FORDS: WHEN, WHERE, WHY AND HOW

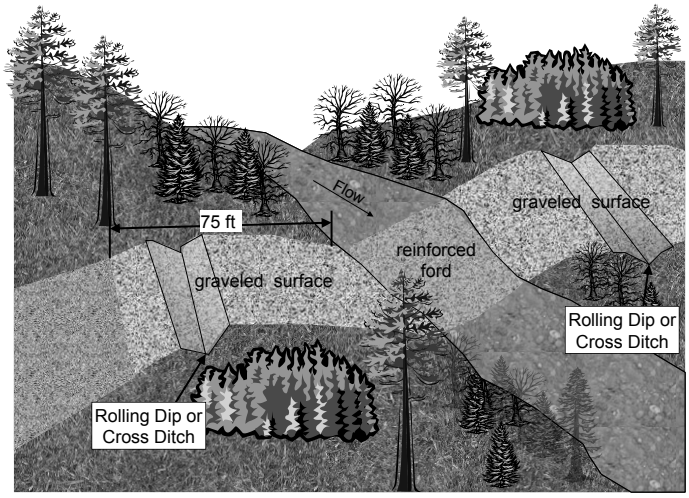
State Forester Forum

When the appropriate site conditions exist, fords can be a preferred alternative for a stream crossing from an economical and environmental perspective. This Forum examines the benefits of using a ford, the conditions when fords are appropriate, and basic ford construction techniques.

When constructing, reconstructing, or reusing a ford crossing, contact a local IDL Private Forestry Specialist for guidance on required permits and construction techniques that comply with the Forest Practices Rules.

WHY USE A FORD?

1. Under the appropriate conditions, fords are easier and less costly to construct and maintain than other types of crossings. Often, ford construction requires only the placement of rock on the stream banks and its approaches. Installation of a culvert or bridge would require much more time and expense. Properly constructed fords prove to require little maintenance, while culvert and bridge maintenance can be expensive.
2. The construction of most fords requires minor earthwork and rocking of the stream banks and its approaches, which contributes minimal sediment to a stream. Culvert installations involve much more earthwork and greater potential of sediment delivery to streams.
3. On streams that have high bedload movement or large amounts of woody debris or commonly develop ice dams, fords eliminate washout failures by allowing rock, debris, and ice to pass freely. In these conditions, culverts and occasionally bridges may have blockage and subsequent failure, causing severe impacts to the aquatic environment.
4. A proper ford will not obstruct natural stream flow, fish passage, or use of the flood plain. Culverts and bridges may disrupt stream flow by constricting the channel, causing upstream ponding, increase downstream water velocities, and limit use of the floodplain. These conditions increase stream scour and sediment transport, and culverts often restrict upstream fish migration.



George B. Bacon
Director and State Forester
Idaho Department of Lands
300 N. 6th Street, Suite 103
Boise, ID 83720
Phone: (208) 334-0200

Forest Practices

No. 7

October 2009

Craig Foss
Chief, Bureau of Forestry Assistance
3780 Industrial Ave. S.
Coeur d'Alene, ID 83815
Phone: (208) 769-1525

FORDS: WHEN, WHERE, WHY AND HOW

WHEN IS IT APPROPRIATE TO USE A FORD?

1. Fords are suitable for crossings with low-volume seasonal traffic. High flow would restrict traffic use during spring runoff, and heavy traffic could cause excessive erosion and sediment delivery to the stream.
2. Fords should not be used or constructed during times of salmonid spawning and egg incubation. Crossing vehicles could disrupt nearby spawning activities and reduce spawning success by introducing sediment to spawning gravels. More specific dates of times to avoid should be obtained from a biologist with local fisheries knowledge.
3. Fords should not be constructed or used in streams above household drinking water intakes to protect public health.
4. Ephemeral streams with high width to depth ratios are the preferable sites for a ford. Fords may also be constructed in small, shallow (< 2 ft. stream depth) perennial streams (less than 20 ft. stream width) with rocky substrates and flat gradients (less than 2%). Fords may be appropriate on wider streams when they have poorly confined channels that often change course from excessive bedload. Fords are not appropriate on deep, narrow stream channels.
5. Fords are appropriate in low public-use areas where people will not be tempted to drive motorized vehicles in the streambed. Fords constructed in high-use areas should be gated when in use and when no longer needed, large woody debris and/or boulders should be placed to prevent access to the streambed. Vegetation should also be restored along the stream. Consult a hydrologist if large woody debris or boulders are to be placed within the stream channel.
6. Remember that there are many types of stream crossings and fords are not always the best choice.

