

# UPPER CHEHALIS WATERSHED INITIAL ASSESSMENT

DRAFT

February 1995

With our multitude of lakes, streams and rivers, Washington State seems to have an abundance of water. However, the demand for water has steadily increased each year, while the available water supply has stayed the same, or in some cases, appears to have declined. This increased demand for limited water resources has resulted in the water-rights-allocation process becoming very complex and controversial.

In order to expedite decisions about pending water rights, it is vital that we accurately assess the quality and quantity of surface water and ground-water within the state. The Washington Department of Ecology recognizes that water-right decisions must be based upon accurate scientific data. Ecology has hired consultants to assist with special studies called Initial Watershed Assessments. Ecology and the consultants will jointly compile and evaluate data in selected watersheds known as Water Resource Inventory Areas (WRIAs).

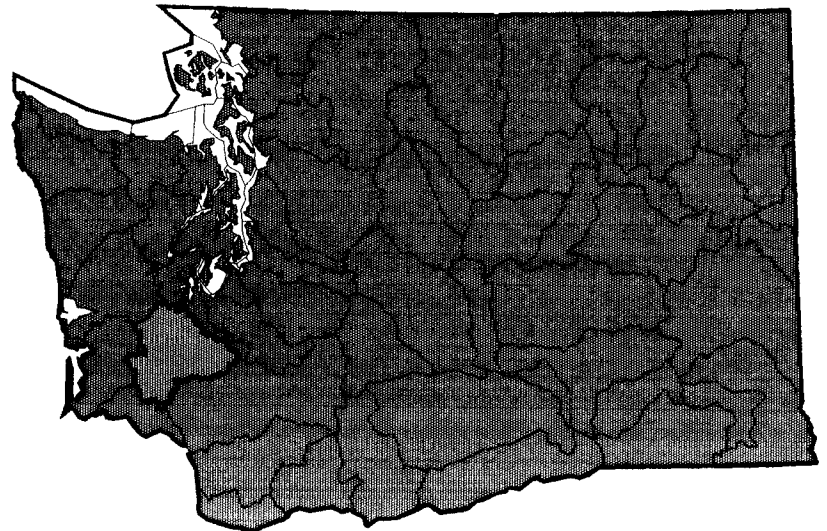
The assessments evaluate water rights, streamflow, precipitation, geology, hydrology, water quality, fisheries, and land use. The assessments describe the water-resource issues which must be considered when making water-management decisions. In watersheds with little existing information, further studies will be necessary to acquire new data. Watersheds with serious water-supply problems will require coordination with local and regional planning efforts to resolve conflicts.

This summary document outlines information detailed in Open File Technical Report 94-09, available from Ecology.

*The Langlow Associates, Inc.  
Dames & Moore, Inc.  
and associated firms*

Prepared in cooperation with the  
*Washington Department of Ecology*

## Upper Chehalis Watershed



### What are the issues affecting water availability in the Upper Chehalis watershed?

- The natural supply of water varies greatly depending on location, season, and year.
- Demand for water is at its highest in dry summer months when natural supply is low.
- Chapter 173-522 Washington Administrative Code (WAC) requires Ecology to protect base flows from impairment by new water rights.
- Required base flows are not met many days each year.
- Surface water-quality is degraded in parts of the Chehalis River and several of its tributaries during the summer months.
- Growth is steadily increasing the demand for water. Increased water use will further degrade water quality and fisheries habitat.

## What is a watershed?

A watershed is a land area which drains to a single stream.

## Where does the water come from?

Ultimately, all surface and ground water in the Upper Chehalis watershed comes from precipitation, as rain or snowmelt. Some of this precipitation evaporates or is used by plants, some flows into streams and rivers, and the rest infiltrates into the soil to become ground water. Some reaches of streams gain water from ground water that seeps into the channel, and other reaches lose water that leaks through the streambed into the ground.

