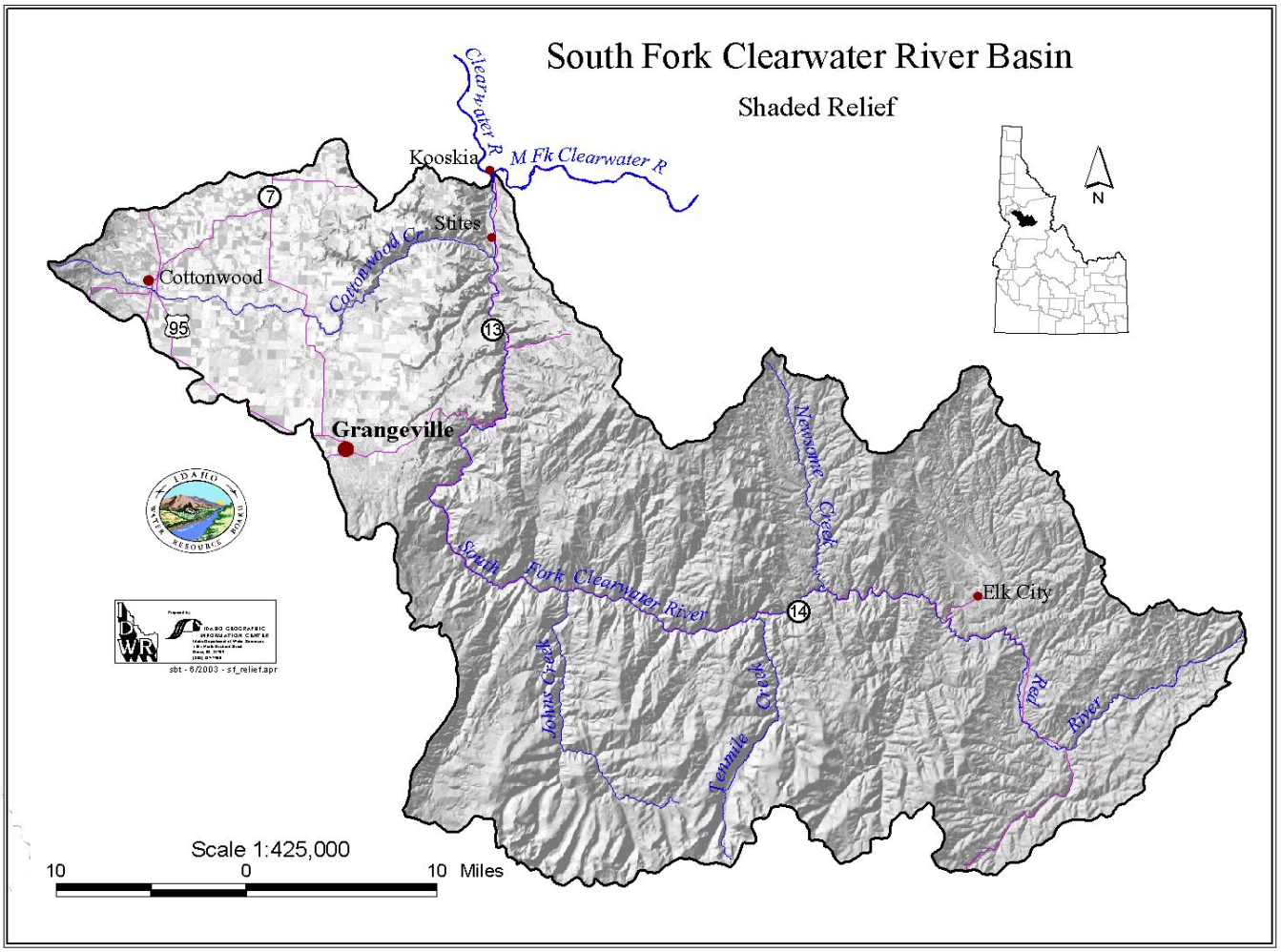


Basin Overview

The South Fork Clearwater River subbasin (U.S. Geological Survey Hydrologic Unit 17060305) extends from the headwaters above Elk City and Red River to the confluence with the Middle Fork of the Clearwater River at Kooskia.

Annual runoff from the South Fork Clearwater River basin averages about 739,000 AF, as measured by the USGS stream gage at Stites. (NPFLA) The mean annual stream flow is 1,060 cfs. Stream flows are highest in May with an average of 3,370 cfs with lowest flows the September average of 258 cfs (TMDL).

Water use in the South Fork Clearwater River basin is mostly consumptive, although consumptive water use is low relative to the total amount of available water. Water claims for commercial and industrial uses, approximately 900 acre feet per year, comprise the largest potential water use in the basin. Appropriations for commercial and industrial uses are about 95% from ground water. Surface and spring water use is about

one third the amount of the ground water use in the basin. The number of claims for spring, surface water, and ground water permits are each about 100.

Ownership and land use in the basin are summarized below.

Land ownership by area.

Land Type	Area
Public Land	
Federal Agency Management	532,691 acres
State of Idaho Management	4,832 acres
Private Land	217,703 acres
Nez Perce Tribe	565 acres

Publicly owned forested lands within the basin, excluding special management areas, are managed primarily for timber production. Predominant tree associations are Ponderosa Pine, Douglas Fir and Lodgepole Pine.

Some livestock grazing occurs on public lands. Though grazing is not a primary land use within the basin, it is important to permit and lease holders. About 220,000 acres of grazing allotments on public land are leased to provide animal unit months of grazing activity. However, of the land in those allotments, approximately 106,000 acres are suitable for grazing.

Land ownership on the Camas plateau area in the northwestern portion of the basin is mostly private. This area of the basin encompasses about 144,280 acres and the predominant land use is agricultural cropland and pasture.

Policy and Planning Context of the South Fork Clearwater River Basin

Several factors led the Idaho Water Resource Board (IWRB) to complete a comprehensive state water plan for the South Fork Clearwater River basin. As part of the SRBA, the USFS agreed to withdraw certain federal reserved water rights if the State of Idaho would work cooperatively to identify and prioritize streams and rivers that could be given minimum instream flow and protection.

Another reason to undertake a plan was that the Idaho Department of Environmental Quality's (IDEQ) water quality improvement process (a Total Maximum Daily Load) in the basin, affording a collaborative opportunity for the IWRB. Coordinating these two state processes was, in part, an attempt to take advantage of a citizen advisory committee established by the IDEQ for their TMDL process. The comprehensive state water plan, after an examination of local, state and federal water resource issues, includes recommendations covering recreational dredge mining, ground water in the Camas Prairie area, minimum flows, and protected river designations. The IWRB desires that this plan be a part of the various state and local processes that ultimately will lead to recovery of threatened and endangered fish species in the basin. Implementation of this plan may help the citizens of Idaho avoid the broad reach of the Endangered Species Act.

A benefit of this collaboration is that state designation of protected river status or minimum stream flow may assist in the implementation of the TMDL through improved flows for recreation and fish, water quality and wildlife habitat.

Issues, Recommendations and Actions

ISSUE 1: Recreational Dredge Mining

Issue Statement: Recreational dredge mining permit/regulation process is adequate in the South Fork Clearwater River basin.

Recommendations:

Currently, numerous laws regulate or restrict dredge mining in the mainstem South Fork Clearwater River including the Clean Water Act, the Stream Channel Protection Act, the Endangered Species Act and others. It is unlikely, that a new recreational dredging operation could be conducted in the South Fork Clearwater River without adequate review and environmental safe guards. Therefore, the IWRB does not recommend changing the current recreational dredge mining permit/regulation process.

ISSUE 2: Declining ground water on the Camas Prairie

Issue Statement: Ground water levels near Grangeville and in the Camas Prairie area of the South Fork Clearwater River basin may be declining.

Recommendations:

- A study by IDWR to update Ralston's work in 1993 should be conducted.
- IDWR should evaluate ground water levels in the Grangeville area to monitor trends especially in the shallower aquifers wells.
- If ground water level declines are found to be a problem, IDWR should evaluate the feasibility of stabilizing groundwater levels in the Grangeville area.

ISSUE 3: Other projects in the basin

C. Issue Statement: The IWRB acknowledges the efforts of the Clearwater Subbasin Assessment and the Clearwater Focus Watershed Project.

Recommendation:

The IWRB acknowledges the usefulness of information from the work of the Clearwater Focus group in their efforts in development of the Subbasin Assessment (http://www.nwppc.org/library/releases/2002/1113.htm) and Subbasin Plan (http://www.nwppc.org/library/isrp/isrp2003-3.htm) to address the numerous factors impacting anadromous and resident fish within the Columbia Basin.

ISSUE 4: Instream flows on public land streams

D. Issue Statement: The South Fork Clearwater River basin has a large area of public land without protected instream flows for anadromous and resident fish, wildlife, recreational and other activities afforded by the Nez Perce NF.

Recommendation:

- Idaho's water resources are valuable. Water provides irrigation, domestic and industrial uses, fish and wildlife habitat, recreation, and aesthetics. To preserve these values and protect downstream water rights in this basin, the IWRB had committed to filing for minimum stream flow water rights on the following streams:
    - **Red River**
    - **American River**
    - **Crooked River**
    - **Newsome Creek**
    - **Tenmile Creek**
    - **South Fork Clearwater River**
    - **Johns Creek**
    - **Mill Creek**
    - **Meadow Creek**

These streams proposed for minimum stream flows had been selected based on cooperative efforts between the IWRB planning staff, USFS personnel, Idaho Fish and Game, and the Nez Perce Tribe. Soon after the IWRB had approved the final draft of this plan, the State of Idaho, the Department of the Interior, the Nez Perce Tribe and others announced the development of a framework for a proposed settlement agreement. One component of this agreement is the establishment of minimum stream flow water rights on streams in the Salmon and Clearwater basins. All of the streams recommended in this plan for IWRB consideration of minimum stream flow water rights were included in the settlement agreement as category A streams and will be considered for legislative enactment in 2005.

The proposed settlement agreement includes minimum stream flows that were not recommended in the plan. Cougar Creek, Peasley Creek, Silver Creek, South Fork Red River, and Big Elk Creek will be adjudicated as list A minimum stream flows at 40% (federal land) exceedence levels. In addition, Three Mile Creek, Sally Ann Creek, and Rabbit Creek will be adjudicated at 50% (state and private land) exceedence levels.

The proposed Nez Perce Tribe settlement agreement also included a stream, Cottonwood Creek, located in the South Fork Clearwater River basin, that is in category B. Category B streams are those where minimum stream flows and non-flow related actions will be developed, pursuant to state law, by the settlement parties in consultation with local stakeholders.

State Protected River Designations

The IWRB has determined that the value of preserving the designated waterways of the South Fork Clearwater River basin is in the interest of and for the benefit of the state as a whole. All landowners – private, state, and federal – are encouraged to manage their lands consistent with the IWRB's protection designations. The IWRB also encourages federal resource management agencies to work within the comprehensive state water planning process rather than pursuing federal protection of waters within Idaho.

To protect the public interest, current resource use, and the multiple-use character of the basin, the Idaho Water Resource Board designates the following streams and stream segments (approximately 54 miles) as **Natural Rivers** (see Map 3) based upon the analysis from Section IV, Resource Summary and Evaluation. All of the Natural designated rivers in the South Fork Clearwater River Basin are on federal land and most originate in Wilderness areas.

1) **Tenmile Creek** - (10 miles) from headwaters to Wilderness boundary and the following tributary:
    - **Williams Creek** - (5.2 miles): Headwaters to confluence with Tenmile Creek,
2) **Twentymile Creek – (**3 miles**):** Headwaters to Wilderness boundary**,**
3) **Johns Creek** - (8 miles): from headwaters to Wilderness boundary, and the following tributaries:
    - **Hagen Creek** - (4.4 miles): Headwaters to confluence with Johns Creek,
    - **Square Mountain Creek** - (5.0 miles) Headwaters to confluence with Moores Creek:
    - **Moores Creek** - (6.4 miles): Headwaters to confluence with Square Mountain Creek,
    - **Gospel Creek** - (6.6 miles): Headwaters to confluence with Johns Creek,
    - **West Fork Gospel Creek** - (5.2 miles): Headwaters to confluence with Gospel Creek,

To protect the public interest, current resource use, and the multiple-use character of the basin, the Idaho Water Resource Board designates the following streams and stream segments (approximately 324 miles) as **Recreational Rivers** (see Map3) based upon the analysis from Section IV, Resource Summary and Evaluation:

1) **Red River** (27.2 miles) Headwaters to confluence with American River, **and the following tributaries**:
    - **Otterson Creek** - (3.5 miles): Headwaters to confluence with Red River,
    - **South Fork Red River** - (11.7 miles): Headwaters to confluence with Red River,
    - **West Fork Red River** - (4.3 miles): Headwaters to confluence with Middle South Fork Red River,
    - **Moose Butte Creek** - (3.5 miles): Headwaters to confluence with Red River,
    - **Red Horse Creek** - (8.2 miles): Headwaters to confluence with Red River,
2) **American River** (21.6 miles) Headwaters to confluence with South Fork Clearwater, **and the following tributaries**:

- **Limber Luke Creek** - (2.8 miles): Headwaters to confluence with American River,
- **West Fork American River** - (5.0 miles): Headwaters to confluence with American River,
- **East Fork American River** - (6.5 miles): Headwaters to confluence with American River,
- **Kirks Fork** - (6.8 miles): Headwaters to confluence with American River,

3) **Crooked River** (11.6 miles) Headwaters to confluence with South Fork Clearwater, **and the following tributary**:
   - **Relief Creek** - (6.3 miles): Headwaters to confluence with Crooked River,
   - **East Fork Crooked River** – (7.1 miles): Headwaters to confluence with Crooked River,
   - **West Fork Crooked River** - (5.3 miles): Headwaters to confluence with Crooked River,
4) **Newsome Creek** (15.7 miles) Headwaters to confluence with South Fork Clearwater, **and the following tributaries**:
   - **Haysfork Creek** - (5.0 miles): Headwaters to confluence with Newsome Creek,
   - **Baldy Creek** - (6.1 miles): Headwaters to confluence with Newsome Creek,
   - **Pilot Creek** – (6.0 miles): Headwaters to confluence with Newsome Creek,
   - **Sawmill Creek** – (3.6 miles) Headwaters to confluence with Newsome Creek,
   - **Sing Lee Creek** - (3.0 miles): Headwaters to confluence with Newsome Creek,
   - **West Fork Newsome Creek** - (6.0 miles): Headwaters to confluence with Newsome Creek,
5) **Tenmile Creek** (7 miles)–Wilderness boundary to confluence with South Fork Clearwater **and the following tributary**:
   - **Sixmile Creek** - (4.7 miles): Headwaters to confluence with Tenmile Creek,
6) **Twentymile Creek**- (8 miles): Wilderness boundary to confluence with South Fork Clearwater,
7) **Wing Creek** - (5.1 miles): Headwaters to confluence with South Fork Clearwater,
8) **Silver Creek** - (15.9 miles): Headwaters to confluence with South Fork Clearwater,
9) **Johns Creek –** (12 miles): Wilderness boundary to confluence with South Fork Clearwater,
10) **Meadow Creek** - (15.2 miles): Headwaters to confluence with South Fork Clearwater,
11) **Mill Creek** - (15.9 miles): Headwaters to confluence with South Fork Clearwater,
12) **South Fork Clearwater** (63.8 miles) Headwaters to confluence with Middle Fork Clearwater

The following activities are prohibited on all streams designated as recreational rivers in the South Fork Clearwater River basin. Specific stream segments and water bodies that have exceptions to the general prohibitions are listed below.

Prohibited activities:

- Construction or expansion of dams or impoundments;
- Construction of hydropower projects;
- Construction of diversion works;
- Dredge or placer mining (including recreational dredging, except where allowed through application for permit, Form 3804-B);
- Mineral or sand and gravel extraction within the stream channel;
- Alterations of the stream channel, except as provided below.

Activities allowed with terms and conditions: The following activities are allowed if they do not impede fish passage, spawning, rearing and boat passage:

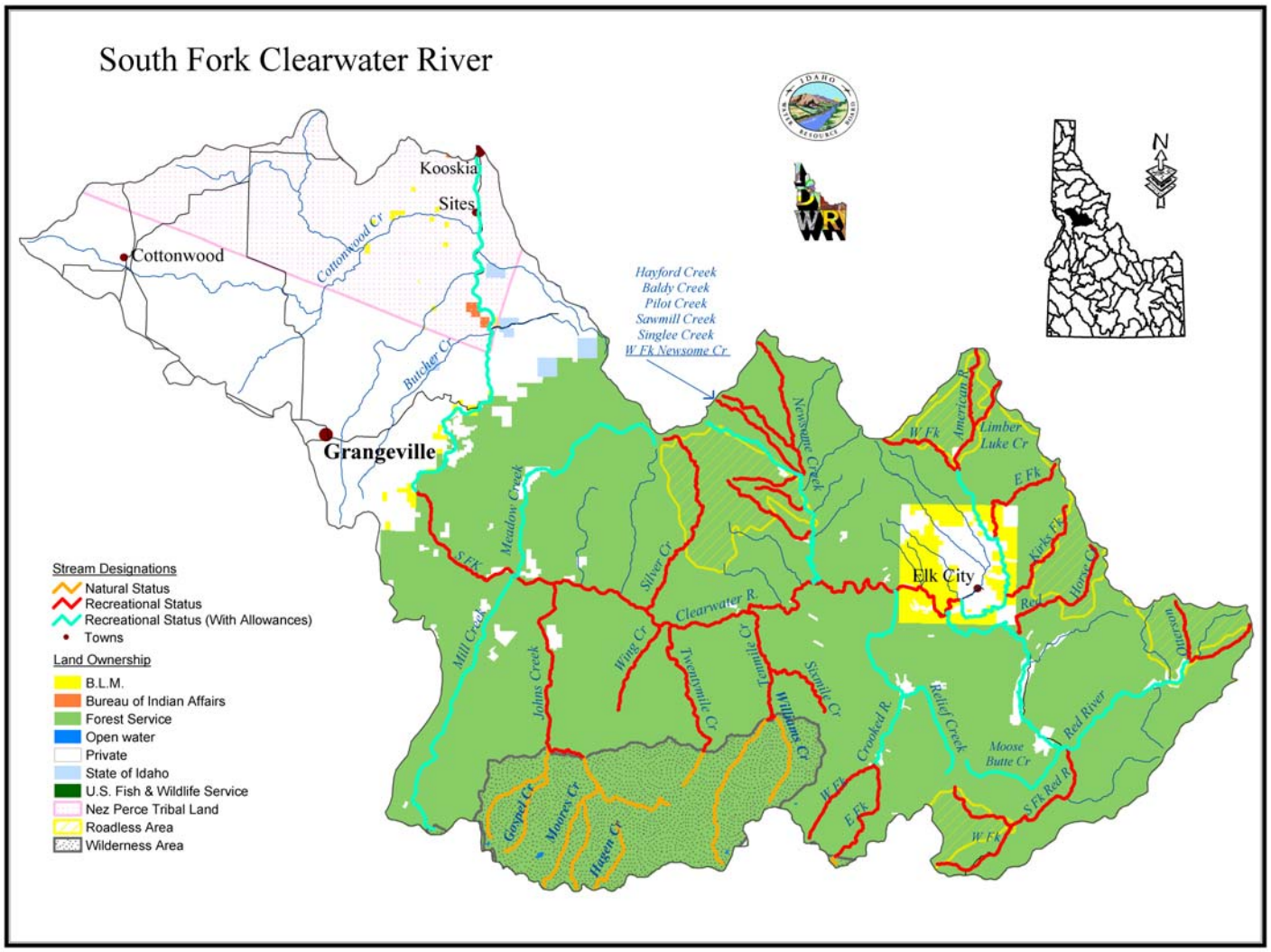
- Alterations of the stream channel for construction and maintenance of:
    - roads, bridges, and trails;
    - public recreation facilities;
    - fish and wildlife enhancement structures;
    - and channel reconstruction projects approved by the IWRB.

Recreational Designated Streams with Exceptions to Prohibited Activities: The following rivers or streams are adjacent to privately owned land which may require construction of diversion works for domestic, municipal or agricultural uses.

1. South Fork Clearwater River, from the Nez Perce National Forest boundary to confluence with Middle Fork Clearwater:
2. Red River and Moose Butte Creek
3. American River, mainstem only
4. Relief Creek
5. Crooked River, mainstem only
6. Newsome Creek mainstem and Pilot Creek
7. Meadow Creek
8. Mill Creek

Exceptions to Prohibited activities: Construction of water diversion works for domestic, municipal, and agricultural uses is allowed on the specified water bodies (1 – 8) if they do not impede fish passage, spawning, rearing or boat passage:

All activities must comply with all state stream channel alterations rules and standards. All works must be constructed or maintained to minimize erosion and sedimentation.



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I. INTRODUCTION

This document describes comprehensive water resource planning for the conservation, development, management, and optimum use of unappropriated water resources in the South Fork Clearwater River basin in north central Idaho (Map 1). The 1,175-square mile basin is located in Idaho County. It joins the Middle Fork Clearwater River at Kooskia, to form the Clearwater River. The Clearwater River basin is the most northern in the larger Snake River basin. The South Fork Clearwater River basin coincides with U.S. Geological Survey Hydrologic Unit 17060305 and Idaho Department of Water Resources (IDWR) Administrative Basins 82 and 85.

The South Fork Clearwater River basin has two distinct parts. The northwestern portion, the Camas Prairie, is rolling plateaus and prairies, and a major dryland agricultural area of the State of Idaho. It accounts for about 20% of the basin's land area. The eastern portion is forested, mountainous and sparsely populated with about 68% of the land area within the Nez Perce National Forest (NF). Individuals and planning or management entities are encouraged to implement recommendations and build upon the concepts established in this plan.

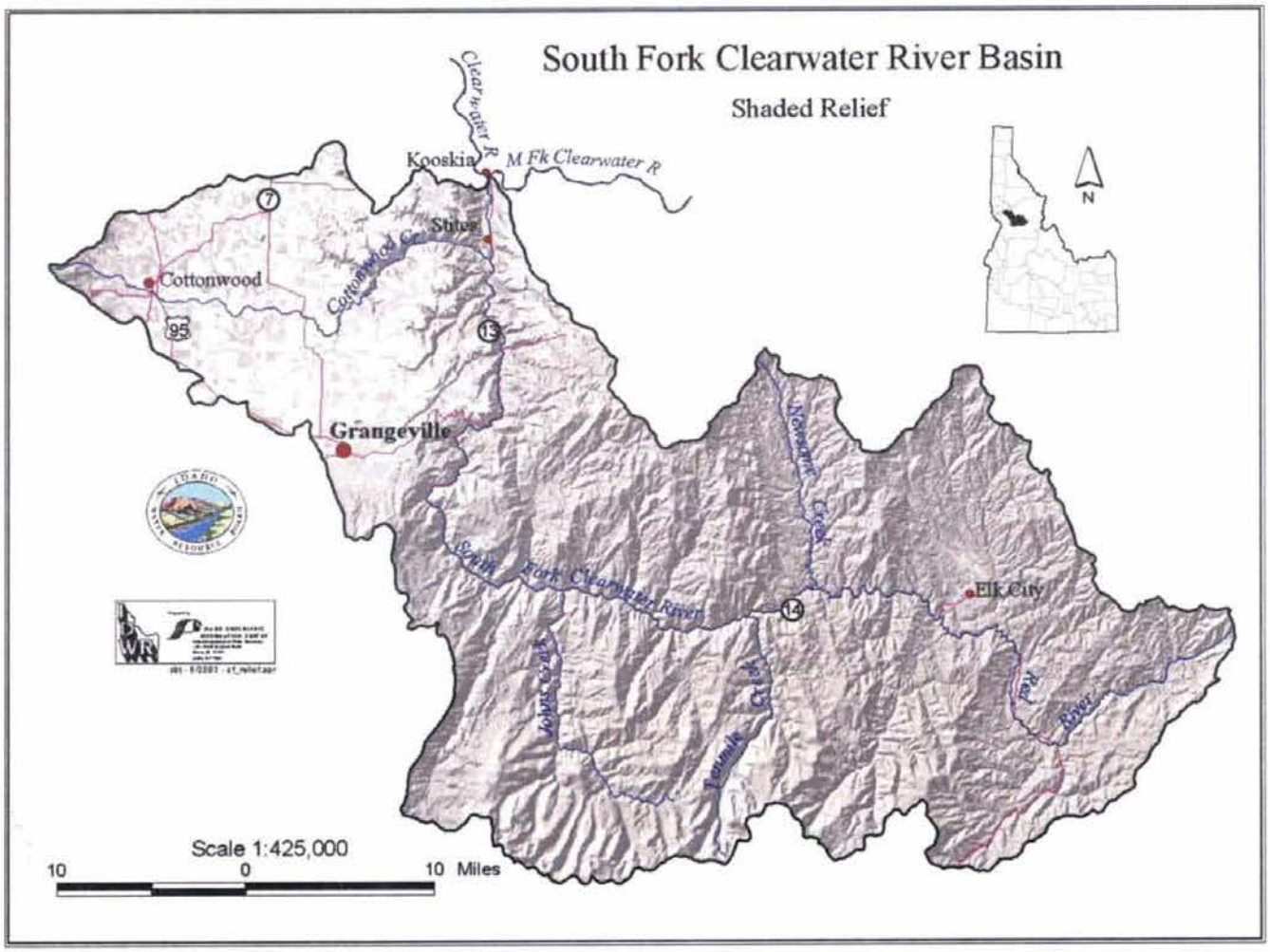
1.1 Constitutional and Statutory Basis of the Comprehensive State Water Plan

The Idaho Water Resource Board (IWRB) is a constitutional agency responsible for developing plans for the state's water resources (Article XV, Section 7 of the Idaho Constitution). The IWRB works within the Idaho Department of Water Resources (IDWR). In 1988, the Idaho State Legislature directed the IWRB to develop a "comprehensive state water plan" (*Idaho Code § 42-1734A*). Idaho Administrative Code for the IDWR further defines comprehensive state water planning rules (IDAPA 37.02.01).

The comprehensive state water plan is a two-part document. "Part A," entitled *Idaho State Water Plan*, sets out statewide policies, goals, and objectives for water resources in the public interest. The latest version was adopted in December, 1996. The second part, "Part B," is directed at specific river basins, waterways, ground water aquifers or other geologic areas defined by the IWRB and in this case, is named the *South Fork Clearwater River Basin Comprehensive State Water Plan-Part B.* The "Part B" plan explains issues, goals, and recommendations that are specific to the South Fork Clearwater River basin. For brevity, the *South Fork Clearwater River Basin Comprehensive State Water Plan-Part B* is referred to as the *Plan* throughout this document.

1.2 Legal, Policy and Planning Context of the South Fork Clearwater River Basin

Several factors led the IWRB to complete a comprehensive state water plan for the South Fork Clearwater River basin. The Snake River Basin Adjudication (SRBA) is a judicial process begun 18 years ago to determine and decree existing water rights in the basin, which includes almost 90% of the land area of Idaho. As part of the SRBA, the USFS agreed to withdraw certain federal reserved water rights if the State of Idaho would work cooperatively to identify and prioritize streams and rivers that could be given minimum instream flow and protection.



Map 1. South Fork Clearwater River basin shaded relief.

Another reason to undertake a plan was that the Idaho Department of Environmental Quality (IDEQ) began a water quality improvement process (a Total Maximum Daily Load) in the basin, affording a collaborative opportunity for the IWRB. Coordinating these two state processes was, in part, an attempt to take advantage of a citizen advisory committee established by the IDEQ for their TMDL process. The *Plan*, after an examination of local, state and federal water resource issues, includes recommendations covering recreational dredge mining, ground water in the Camas Prairie area, minimum flows, and protected river designations. The IWRB desires that this plan be a part of the various state and local processes that ultimately will lead to recovery of threatened and endangered fish species in the basin. Implementation of this plan may help the citizens of Idaho avoid the broad reach of the Endangered Species Act.

1.2.1 Adjudication of Water Rights

In Idaho, adjudications are conducted through the court system. The Department of Water Resources serves as a technical expert for the court in conducting investigations of existing water rights. When completed, the adjudication process and its resulting decree will provide a current, accurate description and security of ownership of water rights for surface and ground water. The decree will be binding on all water users and will identify the water rights as they existed in 1987. This will minimize future challenges against those water rights as long as the rights continue to be used according to law.

This process was prompted by the 1984 Swan Falls agreement between the State of Idaho and Idaho Power Company. Consequently, the Idaho Legislature determined that an adjudication of the entire Snake River Basin was in the public interest. IDWR is responsible for the verification process, including field examinations. A final determination of each claim is the responsibility of the Snake River Basin Adjudication Court, located in Twin Falls.

There have been no prior adjudications in the South Fork Clearwater River basin (Fritschle 2003). There are no rights decreed with the South Fork Clearwater River as the source. The Irrigation and Other Rights Director's Report for Basins 82 and 85 are scheduled for release in 2004.

1.2.2 Federal Reserved Water Rights Claims

One category of claim made in the SRBA is the federal government's reserved claims. Federal reserved water rights are based upon a reservation of land by the United States government, typically stemming from presidential executive order, or an act of Congress. The reserved water rights claims usually carry the priority date when the federal reservation was created by law. The U.S. Supreme Court has held that when the federal government withdraws land for public domain, unappropriated water may be reserved to the extent needed to fulfill the purpose of the land reservation.

In 1993, the United States filed federal reserve water right claims for the Boise, Payette, Clearwater, Nez Perce, Sawtooth, and Salmon-Challis National Forests. In 1997, the SRBA Court rejected federal reserve claims based upon the Multiple Use and Sustained Yield Act (MUSY), but in 1998 ruled that the U.S. could move forward with instream flow claims for federal reserved water rights on national forests under the Organic Administration Act of 1897 provided they could show that channel maintenance flows were required to meet downstream and in-forest uses. The SRBA court rejected the United States' claim for a federal reserved water right for instream flow related to a National Wildlife Refuge in 1998, yet the United States' claims have been granted by the SRBA court in some of the national recreation areas in Idaho. Federally designated Wild and Scenic Rivers reserved water rights claims were also granted.

1.2.3 Memorandum of Understanding

In an effort to avoid continued and costly court proceedings, the US Department of Agriculture Forest Service (USFS) agreed to withdraw 13 channel maintenance water right claims from the SRBA if the IWRB would agree to cooperate and coordinate with the USFS on comprehensive state water plans and forest planning. A memorandum of understanding (MOU) affirming this agreement was signed in August, 2000 by Associate Deputy Chief of the National Forest System, Paul Brouha, and Idaho Water Resource Board Chairman Clarence Parr. This MOU established general guidelines for the agencies to follow in their coordination. The South Fork Clearwater River Basin was chosen as the pilot watershed for the MOU because the basin had no federal wild and scenic water right claims.

A supplemental MOU between the IWRB and the USFS was signed by the Chairman of the IWRB, Joe Jordan, and the Nez Perce National Forest, Forest Supervisor, Bruce Bernhardt, in September of 2001. The purpose of the MOU was to coordinate river basin planning activities in the South Fork Clearwater River basin including collection and sharing of data. One component of the implementation of the supplemental MOU was for the USFS and IWRB to jointly identify and prioritize instream flow needs, streams to be considered as state protected rivers, water development and stream channel protection needs and other water related issues for consideration in comprehensive state water plan and forest planning.

1.2.4 Nez Perce Water Right Negotiations

The Nez Perce Tribe submitted hundreds of water right claims to be arbitrated through the Snake River Basin Adjudication. The claims, based on the Nez Perce Treaties of 1855 and 1863, are mostly for springs and fountains but two claims are for the entire natural flow in the Salmon and Clearwater drainages.

In March of 1993, the United States filed water right claims in the SRBA on behalf of the Tribe as to the legal interest in those rights, and the Tribe filed identical claims on its own behalf as to the beneficial interest. There are three broad categories of claims, each of which contains several components:

Claims on Trust and Tribal Fee Lands. This type of claim is for a variety of purposes, including: domestic, commercial, municipal, and industrial uses; springs and ponds for livestock and wildlife; irrigation from surface water and from ground water; development if wildlife habitat; recreation; and a small amount of hydroelectric power production.

Instream Flow Claims. This type of claim covers areas both on and off reservation land. The Tribe bases these claims from the reservation of fishing rights contained in article 3 of the 1855 treaty. The claims include water for fisheries habitat flows, channel maintenance flows, and riparian maintenance flows.

Springs and Fountains. The basis of this type of claim is the treaty of 1863, which reserved access for use of the springs and fountains for the Tribe.

Voluntary negotiations of the Tribe's claims began in 1993. The negotiations have continued since then, but litigation of the claims also began in 1997. By order of the SRBA court in 1998, the negotiations have involved all the major objectors to the Tribe's claims. After several years of negotiations, the parties have developed a framework for a proposed settlement agreement. Specifically, the framework, or "term sheet" is divided into three separate components: (1) the Nez Perce Tribal component to resolve issues on and near lands ceded by the Tribe in the 1863 treaty, (2) the Salmon/Clearwater component to protect flows and habitat within the Salmon and

Clearwater River basins, and (3) the Snake River flow component to resolve issues involving the use of the Snake River above the Hells Canyon Complex.

The Salmon/Clearwater component is crafted to protect current and some future water appropriations for beneficial use, provide for future domestic, commercial, municipal, and industrial uses and to allow for a certain level of future development of other water uses. Instream flows will be established and held by the IWRB for selected streams of importance to the Nez Perce Tribe to provide benefits for ESA listed fish. The state will administer a cooperative agreement(s) under the Endangered Species Act to enhance riparian habitat and protect existing and future State-permitted uses.

The Tribal component resolves water and other natural resource concerns raised by the Tribe in the SRBA. These concerns include water rights, hatchery management, certain Bureau of Land Management Lands, and fisheries habitat. In exchange for the Tribe's agreement to resolve their water-based claims, the United States will provide financial compensation to the Tribe.

For further information on the settlement agreement contact IDWR, the US Department of the Interior or use the following Internet links. http://www.doi.gov/news/040515a, http://www.idwr.state.id.us/

1.2.5 Advisory Group Coordination

In a cooperative effort related to the Federal Clean Water Act, three agencies are working on the South Fork Clearwater River Total Maximum Daily Load (TMDL) process. The lead agency in developing the TMDL is the Idaho Department of Environmental Quality (IDEQ). Other cooperators are the Nez Perce Tribe and the U.S. Environmental Protection Agency (EPA). To improve the efficiency of the State of Idaho's work and to maximize productivity, IWRB and IDEQ agreed to use the same advisory group for the TMDL process and the comprehensive state water plan process since the two processes would be occurring in the same basin at nearly the same time.

A benefit of this collaboration is that state designation of protected river status or minimum stream flow may assist in the implementation of the TMDL through improved flows for recreation and fish, water quality and wildlife habitat.

Coordinating one advisory group for the different processes of the TMDL and State Water Plan is a challenge. IDEQ and the IWRB follow different procedures in selecting members of the advisory group and in conducting advisory group meetings. Additionally, the TMDL and the State Water Plan each have distinct technical and policy issues that may become even more confusing when considered by the same advisory group.

