LITTLE SPOKANE 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 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, stream flow, 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.

This report summarizes information presented in the detailed Ecology Open-File Technical Report No. 95-15. It also presents some actions that could be taken in response to the results of this assessment.

Dames & Moore, Inc.
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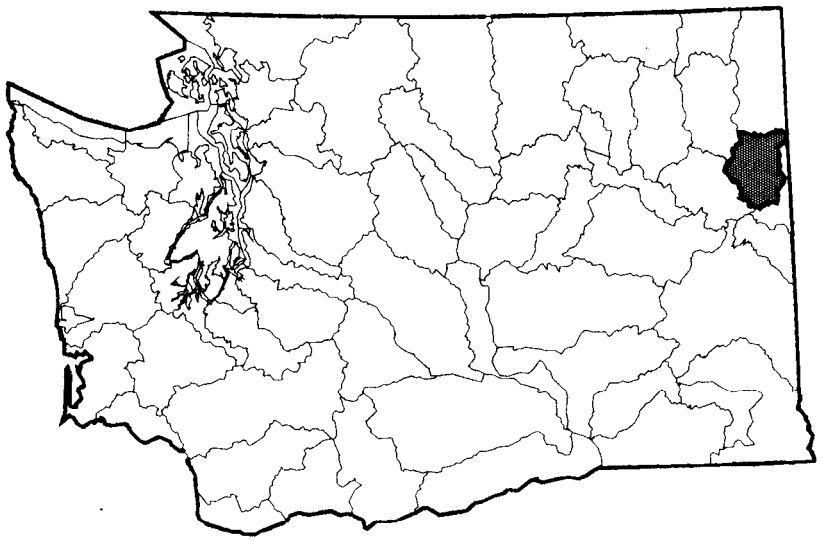
In Partnership with the:
Washington Department of Ecology

Little Spokane River Watershed



What are the water allocation issues?

- Ecology needs to make decisions on 43 pending applications for new water rights.
- Water levels in the Little Spokane River and its tributaries do not meet instream flow requirements set by Ecology approximately 15 percent of the time during average years.
- Declines in stream flows as well as ground water levels are due in part to the consumptive water uses in the basin and lower than average precipitation during recent years.
- Nonpoint pollution is increasingly affecting water quality in the watershed.
- The lower eight-mile reach of the Little Spokane River is a state-designated Scenic River corridor. A river management plan is being developed to preserve the unique quality of this portion of the river, which includes rich and diverse fish and wildlife habitat.
- Population growth and development in the lower part of the watershed are steadily increasing the demand for water. Water may not be available to meet this demand in the summertime.

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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. The Little Spokane River watershed encompasses surface and ground waters that flow to the Little Spokane River in a 700 square-mile area along the eastern border of Washington State just north of Spokane. The watershed encompasses the entire area that drains to the river upstream of its confluence with the Spokane River.

Where does the water come from?

