

The future of Florida's springs isn't eternal

Robert Knight and Sky Notestein, Special to the Times

Published Thursday, July 31, 2008

Florida has more artesian springs — 700 of them — than any other place in the world.

Some are large and familiar, like Silver, Ichetucknee and Wakulla; others small and hidden away, like Fern Hammock and Shangri-La. But they all have a crucial role in Florida's freshwater supply and environmental health, not to mention their recreational values.

In the past decade, longtime threats to these natural gems have become more urgent. Many springs that were formerly blue now have a greenish tint. Unsightly filamentous algae have replaced their natural aquatic plant communities. Flows are declining in numerous springs. Some have stopped flowing altogether.

Scientific research tells us that many of the changes have been caused by humans. Here's a look at what we know, what we don't know, and what we can do to begin to restore our precious springs.

Spring fact: All consumptive uses of groundwater in a springshed reduce spring flows to some extent.

Nearly every aspect of a spring, from the basin size and shape, to the fish, other wildlife, plants and public use, depends on a sufficient flow of pure water. The No. 1 objective of springs' protection must be protection of the volume of water flowing forth. Every human use of water in a springshed (the area of land that recharges water to a spring) — every domestic, agricultural, commercial, and public water supply well, shallow or deep, large or small — to some degree reduces groundwater flow to the local springs.

Spring fact: The concentration of nitrate nitrogen, a recognized pollutant in surface and groundwaters, is rising rapidly in most Florida springs in response to agricultural and urban development.

A continuing increase in nitrate nitrogen concentrations in groundwater is one of the most visible environmental consequences of Florida's agricultural and urban development. Throughout the karst (porous limestone) areas of North and Central Florida where artesian springs are common, groundwater nitrate nitrogen concentrations have increased by 50 to 350 fold, with localized hot spots greater than 10 parts per million — the EPA drinking water standard. These increases not only threaten drinking water but are also harming plants and other organisms. Even if all human-controlled nitrogen pollution sources were stopped today, nitrate pollution in our aquifers and in our springs will take decades to reverse.

Spring fact: Spring ecosystems are undergoing widespread and dramatic changes in natural flora and fauna, often evidenced by replacement of natural plant communities by filamentous algae and native fauna by exotic species.

Natural artesian springs in Florida are generally dominated by luxuriant growths of native submerged aquatic vegetation. Natural algal communities known as periphyton enhance the overall plant productivity that supports fish

and other wildlife. Silver, Ichetucknee and Rainbow springs are prime examples of large springs with high flows that retain much of their former beauty and native plant and animal species. But trampling of plants during human recreation (for example, Wekiwa and Volusia Blue) and uprooting and physical damage by motor boat propellers and anchors (e.g., Weeki Wachee and Fanning) often result in the loss of these native plant communities in springs and spring runs, resulting in the predominance of less desirable exotic plant species and filamentous algae.

Spring fact: Relatively pristine springs with high flows help support local economies.

Visitation numbers at springs are influenced by clear, cool water and attractive plants and wildlife. Annual visits to the 100 largest springs in Florida are estimated at more than 7-million people, with an annual economic value in excess of \$300-million. But springs become less attractive to visitors when the flow and water clarity are reduced and when excessive floating vegetation and filamentous algae predominate.

A time for action

Springs are Florida's canary in the coal mine: If we stand by while they continue to dry up and turn green, we'll have missed one more opportunity to preserve ourselves. What sorts of changes are needed? Primarily those that will lessen our human footprint:

- Stronger water conservation measures in all springsheds and a hold on new consumptive use permits until existing human impacts on spring flow reductions have been quantified and adequate water resources are allocated to preserve the natural water resource values of springs.
- Restrictions on nitrogen fertilizer sales and use in the karst areas of springsheds based on application rates that result in measurable declines in groundwater nitrate nitrogen concentrations.
- Improved practices for treated municipal, agricultural and commercial wastewater reuse and disposal in the karst areas of springsheds by further limiting all groundwater discharges of nitrogen.
- Re-evaluation of public recreational uses in all springs on Florida public lands to develop science-based management plans that ensure compatibility between appropriate recreational activities and sustainable ecological communities in these "crown jewels" of our parks, preserves and national forests.

Robert Knight is an aquatic and wetland scientist and has been conducting applied research in springs and wetlands for more than 30 years. Sky Notestein is an aquatic ecologist who has focused his academic and professional career on springs' restoration over the past 12 years. Both work at Wetland Solutions Inc. in Gainesville.

© 2009 • All Rights Reserved • St. Petersburg Times
 490 First Avenue South • St. Petersburg, FL 33701 • 727-893-8111
[Contact Us](#) | [Join Us](#) | [Advertise with Us](#) | [Subscribe to the Times](#)
[Privacy Policy](#) | [Standard of Accuracy](#) | [Terms, Conditions & Copyright](#)