1.2.6 Clearwater Subbasin Assessment, Inventory and Management Plan

While water quality is very important to fish management, fish species also require diverse habitats that meet the needs of all life stages in order to maintain healthy, reproductive populations. In the South Fork Clearwater River basin, another planning activity related to the water, fish and wildlife resources of the basin is the work of the Clearwater Focus Watershed Project. The Clearwater Subbasin Assessment, Inventory and Draft Management Plan, part of the rolling provincial review process developed by the Northwest Power and Conservation Council, will be used to facilitate future development of a subbasin plan for fish and wildlife resources. The Clearwater Focus program has been the lead and coordinating entity for the work leading up

to the management plan. When completed, the subbasin management plan is intended to provide up-to-date biological assessments of fish and wildlife populations, a synthesis of past and ongoing fish and wildlife management activities, identification of factors currently limiting fish and wildlife production, a description of strategies to address the limiting factors. The management plan will assist the Council in making recommendations for the allocation of funds provided by the Bonneville Power Administration. (Subbasin Assessment http://www.nwppc.org/library/releases/2002/1113.htm and draft subbasin plan http://www.nwppc.org/library/isrp/isrp2003-3.htm) This is part of a larger effort within the Columbia River basin to mitigate the impacts of energy facilities on fish and wildlife.

1.2.7 Nez Perce National Forest Plan Revision

The Nez Perce National Forest Plan was completed in October 1987. Since then there have been numerous social and resource changes. Scientific information and methodology has evolved. A few of these changes have been addressed in amendments to the original forest plan. Many others have not been formally recognized and incorporated. Rules guiding implementation of the National Forest Management Act recognize the need to keep forest plans current, recommending they be revised on a 10-year cycle or at least every 15 years. The forest plan is currently being revised under a joint effort with the adjacent Clearwater National Forest. Six categories of decisions are made in forest plans: goals and objectives, standards and guidelines, management area direction, special area designation, suitable land designation and monitoring and evaluation strategy. For the Clearwater and Nez Perce National Forests, five major revision topics have been identified: access management, watersheds and aquatic ecosystem condition, terrestrial ecosystem condition, noxious weed condition and special designations and areas. Current plans call for the revision process to be completed by October, 2006. Information about the forest plan revision process can be found at http://www.fs.fed.us/cnpz/.

1.3 Public Involvement

Concerns and ideas of Idaho residents are important to the IWRB's planning process. Information meetings, citizen advisory group meetings, and formal hearings provided opportunities for public review and suggestions for the South Fork Clearwater River basin plan.

The initial public information meeting to describe the Comprehensive State Water planning process and to seek volunteers to be on the IWRB's Citizen Advisory Group was held on October 22, 2001 in Kooskia. Public notice of this meeting was delivered through the local papers (Free Press, Clearwater Progress). Volunteers were selected to represent varied interests in the basin, such as ranching, tourism, conservation, wastewater treatment plants, timber, mining, the Nez Perce Tribe and other water users. The first official advisory group meeting was held in Kooskia on November 15, 2001. This group also served as the Watershed Advisory Group for developing the TMDL. This group of people met about once a month for nearly two years to discuss either the Board's comprehensive state water plan, the TMDL or both. The role for the advisory group in the water planning process was to identify local concerns, to review information, and to provide opinions and suggestions for IWRB consideration in plan development. All meetings were open to the public. The advisory group members are listed in Appendix A.

1.4 Planning Process

In addition to the IWRB's public participation efforts, the process of developing a comprehensive state water plan consists of the following six steps. Not all steps occur in the order presented; some take place throughout the planning process and some occur concurrently. All are considered essential to the process of developing effective policy and recommendations for the use of the state's waters.

- ***Inventory Resources in the Basin***

Data, information, figures, and statistics about the resources in the basin are obtained through document reviews, field reconnaissance, contacts with government agencies, and citizen input. Maps are prepared using a computerized geographic information system. Inventory information is presented in the Basin Description, Section V.

- ***Identify Local Issues, and Concerns***

Issues, and concerns relating to water resources are identified through public meetings, formation of a local citizens group, and regular contacts with management agencies and local officials. They are described in ISSUES, ANALYSIS, AND RECOMMENDATIONS, Section III.

- ***Assess Current and Future Water Uses and Constraints***

The IWRB's assessments of the present and potential water uses in the South Fork Clearwater River basin are contained in the WATER DEMAND AND SUPPLY section of this document, Section II. The assessments are based on review of water right records, state laws and regulations, the basin's hydrology, and discussions with agency personnel and water users.

- ***Identify Waterways with Outstanding Resource Values***

Idaho Code directs the IWRB to evaluate the waterways of the state for "outstanding" fish and wildlife, recreational, aesthetic, and geological values. Outstanding resources are indicated by: 1) unique or rare features of regional or national importance, 2) significant public concern for protection and/or, 3) existing legal protection or special agency management designation to protect important resource values or the public safety. Specific criteria are described in the OUTSTANDING RESOURCE EVALUATIONS, Section IV.

The IWRB has authority to protect outstanding waterways by designating them as protected in one of two categories: "Natural River" or "Recreational River." Natural River designation protects streams (or stream reaches, lakes, etc.) that are free of substantial human-made impoundments or other structures and have undeveloped riparian areas. Recreational River designation protects rivers (or stream reaches, lakes, etc.) that have some human development within the streambanks or riparian area.

- ***Generate Policy Alternatives***

Alternatives are the actions, recommendations, or policies that may help achieve the goals identified in the *Plan*. They represent the solutions that are considered by the IWRB. The alternatives developed for the South Fork Clearwater River basin are discussed along with issues, found in Section III.

- ***Develop Specific Actions and Recommendations***

"Actions" are the steps that the IWRB can take under the authority granted by the Idaho Constitution and Idaho Code. These steps include proposing protection designations for streams or stream reaches, and submitting applications for minimum stream flows to the IDWR. "Recommendations" are the policy alternatives that the IWRB proposes to help guide public policy decisions. Many of the actions and recommendations evolved from ideas generated during citizen group meetings. They are found in Section III.

- ***Produce the Plan Document***

Comprehensive State Water Plans are first released as a draft. Draft plans are available for public comment for at least 60 days after release. After receiving comments, the IWRB may make changes to the draft plan, and then choose whether to adopt the plan. If adopted, the plan is submitted to the Idaho Legislature for review and public hearings, possible amendment, and approval. When the plan is approved by the legislature, it becomes an official policy document of the state.

Once a plan is approved by the legislature, it can be amended only by actions of the IWRB and the legislature. The IWRB decides whether to amend a plan based on an evaluation of the impact of proposed changes on the protection and preservation of the state's waterways. The evaluation also includes the economic impact of the proposed change on the state as a whole, its effect on existing water rights, whether it is necessary to provide adequate and safe water for human consumption, and whether it is necessary to protect life. All amendments to comprehensive state water plans (Parts A or B) are submitted to the Idaho Legislature for approval.

II. WATER DEMAND AND SUPPLY

2.1 Water Allocation and Use

The constitution and statutes of the State of Idaho declare all waters to be property of the state. This includes streams and rivers flowing in natural channels, springs and lakes, and all ground water. A water right represents permission from the state to put its waters to a beneficial use. A water rights describe the source of water, priority date, the amount of water to be used, what the water is to be used for, and where and when the water will be used. IDWR administers water rights in Idaho based upon the Doctrine of Prior Appropriation, (i.e., first in time is first in right.)

Water use in the South Fork Clearwater River basin is mostly consumptive, although consumptive water use is low relative to the total amount of available water. As displayed in Fig. 1, water claims for commercial and industrial uses comprise the largest potential water use in the basin. Appropriations for commercial and industrial uses are about 95% from ground water. Surface and spring water use is about one third the amount of the ground water use in the basin. The number of claims for spring, surface water, and ground water permits are each about 100.

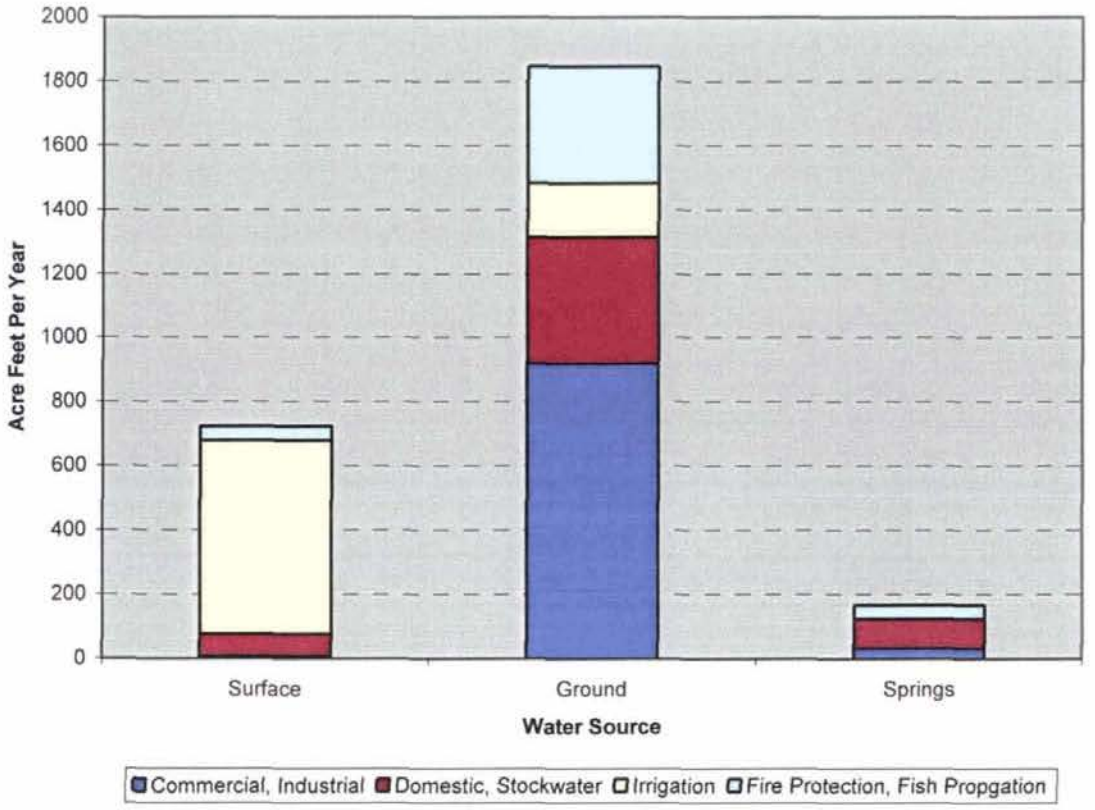


Fig. 1. Water use and source.

2.2 Water Demand

Irrigation development in the basin constitutes about 25% of total potential water use based on

water rights and claims. As shown in Figs. 2 and 3, irrigation is the greatest potential use of surface water and the smallest use of ground water. Pasture for cattle and horse forage is the primary use for surface irrigation. There is some, though relatively little, crop irrigation primarily on the Camas Prairie. Basin irrigation relies primarily on surface water.

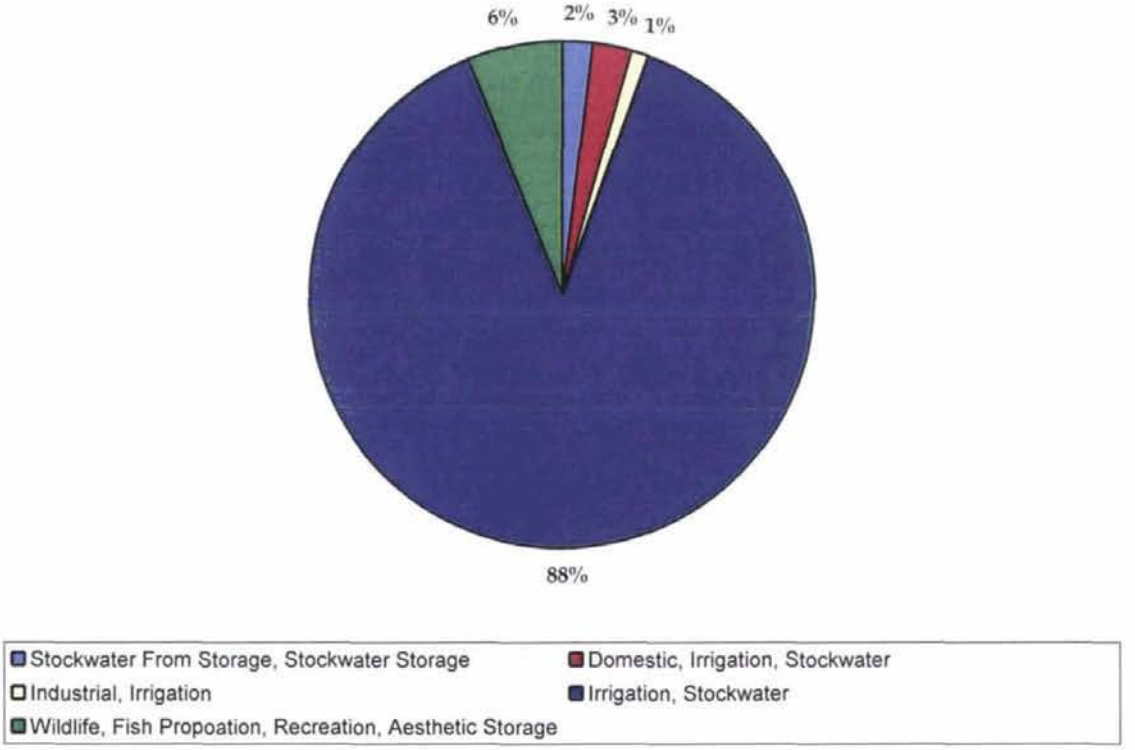


Fig. 2. Surface water use permits and rights.

The largest component of the water used in the basin, 68%, is from ground water, and it is relied upon heavily for domestic and municipal supplies (see Fig. 1 where domestic includes municipal use in the graph). Ground water supplies approximately 40% of domestic, commercial, and municipal users in the basin. Surface water supplies about 26% of the water used in the basin, and the remaining water supply comes from springs. Because this information is based upon water rights it is important to note that there are domestic wells in use that do not have a water right. It is not always necessary, though it is highly recommended, to have a water right for a domestic well. Therefore, the domestic water use is higher than the water right information provides. Approximately 2,750 people in the basin get their domestic water from municipal systems, which is slightly over half the population in the basin (Progressive Engineering Group, Inc., Kimball Engineering, Entranco).

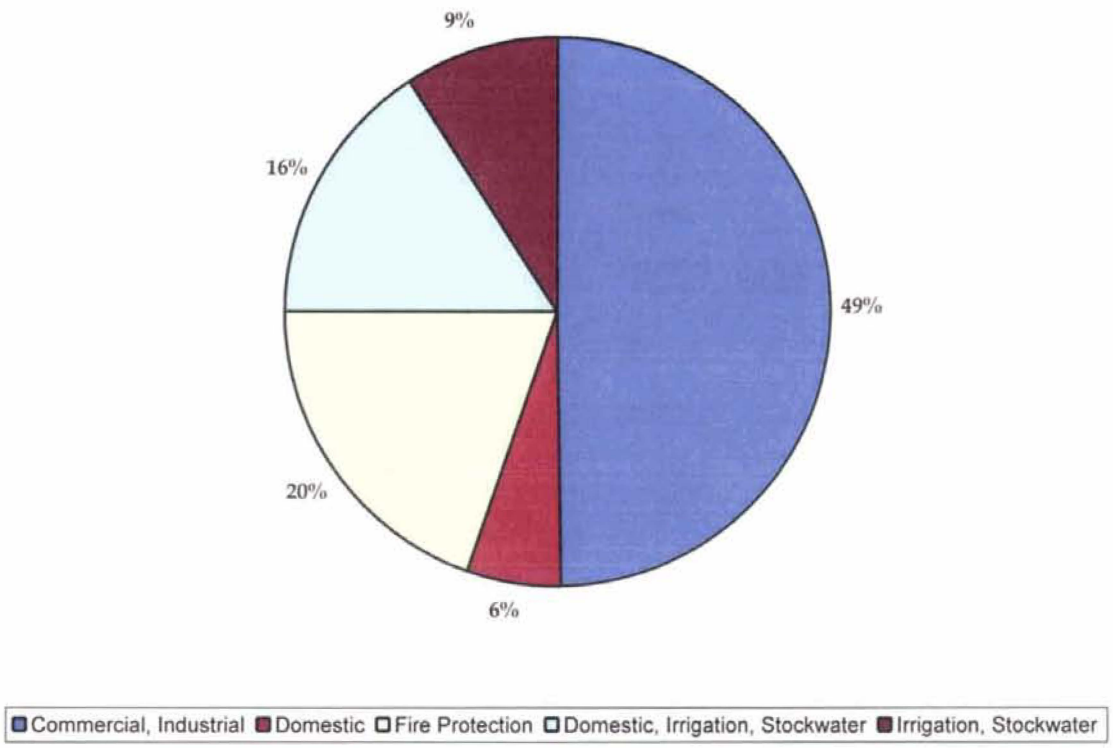


Fig. 3. Ground water rights and permits.

2.2.1 Agriculture Demand

Data for this section were obtained from the National Agricultural Service. The data are available for Idaho County only. The latest year for which data were available is 1997. For a more local perspective of the basin, qualitative information was obtained from local agencies.

Total land in farms is 649,851 acres. Most of these farms are larger than 200 acres and more than a third are larger than 2,000 acres. Farm size has been relatively stable over the last decade of data (from 1987 to 1997). The major crops in the area are wheat, (62,283 acres); hay/alfalfa, (41,025 acres) and barley (28,972 acres). Pastureland accounts for 429,546 acres. Wheat is by far the biggest cash crop in the county followed by barley (see Table 14). Few other crops are grown. Livestock, including poultry, also play an important part in the economy of the county.

Agricultural Irrigation Demand

In Idaho County, there are more than 2,000 irrigated acres, 1,200 of which are irrigated cropland, most of the rest is irrigated pastureland. Most of these acres are located along the Salmon River. Total irrigated acres in 1997 represent an almost 100% decline in irrigated acres from 1987.

Present agricultural irrigation in the South Fork Clearwater basin is less than 100 acres. It includes 30 acres of corn and 20 acres of pasture on Camas Prairie (B. Sandalin, NRCS, 8/5/03). The pasture is irrigated occasionally and the corn is irrigated each year from wells. In addition, a

few small (5 acre) tracts are irrigated along the lower South Fork Clearwater River. These tracts use water from the river or tributary streams. The Camas Prairie and the valley bottoms receive approximately 22 inches of precipitation each year, which is more than adequate for the crops grown. The crop yield is limited by temperature and growing season, rather than by the lack of moisture. Yields of 110 bushels per acre are common for wheat and barley in this area. Although irrigation would increase crop yields during drought and occasional dry periods during the growing season, investment in irrigation systems is not economically viable. Development of ground water and surface water irrigation systems would be expensive and would not increase yield sufficiently to justify the investment.

Approximately 800 acres of potentially irrigable agricultural land were found in the South Fork Clearwater River basin based upon analysis by IDWR. This analysis used geographic information system data. Private land not currently irrigated with slight to moderate limitations (class 1 and 2, U.S. Department of Agriculture 1995) for irrigation based upon slope, surface texture, soil drainage, water table depth, and other soil characteristics was selected. Possible water sources for the potential irrigation include springs, surface water and ground water. Private lands were selected because it is unlikely that public lands would be irrigated. Nearly all of the potentially irrigable lands were on the Camas Prairie and some land near the South Fork Clearwater River north of Harpster.

The lack of a sizable local market and infrastructure for food processing suggests that high-valued crops, some of which use more water than current crops are unlikely to be grown in the basin in the foreseeable future. The stability of the existing farms in terms of acreage and crops suggests that major change is unlikely. The reduction in irrigated acreage in the county suggests a trend toward less irrigation. In conclusion, there appears to be no evidence for large future agricultural irrigation demand either on the Camas Prairie or in the river bottoms.

Livestock Watering

Domestic sheep and cattle arrived in the basin in the mid 1860s, with the gold rush and the influx of non-natives (IDEQ 2002). It is estimated that more grazing by domestic livestock occurred in the early 1900s than occurs now (IDEQ 2002). The Nez Perce also pastured horses throughout the area including the South Fork Clearwater River drainage.

By 1908, when the Nez Perce NF was established and grazing laws were enacted, combination farm and ranch homesteads on the prairie were common. Stites, a community along the South Fork Clearwater River, was the major livestock shipping area for the entire county.

Standard water use, as defined by IDWR, is 12 gallons of water per day for range cattle and horses, and two gallons per day for sheep. Total stock water use was estimated by multiplying the number of gallons typically used in a day by an estimate of days of livestock water use. Total annual livestock water use in the basin is estimated at 11.3 AF, based on an estimated 308,010 days of grazing by livestock in the basin per year. Until recently, Idaho water law did not allow diversion of stock water from live streams to watering troughs unless the landowner held a permitted water right. This law was a disincentive for livestock owners who wanted to develop off-stream water facilities for water quality and stream protection purposes. Idaho Code now allows diversion of in-stream stock water to troughs without the previously required water right (*Idaho Code § 42-113*). The code also covers other requirements related to off-stream livestock water facilities.

Most of the water provided for livestock consumption in the South Fork Clearwater River is surface water. Information on current grazing distribution is limited to allotments on public lands within the basin. The number of livestock in federal management areas is an estimate based on the number of grazing permits issued and Animal Unit Months (AUM's). One AUM is equal to: one bull, steer, or cow with suckling calf, one horse/ mule, or five sheep/goats grazing for one month. Cattle are the only livestock permitted on USFS lands in the South Fork Clearwater River drainage (USFS 1998). Currently, there are 10 active cattle allotments with a total of 9,657 cattle AUM's in the South Fork Clearwater River basin of the Nez Perce NF (Lake, 2002). The BLM has 21 allotments on its land with a total of 243 AUM's. Idaho Department of Lands has nine cattle allotment with a total of 367 AUM's. Most of the cattle that graze on public lands only do so part of the year. The upper basin within the national forest receives heavy snows starting in late October or November. Cattle are removed from these areas and shipped to market or other suitable grazing areas, typically out of the basin.

There is no information on the number of livestock grazing on private lands on the Camas Prairie portion of the South Fork Clearwater River Basin (Hohle 2002).

2.2.2 DCMI Water Use

In general, demand for domestic, commercial, municipal, and industrial (DCMI) water depends on the size and characteristics of the population including their preferences for low-density housing and water intensive activities, the price of water, weather conditions and the characteristics of the commercial and industrial sectors of the local economy. Future demand therefore depends on the same set of factors. Because the total population is predicted to be stable over the next 25 years, demand factors are unlikely to change substantially. The local non-agricultural economy is likely to continue to change from one based on manufacturing to one based on services (Table. 13), however, because water use for the service sector is relatively low, in general, and manufacturing relatively high (Cook 2001), future water use is more likely to decrease than increase.

Information on current local water use was available from three sources: The Water System Study for the City of Cottonwood (Kimball Engineering), the Water System Engineering Study for the City of Grangeville (Entranco), Evaluation of Ground Water Resources in the Vicinity of Grangeville, Idaho (Ralston, D., K. Sprenke, w. Dansart and W. Rember. 1993) and the Water Study for the City of Kooskia (Progressive Engineering). Estimates of water use for these municipal systems underestimate total water use because the use of private wells in rural and some urban areas. However, it is possible to use the measurements of gallons per person per day from the studies to extrapolate to use outside municipal boundaries after making adjustments for commercial water use included in the measurements. Some underestimation may remain because of the use of both a municipal system for drinking water and a well for irrigation (dual use). This does not appear to be a major consideration in either Cottonwood or Grangeville because of the relatively high measured water use per customer. Use ranges from 430 gallons per persons per day (GPD) to 460 GPD. Kooskia may have more dual users, as per customer use appears to be relatively low at 305 GPD.

Table 1. Estimates of annual DCMI water use in thousands of gallons.

Kooskia	Grangeville	Cottonwood	Other	Total
74,382	240,887	78,414	1,222,452	1,616,135

2.2.3 Nonconsumptive demands

Idaho Code directs the IWRB to evaluate the waterways of the state for "outstanding" fish and wildlife, recreational, aesthetic, and geological values. Outstanding resources are indicated by: 1) unique or rare features of regional or national importance, 2) significant public concern for protection and/or, 3) existing legal protection or special agency management designation to protect important resource values or the public safety.

The South Fork Clearwater River basin contains a significant amount of aquatic habitat with high potential fish habitat, and is an important area for fish species when evaluated within the broader context of the Columbia River basin (USFS 1999). The basin currently provides habitat for Endangered Species Act listed species (fall chinook, steelhead, bull trout) and Idaho Endangered or Sensitive Species (Pacific lamprey, redband trout, spring chinook, westslope cutthroat trout). The resident species in the system are thought to be of wild origin, and the system supports both resident and fluvial life histories of westlope cutthroat trout and bull trout. All species remain widely distributed, although the abundance has declined significantly from historic levels (USFS 1999).

Habitat for spawning, feeding, resting, brood rearing, and escape must be provided by the riverine system. Significant areas still exist where uplands, riparian areas and stream conditions are relatively intact. For instance upper Johns and Tenmile Creeks (highlands of the Hump) have had little mining influence and are probably the best habitat for many salmonid species (IDEQ et al. 2002). There is also a significant amount of habitat with high potential to support fish within the Nez Perce National Forest (USFS 1997). Flushing flows maintain the stability and effective function of stream channels (Rosgen et al. 1986), and are a critical requirement to long-term sustainability of healthy riverine systems in the South Fork Clearwater River basin. Adequate flows are required to provide these high quality instream habitats. Therefore, protection of remaining habitat critical to rare plants and animals that rely on these ecosystems for at least some portion of their life cycle is needed.

Outstanding recreational and aesthetic characteristics were also identified in the South Fork Clearwater River basin through the IWRB's planning process, including recommendations of the citizen advisory group. Though the minimum flows proposed for the basin are targeted for aquatic habitat, the flows would also maintain the outstanding recreational and aesthetic attributes including fishing, boating, driving on a state scenic byway and experiencing the natural setting of the area.

Like any other water right, a minimum stream flow must take its place by priority. Existing water rights will not be harmed by the proposed minimum instream flows. Furthermore, the sites for the instream flow claims are surrounded by public land.

2.3 Water Supply

The term "water supply" refers to the amount of water in a particular area, in this case, the South Fork Clearwater River basin. It is measured as basin yield or precipitation.

2.3.1 Surface Water

Daily stream flow records are available for two locations in the basin, Elk City and Stites (Ondrechen 2002). The greatest discharge as measured at Stites, the farthest downstream gage for the South Fork Clearwater River, was in 1976 (Fig. 4). Average annual volume for the years 1965 to 2002 is 739,000 AFA with a mean annual flow of 1,021 cfs (see Table2).

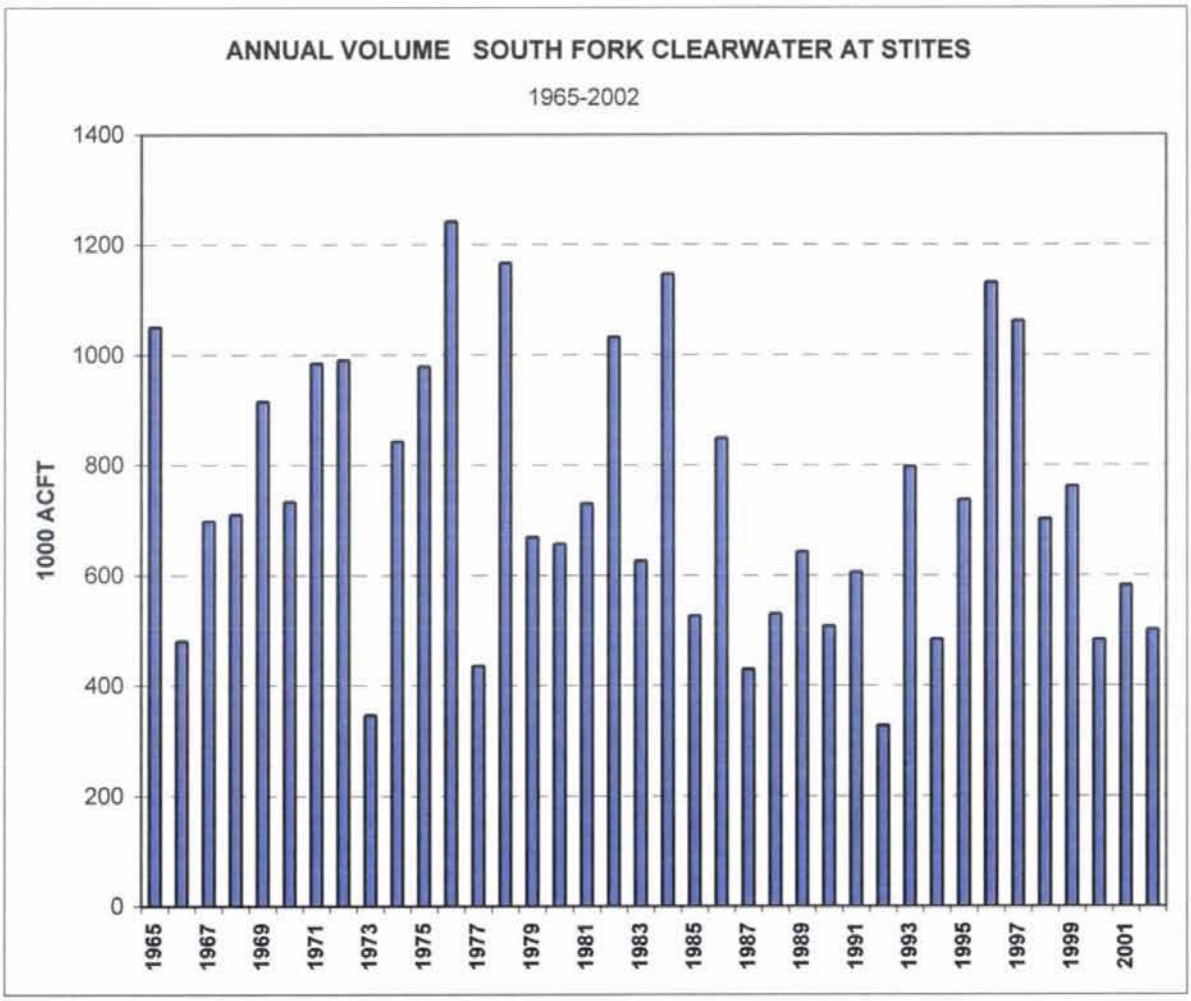


Figure 4. Annual volume - South Fork Clearwater River at Stites.

Table2. Drainage area and average annual runoff.

Location[1]	Drainage Area (mi^2)	Mean Annual Flow (cfs)[2]
Stites	1,150	1,021

[1]Measured at the Stites gage.
[2]Cubic feet per second, observed average annual runoff for period 1965-2002.

IDWR designates standard irrigation seasons of use for the different areas of the state. The standards are based on the water requirements of alfalfa, and take into account climate and elevation (Peppersack 1999). For most of the lower elevations in the South Fork Clearwater River basin, the irrigation season is from March 15 to November 15.Upper elevation farmlands on Camas Prairie have a season from April 1 to October 31.

Recent Historic Floods and Flood Impacts

Currently, river flows are measured and recorded for the South Fork Clearwater River at the U. S. Geological Survey (USGS) gages at Stites (#13338500) and near Elk City (#13337500). The Elk City gage is located 4.5 miles west of Elk City and has a period of record from September 1944 to September 1974, and from August 2002 to the present. The Stites gage is located at Stites, and has a period of record from October, 1910 to April, 1912, and from October, 1964 to the present. In addition, another gage (#13338000), was located about 8 miles upstream of Harpster, and was referred to as "South Fork Clearwater River near Grangeville." This gage had a period of record from May, 1911 to May, 1920, and from May, 1923 to June, 1963 and is no longer in service.

Flood stage at the Stites gage is considered to be 8.0 feet (gage height) with a flow of 9,570 cfs. Since 1948, the river has been at flood stage nine times. Recorded flood stages since 1948 are shown in Table3.

Table 3. Recorded flood stages at Stites.

Date	Gage Height (feet)-River Stage	Peak Flow (cubic feet per second)
May 29, 1948	10.1	16,800
May 20, 1957	8.70	11,800
June 8, 1964	10.3	17,500
May 16, 1975	8.30	9,890
May 11, 1976	8.25	9,710
May 8, 1979	8.01	9,870
May 6, 1995	8.56	11,100
February 7, 1996	8.82	12,100
January 1, 1997	8.68	11,600

Table 4 shows the flood frequency estimates at Stites from the Federal Emergency Management Agency (FEMA) Flood Insurance Study for Idaho County. A 100-year flood event has a recurrence interval of 100 years, or a 1% probability of occurring in a given year. Fig. 5 shows the average monthly flows at Stites for the period of record for that gage.

Table 4. Flood frequency estimate at Stites.

Recurrence Interval (years)	10	50	100	500
Peak Discharges (cubic feet per second)	11,300	15,600	17,400	21,700

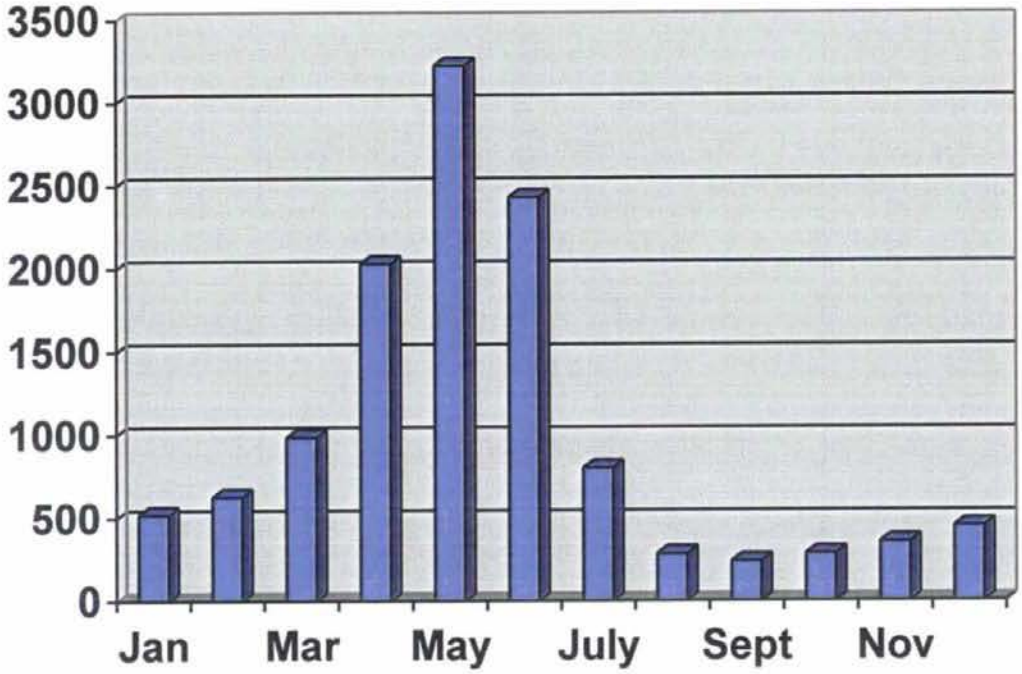


Fig. 5. Average monthly flows at Stites (cubic feet per second).

Flooding along the South Fork Clearwater River and in major tributaries is normally the result of high spring runoff from melting snowpack, warm winter rains and snowmelt, or a combination of both. Winter floods are normally caused by cold Canadian air moving into the watershed followed by wet Pacific weather systems moving over this cold air. Considerable snowfall is followed by rapid warming and heavy rain, which causes significant snowmelt and runoff. Spring floods usually are caused by warm temperatures, heavy rains and a rapid melt of a heavy snowpack.

