



Railroad Car, Steel, and Prestressed Concrete Bridges

Forest Management Practices Fact Sheet Crossing Options Series #6

Introduction

Operators often cross streams during harvesting or other forestry operations. This fact sheet describes several types of temporary bridges that can help protect streams from damage during crossing. They include: *used railroad cars* (flatcars and boxcars) and *truck flatbeds*; *portable hinged bridges*, which can be folded for easier transport; *modular steel bridges*, made of interlocking panels; and *prestressed concrete panels*.

Where Used

Use these bridge types on streams with firm, stable banks. The maximum span distance should not exceed engineering specifications (if available). Where specifications are not available, the distance to be spanned should be at least 4 feet less than the length of the bridge.

Application

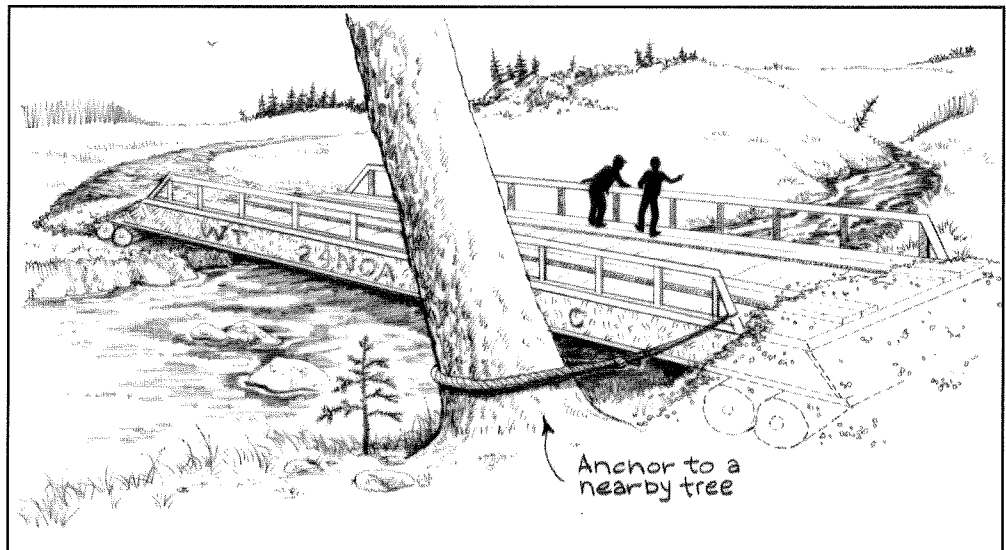
Check with the appropriate regulatory or natural resource agency in your state to see if permits are required.

Buy used railroad cars, truck flatbeds, and steel bridges through commercial sources. Railroad cars and truck flatbeds come in a limited range of lengths, generally 85 feet for railroad cars and 60 feet for truck flatbeds. Purchase new prestressed concrete panels from vendors or used panels from highway departments.

When installing these bridges:

- ▶ Place abutments (e.g., one or more logs or railroad ties) on each bank parallel to the stream flow.

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



Steel bridge

- ▶ Place the railroad car, truck flatbed, steel bridge, or concrete panel on top of the abutments. (You may need two railroad cars or flatbeds side by side for machinery that is wider than about 12 feet.) Nail or bolt the sections together for added stability and to catch debris that may drop off passing vehicles.
- ▶ Build approach ramps. Use wood mats, wood panels or pallets, corduroy, or other materials to protect the approaches if the soil is weak.
- ▶ Attach one end of a cable to the bridge and the other to a tree or other fixed object upstream. This will anchor the structure, especially when the stream flow is heavy.
- ▶ Add guardrails or curbs to the bridge if it is to be used for truck hauling.
- ▶ Revegetate all bank cuts or disturbed areas immediately to prevent soil from entering the stream.

Advantages

Operators can use these options to span wider streams than many other types of bridges. They also wear well. Local regulators generally favor bridge crossings because they minimally impact water quality and fish habitat.

Disadvantages

These options are heavy and may be difficult to transport to the site. Without proper abutments, they may freeze into the ground in winter. Used railroad cars, truck flatbeds, and steel bridges are expensive to purchase and install. Used railroad cars and truck flatbeds may need reinforcement before they can be used as bridges. You may need dozers or special equipment such as cranes to install used railroad cars, long or heavy steel bridges, or prestressed concrete panels.

Maintenance

Periodically inspect bridges during and between uses to determine strength and stability.

Related Fact Sheets in This Series

Temporary Stream Crossing Options (FS-7001); *Fords* (FS-7002); *Culverts* (FS-7003); *Ice Bridges* (FS-7004); *Timber Bridges* (FS-7005); and *PVC or HDPE Pipe Bundle Crossings* (FS-7007).

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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