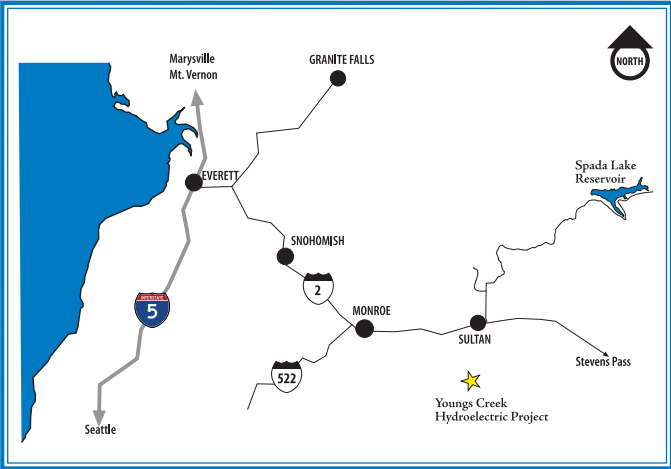


BENEFITS OF HYDRO POWER AT YOUNGS CREEK

- Located outside sensitive wilderness areas
- Sited above a natural barrier to prevent impact on migrating fish
- Close to existing transmission lines and roadways
- Negligible impact on flow rates, river temperatures and oxygen levels
- Non-polluting resource with no heat or noxious gas releases
- A proven technology, competitive in price to other green resources
- Complements intermittent energy sources, such as wind and solar
- Has a long life-span
- Generates enough clean energy for about 1,500 homes per year on average

FOR MORE INFORMATION

Visit our website at www.snopud.com, click on *Power Supply*, then *Hydroelectric* to find Youngs Creek information.



PO Box 1107 • Everett, WA 98206-1107

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YOUNGS CREEK HYDROELECTRIC PROJECT INFORMATION



BACKGROUND

The Youngs Creek Hydro Project is a run-of-the-river hydroelectric facility with an installed capacity of 7.5 megawatts (MW). The project was originally licensed with the Federal Energy Regulatory Commission (FERC) by Snoqualmie River Hydro in May 1992; however, due to a lack of progress on construction, FERC was preparing to terminate the license in the late 2000s. In 2008, the PUD acquired the project assets and license and immediately began engineering and permitting activities for construction.

LOCATION

The project is located approximately 4.5 miles south of Sultan, Washington, on the west slope of the Cascade Mountain Range in the Skykomish River Basin. It is sited on approximately 25.3 acres on Youngs Creek, a tributary to Elwell Creek, which is a tributary to the Skykomish River. Project features begin 1.4 miles upstream of a permanent natural barrier to anadromous fish migration (15-foot waterfall) at river mile 1.0 on Youngs Creek. Nearly the entire drainage has been logged at least once within the last 75 years, leaving timber stands of various ages and plant species associations.

GENERATION

The PUD began construction of the project in February 2010 and completed it in October 2011. The project began operating in November 2011. On average, the project was projected to produce 20,000 megawatt-hours annually, enough for 1,500 homes. During the first year of operation (November 2011 to October 2012), the project exceeded expected generation.

ACCOLADES

This is the first run-of-the-river project (not using existing facilities) to be constructed in Washington state in nearly 20 years, and the first to be built in Snohomish County in the last 30 years. Additionally, on July 1, 2012, the State of California recognized the project as “Certified Eligible for California’s Renewables Portfolio Standard” based on meeting strict low-impact criteria for a hydroelectric facility.

The Youngs Creek Hydro Project won two awards:

- Renewable Energy World – 2012 Hydro Project of the Year Award and
- American Society of Civil Engineers – 2012 Honor Award.

MITIGATION, PROTECTION AND ENHANCEMENT MEASURES

Multiple management plans are in place to monitor and manage the fishery, terrestrial, and water resources of the Project area.



The PUD placed 5.3 acres of land near the intake site into permanent Critical Area Protection Area (previously called Native Growth Protection Area) status. The land is adjacent to the creek’s riparian zone. By protecting these 5.3 acres from harvesting, the trees will be allowed to grow into mature forest characteristics and provide long-term habitat benefits for wildlife. Additional wildlife

habitat management on the other project lands includes:

- reseeding the penstock right-of-way with shallow-rooted shrubs, grasses and forbs to allow visual inspection of the pipeline, prevent soil erosion, and provide foraging habitat for wildlife that use the area (such as black-tailed deer);
- installing bird boxes and snags to provide nesting habitat;
- installing poles to provide perch habitat for birds of prey;
- managing (remove/control) noxious weeds;
- restricting activities during the key nesting season to protect bald eagles; and
- using avian protection devices on transmission lines to reduce harm to birds.