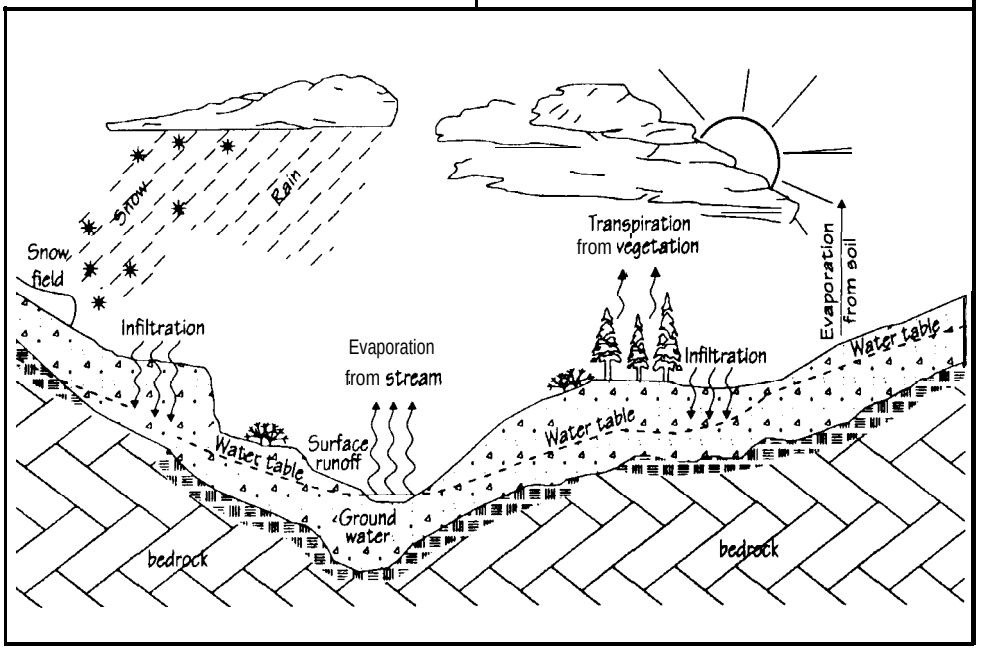
Ultimately, all of the streams, lakes, springs and other surface water and ground water in the watershed comes from rain or snowmelt. Some of this water evaporates or is used by plants, some flows into the streams and rivers, and the rest infiltrates into the soil to become ground water. Some segments 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.

Surface water and ground water in the Little Spokane River and its local tributaries are replenished by precipitation, including rainfall and snowmelt. Water is lost from the watershed through evaporation and use by plants, flows of surface water and ground water out of the watershed and from withdrawals from the system for human use.

The watershed receives approximately 25 inches of precipitation annually, with the majority falling in the winter and spring. The highest monthly totals occur between November and January.

What are the major surface water sources?

Surface water sources include rivers, streams, and lakes. The major tributaries to the Little Spokane River are Dragoon, Deadman, Little Deep and Deer creeks as well as the West Branch of the Little Spokane River. The largest lakes include Eloika, Diamond, Sacheen and Horseshoe lakes, which are all located in the northern half of the watershed.



A general representation of the hydrologic (wafer) cycle (modified from Walker and Nassar).

What are the major ground water sources?

