

PEND OREILLE RIVER WATERSHED INITIAL ASSESSMENT

DRAFT
May 1995

With our multitudes of lakes, streams, and rivers, Washington State seems to have an abundance of water. However, the demand for water resources has steadily increased each year, while the water supply has stayed the same, or in some cases, declined. This increased demand for limited water resources has made approving new water uses complex and controversial.

The purpose of this assessment is to evaluate existing data on water to make decisions about pending water right applications. It does not affect existing water rights.

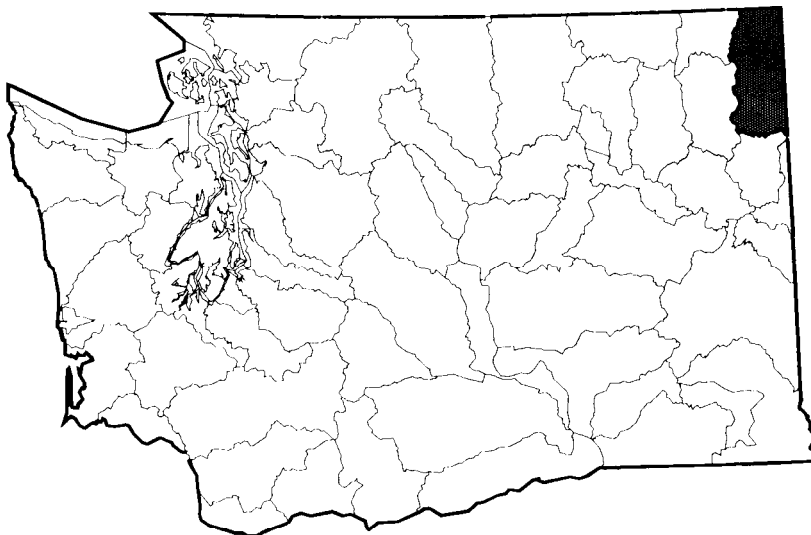
To expedite decisions about pending water right applications, it is vital that we accurately assess the quality and quantity of surface and ground water. The Washington State Department of Ecology recognizes that water right decisions must be based on accurate scientific information. Ecology is working with consultants to conduct special studies called Initial Watershed Assessments throughout the state.

The assessments describe existing data on water rights, streamflows, precipitation, geology, hydrology, water quality, fisheries resources, and land use patterns. Some assessments provide straightforward results, allowing immediate water management decisions. In watersheds with little existing information, further studies will be necessary to acquire new data. In watersheds where major public policy conflicts exist, or where significant land use impacts are expected, water management decisions will be coordinated with local and regional planning processes.

Dames & Moore, Inc.
The Langlow Associates, Inc.
Cosmopolitan Engineers

In Partnership with the:
Washington Department of Ecology

Pend Oreille River Watershed



This report summarizes information presented in the detailed Ecology Open-File Technical Report No. 95-17. It also presents some actions that could be taken in response to the results of this assessment.

- Ecology needs to make decisions on 38 pending applications for new water rights.
- The amount and quality of water in the main stem of the Pend Oreille River are greatly affected by conditions and activities upstream in Idaho and Montana.
- The close interconnection between surface and ground water must be considered when evaluating new water applications in the Pend Oreille River valley.
- Limited streamflow data on small tributary streams has shown widespread seasonal low flow and even zero flow conditions, indicating that water may not be available for new uses.

What is a watershed?

A watershed is an area of land where topographic features such as hills and valleys cause water to flow toward a single major river or other body of water. In the Pend Oreille watershed 95 percent of the area is upstream in Idaho and Montana.

Where does the water come from?

Ultimately, all of the streams, lakes, springs and other surface water and ground water in the watershed comes from rain or snowmelt. Some of this water evaporates or is used by plants, some flows into the streams and rivers, and the rest infiltrates into the soil to become ground water (recharge). Some segments of streams and rivers gain water from ground water that seeps into the channel. Other segments lose water that leaks through the streambed into the ground.

The Pend Oreille River watershed is located in the northeastern part of the state and borders Idaho and British Columbia. The entire watershed covers about 25,200 square miles within the United States. The part of the

watershed which lies within Washington encompasses about 1,300 square miles.

