

Willow Creek Water Consortium

Progress report: 2010 – April 2011



The Willow Creek Water Consortium began with informal contacts and expressions of interest in the idea of a long-term research project to try to better understand the hydrologic nature of the Willow Creek watershed. The small stream of Willow Creek is the principal drainage for a large southern segment of Alaska's Copper River Basin, a region with low annual precipitation and a cold-sensitive surface water supply. Willow Creek is a headwater stream, flowing through a watershed of discontinuous and variable permafrost. The lower portions of the creek lose water during late winter and dry summers, and some area ponds have been decreasing in size in recent years. Many residents are unable to find reliable groundwater resources when attempting to drill wells. With its seasonally-interrupted, weather-dependent flow, Willow Creek a likely indicator of future climatologic and hydrologic trends. The Willow Creek Research Project is a grass-roots effort to identify conditions that are important to the volume and quality of creek water; to understand how surface water relates to groundwater; to determine ways in which Willow Creek water is important to humans, wildlife, fish, and forests of the region; and to ensure that the benefits of that water extend into the future.



Barry Hecht, senior principal hydrologist with Balance Hydrologics, demonstrates the use of a pygmy flow meter in the water of Willow Creek.

The mission of the Willow Creek Water Consortium:

"To determine the factors affecting the quality and the quantity of water in the Willow Creek watershed and to ensure the benefits of that water for the future."

With the aid of a professional hydrologist, a plan took shape to work with community members and interested agencies to collect data relating to water flow, water quality, ground-to-surface water relationships, and biological parameters. Involvement of local youth was seen, from the start, as a high priority. Extension of data collection and analysis over a number of years was also seen as essential, in order to get a better picture of the overall state of the Willow Creek watershed and perhaps to identify long-term hydrologic trends.

Local participation has been sought through informal conversations with local citizens and agencies, and through brief discussions and presentations with groups such as the Kenny Lake Soil and Water Conservation District, the Kenny Lake Community League, the Copper Basin Land and Resource Managers roundtable, and the Copper River Strategy Group. There are currently over 60 groups and individuals who have asked to be included on the Willow Creek Water Consortium contact list.

The first year's progress was primarily dependent on volunteer initiative. Volunteer involvement is expected to continue, but it is hoped that the scope and stability of the effort will be strengthened at some point with funding for staff and consultants. The volunteer participation of two professional hydrologists — Barry Hecht of Balance Hydrologics and Kenji Yoshikawa from the University of Alaska, Fairbanks — has added professional guidance and scientific credibility to the project.

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Recent undertakings and accomplishments include:

- a visit from Barry Hecht, senior principal hydrologist with Balance Hydrologics, Inc., of Berkeley, California, to meet with project participants and provide introductory training in use of equipment
- initial GIS mapping of the course of Willow Creek
- a flyover of the creek to survey the entire watershed, identify sources and tributaries, locate beaver dams and human development, and to photographically document conditions
- verification (by catch) of dates of adult grayling in the creek for spawning in spring of 2010
- walk in to areas around the crossing of the Trans-Alaska Pipeline corridor
- observations of the creek at different locations and seasons, to document conditions and to locate suitable sites for research stations
- several visits to the mouth of the creek for observation and photographic documentation of flow and other conditions
- recording and posting on the Internet of 4 audio interviews of recollections of past conditions of Willow Creek and the watershed
- purchase of basic research equipment for use in 2011 and beyond
- identifying interested and committed individuals to follow through with the research project
- development of budget scenarios for potential funding applications
- writing of project descriptions for grant applications and for general use
- development of a website for public information and communication: www.WillowCreekWater.org



Willow Creek begins as a series of channels just south of the Klutina River. These join into a single channel before the creek crosses the Richardson Highway. Willow Creek then continues southeasterly, passing north of Willow Lake, which drains into the creek, then meandering between the Edgerton and Old Edgerton Highways. It crosses the Edgerton Highway near Kenny Lake School, from there continuing toward the southeast through a forest of spruce, willow, balsam poplar, and aspen, finally emptying into the Tonsina River.

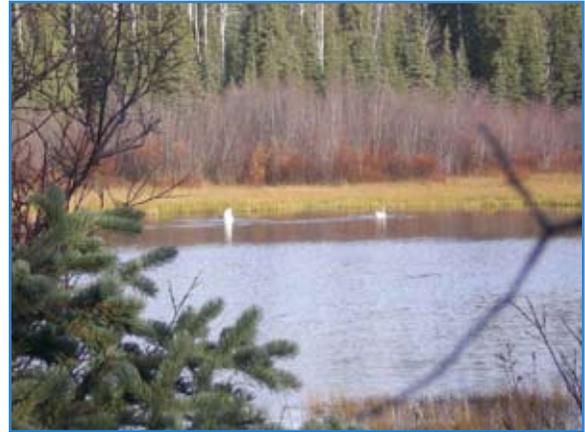
The top photo at the left shows Willow Creek channels crossing the Copper Valley Electric Association power line and the Trans-Alaska Pipeline. The multiple sources of the creek are off the photo to the left. At the upper right of the photo is the Richardson Highway. At the top left, fields of the Tonsina North Agricultural Project are visible. The darker area near the extreme upper left indicates a portion of the Klutina River gorge. The view in this photo is toward the north.



The lower photo shows Willow Creek as it crosses the Edgerton Highway. The creek approaches the highway from the left and crosses under the road through two culverts. Two beaver dams can be seen just to the left (north) of the road crossing, on property owned by Kenny Lake School. School property includes the creek on both sides of the road. The main part of the school campus is at the lower right. The direction of view in this photo is roughly east-northeast.

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Many species of fish and wildlife call Willow Creek home. At the right, two swans rest and feed on a pond near the Trans-Alaska Pipeline crossing.