SALMONID SPECIES	SPAWNING	YOUNG EMERGE FROM GRAVEL
Rainbow trout	Mid March – Late June	Early June – Late August
Cutthroat Trout	Late March – Early July	Early June – Early Sept.
Chinook Salmon	Early August – Early Oct.	Late March – Late May
Bull Trout	Mid August – Late Oct.	Late March – Late May
Brook Trout	Early Sept. – Late Nov.	Mid March – Late May
Brown Trout	Late Sept. – Early Dec.	Early April – Early March
Kokanee	Early Sept. – Early Jan.	Early March – Late May
Lake Whitefish	Early Oct. – Late Jan.	Early April – Late May
Mt. Whitefish	Mid Oct. – Early Feb.	Early April – Late May

CONSTRUCTION RECOMMENDATIONS

1. On small, low-gradient streams (less than 2%) with semi-angular to angular rock bottoms (>1-inch diameter rock) and minimal traffic (no more than five crossings per day), the following is needed for a successful ford:

    A. If appropriate, a ford should be constructed at a right angle to the stream on a straight, shallow section of stream. Fords constructed on stream bends can result in erosion damage or failure due to channel movement.

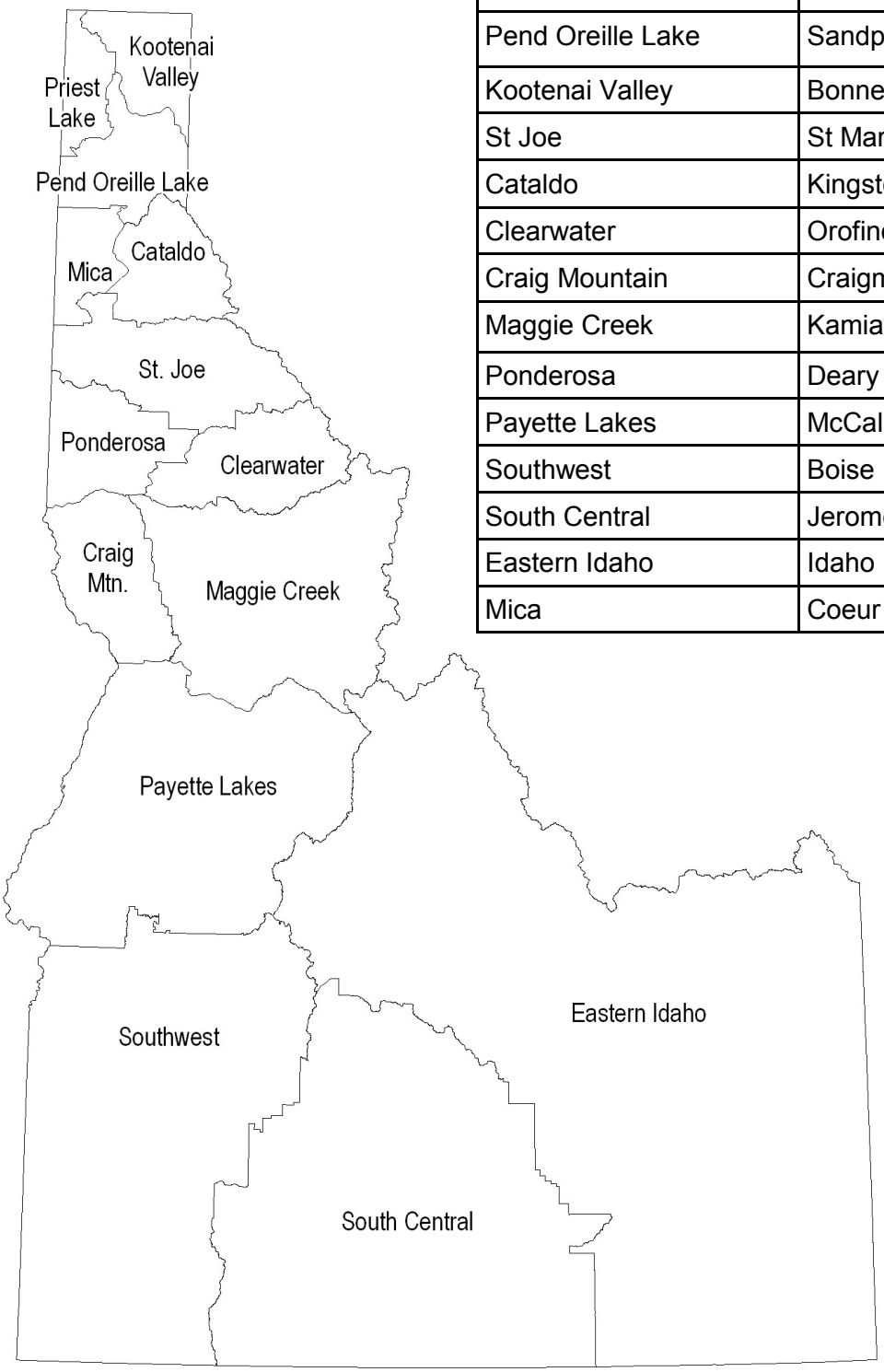
    B. Each approach to the ford should have a rolling dip or cross ditch or divert any water that may run down the road. Dips or cross ditches should drain into dense vegetation or filter strips, to prevent sediment from entering the stream.

