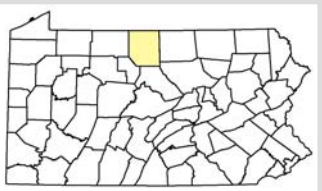
Worksite in Focus

Potter County
Horseshoe Road

6/10/04



Problem Identification

Routine maintenance operations and the wear and tear of traffic had the cumulative effect of lowering the road elevation in relation to the surrounding terrain (see photo). The resulting entrenched road trapped road drainage. Confined by the road, this water concentrated in parallel ditches and gained velocity. As the volume and velocity increased, more and more valuable road material was washed away, polluting nearby Pine Creek.

Project Objectives

1. Prevent direct discharge of sediment-laden road drainage to Pine Creek.
2. Reduce concentrated drainage from parallel ditches.
3. Filter road runoff using existing roadside vegetation.

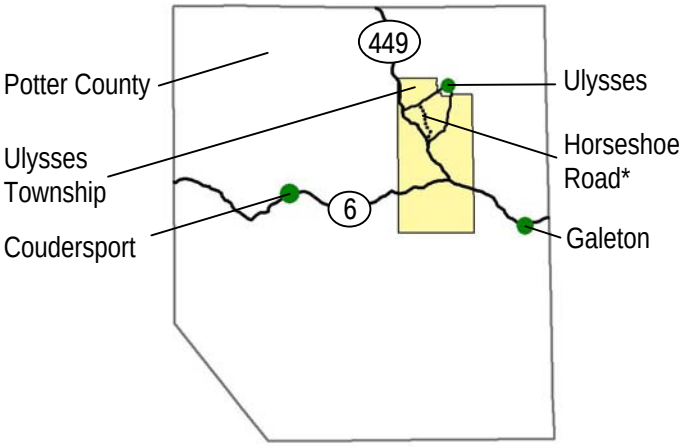
Project Considerations

Off right-of-way (ROW) drainage input from an adjacent driveway compounded the problems on Horseshoe Road. Existing drainage structures (ditches and crosspipes) were inadequate to handle flow volumes.

Spring seeps in the road bank drained directly onto the road surface resulting in a soft road base and observable ditchflow year-round.

Adequately addressing drainage on Horseshoe Road required an additional drainage outlet, installation of under-drain, and elevation of the road itself.

Project Statistics



Road:	Horseshoe Road
Road Owner:	Ulysses Township
Affected Watershed:	Pine Creek
Project Length:	1600 ft
Cost:	$53,829
Date Completed:	September 2002

Before: The entrenched road trapped road drainage resulting in fast-moving concentrated ditchflow. This water eroded road material and deposited it directly into Pine Creek.

The publishers of this publication gratefully acknowledge the financial support of the Pennsylvania State Conservation Commission. For additional information or assistance, contact: Center for Dirt & Gravel Roads Studies, Penn State University, 207 Research Unit D, University Park, PA 16802 (Toll-Free Phone: 1-866-668-6683, Fax: 814-863-6787, Email: dirtandgravel@psu.edu). Additional copies available on our website at: www.dirtandgravelroads.org

Center for Dirt and Gravel Road Studies

Project Solutions

Adding a cross-pipe: Installing a new cross-pipe on the road provided an extra drainage outlet and shortened the flow length of parallel road drainage. By minimzing the distance water has to travel before it is removed from the road corridor, the velocity and erosivity of the water are reduced.

Adding perforated underdrain: Underdrain, or drain tile, was added in the ditch to collect water flowing from spring seeps. This eliminated perennial ditchflow and corrected the soft road base problem.

Filling the road: The elevation of the road was raised by filling the road profile. The added elevation eliminated the need for parallel ditches and allowed drainage to sheet flow into the surrounding terrain through vegetated buffers, removing sediment-laden surface flow to Pine Creek.

Adequate Culvert Size: A hydrologic & hydraulic analysis was used to determine the proper size of the culvert needed for the stream crossing. The existing 30" round concrete pipe was replaced by a 77"x 52" squash pipe. The road was raised to ensure proper cover over the new pipe.

Cost Summary

Total Project Value:	$53,829
District Funding:	$31,769
Materials	$28,428
Contracted Work	$3,341
In-Kind from twp:	$22,060
Materials	$3,837
Labor & Equip.	$18,223

After: The road profile was raised eliminating ditchflow on the downslope side of the road. Drainage that was trapped on the entrenched road can now sheet flow freely off the road into surrounding vegetation. Because the water does not have the opportunity to gain velocity, its erosive potential is greatly reduced.

After: The pipe was re-sized and the road raised for proper cover over the new installation.

For More Information

The Center for Dirt and Gravel Road Studies
(814) 865-5355
www.dirtandgravelroads.org

Potter County Conservation District
Eric Potter
(814) 274-8411

* Directions to Horseshoe Road worksite: From Coudersport: Take U.S. Route 6 east approximately 13 miles to State Highway 449. Follow 449 north to Brookland; just past Brookland veer right at the Y-junction onto SR 1001. Horseshoe Road (T450) is 4/10 of a mile ahead on the left. The project begins at the intersection with SR 1001 and continues for 1600'.