Two of the largest floods in recent times occurred in May 1948 and June 1964. The 1948 flood was the result of high spring runoff from the melting of a high snowpack. The 1964 flood was caused by 3.5 inches of rainfall in a 50-hour period compounded by high snowmelt runoff. The peak flows at Stites for these floods were 16,800 cfs on May 29, 1948, and 17,500 cfs on June 8, 1964. The recorded peak flows at Kamiah on the Clearwater River were 99,000 cfs, and 103,000 cfs for the same events. Widespread flooding took place along the South Fork Clearwater River and major tributaries in the 1948 and 1964 events. Heavy damage was caused by the floodwaters and large accumulations of debris, especially logs. A logjam nearly three miles long was observed on the Clearwater River, which contributed to heavy damage of the railroad bridge, and closing of the highway bridge at Kamiah. Extensive damage took place in the communities of Kooskia, Stites, and Harpster. As a result of the 1948 flood, and another one in February 1949 caused by rain and ice jams, the U. S. Army Corps of Engineers (USACE) constructed emergency flood control levees at Kamiah, Kooskia and Stites. These levees were constructed under emergency conditions and do not provide 100-year (17,400 cfs) protection. Past floods have destroyed portions of the levees, and only some have been rebuilt. A hydrograph of the mean daily discharge for the old South Fork Clearwater River gage "near Grangeville," 8 miles upstream of Harpster, is shown for the 1948 flood event (Fig. 6).

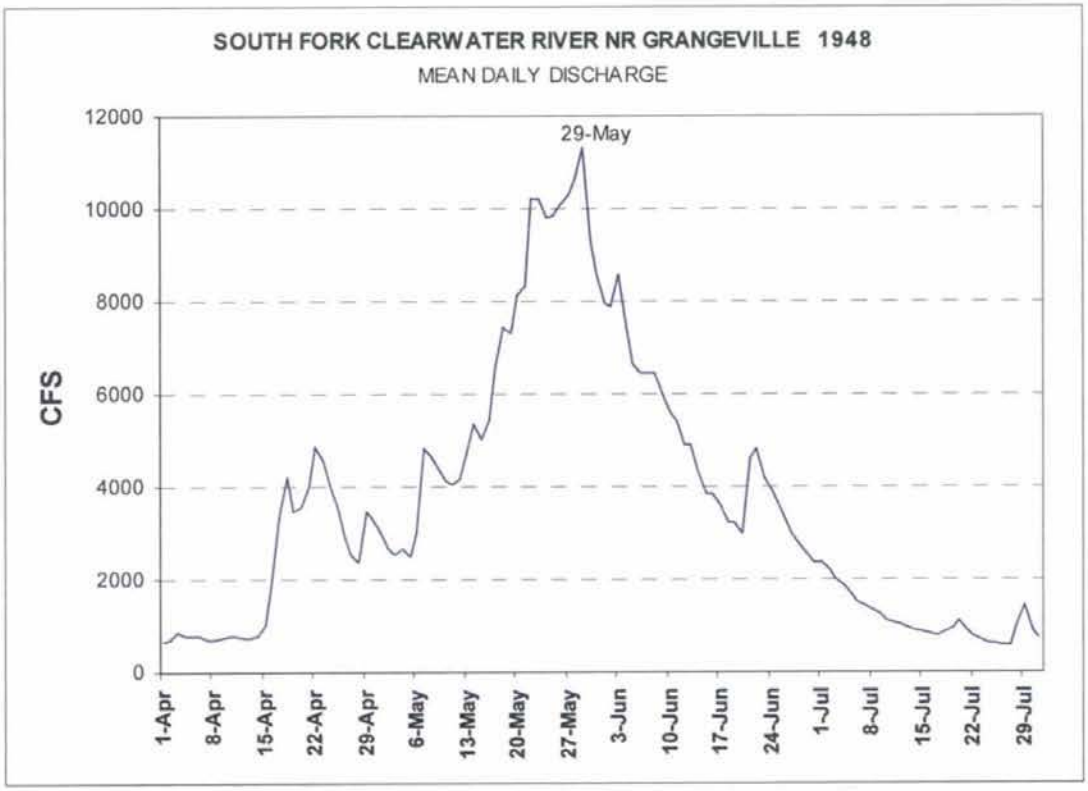


Fig. 6. South Fork Clearwater River near Grangeville –mean daily discharge in 1948.

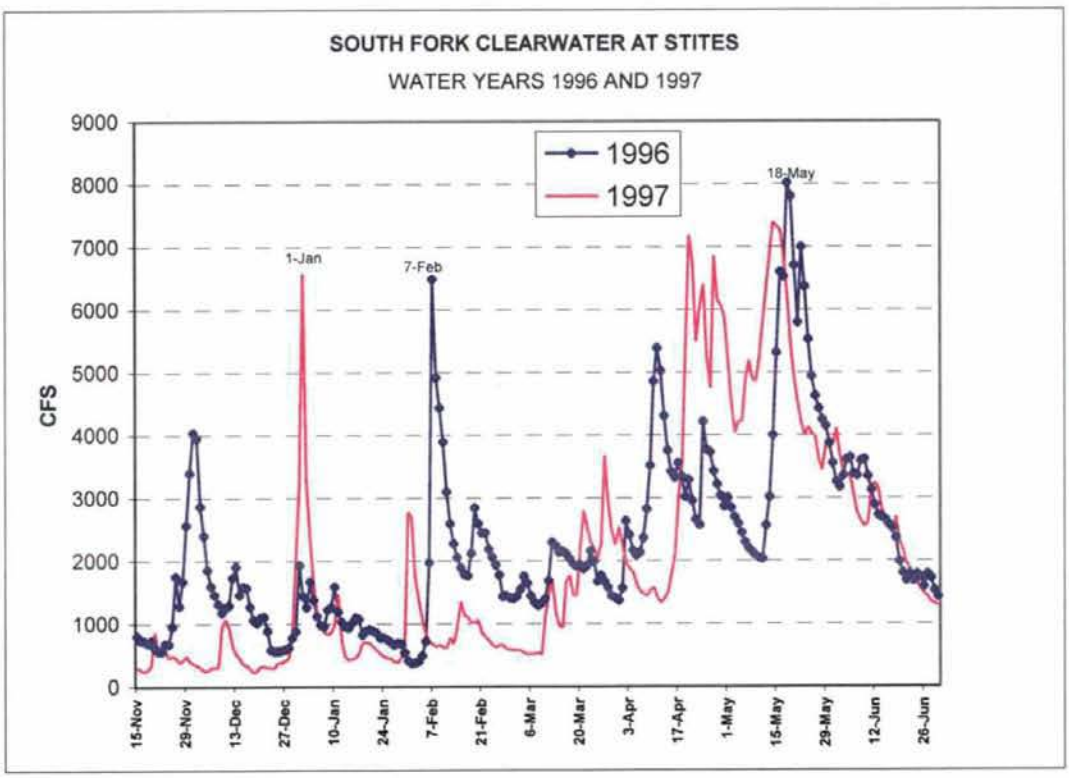


Fig. 7. Hydrographs of the South Fork Clearwater River at Stites for water years 1996 and 1997.

Flood events in 1996 and 1997 were similar in that a winter flood was followed by a spring flood. Cold Canadian air moved into the basin followed by wet Pacific storm systems moving over the cold air, causing heavy snow followed by heavy rain. The winter floods were caused by warm temperatures and heavy rain melting the mid and low elevation snowpack. Warm temperatures and heavy rain melting the higher elevation snowpack caused the spring floods. Flooding was widespread throughout the lower South Fork Clearwater River, but not as extensive as the 1948 and 1964 floods. Stites Creek overflowed its banks and flooded the highway. Highway damages for the 1997 floods were $2,5 million in Idaho County. Additional flood damage claims for Idaho County were $282,000 for the 1996 event and $698,000 for the 1997 event, with most of the damage in the Little Salmon River basin. The hydrographs for these flood events are shown in Fig. 7.

2.3.2 Ground Water

Aquifers are found where streams deposited sand and gravel, and where fractures are formed in rock. Geologists can understand aquifers and ground water flow patterns by mapping rock outcroppings and reviewing well logs. Development of ground water in the basin has been almost exclusively for domestic and municipal uses (Bendixsen 2000).

Castelin (1976) did the first work on ground water supply and availability in the Camas Prairie area. Ralston et al. (1993) addressed the issue of ground water supply on the Camas Prairie in the Grangeville area in the 1990's. Data from water wells drilled in the Grangeville area provided the information for the analysis of the ground water flow. The primary aquifers in the area are at the contact points between individual basalt flows. Basalt flows in the area are generally parallel but the continuity is broken in some places by faults. The intricate geology of the area creates a unique environment for the complex movement of ground water (Castelin 1976).

Ralston et al. (1993) found ground water declines in and around the City of Grangeville that ranged up to 21 feet per year. Ground water declined in the area faster than in other parts of Idaho. Much of the decline was attributed to poor well construction and penetration of multiple aquifers with deep wells. Many of the deep wells were constructed without casings, likely allowing water from the shallow aquifers to drain to lower zones (Ralston et al. 1993). Ralston recommended reconstructing several deep wells in the area to monitor the ground water decline.

2.3.3 Water Quality

Surface Water Quality

The Idaho Department of Environmental Quality (IDEQ) is the agency primarily responsible for water quality in Idaho's rivers and lakes. As a requirement of the Clean Water Act, IDEQ must provide an accurate assessment of the state's waters. The IDEQ works to implement federal and state water quality standards, including the regulation of pollutants that are discharged to the state's waters (http://www.deq.state.id.us/water/surface_water/WaterQualityStandards.htm). IDWR has water quality responsibilities as they relate to water quantity. IDWR coordinates with IDEQ on water quality concerns and protection efforts in the development of comprehensive state water plans for individual basins.

Water quality affects the quantity available for some uses. If water quality is compromised, it may not be suitable for some uses. Refer to the water quality section in the Basin Description for more information.

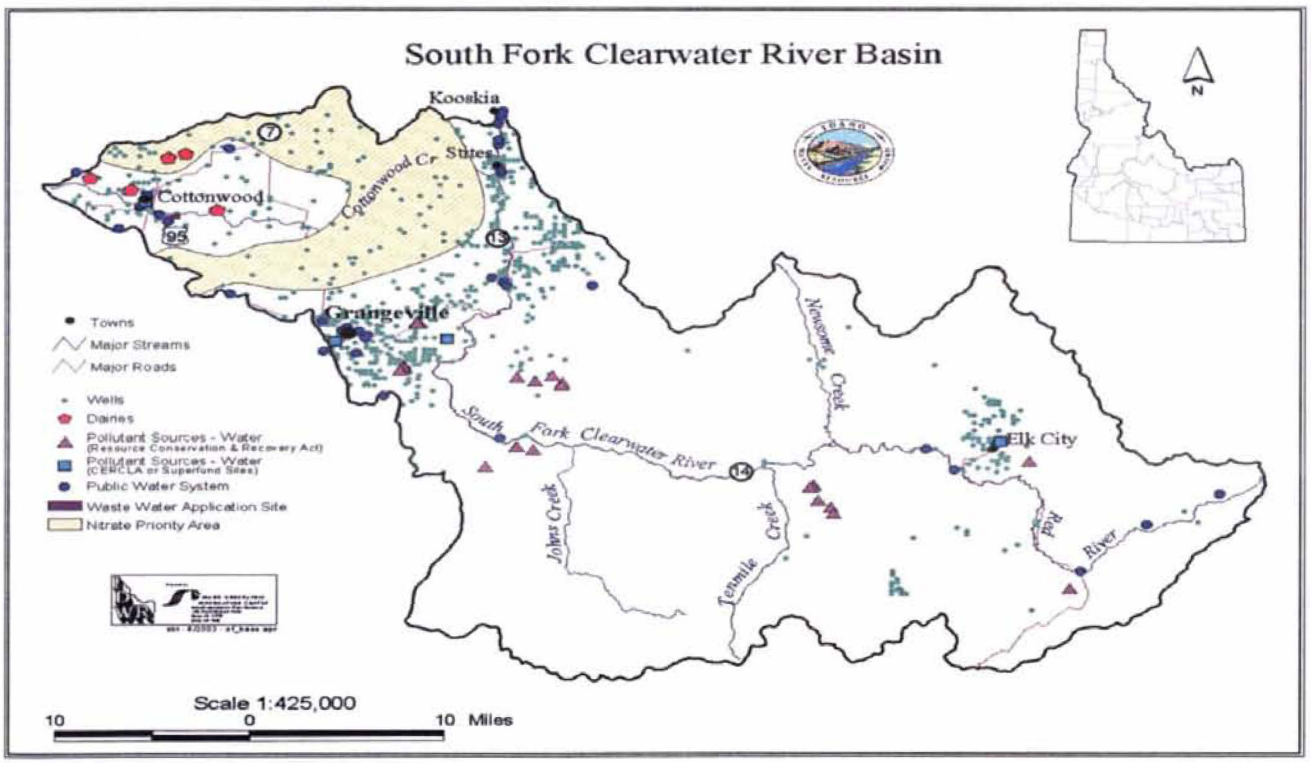
Implications

Restoration or maintenance of high quality aquatic habitat is a necessary component to restore high quality fisheries to the South Fork Clearwater River. While water quality is very important to fish management, fish species also require diverse habitats that meet the needs of all life stages in order to maintain healthy, reproductive populations. Factors outside the basin (e.g., dams) also have a significant impact on fish populations and abundance within the basin. The Northwest Power and Conservation Council (NWPCC) is coordinating efforts within the Columbia basin to address the numerous factors affecting anadromous and resident fish impacted by energy issues. (Subbasin Assessment http://www.nwppc.org/library/releases/2002/1113.htm and Subbasin Plan http://www.nwppc.org/library/isrp/isrp2003-3.htm)

Ground Water Quality

The need for ground water protection is essential in Idaho, where 90% or more of the population gets its drinking water from ground water sources (Clark 1998). The Ground Water Quality Protection Act of 1989 provided the framework for cooperative efforts between IDEQ, IDWR, ISDA, and other entities in comprehensive ground water quality assessment and protection activities (GWQC 1996). Prevention measures and programs are emphasized in the Ground Water Quality Plan as the most efficient and cost-effective means to protect the valuable ground water resources of the state.

Map 2. Potential water quality constraints in the South Fork Clearwater River basin with respect to private and public water supplies (PWS). RCRA (Resource Conservation and Recovery Act) deals with remediation for currently operating facilities. CERCLA (Comprehensive Environmental Response/Compensation/Liability Act) deals with remediation of hazardous substance releases from past practices. Private wells indicated are only the more recent wells established in the basin, as no location record exists for older wells.



IDEQ is designated as the primary agency to coordinate and administer ground water quality protection programs for the state (Idaho Code § 39-120) through permitting, monitoring, grants and loans, and technical assistance programs. Specific programs include Source Water Assessment, Drinking Water Program, Stormwater Program, and the Waste and Wastewater Program. IDWR and the Idaho Department of Agriculture (ISDA) work cooperatively with IDEQ on ground water protection and monitoring efforts. Additionally, many local, state, and federal programs deal with specific aspects of ground water quality (such as prevention, education, and monitoring), and work cooperatively with IDEQ to protect and restore the resource.

Protection of Public Drinking Water

Because of the large percentage of the basin's population that relies on ground water as their source for drinking water, source water assessment is an essential element in ground water quality protection activities. In addition to IDEQ's Drinking Water Program, the Source Water Assessment Plan for Idaho (IDEQ 1999) provides coordination of effort and collaboration among the many source water protection activities that are largely the responsibility of local jurisdictions. IDEQ is in the process of completing source water assessments for all public water systems, which includes delineation of the area that may contribute to source water contamination, contamination source inventory, susceptibility analysis, and public distribution of findings (scheduled for completion in 2005). Source water extraction points in the South Fork Clearwater River basin are shown on Map 2. Many other federal and state programs can integrate and contribute to source water protection. The plan also encourages the use of programs such as well-head protection to ensure the safety of domestic well water. The program emphasizes the need for a combination of BMPs to be most effective. These include land use controls, regulations and permits, structural measures, well-head protection, public education, land management, and emergency response preparedness plans (EPA 2001).

III. Issues, Analysis and Considerations

3.1 ISSUE: Recreational dredge mining

A. Issue Statement: Recreational dredge mining permit/regulation process is adequate in the South Fork Clearwater River basin.

Discussion

Recreational dredge mining is defined as mining with power sluices, small recreational suction dredges with a nozzle 5 inches in diameter or less and equipment rated at a maximum of 15 horsepower. Recreational dredge mining is regulated in Idaho under the Stream Channel Protection Act. This statute requires dredge miners to obtain a permit from IDWR before recreational dredge mining can be started. The state's One Stop Recreational Dredge Mining Permit does not require a National Pollution Discharge Elimination System (NPDES) permit. State regulations also specify the streams where recreational dredging is prohibited. Suction dredging that is not considered "recreation" is currently considered a "point source" of pollution requiring a National Pollution Discharge Elimination System permit from the U.S. Environmental protection agency. Recreational dredge mining is only allowed on the mainstem South Fork Clearwater River. Due to budgetary constraints of the Stream Channel Unit of the Resource Protection Bureau at IDWR, and to possible dredge mining limitations from the TMDL for the South Fork Clearwater River, current management and regulation of recreation dredge mining on the South Fork Clearwater River may be changing in 2005.

- The State of Idaho forbids use of recreational dredges within 500 feet of a developed campground, and the USFS prohibits their use in national recreation areas and protected rivers.
- Recreational suction dredges or sluices operated properly in a stream channel do not cause a great deal of environmental damage unless they are used in fish spawning beds (redds) at the wrong time of year. Redds could be damaged or totally destroyed by dredging. Eggs of salmonids prior to the eyed-up stage and sac fry would suffer high mortality if entrained by dredging (Griffith and Andrews 1981).
- Operation of recreational dredges in the South Fork Clearwater River would have some minor impacts on aquatic invertebrates (Griffith and Andrews 1981). Few insects would be killed but some would likely be displaced downstream. Thomas (1985) found lower abundance of aquatic insects in a 35-meter section of dredged stream. Recolonization was complete in a month after dredging.
- The South Fork Clearwater River may be dredged from July 15 to Aug 15 under the Recreational Dredging Permit if request is made on the Special Supplement. The site must also be inspected by IDWR with a fishery biologist. With that authorization, IDWR will issue a letter of approval. The rest of the drainage is closed under the Recreational Dredging Permit, but approval may be granted to dredge in the waters not open under the recreational permit if application is made using form 3804-B (Joint Application for a Permit). The limited season and permits minimize the impacts discussed under the two previous bullets.

Recommendations:

Currently, numerous laws regulate or restrict dredge mining in the mainstem South Fork Clearwater River including the Clean Water Act, the Stream Channel Protection Act, the Endangered Species Act and others. It is unlikely, that a new recreational dredging operation could be conducted in the South Fork Clearwater River without adequate review and environmental safe guards. Therefore, the IWRB does not recommend changing the current recreational dredge mining permit/regulation process.

3.2 ISSUE: Declining ground water on the Camas Prairie

B. Issue Statement: Ground water levels near Grangeville and in the Camas Prairie area of the South Fork Clearwater River basin may be declining.

Discussion

Aquifers, subsurface water-saturated formations of fractured rock or gravel, are encountered in the area around Grangeville. Geologists develop an understanding of aquifers and ground water flow patterns by mapping rock outcroppings, reviewing well logs and measuring the depth to water in wells. Pumping ground water can cause a decline in water level in an aquifer. If aquifer recharge is less than loss from discharge and pumping, then the water level will drop.

Castelin did the first work on ground water supply and availability in the Camas Prairie area and found that intricate geology of the area creates a unique environment for the complex movement of ground water (Castelin 1976).

Ralston et al.(1993) found that water level declines in and around the City of Grangeville ranged up to 21 feet per year. Ground water decline in the area was faster than other parts of Idaho. Ground water withdrawals appear to be exceeding recharge in the Grangeville area. Much of the decline was attributed to poor well construction and penetration of multiple aquifers with deep wells. Many of the deep wells were constructed without casings, likely allowing water from the shallow aquifers to drain to lower zones (Ralston, et al. 1993). To address the declining ground water, it was recommended that several deep wells in the area be reconstructed to prevent commingling. In this case, commingling refers to the upper aquifer draining into the lower aquifer. IDWR has hired a consultant to update the Well Construction Standards Rules and to investigate other related issues. In addition, Ralston also recommend that another deep well be drilled by the city. This has been done and the well contributes significantly to the city water supply.

A water system engineering study was prepared for the City of Grangeville (Entranco 2003). Both the quantity and quality of the source of city water is adequate to meet current and projected demand until 2022. Little or no growth is projected for the city and water demand is flat or declining. However, Entranco also recommended that the City of Grangeville continue to monitor the production capacity of its' three sources from the shallow ground water aquifer.

Although ground water levels have declined in the Grangeville area, it is not a critical issue at this time (Ralston 2003). Sometime in the future (25 to 50 years), ground water supply in the Grangeville area could be a significant issue. Ralston (1993) stated that monitoring ground water levels in the Grangeville area would be prudent and recommended in 1993 that a study of ground water be conducted every 10 years.

Recommendations:

- A study by IDWR to update Ralston's work in 1993 should be conducted.
- IDWR should evaluate ground water levels in the Grangeville area to monitor trends especially in the shallower aquifers wells.
- If ground water level declines are found to be a problem, IDWR should evaluate the feasibility of stabilizing groundwater levels in the Grangeville area.

3.3 ISSUE: Other projects in the basin

C. Issue Statement: The IWRB acknowledges the efforts of the Clearwater Subbasin Assessment and the Clearwater Focus Watershed Project.

Discussion

The Clearwater Subbasin Assessment and Plan, part of the rolling provincial review process developed by the Northwest Power and Conservation Council (NWPCC), will be used to facilitate future management of resources affecting fish and wildlife. The Clearwater Subbasin Assessment was completed in 2002. The data and information gathered in the assessment was used in creating the initial draft of the Clearwater Subbasin Plan. After review and comment from the NWPPCC and the Columbia Basin Fish and Wildlife Authority, the Clearwater Subbasin Plan is being revised. Once revisions are made and the Subbasin Plan is approved the Clearwater Focus Program will begin implementation.

Recommendation:

The IWRB acknowledges the usefulness of information from the work of the Clearwater Focus group in their efforts in development of the Subbasin Assessment (http://www.nwppc.org/library/releases/2002/1113.htm) and Subbasin Plan (http://www.nwppc.org/library/isrp/isrp2003-3.htm) to address the numerous factors impacting anadromous and resident fish within the Columbia Basin.

3.4 ISSUE: Instream flows on public land streams

D. Issue Statement: The South Fork Clearwater River basin has a large area of public land without protected instream flows for anadromous and resident fish, wildlife, recreational and other activities afforded by the Nez Perce NF.

Cooperative Efforts

The Organic Administration Act of 1897 establishing the National Forest System (NFS) recognized the importance of water and water management. However, whether or not water on NFS lands is part of the federal estate has been the source of controversy, debate and litigation between states and the federal government. Based upon existing laws and court rulings, the USFS is required to pursue protection of instream flows through each state's water rights appropriation statutes. In Idaho, state law requires that minimum stream flow rights for the protection of fish

and wildlife, water quality, recreation, and other beneficial uses be established through the IWRB's Minimum Stream Flow Program, and such rights can be held only by the IWRB, in the public's behalf.

Recognizing the need to protect necessary minimum stream flows in the Nez Perce National Forest, and the problems associated with federal ownership of instream flow water rights in Idaho, the USFS and the IWRB signed a MOU in August 2000, and a supplemental MOU in 2001 for implementation in the South Fork Clearwater basin. One component of the supplemental MOU was for the USFS and IWRB to jointly identify and prioritize instream flow needs, streams to be considered as state protected rivers, water development and stream channel protection needs and other water related issues for consideration in the comprehensive state water plan and forest planning.

Like any other water right, a minimum stream flow must take its place by priority. A minimum stream flow right is filled only when senior rights have been satisfied. The process for the IWRB to acquire a minimum stream flow water right is separate, but maybe initiated through comprehensive state water planning process. Studies to determine the quantity and timing of the minimum stream flow and the beneficial uses to protect must be conducted before a minimum stream flow is granted. The IWRB can then submit an application to the director of the IDWR, who determines whether to grant the right in accordance with Title 42, Chapter 15 of the Idaho Code. Minimum stream flows granted by the director are approved by concurrent resolution of the Idaho State Legislature

Discussion

The South Fork Clearwater River basin contains a significant amount of high to very high potential fish habitat, and is an important area for fish species when evaluated within the broader context of the Columbia River basin (USFS 1999). The basin currently provides habitat for ESA listed species (fall chinook, steelhead, bull trout) and Idaho Endangered or Sensitive Species (Pacific lamprey, redband trout, spring chinook, westslope cutthroat trout). The resident species in the system are thought to be of wild origin, and the system supports both resident and fluvial life histories of westlope cutthroat trout and bull trout. All species remain widely distributed, although the abundance has declined significantly from historic levels (USFS 1999).

The combination of resident and migratory life histories in fish is a strategy for disturbance-based systems, such as the South Fork Clearwater River basin. The intermixing of local subpopulations with metapopulations is also an adaptive strategy (USFS 1997). The problem is that natural disturbance cycles/characteristics have been altered and/or replaced by man-made disturbances. Fish populations are widely distributed, but the distributions are likely quite different than historically. Fish abundance appears to have declined significantly. Viability of the fisheries is at risk due to in-basin and downstream factors that limit flexibility and alter life history strategies (USFS 1997).

Within the lower basin (Cottonwood Creek drainage), BLM's 1999 biological assessment showed suboptimal support for salmonids (IDEQ et al. 2000, Appendix D). Higher temperatures, sediment (suspended and bedload), and loss of habitat in the lower South Fork Clearwater River have reduced connectivity for migrating adult fish (ISWCD 2001).

While only seven segments have been listed for temperature on the 303(d) list, the subbasin assessments within the South Fork Clearwater River basin indicates water temperature is a basin-wide problem. The current standard for the protection of cold-water biota is water temperature of

22°C (71.6°F) with a maximum daily average of 19°C (66.2°F) (IDEQ et al. 2002). The standard for salmonid spawning is water temperature of 13°C (55.4°F) or less with a maximum daily average no greater than 9°C (48.2°F) during the spawning season. Stream channelization, lack of riparian cover, and altered flow regimes are contributing factors to the temperature problem, resulting in wide, shallow channels that increase the river's ability to absorb heat (IDEQ et al. 2000, 2002).

Habitat for spawning, feeding, resting, brood rearing, and escape must be provided by the riverine system. Significant areas still exist where uplands, riparian areas and stream conditions are relatively intact. For instance upper Johns and Tenmile Creeks (highlands of the Hump) have had little mining influence and are probably the best habitat for many salmonid species (IDEQ et al. 2002). There is also a significant amount of high to very high potential to support fish within the Nez Perce NF (USFS 1997). Adequate flows are required to provide these high quality instream habitats.

Long-Term Fish Habitat Sustainability

Minimum stream flows in Idaho are established based on the minimum (not optimum) amount of water needed to maintain instream beneficial uses such as water quality, recreation, and fish and wildlife. To date, minimum stream flow analyses for fish habitat have focused solely on short-term requirements, and have not included long-term sustainability issues.

Flushing flows maintain the stability and effective function of stream channels (Rosgen et al. 1986), and are a critical requirement to long-term sustainability of healthy riverine systems in the South Fork Clearwater River basin. Several assessments have examined the health and sustainability of the biological community within the South Fork Clearwater River basin. The assessments (IDEQ et al. 2000; USFS 1997; IDEQ-BURP, IDEQ et al. 2000, 2002; SAWQP, ISWCD 2001) indicate that the riverine habitat is negatively impacted by a variety of land and water uses. Improvements to habitat cannot be obtained unless functional channels are reestablished (Petts and Catlow 1996, Gordon et al. 1992). Cobble embeddedness occurs when fine sands and silts are deposited over larger substrate particles (gravel, rubble, cobble, boulder). Cobble embeddedness greater than about 30% is considered harmful to cold water biota and fisheries. Increased cobble embeddedness within the river and many tributaries has adversely affected salmonid spawning, juvenile survival, and density and diversity of macroinvertebrates.

Minimum streamflow analyses for the South Fork Clearwater River basin have included this important component. The beneficial use of flushing flows is provided to these systems at intervals outside the current standard used by the IWRB (flow must be met at least 50% of the time).

Recommendation:

- Idaho's water resources are valuable. Water provides irrigation, domestic and industrial uses, fish and wildlife habitat, recreation, and aesthetics. To preserve these values and protect downstream water rights in this basin, the IWRB had committed to filing for minimum stream flow water rights on the following streams:
    - **Red River**
    - **American River**
    - **Crooked River**
    - **Newsome Creek**

- **Tenmile Creek**
- **South Fork Clearwater River**
- **Johns Creek**
- **Mill Creek**
- **Meadow Creek**

These streams proposed for minimum stream flows had been selected based on cooperative efforts between the IWRB planning staff, USFS personnel, Idaho Fish and Game, and the Nez Perce Tribe. Soon after the IWRB had approved the final draft of this plan, the State of Idaho, the Department of the Interior, the Nez Perce Tribe and others announced the development of a framework for a proposed settlement agreement (see page 4). One component of this agreement is the establishment of minimum stream flow water rights on streams in the Salmon and Clearwater basins. All of the streams recommended in this plan for IWRB consideration of minimum stream flow water rights were included in the settlement agreement as category A streams and will be considered for legislative enactment in 2005. Streams in the A category will have minimum stream flow water rights set by month based upon the estimated hydrology of the unimpaired flows, and a reservation for future non-domestic, commercial, municipal, and industrial (DCMI) uses. The exceedence level for each month for streams in federally managed lands is 40%. In other words, the minimum flow rate will be met or exceeded four years out of ten. The only exception to this is the 50% exceedence level on the South Fork Clearwater mainstem due to adjoing privately owned lands along portions of the river. The non-DCMI reservation will be 10% and 25% respectively, of the minimum monthly median flow developed from the estimated hydrology for streams surrounded by federal and private lands. Several conditions must be met for the settlement agreement to be completed, but if the conditions are met, the streams listed above will have adjudicated minimum stream flow water rights.

The proposed settlement agreement includes minimum stream flows that were not recommended in the plan. Cougar Creek, Peasley Creek, Silver Creek, South Fork Red River, and Big Elk Creek will be adjudicated as list A minimum stream flows at 40% (federal land) exceedence levels. In addition, Three Mile Creek, Sally Ann Creek, and Rabbit Creek will be adjudicated as list A minimum stream flows at 50% (state and private land) exceedence levels.

The proposed Nez Perce Tribe settlement agreement also included a stream, Cottonwood Creek, located in the South Fork Clearwater River basin, that is in category B. Category B streams are those where minimum stream flows and non-flow related actions will be developed, pursuant to state law, by the settlement parties in consultation with local stakeholders. The parties will consider the present hydrograph and status of state-granted water rights when negotiating minimum stream flow water rights. These minimum stream flows may be supported by transactions between willing sellers and willing buyers through the Board's water bank.

3.5 Protection Designations

A comprehensive state water plan may designate outstanding waterways as "protected:" as either a "natural" or "recreational" river. Both protection designations are defined by Idaho Code 42-1731(7) and (9) as " ... a waterway which possesses outstanding fish and wildlife, recreation, geologic, or aesthetic values..."

- **Natural Rivers** are free of substantial human development in the waterway, and the riparian area is lacking significant human development (but may be accessible in places by trails or

roads).

- **Recreational Rivers** may include human development in the waterway or the riparian area.

The IWRB considers the impacts of protected river designations on the social, economic, and environmental well being of the region. A protection designation is made if the IWRB determines the value of preserving the waterway is in the public interest and outweighs development for other beneficial uses (Idaho Code 42-1734A(4)). Under a natural river designation, the following activities are prohibited:

- Construction or expansion of dams or impoundments
- Construction of hydropower projects
- Construction of water diversion works
- Dredge or placer mining
- Alterations of the stream bed
- Mineral or sand and gravel extraction within the streambed

Under a recreational river designation, the IWRB determines which of these activities will be prohibited, and may specify terms and conditions for activities not listed (Idaho Code 42-1734A(5).

Prohibitions do not interfere with activities necessary to maintain and improve *existing* utilities, roadway systems, managed stream access facilities, diversion works, or private property. Natural and recreational designations do not change or infringe upon *existing* water rights or other vested property rights. Existing valid mining claims are property rights and are not obstructed by designations. However, future mining claims that impact the stream channel would be prohibited by a natural designation and could be prohibited by a recreational designation.

As a part of the development of the *South Fork Clearwater River Basin Comprehensive State Water Plan*, streams were identified that will benefit from state protection designation to protect current values for the people of Idaho. Streams that were outstanding in at least two of the three screening categories (biological, recreational, aesthetic) were considered for protection, and were prioritized and selected with significant input from and collaboration with the watershed advisory group, and state and federal agencies.

Potential Effects of Designation

There are potential benefits and costs of designating rivers for protection under state law. Benefits include the maintenance and possible improvement of fish and wildlife habitat, recreational uses, and scenic qualities provided by an intact riverine environment. Economic benefits may come from increased local spending by fishermen, recreationists and other benefits of a healthy river system.

Possible costs, (foregone development), depend on the specific prohibitions and conditions placed on a designated river. On the South Fork Clearwater, this may include foregoing construction of hydropower plants, commercial dredge and placer mining operations, and sand and gravel extraction from the streambed. Timber operations are governed by other state and federal regulations and would not be affected by designation, with the possible exception of some types

of stream crossings. However, designations are not intended to prevent stream crossings for silvacultural or recreational activities that do not harm the stream channel. Dispersed livestock watering would not be affected by designation.

Designated Waters in the South Fork Clearwater River Basin

The IWRB has determined that the value of preserving the designated waterways of the South Fork Clearwater River basin is in the interest of and for the benefit of the state as a whole. All landowners – private, state, and federal – are encouraged to manage their lands consistent with the IWRB's protection designations. The IWRB also encourages federal resource management agencies to work within the comprehensive state water planning process rather than pursuing federal protection of waters within Idaho.

To protect the public interest, current resource use, and the multiple-use character of the basin, the Idaho Water Resource Board designates the following streams and stream segments (approximately 54 miles) as **Natural Rivers** (see Map 3) based upon the analysis from Section IV, Resource Summary and Evaluation. All of the Natural designated rivers in the South Fork Clearwater River Basin are on federal land and most originate in Wilderness areas.