Most of the water in the Pend Oreille River originates upstream in the Rocky Mountains. The river enters Washington from Idaho and flows northward, joining the Columbia River in Canada. Streamflow in local tributaries is replenished by precipitation, including rainfall and snowmelt.

Most of the precipitation falls in the winter and spring months. The highest totals are usually recorded between November and January although heavy rainfall also occurs in May and June, particularly in the northern portions of the watershed. At low elevations, average annual precipitation ranges between 20 inches per year near Northport and 25 inches near Newport. Precipitation is generally greater at higher elevations in the watershed.

What are the major surface water sources?

The major surface water sources include the Pend Oreille River and its major tributaries, Sullivan, Calispell,

Tacoma, Ruby, Lost, Slate, LeClerc and Skookum creeks. The largest lakes in the watershed include Sullivan, Bead and Calispell lakes.

What are the major ground water sources?

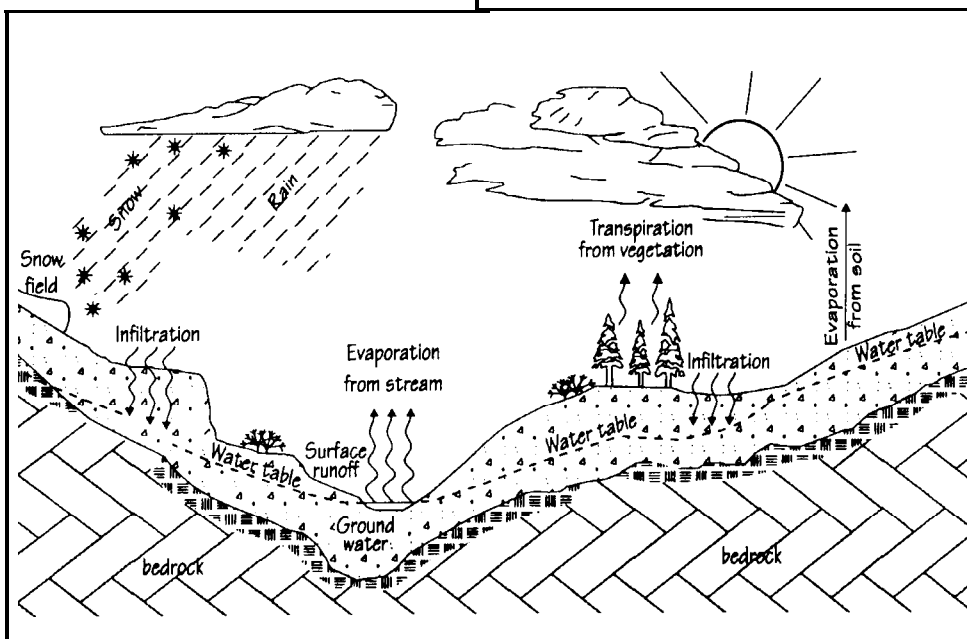
The most productive aquifers occur in sediments found in the major river and stream valleys within the watershed. Sediments alongside the Pend Oreille River constitute the most heavily used aquifer in the watershed. Water levels in this aquifer are maintained by recharge from the Pend Oreille River. Lesser amounts of ground water occur in the bedrock which underlies the sediments and in the upper elevations of the watershed.

How are surface and ground water connected?

In areas where both surface water and ground water are used, the connections between the two sources become important. In some instances, the ground water flows from the aquifer to the surface water, while in others the reverse occurs. Ground water provides the total flow in the rivers and creeks when there is no rain or **snowmelt** to contribute to the flow.

Ground water supplies within the watershed are recharged directly from precipitation or seepage from streams. Infiltration is affected by the amount and type of vegetative cover, soil type and rainfall intensity.

Eventually, all ground water drains toward the surface water bodies such as streams, lakes and rivers. Ground water in shallow aquifers is highly connected to surface water bodies, often flowing short distances before being discharged to a stream or lake. Deeper ground water



A general representation of **the** hydrologic [water] cycle (modified from Walker and Nassar).

follows longer flow paths and is discharged further down the watershed. Where the ground water level lies above a stream or **lakebed**, ground water will flow into the stream channel. Conversely, when the ground water level lies below the stream bed, surface water will flow from the stream into the aquifer.

How is water used?