The Willapa Hills create a rain shadow, shielding a large part of the watershed from winter storms. Average annual precipitation (40-50 inches per year) is quite low, compared to other parts of southwest Washington. However, some areas in the Willapa Hills see as much as 120 inches of rainfall a year.

Most of the precipitation falls between October and May. The driest months are July and August.

## What are the major sources of water?

Surface-water sources include rivers, streams, and lakes. Ground-water sources originate as rain or snow-melt that infiltrates the soil surface and percolates down to geologic layers called aquifers.

The Upper Chehalis watershed is drained by the Chehalis River and its major tributaries, including Elk, Crim, Lincoln, and Scatter Creeks and the South Fork Chehalis, Skookumchuck, Black, and Newaukum Rivers. The Chehalis River flows past the gage near the town of Porter and into the Lower Chehalis watershed, eventually reaching the Pacific Ocean.

Within the watershed, ground water occurs principally within alluvium, glacial sediments, and volcanic and sedimentary rocks. The alluvium in river valleys generally provides the highest water yields to wells. The highest well yields are obtained in the north-central portion of the watershed, and in the lower Newaukum River Valley.

Total water supply in the Upper Chehalis watershed is large, but its distribution is geographically and

seasonally uneven. Seasonal variability in precipitation and ground-water recharge leads to large swings in stream flow, ground-water levels, and water availability.

## How are surface and ground water connected?

Eventually, most ground water within the Upper Chehalis watershed drains to streams or lakes. Some ground water recharges the shallowest aquifer and re-emerges in streams near the point of recharge. Other ground water moves into deeper, more extensive aquifers, following longer flow paths, and re-emerges in streams many miles 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.

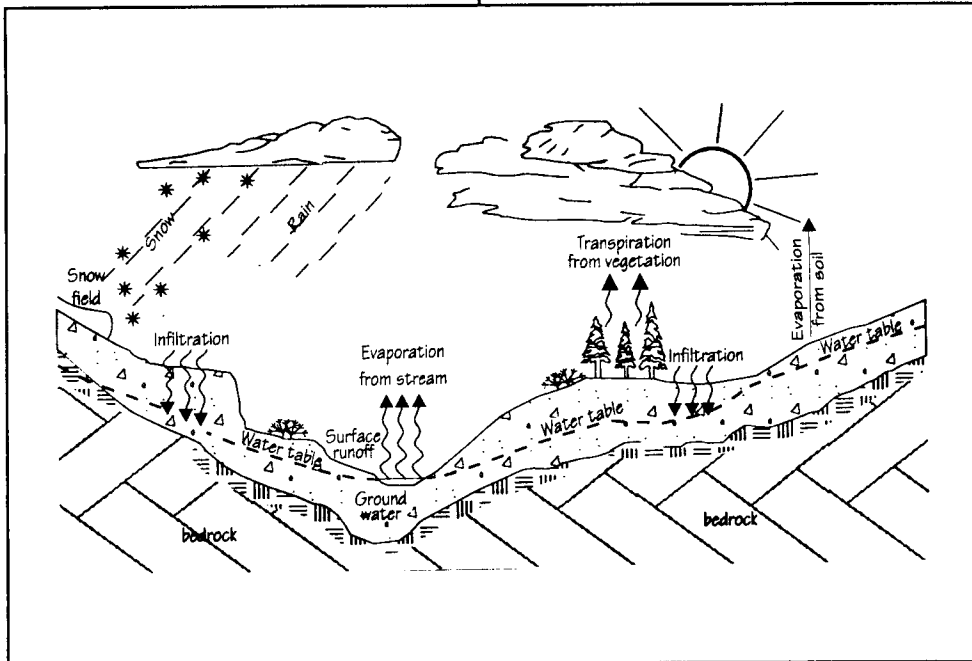
In the Upper Chehalis watershed, ground-water discharge maintains streamflow during periods of little or no rainfall.

