



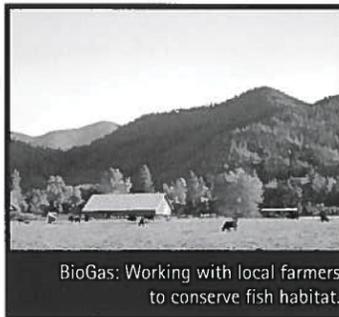
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Tulalip – Quil Ceda Messenger  
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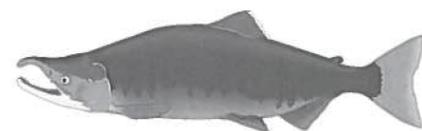
BioGas: Working with local farmers to conserve fish habitat.

After finalizing the agreement, representatives of the Tulalip Tribes and local dairy farmers traveled together to Chino, California to tour a 1 Megawatt BioGas facility. The facility was

developed recently to address waste management issues at a dairy preserve adjacent to the growing suburbs of Los Angeles and Riverside, California.

With the formal agreement solidified, the Tulalips and Snohomish County dairy farmers are creatively combining talents to solve problems today.

**BioGas:**  
A collaborative effort to convert dairy waste into energy and... restore critical salmon habitat.



“The goal is to create a functional stream and wetland system that meanders throughout the reservation as would a natural stream.”

– Kurt Nelson  
Fish and Wildlife Resources  
Scientist for the Tulalip Tribes

### Ecological Restoration – Moving to the Future

The Tulalip Storage Depot and Military Reservation may not sound familiar to those living in or around the Tulalip-Marysville area these days, but for those who were in the area in the 40's, 50's and 60's it is a picture of the past.

**The Past.** Lack of economic opportunity and self-sufficiency forced the hand of tribal members back in the 1940's, and members sold their property to the U.S. Department of Defense (DOD) to create a military storage and testing ground. Known on US Geological Service maps as the Tulalip Storage Depot and Military Reservation, the US Government purchased about 1500 acres. The remnants of the military depot are a grid-like pattern of roads and half-buried storage bunkers, or "igloos".

The 40's and 50's saw ammunition testing, ammunition storage and other classified work by the DOD in the area. Around 1959 the Tribe bought the property from the DOD and leased it to the Boeing Company. Boeing used the area as a testing facility until 2001. Much of the activity by the DOD and Boeing created pollution issues that are, to this day, being addressed by DOD and Boeing. Remediation work is complete on the soils contamination, while shallow ground water table pollution is the main remaining problem.



Man-made streams like these on the old DOD testing grounds will be cleaned and restored to revitalize local fish populations.

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### Tulalips' Wastewater Treatment Facility Goes On Line!

In May of this year, the Tulalips' revolutionary wastewater system went on line. The first stage of the plant will serve Quil Ceda Village and is slated to treat 850,000 gallons per day.

The system treats wastewater through membrane bioreactors (MBR). A MBR plant operates

much like a conventional tertiary treatment plant with addition of secondary clarification and final filtration. Screened wastewater is mixed with activated sludge for biological removal of contaminants followed by the mechanical removal of solids



The new wastewater facility.

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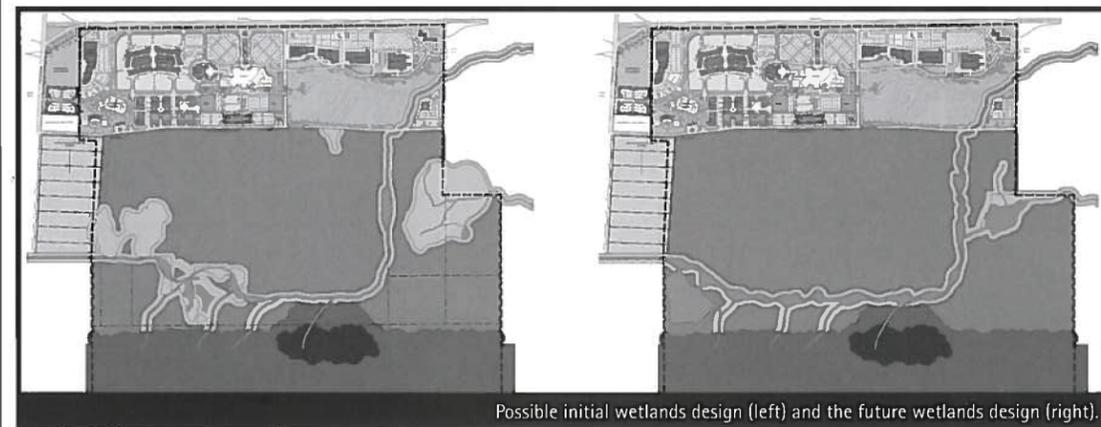
**Ecological Restoration – continued**

**The Damage.** Outside of the contamination issues, the physical changes to the landscape dramatically affected the ecosystem. The military covered the area with a grid-like pattern of roads, ditches and storage igloos. The singular objective of the road and culvert system was to drain the area of water – and the military did a good job. “Back in the 1940’s and 1950’s, the military did not prioritize salmon habitat at all,” said Kurt Nelson, Fish and



An old DOD “igloo”.

