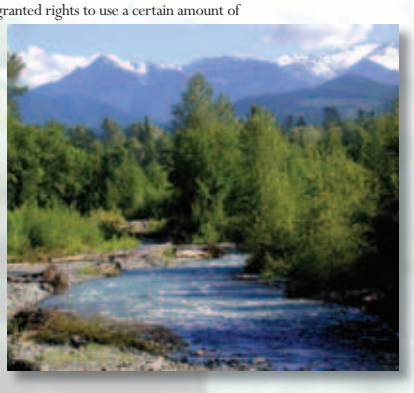
Water Law in the Dungeness Basin

A COMMON RESOURCE

Water in Washington State is considered a common resource. A private party might be granted rights to use a certain amount of water, but—and this might surprise you—the water belongs to all the citizens of the state.

The right to put a certain amount of the public's water to use is granted by the issuance of a "water right." The state Department of Ecology issues water rights and administers state laws regarding water use.

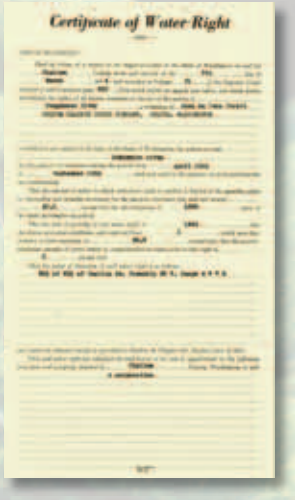


The Dungeness River, taken from Hwy. 101 June, 2002

SENIORITY TAKES PRIORITY

All western states in the U.S. have adopted what is known as the "prior appropriation doctrine." The doctrine, often described as "first in time, first in right," means that whomever diverted water first from a stream is considered senior to all subsequent water users and has full rights to the amount of water in their water right.

If there is not enough water in a given year, "junior" water-right holders have to stop their use to ensure "senior" right holders can divert their full amount.



Certificate of Water Right

Definition of a Water Right

A water right is the right to put a certain amount of water to specific beneficial use from a specific diversion or point of withdrawal.

A WATER RIGHT FOR FISH

The Department of Ecology is required by law to protect and preserve instream uses for:

- Fish and wildlife.
- Recreation.
- Navigation.
- Aesthetics.
- Water quality.
- Livestock watering.

All these are recognized as "beneficial uses" of water under the law, as are drinking water, irrigation, and industrial and commercial uses.

An instream flow and water management rule is, in essence, a water right for fish and other aquatic species. Once adopted, the rule affects only water right decisions made thereafter. It has no effect on senior (existing) water rights.

A salmon during low flow in the Dungeness River.

"WET" AND "PAPER" WATER RIGHTS

It's difficult to know how much water is being used in the Dungeness Basin because of how water rights have been established over the last 150 years.

Since 1917, permits have been required for any use of surface water; groundwater withdrawals have been regulated since 1945. However, irrigation was introduced to the Dungeness Valley in the late 1800s, and many water right claims were made before 1917.

In order for a water right to be validated and receive a final certificate, the water user must demonstrate that they have put the water to "beneficial use."

Not all certificated water rights are currently being used, resulting in a distinction between "wet" water rights, which continue the legal right to withdraw or divert water, and "paper" water rights, which have been lost or relinquished but are still on the books.

Confused? Yes, water law is very complex. It is not an easy process to sort through, and in fact, only the courts can validate water rights and priorities through a process known as adjudication. This happened for the Dungeness Basin in 1924. However, many more certificates were issued after the 1924 adjudication.

DUNGENESS RIVER IS "OVER-APPROPRIATED"

One thing is certain: more water rights have been issued for withdrawals from the Dungeness River than flows in the river can actually support. In legal terms, the river is "over-appropriated."

The Dungeness Valley irrigation districts and companies have banded together to better manage their water and reduce potential legal issues over water rights. They have undertaken major piping projects to decrease the amount of water they need to withdraw from the river, and they have voluntarily trimmed their use at critical low-flow times. This is an example of the type of collaboration that stakeholders refer to as "share the pain, share the gain."