## How does land use affect water movement?

Water is required for many uses in the Upper Chehalis watershed:

- Timber
- Irrigated agriculture
- Stockwater
- Domestic supply (household, garden)
- Municipal supply
- Commercial uses
- Power production
- Fish habitat and propagation
- Recreation

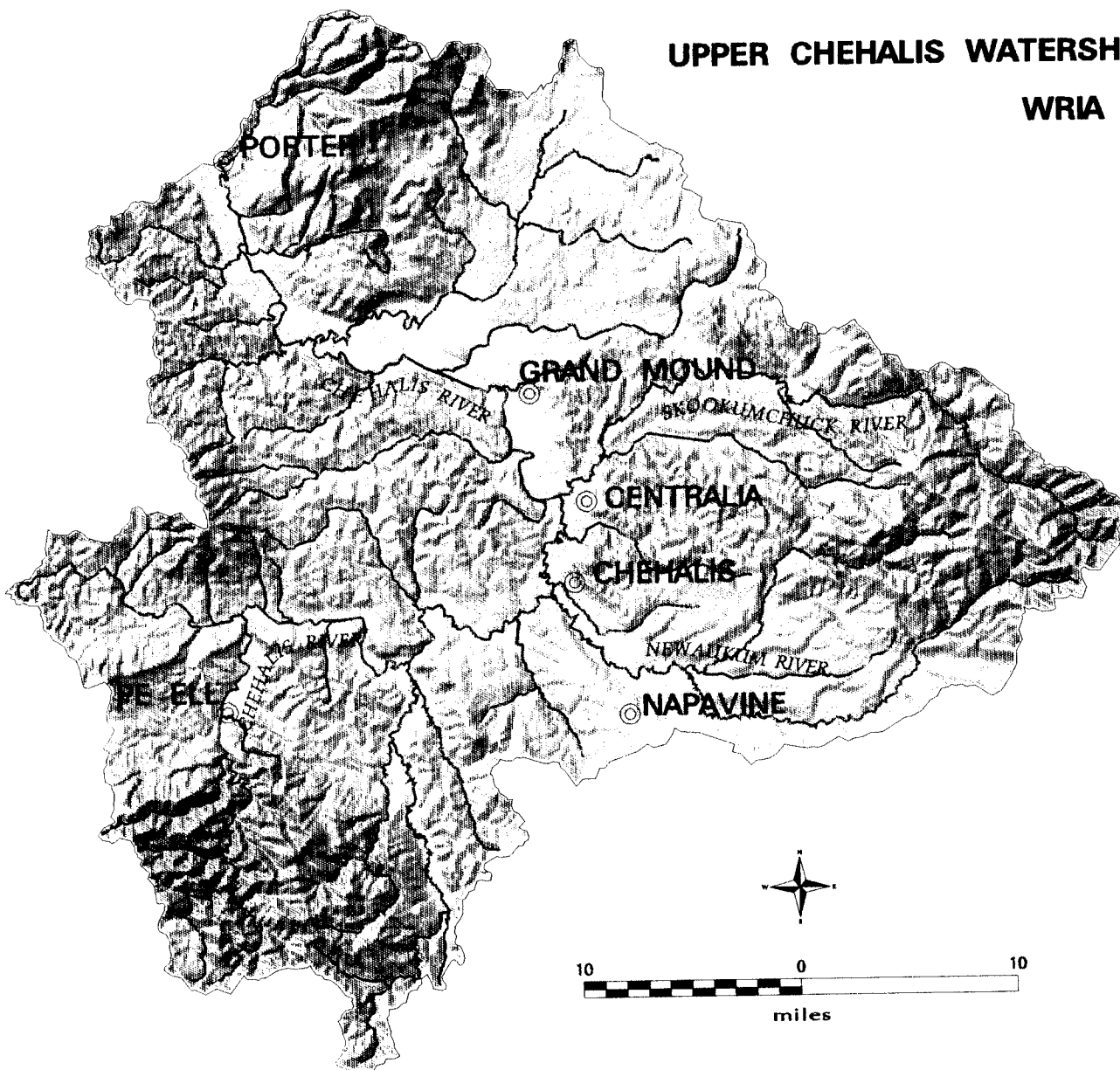
Each of these activities can have profound effects on the amount and quality of water moving through a watershed. Logging operations can strip soils of vegetation, increasing the



A general representation of the hydrologic (water) cycle (modified from Walter and Nassar).

