



## Section 319

# NONPOINT SOURCE PROGRAM SUCCESS STORY

# West Virginia

## Planting Trees and Upgrading Septic Systems Decreases Bacteria in Indian Run

### Waterbody Improved

Elevated fecal coliform levels in Indian Run prompted the West Virginia Department of Environmental Protection (DEP) to add the waterbody to the state's Clean Water Act (CWA) section 303(d) list of impaired waters in 2008. Further investigations and source tracking showed that the elevated fecal coliform levels were due in part to failing or inadequate home septic systems and runoff from agricultural, urban, and residential areas. Pumping and upgrading septic systems, planting trees, and conducting outreach decreased fecal coliform levels in Indian Run. As a result, DEP removed the stream from the state's 2012 CWA section 303(d) list for fecal coliform impairment.

### Problem

Indian Run is within the Sleepy Creek watershed in eastern West Virginia. It flows east from Cacapon Lake in Cacapon State Park, under a highway, through a residential area, and into Sleepy Creek near several agricultural fields (Figure 1). Indian Run has two major tributaries, South Fork Indian Run and North Fork Indian Run, both of which are entirely within Cacapon State Park. The mainstem of Indian Run is 2 miles long. The watershed is largely forested in its upper reaches but is more developed downstream with some residential and agriculture (pasture and cropland) areas. Cacapon State Park's recreational amenities draw thousands of visitors annually.

Failing or inadequate septic systems and pollutant loading associated with agricultural and residential runoff contributed to Indian Run's impairment for fecal coliform bacteria. DEP collected 13 samples on Indian Run 0.6 mile upstream from the mouth between August 2003 and June 2004. Bacteria levels in three of the 13 samples were greater than 400 colony forming units (cfu) per 100 milliliters (mL). To meet West Virginia's water quality standards, bacteria levels in a geometric mean of five or more samples collected within 30 days must be less than 200 cfu/100 mL and no more than 10 percent of the samples collected at a site may exceed 400 cfu/100 mL.

In 2008 DEP added Indian Run to West Virginia's CWA section 303(d) list of impaired waters for fecal

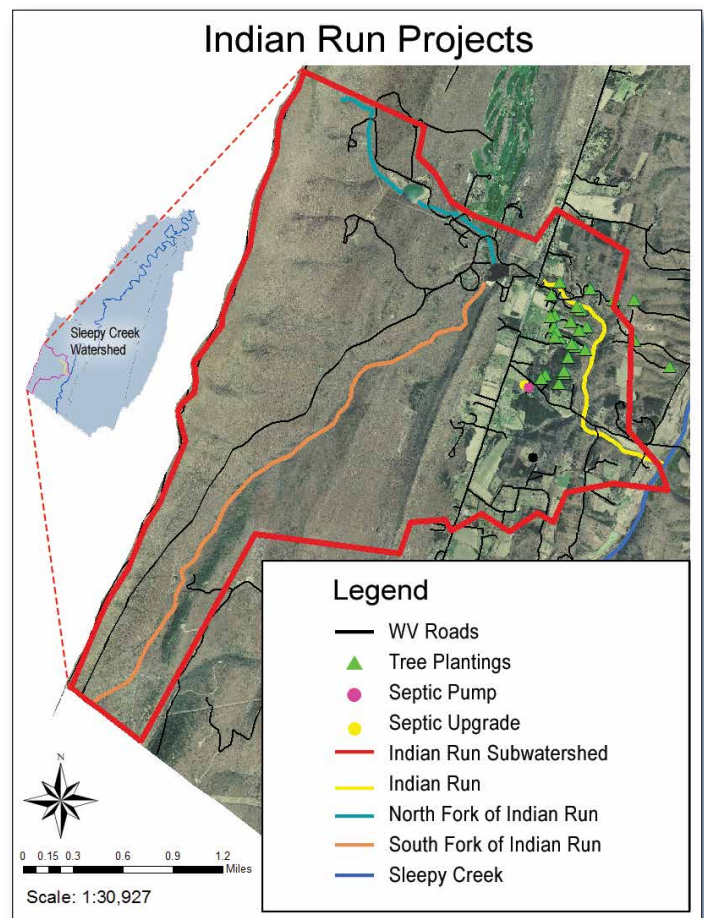


Figure 1. Stakeholders planted trees and pumped out and upgraded septic systems in the Indian Run subwatershed.