At the left, a large beaver dam forms a pond, just beginning to freeze over in the fall of 2010.

Equipment purchase:

Basic research equipment was purchased for use during the 2011 summer season and beyond for this multi-year research project. The selection of equipment was based largely on the recommendations of the hydrologist who is advising the project (Barry Hecht). The equipment purchased includes:

1 water level meter, 300' • 1 case for water level meter • 1 SCT Meter, 10' cable
500 mL wide mouth Nalgene jars (12) • 3 bailers • waterproof paper, 200 sheets
2 Rite In The Rain notebooks • stopwatch • 1 plastic clipboard • 1 fiberglass measuring tape, 50'
camera with built-in GPS, compass, altimeter • 1 increment borer, 12", 3-thread for softwoods
1 current meter, USGS Pygmy • 1 headphone, 2 ear pieces with volume control
1 wading rod, top set, 4' • 3 staff plates, 0'-3' • 3 staff plates, 3'-6' • 1 staff plate, 6'-10'

Volunteer contributions:

During the past year, volunteers have contributed time and expertise to accomplish a variety of tasks, among them being: planning and design of the research project; on-foot excursions to the mouth of the creek and other portions of the creek for observation and photographic documentation; writing, review, and submission of funding requests; donation of airplane use, fuel, and pilot time for flyover of the creek; catching of adult grayling to document the spring spawning run; mapping of the creek course; recording of interviews; development of a website (www.WillowCreekWater.org); purchase of equipment; outreach to communities and organizations.

Finances:

Funding for the Willow Creek Research Project has been sought from several sources. The community of Kenny Lake provided \$4,500 from Alaska State Revenue Sharing funds. These funds have been used for the purchase of equipment and supplies. Wrangell Institute for Science and Environment was asked to contribute and is providing \$2,000 to hire 2 youth as part-time summer research assistants in 2011. A grant application for \$5,000 was submitted to the Alaska Community Foundation in September of 2010. This was unsuccessful. A pre-proposal for the amount of \$95,500 was submitted to the Alaska Fish and Wildlife Fund in March of 2011. This was also unsuccessful.

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Plans for the 2011 season include:

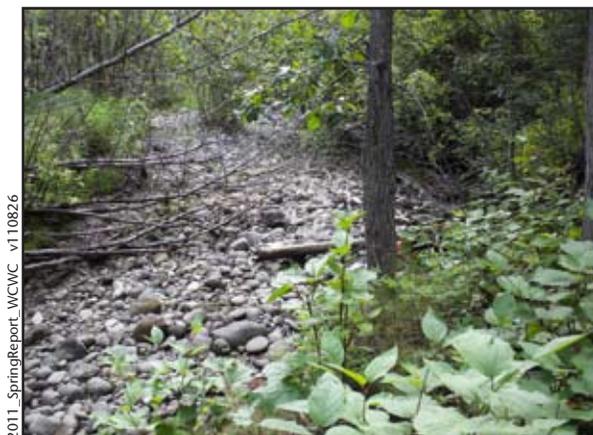
- set up three research stations along Willow Creek
- collect data for volumetric flow, temperature, salinity, and other parameters at each research station
- begin monitoring depth, salinity, and other parameters of wells, for those who wish to participate, to attempt to determine surface sources of groundwater and to chart depths and extent of groundwater bodies
- attempt to determine the destination of Willow Creek water that goes underground in lower portions of the creek
- identify species of young fish found in different locations in Willow Creek
- continue monitoring and documenting conditions and flow at the mouth of Willow Creek
- continue collecting anecdotal remembrances of Willow Creek and past water conditions in the Willow Creek watershed
- attempt to map extent of past forest fires and gauge their possible effects on surface water
- map of the boundaries of the Willow Creek watershed
- begin assessment of depth and extent of permafrost in the Willow Creek watershed
- conduct at least one flyover of the creek course
- further develop the website and other types of public communications
- continue to search for funding to put the project on a secure long-term basis

Invitation:

The Willow Creek Water Consortium is a group of individuals, agencies, and organizations that support this mission: *“To determine the factors affecting the quality and the quantity of water in the Willow Creek watershed and to ensure the benefits of that water for the future.”* To accomplish this mission, a long-term research project is underway, with potentially great benefits for the citizens of the Willow Creek watershed and neighboring areas of the Copper River Basin. Would you or your organization like to participate? Please let us know!

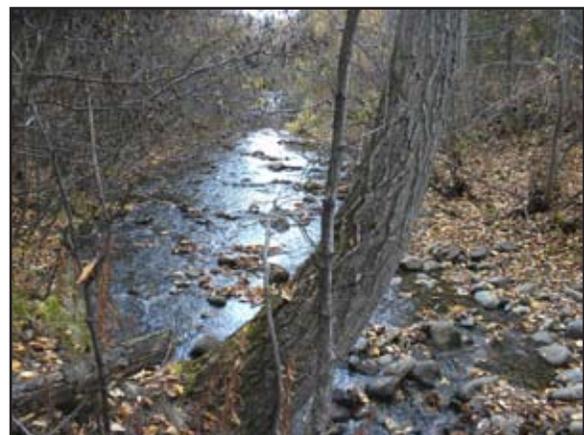
For more information, go to: www.WillowCreekWater.org. To become a part of the Willow Creek Water Consortium, send an email to: contact@willowcreekwater.org.

Unbroken flow through to the mouth of Willow Creek is likely important for survival for fry of grayling and salmon which use the creek as a summer nursery, but must escape to the safety of the Tonsina River for the winter. The two views below, photographed 5-1/2 weeks apart, show the area near the creek mouth changing from dry to flowing.



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15 August 2010



23 September 2010