# UPPER CHEHALIS WATERSHED

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amount of runoff to streams. Increased soil erosion can cloud streams with sediment. In agricultural areas, chemicals and livestock wastes can drain into streams.

Irrigated agriculture requires significant volumes of water. Municipalities and industries use large amounts of water and may discharge waste water to streams. The expansion of impervious surfaces (roads, parking lots, buildings, etc.) increases the volume and rate of runoff into streams. Stormwater runoff

can also carry pollutants from these surfaces into streams. Increased runoff from impervious surfaces also contributes to flooding problems during winter storm events.

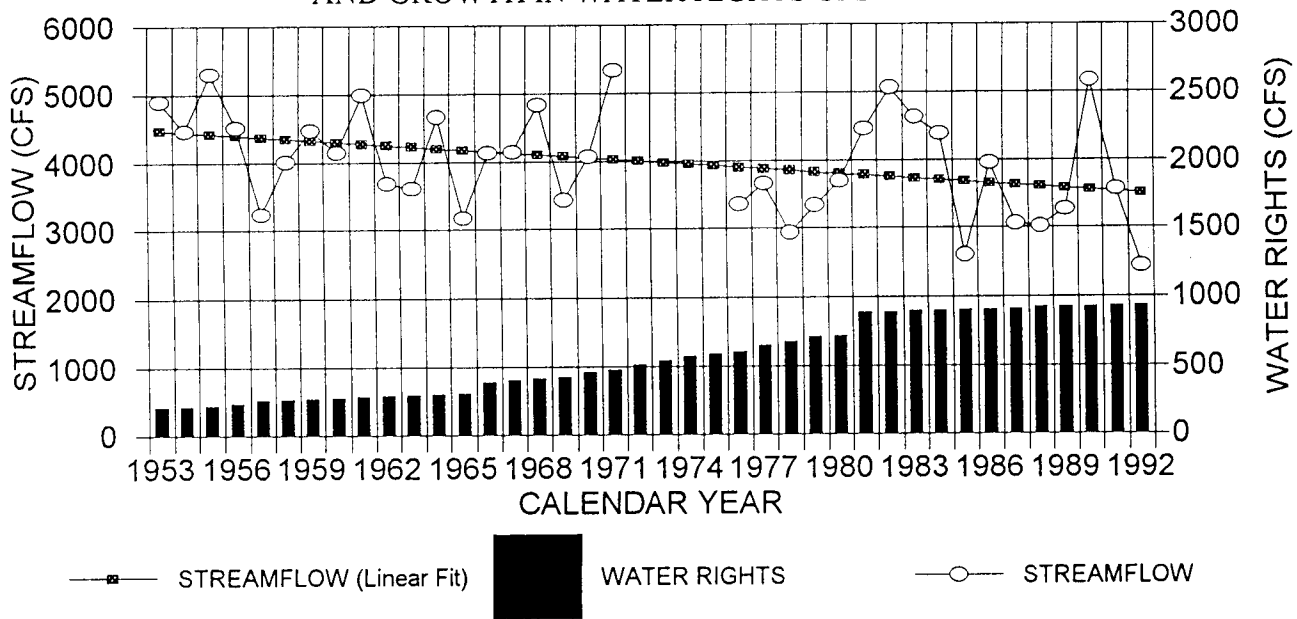
### What are the water quality issues?

Water quality is closely tied to water quantity. Water supplies must be of high quality for human uses and for fish and wildlife habitat. Water quality may depend on preserving large quantities of

clean water to dilute pollutants and maintain proper water temperature for fish.