1) **Tenmile Creek** - (10 miles) from headwaters to Wilderness boundary and the following tributary:
   - **Williams Creek** - (5.2 miles): Headwaters to confluence with Tenmile Creek,
2) **Twentymile Creek – (**3 miles**):** Headwaters to Wilderness boundary,
3) **Johns Creek** - (8 miles): from headwaters to Wilderness boundary, and the following tributaries:
   - **Hagen Creek** - (4.4 miles): Headwaters to confluence with Johns Creek,
   - **Square Mountain Creek** - (5.0 miles) Headwaters to confluence with Moores Creek:
   - **Moores Creek** - (6.4 miles): Headwaters to confluence with Square Mountain Creek,
   - **Gospel Creek** - (6.6 miles): Headwaters to confluence with Johns Creek,
   - **West Fork Gospel Creek** - (5.2 miles): Headwaters to confluence with Gospel Creek,

To protect the public interest, current resource use, and the multiple-use character of the basin, the Idaho Water Resource Board designates the following streams and stream segments (approximately 324 miles) as **Recreational Rivers** (see Map 3) based upon the analysis from Section IV, Resource Summary and Evaluation:

1) **Red River** (27.2 miles) Headwaters to confluence with American River, **and the following tributaries**:
   - **Otterson Creek** - (3.5 miles): Headwaters to confluence with Red River,
   - **South Fork Red River** - (11.7 miles): Headwaters to confluence with Red River,
   - **West Fork Red River** - (4.3 miles): Headwaters to confluence with Middle

South Fork Red River,

- **Moose Butte Creek** - (3.5 miles): Headwaters to confluence with Red River,
- **Red Horse Creek** - (8.2 miles): Headwaters to confluence with Red River,

2) **American River** (21.6 miles) Headwaters to confluence with South Fork Clearwater, **and the following tributaries**:
   - **Limber Luke Creek** - (2.8 miles): Headwaters to confluence with American River,
   - **West Fork American River** - (5.0 miles): Headwaters to confluence with American River,
   - **East Fork American River** - (6.5 miles): Headwaters to confluence with American River,
   - **Kirks Fork** - (6.8 miles): Headwaters to confluence with American River,

3) **Crooked River** (11.6 miles) Headwaters to confluence with South Fork Clearwater, **and the following tributary**:
   - **Relief Creek** - (6.3 miles): Headwaters to confluence with Crooked River,
   - **East Fork Crooked River** – (7.1 miles): Headwaters to confluence with Crooked River,
   - **West Fork Crooked River** - (5.3 miles): Headwaters to confluence with Crooked River,

4) **Newsome Creek** (15.7 miles) Headwaters to confluence with South Fork Clearwater, **and the following tributaries**:
   - **Haysfork Creek** - (5.0 miles): Headwaters to confluence with Newsome Creek,
   - **Baldy Creek** - (6.1 miles): Headwaters to confluence with Newsome Creek,
   - **Pilot Creek** – (6.0 miles): Headwaters to confluence with Newsome Creek,
   - **Sawmill Creek** – (3.6 miles) Headwaters to confluence with Newsome Creek,
   - **Sing Lee Creek** - (3.0 miles): Headwaters to confluence with Newsome Creek,
   - **West Fork Newsome Creek** - (6.0 miles): Headwaters to confluence with Newsome Creek,

5) **Tenmile Creek** (7 miles)–Wilderness boundary to confluence with South Fork Clearwater **and the following tributary**:
   - **Sixmile Creek** - (4.7 miles): Headwaters to confluence with Tenmile Creek,

6) **Twentymile Creek**- (8 miles): Wilderness boundary to confluence with South Fork

Clearwater,

7) **Wing Creek** - (5.1 miles): Headwaters to confluence with South Fork Clearwater,

8) **Silver Creek** - (15.9 miles): Headwaters to confluence with South Fork Clearwater,

9) **Johns Creek –** (12 miles): Wilderness boundary to confluence with South Fork Clearwater,

10) **Meadow Creek** - (15.2 miles): Headwaters to confluence with South Fork Clearwater,

11) **Mill Creek** - (15.9 miles): Headwaters to confluence with South Fork Clearwater,

12) **South Fork Clearwater** (63.8 miles) Headwaters to confluence with Middle Fork Clearwater

The following activities are prohibited on all streams designated as recreational rivers in the South Fork Clearwater River basin. Specific stream segments and water bodies that have exceptions to the general prohibitions are listed below.

Prohibited activities:

- Construction or expansion of dams or impoundments;
- Construction of hydropower projects;
- Construction of diversion works;
- Dredge or placer mining (including recreational dredging, except where allowed through application for permit, Form 3804-B);
- Mineral or sand and gravel extraction within the stream channel;
- Alterations of the stream channel, except as provided below.

Activities allowed with terms and conditions: The following activities are allowed if they do not impede fish passage, spawning, rearing and boat passage:

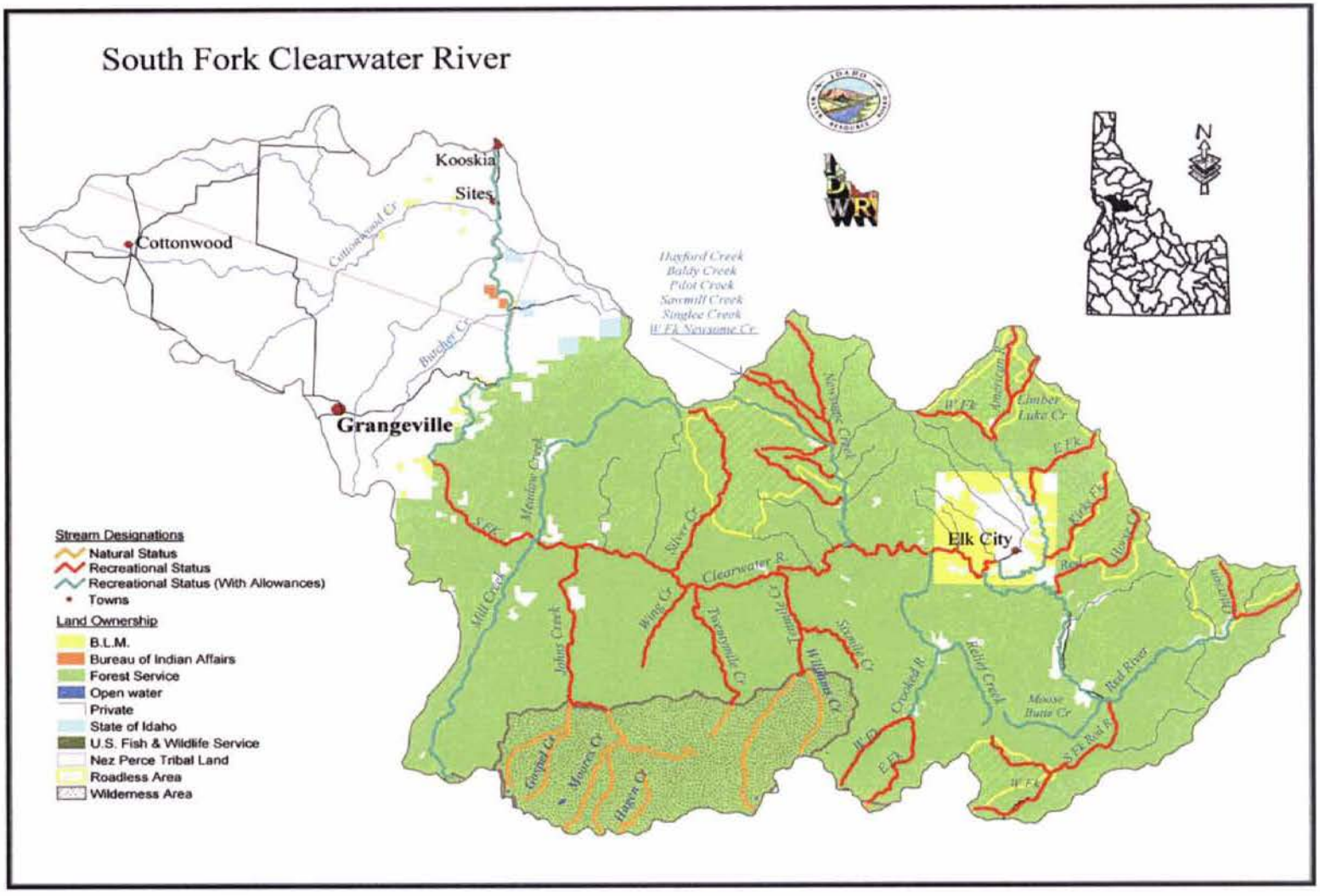
- Alterations of the stream channel for construction and maintenance of:
    - roads, bridges, and trails;
    - public recreation facilities;
    - fish and wildlife enhancement structures;
    - and channel reconstruction projects approved by the IWRB.

Recreational Designated Streams with Exceptions to Prohibited Activities: The following rivers or streams are adjacent to privately owned land which may require construction of diversion works for domestic, municipal or agricultural uses.

1. South Fork Clearwater River, from the Nez Perce National Forest boundary to confluence with Middle Fork Clearwater:
2. Red River and Moose Butte Creek
3. American River, mainstem only
4. Relief Creek
5. Crooked River, mainstem only
6. Newsome Creek mainstem and Pilot Creek
7. Meadow Creek
8. Mill Creek

Exceptions to Prohibited activities: Construction of water diversion works for domestic, municipal, and agricultural uses is allowed on the specified water bodies (1 – 8) if they do not impede fish passage, spawning, rearing or boat passage:

All activities must comply with all state stream channel alterations rules and standards. All works must be constructed or maintained to minimize erosion and sedimentation.



Map 3. Protected river designations

IV. Resource Summary and Evaluation

4.1 State River Designation

Idaho's designated rivers program is designed to protect waterways that "possess outstanding fish and wildlife, recreation, geologic, or aesthetic values" [*Idaho Code 42-1731b (7), (9)*]. Two categories of protection exist: 1) a **natural river** is free of substantial impoundments, dams, or other structures, and the riparian area is largely undeveloped, 2) a **recreational river** may include some man-made development in the waterway or riparian area. The resource evaluation assesses a basin's rivers and streams for qualities that make them eligible for designation. A designation is made only if the IWRB determines the value of preserving the waterway is in the public interest, and outweighs developing the river for other beneficial uses. State designation does not change or infringe upon existing water rights or other vested property rights.

4.2 Screening Process

Three assessment criteria were used to identify outstanding resource values: 1) biological, 2) aesthetic (including geologic features), and 3) recreational.

All perennial waterways or segments were considered initially as eligible for resource evaluation. Biological, aesthetic, and recreational data were collected from numerous sources (e.g., IDEQ, IDFG, USGS, local government). These data were used in conjunction with field evaluations using biological, aesthetic, and recreational assessment criteria to rank waterways' resource values within the basin.

4.3 Biological Values

The biological screening procedure identifies outstanding fish, wildlife, and riparian community values of a waterway. The procedure incorporates a number of different stream assessment methodologies, including the Rapid Bioassessment Protocol and STREAMWALK (EPA), the Beneficial Use Reconnaissance Procedure (IDEQ), and StreamNet (IDFG). The screening involves a two-step process: 1) an aquatic and riparian assessment, based on field evaluations and existing data, of 20 specific attributes that characterize biological value, and 2) collection of all pertinent data available on the aquatic and riparian resources of the South Fork Clearwater River and tributaries to determine crucial/unique species and habitats. The 20 attributes (Table 5) were divided into four basic components for ease in organizing and prioritizing, and included:

1) *Aquatic habitat* – physical conditions and water quality associated with the waterway,
2) *Riparian habitat* – physical conditions and vegetation community characteristics in the riparian corridor,
3) *Aquatic species* – plant and animal species associated with the waterway and their population attributes,
4) *Riparian species* - plant and animal species associated in the riparian corridor and their population attributes.

Based on the data and field assessments, attributes for each waterway or waterway segment were scored as positively contributing to the quality of the aquatic or riparian community (1), marginally contributing (0.5), or not contributing or absent (0). It was also noted where no data existed for an attribute. Multiple sites were assessed for selected river segments or tributaries. Sites were selected based on accessibility and representation of broad condition classes found within the segment. Scores were averaged to represent the segment score, with the average

weighted according to the estimated proportion of the area that the site represented (condition class) within the entire segment being evaluated.

Crucial Species and Habitats

Rare plants and animals and crucial or unique habitat for wildlife are considered biologically outstanding. In the South Fork Clearwater River basin, mining, roadways, timber production, and other human activities have impacted important habitat. Protection of remaining habitat critical to rare plants and animals that rely on these ecosystems for at least some portion of their life cycle is needed. In the South Fork Clearwater River basin, these species and habitats include:

- **Presence of Idaho or Federal Threatened and Endangered Species:**
  - Fall chinook salmon (*Oncorhynchus tshawytscha*) is listed as threatened under the Endangered Species Act. All fall chinook above Lower Granite Dam are considered one ESU. Fall chinook salmon is one of three races of chinook salmon in Idaho. The races are differentiated on the basis of entry time into fresh water.
  - The anadromous steelhead trout (*Onchorhynchus mykiss*) including those in the South Fork Clearwater Riverwas listed as threatened under the Endangered Species Act in 1997. Naturally produced South Fork Clearwater Riversteelhead are considered part of the Snake River ESU.
  - Bull trout (*Salvelinus confluentus*), a charr, was listed as threatened under the Endangered Species Act in 1998. The listing required that agencies administer active management plans to protect the species and its habitat. Key habitat for bull trout includes the entire South Fork Clearwater Riversubbasin above Meadow Creek (Idaho Bull Trout Conservation Plan (1996).
  - Pacific lamprey (*Lampetra tridentata*) is listed as Endangered by the state (IDFG 2001). Adult returns of lamprey to the Snake River from 1995-1999 were much less than they were in the 1960s.
  - Bald eagle (*Haliaeetus leucocephalus*) is currently listed as threatened. Bald eagles winter along the South Fork Clearwater River and on the Camas Prairie.
- **Rearing and spawning habitat and/or population and habitat strongholds for fall chinook, spring chinook, Steelhead, Bull Trout, and Westslope Cutthroat Trout:** The subbasin is an important area for fish species within the Columbia River basin. Bull trout have very specific habitat requirements. Much of the high elevation habitat remains in good condition. In the mid to high elevation low relief hills and alluvial valleys, in the upper basin, there has been considerable habitat degradation. Management recommendations include conservation of existing high quality bull trout spawning and rearing habitat and subadult/adult rearing habitats (strongholds and habitat strongholds), conservation of existing steelhead trout strongholds, which include Johns and Tenmile Creeks, and conservation of existing cutthroat trout stronghold spawning and rearing areas and subadult/adult rearing habitats. These include Johns Creek, Twentymile Creek, Tenmile Creek, and Upper Crooked River (South Fork Clearwater River Landscape Assessment 1998).
- **Outstanding Aquatic Habitat:** There are significant areas within the South Fork Clearwater River subbasin where upland watershed, riparian, and stream conditions are relatively intact. The integrity of these relatively pristine areas needs to be protected (South Fork Clearwater River Landscape Assessment 1998).

- **Unique wetland communities:** Significant wetland communities are disappearing rapidly due to human activities. These communities provide important wildlife habitat and/or migration corridors, diverse plant and animal assemblages, and water quality protection, and should be preserved. About 4 to 6% of the land area in the Nez Perce NF consists of various wetland communities. Many of these wetlands have been altered to some degree from their natural condition. Unique wetland communities within the South Fork Clearwater River basin include:
  - 1) Black cottonwood - grows as isolated small groups and individuals in areas with high summer moisture and along major streams, particularly along the lower South Fork Clearwater River. Fire suppression, and consequent reduction in water yield fluctuations, streamside road construction and floodplain constriction, agriculture, and dredge removal of valley substrates, have reduced the area available to cottonwood;
  - 2) Streamside montane meadows - dominated by grasses, rushes, sedges, and forbs requiring wet conditions. The integrity of riparian vegetation and its extent along rivers has been changed and fragmented throughout the basin in response to forest conversion and streamside disturbance These habitats add diversity to the surrounding expanse of coniferous forest. Common snipe, Lincoln's sparrow, spotted frog, and moose are all associated with montane meadows. Too much disturbance (such as from excessive grazing) or too little disturbance (such as the complete absence of fire for several decades) threaten the viability of these habitats; and
  - 3) Fens - wet areas that support plant species like cottongrass and sundew that require acid organic soils and high water tables. These communities are vulnerable to activities that alter hydrologic regimes or soil acid, encourage conifer encroachment, or directly impact the areas through excavation or trampling. (based on South Fork Clearwater River Landscape Assessment 1998, South Fork Clearwater River Biological Assessment 1999)

Biological Resource Screening Results

Both components of the evaluation, aquatic and riparian, were considered to determine if a waterway possessed outstanding biological values. Waterways identified as possessing outstanding biological values within this basin needed to score at least 50% on the attribute criteria, or possess crucial/rare/unique species or habitats. Table 6 summarizes the biological assessment for the waterways evaluated in the South Fork Clearwater River basin.

Table 5. Twenty attributes used to evaluate biological values.

HABITAT—AQUATIC

[Attribures are scored as: D = no data; 1 = criteria met; 0.5 = criteria marginally met; 0 = criteria not met]

1. Bottom substrate type (observe in channel-forming pool tail-outs [at least 1/3 of stream width] and low gradient riffles): gravel/cobble/boulders dominant; fine sediment not dominant
2. Instream cover: large woody debris and/or undercut bank
3. Instream habitat: complexity of stream channel habitats present (riffles [or bends], runs, pools)
4. Water quality: at least one of the following DEQ classifications applies to study reach:
    - Meets ***all*** beneficial uses (***not*** 303(d) listed waterbody)
    - Outstanding Resource Water (nominated or designated)
    - Special Resource Water

Critical spawning habitat:

5. Spawning occurs, or habitat present favorable for spawning

HABITAT—RIPARIAN

6. Bank stability: vegetation canopy and roots cover majority of bank and no slumping or eroding occurs
7. Riparian vegetation cover: dominated by shrubs and/or trees
8. Special management areas: at least one of the following occurs along study reaches;

- Area of Critical Environmental Concern
- Pioneer Area
- Priority Wetlands
- Research Natural Area
- Wild & Scenic River or eligible
- Special Interest Botanical Area
- Recovery Area
- Wildlife Refuge
- Hot Springs Aquatic Community
- Wilderness Area or proposed
- Wildlife Management Area

Critical wildlife habitat:

[9. wintering/calving/fawning
10. migratory/roosting

SPECIES—AQUATIC

11. Fishery classification: at least one of the following IDFG fishery classifications applies to study reach:
    Trophy Preservation Quality Wild Trout Anadromous
12. Fish species richness: diversity (no. species with balanced abundances) relatively high
13. Fish species composition: predominantly native or game species
14. Aquatic insect composition: predominantly species of low pollution/sediment tolerance (e.g., mayflies, stoneflies, caddisflies)

Rare aquatic biota:
15. Federal listed species: Names/classification_____
16. State priority species (IDFG/CDC ranking): Names/classification_____

SPECIES—RIPARIAN
17. Riparian species richness: diversity (total no. species with balanced abundances) relatively high
18. Riparian species composition: predominantly native species

Rare riparian biota:
19. Federal listed species: Names/classification_____
20. State priority species (IDFG/CDC ranking): Names/classification_____

Table 6. Summary of biological values identified during resource screening of the South Fork Clearwater River basin.

Drainage	River Segment or Tributary	Criteria Score (%)[1]	Unique Species or Habitats
Mainstem SF Clearwater River	SF Clearwater River (confluence with Middle Fork Clearwater to Nez Perce NF border)	57.5	Bald eagle wintering Remnant Black Cottonwood Forest Fall chinook spawning and rearing habitat Presence of pacific lamprey, bull trout, steelhead
	SF Clearwater River (Nez Perce NF border to Leggett Creek)	65.0	Bald eagle wintering Spring chinook spawning and rearing Presence of pacific lamprey, bull trout, steelhead
	SF Clearwater River (Leggett Creek to Red and American Rivers)	62.5	Spring chinook spawning and rearing Presence of pacific lamprey, bull trout, steelhead
Cottonwood Creek Drainage	Lower Cottonwood Creek	30.0	Remnant Black Cottonwood Forest Bald eagle winter foraging Presence of steelhead trout
		25.0	
	Upper Cottonwood Creek		
	SF Cottonwood Creek	12.5	
	Shebang Creek	12.5	
	Stockney Creek	15.0	
	Red Rock Creek	13.2	
	Long Haul Creek	10.0	
Newsome Creek Drainage	Newsome Creek	47.5	Spring chinook spawning and rearing Montane meadows Presence of bull trout, steelhead
	WF Newsome Creek	50.0	Presence of bull trout, steelhead

	Sing Lee Creek	40.0	Montane meadows and fens
			Presence of steelhead
	Sawmill Creek	52.6	Presence of bull trout, steelhead
	Pilot Creek	52.6	Bull trout spawning and rearing
			Fens
			Presence of bull trout, steelhead
	Baldy Creek	50.0	Bull trout spawning and rearing
			Presence of bull trout, steelhead
	Haysfork Creek	42.0	Montane meadows
			Presence of steelhead
	Mule Creek	47.4	Presence of bull trout, steelhead
	Beaver Creek	35.0	Presence of steelhead
	Nugget Creek	47.5	Presence of bull trout, steelhead?
	Bear Creek	44.7	Presence of bull trout, steelhead
American River Drainage	American River	42.5	Spring chinook spawning and rearing
			Montane meadows
			Presence of bull trout, steelhead, pacific lamprey
	Elk Creek	36.8	Presence of bull trout, steelhead
	Big Elk Creek	36.8	Montane meadows
			Presence of steelhead
	Little Elk Creek	36.8	Presence of bull trout, steelhead
	WF American River	44.4	Montane meadows
			Presence of steelhead
	Limber Luke Creek	56.6	Presence of steelhead
	EF American River	57.9	Spring chinook spawning and rearing
			Presence of bull trout, steelhead
	Kirks Fork American River	47.4	Presence of bull trout, steelhead

Red River Drainage	Red River	57.5	Spring chinook spawning and rearing
			Montane meadows
			Presence of pacific lamprey, bull trout, steelhead
	Red Horse Creek	42.1	Presence of bull trout, steelhead
	Siegel Creek	47.4	Presence of bull trout, steelhead
	Otterson Creek	36.8	Presence of bull trout, steelhead?
	Bridge Creek	39.5	Presence of steelhead?
	Trail Creek	44.7	Presence of bull trout, steelhead?
	Soda Creek	47.3	Presence of steelhead?
	Trapper Creek	52.6	Montane meadows
			Presence of bull trout, steelhead
	WF Red River	52.6	Bull trout spawning and rearing
			Presence of bull trout, steelhead
	SF Red River	52.6	Bull trout and spring chinook spawning and rearing
			Presence of bull trout, steelhead
	Moose Butte Creek	50.0	Presence of bull trout, steelhead
	Dawson Creek	35.3	Presence of steelhead?
Crooked River Drainage	Lower Crooked River	47.5	Spring chinook spawning and rearing
			Presence of pacific lamprey, bull trout, steelhead
	Upper Crooked River	45.0	Bull trout and spring chinook spawning and rearing
			Presence of bull trout, steelhead
	Relief Creek	55.3	Outstanding aquatic habitat
			Bull trout spawning and rearing
			Stronghold
			Presence of bull trout, steelhead

	Quartz Creek	42.9	Outstanding aquatic habitat Stronghold
	EF Crooked River	63.2	Outstanding aquatic habitat Bull trout spawning and rearing Stronghold Montane meadows Presence of bull trout, steelhead
	WF Crooked River	52.6	Outstanding aquatic habitat Bull trout spawning and rearing Stronghold Presence of bull trout, steelhead
Tenmile Creek Drainage	Tenmile Creek	70.0	Outstanding aquatic habitat Bull trout spawning and rearing Stronghold Montane meadows Presence of pacific lamprey, bull trout, steelhead
	Sixmile Creek	55.3	Outstanding aquatic habitat Stronghold Montane meadows Presence of bull trout, steelhead
	Williams Creek	68.4	Outstanding aquatic habitat Presence of bull trout, steelhead
Johns Creek Drainage	Lower Johns Creek	77.5	Outstanding aquatic habitat Bull trout spawning and rearing Stronghold Presence of bull trout, steelhead, pacific lamprey
	Upper Johns Creek	77.5	Outstanding aquatic habitat Bull trout spawning and rearing Stronghold Presence of bull trout, steelhead
	Trout Creek	33.3	Presence of steelhead

	American Creek	--	Montane meadows
	Gospel Creek	71.1	Outstanding aquatic habitat Stronghold Presence of bull trout, steelhead
	WF Gospel Creek	71.1	Outstanding aquatic habitat Stronghold Presence of bull trout
	Moores Creek	76.3	Outstanding aquatic habitat Stronghold Bull trout spawning and rearing Presence of bull trout, steelhead
	Square Mountain Creek	73.7	Outstanding aquatic habitat Stronghold Presence of bull trout, steelhead
	Hagen Creek	73.7	Outstanding aquatic habitat Stronghold Presence of bull trout, steelhead
Additional Smaller Drainages	Buffalo Gulch Creek	35.0	Presence of steelhead
	Maurice Creek	44.7	Presence of steelhead
	Whiskey Creek	57.9	Presence of steelhead, bull trout
	Leggett Creek	44.7	Presence of steelhead
	Fall Creek	44.7	Presence of steelhead?
	Silver Creek	52.6	Outstanding aquatic habitat Presence of bull trout, steelhead (mouth only)
	Peasley Creek	42.1	Presence of steelhead
	Cougar Creek	40.0	Presence of steelhead?
	Meadow Creek	55.0	Stronghold Montane meadows Spring chinook spawning and rearing Presence of steelhead, pacific lamprey Bald eagle wintering
	Sally Ann Creek	36.8	Presence of bull trout, steelhead

Rabbit Creek	35.0	Presence of bull trout, steelhead
Threemile Creek	30.0	Presence of steelhead
Butcher Creek	30.0	Presence of steelhead
Mill Creek	60.5	Spring chinook spawning and rearing Stronghold Montane meadows Presence of bull trout, steelhead, pacific lamprey
Wing Creek	50.0	Outstanding aquatic habitat
Twentymile Creek	65.8	Outstanding aquatic habitat Montane meadows Presence of bull trout, steelhead (mouth only)

[1] Score of 50% or greater is outstanding classification.

4.4 Aesthetic Qualities

The aesthetic assessment rates the visual importance of the waterway and adjacent riparian area, taking into account geologically and historically significant visual features, and compares the rating to other waterways within the basin. This process of aesthetic rating and ranking of the waterways assists in the determination of state protected river designation.

The aesthetic evaluation process used for the South Fork Clearwater River basin is based upon the identification and inventory component of the Bureau of Land Management's Visual Resource Management system (VRM) and the U. S. Forest Service's Visual Management System (U. S. Forest Service 1974). The VRM system, as a whole, is a tool for identifying visual values, establishing management objectives, and providing input on landscape disturbing activities. The IWRB may protect waterways based upon values including aesthetics. However, the IWRB does not have management authority of the land uses or landscape- altering activities that affect the aesthetic values of the landscape. The IWRB's authority is limited to the waterway, though aesthetically it is difficult to separate the waterway from the riparian area, and the surrounding uplands. Therefore, the adapted visual screening process used for this plan focuses on the waterway while including landscape views from the waterway.

Visual screening involves a two-step process: 1) a waterway aesthetic assessment, based on field evaluations, of 16 visual attributes that characterize aesthetic value, and 2) collection of pertinent information on previous visual resource inventories in the South Fork Clearwater River basin to determine important and unique aesthetic values.

The visual attributes identified and inventoried include form, line, color, and texture of the water, the landscape, vegetation, man-made structures and uniqueness. These attributes are scored for both near and far landscape views. Each attribute was scored from zero (lowest) to five (highest). A site is aesthetically "outstanding" and eligible for state designation based solely upon aesthetics if it scored 21 or more points out of the possible 35. A segment that scored between 17.5 and 20.9 is considered aesthetic and contributing toward a designation but not "outstanding" in the sense that designation based solely on aesthetic qualities is warranted. See Table 7 for segment aesthetic qualities classifications.

Table 7. Summary of aesthetic qualities identified during resource screening of the South Fork Clearwater River basin

Drainage	Segment/tributary	Average Attribute Score	Total Score	Segment Class
Mainstem SF Clearwater River	SF Clearwater River (Middle Fork to NP Nat Forest)	2.84	19.85	Aesthetically Significant
	SF Clearwater River (NP NF border to Leggett Crk)	3.46	24.25	Aesthetically Outstanding
	SF Clearwater River (Leggett Crk to Red & American Rivers)	2.90	20.31	Aesthetically Significant
Cottonwood Creek Drainage	Lower Cottonwood Creek	2.61	18.25	Aesthetically Significant
	Upper Cottonwood Creek	1.96	13.75	Not Aesthetically Significant
	SF Cottonwood Creek	1.82	12.75	Not Aesthetically Significant
	Shebang Creek	1.89	13.25	Not Aesthetically Significant
	Stockney Creek	1.71	12.00	Not Aesthetically Significant
	Red Rock Creek	1.71	12.00	Not Aesthetically Significant
	Long Haul Creek	2.04	14.25	Not Aesthetically Significant
Newsome Creek Drainage	Newsome Creek	2.97	20.80	Aesthetically Significant
	WF Newsome Creek	2.84	19.85	Aesthetically Significant
	Sing Lee Creek	3.46	24.25	Aesthetically Outstanding
	Sawmill Creek	2.86	20.05	Aesthetically Significant
	Pilot Creek	3.07	21.50	Aesthetically Outstanding
	Baldy Creek	2.95	20.65	Aesthetically Significant
	Haysfork Creek	2.88	20.15	Aesthetically Significant
	Mule Creek	2.96	20.75	Aesthetically Significant
	Beaver Creek	2.75	19.25	Aesthetically Significant
	Nugget Creek	2.82	19.75	Aesthetically Significant
	Bear Creek	2.88	20.15	Aesthetically Significant
American River Drainage	American River	2.68	18.75	Aesthetically Significant
	Elk Creek	2.32	16.25	Not Aesthetically Significant
	Big Elk Creek	2.89	20.25	Aesthetically Significant

	Little Elk Creek	2.96	20.75	Aesthetically Significant
	WF American River	2.93	20.50	Aesthetically Significant
	Limber Luke Crk	3.07	21.50	Aesthetically Outstanding
	EF American River	2.75	19.25	Aesthetically Significant
	Kirks Fork American River	2.79	19.50	Aesthetically Significant
	Buffalo Gulch Creek	2.14	15.00	Not Aesthetically Significant
Red River Drainage	Red River	3.39	23.75	Aesthetically Outstanding
	Red Horse Creek	3.04	21.25	Aesthetically Outstanding
	Siegel Creek	3.04	21.25	Aesthetically Outstanding
	Otterson Creek	3.25	22.75	Aesthetically Outstanding
	Bridge Creek	3.29	23.00	Aesthetically Outstanding
	Trail Creek	2.93	20.50	Aesthetically Significant
	Soda Creek	3.07	21.50	Aesthetically Outstanding
	Trapper Creek	2.79	19.50	Aesthetically Significant
	WF Red River	3.00	21.00	Aesthetically Outstanding
	SF Red River	2.93	20.50	Aesthetically Significant
	Moose Butte Creek	2.61	18.25	Aesthetically Significant
	Dawson Creek	3.29	23.00	Aesthetically Outstanding
Crooked River Drainage	Lower Crooked River	3.07	21.50	Aesthetically Outstanding
	Upper Crooked River	3.25	22.75	Aesthetically Outstanding
	Relief Creek	3.00	21.00	Aesthetically Outstanding
	Quartz Creek	2.82	19.75	Aesthetically Significant
	EF Crooked River	3.14	22.00	Aesthetically Outstanding
	WF Crooked River	3.07	21.50	Aesthetically Outstanding
Tenmile Creek Drainage	Tenmile Creek	3.51	24.60	Aesthetically Outstanding
	Sixmile Creek	3.32	23.25	Aesthetically Outstanding
	Williams Creek	3.54	24.75	Aesthetically Outstanding
Johns Creek Drainage	Lower Johns Creek	3.96	27.75	Aesthetically Outstanding
	Upper Johns Creek	4.29	30.00	Aesthetically Outstanding
	Trout Creek	2.96	20.75	Aesthetically Significant
	American Creek	3.50	24.50	Aesthetically Outstanding
	Gospel Creek	4.25	29.75	esthetically Outstanding
	WF Gospel Creek	4.29	30.00	Aesthetically Outstanding
	Moores Creek	4.07	28.50	Aesthetically Outstanding
	Square Mountain Creek	4.21	29.50	Aesthetically Outstanding
	Hagen Creek	4.18	29.25	Aesthetically Outstanding

Additional, smaller drainages	Maurice Creek	2.39	16.75	Not Aesthetically Significant
	Whiskey Creek	2.39	16.75	Not Aesthetically Significant
	Leggett Creek	2.93	20.50	Aesthetically Significant
	Fall Creek	2.21	15.50	Not Aesthetically Significant
	Silver Creek	3.06	21.45	Aesthetically Outstanding
	Peasley Creek	2.63	18.40	Aesthetically Significant
	Cougar Creek	2.44	17.10	Not Aesthetically Significant
	Meadow Creek	3.00	21.00	Aesthetically Outstanding
	Sally Ann Creek	1.79	12.50	Not Aesthetically Significant
	Rabbit Creek	2.54	17.75	Aesthetically Significant
	Threemile Creek	1.89	13.25	Not Aesthetically Significant
	Butcher Creek	2.14	15.00	Not Aesthetically Significant
	Mill Creek	3.93	27.50	Aesthetically Outstanding
	Wing/TwentyMile Creek	3.68	25.75	Aesthetically Outstanding

4.5 Recreational Values

The recreation screening rates the recreational importance of the waterway and compares the rating to other waterways within the basin. This process of recreation rating and ranking of the waterways is meant to assist in the determination of state protected river designation.

The recreational evaluation entails analysis of two factors: 1) recreational diversity, and 2) importance of opportunities. Recreational diversity considers three criteria: land-based and water-based recreational opportunities, and level of access. Recreational importance considers three criteria: recreation opportunity features unique to the local region or state, public concern for or use of recreational values of the waterway, and special designations or management of the waterway.

Waterways with "outstanding" and eligible for state designation based solely upon recreational values totaled attribute values required a score of 21 out of the possible 30 points.. Outstanding recreation waterways provide a diversity of recreational activities, a unique experience within the region or basin, and receive recreational use. A segment that scored between 17.5 and 20.9 was considered recreationally significant and contributing toward a designation but not "outstanding" in the sense that designation based solely on recreational values was warranted. See Table 8 for segment recreation values classifications.

