

THE VALUE OF WATER: Cool, Clear, Water by C. Nelson Hoy, Forester, Rancher and Conservationist

Editor's note: The following essay is the fifteenth in a five-year series on water resources stewardship in the Cowpasture River Watershed, sponsored by the Cowpasture River Preservation Association and published by The Recorder. The goal of the series is to create awareness among students, citizens and officials of the critical need to protect our surface and ground-water resources, and to stimulate interest in progressive stewardship.

WILLIAMSVILLE – Bob Nolan in 1936 stroked the lyrics to "Cool Water", a now classic western cowboy poem and song about a man and his mule, Dan, and the mirage of cool, clear, water in the dry desert of the American southwest. More than 80 years later, the Cowpasture River Valley of Virginia's surface and ground water resources are at risk of degradation from the development of an industrial-scale gas pipeline. The Cowpasture River Preservation Association (CRPA) in an effort to highlight the environmental risks and exposures is working to determine the value of the Valley's water resources and to protect both surface and ground water in the watershed. But why should water conservation measures matter to citizens, students and local public officials?

Water Ecosystem Services:

Homesteaders, farmers and businesses in the Cowpasture and Bullpasture Rivers Valley are 100% dependent upon cool, clear, water and use water for at least eight purposes:

- (1) Domestic Water Wells – The water ecosystem services include water for drinking, cooking, bathing, gardening and washing.
- (2) Public Water Wells – The ecosystem services are almost the same as for domestic wells.
- (3) Farm Livestock Water Supplies – Services include water for draft horses, beef cattle, dairy cattle, sheep, goats, pigs, poultry and fish.
- (4) Farm Irrigation Water Supplies – Agricultural uses includes operations such as commodity crop farms, landscape and horticulture businesses , tree nurseries and fish hatcheries.
- (5) Commercial Water Withdrawals – Commercial water uses include golf courses, local and state installations, hotels and restaurants, laundromats and car washes among others.
- (6) Outdoor Recreation Usage – Recreation-based ecosystem services include fishing, hunting, wildlife viewing, boating and swimming.
- (7) Non-consumptive Water Services – Non-consumptive uses include painting, photography, scenery enjoyment and property view sheds.
- (8) Natural Heritage Water Services – Cultural contributions include aesthetic values, existence values, endangered species values, bequest values and option values.

The Value of Wells and Springs:

The University of Minnesota's Natural Resources Research Institute concluded twenty years ago that ground water was vastly more valuable than surface water – about 13 times more valuable in terms of economic activity and jobs. According to The Value of Water Campaign, “The average American uses



Cool, Clear Waters of the Bullpasture River Gorge – Photographic Credit Hereby Given to Kathy Farmer

176 gallons of water per day – that's 64,240 gallons per year.” How do we use this water? “Seventeen percent goes toward your morning shower, 27% is used by the toilet, your faucet drains 15%, the clothes washer another 22%, miscellaneous needs take up 5%, and those pesky leaks steal another 14%.” The author's cost estimates presented below for the value of wells and springs in the Cowpasture River Valley are based upon the costs today for developing each water supply source and the costs of financing this development over the next 30 years.

Livestock Well or Spring – A farmer or rancher in the Cowpasture River Valley who develops a stand-alone livestock water supply system incurs costs for well drilling and casing, a solar powered pumping plant, a water delivery piping system, a water storage tank and troughs and interest on a 30-year farm loan for a total cost of \$35,000. The development by a farm of a natural karst spring, therefore, should deliver an economic benefit of comparable value.

Domestic Water Supplies – Homesteaders in the Cowpasture River Valley who drill and develop a water supply system for their homes invest an estimated \$40,000 in drilling, casing, pump, piping,

electric, a pressure tank, water treatment equipment, permits and testing.

Dairy Water Supplies – Dairies in the Cowpasture Valley that drill into a sufficiently productive aquifer invest an estimated \$50,000 or more for drilling, casing, pump, piping, electric, storage, treatment and permits and tests plus financing costs.

Municipal Water Supplies – City and town governments in Virginia that must replace a municipal water supply well that becomes contaminated with hazardous industrial chemicals with a new well drilled into a potable aquifer face an out-of-pocket expenses of an estimated \$2,500,000 or more for geophysical and hydrological studies, land purchases, engineering studies, drilling a 1,000 foot deep well and casing, pumping equipment, transmission piping, water treatment system, telemetry, monitoring and control systems, support buildings plus Municipal AA-rated bond interest over 30 years for a total cost of close to \$4,300,000.