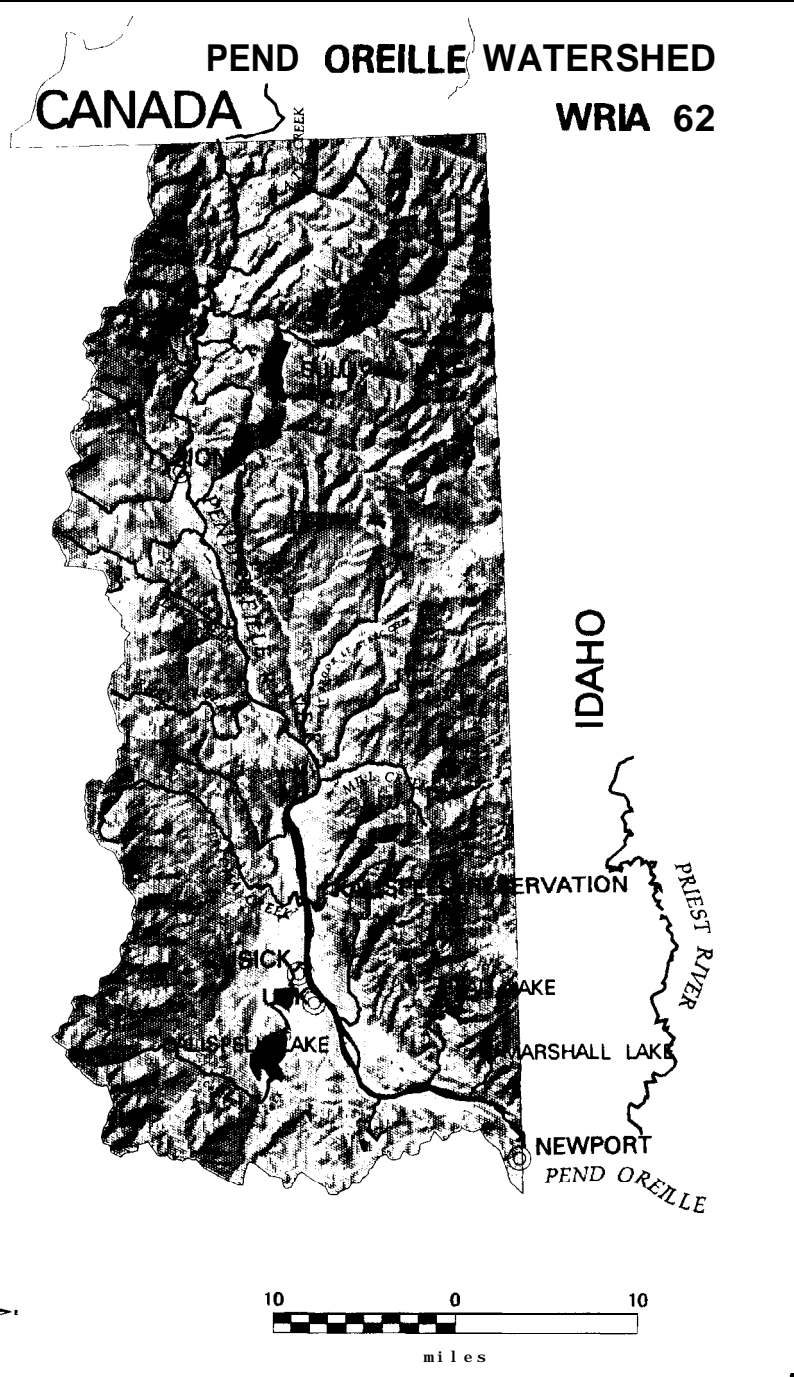
Irrigated agriculture and domestic use account for most of the out-of-stream use of water. The heaviest period of irrigation occurs during summer months when water is least available and most necessary to maintain **instream** flows. Other uses of water include stockwater, fish rearing, recreation and power production.

Approximately ten percent of the documented water use in the watershed is from ground water. Most of the ground water is used for domestic purposes.

How does land use affect water?

Land use practices can affect the amount and quality of water moving through the watershed. Land use here has not changed significantly for several decades. Main agricultural areas are located within the river corridor. Agricultural land uses include fruit orchards, cultivated crops and livestock grazing. Irrigation can require significant amounts of water seasonally or during the dry summer months.