Table 8. Summary of recreational values identified during resource screening of the South Fork Clearwater Riverbasin

Drainage	Segment/Tributary	Total Score	Average Attribute Score	Segment Class
Mainstem SF Clearwater River	Middle Fork to NP Nat Forest	15	2.5	Not Recreationally Significant
	NP NF border to Leggett Crk	27	4.5	Recreationally Outstanding
	Leggett Crk to Red & American Rivers	25.0	4.17	Recreationally Outstanding
Cottonwood Creek Drainage	Lower Cottonwood Creek	13.5	2.25	Not Recreationally Significant
	Upper Cottonwood Creek	13.0	2.17	Not Recreationally Significant
	SF Cottonwood Creek	5.0	0.83	Not Recreationally Significant
	Shebang Creek	5.5	0.92	Not Recreationally Significant
	Stockney Creek	5.5	0.92	Not Recreationally Significant
	Red Rock Creek	5.0	0.83	Not Recreationally Significant
	Long Haul Creek	5.0	0.83	Not Recreationally Significant
Newsome Creek Drainage	Newsome Creek	28.0	4.67	Recreationally Outstanding
	WF Newsome Creek	25.5	4.25	Recreationally Outstanding
	Sing Lee Creek	23.5	3.92	Recreationally Outstanding
	Sawmill Creek	15.0	2.50	Not Recreationally Significant
	Pilot Creek	15.0	2.50	Not Recreationally Significant
	Baldy Creek	23.0	3.83	Recreationally Outstanding
	Haysfork Creek	25.5	4.25	Recreationally Outstanding
	Mule Creek	19.5	3.25	Recreationally Significant
	Beaver Creek	20.0	3.33	Recreationally Significant
	Nugget Creek	24.5	4.08	Recreationally Outstanding
	Bear Creek	27.0	4.50	Recreationally Outstanding
American River Drainage	American River	25.5	4.25	Recreationally Outstanding
	Elk Creek	20.5	3.42	Recreationally Significant
	Big Elk Creek	21.0	3.50	Recreationally Outstanding

	Little Elk Creek	21.0	3.50	Recreationally Outstanding
	WF American River	23.3	3.88	Recreationally Outstanding
	Limber Luke Creek	24.0	4.00	Recreationally Outstanding
	EF American River	23.5	3.92	Recreationally Outstanding
	Kirks Fork American River	18.5	3.08	Not Recreationally Significant
Red River Drainage	Red River	28.3	4.71	Recreationally Outstanding
	Red Horse Creek	22.5	3.75	Recreationally Outstanding
	Siegel Creek	20.0	3.33	Recreationally Significant
	Otterson Creek	23.5	3.92	Recreationally Outstanding
	Bridge Creek	27.3	4.54	Recreationally Outstanding
	Trail Creek	21.5	3.58	Recreationally Outstanding
	Soda Creek	23.5	3.92	Recreationally Outstanding
	Trapper Creek	20.5	3.42	Recreationally Significant
	WF Red River	23.8	3.96	Recreationally Outstanding
	SF Red River	23.5	3.92	Recreationally Outstanding
	Moose Butte Creek	21.8	3.63	Recreationally Outstanding
	Dawson Creek	20.3	3.38	Recreationally Significant
Crooked River Drainage	Lower Crooked River	25.8	4.29	Recreationally Outstanding
	Upper Crooked River	26.5	4.42	Recreationally Outstanding
	Relief Creek	17.3	2.88	Not Recreationally Significant
	Quartz Creek	18.0	3.00	Not Recreationally Significant
	EF Crooked River	18.3	3.04	Not Recreationally Significant
	WF Crooked River	19.5	3.25	Recreationally Significant
Tenmile Creek Drainage	Tenmile Creek	20.0	3.33	Recreationally Significant
	Sixmile Creek	20.8	3.46	Recreationally Significant
	Williams Creek	20.5	3.42	Recreationally Significant
Johns Creek Drainage	Lower Johns Creek	29.0	4.83	Recreationally Outstanding
	Upper Johns Creek	28.5	4.75	Recreationally Outstanding
	Trout Creek	24.8	4.13	Recreationally Outstanding

	American Creek	25.8	4.29	Recreationally Outstanding
	Gospel Creek	26.0	4.33	Recreationally Outstanding
	WF Gospel Creek	25.8	4.29	Recreationally Outstanding
	Moores Creek	26.0	4.33	Recreationally Outstanding
	Square Mountain Creek	24.0	4.00	Recreationally Outstanding
	Hagen Creek	19.3	3.21	Not Recreationally Significant
Additional, smaller drainages	Buffalo Gulch Creek	18.0	3.00	Not Recreationally Significant
	Maurice Creek	16.3	2.71	Not Recreationally Significant
	Whiskey Creek	18.3	3.04	Not Recreationally Significant
	Leggett Creek	23.8	3.96	Recreationally Outstanding
	Fall Creek	20.5	3.42	Recreationally Significant
	Silver Creek	20.0	3.33	Recreationally Significant
	Peasley Creek	22.8	3.79	Recreationally Outstanding
	Cougar Creek	20.5	3.42	Recreationally Significant
	Meadow Creek	28.3	4.71	Recreationally Outstanding
	Sally Ann Creek	14.0	2.33	Not Recreationally Significant
	Rabbit Creek	0.0	0.00	Not Recreationally Significant
	Threemile Creek	5.5	0.92	Not Recreationally Significant
	Butcher Creek	6.5	1.08	Not Recreationally Significant
	Mill Creek	22.0	3.67	Recreationally Outstanding
	Wing/TwentyMile Creek	22.5	3.75	Recreationally Outstanding

V. BASIN DESCRIPTION

5.1 Geography and Climate

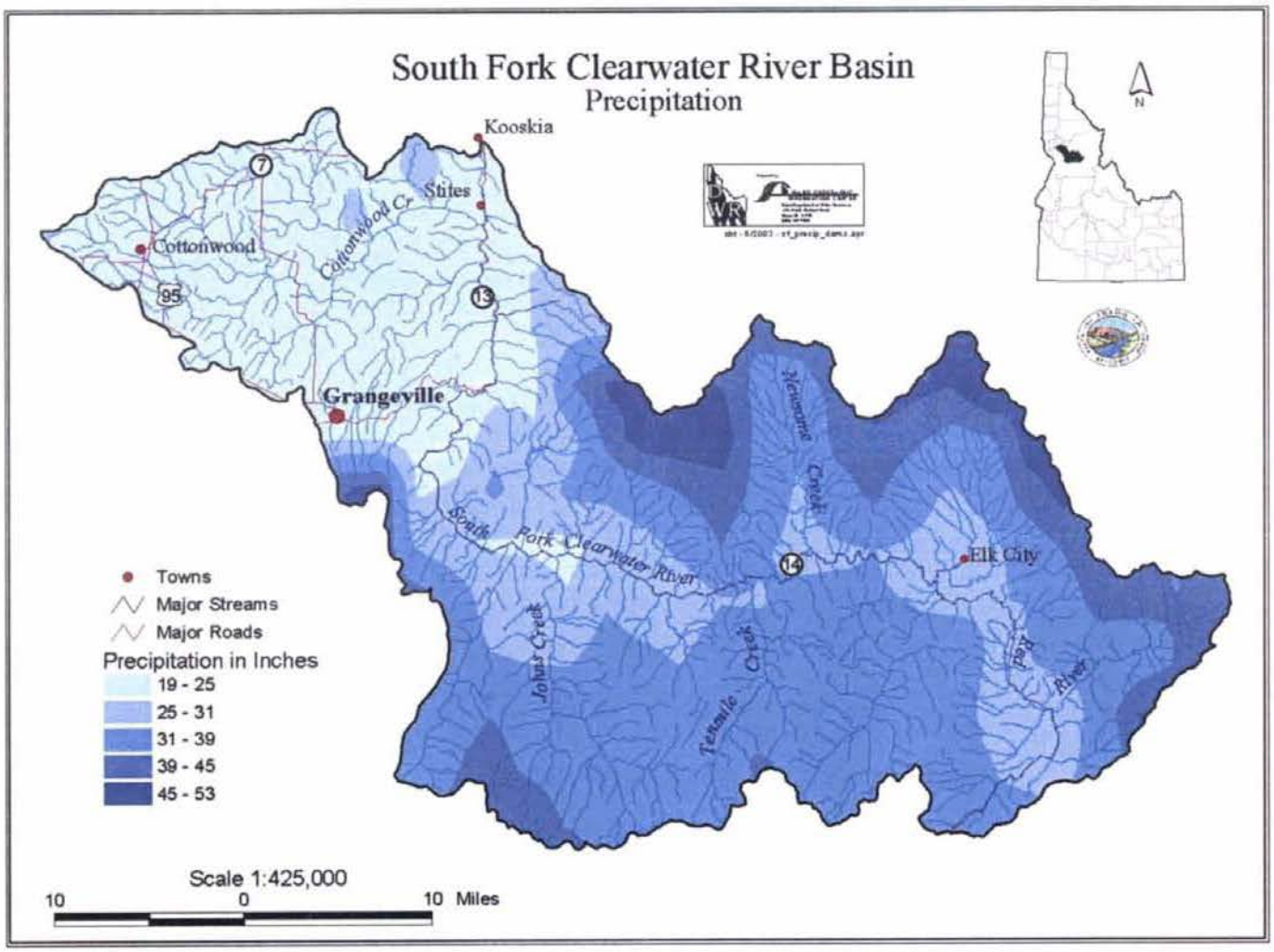
The South Fork Clearwater River subbasin (U.S. Geological Survey Hydrologic Unit 17060305) extends from the headwaters above Elk City and Red River to the confluence with the Middle Fork of the Clearwater River at Kooskia.

The river basin is within the Northern Rocky Mountain physiographic province (Savage 1967). Lowlands of the river valley and the basin are flanked by the uplands to the west, and the mountain range and uplands to the east. Elevation within the basin ranges from 1,280 feet at the confluence of the South Fork Clearwater River and Middle Fork Clearwater at Kooskia to over 6,000 feet in the mountains.

Climate within the basin is dominated by Pacific maritime air masses and prevailing westerly winds. Over 85% of the annual precipitation occurs during the fall, winter and spring months. Cyclonic storms consisting of a series of frontal systems moving east produce long duration, low-intensity precipitation during this portion of the year. In winter and spring, this inland maritime regime is characterized by prolonged gentle rains, fog, cloudiness and high humidity. The climate during the summer months is influenced by stationary high-pressure systems over the northwest coast. These warm dry systems result in only 10 to 15% of the annual precipitation falling during the summer. Climate station information is summarized in Table 9. Summers and winters are relatively mild due to the Pacific maritime influence. However, conditions can vary locally due to the wide range in elevation and terrain features. (TMDL 5,6)

Annual precipitation ranges from about 22 inches on the Camas Prairie in the mid to lower basin to more than 50 inches along the higher ridges in the upper reaches of the basin (Map 4). July and August are the driest months, whereas the greatest amounts of precipitation occur between December and March (Fig. 8). Snowfall during the winter is heavy in the mountains and can be heavy on the Camas Prairie.

Annual runoff from the South Fork Clearwater River basin averages about 739,000 AF, as measured by the USGS stream gage at Stites. (NPFLA) The mean annual stream flow is 1,060 cfs. Stream flows are highest in May with an average of 3,370 cfs with lowest flows the September average of 258 cfs (TMDL).



Map 4. Precipitation

Table 9. Climate factors at Elk City, Grangeville and Kooskia.

Climate Factor	Elk City	Grangeville	Kooskia
Elevation (ft.)	4,060	3,360	1,280
Annual Precipitation (in.)	30.2	23.8	24.2
Annual Snowfall (in.)	133.4	53.4	22.5
Average January Precipitation (in.)	3.51	1.62	2.05
Average January Minimum Temp (°F)	10.1	21.3	22.7
Average January Maximum Temp (°F)	34	37	37.5
Average July Precipitation (in.)	1.46	1.17	1.04
Average July Minimum Temp (°F)	40.6	49.7	51
Average July Maximum Temp (°F)	80.6	81.5	91.2

Climatological summary data, 1961-1990 (Natural Resources Conservation Service, National Water and Climate Center, internet site).

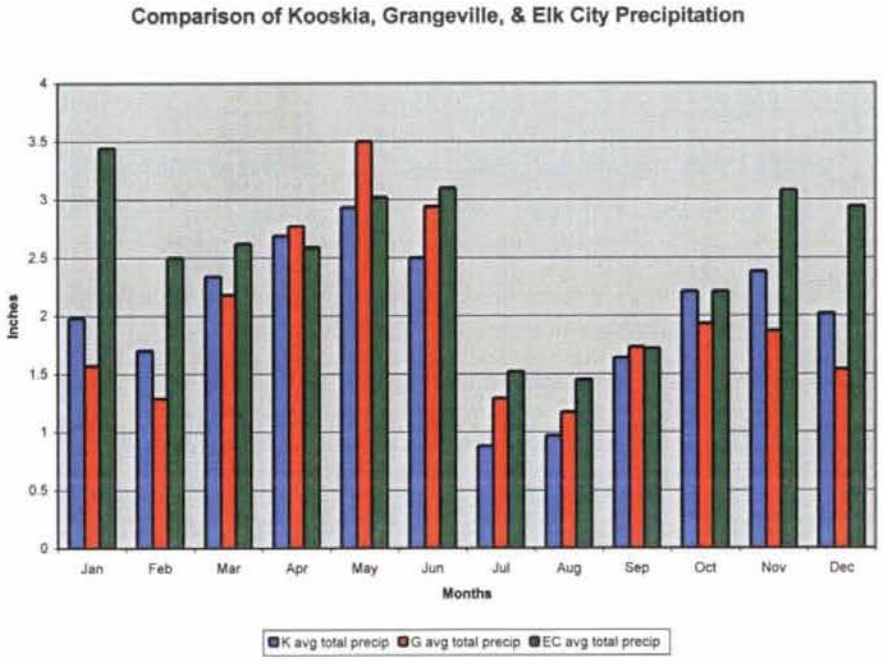


Fig.8. Comparison of precipitation at Kooskia, Grangeville and Elk City.

5.2 Geology and Soils

The Idaho Batholith formed in the Late Cretaceous age (75-100 million years old). The batholith and the activities that formed it were a product of the subduction of the Pacific Plate beneath North America during Cretaceous time (Alt and Hyndman 1989). The Idaho Batholith of central Idaho is not as continuous or as uniform as once believed. The batholith is composed of the Atlanta Batholith and the Bitteroot Batholith. A portion of the South Fork Clearwater River basin is within the Atlanta Batholith and the mainstem South Fork Clearwater River is underlain by granite (Alt and Hyndman 1989). Columbia River basalt (4-17 million years old) is also visible in the basin.

The Camas Prairie region of the basin is relatively uniform in soil composition and geology (Maps 5 and 6). The mountainous region of the basin is composed of granitic soils and is subject to increased erosion rates following disturbance (Megahan and Ketcheson 1996).

Landform groups are ecological units that describe patterns of soils, geology, climate and vegetation (IDEQ 2002). The South Fork Clearwater River basin is composed of seven landform groups. Landform group 1 is less than 1% of the basin area (IDEQ 2002). It occurs along headwater streams south and east of Grangeville and is primarily low rolling hills, derived from Columbia River basalt. The parent material is grandorite. Sediment hazard from substrate erosion is very high.

Landform group 2 comprises about 56% of the basin (IDEQ 2002). This landform is rolling uplands and occurs east of Grangeville. It does not include the headwater streams and the mainstem South Fork Clearwater River . The parent material is granite, gneiss, schist and quartzite. Erosion hazard is moderate to high.

Landform 3 includes the middle reach of the mainstem and the lower reaches of Mill Creek, Johns Creek, Tenmile Creek Crooked River and Peasley Creek and is about 12% of the basin. It is characterized by breaklands. The parent material is also granite, gneiss, schist and quartzite (IDEQ 2002). Erosion hazard is moderate to high.

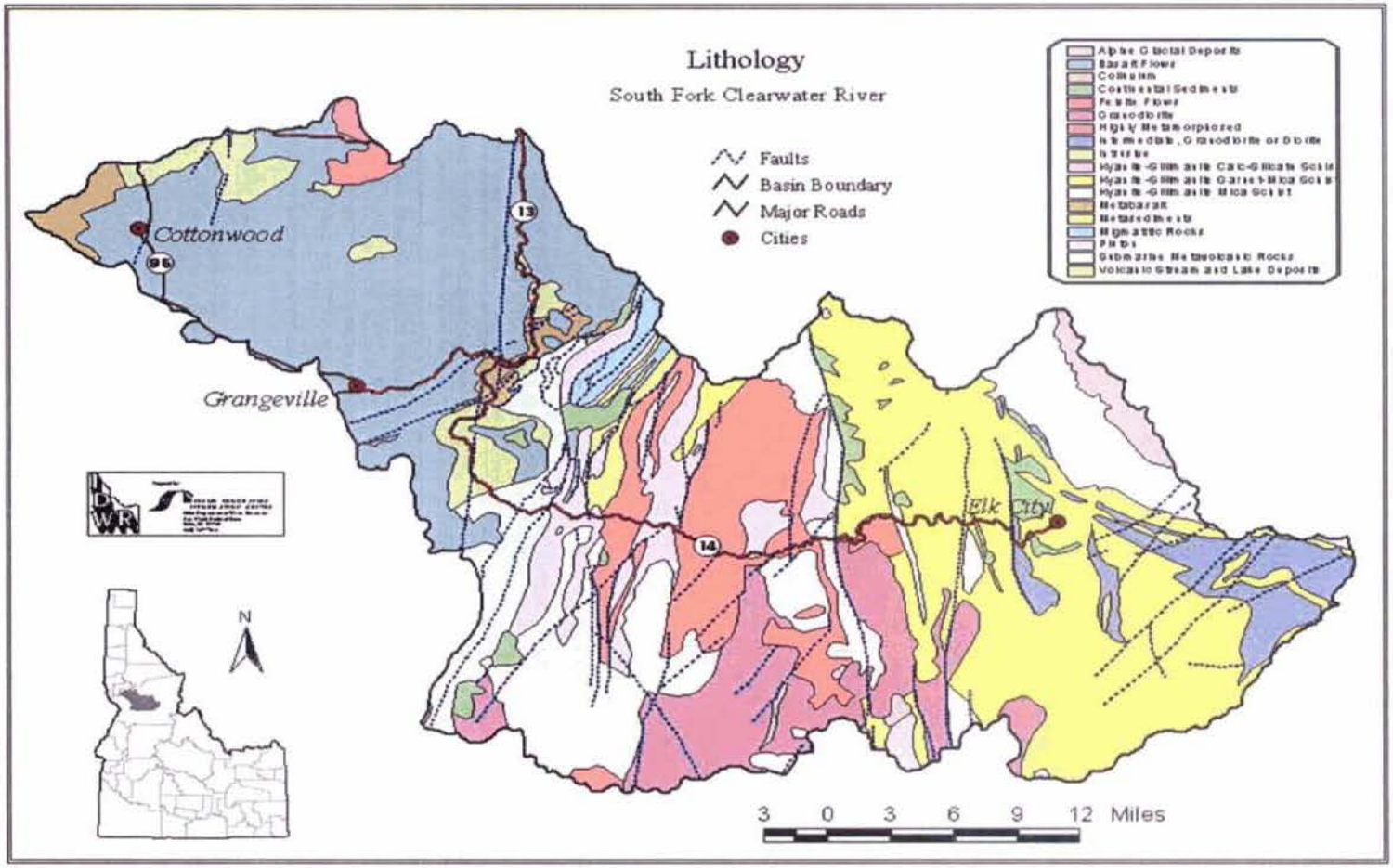
Landform 4 includes the upper reaches of Tenmile Creek and Johns Creek in the Gospel Hump Wilderness (IDEQ 2002). Landform 4 is characterized by ice-scoured cirques and glacial troughs and is about 5% of the basin (IDEQ 2002). Parent material is quartzite and diorite. Erosion hazard is low to high.

Landform 5 is primarily forested rolling hills, plateaus and is about 1% of the basin (IDEQ 2002). Basalt is the parent material. Erosion hazard is low.

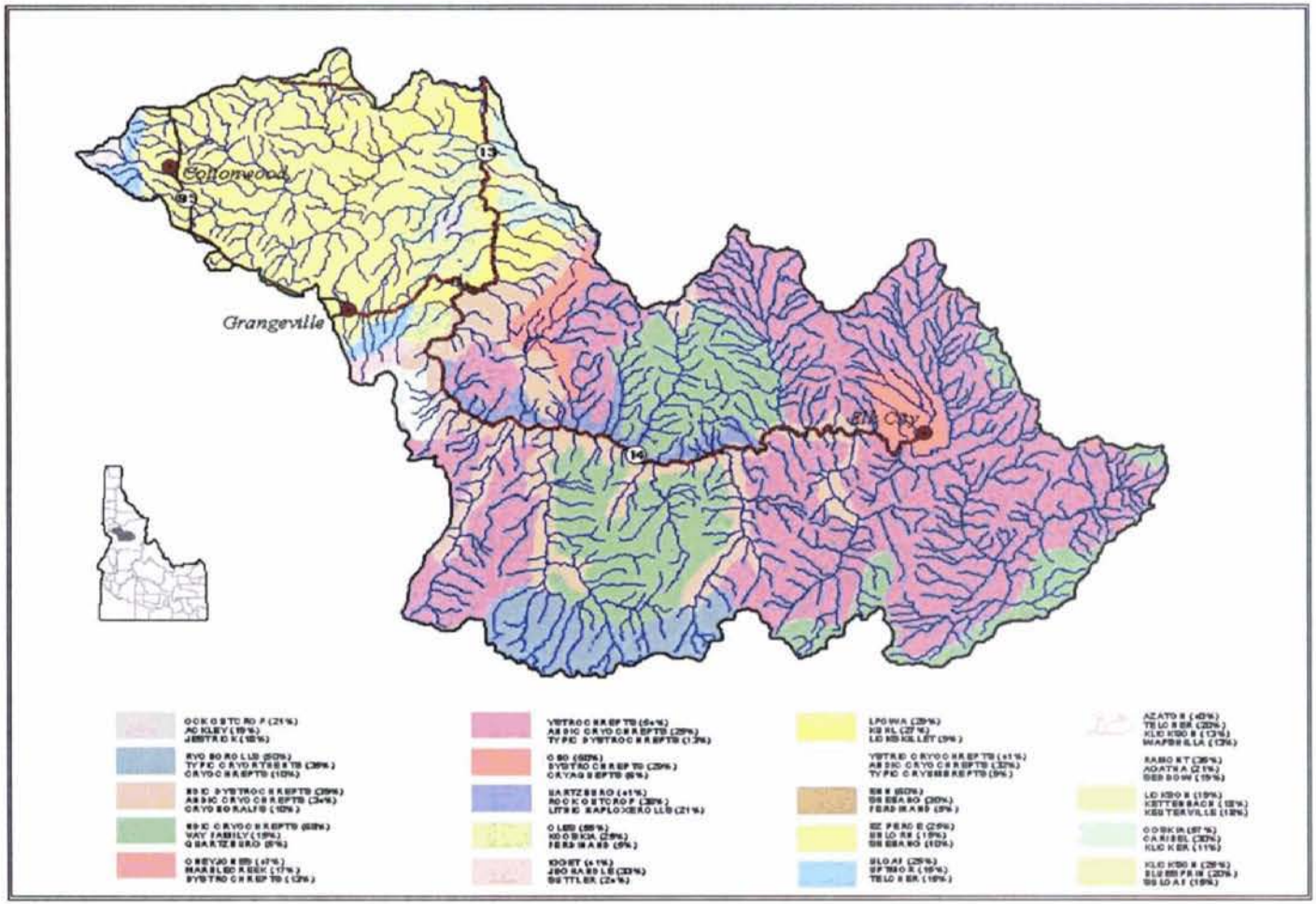
Landform 6 is characterized by steep mountain slopes and stream breaklands and is approximately 65% of the basin (IDEQ 2002). Parent material is basalt and erosion hazard is low under natural, undisturbed conditions.

Landform 7 is rolling plateaus and prairie (IDEQ 2002). It is about 20% of the basin and includes the Camas Prairie. Parent material is basalt and the erosion hazard is low.

Soils (see Map 6) in the Idaho Batholith are coarse-textured and as mentioned, most have high erosion potential (Clayton and Megahan 1997).



Map 5. Lithology



Map 6. Soils

5.3 Land Ownership and Use

Ownership and land use in the basin are shown in Map 7 and summarized in Table10.

Table 10. Land ownership by area.

Land Type	Area
Public Land	
Federal Agency Management	532,691 acres
State of Idaho Management	4,832 acres
Private Land	217,703 acres
Nez Perce Tribe	565 acres

The present pattern of vegetation cover and use are displayed in Map 9. Publicly owned forested lands within the basin, excluding special management areas, are managed primarily for timber production. Predominant tree associations are Ponderosa Pine, Douglas Fir and Lodgepole Pine.

Some livestock grazing occurs on public lands (see stock water section). Though grazing is not a primary land use within the basin, it is important to permit and lease holders. About 220,000 acres of grazing allotments on public land are leased to provide animal unit months of grazing activity. However, of the land in those allotments, approximately 106,000 acres are suitable for grazing.

Land ownership on the Camas plateau area in the northwestern portion of the basin is mostly private. This area of the basin encompasses about 144,280 acres and the predominant land use is agricultural cropland and pasture.

Special management areas include relatively pristine forested lands, and wetland communities managed as Research Natural Areas, scenic and recreation areas, and wilderness areas in the upper reaches of the basin. The USFS determined that the South Fork Clearwater River is eligible for recreational river designation under the national Wild and Scenic Rivers Act and Johns Creek is eligible for wild river designation. The river corridors are managed to protect these classification until the rivers are studied for suitability and Congress acts on the designations.

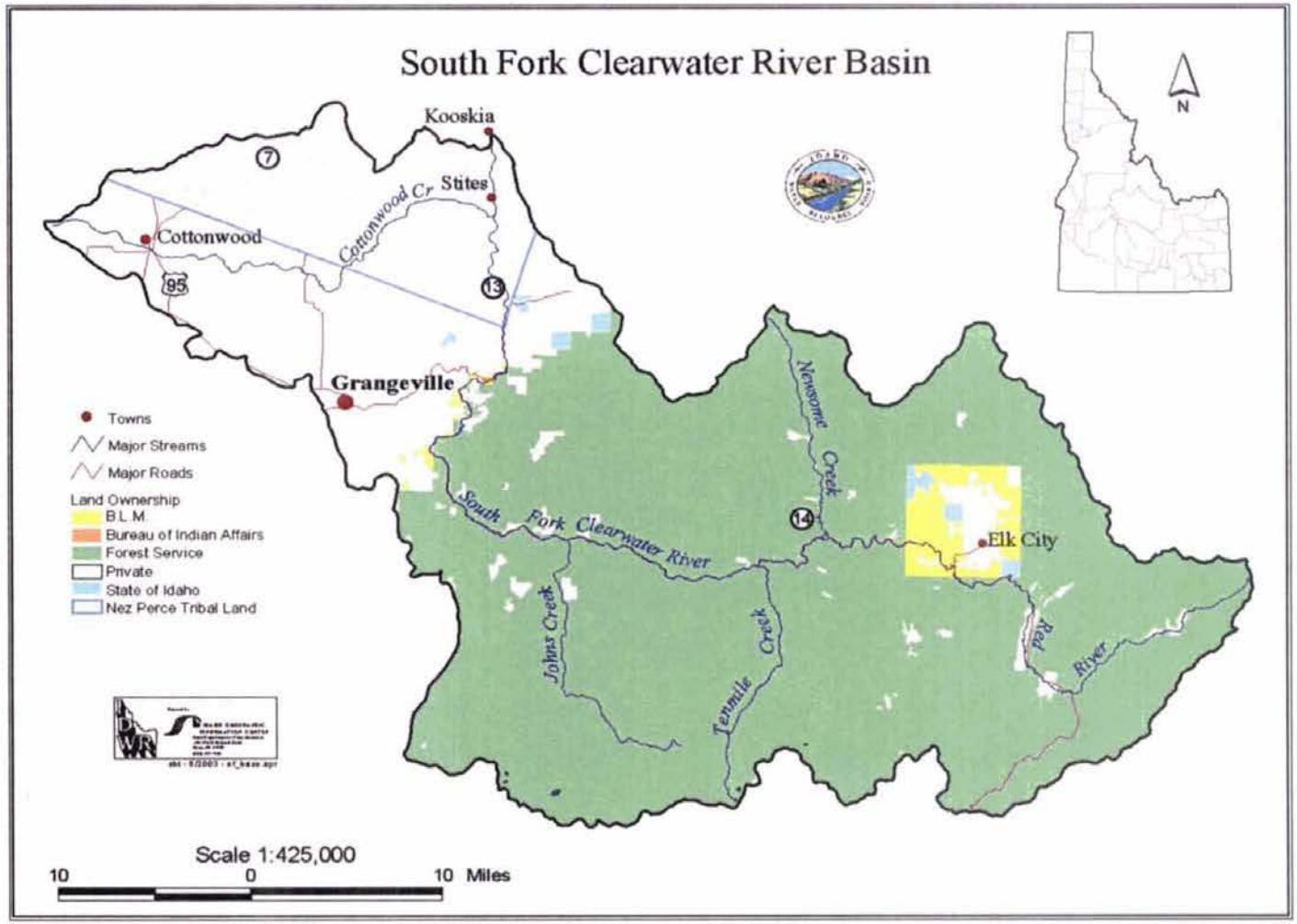
5.4 Basin Demographics

Estimates of population, housing, income, employment, and unemployment are used to describe the demographic and economic characteristics of the basin. Data for this section were obtained primarily from the U. S. Census Bureau and the Idaho Department of Commerce (IDC). Specific information regarding agriculture, timber, mining, and recreation was compiled by IDWR to meet the needs of this plan. Demand for water depends on the levels and patterns of demographic and economic activities in the South Fork Clearwater River basin.

The South Fork Clearwater River basin encompasses about 14% of Idaho County. County level data may not be a precise picture of local demographic and economic conditions within the basin. However, it is likely representative.

5.4.1 Population

Idaho County had a population of 15,423 in 2001 (IDC 2001). It is first in area among Idaho's 44 counties but ranks 19th in population. In contrast, Ada County, which includes Boise, is 31st in area and first in population. It is estimated that the population of the basin in 2000 was less



Map 7. Land Ownership

than 14,900. The population of the county is projected to be about 17,690 by 2025 for an annual growth rate of 0.5% (Church 2002). The number of households in the county was 6,100 in 2001 (Idaho Power 2002). The number of households was projected to be 7,120 in 2025 (Church 2002). In the county, about 79% of the population in 2000 was rural. In Ada County in 2000, 93% of the population was urban.

The birth rate in Idaho County declined from 17.6 in 1980 to 10.2 in 2000. Birth rate is expressed as the number of live births per year per 1,000 population. The median age of the population has increased in the county from 30.3 in 1980 to 42.3 in 2000, which could indicate that young adults are migrating to urban areas to find work. The number of deaths in the county increased from 1,200 during the 1970-1980 period to 1,417 in the 1990-2000 time frame. Net migration was 1,534 from 1990 to 2000.

Grangeville is the largest incorporated city in the South Fork Clearwater River basin with a population of 3,228 in 2000. (Table 11). The population of Idaho increased 55% from 1970 to 2000 but all of the cities in the basin, except Cottonwood, lost population during this period (IDC 2001).

Table 11. City population trends in the South Fork Clearwater River basin (IDC 2001).

City	1970	1980	1990	2000
Cottonwood	867	941	822	944
Grangeville	3,636	3,666	3,226	3,228
Kooskia	809	784	692	675
Stites	263	253	205	226
Totals	5,575	5,644	4,945	5,073

All cities in the basin lost population during the 1980s. The loss of population in the 1980s corresponds to a period when rural areas in Idaho were experiencing significant recession (IDWR 1999). Idaho County lost population during the 1980s (IDC 2001).

5.4.2 Economics

Annual unemployment rates in Idaho County were 12.7%, 9.0% and 10% in 1980, 1990 and 2002, respectively (Table12). This contrasts to Ada County's unemployment rates of 6.6%, 4.0%, and 4.5 % for the same years. Fremont County, with about 72% of the population designated rural, and with a similar population size, had a lower unemployment rate of 6.2% in

Table 12. Selected Idaho counties' unemployment rates (IDC 2003).

County	1980	1990	2002
Idaho	12.7	9.0	10
Fremont	7.8	8.7	6.2
Madison	5.4	5.1	2.1
Adams	16.5	12.7	14.2
Clearwater	16.1	13.9	15
Lewis	10.4	8.3	8.7
Ada	6.6	4.0	4.5
State	7.9	5.9	5.8

2002. However, many of Fremont County's' residents (more than 25%) living in the south end of the county, travel to nearby Madison County to work (IDC 2001). Madison County historically has had relatively low unemployment rates. The counties surrounding Idaho County are rural and also have high unemployment rates. Clearwater, Lewis and Adams Counties all have had higher unemployment rates historically than the state as a whole.

Per capita personal income in Idaho County was $17,690 in 1999. In adjacent Adams and Clearwater Counties, per capita income in 1999 was $18,212 and $18,429, respectively. For Idaho, per capita income was $22,871 in 1999.

Services, retail, manufacturing, state and local government and farm were the top employment industries in Idaho County in 1999 (Table13). Service industries employed the most people. All government entities (federal, state and local) employed the next greatest number of people. Of the total 5,153 employed residents, 786 worked in adjacent counties.

Two lumber mills in the basin, Bennett Forest Industries and Clearwater Forest Industries (CFI), employ most of the workers in the manufacturing sector. Bennett is located near Elk City and CFI is in Kooskia.

Table 13. Employment by industry in Idaho County.

Industry	1980	1990	1999
Farm	960	831	961
Manufacturing	1,206	1,210	982
Mining	33	111	95
Construction	278	294	566
Retail Trade	754	905	1,099
Services	888	1,117	1,511
Federal Civilian	583	599	459
State and Local Government	606	732	930

According to U. S. Department of Agriculture statistics (1997), in Idaho County a total of 661 farms sold over $32 million of agricultural products in 1997 (Table 14).

Table 14. Market value of major agricultural goods in Idaho County (USDA 1997).

	Value ($1,000)		
Crop*	1987	1992	1997
Wheat	11,218	10,515	11,963
Barley	3,379	1,429	3,977
Hay, silage and field seeds	1,652	806	1,818
Livestock, poultry	15,860	15,932	13,598
Hogs and pigs	1,544	1,330	462
Sheep, lambs and wool	413	531	240

*By North American Industry Classification System

Water demand for domestic and municipal uses is not expected to grow much in the basin because of the expected low population growth. Water use should not shift from agricultural to municipal because demographics in the basin are likely to remain stable.

In summary, Idaho County is a rural area with low population and a slow growth rate. The population growth rate is expected to remain low. The unemployment rate is consistently high. Water demand will not greatly increase nor will there likely be a major redistribution of consumptive water use from agriculture to domestic or municipal.

5.5 Other Water Resources

Stream Channel Protection

Stream channel activity in all continuously flowing streams within the State of Idaho requires a Stream Alteration Permit from IDWR, unless the work is exempt. The permit is required by the Idaho Stream Channel Protection Act, Title 42, Chapter 38, Idaho Code. The Act requires that the stream channels of the state and their environment be protected against alteration for the protection of fish and wildlife habitat, aquatic life, recreation, aesthetic beauty, and water quality. A stream channel alteration is any activity that will obstruct, diminish, destroy, alter, modify, relocate, or change the natural existing shape or direction of water flow of any stream channel. A Joint Application can be made for this permit, USACE permits, and Idaho Department of Lands permits. The South Fork Clearwater River basin is administered by the Northern Region of IDWR.

Local

To participate in the National Flood Insurance Program, a community must adopt and enforce a floodplain management ordinance that regulates development in the community's floodplain. Idaho County adopted a Flood Damage Prevention Ordinance (#36) on April 14, 1997. Idaho County's date of entry into the program was May 2, 1997, and the effective date of the current Flood Insurance Rate Maps was August 23, 2001. The Floodplain Administrator is designated by the Idaho County Commissioners.

Cities participating in the National Flood Insurance Program, their dates of entry and current effective map dates are: Cottonwood, 5/1/85; Grangeville, 6/1/84; Kooskia, 3/18/85; and Stites, 4/15/88. The mayor or another city official usually is designated as the community's floodplain administrator.

Additional Information

Additional information on flood programs is on the IDWR website (www.idwr.state.id.us/). The National Flood Insurance Program is covered along with agency programs related to flood warning and forecasting, flood control, floodplain management, and flood disaster recovery and mitigation. In addition, Flood Risk Reduction and Management Alternative programs are included that provide assistance to local communities in reducing their flood risks and damages.

Geothermal Water

Idaho ranks third in the nation for the number of active geothermal springs. The majority of the geothermal wells and springs are found in the central and southern parts of the state where.

An Internet web site has been created to provide information and data about geothermal resources in the state. The site provides access to a wealth of geothermal information including an interactive mapping program that can pinpoint and provide data about geothermal resources around the state. A new technical report on geothermal potential at some selected sites in Idaho is also available via the web site. The Internet address for the web site is: www.idahogeothermal.org.

