Dirt and Gravel Roads, Culverts, and Trout

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Pennsylvania Coldwater Habitat Restoration Program
Mission – To conserve, protect, and restore North America’s coldwater fisheries and their watersheds

Abandoned Mine Drainage
- AMD Technical Assistance Program
- On-the-ground AMD remediation
- Biological surveys
- Recovery research and monitoring

Coldwater Habitat
- Design and permitting assistance
- Instream habitat improvement
- Dirt and gravel road improvement
- Riparian reforestation
- Aquatic organism passage assessment
- Culvert replacement

PA Chapters
- www.patrout.org
PA Trout Unlimited led the way for improvement of dirt and gravel roads

1990 - God’s Country Chapter of Trout Unlimited (Potter County) initiated discussions

1993 – Task Force on Dirt and Gravel Roads created

1996-98 – Trout Unlimited volunteers inventoried dirt and gravel roads (over 900 sites identified)

1997 – Section 9106 of PA Vehicle Code enacted, which established the PA Dirt and Gravel Road Maintenance Program with funding

2000 – Conservation districts complete their assessment (over 12,000 sites identified)

2001 – Center for Dirt and Gravel Road Studies created at Penn State University
Trout Unlimited’s continued involvement

- TU chapters remain involved at the local level to identify and coordinate projects with conservation districts and local townships/municipalities
- TU volunteers and staff advocate across PA and in Harrisburg for continued and increased funding of the Dirt and Gravel Roads Maintenance Program
- TU staff partner with local townships and others to plan and implement projects, including fundraising from other grant programs
- TU staff conduct assessments to further identify and prioritize problem sites (Cross Fork and Little Kettle Creek drainages, Potter County)
- TU staff serve on the Center for Dirt and Gravel Road Studies Policy and Planning Workgroup and provide assistance with culvert-related trainings
Kettle Creek Watershed – Clinton, Potter, & Tioga Counties

Lack of any ESMPs – contribution of massive sediment load to streams

Lack of vegetated, stabilized banks erode and contribute sediment directly into cross pipes and into receiving streams
Just in the past four years, TU has worked in partnership with local townships to plan and install ESMPs on more than four miles of dirt and gravel roads, including rainfall simulation studies.

In addition to funds through the Dirt & Gravel Roads Maintenance Program (grants to townships), TU has secured additional funding from the DEP Growing Greener, National Fish & Wildlife Foundation, and Richard King Mellon Foundation.
With a grant from PA’s Act 13 Marcellus Legacy Fund, TU decommissioned over 1,000 feet of dirt and gravel roads and improved sediment drainage on 4,400 feet of state forest roads.

Main purpose of these improvements and road closures was to eliminate sediment from abandoned mine drainage treatment systems and recovering brook trout streams.
Aquatic organism passage (AOP) -
The ability of aquatic and semi-aquatic organisms to utilize upstream and downstream habitat through or beneath human infrastructure such as culverts, bridges, diversions, and dams.
Why is TU interested in road-stream crossings?

Undersized or improperly installed culverts cause the following:

- Streambank erosion, habitat degradation
- Reduced or no aquatic organism passage
  - Prevents native brook trout and other aquatic organisms from accessing coldwater habitat for food, refuge, and reproduction
- Increased maintenance needs and associated costs due to lack of flood resilience ($$ could be better spent on road improvements and maintenance)
755 culvert surveys completed in Pine, Kettle, and Young Womans Creeks (2015-16)

AOP Coarse Screen Results
- Full AOP 32%
- Reduced AOP 26%
- No AOP 42%
Box culverts and pipes were the only offenders
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Common problems noted:
• Undersized
• Not installed to correct elevation
• Designed and installed at less than bankfull width
  - Buildup of debris, blockage
  - Perched culvert
  - Downstream erosion
  - Increased chance of overtopping roadway, culvert blowout and road damage
More than 30,000 road-stream crossings in PA
Precipitation trends since 1948

T. Madsen & N. Willcox. 2012
Little Lyman Run Culvert Replacement, Potter County

- Undersized pipe replaced with pre-fabricated aluminum bottomless arch, designed to 100% bankfull width
- Reconnect 7.8 miles of coldwater habitat for brook trout and eliminated ~3.6 tons annual sediment inputs to Little Lyman Run and Cross Fork Creek
- Funded with grants from National Fish and Wildlife Foundation, PA Fish and Boat Commission, Richard King Mellon Foundation, and Orvis
Comparison of different culvert types

**GET THE FACTS**

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<th>STREAM SIMULATION</th>
<th>Q25 BOX</th>
<th>TRADITIONAL CULVERT</th>
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<td><strong>LIFESPAN</strong></td>
<td>50-75 years</td>
<td>25-50 years</td>
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<td><strong>FLOOD RESILIENCY</strong></td>
<td>High: Q100</td>
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<td><strong>AQUATIC ORGANISM PASSAGE</strong></td>
<td>100% passage at all life stages</td>
<td>Targets Specific Fish</td>
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Q = design flood; Q100 = predicted peak runoff from a 100-year storm. This graphic is based on NCDOT flood design requirements for secondary roads not located in a detailed flood study zone.

www.tu.org