During the summer months, the Chehalis River and many of its largest tributaries often fail to meet water-quality standards for temperature, dissolved oxygen, fecal coliform, pH, and nitrogen and phosphorus compounds. Currently, 28 facilities hold permits to discharge waste water to these streams. These discharges were

## ANNUAL STREAMFLOW IN CHEHALIS RIVER NEAR PORTER AND GROWTH IN WATER RIGHTS UPSTREAM



Annual stream flow in the Chehalis River, recorded at the USGS gaging station near Porter from 1953 to 1992. The runoff has shown an average decline over these years.

permitted on the assumption that the receiving streams contain enough high quality water to assimilate the discharges without violating the surface-water-quality standards. This has not proven to be the case.

The worst problem areas include the Chehalis River between Pe Ell and Porter, the Black, Skookumchuck, and Newaukum Rivers, and several smaller tributaries.

Reductions in waste discharges from point and non-point sources will be required to meet water-quality standards.

### Fishery Issues

Chinook, chum, coho, and steelhead salmon, and cutthroat and resident rainbow trout reside in streams and

streams of the watershed. The Washington Department of Wildlife summarized the condition of wild stocks of anadromous fish species throughout Washington. In the Upper Chehalis watershed the worst conditions are in the Skookumchuck River and the Newaukum River which have "depressed" stocks of winter steelhead, while stocks of coho, spring chinook, and fall chinook salmon appear to be healthy. In order to maintain habitat for these fish stocks, streams must contain sufficient high quality water.

Habitat is degraded in many streams in the basin due to low stream flows and poor water quality. Activities or factors that affect water quality and quantity include logging, mining, dams, diversions, obstructions, and commercial and residential development near streams.

### Stream Flows in the Chehalis River

In 1976, Ecology established minimum base flows at 29 control stations along the Chehalis River and its tributaries (Chapter 173-522 WAC). Also, several smaller tributaries were closed to further water withdrawals. These base flows and closures are necessary to preserve wildlife, fish, recreation, scenic, aesthetic, and other instream needs. At two of these control stations (one near Grand Mound and one near Porter), annual flows have decreased by 300 cfs since 1930 and 800 cfs since 1953, respectively. At the Porter gage the minimum base flows are not met an average of 77 days per year.

**What are water rights?**

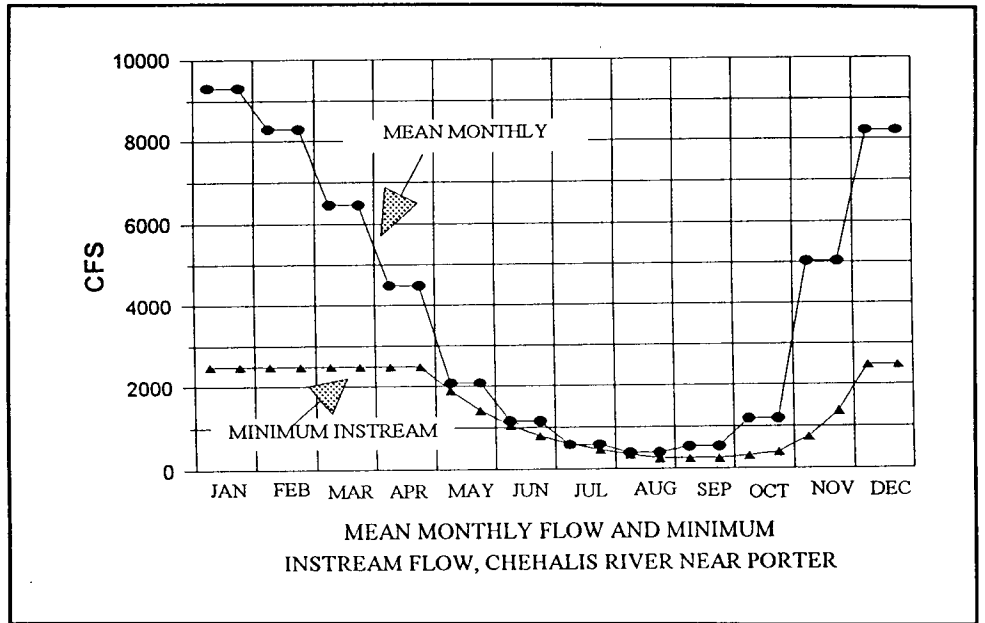
A water right is a legal document which authorizes the use of public water for a specified purpose. A water right is required for any surface-water use. Ground-water use in excess of 5,000 gallons per day or irrigation of more than one half acre, also requires a water right. Water rights are issued on a "first in time, first in right." basis. Thus, during periods of water shortage, junior rights may be restricted to protect senior rights.