Although migrating salmon are not present in Youngs Creek, the project is still operated to protect resident fish and their habitat within the creek. It is outfitted with screens to prevent fish from entering the facility, a bypass system to move fish downstream of the weir, and flow continuation devices to prevent sudden flow fluctuations in the creek during start-up and shut-down operations. The PUD also follows seasonal instream flow and ramping schedules to further protect fish and water quality. Fish biologists conduct fish population surveys in the summer to monitor the health of the system.

YOUNGS CREEK HYDRO

renewable • reliable • environmentally responsible
SNOHOMISH COUNTY PUD

POWERHOUSE

The powerhouse is located at river mile 2.4, upstream of a complete natural barrier to anadromous fish migration that is located at river mile 1.0. The powerhouse is an approximately 46-foot by 48-foot concrete structure, set back from the ordinary high water mark of the river by about 40 feet. The powerhouse contains a Pelton turbine with an installed capacity of 7.5 MW. An outdoor switchyard is located next to the powerhouse and houses the main power transformer and other electrical equipment.



TAILRACE

After traveling through the power facility, water is returned to Youngs Creek via the powerhouse tailrace – a 12-foot-wide channel.



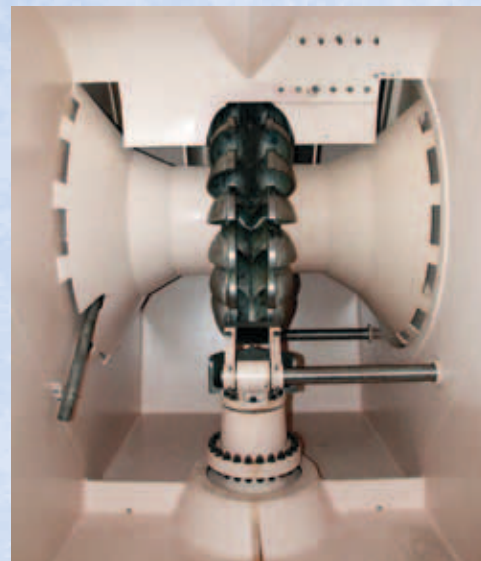
TRANSMISSION

The new 12.5 kV transmission line follows the access and existing roads for approximately 8 miles to the PUD substation in Sultan. About 4 miles of the transmission line is buried along the existing roads; the other half is overhead on existing or new poles that also hold distribution lines.



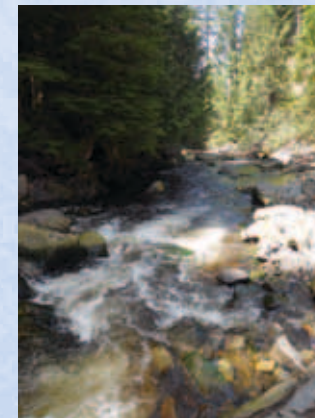
PENSTOCK

The penstock (the pipeline that conveys water to the powerhouse) runs alongside Youngs Creek and no crossing of the creek occurs. This steel pipeline is 14,300 feet long with an initial diameter of 51 inches transitioning to 48 inches, routed down existing roads that have been cleared of trees since 1994. It was buried underground as to not impact wildlife migration in the area.



BYPASS REACH

While a portion of the water is diverted into the intake for power generation, water is also left in the creek to provide habitat and maintain water quality for the fish and aquatic resources.



DIVERSION WEIR & INTAKE

The diversion weir is a 12-foot-high, 65-foot-long structure that diverts a portion of the water from Youngs Creek to the intake of the powerhouse. The water intake structure screens fish and debris from entering the penstock. It consists of a concrete structure with self-cleaning trash racks, fish screens, and closure gate – all built to Washington Department of Fish and Wildlife fish protection standards. The diversion weir and intake structure are located at river mile 5.0. The total pool behind the weir is approximately 0.21 acres.

