NRCS Natural Resources Conservation Service
Washington

CONSERVATION Showcase

Saving more than water:
Upgraded irrigation system provides additional flow for salmon habitat

Living in the shadow of the Olympic Mountains, Sequim Prairie farmers receive roughly 11 inches of rain annually and depend upon the Dungeness River for their irrigation needs.

In 2005, Washington suffered through drought conditions brought on from lack of winter snows, causing many rivers to have minimal summer stream flows.

The concern for water flow in the Dungeness River – and conservation – motivated the Sequim Prairie Tri Irrigation Association (SPTIA) to upgrade their irrigation system from an open ditch method of delivering water to a modern, high pressure pipeline system.

Keeping the perfect amount of water in reservoir is the job of three inlet valves which operate with a float system demonstrated by Gary Smith, Sequim Prairie Tri Irrigation Association member.

"Keeping more water in the Dungeness River was our objective in switching to a pipeline system," says Gary Smith, Sequim Prairie Tri Irrigation Association member. "The drought situation did not meet minimum flow requirement for salmon habitat in the river," he says.

The Sequim Prairie Tri Irrigation Association Reservoir Project consists of 11 landowners, including both commercial agricultural producers and residential owners, with more than 670 acres to irrigate.

"Landowners were tired of watching good water being wasted with an open-ditch irrigation system," says Mr. Smith. "It required constant maintenance, high-labor, and allowed far too much wasted water, with high energy costs running the pumps," he says.

To upgrade the irrigation system SPTIA needed technical and financial assistance from local conservation partners.

"This water conservation project was funded by Washington State Salmon Recovery Funding Board, Washington State Irrigation Efficiencies Funds, and the Clallam Conservation District," says Mr. Smith. "The USDA-Natural Resources Conservation Service (NRCS) provided the engineering design."

All the water needs for the Sequim Prairie Tri Irrigation Association begins at this inlet structure where Leigh Nelson, NRCS Irrigation Engineer, and Gary Smith, calculate the flow of water entering the first stage of the irrigation system.

"This is a complicated project. Fortunately, we have the expertise to handle the design," says Leigh Nelson, NRCS Washington State Irrigation Engineer. "We were able to provide the engineering design through our Conservation Technical Assistance (CTA) program," he says.

According to Nelson, CTA is a voluntary program that provides technical assistance supported by science-based technology to help people conserve, maintain, and improve their natural resources. "NRCS provides CTA assistance to landowners, communities, conservation districts, and tribes," he says.

The old irrigation system consisted of approximately 18,000 feet of open ditches with 11 pumps to convey water across the project area.

"The problem with an open ditch irrigation system is evaporation, seepage, and maintenance," says Nelson. "The pumping plants used by the individual landowners require extra water to ensure adequate supply to the pumps," he says.

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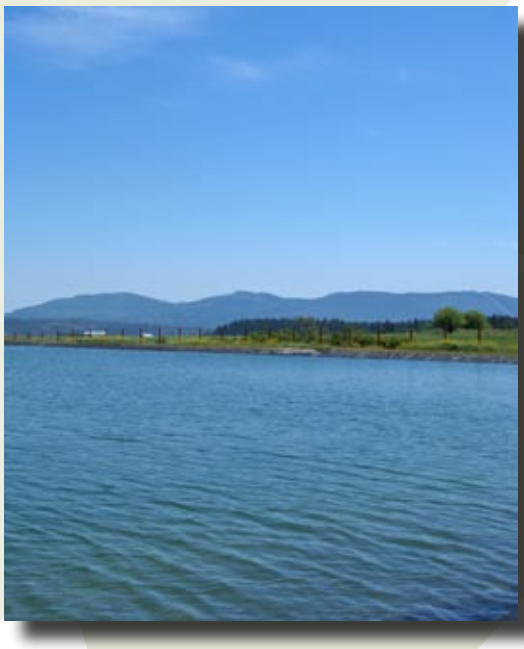
Gary Smith
Sequim Prairie Tri Irrigation Association Member

"Modern irrigation equipment will provide more water to the land efficiently with very low maintenance costs, especially compared to controlling the open-ditch system," says Mr. Smith. "Cleaning debris out of five miles of ditches is a hassle," he says.



Above, the water reservoir, the second stage of the irrigation system, which can hold 4.1 million gallons of water.

The high-pressure irrigation design works in three stages to ensure the most efficient and effective system. First, water is diverted from the Dungeness River and enters an existing 3-mile long supply ditch where an inlet was available for the reservoir project. Water then flows into the storage reservoir. In the final stage, a pumping plant located below the reservoir, pressurizes the system and supplies water to the landowners.

According to Nelson, the reservoir makes better use of the water by minimizing tail water loss and allowing for variations in pumping by the landowners. "The system is designed for all users to operate at one time with constant pressure, without continually adjusting flows diverted from the river," he says.

"The reservoir can hold 4.1 million gallons of water which is enough water to fill 137,000 standard size bathtubs," says Mr. Smith. "An 18 inch pipe from reservoir to pumping plant can handle 7.8 cfs (cubic feet per second) or 3,500 gallons a minute," he says.

"The pumps were designed to maintain a set pressure in the system by varying the speed of the motors," says Nelson. "The flows will vary based on cropping, climate, precipitation, and management practices," he says.

"Twenty-thousand feet of pipe connect to the pumping house," says Mr. Smith, "to irrigate our crops: alfalfa, grass, hay, barley, cauliflower and red beets for seed, lavender, and raspberries."

To handle overflows from the water inlet structure, an outlet was incorporated into

Above, using a self propelled reel irrigation system, the Rainstar E41 helps Mr. Smith apply the right amount of water to his crops.

Any excess water from the irrigation system flows down to an adjacent wetland and then out to Sequim Bay.

the design allowing excess water to run into an adjacent wetland then flow into Sequim Bay.

"A high density, 18-inch pipe handles overflow to the wetland," says Nelson. "To limit the disturbance to the surrounding environment, the pipe was laid on the surface," he says.

Flow meter stations at the head of the irrigation/overflow site and at the reservoir monitor water levels while a computer keeps logs of both readings (cfs of water and height at reservoir).

The true test of the pressurized system will come during the peak of irrigation season, July and August. The season begins April 15 and runs 154 days until September 15.

"In the first month the irrigation system has been on-line, we have saved half of the water we would have used in previous years," says Mr. Smith.

Conserving water in the Dungeness River for salmon habitat was SPTIA's major focus in upgrading the irrigation system with the added bonus of using water more efficiently and effectively saving them time and money.

"Everything is working well and is still under warranty," says Mr. Smith. "It is a great design." A design made possible through NRCS' conservation technical assistance.

Kelly Sprute, NRCS Washington
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Gary Smith
Sequim Prairie Tri Irrigation Association Member