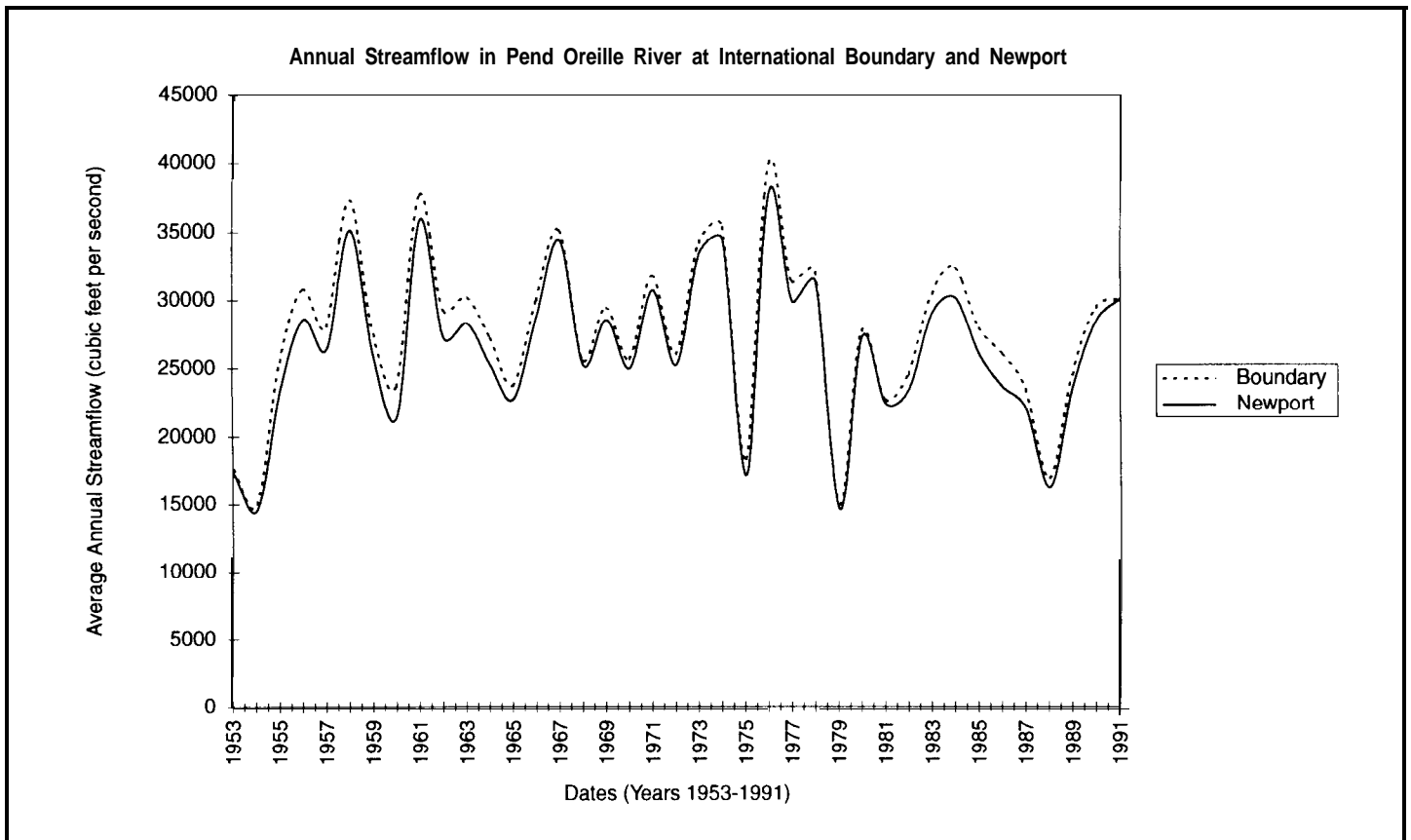
The small town of Newport, located along the Pend Oreille River at the Idaho border, is the major developed area in the watershed. (Other small towns located within the Pend Oreille River valley are Lone, Metaline, Metaline Falls and Usk.)



The remainder of the watershed is primarily federally managed forest, typically located in the upland areas away from the Pend Oreille River valley. (The primary uses of the forest lands are timber and livestock production, which solely rely on precipitation.)