Aqua-agriculture Usages – The Virginia Department of Game and Inland Fisheries, Coursey Springs Fish Cultural Center in the Cowpasture River Valley depends upon cold and pure water from the Cowpasture River which sinks and resurges as Coursey Springs the third largest spring in the Commonwealth with a flow rate of 4,000 to 16,000 gallons per minute. The author believes that the development of Coursey Springs, a natural karst spring, appears roughly comparable to the development of a municipal water supply system or about \$4,000,000 in value.

The Value of Surface Waters:

Water-powered Mills – Harnessing water resources to power mill machinery for the purposes of grinding grains, forging iron, carding wool and sawing logs enhanced the quality of life for early Americans because water-power dramatically reduced human labor. Grinding corn with water-powered millstones, instead of grinding corn by hand, freed up many hours of farm labor and at the same time, produced a more palatable food source. Sawing logs into timbers, planks and boards at a water-powered mill saved back-breaking labor in a sawyers pit pulling a vertical saw up or down, and it allowed the building of more refined homes. Water-powered mills contributed enormous values to the Virginia frontier and allowed for a greater self-sufficiency.

Summer Camps Along the Cowpasture – For 100 years, young women and men have come in the summer time to the remote, rugged and romantic Cowpasture River Valley. Their bodies, minds and spirits have grown in the great outdoors, swimming and canoeing in the river's cool green waters, learning the skills and shouldering the responsibilities of being life guards, and learning a special appreciation for river flora, fauna and fishes. Value is demonstrated by parents and grandparents who financially sacrificed to send their children to summer camp and by "10,000" young lives that over those many years were enriched by the Cowpasture River.

The Value of Surface Waters

Recreational Fisheries – Visitors from the Baltimore, Washington and Richmond corridor enjoy recreational fishing for trout along the Bullpasture River and eastern brook trout fishing in the upper Cowpasture River, Benson Run, Crab Run, Davis Run and Shaws Fork with estimated expenditures of \$250 per person per day for travel, lodging and meals plus secondary purchases, and with no value placed upon their time.

Rural Real Estate Values – Rivers, creeks, drafts and runs add value to rural real estate holdings by

somewhere between \$10 and \$1,000 or more per linear foot of waterway frontage. Other variable factors in this calculus include the number of acres in the parcel, whether ownership is on one side of the river or stream or both, the water volume for canoeing and swimming, the stream habitat for trout and other game fishes, and water flow during extended dry periods. But the influence on property values is real and potentially significant.

Frontiers in Water Valuation:

During the last 30-odd years, scientists, economists and statisticians have developed increasingly sophisticated tools for determining the value of water. Two leading academics in the field of how to place value on water ecosystem goods and services are Dr. Robert A. Young and Dr. John B. Loomis, both of the Colorado State University. The National Capital Project, a partnership among Stanford University, The Nature Conservancy and the World Wildlife Fund, works to integrate the emerging academic knowledge about ecosystem services and values into everyday natural resource management decision-making.

In the Cowpasture River Valley of Virginia, the CRPA's outreach initiatives work to enlighten citizens, students and public officials about the value of water resources and to protect both surface and ground water resources.

Follow-up Research Sources:

Young, Robert and Loomis, John, Determining the Economic Value of WATER Concepts and Methods (New York, New York: Resources for the Future Press, Second Edition, 2014), 337 pages.

<http://thevalueofwater.org/> See: "The Value of Water Campaign".

Sidebar:

"Cool Water" by Bob Nolan

Audio Linkage: <https://www.youtube.com/watch?v=V3GME0VUZiQ>

All day I've faced the barren waste
Without the taste of water, cool water
Old Dan and I with throats burned dry
And souls that cry for water, cool, clear water

Keep a-movin', Dan, don't you listen to him, Dan
He's a devil not a man
And he spreads the burning sand with water
Dan can you see that big green tree
Where the water's runnin' free
And it's waiting there for you and me

The nights are cool and I'm a fool
Each star's a pool of water, cool water
But with the dawn I'll wake and yawn
And carry on to water, cool, clear, water

The shadows sway and seem to say
Tonight we pray for water, cool, water
And way up there He'll hear our prayer
And show us where there's water, cool, clear, water

Dan's feet are sore he's yearning for
Just one thing more than water, cool, water
Like me I guess he'd like to rest
Where there's no quest for water, cool, clear, water