



PVC or HDPE Pipe Mats and Plastic Roads

Forest Management Practices Fact Sheet Crossing Options Series #12

Introduction

Appropriate crossing options can protect wetlands during forest management activities. These options allow access while protecting soils, wetland hydrology, and aquatic habitat.

PVC or HDPE pipe mat crossings are built by cabling together PVC (polyvinyl chloride) or HDPE (high-density polyethylene) pipes to form mats. *PVC or HDPE pipe plastic road crossings* are built by linking together PVC or HDPE pipes using 1-inch PVC to form mats. The plastic road includes transition mats to ease the passage of tires up to and down from the crossing. Both options help protect wetland haul roads from rutting by distributing the load across the surface.

Where Used

These crossings work well on most wetland soils. Haul roads should have slopes less than 4 percent without stumps or other high spots. The crossings work best with existing root or vegetation mats. Skidding will move the mats, so limit this option to hauling and forwarding.

Application

When installing a pipe mat or plastic road:

- ▶ Smooth out high spots, fill ruts, and leave the root mat of any vegetation in place.
- ▶ Cover the entire crossing area with nonwoven geotextile. (Geotextile is a fabric mat that allows water drainage and provides support.) Place the mats on the geotextile. For a pipe mat crossing, build soil ramps up to and down from the crossing. Or, make ramps by interconnecting 2-, 3-, and 4-inch diameter pipes. The plastic road includes transition mats.
- ▶ Cover PVC with geotextile to prevent degradation by sunlight. HDPE doesn't need to be covered and will tolerate cold better than PVC. However, you may

Best Management Practices (BMPs) can prevent or minimize the impact of forestry activities on rivers, lakes, streams, groundwater, wetlands, and visual quality.

To construct a 12-foot-wide pipe mat:

Use 20-foot lengths of 4-inch-diameter Schedule 40 PVC or SDR11 HDPE. Saw pipes into 12-foot lengths. Saw the remaining 8-foot sections in half. Drill four 1/4-inch holes completely through the 12-foot long pipes at locations 2 feet and 4 feet from either end. Drill two holes completely through each 4-foot section 1 foot from each end.

Alternate one 12-foot long section with one row made of two 4-foot wide sections placed 2 feet from each other.

String 3/16-inch galvanized steel cable through all sections. Make loops at the end of each cable, extending beyond the last pipe. Secure the loops with 3/16-inch cable clamps.

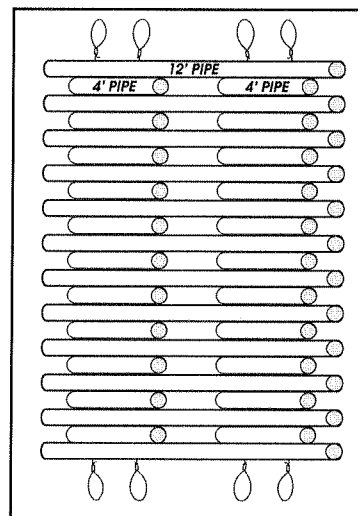
To construct a plastic road:

Detailed directions, including drawings, for constructing the plastic road are found in the following free publication:

Moll, J.E., and R. Hiramoto. 1996. *The Plastic Road*. USDA Forest Service, Technology and Development Program, Publication 9624 1206-SDTDC. 12p. (444 East Bonita Ave. San Dimas, CA 91173; 909-599-1267).

wish in either case to add another layer of geotextile. Cover that with materials such as expanded metal grating to add traction.

- Size the mat to meet anticipated loads, soil strength, and installation equipment. Use larger mats on very weak soils that have a low bearing strength (e.g., muck or peat).



Assembled pipe mat

Advantages

Pipe mat and plastic road sections are easy to transport, install, remove, and repair. Water can flow through the pipes instead of over the crossing. PVC materials can be bought locally.

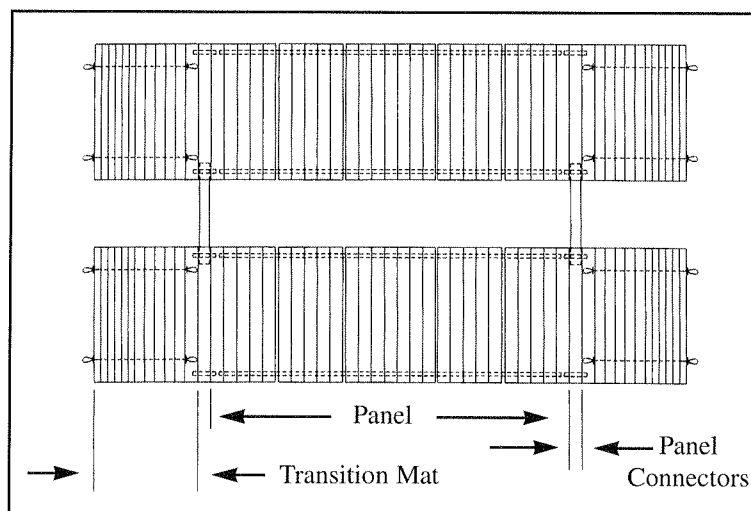
Disadvantages

The surface of the mats can be slippery when wet, with little traction on grades. You may need to order HDPE pipes from a national distributor.

Maintenance

Inspect pipe mats and plastic road sections during and between uses for broken pieces. Repair by sliding off and replacing broken sections.

Adapted from "The Plastic Road," USDA Forest Service, 1996.



Plastic road with transition mat

Related Fact Sheets in This Series

Temporary Wetland Crossing Options (FS-7008); Wood Mats (FS-7009); Wood Panels and Pallets (FS-7010); Expanded Metal Grating (FS-7011); Bridge Decks, Tire Mats, and Pole Rails (FS-7013); Corduroy Crossings (FS-7014); Low-Ground-Pressure Equipment (FS-7015); and Equipment With Central Tire Inflation (FS-7016).

Cooperators

University of Minnesota Extension Service, Minnesota Department of Natural Resources, Minnesota Logger Education Program, Michigan Department of Natural Resources, Michigan State University Extension, USDA Forest Service, and Wisconsin Department of Natural Resources.



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