What are the water quality issues?

Water quality is closely tied to water quantity. Water supplies must be of high quality for drinking water use and to support fish and wildlife. At the same time, water quality may depend on maintaining large quantities of clean water to reduce the adverse effect of existing pollutants and maintain proper water temperatures for fish.



Annual streamflow in the Pend Oreille River, recorded at the USGS gaging stations at Newport and the International Boundary.

Water quality throughout most of the watershed is considered to be good to excellent. Those water quality problems that have been identified only occur occasionally. The main stem of the Pend Oreille River does have some problems with Eurasian milfoil (an aquatic weed). Additional problems are high temperatures, fecal coliform and pH (acidity). Resident fish habitat is impaired by these adverse conditions.

Are fish resources stable?

The Pend Oreille River watershed is home to a rich variety of resident fish species including Eastern brook and rainbow trout, brown trout, westslope cutthroat trout, large scale suckers, mountain whitefish, brown bullhead, largemouth bass, walleye and yellow perch. Dams have helped to create habitat for these warm water species and favorable conditions for aquatic vegetation.

Bull trout, a sensitive species that has been recommended for listing as threatened, have been found in at least five tributaries of the Pend Oreille River. Listing of the bull trout could significantly affect dam operation and water withdrawals from tributary streams within the Pend Oreille watershed.

Prior to construction of Grand Coulee Dam and other dams along the Columbia River, several species of salmon migrated and spawned the Pend Oreille River. There are no longer anadromous fish within the Pend Oreille River system.

How have streamflows changed?

The U.S. Geological Survey operates three stream gage stations which measure flow on the Pend Oreille River at Newport, below Box Canyon Dam and at the U.S.- Canada boundary. A

gage is also located on Outlet Creek near Metaline Falls.

Average annual streamflow for the Pend Oreille River at Newport is 25,740 cubic feet per second (a measure of the volume of water flowing through a stream, or cfs) for the period from 1912 to 1992. Streamflow in the main stem of the Pend Oreille River is heavily dependent on precipitation and reservoir storage conditions upstream. Only five percent of the total flow of the river occurs in Washington State.

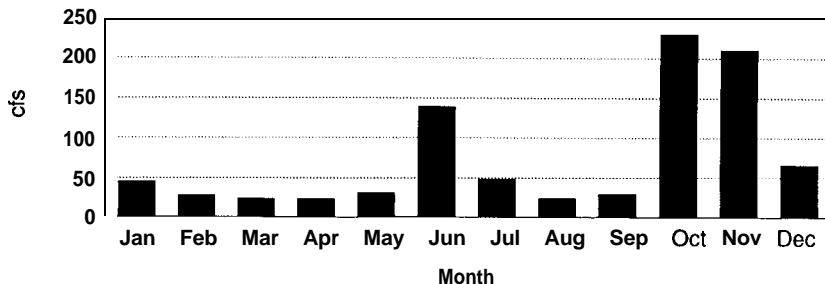
The total flow of the river at Newport, while varying on an annual basis, has declined just slightly since the 1940s. The same trend is evident for the Pend Oreille River at the International Boundary gage, although total streamflow is somewhat higher. Flows measured at Outlet Creek also show a slight decline for the same period.

Some tributary streams get extremely low or cease to flow in late summer. These include streams located at higher elevations in the Metaline Falls area and in the southern portion of the watershed near Calispell, Skookum and Marshall creeks. Although streamflow data are incomplete for these tributary streams, the low flows indicate seasonally limited water availability in these basins. This may be the case for other portions of the watershed as well.

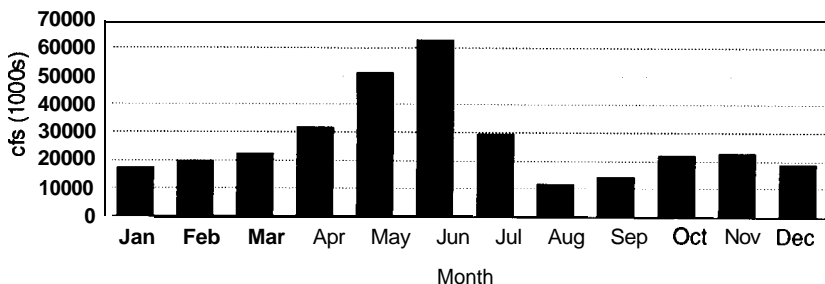
While no **instream** flows have been formally established by rule for the Pend Oreille River watershed, recent water rights issued for the main stem of the river have been conditioned on the basis of a tentative recommended low flow of 8,500 cfs as measured at lone. Currently, this flow is met more than 90 percent of the time. Further investigation may be needed to establish more definitive **instream** flows.