Because of the special value of geothermal resources, they are protected through Idaho statutes. Geothermal resources are defined Geothermal Resources Act (Idaho Code Title 42-40) as either low temperature geothermal (86 to 212 degrees Fahrenheit) or geothermal (greater than 212 degrees Fahrenheit). Rules for drilling for geothermal resources can be found at Drilling for Geothermal Resources Rules (IDAPA 37.03.04) and Well Construction Standards Rules (IDAPA 37.04.09). In the basin there are some geothermal sites (see website), but they are not as abundant as in the Salmon River drainage, for example.

5.6 Water Quality

Historic Surface Water Quality Impacts

Some cultivation and grazing has occurred in the basin since the mid-1800s. Gold was discovered in 1861, with active and intense hydraulic and dredge mining occurring intermittently through the 1950s (IDEQ et al. 2003). Glory holes left after hydraulic mining have drastically altered the landscape and continue to contribute significantly to accelerated erosion and sediment loads to basin streams. Timber harvest began in the mid to late 1800s in association with mining activities. Homesteaders arrived in late 1800s and early 1900s. All of these human activities (road construction, mining, timber harvest, building construction, agriculture, and grazing) have led to increased surface erosion and sediment loading to the South Fork Clearwater River and tributaries (IDEQ et al. 2003).

A number of studies have been conducted over the last 40 years, looking at impacts to water quality and fish and wildlife. IDFG identified low flows and high stream temperatures as problems for the Cottonwood Creek drainage as early as 1962. A 1984 assessment by BLM showed poor condition in this drainage due to lack of riparian vegetation and degraded streambanks (IDEQ et al. 2000). The impacts of mining, road building, logging, grazing, and channel alteration on fish and aquatic habitat within the Nez Perce NF have been a long-time concern. Mitigation efforts were undertaken in the 1980s to reduce sediment delivery and improve habitat, with limited success.

Water Quality Limited Water Bodies

Section 303(d) of the Federal Clean Water Act requires states to list water bodies that are impacted by one or more pollutants. These water bodies cannot meet water quality standards for designated uses despite point source technologies. States must develop budgets for listed water bodies that determine the maximum loadings of pollutants of concern (incorporating seasonal variation and a margin of safety). Loads include both point and nonpoint sources contributing to the water body, and the maximum load must be consistent with water quality standards and designated uses. These budgets, or Total Maximum Daily Loads (TMDLs), must be approved by EPA and then become the basis for implementation plans to restore the water quality to a level that supports its designated uses.

The most current approved listing of impacted Idaho water bodies is presented in the *1998 303(d) List* (additions to the list by EPA in 2000) (IDEQ 1998). The list contains stream segments with designated uses that are deemed impaired by one or more pollutants or stressors. The 303(d) list provides a mechanism for the state to prioritize cleanup of water quality problems. Streams on the list are required to have a TMDL established within certain dates, or basin assessments demonstrating that beneficial uses are fully supported and therefore not requiring TMDL development. Impacted rivers and streams in the South Fork Clearwater River basin are presented in Table 16. A TMDL addressing the Cottonwood Creek drainage was developed in 1999 and approved by EPA in 2000. The Nez Perce Tribe has a Nonpoint Source Coordinator working with

landowners and farmers on BMPs on the Nez Perce Reservation, including the Cottonwood Watershed, to meet TMDL targets.

Sources of pollutants in this subbasin include practices associated with agriculture, grazing, and forestry; stormwater runoff; roads; failing septic systems; and a WWTP (wastewater treatment plant)(IDEQ et al. 2000). Causes of impacts to beneficial uses are hydrologic modifications from change in vegetation cover, increase in drainage density, annual cropping tillage practices, unrestricted access by livestock, roads, right-of-way farming, AFOs (Animal Feeding Operations), failed septic systems, stream channel modifications, low canopy cover, low plant density, erosion, and storm runoff (IDEQ et al. 2001). The Idaho Soil and Water Conservation District's (ISWCD) State Agricultural Water Quality Project (SAWQP) established priority areas and appropriate Best Management Practices (BMPs) to reduce pollutant contributions within the drainage (ISWCD 2001). Programs, best management practices, and monitoring that will be used to restore beneficial uses (Table 15) to the Cottonwood Creek drainage are outlined in the implementation plan (IDEQ et al. 2001). The plan includes establishment of critical treatment units for croplands, riparian areas, animal feeding operations, and roads (approximately 75% of land area of basin, based on ISWCD SAWQP). Subwatershed priorities are South Fork Cottonwood, Stockney, Long Haul, Shebang, Red Rock, Upper Cottonwood, and Lower Cottonwood Creek subwatersheds. The Natural Resources Conservation Service (NRCS) cooperates with TMDL implementation and assists private landowners in establishing best management practices. Urban/suburban sources such as stormwater runoff and septic systems are also being addressed.

The remaining SF Clearwater Rive basin water quality is addressed in the "South Fork Clearwater River Subbasin Assessment and TMDLs (IDEQ et al. 2003, Public Comment Draft-May 2003), developed by IDEQ, the Nez Perce Tribe, EPA, and the South Fork Clearwater River Watershed Advisory Group (WAG). Pollutant sources in the basin derive from both point (WWTPs, suction dredge mining, AFOs, and stormwater runoff) and nonpoint sources (forestry, grazing, agriculture, mining, county and forest roads, and stormwater runoff). The draft assessment indicates sediment is a major concern in the basin, with sediment loadings from agricultural and grazing areas as the primary pollutant sources. Therefore, a sediment TMDL was developed for Threemile and Butcher Creeks (primary agricultural areas in the basin). Additionally, a sediment TMDL was developed for the SF Clearwater River, with four control points from Harpster to above Crooked River. These control points were set with the goal of directing land managers to reduce sediment at appropriate locations in the upper basin, where sand-sized material from human activities affects salmonid spawning. Temperature in the subbasin is a concern, and all water bodies will be included in the temperature TMDL even though not all are listed water bodies. Effective shade and canopy closure will be surrogate targets for temperature improvements associated with the TMDL targets. Bacteria were found to impact beneficial uses (Table 15) on Threemile Creek but not on Butcher Creek (delisting for bacteria is recommended for Butcher Creek), so a bacteria TMDL was developed for Threemile Creek only. Nutrient levels in Threemile Creek substantially exceeded EPA's regional guidance for both phosphorus and nitrogen; therefore a nutrient and a dissolved oxygen TMDL were also developed for Threemile Creek. An assessment of Lucas Lake indicates that sediment and metals are not impairing beneficial uses, so TMDL development was not needed for the lake and presumably the WAG will recommend delisting for sediment (IDEQ et al. 2003, Appendix P). The implementation plan is currently under development, and should be completed in 2004

Table 15. South Fork Clearwater River and tributary segments deemed to be water quality limited (IDEQ 1998, IDEQ et al. 2000). Forty-one segments previously listed within the watershed were removed from the 1996 303(d) List.

Stream Segment	Pollutants of Concern	Stream Miles
Cottonwood Creek- Headwaters to South ForkCR	BACTERIA, NUTRIENTS, SEDIMENT, TEMPERATURE, DISSOLVED OXYGEN, AMMONIA, HABITAT	31.2
Stockney Creek – Headwaters to Cottonwood Creek	SEDIMENT, BACTERIA	12.0
Red Rock Creek - Headwaters to Cottonwood Creek	SEDIMENT	11.0
SF Clearwater River Cottonwood Creek – Headwaters to Cottonwood Creek	HABITAT, BACTERIA, NUTRIENTS, TEMPERATURE	7.0
Shebang Creek – Headwaters to Cottonwood Creek	UNKNOWN	14.6
Long Haul Creek – Headwaters to SF Cottonwood	UNKNOWN	1.6
Threemile Creek- Headwaters to SFCR	NUTRIENTS, SEDIMENT, TEMPERATURE, BACTERIA, DISSOLVED OXYGEN, FLOW ALTERATION, HABITAT, AMMONIA	49.8
Butcher Creek – Headwaters to SFCR	DISSOLVED OXYGEN, TEMPERATURE, HABITAT, SEDIMENT, BACTERIA, FLOW ALTERATION	18.9
Newsome Creek – Beaver Creek to mouth	SEDIMENT	6.9
Cougar Creek – Headwaters to SFCR	SEDIMENT	6.4
Beaver Creek – Headwaters to Newsome Creek	SEDIMENT	5.0
Buffalo Gulch – Headwaters to mouth	SEDIMENT	6.5
Dawson Creek – Headwaters to mouth	SEDIMENT	2.3
Nugget Creek – Headwaters to Newsome Creek	SEDIMENT	2.7
Sing Lee Creek- Headwaters to Newsome Creek	SEDIMENT	3.1
SFCR- Red River to Clearwater River	SEDIMENT, TEMPERATURE, HABITAT	63.8
Little Elk Creek- Headwaters to Big Elk Creek	TEMPERATURE	9.2
Big Elk Creek- Headwaters to Elk Creek	TEMPERATURE	9.6
Lucas Lake	SEDIMENT	0.00

Surface Water Quality Summary

Predominant land use in the Cottonwood Creek drainage is agriculture. The Beneficial Use Reconnaissance Program (BURP) conducted in 1995-96 indicated beneficial uses were not fully supported in Cottonwood Creek or its tributaries. Low flows and high temperatures were problematic, as were lack of riparian vegetation and degraded streambanks. Additionally, sediment delivery to the river and streams was impacting aquatic habitat. The ISWCD initiated a SAWQP to address these priority problems (IDEQ et al. 2000).

Of those streams evaluated as part of the BURP assessment for the remainder of the South Fork Clearwater River basin (excluding Cottonwood Creek drainage), only upper Cougar Creek showed full support of beneficial uses. Five WWTPs located within the basin include Grangeville, Kooskia, Elk City, Stites, and Red River Ranger Station. Sediment and temperature are pervasive problems throughout the basin, while nutrients and bacteria impact only one segment (IDEQ et al. 2003). South Fork Clearwater River is designated by IDEQ as a Special Resource Water from Red River to the Clearwater River. Stream segments or water bodies designated as Special Resource Waters need intense protection to preserve outstanding or unique characteristics or to maintain current beneficial uses, and are protected from additional point source contributions (IDAPA 58.01.02.002.96).

Cottonwood, South Fork Cottonwood, and Threemile Creeks have nutrients listed as impacting beneficial uses. Nutrients are problematic in the Cottonwood Creek drainage, especially nitrates. Cottonwood Creek and tributaries drain the area north of Grangeville, which has documented nitrate contamination problems (ISWCD 2001, IDEQ 2002, Neely 2002). Severe nitrate levels were found in all tributaries of this drainage during spring runoff of 2001, thought to be a result of fall application of anhydrous ammonia (fertilizer)(Myler 2002). According to Myler (2002), much of the phosphorus in surface waters of the Cottonwood Creek drainage is correlated with sediment. The WWTP appears to be the largest contributor to nitrogen and phosphorus loads on Threemile Creek, although non-point sources also contribute a considerable proportion

Erosion and sediment from land use practices is a major problem throughout the entire basin. Thirteen segments list sediment as a pollutant impacting beneficial uses. Mining operations that dredged the South Fork Clearwater River and tributaries drastically altered channel configuration and riparian habitat. These mines sent large amounts of sediment into the South Fork Clearwater River, increasing sediment deposition, bedload, and instability of the system. Most sediment within the upper basin moves in conjunction with 5-year return (or greater) storm events, while mass failures are generally a result of 15-year return (or greater) storms. The largest nonpoint source for sediment in the upper South Fork Clearwater River basin is agricultural lands in Threemile, Butcher, Sally Ann, and Rabbit Creek drainages. The second largest source is erosion resulting from livestock grazing and roads. Red River, Crooked River, Newsome Creek, and American River are heavily impacted by mining, logging, forest roads and grazing. Within the Cottonwood Creek drainage, sediment problems are associated with roads, cropland (37% classified highly erodible), and eroding streambanks from livestock use. Most erosion occurs in winter and during high intensity spring and summer storms (ISWCD 2001).

Table 16. Designated (or existing) beneficial uses for the South Fork Clearwater River and tributary segments listed in the 1998 303(d) list (IDEQ et al 2001).

River/Stream Segment	Designated Beneficial Uses
Cottonwood Creek- Headwaters to SFCR	Coldwater Biota Secondary Contact Recreation Salmonid Spawning Agricultural Water Supply
Stockney Creek – Headwaters to Cottonwood Creek	Undesignated[1]
Red Rock Creek - Headwaters to Cottonwood Creek	Undesignated[1]
SF Clearwater River Cottonwood Creek – Headwaters to Cottonwood Creek	Undesignated[1]
Shebang Creek – Headwaters to Cottonwood Creek	Undesignated[1]
Long Haul Creek – Headwaters to SF Cottonwood	Undesignated[1]
Threemile Creek – Headwaters to the SF Clearwater River	Coldwater Biota Secondary Contact Recreation Salmonid Spawning
Butcher Creek– Headwaters to the SR Clearwater River	Coldwater Biota Secondary Contact Recreation Salmonid Spawning
Newsome Creek – Beaver Creek to SF Clearwater River	Coldwater Biota Primary Contact Recreation Secondary Contact Recreation Salmonid Spawning
Beaver Creek – Headwaters to Newsome Creek	Coldwater Biota Primary Contact Recreation Secondary Contact Recreation Salmonid Spawning
Buffalo Gulch – Headwaters to American River	Coldwater Biota Primary Contact Recreation Secondary Contact Recreation Salmonid Spawning
Dawson Creek – Headwaters to Red River	Coldwater Biota Primary Contact Recreation Secondary Contact Recreation Salmonid Spawning
Nugget Creek – Headwaters to Newsome Creek	Coldwater Biota Primary Contact Recreation Secondary Contact Recreation Salmonid Spawning
Sing Lee Creek – Headwaters to Newsome Creek	Coldwater Biota Primary Contact Recreation Secondary Contact Recreation Salmonid Spawning
SF Clearwater River– Red River to Clearwater River	Coldwater Biota Primary Contact Recreation Secondary Contact Recreation Salmonid Spawning SPECIAL RESOURCE WATER

Cougar Creek- Headwaters to the SF Clearwater River	Coldwater Biota Primary Contact Recreation Secondary Contact Recreation Salmonid Spawning
Little Elk Creek- Headwaters to Big Elk Creek	Coldwater Biota Primary Contact Recreation Secondary Contact Recreation Salmonid Spawning
Big Elk Creek- Headwaters to Elk Creek	Coldwater Biota Primary Contact Recreation Secondary Contact Recreation Salmonid Spawning
Lucas Lake	Coldwater Biota Primary Contact Recreation Secondary Contact Recreation Salmonid Spawning

[1] Undesignated water bodies are presumed to support cold-water biota and primary or secondary contact recreation unless IDEQ determines otherwise (IDAPA 58.01.02.140) (IDEQ 2001).

While only seven segments have been listed for temperature on the 303(d) list, the subbasin assessments within the South Fork Clearwater River basin indicates water temperature is a basin-wide problem. Stream channelization, lack of riparian cover, and altered flow regimes are contributing factors to the temperature problem, resulting in wide, shallow channels that increases the river's ability to absorb heat (IDEQ et al. 2000, 2003). Prolonged warming occurs in the basin from late spring into fall, with maximum temperatures in June through August. (IDEQ et al. 2003). Temperatures in the upper basin are generally stable, while lower-end South Fork Clearwater River temperatures show a dramatic increase and greater diurnal fluctuations. Temperature criteria exceedances have been noted on a number of tributaries within the upper basin as well. The EPA issued new regional water temperature guidance in May 2003, and the South Fork Clearwater River is the first TMDL developed in Idaho to utilize the natural background criteria of the guidance to determine the temperature TMDL.

Bacteria and other pathogens are considered problems in surface waters when levels of either are high enough to create human health problems in rivers or streams used for recreational activity. Bacteria exceedances for primary and secondary recreation have been observed at all sampling locations performed by SAWQP (ISWCD 2001) in the Cottonwood Creek drainage, with May and June occurrences primarily attributed to cattle (Myler 2002). Significant reductions will be required (23-88%) to meet the bacteria TMDL, where sources include hog/dairy/beef operations and failing human septic systems (IDEQ et al. 2000). Threemile Creek in the upper basin is the only segment with observed bacteria exceedances. Likely pathogen sources include: livestock, AFOs, wildlife, failing septic systems, and storm water runoff (IDEQ et al. 2003). (For further information on water quality standards, policies and procedures please see http://www2.state.id.us/adm/adminrules/rules/idapa58/0102.pdf.)

Aquatic Biology and Habitat Concerns

The TMDL process does not address all factors important to the quality of water and the aquatic system. Flow alteration, riparian vegetation, and instream habitat are outside the scope of the TMDL process, but still have critical impact on water quality, the health of the aquatic system, and the community structure. An evaluation of the ecological components provides further information on the man-made impacts to the system.

Biotic Integrity and Instream Habitat

Several assessments have examined biotic integrity (health and sustainability of the biological community) within the South Fork Clearwater River basin (BLM (IDEQ et al. 2000), USFS (1997), IDEQ-BURP (IDEQ et al. 2000, 2002), SAWQP (ISWCD 2001)). These assessments all indicate that the riverine habitat is impacted negatively by a variety of land and water uses. Extreme alterations to channel morphology due to placer mining (IDEQ et al. 2002) have occurred in the upper basin. Four major tributaries (Red River, Crooked River, American River, and Newsome Creek) as well as the upper mainstem have extensive dredge mining alterations. Improvements to habitat cannot be obtained unless functional channels are reestablished in some way (Petts and Catlow 1996, Gordon et al. 1992). The South Fork Clearwater River is impacted below the national forest boundary by many activities, and is wider, shallower and generally lacking in quality pool components (USFS 1997, IDEQ et al. 2000, Appendix C and D). Woody debris is missing in the lower end of the basin (Cottonwood Creek drainage), although it once provided a critical function. Where pools do exist, quality is low due to this lack of woody debris or instream cover. Little offstream habitat exists to provide refuge for fish (IDEQ et al. 2000, Appendix D).

Cobble embededness occurs when fine sands and silts are deposited over larger substrate particles (gravel, cobble, boulder). Increased cobble embeddedness within the river and many tributaries has adversely affected salmonid spawning, juvenile survival, and density and diversity of macroinvertebrates (IDEQ et al. 2000, Appendix D). Benthic macroinvertebrates integrate the effects of upstream land and water uses in a basin over the long term, and therefore are important indices of water quality. While the biotic integrity of the South Fork Clearwater River is of intermediate quality overall (Maret et al. 2001), many streams within the basin are degraded.

The combination of resident and migratory life histories in fish is a strategy for disturbance-based systems such as the South Fork Clearwater River basin. The intermixing of local subpopulations with fluvial or migratory populations (metapopulations) is also an adaptive strategy (USFS 1997). Natural disturbance cycles/characteristics have been altered and/or replaced by man-made disturbances, causing problems for fish and wildlife. Fish populations are widely distributed, but they are likely quite different than historical distributions. Fish abundance appears to have declined significantly. Viability of the fisheries is at risk due to in-basin and downstream factors that limit flexibility and alter life history strategies (USFS 1997). While much of the native ecosystem has been altered in some way within the basin, there are still core areas available for rebuilding and maintaining native aquatic systems. Significant areas still exist where upland watershed, riparian and stream conditions are relatively intact. For instance upper Johns and Tenmile Creeks (highlands of the Gospel-Hump) have had little mining influence and are probably the best habitat for many salmonid species (IDEQ et al. 2003).

Riparian Habitat

The loss of riparian habitat due to land use has been problematic within the South Fork Clearwater River basin for more than 50 years. The integrity of riparian vegetation and its extent along rivers has been changed and fragmented by forest conversion and streamside disturbance (USFS 1997). In the upper basin, upper and lower Canyon Creek, Meadow Creek, Cougar Creek, Newsome Creek, lower American River, Red River, lower Crooked River, and lower Mill Creek all have high to very high departures from historic riparian condition, many of which represent the most valuable aquatic habitats in the subbasin (USFS 1997). Many of the tributaries to Cottonwood Creek lack plant diversity and have lost important shrub communities and other woody plant species. These communities are important in providing shade, wildlife habitat, and material for instream cover components. Although riparian habitat is not formally addressed in

the TMDL process, effective shade and canopy closure will be used as surrogate targets for temperature improvements associated with the TMDL targets.

Flow Alteration

Land vegetative cover and subsequent management have resulted in dramatic changes to runoff and peak discharge from the watershed during storm events in the lower basin. In the upper basin, forest practices such as harvesting and fire suppression, have altered the disturbance cycle and therefore the resulting hydrology as well. Flow changes include higher and greater volume peaks due to land use. ISWCD (2001) estimates that peak flows are 60% greater than under historic conditions in the lower basin. Higher peak flows may impact stream channels by widening and scouring, and providing energy for transporting and moving large substrate downstream. Less infiltration and higher runoff also reduces the water storage component and hence summer flows. This affects availability of instream and side channel habitat for fish and increases stream temperatures (IDEQ et al. 2000). Although not addressed by the TMDL, the ISWCD's SAWQP will be implementing BMPs to mitigate changed hydrology due to land use. The Nez Perce NF also has plans to change forest management practices (e.g., prescribed burning) to restore more natural disturbance cycles and characteristics, as well as improvements to restore channel function.

Ground Water Vulnerability and Contamination Pathways

The primary land uses/types in the South Fork Clearwater River basin are agriculture, rangeland, and forest. Rangeland and dry-land agriculture are located primarily in the western portion of the basin, and forested lands dominate the eastern areas. There is a strong relationship between land use activities and ground water quality (GWQC 1996). Water management practices as well as land uses, in combination with the hydrogeologic conditions, can increase the potential for ground water quality degradation, threatening ground water beneficial uses. Studies of the Camas Prairie in the basin (Bentz 1998, Neely 2002, Parliman 2002) have shown that the aquifer appears to be vulnerable to nitrate contamination, and greatest nitrate concentrations occurred adjacent to cultivated fields (Bentz 1998). A large percentage of septic system failures in certain areas have also been estimated by the local Health Department (Cottonwood TMDL 2000). There are areas of declining ground water on the plateau despite limited pumping, and cross contamination is occurring from shallower to deeper aquifers from inappropriate well siting/construction (South Fork Clearwater River Draft TMDL 2002).

Both point (specific source of pollutant, usually localized) and nonpoint (more diffuse, multiple sources, usually widespread) sources of pollutants contribute to ground water quality degradation. Nonpoint sources are often associated with broad land use practices, such as crop production (USGS 1998). Practices such as fertilizer and pesticide application and application of animal waste have the potential to threaten the aquifer. Once degraded, it is difficult to mitigate the effects of ground water pollutants. For this reason, many ground water quality programs emphasize the need for preventive practices.

Monitoring

Within the South Fork Clearwater River basin, IDWR monitors only 12 wells. Reports (Neely and Crockett 1998, Neely 2001) characterizing regional and county ground water quality are based on well sampling conducted from 1991 to 1999.

Currently identified ground water quality problem areas or potential problem areas have been established in the basin based on past monitoring activities (Map 2). Results of ground water monitoring (Neely 2002, from IDWR Ground water Quality database) are summarized in Table 17. There are few ground water contaminants indicated from IDWR ground water monitoring wells (Neely 2002). Iron and radioactivity may be constituents of concern detected in ground water, but they are most likely from natural causes or conditions.

The Camas Prairie region has been designated a nitrate priority area (fifth priority in the state) by IDEQ (2002)(Map 2). More than half of the wells in the Camas Prairie have had nitrate levels exceeding 5 mg/L (IDEQ 2002). Examination of data from 1990-99 revealed wells ranging in values from 0 to 80 mg/L, with a mean of 5.1 mg/L for the entire Camas Prairie. Nitrate concentration values greater that 2 mg/l are considered impacted by land use activities As of 2000, seven IDWR wells have been sampled for nitrates in the South Fork Clearwater River basin, and four of these wells had mean nitrate levels greater than 2 mg/L. Based on these results, and monitoring results by IDEQ (Bentz 1998), ISDA initiated the Southern Clearwater Plateau Volcanic Aquifer regional monitoring project in 2001. First-year results showed that 22% of wells in the South Fork Clearwater River basin had nitrate levels between 2 and 5 mg/L, and 11% of wells had values exceeding the MCL (data from Bahr and Carlson 2002). Bentz (1998) found that nitrate tended to be highest adjacent to cultivated lands with shallow wells. The long-term trends are unclear, but short-term trends in nitrate levels appear to be increasing in the Camas Prairie region (Parliman 2002).

IDEQ maintains a list of known leaking underground storage tanks (LUSTs). Five are located in the basin, and all have completed required clean-up procedures. Initial sampling has shown that localized pesticide/herbicide levels could be a concern in the basin, and further monitoring will be done by ISDA (2002). ISDA is in the process of developing the State Pesticide Management Plan to address water quality concerns regarding pesticide, fungicide, and herbicide use and disposal.

Table 17. Inorganic ground water quality constituents found in the South Fork Clearwater River basin aquifers from 1990 to 1999 (IDWR ground water quality database). Well depths range from 58 to 430 feet.

Constituent	Primary MCL	Secondary MCL	Minimum Value	Median Value	Maximum Value	Potential Health Risks (from EPA)
Chloride (mg/L)[1]	---	250	0.1	3.78	21	Aesthetic: salty taste
Fluoride (mg/L)[3]	4.0	2.0	0.20	0.53	0.8	Bone disease, tooth decay
Iron (mg/L)[1]	---	0.3	0.005	0.201	0.490	Aesthetic: metallic taste, appliance staining, rusty color of water
Nitrate (mg/L)	10	---	0.24	2.51	6.5	Serious illness in young infants
Sulfate (mg/L)[1]	---	250	2.8	12.6	48	Aesthetic: salty taste
Alpha (pCi/L)	15 pCi/L	---	0	1.19	4.1	Increased risk of cancer
Beta (pCi/L)	50 pCi/L[2]	---	0.6	3.21	7.7	Increased risk of cancer

Units are in milligrams per liter (mg/L) unless otherwise noted. Milligrams per liter are equivalent to parts per million.

Notes:

[1] No primary MCL. Value presented is the Secondary MCL, which is a guideline (non-enforceable) to regulate contaminants for cosmetic or aesthetic effects.

[2] A public water system is considered to be in compliance if the gross beta does not exceed 50pCi/L. The actual Primary MCL is 4 millirems per year.

[3] Fluoride has both a Primary MCL and Secondary MCL

The U.S. Environmental Protection Agency (EPA) has established National Primary Drinking Water Regulations that set mandatory water quality standards for drinking water contaminants. These are enforceable standards called "maximum contaminant levels" or "MCLs", which are established to protect the public against consumption of drinking water contaminants that present a risk to human health. An MCL is the maximum allowable amount of a contaminant in drinking water which is delivered to the consumer.
In addition, EPA has established National Secondary Drinking Water Regulations that set non-mandatory water quality standards for 15 contaminants. EPA does not enforce these "secondary maximum contaminant levels" or "SMCLs." They are established only as guidelines to assist public water systems in managing their drinking water for aesthetic considerations, such as taste, color and odor. These contaminants are not considered to present a risk to human health at the SMCL.

5.7 Energy Supply and Conservation

Electrical energy to the South Fork Clearwater River basin is provided by AVISTA (formerly Washington Water Power Company) and by a local cooperative, Idaho County Light and Power Inc. There are no commercial hydropower facilities in the basin (Crockett, IDWR, 2002).

Wood is a popular choice for heating because of the convenience of the basin's private and public forest properties. The low efficiency of wood as a fuel is offset by its low cost. It is not known if supply and distribution limitations constrain wood as a source to meet future energy needs in the basin.

There is some use of propane for heating fuel. Idaho County Light and Power Inc. provides propane. Propane prices can exhibit price spikes that are greater in intensity than would be expected from normal supply and demand influences (Energy Information Administration n.d.). Price increases are often seen in the winter, as demand increases and refinement production remains constant.

The gasoline supply is adequate in the basin. Retail outlets are located in most cities including Grangeville, Cottonwood, Elk City and Kooskia. As with other fuel sources, the basin remains vulnerable to stormy weather and interruptions in the surface transportation system. Natural gas, carried via pipelines to the end consumer, is not available in the South Fork Clearwater River basin.

Conservation programs designed to increase efficiencies in energy use are expected to play major roles in meeting future energy requirements in the short-run (Idaho Power Company 2001). The Energy Division of IDWR provides information, technical assistance, and financial support to promote cost-effective conservation and the use of energy-efficient resources. The Northwest Energy Code and locally adopted building codes are examples of programs that support modern conservation standards for new building construction, and are usually administered by local governments. Existing buildings are eligible for energy conservation upgrading through several programs sponsored by state and federal agencies and the private utilities industries, including the Building Commissioning program, Gem Star Home Energy Rating System, Super Good Cents and Natural Choice (Eklund 1997).

The Agricultural Efficiency Program was initiated because of agriculture's significance within Idaho, both as an economic base and a highly consumptive energy and water user. The program is designed to assist Idaho's irrigators in reducing energy use and irrigation costs by controlling and managing water. The program includes Scientific Irrigation Scheduling, Pump Efficiency

Testing, and other technical assistance. The IDWR Energy Division has a Low Interest Agricultural Loan program to repair and replace irrigation systems, improve efficiencies of irrigation systems, and to improve efficiencies of other farm facilities such as feed mills, dairies, poultry, greenhouses and commodity storage buildings.

The IDWR Energy Division provides technical information and assistance in the use of solar, wind power, geothermal, hydropower, and biomass energy sources. The Energy Division provides low interest loans to finance the development of Energy Conservation and Energy Generation projects that utilize renewable energy resources. The loan programs cover residential, agricultural, governmental, schools, hospitals, health care, commercial and industrial facilities.

5.8 Potential Hydropower

Numerous hydropower sites have been studied in the South Fork Clearwater Basin by the U. S. Army Corps of Engineers, the U. S. Water and Power Resources Service(Bureau of Reclamation), and the Idaho Water and Energy Resources Research Institute(Idaho Water Resources Research Institute), University of Idaho. The most feasible sites studied are listed in *Potential Hydroelectric Energy Resources of Idaho*, Idaho Department of Water Resources, June, 1981(Warnick, Filler, Vance). These sites are shown in Table 18 and on Map 8. It should be noted that the installed capacities (MW) listed cannot be summed for the total power potential in the basin as studied at the time. These studies indicate that about 135 – 315 megawatts of power could have been developed for the economic, environmental and other conditions of that time. New studies conducted would most likely develop different installed capacities due to changed economic conditions, NEPA and ESA requirements, water quality, fisheries, social, recreation and other concerns and requirements.

Table 18. Potential hydroelectric power development.

Powerplant Site	Map Site No.	Stream Name	Head (ft)	Installed Capacity (MW)
Bully Creek	6	S. F. Clearwater	30	2.4
Elk City	10	S. F. Clearwater	580	3.9
Grangeville Site	4	S. F. Clearwater	292	16.3
Johns Creek 1	3	S. F. Clearwater	785	38.3
Johns Creek 2	3	S. F. Clearwater	66	4.7
Lower Golden	9	S. F. Clearwater	66	2.9
Meadow Creek 1	8	S. F. Clearwater	810	2.3
Meadow Creek 2	8	S. F. Clearwater	66	1.6
Mount Idaho	5	S. F. Clearwater	50	4.1
Newsome Creek	10	S. F. Clearwater	787	20.7
Newsome Creek 1	10	S. F. Clearwater	1040	75.8
Newsome Creek 2	10	S. F. Clearwater	66	2.9
Red Horse 1	11	Red River	300	0.8
Red Horse 2	11	Red River	66	1.3
Sheep Bridge	7	S. F. Clearwater	300	15.5
Silver Creek	9	S. F. Clearwater	295	10.5
Silver Creek 1	9	S. F. Clearwater	430	12.5
Silver Creek 2	9	S. F. Clearwater	66	3.5
SF Clearwater River1	2	S. F. Clearwater	355	64
SF Clearwater River2	2	S. F. Clearwater	66	5.5

SF Clearwater River Site	2	S. F. Clearwater	355	21.5
Tenmile Creek 1	9	S. F. Clearwater	420	4.2
Tenmile Creek 2	9	S. F. Clearwater	66	3.2
Three Mile Creek	1	S. F. Clearwater	155	9.6
Three Mile Creek 1	1	S. F. Clearwater	600	6.4
Three Mile Creek 2	1	S. F. Clearwater	66	3.3
Upper Golden	9	S. F. Clearwater	66	2.9

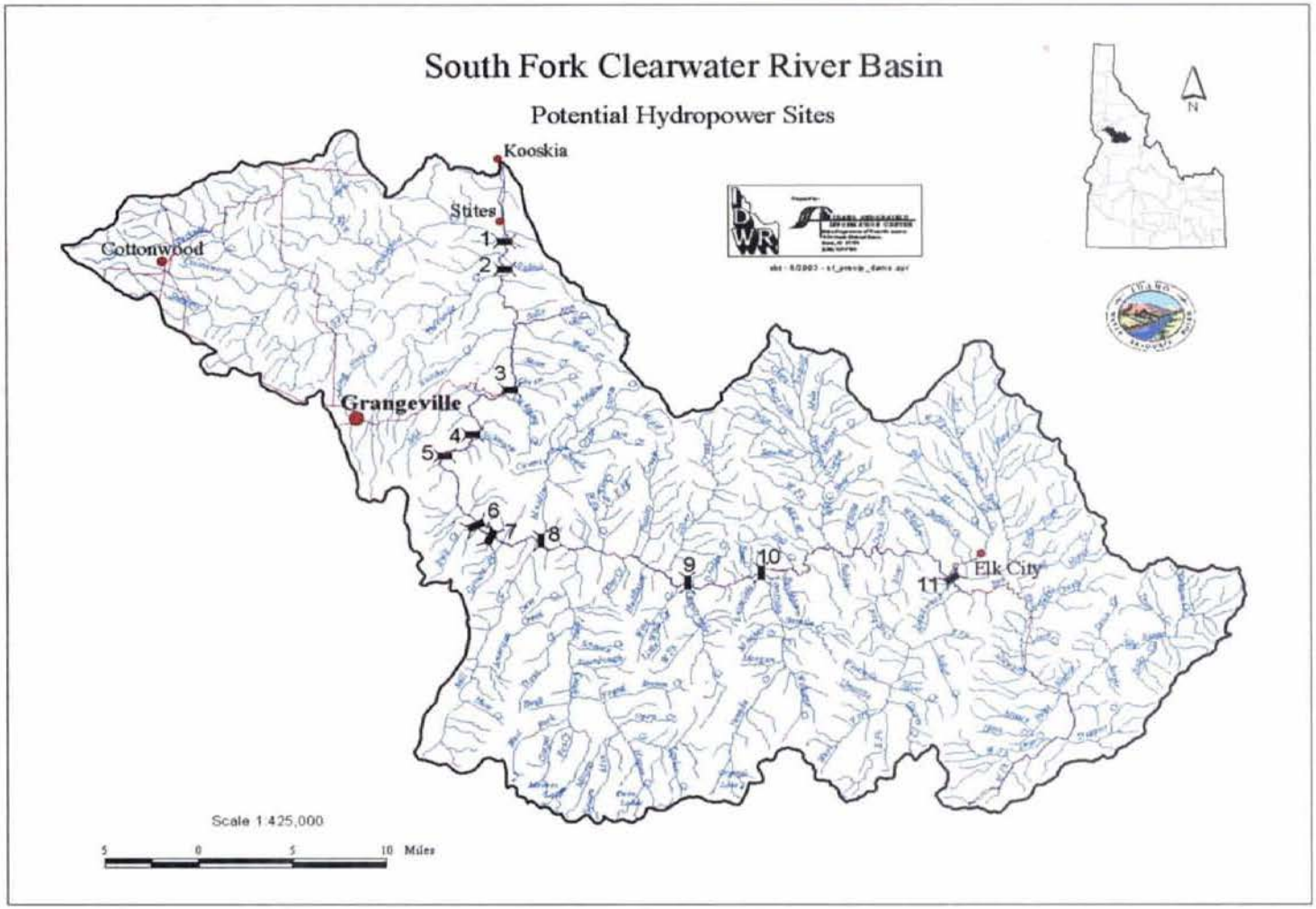
While there are no specific State of Idaho energy licensing requirements for hydropower projects, all hydropower projects must have a water right issued by IDWR. At the present time, there are no hydropower plants in the basin that have received water right licenses from IDWR (Sherman, IDWR 2002). The Idaho State Water Plan (December 1996), Section 4D – Hydropower Licensing, states that hydropower water rights may be limited to a specific term and subordinated to upstream depletionary uses[Idaho Code, 42-203B(6) and (7)]. Water rights for power purposes may also be defined by agreement as unsubordinated to an established minimum flow [Idaho Code, 42-203B(2)]. It is the policy of the State of Idaho to keep hydropower development from precluding the future development of water for higher and better uses. Article XV, §3 of the Idaho Constitution, states in part: *"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."*

Federal hydropower development is authorized by Congress, and non-federal development is authorized and licensed by the Federal Energy Regulatory Commission (FERC). In certain cases, non-federal hydropower projects may qualify for an exemption from licensing by the FERC. If no federal lands are involved, small hydropower projects of 5 megawatts or less, and projects built on existing water conduits may be exempt if they meet all FERC regulations pertaining to these exemptions. The federal government, in the hydropower licensing process, must recognize water rights and other constraints on water use established through state law. The Idaho State Water Plan, Section 4E – Hydropower Siting, states that specific hydropower siting issues are addressed in the Idaho Water Resource Board's comprehensive river basin plans. It further states that the Federal Energy Regulatory Commission must consider State comprehensive plans in making hydropower siting decisions. As a general policy, the Idaho Water Resource Board believes that energy conservation and efficiency improvements are the most desirable methods to provide for additional power requirements.