Wildlife Resources Scientist for the Tulip Tribes. “It was just not much of a thought back then – maintaining salmon access or spawning grounds,” he said.



Possible initial wetlands design (left) and the future wetlands design (right).

**The Restoration.** The goal is to enhance and restore streams and wetlands to as close as possible to their natural condition before the modification by the

DOD. “It will never be in its natural state, as far as completely



An aerial photo of the DOD storage depot in 1947.

reversing the environmental effects of the military depot,” explained Nelson. “The area was so highly modified.”

The Tribes are taking the current man-made, grid-like water drainage structure and transforming it into a quasi-natural stream. “The goal is to create a functional wetland and stream system that meanders throughout the reservation as would a natural stream,” said Nelson. “Ironically, we too are creating a man-made wetland system; although, the focus of our system of streams and wetlands is

on increasing the salmon habitat and raising the classification of the wetlands,” Nelson went on to say.

Currently, many wetlands

within the old military depot are a lower class of wetlands, which means it is not ecologically diverse. The restoration efforts, will include wetland creation and enhancement (e.g. removing reed canary grass and planting wetland plants that are not currently present), which will increase the ecological diversity within the military depot.

“We will be removing roads and ditches, linking several small existing springs and isolated wetlands into a diverse interconnected stream and wetland system,” explained Nelson. The first steps were taken in the fall of 2002 with the removal of 13 culverts. “It’s not pretty and it’s not difficult; we used an excavator to pull out culverts and added gravel to stabilize the stream beds. But, it is an essential first step in meeting our goal,” explained Daryl Williams, Environmental

Liaison for the Tulip Tribes. The Tribe will continue to modify the ditches and culverts over the next five years. After that, the larger enhancement plans will

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**Wastewater – continued**

via the membranes. The MBR system is smaller and cleaner as compared to a traditional wastewater system, and unlike traditional systems it is expandable and portable.



Treatment plant under construction.

The Tulips’ system will treat the water to drinking water standards; however, the water will be injected back into the soil. In the future, the water will be used to irrigate lawns and for non-potable uses (e.g., fountains, toilets) in Quil Ceda Village.

**Ecological Restoration – continued**

depend on the Tribes’ decisions concerning the development of Quil Ceda Village.

The current ditch and culvert system, surprisingly, provided access for a few spawning salmon – coho and chum, and cut throat trout. Yet, the access and available habitat are minimal, and the returns are minimal. “In 2001 we began to collect some baseline information; several hundred chum spawned within the ditch system that year. However, because of poor spawning conditions the chum were not very successful. Last fall we observed only 6 redds (a gravel nest made by the female salmon) in the ditch system and we are currently evaluating the

**Tulip Tribes Finalize BioGas Agreement**

The Tulip Tribes, Lower Skykomish River Habitat Conservation Group, Northwest Chinook Recovery, and Washington State Dairy Federation finalized their agreement creating the Snohomish Basin BioGas Partnership, a collaborative effort to convert dairy waste into energy and to conserve and restore critical salmon habitat.

For over a year the group has been working together to find cooperative solutions to restore salmon runs and preserve the agricultural heritage of the region. These talks resulted in addressing two complementary efforts:

the first entails the development of a BioGas facility to convert waste from the area’s dairy cattle



BioGas: Converting waste into energy.

into green energy and marketable compost; the second initiative has tribes and area farmers working together to identify important salmon spawning and off-channel habitat, and protect the habitat through acquisition and restoration efforts.

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success of that spawning activity,” explained Nelson. “We strongly believe that with enhancement, the stream and wetland system could be highly productive for salmon and provide highly diverse habitat for other wildlife species. With this early baseline information we will be able to measure the improvement to the returning salmon runs,” he said.

**The Balancing Act.** “Our environmental team is doing a great job with the restoration of this area of the business park,” stated Herman Williams, Jr., Tribal Chair. “The challenges we face are balancing the restoration of the stream and wetlands system, and the development of Quil Ceda Businesses Park.” Meeting

the environmental needs and economic development needs are neither mutually exclusive, nor incompatible issues.

“There are some initial development designs that the Tribe is mulling over,” explained Williams. “As we learn more about the required environmental enhancements and our development plans, we will find a balance that will allow the Tribe to restore the ecological system that essentially has been nonexistent for over 60 years, while at the same time solidifying the Tribes’ future through diversified investments,” he said.

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