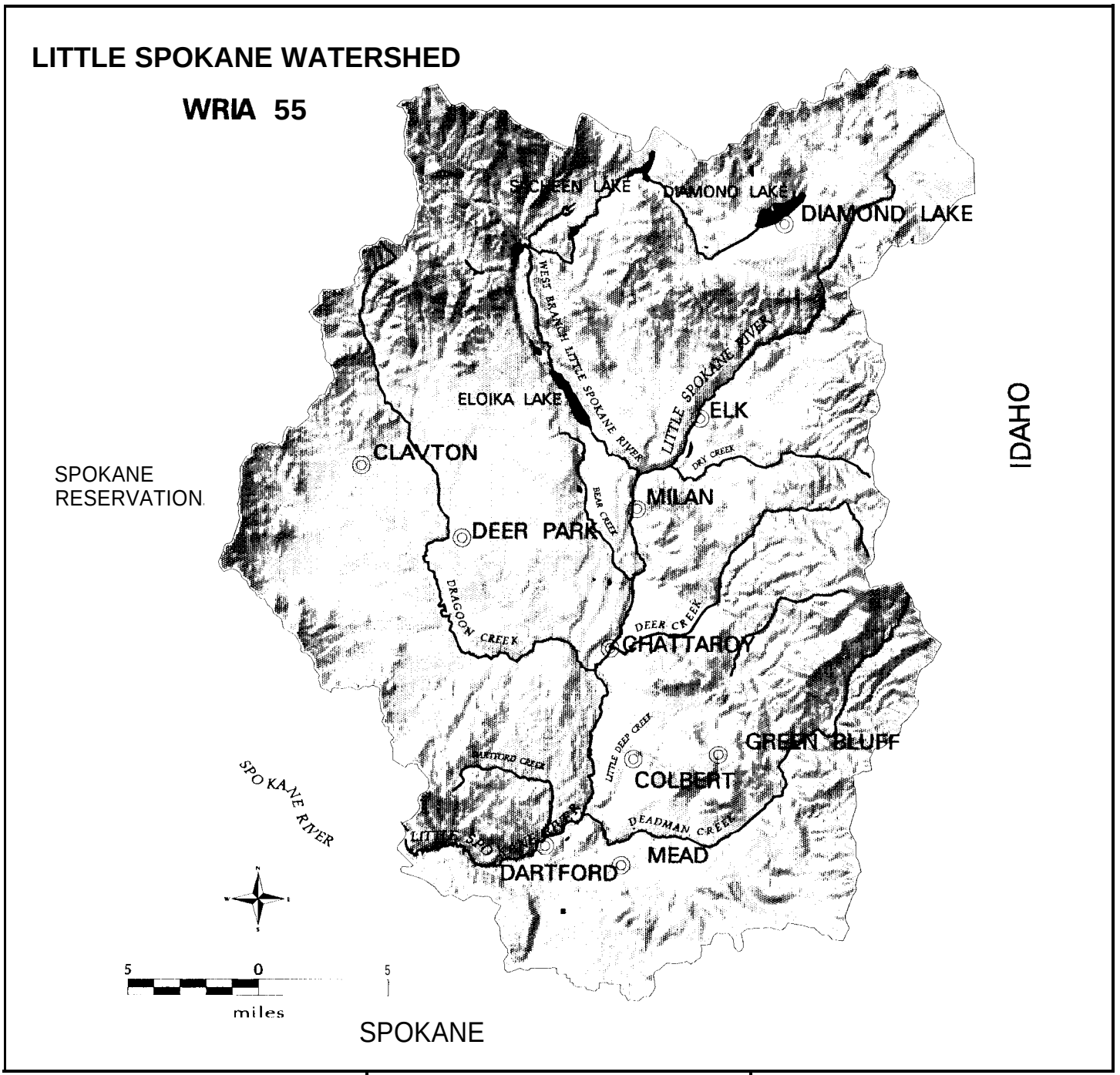
Ground water sources originate as rain or snowmelt that infiltrates through the soil surface down to geologic layers called aquifers. Ground water occurs in alluvial and glacial sediments found in the major river and stream valleys within the watershed. It also occurs in bedrock formations located beneath the glacial and alluvial sediments and in the upper elevations of the watershed.

The largest aquifers in the watershed occur within the valley of the Little Spokane River. Additionally, smaller and localized aquifers occur within tributary valleys and in upland areas. The Spokane/Rathdrum aquifer, a large, regional ground water system, occupies a small portion of the southern part of the watershed. Generally, ground water provides a more reliable year-round water supply. This reliability, combined with limited access to surface water, results in heavier use of ground water in the watershed.

Withdrawals have led to interference between wells and lowered water levels in some areas, although the effects on senior ground water rights have not been determined. However, concern is mounting in areas such as Green Bluff where water level declines are occurring. Some water right applications have been protested by local residents concerned about adverse impacts to their wells.

