

### The FITT initiative

This guide was published by FPInnovations — Feric's Forest Innovation and Technology Transfer initiative, based in Sault Ste. Marie. FITT provides forestry contractors and the forest industry in Northern Ontario with a range of services to help keep abreast of the latest innovations, working methods and developments in technology.

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This guide is part of a series that presents best practices to **reduce damage during partial cut operations** in the Great Lakes-St. Lawrence Forest Region of Ontario

# Installing Water Crossings in Harvest Blocks



## A Practical Guide for Forest Workers

If not installed properly, water crossings used during harvest operations risk damaging watercourses, which in turn can affect water quality and fish habitat.

FPInnovations — Feric created this guide to help machine operators adopt best practices and thereby prevent damage to streams should water crossings be required.

### Best Practices



#### Plan Your Work!

Choose a crossing location with the following characteristics:

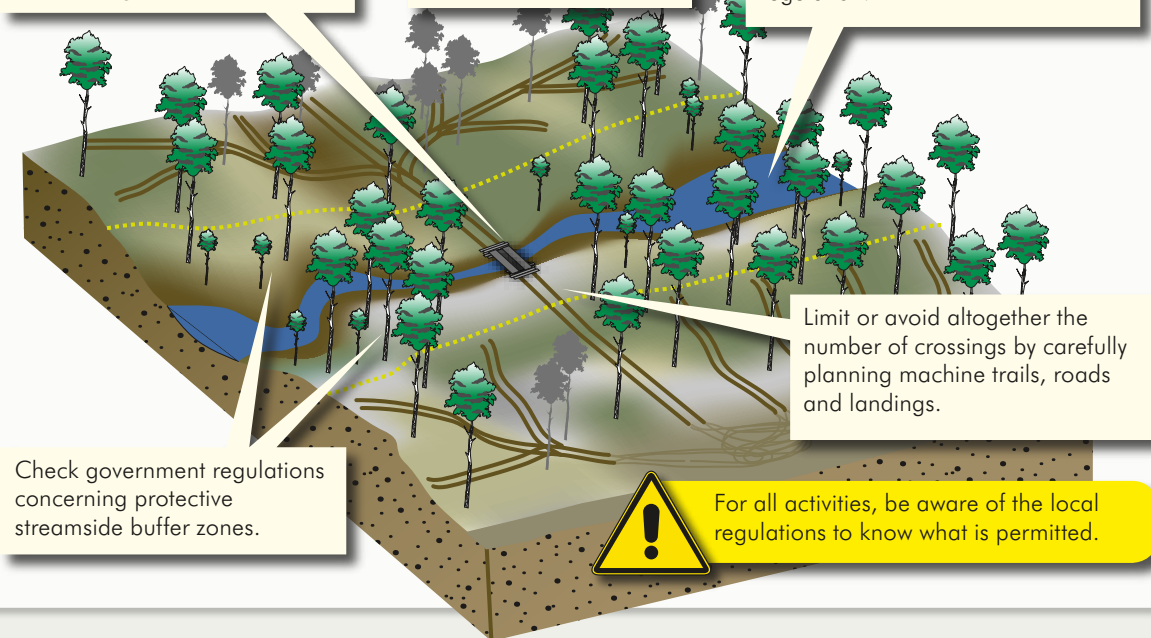
- Narrow stream width
- Solid, stable stream bank and bed that can withstand possible damage
- Not associated with sensitive fish or wildlife habitat, e.g. a riffle or stick nests
- Located on flat ground and having a good bearing capacity

Identify all crossings and streamside buffer zones before harvest begins.

Schedule work to avoid activities during wet weather.



Determine stream class, i.e. permanent, intermittent or other to apply the correct government regulation.



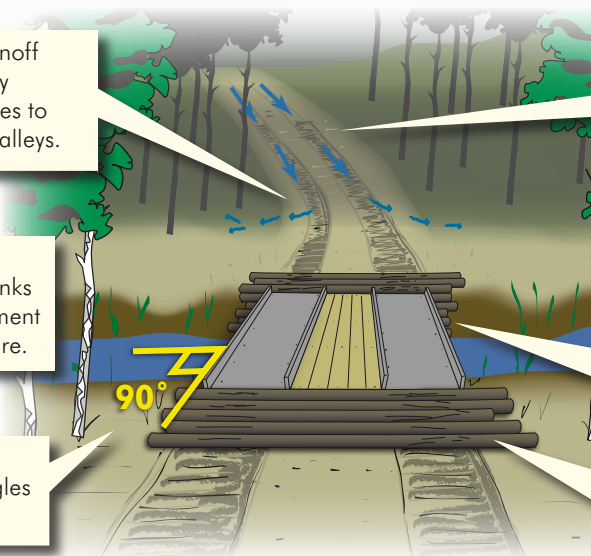


Construction and Installation

Redirect trail water runoff away from streams, by curving the approaches to crossings located in valleys.