Although the SF Clearwater basin is abundant in water flows and elevation drop (head), changes to the natural hydrologic regime by impounding or diverting water can affect fish, wildlife, and vegetation resources in numerous ways. The potential benefits of any new hydroelectric project development must be weighed against the potential negative impacts to the basin resources.

This comprehensive river basin plan provides for consideration of minimum stream flows and designates the South Fork Clearwater River mainstem (63.8 miles), as "Recreational" thus preventing hydropower development without IWRB approval. The potential hydropower sites that have been studied are located on the mainstem. Other hydropower sites on the tributary streams of the basin could be studied in the future. Many of the tributary streams are also recommended for consideration of minimum flows and protected status. This plan addresses potential hydropower development in the Recommendations and Designated Rivers Sections.

Map 8. Potential hydropower sites.



5.9 Other Resources

5.9.1 Fish Species Listed Under the Federal Endangered Species Act

Fall chinook (*Oncorhynchus tshawytscha*)

Fall chinook are listed as threatened under the Endangered Species Act. All fall chinook above Lower Granite Dam are considered one Ecologically Significant Unit (ESU) (Waples et al. 1991).

From 1911 to 1963 a Washington Water Power Dam, Harpster Dam, was located on the South Fork Clearwater River upstream from its confluence with the Middle Fork of the Clearwater River. The structure only had fish passage facilities from 1935 to 1949 and the effectiveness of the passage system was not known (USFS 2000). It likely greatly impacted or eliminated some anadromous runs of salmon and steelhead in the South Fork Clearwater River basin. It is believed that all indigenous spring chinook salmon were eliminated by the construction of Lewiston Dam in 1927 (USFS 1998; USFS 1999).

Both dams have been removed but the impacts to fish were severe. Prior to 1900 and the construction of the many dams in the Snake River, fall chinook salmon were widely distributed (Waples et al. 1991). After the removal of the Lewiston and Harpster dams, anadromous fish were outplanted in the basin and naturalized runs were established with varying success.

Table 19. Fish listed as Threatened, Endangered, Sensitive, or Species of Special Concern in the South Fork Clearwater River basin.

Fish Species	Life History	Status
Fall chinook salmon (*Oncorhynchus tshawytscha*)	Anadromous	Threatened[1]
Steelhead (*Onchorhynchus mykiss*)	Anadromous	Threatened[1]
Bull trout (*Salvelinus confluentus*)	Resident and Fluvial	Threatened[1], Sensitive Species[2]
Pacific lamprey (*Lampetra tridentata*)	Anadromous	Endangered[3]
Spring chinook salmon (*Oncorhynchus tshawytscha*)	Anadromous	Sensitive[2], Species of Special Concern[3]
Westslope cutthroat trout (*Onchorhynchus clarki*)	Resident and Fluvial	Sensitive[2], Species of Special Concern[3]
Redband rainbow trout *Onchorhynchus mykiss*)	Sensitive of Special Concern[3]	Sensitive[2], Species

[1] ESA federal listing
[2] Forest Service Region 1 listing
[3] Idaho Department of Fish and Game state listing

Reintroduction of fall chinook in the basin has not been as successful as the spring chinook program (IDFG 2001). Populations in the basin are extremely depressed. Two fall chinook redds were observed in the South Fork Clearwater River in 1999 and one was noted in 2000 (WSU 2001). Some fall chinook juvenile rearing likely occurs in the lower South Fork Clearwater River(USFS 2000).

Steelhead Trout (*Onchorhynchus mykiss*)

The anadromous steelhead trout including those in the South Fork Clearwater River were listed as threatened under the Endangered Species Act in 1997. Naturally produced South Fork Clearwater River steelhead are considered part of the Snake River ESU.

The South Fork Clearwater River basin has a high capacity to produce steelhead (USFS 1998). In general, the basin contains a significant amount of habitat with high to very high potential to support native species (USFS 1999). Optimum steelhead spawning habitat can be characterized by temperatures of 50°-60°F, water depths of 1 to 2 ft., and gravels of 1 to 3 in. High quality habitat for steelhead is found in lower Crooked River, Newsome Creek, Johns Creek and Tenmile Creek. Sections of Crooked River and Newsome Creek have been impacted by mining and human activities. Mill Creek, Meadow Creek, Red River and the American River have been degraded moderately to severely and some limited spawning occurs in the mainstem South Fork Clearwater River.

Adults returning to the South Fork Clearwater River are considered "B" run steelhead. "B" refers to the time of crossing over Bonneville Dam. "B" run fish run later than " A" run fish. Most "B' run fish spend two years in the ocean and weigh 12 to 13 lbs when they return to the Clearwater River basin.

Bull Trout (*Salvelinus confluentus*)

The bull trout, a charr, was listed as threatened under the Endangered Species Act in 1998. The listing required that agencies administer active management plans to protect the species and its habitat. Critical habitat for bull trout has been proposed in Idaho in the Clearwater and Salmon River basins (USFWS 2003).

Bull trout have specific habitat requirements. Water temperatures above 59^0 F limit bull trout distribution (Pratt 1984). Spawning temperatures range from 40° to 46°F, lower than most other Idaho trout. Lack of migration corridors, substrate, stream flows and channel stability can also impact bull trout distribution (Thurow 1997; Fraley and Shepard 1989).

Watson and Hillman (1997) state that management and protection of bull trout needs to be site specific. The IDFG, the USFS and the BLM sponsored an ongoing study in the South Fork Clearwater River basin starting in 1993, to learn more about native bull trout and its habitat (IDFG 2001). South Fork Clearwater River basin is a key watershed for bull trout (Idaho 1996).

Movement of bull trout among the South Fork Clearwater, Middle Fork Clearwater, Lochsa and Selway Rivers has not been documented but is feasible (USFS 1999). Movement of fluvial bull trout in the Blackfoot River in Montana migrated up to 80 miles (Swanberg 1997). The distance from the upper tributaries in the South Fork Clearwater River to the confluence of the Middle Fork Clearwater River is about 50 miles. It is possible that some migratory bull trout were restricted in movements during the period that Harpster Dam was in place on the South Fork Clearwater River.

5.9.2 Sensitive Species

Spring chinook Salmon (*Oncorhynchus tshawytscha*)

Spring chinook salmon enter the Columbia River and begin spawning migrations during April and May. Snake River spring/summer chinook were listed as a threatened species under the federal Endangered Species Act in 1992 (Table 19). Spring chinook in the Snake River are considered an ESU, but the South Fork Clearwater River chinook are not considered part of the ESU. It is believed that the indigenous spring chinook salmon in the Clearwater basin were eliminated by the construction of Lewiston Dam in 1927 (USFS 1998). Reintroduction of spring chinook has resulted in a naturalized population , but South Fork Clearwater River chinook are not listed because of the genetic uncertainty of the stock (IDFG 2001).

Nutrient flow of carbon, nitrogen, and phosphorus brought upstream by spawning salmon is significant in determining the overall productivity of both watersheds and salmon runs (Willson and Halupka 1995). Trees and shrubs near spawning streams derive approximately 22 to 24% of their nitrogen from spawning salmon as indicated by isotopic analyses (Helfield and Naiman 1998).

The South Fork Clearwater River and some tributaries provide travelways, spawning, and rearing habitat for the chinook. The most important habitat in the basin is found in the Red River, Crooked River and American River. Redd counts in the South Fork Clearwater River basin have been highly variable (Table 20). The lowest recorded number of redds was in 1999.

To reestablish runs of spring Chinook in Newsome Creek, the Nez Perce Tribe operates the Newsome Creek Satellite Acclimation Facility. Approximately 75,000 spring Chinook fingerlings from the Nez Perce Tribal Hatchery are transferred to the facility in May and are held until release in October.

Table 20. South Fork Clearwater River spring chinook salmon traditional trend aerial redd counts, 1966-2001.

Year	Number[1]	Year	Number[1]
1974	17	1988	110
1975	59	1989	53
1976	33	1990	78
1977	88	1991	6
1978	77	1992	98
1979	27	1993	209
1980	46	1994	17
1981	75	1995	6
1982	112	1996	44
1983	113	1997	242
1984	87	1998	64
1985	130	1999	5
1986	109	2000	154
1987	143	2001	

1 South Fork Clearwater River Clearwater counts in Red, American, Crooked Rivers and Newsome Creek;
Newsome Ck had 280 excess adult outplants during 1997 and 362 adults, 125 jacks excess Adult outplants during 2000.

Westslope cutthroat trout (*Onchorhynchus clarki lewisi*)

Westslope cutthroat trout are listed as Sensitive by the USFS and a Species of Special Concern by the IDFG (Table). Westslope cutthroat trout historically were the dominant trout in streams of central and northern Idaho (Behnke and Wallace 1986).

Westslope cutthroat in the South Fork Clearwater River basin are an important metapopulation in the Clearwater River basin (USFS 1998). Strong populations are found in Johns Creek, Tenmile Creek, Crooked River, Meadow Creek and Mill Creek (USFS 2000). Populations in the basin are generally small fluvial fish (USFS 1998). Poor habitat in the lower reaches of streams in the basin probably limits cutthroat trout dispersion.

Redband Rainbow Trout (*Onchorhynchus mykiss*)

Redband trout are considered by the USFS to be a Sensitive Species (USFS 1998). They are a listed as a Species of Concern by Idaho (IDFG 2001). Redband trout are a non-anadromous form of *Onchorhynchus mykiss* and distribution in the western U.S. closely matches steelhead (Behnke 1992).

Redband populations are found in areas of more extreme conditions than other rainbow trout (IDFG 2001). The South Fork Clearwater River basin has good habitat for redband/steelhead in numerous areas. It is not known if redband move from the mainstem South Fork Clearwater River into the lower reaches of the tributaries when the water temperature increases in the summer.

Pacific Lamprey (*Lampetra tridentata*)

The Pacific lamprey is listed as Endangered by Idaho (IDFG 2001). Adult returns of lamprey to the Snake River from 1995-1999 were ten magnitudes less than they were in the 1960's (Cochnauer and Claire 2000). Historically, up to 400,000 lampreys were counted migrating past Bonneville Dam (USFS 1998).

Pacific lampreys are anadromous and face the same migratory threats as South Fork Clearwater River salmon and steelhead (Moser et al. 2002). Logging, stream impoundment, road building, grazing, mining and community development have impacted habitats in the Snake River corridor and the Clearwater River basin. Lampreys can be a large portion of the biomass in streams where they are abundant (Close et al. 2002). They are important in nutrient cycling, nutrient storage and as an important prey item. Lampreys have adapted with their prey (Beamish 1980).

The lamprey is not a game fish and has not been a fishery management priority with most agencies. However, Native American Tribes view the loss of the lamprey as loss of culture, loss of fishing opportunity and they are forced to travel to the lower Columbia tributaries to harvest lampreys (Close et al. 2002).

Cochnauer and Claire (2000) have studied the lamprey in the South Fork Clearwater River basin focusing on distribution, life history and habitat requirements. Lampreys were collected by electrofishing and trapping. Lampreys have been found in Red River and could occur in the American River (USFS 1998; Cochnauer and Claire 2000).

Fish Hatcheries

A federal fish hatchery, managed by the USFWS, is located at Kooskia. Spring/summer chinook salmon are produced here and fall chinook and steelhead have been reared here. IDFG has satellite facilities at Red River, Crooked River and a pond at Red River for anadromous fish

production. The Nez Perce Tribe releases chinook and steelhead in the basin.

Additional Sensitive Species

The South Fork Clearwater River basin is home to many species not on the USFWS threatened or endangered list, but whose populations may be at risk or are considered sensitive by the resource agencies. These species include:

- ***Mammals***: fisher, wolverine, and Townsend's big-eared bat
- ***Birds***: pygmy nuthatch, northern goshawk, great gray owl, barred owl, black-backed woodpecker, white-headed woodpecker, three-toed woodpecker, Lewis woodpecker, mountain quail, flammulated owl
- ***Plants***: broad fruit mariposa, Oregon bluebells, evergreen kittentail

Little is known about the distribution and abundance of most of these species in the basin. However, it is known that white-headed woodpecker, flammulated owl, and northern goshawk numbers are declining in the basin due to the loss of large Ponderosa pine trees.

5.9.3 Wildlife

Wildlife habitats have been identified in studies by various government agencies and observations of the residents and visitors to the basin.

Big Game

Most of the large game mammal populations in the South Fork Clearwater River basin, including whitetail deer, elk, black bear, moose, and mountain lion, are stable or expanding. However, the hunting quota for large bull elk in Unit 15 has been reduced by 25% (Crenshaw 2002).

5.9.3.1 Birds and Mammals Listed Under the Endangered Species Act

Bald Eagle (*Haliaeetus leucocephalus*)

Bald Eagles are listed as Threatened. Originally listed as Endangered on March 11, 1967, they were downlisted to threatened on July 12, 1995. On July 6, 1999, the USFW proposed delisting the bald eagle because data suggest that the species has recovered to levels necessary to maintain a viable population (U.S. Fish and Wildlife Service 2000b). No bald eagles nest within the South Fork Clearwater River basin. Some bald eagles have been seen in the winter along the South Fork Clearwater River and on the Camas Prairie.

The South Fork Clearwater River basin is part of Bald Eagle Recovery Zone 15, which encompasses all of central Idaho. The recovery goal for Zone 15 is to provide secure habitat for at least six bald eagle nesting territories, with long-term occupation of at least four.

Canada Lynx (*Lynx canadensis*)

This species is listed as Threatened, effective April 24, 2000. Lynx have been recorded in the South Fork Clearwater River basin (USFS 1998). Lynx denning habitat is abundant in the upper elevations of the basin. The most suitable lynx habitat is in Johns Creek, American River, Crooked River and Red River.

Gray Wolf *(Canis lupus)*

The population of gray wolves south of Interstate 90 was listed on November 22, 1994, as an "Experimental Population – non-essential." On July 13, 2000, the U.S. Fish and Wildlife published a proposal to reclassify populations of gray wolf. Under this change, Idaho's population south of Interstate 90 would retain Experimental Population designation, and would be a part of the Western Distinct Population Segment, subject to rules specific to that Distinct Population Segment. Wolves north of Interstate 90 are listed as Endangered.

Grizzly Bear (*Ursus arctos*)

In the early 1800s, grizzly bears were abundant in the Clearwater River basin. Currently, grizzly bears do not occupy any part of the South Fork Clearwater River basin (USFS 1999). The last sighting of a grizzly bear in the basin was in 1956 (USFS 2000). The Bitterroot Grizzly Bear Recovery Area is a few air miles from the South ForkCR. The home range of a grizzly bear can be up to 1,000 miles (Le Franc et al. 1987). If grizzly bears are reintroduced to the Bitteroot Mountains, then it is possible that bears will be sighted occasionally in the basin.

5.10 Recreation

The South Fork Clearwater River basin serves primarily as a local and regional recreational resource. The recreational opportunities occur mostly on USFS, BLM and IDFG lands in the upstream, eastern side of the basin. The western side of the basin is mostly private farmland. There are scattered parcels owned by the BLM, but none of them are managed for recreation.

There is one recreation area on the western side of the basin, Snow Haven Ski Area. It is south of Grangeville and just north of the Nez Perce NF boundary (Idaho County Free Press 2002). The Snow Haven Ski Area has a rope tow, T-bar lift and a day lodge. It is on private land.

On its eastern side, the South Fork Clearwater River and its tributary streams offer a range of recreational opportunities throughout the seasons. There is access through the South Fork Clearwater River basin to three federally designated wilderness areas – the Selway, Frank Church River of No Return and Gospel Hump. There are resorts, such as the Red River Hot Springs; developed camping sites and many places for dispersed camping. The USFS, although it does not have user numbers, reports that recreational use of the Nez Perce NF continues to grow (U.S.D.A. Forest Service 1998).

Extensive mining history, sites of ghost towns and former dredges are some of the tourist attractions in the basin. Travelers can explore the historic Elk City Wagon Road and participate in the annual summer festival honoring the 53-mile route, built in 1894 – 1895, for miners and prospectors to get to the gold fields of Elk City (Idaho County Free Press 2002).

May and June are the months boaters, mostly accomplished kayakers, hit the South Fork Clearwater River. Two runs, Golden Canyon and below Bully Creek, are discussed by Amaral (1990). Both runs are described at spring runoff flows. Below 600 cfs, the river becomes constricted and is too rocky for boating. The most difficult conditions, at higher flows, are sought out as one of the premier challenging runs in the state by expert boaters in kayaks, small rafts or catarafts (USFS 1997). There is no power boating on the South Fork Clearwater River.

Summer and fall are seasons for camping, fishing, hiking, and exploring the side drainages and back roads. Both roaded and trail recreation opportunities are available throughout the basin. Roaded recreation opportunities are available primarily in the lower elevations, while trail recreation dominates the higher areas. There are many miles of groomed and non-groomed

snowmobile trails in the South Fork Clearwater River basin that provide winter recreational opportunities. Cross-country skiing is popular in the basin. The Nez Perce NF provides most of the recreational opportunities on the eastern side of the basin. Recreational designations and assessments and human use trends are presented in the South Fork Clearwater River Landscape

Assessment, available on the Nez Perce NF website www.fs.fed.us/r1/nezperce. The assessment is updated as information becomes available.

The dramatic increase in off-road vehicle (ORV) use has created a management challenge for the public landowners. Currently, a process is developing to get both USFS regions, the BLM and State of Idaho together to address ORV use (Personal comm., Doman 2002). Few trails are designed specifically for ORVs. People have been driving ORVs in inappropriate places and resource damage is occurring. If all public landowners can work together, as has happened in other states, the management challenges regarding ORV use may be reduced.

In 1997, there was a limited fishery for spring chinook salmon in the South Fork Clearwater River basin: harvest was less than 100 (Horton, IDFG, personal communication 2002). Harvest of chinook in the South Fork Clearwater River basin was estimated at 4,105 in 2001. There was a season for chinook in 2002 from April 20 through August 4 and the limit was two per day and 20 for the season. About 900 chinook were harvested in 2002 (Barrett, IDFG personal communication).

The IDFG conducted a creel survey on the South Fork Clearwater River in 1999 (Cochnauer et al. 1999). Angler effort on the South Fork Clearwater River was estimated at nearly 20,000 hours. Fishing for steelhead was estimated at 14,856 hours (74% of effort). Anglers harvested 2,628 steelhead from the South Fork Clearwater River in 1999. About the same number were harvested in 2000 and 2001. Most of the harvest is in the spring during the months of March and April (Barrett, IDFG personal communication). An estimated 5,898 resident fish were harvested in 1999 including about 3,300 hatchery rainbow/steelhead trout, 2,300 wild rainbow/steelhead trout, 118 brook trout and 88 cutthroat trout.

Not all hatchery chinook released in the basin are marked. The Nez Perce Tribe does not mark sub-yearling chinook of hatchery origin. Therefore, some returning adults of hatchery origin are unmarked and cannot be harvested by anglers.

Lake fishing in this part of the basin is, almost exclusively, for native westslope cutthroat trout in high mountain lakes (Barrett IDFG, personal communication). Brook trout are found in some high mountain lakes in the basin. Brook trout can out-compete cutthroat trout in high mountain lakes, resulting in declines of the native species and a population of stunted brook trout. IDFG has stocked sterile tiger muskie in Rainbow Lake to reduce or eliminate nonnative brook trout. In addition to the westslope cutthroat trout fishing, two ponds along Crooked River are stocked with rainbow trout (Personal comm.. Barret, IDFG).

Fall hunting may attract the most visitors to the basin who are not from the local area. Hunters come from out-of-state in search of big game. The South Fork Clearwater River basin includes Big Game Management Area Unit 15 and a portion of Units 11A and 16. Big game species in the South Fork Clearwater River basin are moose, elk, deer, bear and mountain lion. Unit 15 is a popular whitetail deer hunting areas. Few mule deer are taken in the basin (Personal comm.., Crenshaw 2002). In Unit 15, management objectives for large bull elk were not being met, and harvest goals have been reduced. In 2001, rifle hunters harvested 140 elk in Unit 15. Success rate was 18%. Rifle deer harvest in Unit 15 was 927 animals with a success rate of 50%.

Bear and mountain lion hunting have been closed on the north side of the South Fork Clearwater River for three years while a fawn mortality study is being conducted. Hunting for these species is still open on the south side of the drainage.

The BLM owns land in the Elk City Township. The BLM has a management agreement with the Nez Perce NF that gives the USFS responsibility for snowmobile trails on BLM land. The BLM currently is completing an environmental assessment to allow outfitted trail rides on their lands (Personal comm. Grussing 2002). The BLM has no developed recreation sites in the area.

The Red River Wildlife Management Area is a former ranch owned by the Idaho Department of Fish and Game. An accessible, covered overlook offers year-round wildlife viewing in the meadows along the Red River.

Outfitters and Guides

There are a number of outfitter and guides licensed to work in the South Fork Clearwater River basin (Outfitters and Guides Licensing Board 2001). Outfitters and guides are licensed to lead an array of recreational activities from big game hunting and fishing to backpacking and horseback riding.

5.11 Culture and History

Native American

Since time immemorial, the Nez Perce have used and occupied large portions of the Snake and Clearwater River Basins, including the land and waters of the South Fork of the Clearwater River. (Nez Perce Tribal Executive Committee draft comments 11/17/2004) They fished the streams, hunted in the woodlands and dug bulbs of the edible camas lily on the high plateaus. (US DDOI NPS Nez Perce National Historic Park brochure) The Nez Perce Tribal members grouped themselves in small semi-permanent villages, with groups of villages combining to form bands (Landeen and Pinkham 1999, Walker 1978). There was no permanent political body, but each band relied on the older males who came together as a council as needed. The Tribes preferred local leadership to centralized authority (Walker 1978).

The Nez Perce Tribe considers salmon to be a part of their spiritual and cultural identity. The Native Americans Claims Commission concluded that the Native Americans economic cycle could be described as ten months of fishing and two months of berry picking, while hunting year-round. Each band had its own fishing places, which were respected by other bands (Landeen and Pinkham 1999). Important changes came with the acquisition of horses in the early 18th century. The Nez Perce and the Shoshone-Bannock increased their areas of travel. Both of these Tribes were wealthy because of the resource abundance of the central Idaho mountains and valleys and their use of horses for travel, hunting, and defense. Both Tribes developed class societies based on wealth, which in turn was based on the ownership of horses (Walker 1978). The Nez Perce Tribe pastured large bands of horses throughout the basin. It is also known that the Tribe practiced fire management.

Changes came again with the influx of euro-Americans in the 19th century. In 1836, Presbyterian missionaries introduced Christianity to the Tribes, creating religious divides that influenced tribal government, treaty negotiations, and tribal and individual wealth (Landeen and Pinkham 1999). Conflicts with new settlers arose over access to lands and streams. The federal government became involved, and the Tribes entered into treaty negotiations during the middle part of the 19th

century. Tribal governmental systems changed; the U.S. government's demand for a single authority figure to act for the entire Tribe was largely responsible for the creation of the head chief position (Walker 1978). The Nez Perce Tribe ceded tribal lands in the Treaty of 1855. The Nez Perce Reservation boundaries were further reduced by the 1863 Nez Perce Treaty. The 1893 Allotment Agreement served to open the Reservation to settlement by non-Indians. (Nez Perce Tribal Executive Committee draft comments 11/17/2004)

Tribal treaty rights apply to the "ceded territories," areas beyond the current Reservation boundary that encompasses the entire South Fork Clearwater River basin. Excerpts from the Treaties of 1855 and 1863 describe these rights. (9-18-02 SFC TMDL pg. 26)

- 1855 Treaty, Article 3: "The exclusive right of taking fish in all streams where running through or bordering said Reservation is further secured to said Native Americans; as also the right of taking fish in all usual and accustomed places in common with citizens of the Territory; and of erecting temporary buildings for curing, together with the privilege of hunting, gathering roots and berries, and pasturing their horses and cattle upon open and unclaimed land." (9-18-02 SFC TMDL pg. 26)

- 1863 Treaty, Article 8: "The United States also agrees to reserve all springs or fountains not adjacent to, or directly connected with, the streams or rivers within the lands herby relinquished, and to keep back from settlement or entry so much of the surrounding land as may be necessary to prevent said springs or fountains being enclosed; and, further, to preserve a perpetual right of way to and from the same, as watering places, for the use in common of both whites and Native Americans." (9-18-02 SFC TMDL pg 27)

The General allotment Act of 1887 aimed at giving individual Native Americans title to 40 to 160 acres of land in the belief that land ownership would further assimilate them into the non-Indian culture. The unalloted land was sold to the general public. Over time, more than 70% of the Reservation land was in non-Native ownership. (US DDOI NPS Nez Perce National Historic Park brochure)

Nez Perce Conflict

The 1863 treaty between the U.S. and the Nez Perce Tribe reduced their Reservation lands. In 1867 the U.S. began a campaign to move the Nez Perce onto the smaller Reservation. Approximately ten years later in 1877, the Nez Perce who had resisted were informed that they would be moved forcibly onto the Reservation. This group of "non-treaty" Nez Perce began a journey, including battles, skirmishes and deaths to Nez Perce and white settlers alike that spanned parts of Oregon, Idaho, Montana, and Wyoming. Ultimately the Nez Perce were forced onto the Reservation. Their journey is documented and commemorated as the Nez Perce National Historic Trail. Included on this trail are the Cottonwood Skirmishes and Clearwater Battlefield park sites in the Clearwater River basin. For more information on the trail or the park, contact Nez Perce National Historic Park, Route 1 Box 100, Highway 95, Spalding, ID 83540 or go to the website http://www.fs.fed.us/npht/index.shtml.

Tribal management of land and water resources

As a sovereign tribal government, the Nez Perce Tribe has sovereign powers to regulate its lands, waters, and people. The Nez Perce Tribe is governed by the nine person Nez Perce Tribal Executive Committee (NPTEC), whose authority is recognized by a Constitution and Bylaws originally adopted in 1948. The NPTEC has authority to regulate the lands and waters within the

Reservation, as well as the exercise of treaty-reserved hunting, fishing, gathering, and pasturing rights reserved in the 1855 Treaty. As a co-manager of natural resources, the Tribe works closely with its federal, state, local, and tribal partners to address important natural resource management issues. (Nez Perce Tribal Executive Committee draft comments 11/17/2004)

The Nez Perce Tribe owns about 101,000 acres in the basin (Nez Perce Tribal Executive Committee draft comments 11/17/2004) although about 20% of the land in the basin is within the Nez Perce Tribal Reservation boundaries. (9-18-02 SFC TMDL pg. 26) The Reservation is about 780,000 acres in total with approximately 90,000 acres owned by the Tribe and Tribal members. (South Fork Clearwater River Landscape Assessment pg. 21). Currently the Nez Perce Tribe has 3,292 enrolled members.

Numerous Nez Perce religious and cultural sites are identified and protected in the South Fork Clearwater River basin. In most cases, their locations are not available for public disclosure in order to protect the integrity of the sites. Nez Perce tribal members continue to use the basin to exercise their treaty fishing and hunting rights.

National Register of Historic Places

Within the South Fork Clearwater River basin, there are several sites on the national register of historic places. These sites include the Grangeville Savings and Trust, Gold Point Mill in Elk City, Moose Creek Administrative Site, the State Bank of Kooskia, and St. Gertrude's Convent and Chapel in Cottonwood. There are others in the Nez Perce NF but not within the basin.

5.12 Forestry

A majority of the land in the basin is forested. The eastern portion of the basin is nearly all forested land. Management of the forested lands has resulted in the existing conditions as reported in the USDA Forest Service's South Fork Clearwater River Landscape Assessment:

- Forest succession, fire suppression, and timber harvest have resulted in declines in large open-growth Ponderosa pine. Early seral, intolerant species like lodgepole pine and western larch, have also declined with suppression.
- Whitebark pine is in serious decline from blister rust, fire exclusion and mountain pine beetle. Western white pine, never abundant in the basin, has also declined from blister rust.
- Grand fir, Douglas-fir, and subalpine fir have increased.
- Early seral structural stages, including forest openings, seedling and sapling, and pole stands, with fir snags and down wood, have decreased because of fire suppression. Medium and large tree classes have increased in most areas, except larch and Ponderosa pine forests.
- Large patches of fire-killed snags have declined with fire suppression. Large diameter snags have declined where timber harvest has occurred.

5.12.1 Fire Management

Fire was a pervasive agent of change within the basin before Euroamerican settlement. Fire Suppression became effective by about 1940. Fires affected almost 6,000 acres per year before 1930 and since have burned about 400 acres annually (U.S. Forest Service 1998).

An increase in medium and large tree classes in most settings and reductions in young tree classes and shrublands have resulted from fire suppression. Shade tolerant tree species have increased

and stand densities have probably increased over historic conditions in some settings. One consequence of this is increased risk of insect and disease activity and more severe fire (U.S. Forest Service 1998).

For more detailed information on fire disturbance frequency, size and severity please see the Fire Disturbance section of the South Fork Clearwater River Landscape Assessment, available on the Nez Perce NF website http://www.fs.fed.us/r1/nezperce/pua_sf_clw/index.html.

5.12.2 Timber

Timber was harvested from the basin as early as 1860 and the first sawmill was built in 1863 (USFS 1999). By 1900, seven sawmills were operating in the basin. The first commercial harvest began in the 1940s (USFS 1999). Early timber harvest selected high value species.

Currently there are two lumber mills operating in the basin. In 1958, Shearer Lumber Products mill opened. The same mill, now owned and operated by Bennett Forest Industries, may be relocated to the Lewiston area. (Idaho Statesman 3-6-03). Clearwater Forest Industries has a mill now in Kooskia. A large demand for timber resulted in an increased harvest in the basin during the 1960s and 1970s and clearcutting was the primary harvest method (USFS 1999). Since the 1980's the trend has been away from clearcutting, but some is allowed under current open contracts (McGee 2002). Timber harvest has declined on the Nez Perce NF in the basin since the 1980s, although timber sales are ongoing (Table 21).

Table 21. Sawlog volume of timber sold from the South Fork Clearwater River basin.

Year Periods	Total MMBF Sold	Mean MMBF Sold Per Year
1971-1975	289.3	57.9
1976-1980	284.3	56.9
1981-1985	224.4	44.9
1986-1990	221.0	44.2
1991-1995	91.8	18.4
1996-2001	72.4	14.5

The Bureau of Land Management (BLM) manages about 12,000 acres in the basin (Haaland 2002). All BLM land is in the Elk City Township. In 1996 the BLM harvested 3.2 mmbf from

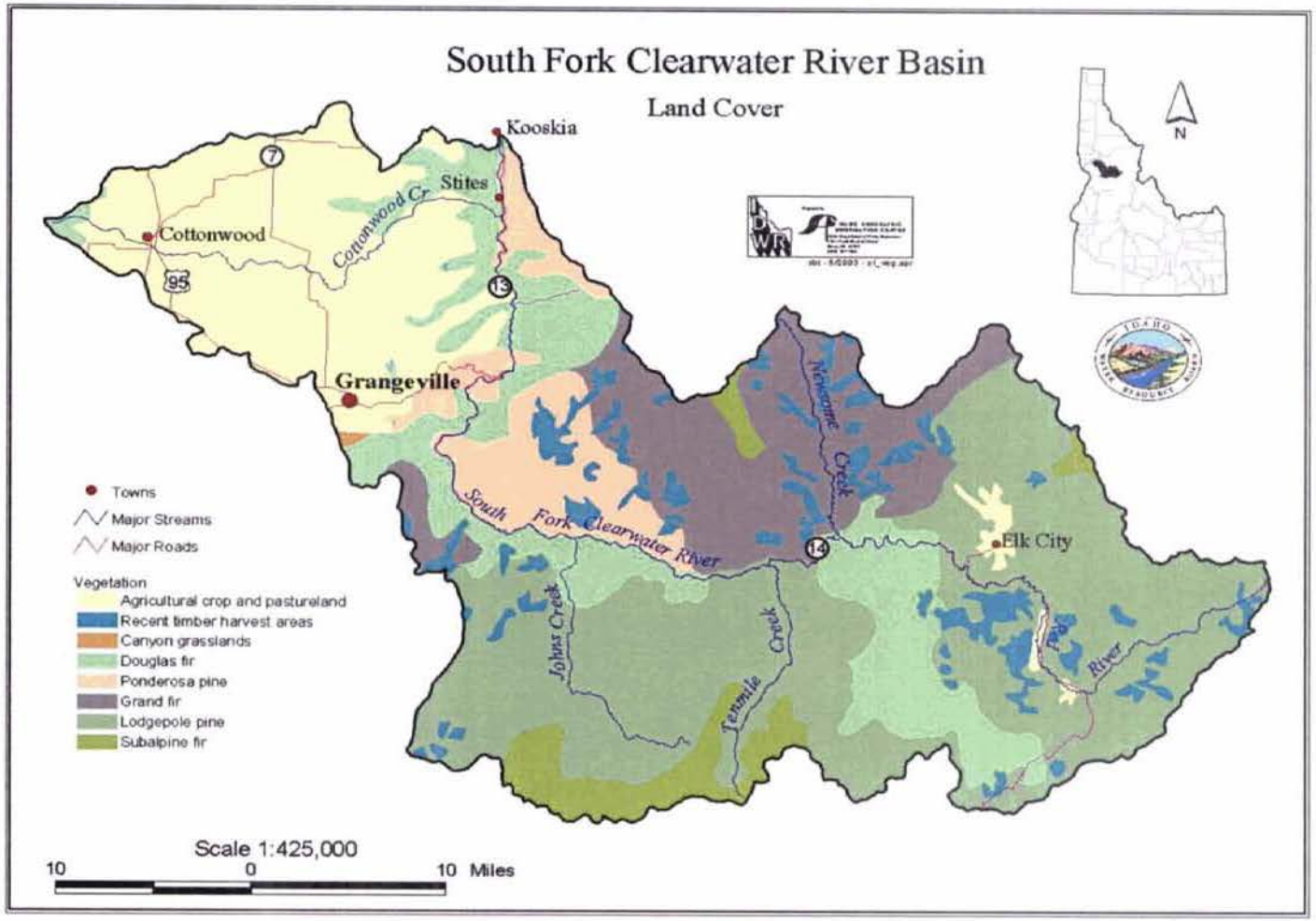
the Forgotten 400 timber sale located in section 34. Over the last ten years, The BLM harvested approximately 500 mmbf from small sales throughout the township. Within the next three years, the BLM plans to harvest approximately 8 mmbf from the southwest portion of the township.