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

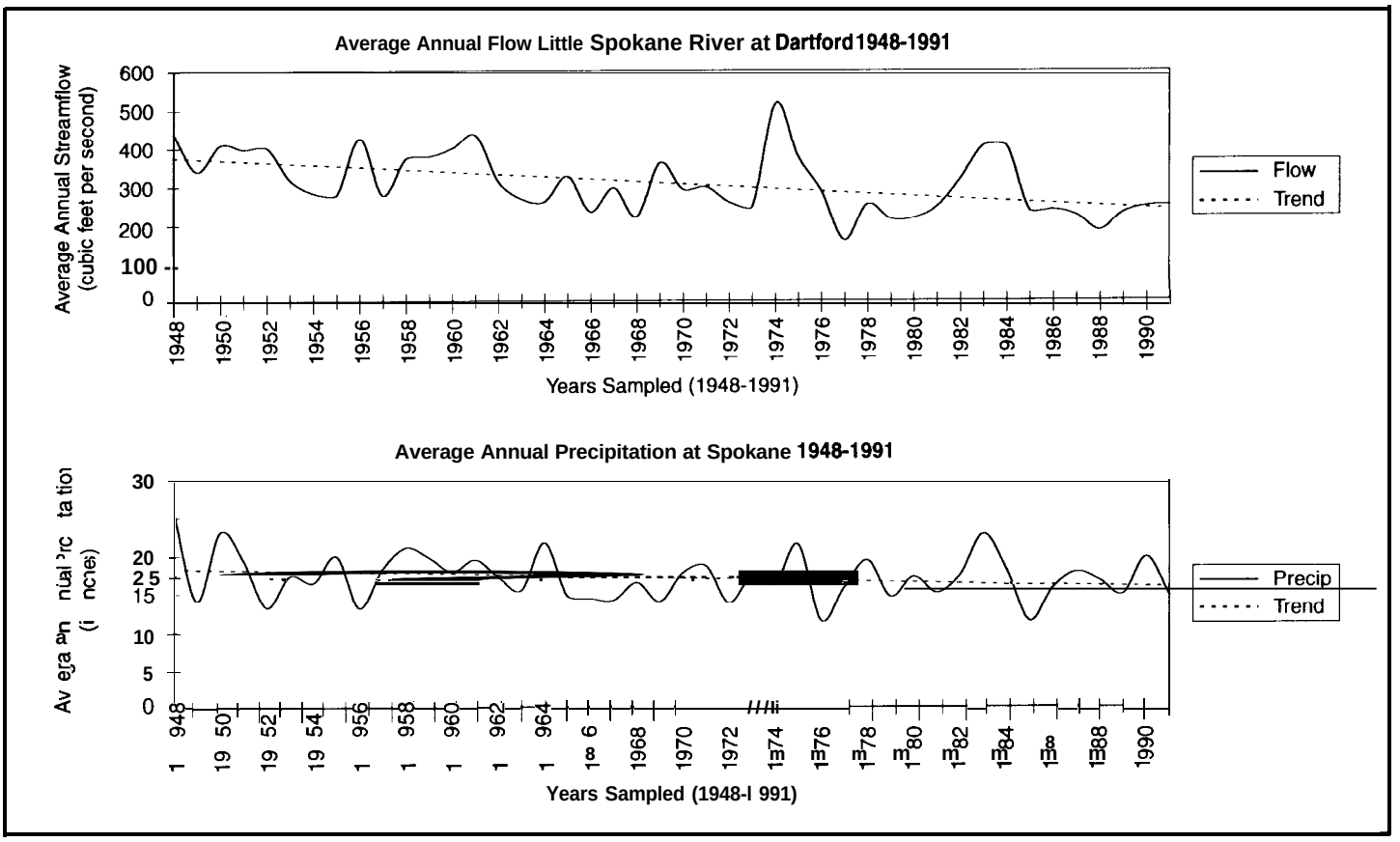


the total flow in the rivers and creeks when there is no rain or snowmelt to contribute to the flow.

Ground water supplies within the Little Spokane River watershed are recharged directly from precipitation and from stream seepage where aquifers contact streambeds. Infiltration is affected by the amount and type of vegetative cover, soil type and rainfall intensity.

Eventually, all ground water drains toward 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. Ground water which is located at a greater depth or is found in the Spokane/Rathdrum aquifer follows longer flow paths and is discharged further down the watershed or to surface water bodies outside of the watershed, such as the Spokane and Columbia rivers.