Numerous small tributaries to the Pend Oreille River have been administratively closed or subject to minimum flows for a number of years. As far back as the **1950s**, the Department of Game recommended closures on some streams to protect habitat. Water right decisions on these tributaries have taken such recommendations into account.

Average Monthly Streamflow Outlet Creek near Metaline Falls (1959-1992)



Average Monthly Streamflow Pend Oreille River below Box Canyon Dam (1952-1992)



What are water rights?

A water right is a legal authorization to use a certain amount of public water for specific beneficial purposes.

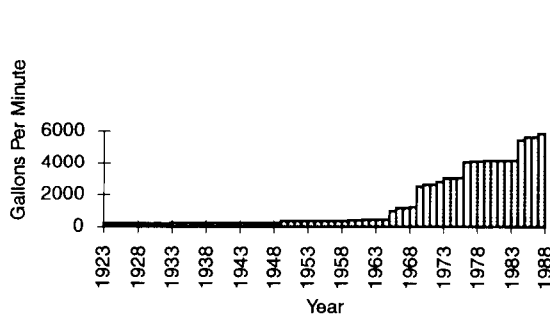
State law requires every user of streams, lakes, springs and other surface waters to obtain a water right permit before using these waters. People who use ground water also need a water right permit unless they use 5,000 gallons or less each day for one or more of the following purposes: watering stock, watering a lawn or garden less than one-half acre in size,

or for a single or group domestic or industrial water supply.

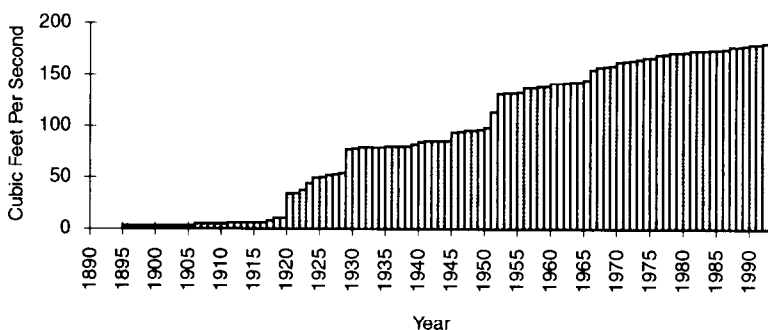
What are water right claims?

A water right claim is just that, a claim for a right to use water. A water right claim on file with Ecology may or may not represent a valid water right. The validity of a claim can only be established through a superior court determination of water rights. Within the watershed, a total of 1,053 water right claims have been filed, for a total flow equivalent to about 175 cfs.

Cumulative Growth in Ground Water Rights

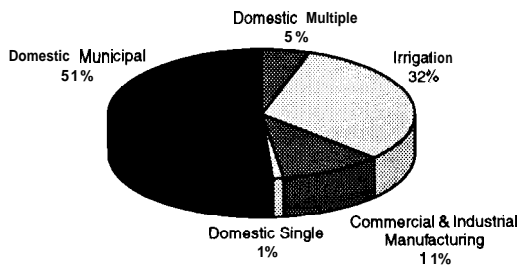


Cumulative Growth in Surface Water Rights

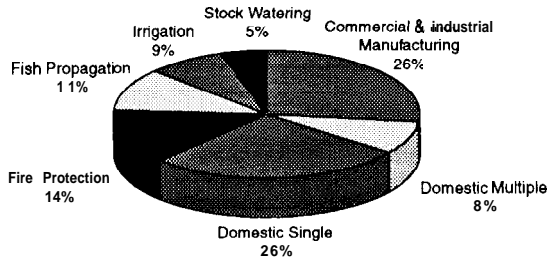


Pend Oreille River Watershed

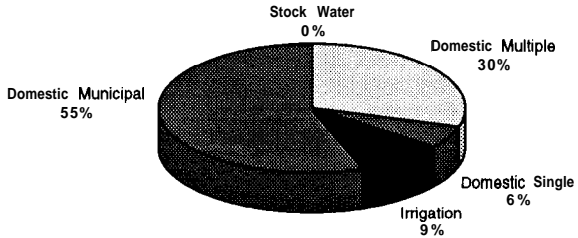
Ground Water Applications
Primary Purpose of Use As Percentage of Total Applied For