**Why are water rights so important?**

The intent of water resource management and the water rights process is to ensure that Washington's water resources are appropriately allocated and managed to protect water quantity and quality. Regulating how and when water is used is the principal way competing needs for water are managed to protect senior rights and instream resources.

**What are the water use conflicts in the watershed?**

Water-use conflicts occur when available water supply is insufficient to maintain minimum base flows and fulfill existing water rights and claims at the same time. Conflicts also arise when proposed uses may impair minimum base flows or existing water rights.



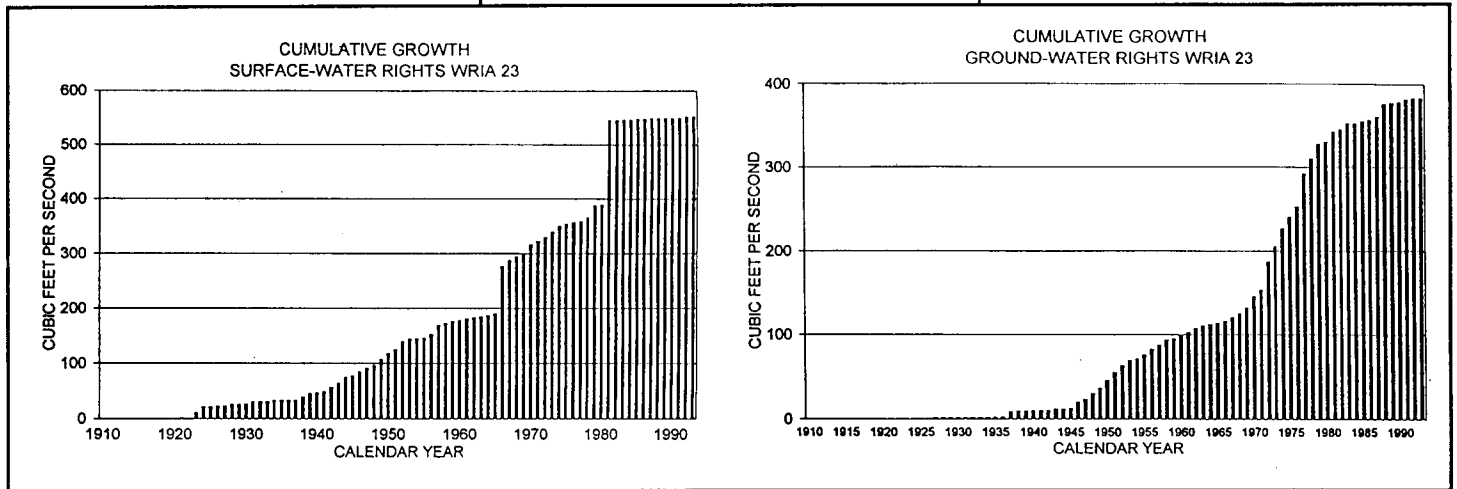
In order to make wise management decisions about water use, the following factors must be considered:

- Competing water uses
- Low flows in summer months
- Increasing water use
- Anticipated future growth
- Decline in fish stocks
- Maintenance of minimum base flows
- Degradation of water quality and aquatic habitat.