Even with these improvements, the Dungeness River still experiences shortfalls almost every summer when it comes to meeting the needs of both fish and irrigation.

Aerial photo of the Dungeness River.

TRIBAL RIGHTS GO WAY BACK

In addition to its water management responsibilities, the State of Washington must respect treaty obligations and collaborate with the governments of Native American tribes.

Tribes have fishing rights in their historic "usual and accustomed areas." A right to productive salmon habitat is asserted along with the right to fish, meaning that flows to support productive fish stocks must be maintained in salmon-producing rivers and streams.

The effective date of flows to support salmon habitat and fish production has been characterized in court cases as "time immemorial," making this the most senior of water rights in the state.

Jamestown Tribal Photo Archives

S'Klallam ancestors on the Dungeness River in 1919.

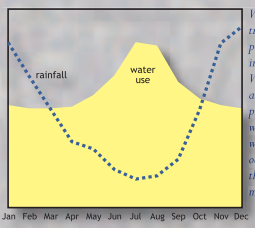
There are 29 recognized tribes in Washington state. The Lower Elwha Klallam, Jamestown S'Klallam and Port Gamble S'Klallam tribes have interests in the Dungeness watershed.

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Surface and Ground Water Hydrology in the Dungeness Basin

DRY SUMMERS AND THIRSTY HABITS

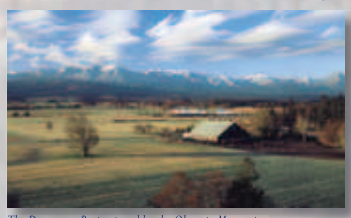
Most of our precipitation (snow and rain) occurs between October and March. This means rivers and streams in our watershed have naturally low summer flows because in the summer they are then dependent on groundwater rather than precipitation and runoff.



Water demand trends and precipitation in Western Washington are inversely proportional, with the highest water use occurring during the driest summer months.

People use water for irrigation in the summer months, in addition to activities like lawn watering and cooling off under the sprinkler. Most of this water is withdrawn from the ground, at a time when streams are most dependent on groundwater to keep flowing.

SNOW + RAIN + GROUNDWATER = STREAM FLOW



The Dungeness Basin ringed by the Olympic Mountains.

The lofty Olympic Mountains provide a key source of water for the Dungeness Basin in the form of melting snow.

The flows of some rivers and streams in the Dungeness Basin (Dungeness, Siebert and McDonald) are heavily influenced by snowmelt because their sources are at high elevations in the Olympic Mountains. These systems have high flows during winter rains and storms and in the spring when the snow melts. Their flows are naturally low in the summer.

By contrast, the flows of smaller lowland streams are primarily fed by groundwater and rain. But the two stream types have something very important in common: in both, summer flows are dependent on groundwater.

HOW GROUNDWATER WORKS

Understanding the relationship between groundwater and surface water is an important part of understanding the water picture in the Dungeness Basin. Groundwater—that is, water moving under the ground—is one of our primary sources of potable water.

Groundwater can come from several sources, such as snow melt, rainwater percolating down through the soil, leakage from ditches, or water moving into the ground from a stream or a river.

Groundwater is contained in an aquifer—underground layers of sand and gravel through which water can move relatively easily. In the dry months when stream levels drop, groundwater can move from the aquifer to surface waters. Because of this, the water we see flowing in our rivers and streams in late summer and fall is mostly from groundwater that has seeped into the streams.

Illustration by Jennifer Kingsley

This graphic depicts how a stream can receive water from a surrounding aquifer.

The rock, gravel, clay and sand layers in the Dungeness Valley are glacial deposits that vary tremendously from Sequim Bay to Bagley Creek and from the mountains and foothills to the shoreline. In some areas there might be only one thin aquifer that doesn't contain much water. In other areas there may be three or more distinct aquifer layers.

WHERE DOES YOUR WATER COME FROM?

Nearly all residents in the Dungeness Basin get their water from groundwater. The irrigation districts and companies take their water directly from the Dungeness River.

Rural residences may have their own individual wells or may be served by small community water system wells. Some residences in Carlsborg and nearby areas are served by the Clallam County Public Utility District (PUD), which pumps its water from a single 177-foot-deep well. Residences in Sequim are hooked up to a city water system that gets most of its supply from several large wells.