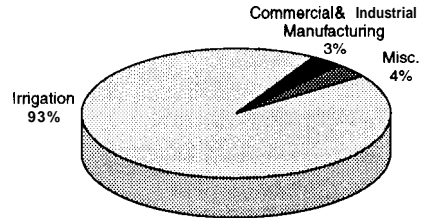
Surface Water Applications
Primary Purpose of Use As Percentage of Total Applied For



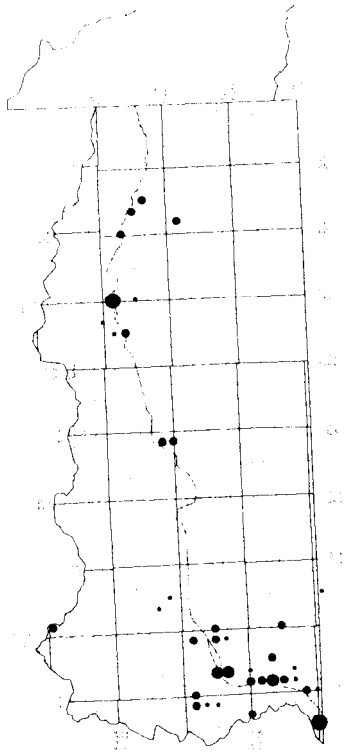
Ground Water Rights
Primary Purpose of Use As Percentage of Total Applied For



Surface Water Rights
Primary Purpose of Use As Percentage of Total Applied For



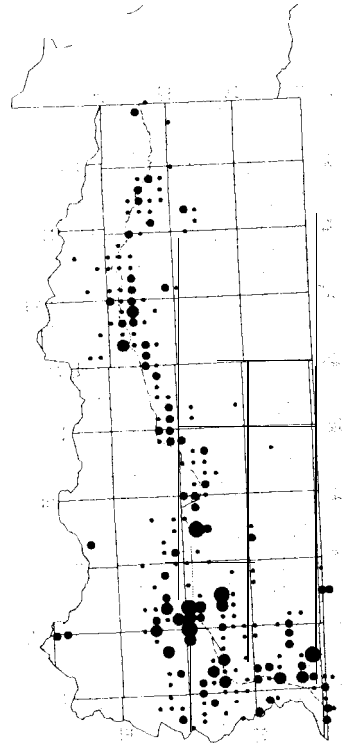
GROUND-WATER RIGHTS BY SECTION



- > 10,000 Acre-Feet/Year
- 1,000-10,000 Acre-Feet/Year
- 100-1,000 Acre-Feet/Year
- 5-100 Acre-Feet/Year
- < 5 Acre-Feet/Year



SURFACE WATER RIGHTS BY SECTION



- 1,000-10,000 Acre-Feet/Year
- 100-1,000 Acre-Feet/Year
- 5-100 Acre-Feet/Year
- < 5 Acre-Feet/Year



Why are water rights important?

The basis for water rights is "first in time, first in right." This means people with older, or senior, rights get to use the water first when there is not enough for everyone. The water rights program ensures that Washington's water resources are appropriately allocated and managed. By effectively managing allocation of new water rights, Ecology can protect senior water rights and benefit the overall public good.

How is water currently allocated and what new uses are proposed?

In the Pend Oreille River watershed a total of 553 water right permits and certificates have been issued, 492 for surface water and 61 for ground water. Permitted withdrawals for both surface and ground water total 193 cfs.

Twenty-eight applications for surface water right permits have been filed, requesting approximately 12 cfs. Additionally, 10 applications for ground water permits are on file with Ecology, requesting a total of nine cfs. Before issuing new water rights, Ecology must consider potential effects on other water users.