Withdrawals from aquifers affect ground water discharge to streams and can reduce low flows that are dependent on ground water discharge, especially during summer months. Water availability in both local surface waters and aquifers may be seasonally limited due to variability in precipitation, snowmelt and recharge.



Annual streamflow at Dartford and at Spokane.

How is water used?

As previously mentioned, ground water is used to a greater extent than surface water in the watershed. The main uses include commercial, manufacturing, domestic (including single family, multiple family and municipal systems) and irrigation. The largest water use in the watershed is for domestic purposes. Surface water accounts for approximately 26 percent of total documented water allocation, with irrigation the primary purpose.

How does land use affect water?

Land uses in the Little Spokane River watershed vary greatly. Existing land cover is primarily forest interspersed with areas of rangeland, agriculture and development. Principal agricultural uses are fruit orchards, cultivated crops and livestock rearing. Deer Park, Mead and the northern portion of Spokane are the main developed areas.

Over the last decade, land use changes in the watershed have been dramatic, especially in the Spokane area. Economic growth has led to much of this area being converted from rural land to urban and suburban environments.

Land use activities can significantly alter the quantity and quality of both surface and ground water moving through a watershed. Irrigated agriculture requires significant volumes of water and can increase the amount of water lost by plant use and evaporation. Some industries use large amounts of ground water and discharge treated waste water to the Little Spokane River after use.

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 preserving large quantities of clean water to reduce the adverse effect of existing pollutants and maintain proper water temperatures for fish.

In general, the Little Spokane River watershed has good to excellent ground water quality. However, there are some problems with fecal coliform, high temperatures and inorganic compounds, such as nitrates. Typically, levels of these pollutants are heightened during summer low flow periods.

Are fish resources stable?

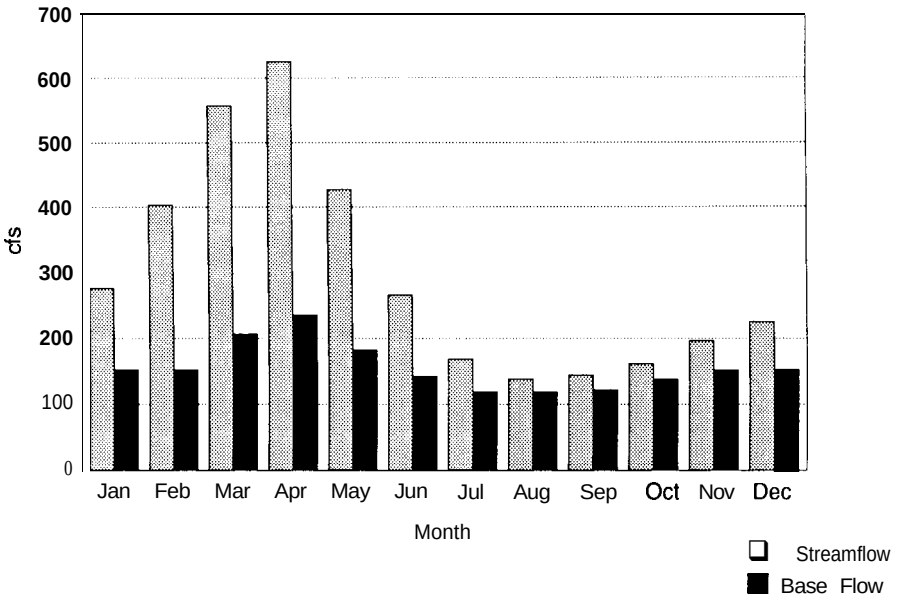
The fisheries resources of the Little Spokane River have been changed dramatically by downstream dams on the Columbia and Spokane rivers. The Little Spokane River watershed is home to a rich variety of resident fish including Eastern brook, rainbow and brown trout, sculpin, largescale suckers, northern squawfish and mountain whitefish. It is not known if salmon and steelhead used the Little Spokane River for migration and spawning habitat in the past, although it is probable.

How have streamflows changed?