In addition to timber harvested from the Nez Perce NF and BLM land, the Idaho State Department of Lands (IDL) has 2,400 acres in the basin and conducts periodic timber sales (Bates, IDL, 2002). Approximately 8 mmbf of timber were harvested from state lands in the last ten years. All the harvest from these sales was selective with the retention of a variety of tree densities in each sale area. Plans are to manage all the state land in the South Fork Clearwater River basin on an uneven aged basis.

There are also timber sales on private lands. Private forest lands generally fall under two categories. Industrial land belongs to timber companies or corporations and is primarily managed for long-term timber production. During the period from October 2001 to October 2002 approximately 5.8 mmbf were harvested from these lands. Non-industrial private forest land (NIPF) is the second category. Landowners in this category have a variety of parcel sizes and land objectives. Approximately 3.7 mmbf were removed from NIPF lands from October, 2001 through October, 2002 in the South Fork Clearwater River basin. Timber sales on both types of private land have been regulated by the State of Idaho's Forest Practices Act since 1974. Harvest of timber from private land is mostly selective with "uneven age management", although clearcutting occurs on a small percentage (5% to 10%) of the harvests (Bates, 2002).

A significant challenge in the basin is forest health. The number of dead and dying trees in some areas in the basin is a major forestry issue. Fuel reduction needs to be addressed. How these issues are resolved could be major factors in water quality in the basin

Map 9. Land Cover.



5.13 Agriculture and Grazing

Domestic sheep and cattle were brought to the basin in the mid 1860s during the gold rush. Livestock increased with the number of settlers, and operations were concentrated in suitable areas around major trail heads leading to the large mining camps. The livestock industry thrived on rangeland of the area. Stites was the major livestock shipping location for the county.

In the mid 1800s settlers began moving into the basin, establishing homesteads and ranches. Larger areas were put into crop production with the development of mechanized equipment. Agricultural land use occurs predominantly in the Three Mile Creek, Butcher Creek, and Cottonwood Creek sub-watersheds and on the Camas Prairie.

The majority of cropland is devoted to dryland agriculture. The major crops are winter wheat, spring wheat, barley, peas, lentils, and canola. Most of the cropland is on gently sloping, well-drained soils. Farming practices include conventional tillage for seedbed preparation, plow, disc, harrow, and fertilization. Crops are generally grown in rotation with grain following a legume or canola.

5.14 Mining

The South Fork Clearwater River basin's history is closely tied to mining. Deposits of gold and other valuable metals led to the first occupation of the area by white miners and settlers (USFS Landscape Assessment). Placer gold reportedly was discovered in a tributary of the Clearwater River in 1857 (Thomson and Ballard 1924). The first major gold discovery in the South Fork Clearwater River basin was in June 1861 near present day Elk City.

Early placer mining was done with hand tools and sluices and rocker boxes to remove gold from streams in the upper part of the basin. By the mid 1860s extensive ditch construction allowed the first hydraulic mining to occur. By the mid 1920s, an estimated $30 to $60 million of gold had been placer mined in central Idaho (Thomson and Ballard 1924). Placer and hydraulic mining continued, at fluctuating levels through the 1930s.

"Of all the historic human activities that have occurred in the assessment area, large scale dredging has had the most direct negative impact on streams," (USFS, Landscape Assessment 1998).

Lode, or hard rock mines were prospected as early as 1870. The Buster mine at Elk City was the first quartz mine to be opened and that was in 1884 (Thomson and Ballard 1924). The first mill in the basin was built in 1902. "However, the isolation of the mining district presented problems that rendered local treatment of the base ores unprofitable. The problem of transportation was the all-important factor governing the operation of those mines that had been producing," (Thomson and Ballard 1924). At that time, the road from Elk City to Grangeville did not exist and travel to the ore-rich part of the basin was difficult over a 53-mile wagon road between Stites and Elk City.

Currently there are two active reclamation permits for gold mines in the basin. One is for the Idaho Consolidated Metals surface mine near Elk City. The other is for a placer operation in the headwaters of Five Mile Creek.

Aggregate

There are two active reclamation permits for aggregate sources in the South Fork Clearwater River basin. Both are for gravel sources used by the Idaho Department of Transportation. They are located near Elk City.

Recreational Dredge Mining

Recreational dredge mining is allowed for specified times on designated sections of Idaho's rivers and requires a permit from the IDWR. The South Fork Clearwater River is open for recreational dredge operations from July 15 to Aug. 15. There are special requirements for recreational dredge mining on the South Fork Clearwater River to mitigate impacts to salmon and salmon habitat.

Recreational dredging equipment must have an intake of 5 inches diameter or less and a rating of 15 horsepower or less. A stream channel alteration permit is required for larger dredges. Dredge operations must be at least 100 feet apart. And, operations on a national forest must comply with Forest Service mining regulations.

5.15 Navigation

There is no commercial navigation within the South Fork Clearwater River basin. Historically, logs may have been floated down the South Fork Clearwater River during spring runoff.

GLOSSARY

Acre-foot: The volume of water required to cover one acre of land (43,560 square feet) to a depth of one foot; equivalent to 325,850 gallons.

Adjudicated water right: A water right for which the defining parameters required by law have been determined and decreed by a court of law.

Alluvium: Soil material, such as sand, silt, or clay that has been deposited on land surface by water.

Alteration: A term usually used in reference to Idaho Code Title 42, Chapter 38, the Stream Protection Act. An alteration is any activity that obstructs, diminishes, destroys, alters, modifies, relocates, or changes the natural existing shape of the stream channel within or below the mean high water mark. It includes removal of material from the stream channel and emplacement of material or structures in or across the stream channel where the material or structure has the potential to affect flow in the channel as determined by the director of the Idaho Department of Water Resources.

Anadromous: Fish species, such as salmon, that are born in fresh water, spend most of their adult life in the ocean, and return to fresh water to reproduce.

Appropriate or appropriation: To obtain the right to divert and use the public waters of the state of Idaho.

Beneficial use: The uses of water that can legally be protected by water rights.

Best management practices: State-of-the-art land and water use practices that are efficient, effective, practical, economical, and environmentally sound. The goal of best management practices is to minimize soil erosion.

IWRB: Idaho Water Resource IWRB.

Bull trout: The common name for *Salvelinus confluentus*, a char native to the Pacific Northwest and Canada.

Clearwater Focus Watershed Project: The purpose of the Clearwater Focus Program is to coordinate projects to enhance and restore fish and wildlife habitats in the Clearwater River subbasin to meet the goals of the Northwest Power and Conservation Council's program. Idaho Soil Conservation Commission (ISCC) and the Nez Perce Tribal Watershed Division (one of 6 divisions within the NPT Fisheries Department) co-coordinate the Focus Program on behalf of Idaho State and the Nez Perce Tribe (NPT).

Colluvium: Soil material, rock fragments, or both, moved by creep, slide, or local wash and deposited the base of steep slopes.

Commercial Business: Non-manufacturing business.

Comprehensive State Water Plan: A plan adopted by the Idaho Water Resource IWRB and approved by the legislature pursuant to Section 42-1734A of the Idaho Code.

Confluence: The point at which one or more bodies of water flows into another.

Conservation: Actions taken to increase the efficiency of energy or water use, production, or distribution.

Consumptive use: The portion of the volume of water diverted under a water right that is transpired by vegetation, evaporated from soils, converted to non-recoverable water vapor, incorporated into products, or otherwise does not return to the waters of the state. Consumptive use does not include any water that falls as precipitation directly on the place of use unless it is captured, controlled, and used under an appurtenant water right [Idaho Code 42-202B(1)].

Cubic feet per second (cfs): A unit of measure for the rate of discharge of water. One cubic foot per second is the rate of flow of one square foot of water that is flowing at mean velocity of one foot per second. It is equal to 448.8 gallons per minute, or 1.98 acre-foot per day.

Decree: A written decision by a court of law. Water right disputes are sometimes taken to court for resolution – the resultant description of the water rights in question are known as "decreed" water rights.

Domestic water use: The use of water as described in Idaho Code 42-111. Domestic use can be for home, livestock, and for any other purposes in connection with a home, including irrigation of up to one-half acre of land. The total use cannot exceed 13,000 gallons per day. Domestic use can also be for other small uses such as commercial or business establishments, if the total diversion rate does not exceed 0.04 cubic feet per second and a diversion volume of 2,500 gallons per day.

Ecosystem: A complex system composed of a community of flora and fauna, taking into account the chemical and physical environment with which the system is interrelated.

Endangered species: Any species or subspecies that is in danger of extinction throughout all or a significant portion of its range. The term is usually used in relation to the Endangered Species Act (see below).

Endangered Species Act: A federal statute that invokes protection for the species listed under the law (16 U.S.C. §1536). Animals and plants are designated as "endangered" or "threatened" by either the U.S. Fish and Wildlife Service or the U.S. National Marine Fisheries Service. There are other designations for "experimental populations." Listed populations receive the highest protection possible, with penalties for taking, harming, or injuring an individual or its environment. Special procedures apply to government projects in areas where listed species may be present.

Evapotranspiration: The loss of moisture by evaporation from land and water surfaces and transpiration from plants.

Fishery enhancement structure: A structure deliberately placed within the waterway to improve fish habitat.

Floodplain: Land that may be submerged by floodwaters. The floodplain built up by stream deposition. The 100-year floodplain identifies the land in the floodplain subject to a 1% or greater chance of flooding in any given year.

Friable: Easily crumbled or pulverized.

Geothermal: The natural heat energy of the earth. In this plan, the term refers to water that is heated underground, and retains at least some of that heat at land surface or at the bottom of a well.

Ground water: All water under the surface of the ground whatever may be the geological structure in which it is standing or moving (Idaho Code 42-230).

Habitat: The place or type of natural site where a plant or animal normally lives and grows.

Head: The elevation difference between surfaces of water.

High water mark: The line that separates aquatic vegetation from terrestrial vegetation. The line which the water impresses on the soil by covering it for sufficient periods of time to deprive the soil of its terrestrial vegetation and destroy its value for commonly accepted agricultural purposes (Idaho Code 42-3802).

Hydropower project: Any development which uses a flow of water as a source of electrical or mechanical power, or which regulates the flow of water for the purpose of generating electrical or mechanical power. A hydropower project development includes all powerhouses, dams, water conduits, transmission lines, water impoundments, roads, and other appurtenant works and structures [Idaho Code 42-1731(5)].

Idaho Batholith: The body of intrusive igneous (volcanic) rock in central Idaho about 250 miles long and a maximum of 100 miles wide. It is approximately 100 million years old.

Idaho Code: Idaho laws, as written by the state legislature and approved by the governor.

Idaho Water Resource IWRB: A constitutional water agency within the Idaho Department of Water Resources consisting of eight appointed members pursuant to the provisions of Article 15, Section 7 of the Idaho Constitution (Idaho Code 42-1732).

Industrial business: A business that manufactures products.

Irrigation: The watering of cropland. Residential lawn and garden uses are not considered "irrigation" in the context of water rights issued by the state of Idaho.

Kilowatt: A unit of electric power equal to 1,000 watts, or about 0.746 horsepower.

Listed Species: Used in reference to animals and plants listed under the Endangered Species Act.

Mean high water mark: A water level corresponding to the natural or ordinary high water mark. The line which the water impresses on the soil by covering it for sufficient periods of time to deprive the soil of its terrestrial vegetation and destroy its value for commonly accepted agricultural purposes [Idaho Code 42-3802(h)].

Megawatt: A unit of electrical power equal to 1,000,000 watts, or about 746 horsepower.

Minimum stream flow: A water right that retains water in the stream or river for wildlife habitat, recreation, navigation, and aesthetic beauty. Idaho Code defines this term as the minimum flow of

water in cubic feet per second of time, or minimum lake level in feet above mean sea level, required to protect fish and wildlife habitat, aquatic life, recreation, scenic beauty, navigation, transportation, or water quality of a waterway in the public interest [Idaho Code 42-1502(f)].

Municipal water use: Water for residential, commercial, or industrial use: for irrigation of parks and open spaces: or for related purposes. Municipal water use does not include use of water from geothermal sources for heating, which a municipal provider is entitled or obliged to supply to all those users within a service area, including those located outside the boundaries of a municipality served by a municipal provider [Idaho Code 42-202B(3)].

Natural River: A designation made by the Idaho Water Resource IWRB. It defines a waterway which possesses outstanding fish and wildlife, recreation, geologic, or aesthetic values; which is free of substantial existing human-made impoundments, dams, or other structures; and of which the riparian areas are largely undeveloped although accessible in places by trails and roads [Idaho Code 42-1731(7)].

Public interest (local): In regards to water appropriations, this encompasses the affairs of the people of the area directly affected by the proposed use [Idaho Code 42-203A(5)].

Recreational dredge mining: Operation of vacuum or suction dredges and power sluice equipment in which the nozzle is 5 inches or less, and the equipment rated at 15 horsepower or less, and capable of moving 2 cubic yards per hour or less.

Recreational River: A designation made by the Idaho Water Resource IWRB. It defines a waterway which possesses outstanding fish and wildlife, recreation, geologic or aesthetic values, and which might include some human-made development within the waterway or within the riparian area of the waterway [Idaho Code 42-1731(9)].

Rental pool: A market for exchange of stored water operated by a local committee. The committee is appointed by the Idaho Water Resource Board.

Riparian area: The area associated with aquatic (stream, river, or lake) habitats. The term is defined in Idaho Code for purposes associated with the Idaho Department of Water Resources and the Idaho Water Resource Board, as the area within one hundred (100) feet of the mean high water mark of a water way [Idaho Code 42-1731(10)].

River basin: The total drainage or catchment area of a stream (i.e., the watershed).

River corridor: The area of varying width along both sides of a river or stream.

River reach: A continuous section of a river from one point to another; a stretch of the river.

Scrub vegetation: Vegetation dominated by shrubs, typically found at elevations below montane (mountain) vegetation.

State agency: Any IWRB, commission, department, or executive agency of the state of Idaho.

Streambed: A natural water course of perceptible extent with a definite bed and banks, which confines and conducts the water of a waterway that lies below and between the ordinary high water marks on either side of that waterway [Idaho Code 42-1731(12)].

Threatened species: A species of plant or animal that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range, as determined by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service.

Total Maximum Daily Load (TMDL): The sum of all pollutants in a waterway. Pollutant levels established through TMDL standards must be at or below the level that the water body can assimilate without violating the state's water quality standards.

Unappropriated water: Water that is not subject to diversion and use under existing water rights [Idaho Code 42-1502(g)].

Water right: The legal right, however acquired, to the use of water for beneficial purposes [Idaho Code 42-230(e)].

Water right application: An application filed by any person, association, or corporation with the Idaho Department of Water Resources, intending to acquire the right to the beneficial use of the waters of any natural streams, springs, or seepage waters, lakes, or ground water, or other public waters of the state of Idaho [Idaho Code 42-202].

Waterway: A river, stream, creek, lake, or spring, or a portion thereof.

Water table: The highest part of the soil or underlying rock material that is wholly saturated with water. On some places an upper, or perched, water table may be separated from a lower one by a dry zone.

Wetlands: Transitional lands between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water.

REFERENCES

Alt, D. and Donald W. Hyndman. 1989. *Roadside Geology of Idaho*. Mountain Press Publishing Company: Missoula, Montana.

Amaral, Grant. 1990. Idaho – The Whitewater State: A Guidebook. BookCrafters, Chelsea, MI.

Author unknown. 2000. City of Cottonwood Comprehensive Plan. 29pp

Barrett, Larry. Personal Communication. Fisheries biologist, Idaho Department of Fish and Game, Lewiston, ID. 16 Oct. 2002.

Bahr, G., R. Carlson, and R. Carlson. 2002. Ground water quality of southern Clearwater Plateau Volcanic Aquifer. Idaho Department of Agriculture Technical Results Summary #9.

Bates, T. 2002. Personal communication. Idaho Department of Lands, Kamiah, ID.

Beamish, R. 1980. Adult biology of the river lamprey (*Lampetra ayresi*) and the Pacific lamprey (*Lampetra tridentata*) from the Pacific coast of Canada. Canadian Journal of Fisheries and Aquatic Sciences 37: 1906-1923.

Behnke, R. 1992. Native trout of western North America. Monograph of the native trouts. Monograph No. 6(Bethesda, MD): American Fisheries Society. 275 p.

Behnke, R. and R. Wallace. 1986. A systematic review of the cutthroat trout, *Salmo Clarki,* a polytypic species. Pages 1-27 in J.S. Griffith (editor). The ecology and management of interior stocks of cutthroat trout. Special publication of the Western Division, American Fisheries Society.

Bentz, B. 1998. A Reconnaissance of Nitrite/Nitrate in Camas Prairie Ground Water Volume I, Lewis and Idaho County, Idaho. Idaho Division of Environmental Quality, Lewiston Regional Office. 42p.

Bentz, B. 1998. Camas Prairie Well Site Records Volume II, Lewis and Idaho County, Idaho. Idaho Division of Environmental Quality, Lewiston Regional Office.

Bransford, S. 2001. *Newsome Creek Watershed Improvement Project (Draft)*. Nez Perce Tribe and Nez Perce NF. Grangeville, ID.

Castelin, P. 1976. A reconnaissance of the water resources of the Clearwater Plateau, Nez Perce, Lewis, and northern Idaho counties, Idaho. Idaho Department of Water Resources, Water Information Bulletin No. 41.

City Council of Kooskia. 2002. Comprehensive Plan City Council of Kooskia, Idaho.

Clark. W.H. 1998. 1998 Idaho water quality status report. Division of Environmental Quality, Water Quality and Remediation Division.

Clayton J., and W. Megahan. 1996. Natural erosion rates and their prediction in the Idaho Batholith. Journal of the American Water Resources Association, Water Resources Bulletin 33: 689-703.

Cochnauer, T and C. Claire. 2001. Evaluate status of the Pacific Lamprey in the Clearwater River drainage Idaho. Idaho Department of Fish and Game Annual Report to Bonneville Power Administration, Contract No. 00000090, Project No. 200002800. Idaho Department of Fish and Game, Lewiston, Idaho. 28pp.

Cochnauer, T., E. Schriever, D. Schiff, J. Brostrom and P. Murphy. 2001. South Fork Clearwater River bull trout investigations. Report to the Nez Perce NF and Bureau of Land Management Idaho Department of Fish and Game, Lewiston, Idaho.

Church, J. 2002. 2002 Idaho Economic Forecast for the State of Idaho (2001 2025). Prepared by John Church, Idaho Economics, Boise, Idaho.

Clearwater River Brink and a Half Club. 1950s? The Golden Road to Adventure 3rd ed. 53p.

Close, D., M. Fitzpatrick and H. Li. 2002. The ecological and cultural importance of a species at risk of extinction, Pacific lamprey. Fisheries Vol. 27 (7): 19-25.

Crenshaw, J. 2002. Personal communication. Regional Wildlife Manager, Idaho Department of Fish and Game.

Crockett, J. 2002. Personal communication. Idaho Department of Water Resources, Boise, Id.

Doman, Laurie. Personal communication. Recreation and trails, Nez Perce NF, Supervisor's Office, Grangeville, ID. 11 Oct. 2002 and 22 Oct. 2002.

Drake, T and R. Mattrass. 1980, amended 1995. The Grangeville Comprehensive Plan.

Ecklund, K. 1997. Personal communication. Idaho Department of Water Resources, Boise, ID.

Ecovista. 2002. Final Draft Clearwater Subbasin Management Plan. Prepared by Ecovista for Nez Perce Watershed Division. In cooperation with Clearwater Policy Advisory Committee (Funded by Northwest Power Planning Council). On CD.

Entranco. 2003. City of Grangeville Water System Engineering Study. Prepared by Entranco for City of Grnageville. 3050 North Lakeharbor Drive, Suite 200 Boise, Idaho 83703.

Fraley, J. and B. Shepard. 1989. Life history, ecology, and population status of migratory bull trout (*Salvelinus confluentus*) in the Flathead Lake and River system, Montana. Northwest Science 63(4):133-143.

Gordon, N.D., T.A. McMahon, and B.L. Finlayson. 1992. Stream hydrology, an introduction for ecologists. Wiley Inc.: New York, NY.

Graham WG, Campbell LJ. 1981. Groundwater Resources of Idaho. Boise: Idaho Department of Water Resources. 100p.

Griffith J. and D. Andrews. 1981. Effects of a small recreational dredge on fishes and aquatic invertebrates in Idaho streams. North American Journal of Fisheries Management 1:21-28.

GWQC (Ground Water Quality Council). 1996. Idaho Ground Water Quality Plan. Idaho Department of Health and Welfare Division of Environmental Quality, Idaho Department of Water Resources, and Idaho Department of Agriculture. 176 pp.

Grussing, LuVerne. Personal communication. Outdoor recreation planner, Bureau of Land Management, Cottonwood, ID. 15 Oct. 2002.

Haaland, J. 2002. Personal communication. Bureau of Land Management.

Helfield, J.M. and R.J. Naiman. 1998. Fertilization of Riparian Vegetation by Spawning Salmon: Effects on Tree Growth and Implications for Long-Term Productivity. Ecology Manuscript, in Press. Seattle, Washington.

Idaho County Free Press. Summer 2002. Idaho County Visitor's Guide. Grangeville, ID.

Idaho Department of Commerce. 2001. County Profiles of Idaho. IDC, Economic Development Division. Boise, Idaho.

IDEQ. 1996. Idaho risk-based corrective action guidance document for petroleum releases. Idaho Division of Environmental Quality, Remediation Bureau, August 1996.

IDEQ. 1998.1998 303(d) List. Idaho Division of Environmental Quality. [EPA additions to the list in 2000 available at: http://www2.state.id.us/deq/water/basins/303d_additions_list.pdf (accessed 10/30/02)].

IDEQ. 1999. Idaho Source Water Assessment Plan. Idaho Division of Environmental Quality, Ground Water Program. October 1999.

IDEQ, Nez Perce Tribe, and U.S. Environmental Protection Agency. 2000. Cottonwood Creek Total Maximum Daily Load TMDL. Prepared in cooperation with the Cottonwood Creek Watershed Advisory Group, IDEQ Lewiston Regional Office.

IDEQ. 2001. State of the environment. Idaho Department of Environmental Quality.

IDEQ. 2002. DEQ's final nitrate priority area ranking. (http://www.deq.state.id.us/water/gw/nitrate.FinalRank.pdf (accessed December 6, 2002).

IDEQ, Nez Perce Tribe, and U.S. Environmental Protection Agency. 2001. Cottonwood Creek TMDL Implementation Plan. Prepared in cooperation with the Cottonwood Creek Watershed Advisory Group, IDEQ Lewiston Regional Office.

IDEQ, Nez Perce Tribe, and U.S. Environmental Protection Agency. 2003. South Fork Clearwater River Subbasin Assessment and TMDLs. Public Comment Draft – May 2003. Prepared in cooperation with the South Fork Clearwater River Watershed Advisory Group, IDEQ Lewiston Regional Office.

IDEQ. 2002. DEQ's final nitrate priority area ranking. (http://www.deq.state.id.us/water/gw/nitrate.FinalRank.pdf (accessed December 6, 2002).

Idaho Department of Fish and Game. 2001. Fisheries Management Plan 2001-2006. Boise, Idaho.

Idaho Department of Lands. 1986. Navigable Waters in Idaho. Operations Memorandum Number 1700. Boise, Idaho.

Idaho Department of Water Resources. 1999. Comprehensive State Water Plan Payette River Basin. IDWR, Boise, Idaho.

Idaho Department of Water Resources. 2002. Recreational Dredging Application.

ISWCD (Idaho Soil and Water Conservation District). 2001. Cottonwood Creek state agricultural water quality project. Final planning report and environmental assessment, Idaho County, Idaho.

Idaho State. 1996. State of Idaho Bull Trout Conservation Plan. Office of the Governor, Boise, Idaho.

Kiefer, R and J. Lockhart. 1995. Intensive evaluation and monitoring of chinook salmon and steelhead production Crooked River and Upper Salmon River sites. Annual Progress Report to Bonneville Power Administration, Contract No. 00005852, Project No. 199107300. 64p

Kimball Engineering. 2000. City of Cottonwood Water System Study. Prepared by Kimball Engineering for the City of Cottonwood. 114 Thain Road Lewiston, Idaho 83501.

Landeen, D. and Allen Pinkham. 1999. *Salmon and His People – Fish and Fishing in the Nez Perce Culture*. Nez Perce Tribe, Confluence Press: Lewiston ID.

LeFranc, M., M. Moss, K. Patnde, W. Sugg. 1987. Grizzly Bear Compendium sponsored by the Interagency Grizzly Bear Committee 1987. 540pp.

Maret, T.R., D.E. MacCoy, K.D. Skinner, S.E. Moore, and I. O'Dell. 2001. Evaluation of macroinvertebrate assemblages in Idaho rivers using multimetric and multivariate techniques, 1996-98. USGS Water Resources Investigations Report 01-4145, Boise, ID.

McGee, M. 2002. Personal communication. Nez Perce NF, Timber Harvest Officer, Grangeville, ID.

Mech, L.D. (1970). The wolf: the Ecology and Behavior of an Endangered Species. Natural History Press. Doubleday, NY. 389pp.

Megahan, W. and G. Ketcheson. 1996. Predicting downslope travel of granitic sediment from the forest roads in Idaho. Journal of the American Water Resources Association, Water Resources Bulletin 32: 371-382.

Merigliano, M. 1996. Ecology and Management of the South Fork Snake River Cottonwood Forest. School of Forestry, University of Montana, Missoula, Montana.

Montgomery, D.R. 1994. What does channel stability mean. Proceedings of the International workshop of the ecology and management of aquatic-terrestrial ecotones. University of Washington, Seattle, WA.

Moser, M., Ocker P., L. Stuehrenberg and T. Bjornn. 2002. Passage efficiency of adult Pacific lampreys at hydropower dams on the Lower Columbia River, USA. Transactions of the American Fisheries Society 131:956-965.

Myler, C. 2002. Tributaries of Cottonwood Creek monitoring report 2002. Idaho Association of Soil Conservation Districts, Technical Results Summary CDM-TCC-02.

Neely, K.W. 2002. Nitrate results from the Statewide Program, 1991-2000. Idaho Department of Water Resources. (http://www.idwr.state.id.us/planpol/techserv/gwmon/Nitrate_Results_From_The_Statewide_Program.pdf) (Accessed December 2, 2002).

Neely, K.W., and J.K. Crockett. 1998. Ground water quality characterization and trend analysis for the Treasure Valley shallow and deep hydrologic subareas. Idaho Department of Water Resources, Water Information Bulletin No. 50, Part 3. 80 pp.

Pacific Northwest River Basins Commission-Technical Staff. 1970. Columbia-North Pacific Region Comprehensive Framework Study, Water Resources. Volume I (subregions 1-6, 6 includes SFCR). Vancouver, WA. 543p.

Pacific Northwest River Basins Commission-Technical Staff. 1971. Columbia-North Pacific Region Comprehensive Framework Study, Municipal & Industrial Water Supply. Volume I (subregions 1-6, 6 includes SFCR). Vancouver, WA. 257p.

Packard, J. and L.D. Mech. 1980. Population regulation of wolves. In: Cohen, M.N., R.S. Malpass, and H.G. Klein. Biosocial mechanisms of population regulation. Yale University Press, New Haven, CT. pp.135-150.

Parliman, D.J. 2002. Analysis of nitrate (NO_3-N) concentration trends in 25 Ground Water Quality Management Areas, Idaho, 1961- 2001. USGS, Water Resource Investigations Report WRIR 02-4056 (http://idaho.usgs.gov/PDF/wri024056/index.html).

Petts, G., and P. Calow (eds.). 1996. River flows and channel forms: selected excerpts from The Rivers Handbook. Blackwell Science: Cambridge, MA.

Pratt, K. 1984. Habitat selection and species interactions of juvenile westslope cutthroat trout (*Salmo clarki lewisi*) and bull trout (*Salvelinus confluentus*) in the upper Flathead River Basin. University of Idaho, Moscow, Idaho. M. S. Thesis.

Progressive Engineering Group, Incorporated. 2002. City of Kooskia Water Study. Prepared by Progressive Engineering Group, Inc. for the City of Kooskia. 1208 Idaho Street Lewiston,

Idaho 83501.

Ralston, D., K. Sprenke, w. Dansart and W. Rember. 1993. Evaluation of the ground water resources in the vicinity of Grangeville, Idaho. Prepared for the City of Grangeville. Moscow, Idaho.

Ralston, D. 2003. Personal communication. Moscow, ID.

Rosgen, D.L., H.L. Silvey, and J.P. Potyondy. 1986. The use of channel maintenance flow concepts in the Forest Service. Pp. 19-26 IN: American Institute of Hydrology, Hydrological Science and Technology: Short Papers, Volume 2.

Sherman, S. 2003. Personal communication. Idaho Department of Water Resources, Boise, Idaho.

Siddall, P. 1992. South Fork Clearwater RiverHabitat Enhancement Nez Perce NF. Project No. 84-5 Contract No. DE-AI79-84BP16475 prepared for Bonneville Power Administration, Portland, Oregon.

Swanberg, T. 1997. Movements of and habitat use by fluvial bull trout in the Blackfoot River, Montana. Transactions of the American Fisheries Society 126: 735-746.

State of Idaho Outfitters and Guides Licensing IWRB. 2001. Licensed outfitter directory and activity listing. Boise, Idaho. 74pp.

Thomas, V. 1985. Experimentally determined impacts of a small, suction gold dredge on a Montana stream. North American Journal of Fisheries Management 5:440-488.

Thomson, Francis and Ballard, Samuel. 1924. Geology and Gold Resources of North Central Idaho. Idaho Bureau of Mines and Geology, University of Idaho, Moscow, ID.

Thurow, R. 1997. Habitat utilization and diel behavior of juvenile bull trout (*Salvelinus confluentus*) at the onset of winter. Ecology of Freshwater Fish (Copenhagen) Vol. 6:(1) 1-7.

U.S. Department of Agriculture Natural Resource Conservation Service. 1995. Soil Survey Geographic Database. National Cartographic and GIS Center, PO Box 6567, Fort Worth, TX 76115-0567 http://www.ftw.nrcs.usda.gov/pdf/ssurgo_db.pdf

U. S. EPA. 2001. Source water protection: Best management practices and other measures for protecting drinking water supplies. Environmental Protection Agency, Drinking Water Academy, Training Course, August 2001, Boise, Idaho.

U.S. Fish and Wildlife Service. 1987. Northern Rocky Mountain Wolf Recovery Plan. Denver, CO. 119pp.

U.S. Fish and Wildlife Service. 2000. Grizzly Bear Recovery in the Bitterroot Ecosystem. Final Environmental Impact Statement. US Department Of the Interior, Fish and Wildlife Service.

U.S. Fish and Wildlife Service. 2003.

U.S. Fish and Wildlife Service, Nez Perce Tribe, National Park Service, and USDA Wildlife Services. 2002. Rocky Mountain Wolf Recovery 2001 Annual Report. T. Meier, ed. USFWS, Ecological Services, 100 N Park, Suite 320, Helena MT. 43pp.

U. S. Forest Service. 1974. National Forest Landscape Management, Volume 2, Chapter1- The Visual Management System. Agriculture Handbook No. 462. U.S. Government Printing Office: Washington, D.C.

U.S. Forest Service. 1987. Nez Perce NF Plan, Final Environmental Impact Statement.

US Forest Service Nez Perce NF. 1987. Nez Perce NF Plan.

US Forest Service, Clearwater National Forest. 1996. Clearwater National Forest Monitoring and Evaluation Report; 101p.

U.S. Forest Service. 1997. United States' Expert Report Disclosing Methodologies Utilized for Quantification of Multiple-Use Sustained-Yield Act Claims (Unpublished manuscript). 157 pp.

USFS. 1997. Southfork Clearwater Subbasin Landscape Assessment. Preliminary Report. Nez Perce NF, Grangeville, Idaho. (Accessed 10/03/02 at http://www.fs.fed.us/r1/nezperce/pua_sf_slw/narrative)

U.S. Forest Service. 1998. Nez Perce NF, South Fork Clearwater River Landscape Assessment, Vol. I and II. Idaho County, ID.

US Forest Service, Nez Perce NF. 1999. South Fork Clearwater River Biological Assessment; 850p.

US Forest Service, Nez Perce NF. 2000. El Luky Duk Placer Claim. Draft EIS.

USGS in cooperation with IDEQ. 2002. Analysis of Nitrate (NO3-N) Concentration Trends in 25 ground Water-Quality Management Areas, Idaho, 1961-2002.

Van Steeter, M.M, R.L. Mahler, and L.L. Mink. 1998. Groundwater in Idaho. University of Idaho Cooperative Extension System, Water Quality for Idaho Current Information Series No. 900. (accessed July 23, 2001 – http://www.uidaho.edu/wq/wqpubs/cis900.html).

Waples, R., R. Jones, B. Beckman and G. Swan. 1991. Status Review for Snake River Fall chinook Salmon. U. S. Dep. Commerce, NOAA Tech. Memo. NMFS F/NWC-201. 73p.

Warnick, C., J. Filler and P. Vance. 1981. Potential hydroelectric energy resources of Idaho. A contract report to IDWR. Idaho Water and Energy Resources Research Institute, University of Idaho, Moscow, ID.

Watson, G. and T. Hilman. 1997. Factors affecting the distribution and abundance of bull trout: and investigation at hierarchical scales. North American Journal of Fisheries Management 17: 237-252.

Washington State University Center for Environmental Education. 2001 Clearwater Subbasin Assessment; Terrestrial and Aquatic. Prepared for Clearwater Focus Program, Nez Perce Tribe (Funded by Northwest Power Planning Council). On CD 650p.

Willson, M.F. and K.C. Halupka. (1995). Anadromous fish as keystone species in vertebrate communities. Conservation Biology 9:489-497.

Wilson, Eric. Personal Communication. Idaho Department of Lands, Boise, ID. Dec. 6, 2002.

APPENDIX A

South Fork Clearwater River Watershed Advisory Group

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Road Districts
Kooskia

Kelly Frazier
Water Treatment/City of Kooskia
Kooskia

Dick Wilhite
Timber Industry
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JoAnn Mider
Family Farmers
Kamiah,

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Outfitter/Guide
Kooskia

Rudy Carter
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Ed Stuivenga
Agriculture
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Ron Andrews
Tourism/Travel
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Borg Hendrickson
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Phil Jahn
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Recreational and Commercial Mining
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