Minimize equipment damage to stream banks or beds during placement of the crossing structure.

Align water crossing structures at right angles with the stream.



Choose a crossing site that minimizes the slope of the machine trail approaches to the crossing.

Avoid dropping trees or debris into water.

Place logs on the stream banks and under the structure to protect against damage.

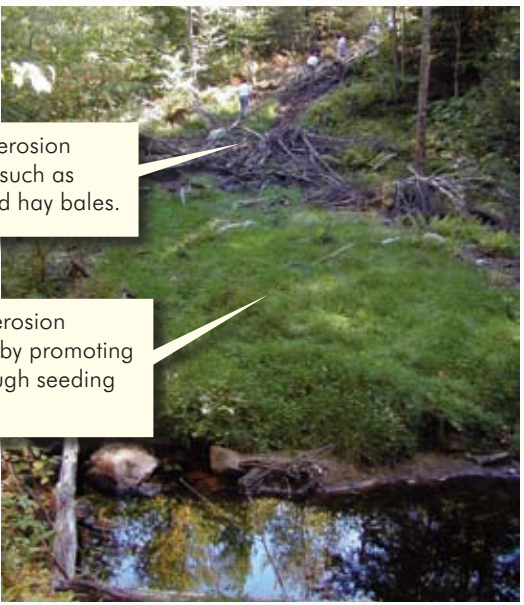
Place logging debris or corduroy on approaches to the crossing to minimize rutting and transport of soil material.

Decommissioning


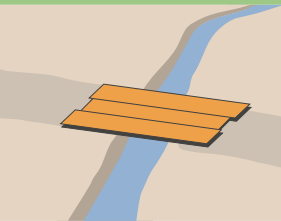
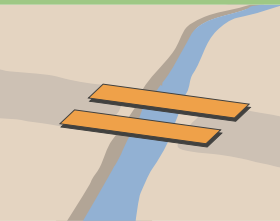
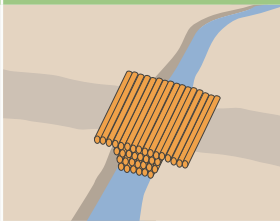
- Immediately remove crossings when no longer required.
- Remove any pooled water in machine trails or install barriers to stop movement. Employ water bars or off-takes.
- Stabilize exposed mineral soils at the crossing site and on approaches.
- Additional information can be found in the companion guide Controlling Soil Erosion on Skid Trails and Landings.

Install short-term erosion control measures such as logging debris and hay bales.

Install long-term erosion control measures by promoting revegetation through seeding and mulching.



Choice of Structure

Factors to consider	Full deck bridge	Partial deck bridge (planks)	In-stream crossings												
<ul style="list-style-type: none"><li>• Type and size of equipment (skidder vs. forwarder)</li><li>• Number of anticipated crossings</li><li>• Stream class and characteristics (width, firmness of bed and banks, etc.)</li><li>• Season of use</li><li>• Structures in use in nearby similar operations. Consider creating a fleet or pool of structures that may be shared with other operations.</li><li>• Method of transportation of the structure to the crossing site</li></ul> <div><p><b>In winter operations:</b> Snow fills and brush may be used for temporary crossings on intermittent streams.</p></div>	 <table><tr><td>High</td><td>High</td></tr><tr><td>Traffic level</td><td>Site protection</td></tr></table> <ul style="list-style-type: none"><li>• Crossing types include steel or wood timber/log bridge and steel or high-density polyethylene arch</li><li>• Fully covered deck that helps protect stream</li><li>• Typically, the largest structure option so may be difficult to transport to the crossing site</li><li>• May be available in sections that can be transported to the site</li></ul>	High	High	Traffic level	Site protection	 <table><tr><td>Average</td><td>Average</td></tr><tr><td>Traffic level</td><td>Site protection</td></tr></table> <ul style="list-style-type: none"><li>• Usually made of steel or wood timbers</li><li>• Popular, with many designs available</li><li>• Since open decking can allow material to enter the stream, logs can be placed between planks</li><li>• Easy to transport</li></ul>	Average	Average	Traffic level	Site protection	 <table><tr><td>Low</td><td>Low</td></tr><tr><td>Traffic level</td><td>Site protection</td></tr></table> <ul style="list-style-type: none"><li>• Crossing types include pipe bundles, small round culverts and log bundles</li><li>• Machinery or crossing structure material is in contact with the streambed</li><li>• Must be used with streams with stable stream beds and banks</li><li>• May not be approved in all jurisdictions, but possibly used on intermittent or ephemeral streams</li></ul> <div><p><b>Note:</b> Fords can be used when a very low number of machine crossings are required.</p></div>	Low	Low	Traffic level	Site protection
High	High														
Traffic level	Site protection														
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**Note:** Fords can be used when a very low number of machine crossings are required.