Streamflows in the Little Spokane River have declined since the 1950s. However, flows vary considerably on an annual and seasonal basis. Streamflow declines are the result of increased water use as well as lower than average precipitation.

Ecology set instream flows for the Little Spokane River in 1975 and some tributary streams have been closed since 1951. Still, measured flows exceed instream flows most of the time. However, in some years, instream flows are not met for more than six months.

Average Monthly Streamflow Little Spokane River at Dartford (1929-1992)



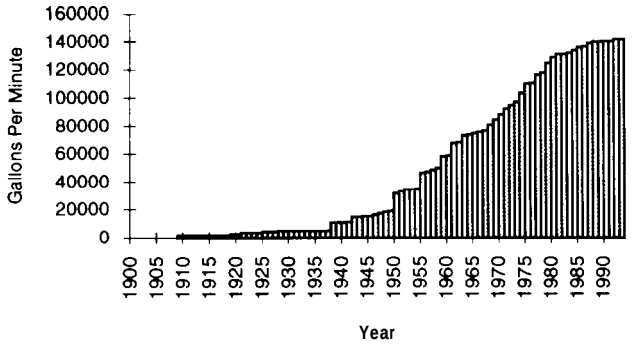
Since the 1970s, instream flows have not been met an average of 53 days per year, typically during the summer and fall months. This trend has been increasing in recent years.

What are water rights?

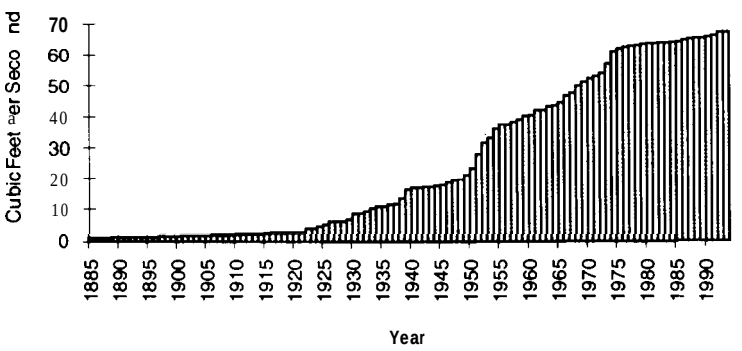
A water right is a legal authorization to use a certain amount of public water for specific beneficial purposes.

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.

Cumulative Growth in Ground Water Rights

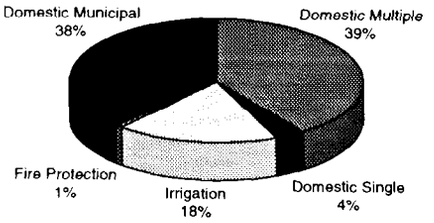


Cumulative Growth in Surface Water Rights

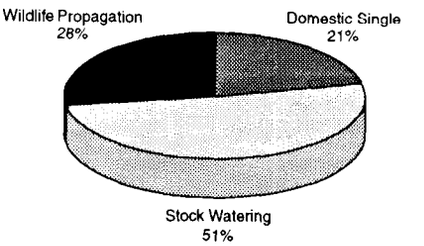


Little Spokane River Watershed

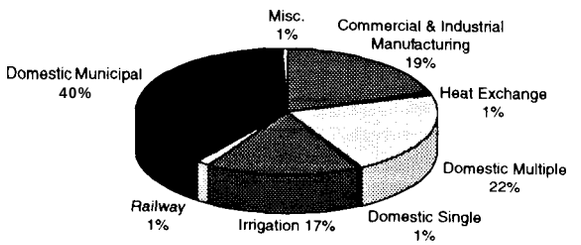
Ground Water Applications
Primary Purpose Use As Percentage of Total Allocation



