

BWTF working to reduce nitrogen in Gallatin watershed

BY JON HOLTZMAN
BLUE WATER TASK FORCE

BIG SKY – In the words of Pogo, we have met the enemy and he is us.

“Since recordkeeping began in the early 1970s, the levels of nitrogen in streams of the Big Sky watershed have been steadily rising,” said Dr. Kristin Gardner, executive director of the Blue Water Task Force in Big Sky. “The increase has been in direct proportion to the growth of the number of residences in Big Sky.”

Gardner recently presented at a workshop for Big Sky Golf Course maintenance staff on May 28, to show the crew how they can help protect and improve water quality.

Nitrogen occurs naturally in the environment and accounts for about 80 percent of the atmosphere. It’s an essential nutrient for growth and is present in humans, animals and plants. But there can be too much of a good thing.

High levels of the plant available forms of nitrogen in streams typically lead to the rapid growth of algae. In the summer, a green trail of algae is visible in the West Fork from Meadow Village to the main stem of the Gallatin.

“At first algae can be a source of added food for fish and the bugs they eat,”



Alicia DeGroot, Elijah Harder and Mike Richter

Gardner said. “But as it dies back in winter, it consumes oxygen from the water. High oxygen content is important to sustain healthy populations of trout, stoneflies, caddis flies and mayflies.”

The Meadow Village area was identified as the biggest source of nitrogen in the Total Maximum Daily Load assessment conducted between 2005 and 2009. Sources include the use of fertilizer by residents, golf courses and businesses on lawns; waste from pets and horse corrals; seepage from septic tanks or sewer main leaks; runoff of irrigation water from pastures or the golf course; breaks in irrigation distribution systems; and the removal of buffering and filtering vegetation along stream beds.

“Although there are other potential nitrogen sources, there were several good reasons to begin addressing the prob-



lem along the golf course,” Gardner said, “not the least of which was that the resort was willing to take leadership in being part of the solution.”

Since the completion of the TMDL assessment, BWTF has collected and analyzed water samples from five groundwater wells, eight collection sites and two springs along the West Fork. Soil samples were collected and analyzed from 12 sites in the Meadow Village area. BWTF worked with the Big Sky Water and Sewer District to video sewer mains in the Meadow Village area to look for

leaks. All of this data has been analyzed to better understand nitrogen sources to the river.

In addition, BWTF gathered information on the land management practices of the Big Sky Golf Course. As a result of these discussions, the golf course has replaced 17 sprinkler heads that were spraying irrigation water directly into the river and has added vegetative buffers in areas next to the stream.

“We all have a responsibility to do our part,” said Sam Woodger, golf course superintendent. “Some of the action steps will depend on fine tuning our testing and record keeping, repair and maintenance of the irrigation system and close control of irrigation and fertilizer application.”

The irrigation water source for the golf course comes from nitrogen rich, treated wastewater supplied by Big

Sky Water and Sewer. Woodger noted better testing and control could lead to lower operating costs through a reduction in fertilizer needed through the summer.

The workshop was a result of a three-year watershed study recently completed by the BWTF under the direction of the Montana Department of Environmental Quality 319 Program, according to Gardner.

Other presenters included MSU extension soil fertility specialist Dr. Clain Jones and a MSU extension horticultural

specialist, who shared their knowledge on minimizing irrigation and fertilizer while maximizing yield. Mark Sembach from Biolyneceus discussed microbial alternatives to fertilizer.

The DEQ supplied major funding for the study, with additional support from Big Sky Resort Tax, the Gallatin Local Water Quality District and the Montana Bureau of Mines and Geology. For more details on what individuals and businesses can do to reduce impacts on water quality in the Gallatin watershed visit bluewartaskforce.org.



Mike Richter and Jeremy Harder