So while city and PUD customers don't depend on small, individual wells, they still depend on the availability of groundwater within the Dungeness Basin.

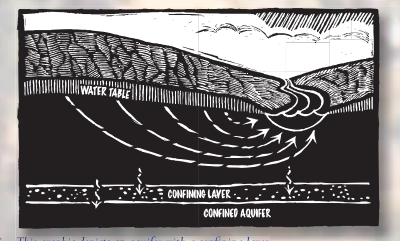
Map of the Class A public water systems within the Dungeness Basin.

PUMPING GROUNDWATER AFFECTS SURFACE WATER

The fact that water can easily flow through sand and gravel is what allows us to pump and use groundwater. But pumping water out of the ground affects the groundwater that is available to flow to streams and rivers. Shallow aquifers are connected to surface waters.

Aquifers are also connected to each other as well. Groundwater can move from one aquifer to another, either upward or downward. Scientific studies indicate that the direction of flow in Dungeness is generally to the northeast and the Strait.

Therefore, groundwater pumping affects water movement within an aquifer and between aquifers as well as influencing what is happening in surface streams. Pumping water can either directly capture water that was headed for a stream, or it can affect surface waters indirectly by altering how water moves in the aquifer.



This graphic depicts an aquifer with a confining layer.

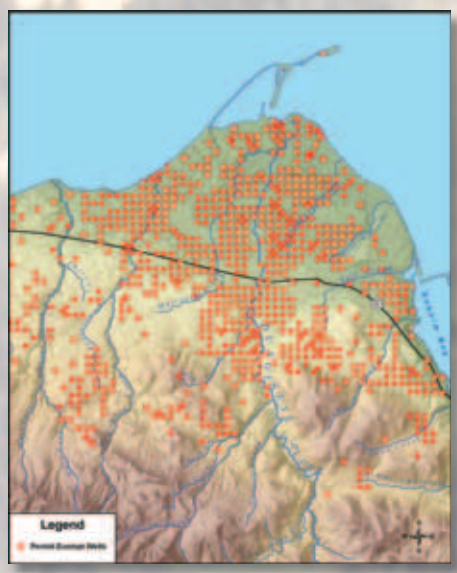
This graphic demonstrates that pumping from a confined aquifer can still affect other aquifers.

TAKING GROUNDWATER USE INTO ACCOUNT

Many people living in the Dungeness Basin obtain their water from individual wells. Small, single-owner wells are often referred to as "permit-exempt wells" because you do not have to go through the state's permit application process for a water right. Small community water systems also often use these permit-exempt wells.

If you look at the thousands of wells already in existence in the Dungeness Basin and add in the thousands expected to be drilled in the future, you can see that these wells will have significant impacts on the amount of water in our streams and aquifers. When you add these impacts to stream flows that are already low, the effects on aquatic life could be devastating.

Existing water withdrawals already leave less flow in the river than fish need, especially at critical low-flow periods in the summer and fall. The impact of groundwater use can be relatively greater for smaller streams. There, naturally low summer flows are so low that the cumulative impact of nearby shallow wells could literally mean life or death for aquatic species living in the stream.

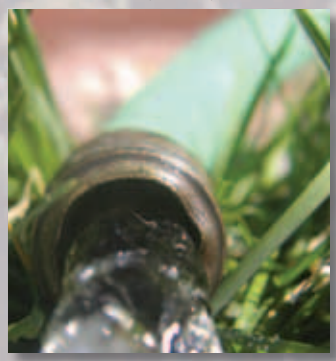


THE WHOLE, COMPLICATED PICTURE

So how much water does the average Dungeness Basin family actually use? One estimate is about 100 gallons a day per person averaged over the year. That doesn't sound like very much, but we need to consider the whole picture.

Any single water user is probably not going to have a big impact on our streams or groundwater. It is the cumulative use—the effects of many, many users taking water—that really adds up.

But it is a complicated picture. It is not just the amounts of water being used, but also how it is used that contribute to the overall effects. For example, if you limit your water use to in-house (no outdoor irrigation), are on a septic system, and are located away from streams, you would be only a small part of the cumulative effect.