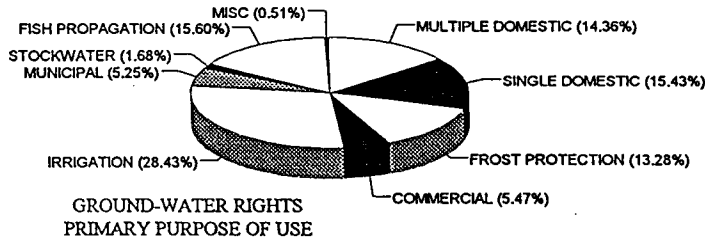
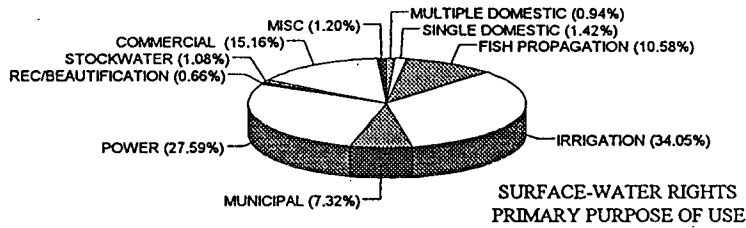
Balancing these needs is complex. Low summer flows are caused not only by low rainfall, but also by permitted uses for household, farming, and industrial needs. Wells drawing water from aquifers can reduce ground-water discharge to rivers and streams.

Reduced water quality can severely damage habitat. Low stream flow can block fish migration.

In the Upper Chehalis watershed the combined allocation for surface water and ground water rights and claims totals 1,202 cfs per year. Applications are on file with Ecology for an additional 46 cfs. In winter when flows are high, additional water is available for allocation. However, in summer months, rights and claims exceed natural stream flow in many instances. For example, during an average August at the Porter gage located at the base of the watershed, upstream rights and claims exceed natural flow by 275 percent (nearly three times).



# Water Right Applications



What are the current and future major water uses in the watershed?

Irrigated agriculture accounts for the largest use of water in the watershed. This use occurs during summer months when water is least available and most necessary for maintaining minimum base flows.

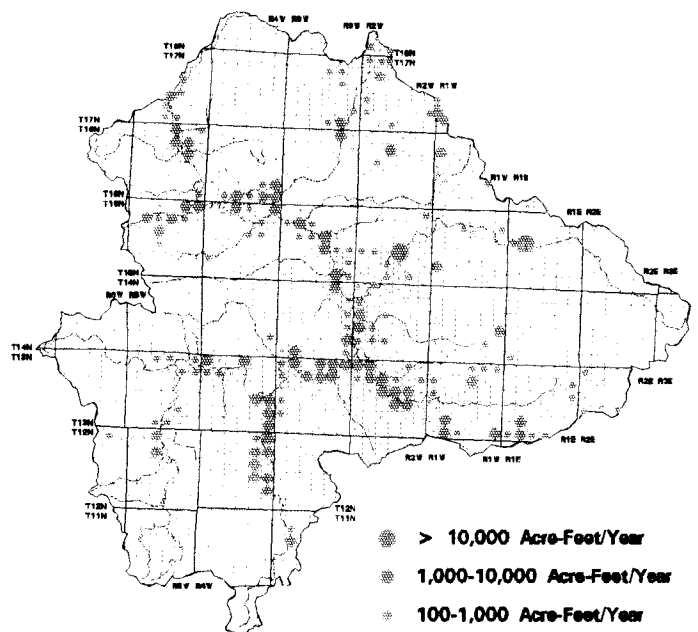
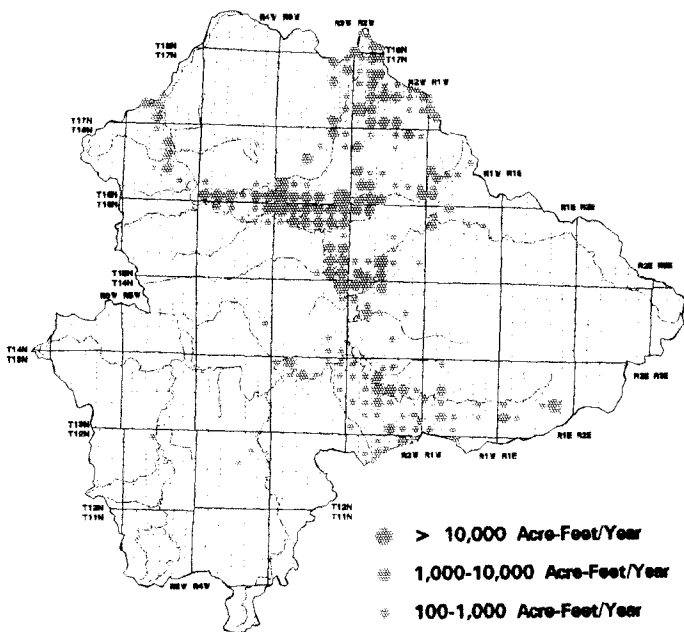
Population growth is expected to increase steadily, requiring development of new water supplies. Sufficient water must be maintained in streams to adequately dilute permitted wastewater discharges.

