



# Timber Bridges

## Forest Management Practices Fact Sheet Crossing Options Series #5

### Introduction

**T**imber bridges can help protect water quality and stream habitat during forestry operations.

There are three basic types of temporary timber bridges. *Log stringer bridges* are built from trees felled in the area. *Solid-sawn stringer bridges* are made from new lumber, railroad ties, or large timbers removed from buildings that are being torn down. *Panel bridges* are constructed from stress-laminated, glued-laminated, dowel-laminated, or nail-laminated lumber. A licensed engineer can help operators design a safe, appropriate timber bridge.

### Where Used

### Application

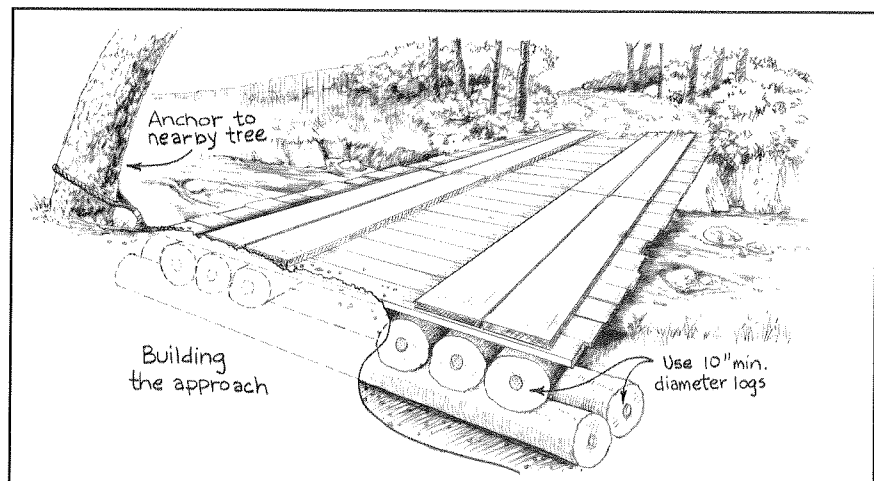
Timber bridges can be placed over small streams or channels with firm, stable banks.

Check with the appropriate regulatory agency in your state to see if permits are required to build timber bridges.

When building and installing a log stringer bridge:

- ▶ Use logs from a high-strength species (e.g., oak or pine) that are rot-free. They should be at least 10 inches in diameter on the small end.
- ▶ Cut logs at least 6 feet longer than the width to be spanned (e.g., use logs 18 feet long for a 12-foot-wide stream). Use at least six logs, more if using aspen, basswood, or other low-strength species.
- ▶ Place abutment material (e.g., one or more logs or railroad ties) on each bank parallel to the stream flow. This helps level the structure, minimizes stream bank disturbance, and makes removal easier.
- ▶ For each wheel path, place at least three logs on the abutments. Tie together the logs in each wheel path with three cables and clamps.

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



Log stringer bridge

- ▶ Nail lumber between the two wheel paths to stabilize the bridge and to catch debris that may drop off passing vehicles.
- ▶ Build approach ramps. Stabilize them as needed using wood mats, wood panels or pallets, expanded metal grating, or other materials.
- ▶ Anchor one end of the bridge with a cable to a nearby upstream tree or other fixed object. Add guardrails or curbs to the bridge if you will be using trucks to haul loads.
- ▶ After you finish construction, immediately revegetate the banks and any disturbed areas. This will prevent soil from eroding into streams.

When building and installing a solid-sawn stringer bridge:

- ▶ Follow directions for building and installing a log stringer bridge, substituting lumber from a high-strength species. The lumber must be at least 8 inches thick and 8 inches wide.

When installing a panel bridge:

- ▶ Follow directions for installing a log stringer bridge, using stress-laminated, glued-laminated, dowel-laminated, or nail-laminated panel sections centered in each wheel path. Place panels side by side with lumber covering any gaps between them.

### **Advantages**

Operators can find materials for timber bridges at the site or purchase them locally or through commercial outlets. Little site preparation is needed. Structural characteristics are known and engineering specifications may be available for lumber or panels. Operators can remove and reuse timber bridges several times. Local water regulators generally favor timber bridges.

### **Disadvantages**

Timber bridges may pose a safety hazard if operators don't get help from a licensed engineer or accurately assess the strength of logs and other construction materials. Logs, railroad ties, and demolition materials can have rot, knots, and other problems that affect strength. If operators don't use proper abutments, timber bridges may freeze into the ground during the winter. Surfaces may wear quickly during skidding operations.

### **Maintenance**

Inspect timber bridges during and between uses to check for signs of wear or weakness.

### **Related Fact Sheets in This Series**

*Temporary Stream Crossing Options* (FS-7001); *Fords* (FS-7002); *Culverts* (FS-7003); *Ice Bridges* (FS-7004); *Railroad Car, Steel, and Prestressed Concrete Bridges* (FS-7006); 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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