By contrast, a user in a house with outdoor irrigation, using an inefficient method of applying the water, and irrigating all summer long would have a much greater effect on our water supply.

Since all of our water is connected, it will take coordinated management of our scarce resources to meet a growing demand and to maintain and restore the environment we all cherish.

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Fish Habitat Needs in the Dungeness River

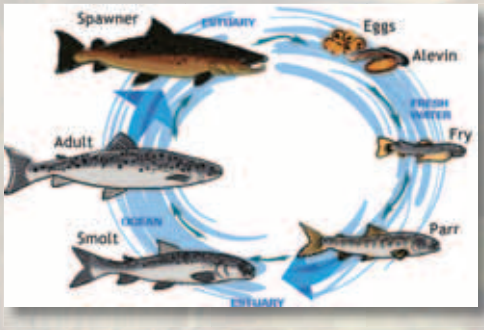
SALMON NEED FRESH WATER, TOO

Although we often think of salmon as ocean fish, most spend important parts of their lives in streams and estuaries such as the Dungeness River and Bay.

The salmon's complex life cycle can be broken into five life stages:

- Upstream migration from the ocean.
- Spawning and incubation.
- Rearing.
- Downstream migration to salt water.
- Feeding and adult growth.

Four of these life stages occur in streams and estuaries.
Only one stage—adult growth—occurs solely in the ocean.



Salmon spend about half of their lives in freshwater streams and estuaries.

A THREAT TO FISH SURVIVAL

Four species of fish that depend on the habitat of the Dungeness River have been listed as "threatened" under the federal Endangered Species Act (ESA): Chinook, steelhead, East Juan de Fuca Strait summer chum, and bull trout. Other Dungeness salmon stocks are in critical condition.

Many factors have contributed to the alarming declines of these species. One is the change in normal stream flows due to irrigation and other water withdrawals, including groundwater use. The irrigators have adopted many conservation and efficiency measures but flows can still be a problem. Although the irrigators leave at least half the flow in the river throughout the irrigation season, in August and September this is frequently less than the Chinook could use.

We must take future water management decisions seriously. The very survival of these species depends on it.

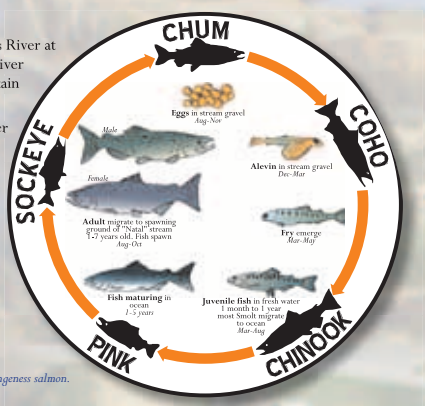
Dramatic declines in salmon populations.

FISH AND FLOWS

Various species of fish use different sections of the Dungeness River at different times of year. This is because flows vary within the river and throughout the year, and fish species have adapted to certain ranges of flows at different parts of their life cycle.

For example, adult Chinook salmon usually return to the river in the summer when flows are dropping. They need enough water in the channel to migrate upstream through a series of gravel bars and pools to their spawning grounds. If flows are too low, Chinook may be forced to lay their eggs in the center of the channel, where they are vulnerable to being scoured out by floods.

Juvenile salmon need cool side channels and pools for feeding and hiding from predators. Low flows can reduce the depth of pools and may result in higher water temperatures that limit fish survival. During high flows, juvenile salmon need the protection and slower waters of side channels.



Life cycle of Dungeness salmon.

ONE TOOL: A WATER RIGHT FOR FISH

An instream flow and water management rule is, in essence, a water right for fish and other aquatic species.

Protecting stream flows by setting flow levels in a rule is one important tool for protecting salmon habitat and aiding in its restoration. Salmon need healthy streams, estuaries and oceans to survive and thrive.

Sufficient stream flows are also a key component of stream and estuary health. Flows help distribute gravel and woody debris in streams, and help form natural, sinuous curves.

The Dungeness River in September with low flows.