Accordingly, minimum base flows are often not met, and water-quality and

fisheries habitat problems are compounded.

**GROUND WATER RIGHTS BY SECTION**

**SURFACE WATER RIGHTS BY SECTION**



## What decisions can be made?

The environmental problems of water quality degradation and depletion of fish stocks, and the over-allocation of water rights have been identified in the Upper Chehalis watershed. A number of management/permitting options are available described below:

### Deny applications for new Water Rights unless acceptable mitigation is proposed

Pro: -Decisions on applications could be made if no further degradation of water quality or impacts of fish stocks occur.

Con: -"Acceptable mitigation" is difficult to achieve and potentially very expensive for the applicant.

### Encourage conservation and efficient use of existing water rights

Pro: -Could lead to a reduced demand for new sources of supply.  
-May have less impact on water resources.

Con: -May only be applicable to large water users.  
-May be an expensive option.

### Consider transfers of existing rights

Pro: -May be new development with little or no impact to system.

Con: -May only be available in limited areas of the watershed.

### Enforce against unauthorized use

Pro: -Unauthorized water use would be stopped.  
-Additional water may be available for authorized water right holders.

Con: -Time consuming, expensive, and controversial.  
-Water savings resulting from enforcement may be minimal or less substantial than projected.

### Develop off stream storage

Pro: -May allow some additional development.

Con: -Engineering and construction costs are very high.  
-Potential water quality and habitat impacts could result.

### Consider regional planning

The Chehalis Watershed Council was organized to help address watershed management issues that affect the Chehalis River watershed. The council provides a framework for coordinating interest groups and implementation of watershed action programs. This group includes representatives of local government, water users, waste dischargers, business, local environmental groups, and tribes. The Chehalis Watershed Council could form the basis of a regional planning group.

Pro: -Provides process for widespread involvement and cooperative decision-making.

Con: -Resource- and time-intensive; may delay decisions.

**Where do we go from here?**

Ecology will hold a public workshop to discuss the available information for the Upper Chehalis watershed and the decision options. Ecology will then choose a course of action leading to water right decisions.

**What additional information is available for the Upper Chehalis watershed?**

If you would like to learn more about water rights issues in the Upper Chehalis watershed, the following technical report is available to the public:

"Initial Watershed Assessment, Upper Chehalis Watershed," 1995, Open File Technical Report 94-09. Washington Department of Ecology.

**For more information...**

Contact Gale Blomstrom, (360) 407-6000, or write Department of Ecology, Water Resources Section, P. O. Box 47600, Olympia, WA 98504-7600.

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

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