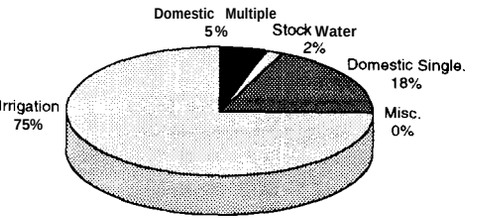
Surface Water Applications
Primary Purpose Use As Percentage of Total Allocation



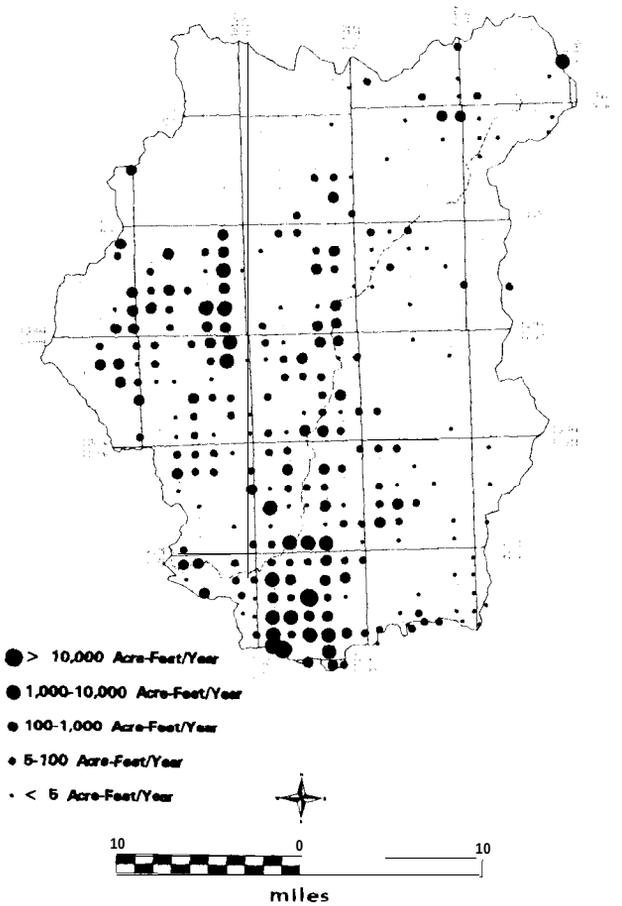
Ground Water Rights
Primary Purpose Use As Percentage of Total Allocation



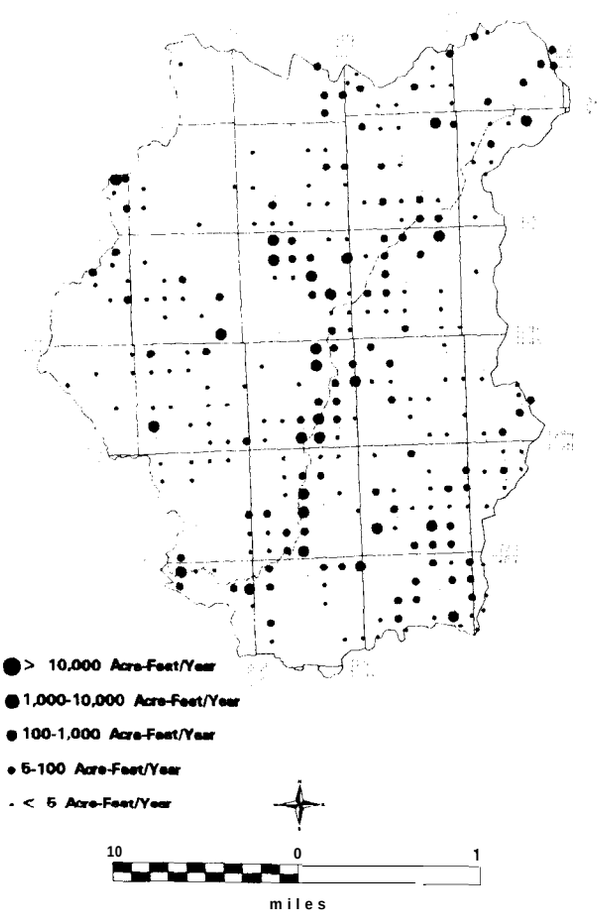
Surface Water Rights
Primary Purpose Use As Percentage of Total Allocation



GROUND-WATER RIGHTS BY SECTION



SURFACE WATER RIGHTS BY SECTION



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 4,612 water right claims have been filed, for a total flow equivalent to about 260 cfs.