Courtesy of US Forest Service

Hiking on the Tubal Cain Trail in the Buckhorn Wilderness high above the Dungeness River.

WHAT'S GOOD FOR FISH IS GOOD FOR PEOPLE

Healthy streams and estuaries provide many valued functions for humans, too. Riparian zones and wetlands can help reduce flooding and lessen the damage to homes and structures. Rivers and estuaries produce fish and shellfish that are a valuable part of our food supply, and provide opportunities for recreation and aesthetic enjoyment.

When it comes to natural, functioning streams, what's good for fish is also good for people.

WHO SETS THE INSTREAM FLOWS?

A lot of investigation, science and thought have gone into determining the amount of water needed for fish in the Dungeness River. Biologists from a number of local, state and federal agencies and the Jamestown S'Klallam Tribe have conducted field studies and computer modeling to analyze key characteristics of the river. Their results show how different amounts of water in the Dungeness River affect the quantities of habitat available for fish.

Recommendations based on fish needs were used by the Elwha-Dungeness Planning Unit to develop recommendations for instream flow levels.

An instream flow and water management rule does not require these levels of flow to be in the river, but it does protect them when future water right decisions are made. Once adopted, the rule affects only water right decisions made afterward. It has no effect on senior (existing) water rights.

A field biologist performs field studies.

BEGINNINGS OF SUCCESS

Many people have been working hard to aid the recovery of salmon in the Dungeness River.

- Restoration projects have been constructed.
- Conservation programs have been initiated.
- Property has been purchased to give the river the room it needs to handle high flows.

Much has been accomplished and much future work is planned, yet salmon and other aquatic species still face many challenges in the future. Increasing human population, growing demands for water and predicted reductions in snow pack will continue to threaten their survival.

Photo courtesy of Ryan Bell

Installation of a log jam adds fish habitat to the Dungeness River.

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Options for the Future and Some Successful Starts

THEY'RE NOT MAKING ANY MORE WATER

All the fresh water in the world is moving in a closed-loop system. Except for the very expensive exception of turning seawater into drinking water, we can't make more fresh water—we can only take good care of what water we have.

As the number of people in the Dungeness Basin continues to grow, demand for water will also grow.

What are our options for future water supply, and what are our successful strategies at making it last?

CONSERVATION: MAKING THE BEST USE OF THE WATER WE HAVE

With the recent severe droughts in other parts of the country, it should come as no surprise to hear that we all need to conserve water. This means making changes in how we build our homes, operate our businesses and tend our gardens right here in the Dungeness Basin.

Individuals, government agencies and water suppliers all have roles to play in conservation:

- Clallam County PUD has adopted a tiered pricing system which encourages people to use less water in the summer.
- The City of Sequim, Clallam County and others regularly share public education materials with water-saving tips and techniques.

Landscaping with drought-tolerant plants.

- Building codes continue to evolve, requiring low-flow showers and toilets and other efficiency measures that reduce household water use.
- Clallam Conservation District conducts natural landscaping workshops throughout the year to help homeowners reduce lawn areas and landscape with low-water-demand plants.
- Many homeowners here in the Basin have planted gardens which can survive well on little water during the summer.

We all need to support each other in our conservation efforts so we can make the water supply we have last longer.

PARTNERSHIPS: WORKING TOGETHER FOR THE LONG TERM

Undoubtedly the biggest users of water in the Dungeness Basin are the commercial irrigators. That is why their efforts to conserve and act as partners are so important. The irrigation community has fully participated in reducing their impact on the river to leave more flows for fish.

Irrigation diversions from the Dungeness River from mid-April to mid-September have been reduced from an average of over 100 cubic feet per second (cfs) in the early 1990s to recent average withdrawals of 55 to 60 cfs. This is due largely to the lining of irrigation ditches and improvements in farm irrigation efficiency.

Keeping a healthy agricultural economy in the Dungeness Basin is an important community value and consequently we all must work to support the farmers' conservation work. One way to do this is to use less water—especially on our lawns and gardens—in late summer and fall, so we don't compete with farmers and fish at the low-flow times of year.

Pipe being installed to replace an open irrigation ditch.