Total withdrawals are currently very small in relation to flows in the Pend Oreille River, even during seasonally low flows. Low or nonexistent flows in tributaries could pose serious problems for both water quality and fish habitat.

What are the conflicts?

Water use conflicts occur when available water supply is insufficient to fulfill existing water rights and claims and, at the same time, maintain sufficient water quality and aquatic habitat.

Balancing these needs is complex. Water does appear to be available for additional allocation from the main stem of the Pend Oreille River and from ground water sources connected to the river, as long as sufficient **instream** flows are maintained. However, water rights issued from the main stem are conditioned on the basis of a recommended low flow of 8500 cfs (measured at lone). Currently, the River flows greater than this volume more than 90 percent of the time.

The same cannot be said for the small tributary streams. Comprehensive long-term data are lacking, but available information indicates seasonally low flow and even zero flow conditions are widespread. It is therefore difficult to adequately assess water availability for these areas, but it appears that, at least seasonally, water may not be available for additional allocation.

Many of these small tributaries have been administratively closed or have had low flow limitations for a number of years. As far back as the **1950s**, the Departments of Fish and Game have recommended closures on some streams to protect habitat. The interconnection between surface and ground water in these areas is not well known, but new allocations for use of ground water will need to be evaluated as to their effect on the flows of the streams.

What additional information is available?

If you would like more about water issues in the Pend Oreille River watershed, the following studies and technical report is available:

Ecology. 1995. Initial Watershed Assessment, Pend Oreille River Watershed. OFTR 95-17. Washington Department of Ecology.

For more information ...

Contact Bruce Howard, (509) 456-5057 (voice), (509) 458-2055 (TDD), or write the Department of Ecology, Water Resources Section, N. 4601 Monroe, Suite 202, Spokane, WA 99205-1 295.

Ecology does not discriminate in its services. If you have special **communications** needs, contact Lisa Newman at (360) 407-6604 (voice) or (360) 407-6006 (TDD).

Where do we go from here?

While Ecology is mandated by law to protect **instream** water use and existing water rights, Ecology also is responsible for making decisions on applications for new water rights. The public's opinion is important to Ecology in making its program decisions related to water use. Ecology invites public input on what steps should be taken next. We will also work with people who have applied for new water rights in the area to discuss options for processing their applications.

What do we know about the Pend Oreille watershed?

This assessment found that the amount and quality of water in the Pend Oreille River are greatly affected by conditions and activities upstream in Idaho and Montana.

Currently, there is water available in the Pend Oreille River and directly connected ground water for new uses. Streamflow in the tributaries is limited and may not be available for new uses. In addition, increased ground water pumping may cause further declines in streamflow which could adversely effect water quality and aquatic habitat. Because of these findings, the Pend Oreille watershed is classified as "medium risk" by Ecology. Water rights decisions must consider additional adverse impacts to existing water rights and **instream** resources.

What actions can be taken?

The list below describes some actions that could be taken to address the water issues raised in this report. This list is not comprehensive. Ecology wants to hear your opinions on the actions listed below, and any other ideas you have. Usually, a combination of actions is needed to effectively manage water resources and to meet the challenges faced with managing those resources.

Based on the risk, Ecology could take a number of actions. Usually, a combination of actions needs to be taken to effectively manage water resources. The list below describes some actions that could address issues raised in this report. This list is not comprehensive. Ecology wants to hear your opinions on the actions listed here, and any other ideas you have about water management.

Issue water rights from the Pend Oreille River or ground water in direct connection as long as senior water rights and instream flows are not affected.

Pro: Applicants would receive water rights for new uses.

Con: Occasionally water may not be available when stream flows drop below recommended flows.

Encourage water conservation, changes and transfers of water rights, and water reuse to allow efficient use of water.

Pro: May meet new water use demand without an adverse impact on streamflow and senior water rights.

Con: May only be applicable to municipalities or other large water users, and may not meet all demands through these mechanisms.

Approve applications on or near tributaries where water is available and impairment of existing rights would not occur.

Pro: Applicants would get approvals; surface waters and existing rights would be protected.

Con: Applicant may need to provide data to determine water availability or no impairment.

Deny applications for new water rights where source is closed.

Pro: Applicants would get decisions now; surface waters and existing rights would be protected.

Con: Applicants would not get the decisions they want.