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 Little Spokane River watershed a total of 1,237 water right permits and certificates have been issued, 741 for surface water and 496 for ground water. Permitted withdrawals of both surface and ground water total 382 cubic feet per second (cfs).

Thirty-one applications for ground water permits have been filed, requesting approximately 32 cfs. Additionally 12 surface water permit applications are on file with Ecology, requesting a total of two cfs. Before issuing new water rights, Ecology must consider potential effects on other water users.

Comparisons of average annual flows in the Little Spokane River and total water withdrawals from the watershed indicate that water use in the basin is as much as 30 to 35 percent of streamflow, an unusually large percentage.

What are the conflicts?

Water use conflicts occur when the available water supply is insufficient to fulfill existing water rights and claims, including maintaining instream flows. Future conflicts could occur between existing rights and proposed future uses.

Balancing these needs is complex. Low summer flows are caused not only by reduced rainfall, but also by permitted uses for municipal, household, farming, and industrial needs. Wells drawing water from aquifers can reduce ground water discharge to rivers and streams. Reduced water quality can severely damage habitat.

In the Little Spokane River watershed, urban and suburban growth and land use changes have combined to increase the pressures on the water resources of the area. New appropriations in the 1970s contributed to the lowering of streamflows. Water quality has also suffered, particularly in the lakes and during periods of low flows in the streams. Since instream flows may not be met as much as 50 percent of the time in some years, fish may be adversely affected.

Where do we go from here?

The legislature has charged Ecology to protect instream water uses and existing rights, and to make decisions on applications for new water uses. In doing this, we want to work with the public to make sure the measures we take address the area's environmental and economic needs. 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 additional information is available?

If you would like more about water issues in the Little Spokane River watershed, the following studies and technical reports are available:

Deer Park Basin Groundwater Advisory Committee. 1992. Draft Deer Park Basin Groundwater Management Plan. Deer Park Basin Groundwater Advisory Committee.

Ecology. 1995. Initial Watershed Assessment, Little Spokane River Watershed. OFTR 95-15. Washington Department of Ecology.

State of Washington. 1976. Washington Administrative Code, Chapter 173-555 WAC, Water Resources Program in the Little Spokane River Basin, WRIA 55.

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-I 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).

What do we know about the Little Spokane watershed?

This assessment found streamflows in the Little Spokane and its tributaries often do not meet flow requirements during the summer and fall months. In addition, changes in land use and increases in ground water pumping may cause further declines in streamflow which would adversely effect water quality and aquatic habitat. Because of these findings, the Little Spokane watershed is classified as "high 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.

Encourage water conservation, changes and transfers of waterrights, water reuse, and pipeline-interconnections 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 for new--water rights where acceptahlamitigationis proposed and impairmentof senior water-rights would not occur.

Pro: Some applicants would get approvals; surface waters and senior water rights would be protected

Con: No criteria exist for "acceptable mitigation"; could be expensive and time consuming.

Deny applications for new water-rights from-closedtributaries and directly connected ground water.

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

Con: Applicants would not get the decisions they want.

Encourage regional watershed planning and coordinate with growth planning.

Pro: Cooperation between water interests would allow more flexible solutions and cost-effective approaches to water issues. Activities could include improvement of aquatic habitat and water quality, interconnection of water suppliers, and additional collection of hydrogeologic and water use data. A regional perspective could be used to meet new water uses.

Con: Would require time, money, and political consensus to create and carry out the plan. Availability of funding is uncertain.