RE-USE: IT MAKES SENSE

To help ease demands on local rivers and groundwater, the City of Sequim has built an award-winning facility to treat and re-use water from its sewage treatment plant. This water has many potential uses, including improving stream flows, recharging groundwater and providing irrigation.

The City aims to achieve 100% re-use of its treated water. Initially the reclaimed water was used for various City operations. In 1999, the City built the Re-use Demonstration Site next to Carrie Blake Park. Reclaimed water is now used there for irrigation of fields and gardens.

The demonstration site is one of the first of its kind. Ongoing data collection will help assess how the aquifer responds to irrigation. The City also adds to streamflow in Bell Creek with reclaimed water.

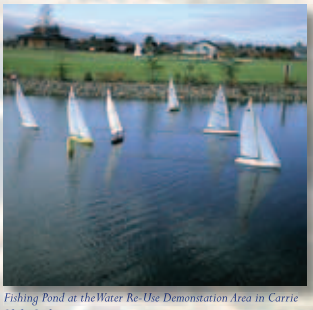


Photo courtesy of City of Sequim Public Works

Fishing Pond at the Water Re-Use Demonstration Area in Carrie Blake Park.

Glacier in the Olympic Mountains.

BE AWARE: PAY ATTENTION TO CLIMATE CHANGE

Much research is underway locally and world-wide to assess potential effects of climate change. Should predictions turn out to be accurate, the snow pack normally feeding the Dungeness River and aquifers will be much reduced—even gone—in the not-very-distant future. Effects on water supplies and all life depending on water could be very serious indeed.

Given the uncertainty around global warming effects, scientists are urging more conservative decision-making in watershed management.

BAND TOGETHER: ENCOURAGE PUBLIC WATER SYSTEMS

The Elwha-Dungeness Watershed Management Plan recommends that new developments get water from existing water systems whenever they can.

Using water from a larger system that serves many people can have several advantages over drilling a single residence well, including:

- Increased reliability of supply.
- Regular monitoring of water quality.
- Reduced numbers of holes in the ground that are pathways for pollution to enter the groundwater.
- Better ability to manage the water.

Some people may resent losing the option of drilling their own well, but if we are to wisely manage the remaining water in the Dungeness Basin, we need to employ the most efficient and effective management systems.

A public water system can provide important things like water for fire protection.

LEARN MORE: A CONTINUAL EDUCATION PROCESS

The Dungeness Basin is renowned for having one of the state's most cooperative, effective and integrated watershed management teams. As we work together to manage the basin's water, we will continue to learn how the watershed works.

Right now, a $1.6 million grant from NASA is being put to use by scientists at the Pacific Northwest National Laboratory in Sequim. They are working with NASA to learn how to use satellite data to forecast snowmelt and flooding in the Olympic Mountains and its effects on the flow of the Dungeness River. This data will help predict stream flow levels, and will be crucial if snow packs shrink.

We need to know all we can to ensure there is enough water for people, farms, and fish to co-exist in the Dungeness Basin.

NASA, satellite image

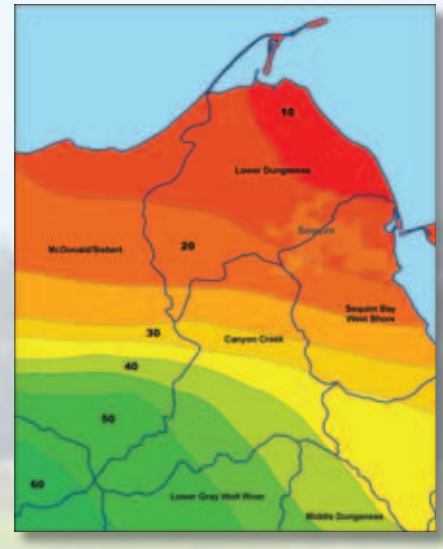
WASHINGTON STATE DEPARTMENT OF ECOLOGY

Water Supply in the Dungeness Basin

IT'S NOT AS WET AS YOU MIGHT THINK

Did you know that some parts of our watershed receive about the same amount of rain as the Arizona desert? It's true. While the annual precipitation in the mountains of the Dungeness Basin averages 80 inches per year, Sequim receives 16 inches per year—only four inches more than Tucson.

