for harvest. 0.5 fish/hr.
So. Fork Boise - Pine Bridge to headwaters	50/242	Coldwater	Rainbow trout Bull trout Mountain whitefish Kokanee	Put-and-take trout General	Good quality habitat with wild trout potential. High accessability and campgrounds give potential for hatchery return rates of >30%. Consider use of regulation allowing harvest of adipose fin-clipped fish only. Evaluate to allow wild stocks to rebuild and maintain harvest opportunity on catchable rainbow. Maintain catch rates of 0.5 fish/hr.
Big Smoky Creek - mouth to Barlow Creek	5/12	Coldwater	Rainbow trout Bull trout mountain whitefish kokanee	Put-and-take trout General	Good quality habitat with wild trout potential. High accessability gives potential for >30% return on fish. Consider evaluation of adipose fin regulation to allow wild stocks to rebuild and maintain harvest opportunity on catchable rainbow. 0.5 fish/hr.
Big Smoky Creek - Barlow Creek to headwaters	14/34	Coldwater	Rainbow trout Bull trout Mountain whitefish	Wild trout	Evaluate social and biological potential for quality management. Emphasize bull trout, self-sustaining rainbow populations. Maintain limited harvest opportunity. 1.0 fish/hr.
All other streams in South Fork Boise River drainage upstream from Anderson Ranch Reservoir	297/324	Coldwater	Rainbow trout Bull trout Mountain whitefish	Wild trout	Investigate potentially unique redband trout and ensure survival. Maintain naturally reproducing populations and harvest opportunity. 0.7 fish/hr.
North Fork Boise River Mouth to Rabbit Creek		Coldwater	Rainbow trout Bull trout Whitefish	Wild Trout	Manage for high catch rates (3/hr) and low angler densities.

Other alpine lakes	/801	Coldwater	Rainbow trout Cutthroat trout Golden trout Brook trout	General	Put-and-grow for trout and char. Consider use of bull trout to develop trophy aspect in some waters. 0.5-1.0 fish/hr.