coliform bacteria. DEP prepared a total maximum daily load (TMDL) for fecal coliform in Sleepy Creek that same year. According to the TMDL, nonpoint source pollution—especially from leaking septic systems—accounted for the majority of the fecal coliform bacteria. At the time the TMDL was developed, DEP estimated that 6,400 homes in the Sleepy Creek watershed were served by septic tanks, approximately 900 of which were failing.

## Project Highlights

As part of the overall Sleepy Creek project, watershed partners completed several projects in the Indian Run subwatershed between 2008 and 2011, including planting trees and pumping and upgrading septic systems. The Morgan County Health Department (MCHD) conducted the septic portions of this program in the priority areas. Septic upgrades took place mostly in agricultural homes in the lower portion of the subwatershed. In October 2010, 68 volunteers planted 520 trees in the Cacapon East and South Subdivisions. The tree planting project aims to restore the native tree population in this area, which has suffered greatly from the invasive emerald ash borer. The trees will also help reduce and manage stormwater runoff.

Figure 1 shows the location of the restoration activities within the Indian Run subwatershed. In addition to the CWA section 319-funded activities, Cacapon State Park upgraded several sewage systems and made other improvements around the park.

## Results

The Cacapon Institute conducted monthly sampling from March through September 2010 near the mouth of Indian Run. Based on their results, which showed that the stream was meeting standards, the Sleepy Creek Project Team decided to continue sampling for an additional 12 months. During that time frame, Indian Run fully complied with water quality standards, indicating that the cause of the fecal coliform bacteria impairment had been addressed. As a result, DEP de-listed Indian Run for its fecal coliform impairment in 2012. Anecdotal benthic evidence supports the fecal coliform reduction. Benthic communities in the lower portion of Indian Run and just downstream of its confluence with Sleepy Creek show fewer pollution-tolerant organisms (e.g., Simuliidae, Chironomidae). Indian Run now fully attains its primary contact recreation designated use.



Figure 2. Volunteer monitors collect benthic macroinvertebrate samples near the mouth of Indian Run during a DEP-led workshop in 2006.

## Partners and Funding

The West Virginia Conservation Agency (WVCA) oversaw grant implementation and provided technical assistance. DEP assisted with education, outreach, and monitoring in the watershed (Figure 2). The Eastern Panhandle Conservation District administered grant funding and implemented education and outreach within the watershed. The West Virginia Department of Agriculture and the Cacapon Institute performed water quality monitoring, assisted by the Sleepy Creek Watershed Association (SCWA). West Virginia Division of Forestry, WVCA, SCWA, and landowners played critical roles in implementing the tree planting project. MCHD provided outreach to the public regarding septic systems. Some of the work performed was funded by a CWA section 319 Sleepy Creek watershed project grant of \$292,550 from the U.S. Environmental Protection Agency and a state match of \$195,036. The cost of the Indian Run portion of the overall Sleepy Creek restoration effort totaled approximately \$45,000. CWA section 319 funds were used to supplement the cost of the septic repairs, pumping, and monitoring—about \$16,000. West Virginia Division of Forestry, WVCA, MCHD, the Cacapon Institute, and volunteers supported the remaining efforts in this subwatershed, including outreach and education, tree planting, a few septic system percolation tests, and additional monitoring.



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## For additional information contact:

**Suzy Lucas**  
West Virginia Conservation Agency  
304-539-2682 • [rlucas@wvca.us](mailto:rlucas@wvca.us)