This lack of rain in the most populous part of our watershed results from its position at the base of the Olympic Mountains and its relation to the prevailing weather patterns. The phenomenon is known as "the rainshadow effect."



This figure shows the variation in the amount of rainfall in the Dungeness Basin, ranging from 10 inches annually (red) to 60 inches (dark green.) Note the dramatic change in precipitation over very short distances.

SUMMERTIME SCARCITY

To understand the natural water supply in the Dungeness Basin, we must recognize that precipitation and stream flows vary greatly throughout the year. This leads to seasonal scarcity.

Melting snow in the mountains feeds streams and rivers in spring and early summer, but by late summer the snow is gone and stream flows are reduced. These flows are almost entirely fed by groundwater, which is a less understood source of supply.

Summertime demand for water from all users at once—people, farms, and fish—strains the system at the very time water is naturally most limited.

FARMING: JUST ADD WATER

Engineering has allowed agriculture to flourish in the sunny Dungeness Valley for more than a century.

Irrigation ditches brought water from the river to the fields, and as far back as 1924, more water rights were legally appropriated than there was flow in the river for many times of the year.

In the past the valley has supported dairies, livestock, and crops. Today, the fruits and vegetables that we all enjoy eating fresh from the field are becoming well known around Puget Sound. Some farmers have switched to crops that are less water-intensive, including lavender and plants grown for seed.

Intensive management of the Dungeness Valley for agriculture has profoundly changed the landscape. But now farming's influence is declining and fields are sprouting housing developments instead.

Photo courtesy of the Port Townsend Farmers Market, by Matt Brady

Produce cart with fresh food grown in the Dungeness Basin.

OUR TURN TO SUPPORT THE FARMERS

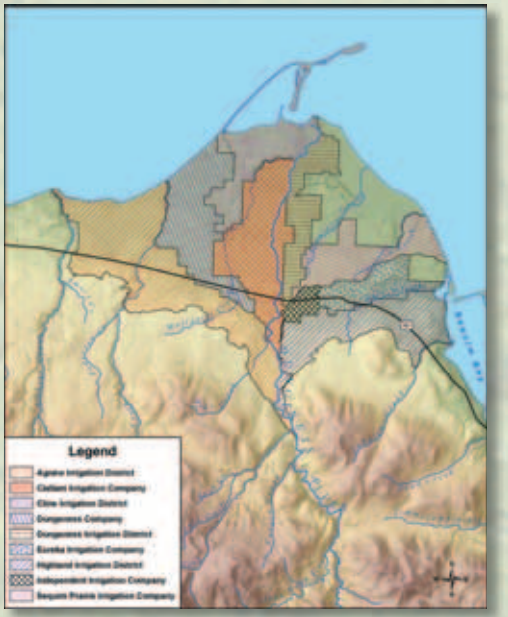
Water decisions made more than a hundred years ago have left a legacy that affects our landscape and water supply today.

Presently, irrigation districts and companies hold much of the basin's water rights and play a major role in watershed planning, resource protection, and salmon recovery.

Until recently, irrigation ditches brought water from the Dungeness River to the fields. To reduce the amount of water seeping from ditches into the ground on its way to the farmers' fields, ditches have been converted to pipe systems and irrigation districts and companies have worked to implement other conservation strategies for the benefit of all water users.

The farmers of the Dungeness Valley continue to do their part to use water wisely. Now it's our turn to support them by being wise water consumers ourselves.

Dungeness basin irrigation districts.



WATER AVAILABILITY WILL INFLUENCE HOW WE USE WATER IN THE FUTURE

Many people have chosen to live in this land of sunny skies, and many more are predicted to come in the next decades.

People need water to live and demand a clean, constant supply. Farmers need water to irrigate their crops and make a living. Fish and other aquatic species need water to make their homes in our streams and rivers…or else they will vanish.

Limited water supplies are a serious concern in how we plan for future growth. But with careful management, we can make water available for people and help fish and other aquatic species at the same time.

Photo courtesy of Jefferson County Public Works

A drill rig used to drill wells for single-family homes.

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