    C. Approaches and stream banks should be rocked with angular gravel or pit run material for the entire width of the flood plain, ensuring that rocking occurs for at least 75 feet on each side of the stream. Rocking the approaches provides a suitable running surface, protects the stream banks and flood plain and keeps soil from sticking to tracks or tires, and washing off in streams. If the soil type for the approaches is fine grained, it is recommended to use a woven geotextile fabric between the subgrade and the gravel surfacing for added strength and separation (Figure 2). For lighter traffic, material should only be added to the streambed to level it out. For heavier traffic (including log trucks) even streams with course, angular substrate may need to be reinforced with additional rock, however, the added rock should not raise the level of the streambed significantly higher than the existing level or fish passage problems may result.

    D. The amount of vegetation removed adjacent to the crossing should be minimized and bank cuts should be revegetated immediately following construction.

2. If a ford is needed on a stream with silt, sand, fine gravel (less than 1-inch diameter) or rounded coarse material bottoms, steeper gradients (more than 2%), or that requires more than five crossings per day, an expert should be consulted.

3. Removal of fords—When a ford is no longer needed, it should be obliterated. This consists of placing large woody debris and/or boulders to prevent access to the streambed, restoring the riparian vegetation, and barricading the road. These actions help eliminate recreational use of the ford, increase stream bank stability, and provide future shade and structure to the stream.

FOR MORE INFORMATION CONTACT ANY IDAHO DEPARTMENT OF LANDS PRIVATE FORESTRY SPECIALIST

Area Office	Location	Phone
Priest Lake	Coolin	(208) 443-2516
Pend Oreille Lake	Sandpoint	(208) 263-5104
Kootenai Valley	Bonners Ferry	(208) 267-5577
St Joe	St Maries	(208) 245-4551
Cataldo	Kingston	(208) 682-4611
Clearwater	Orofino	(208) 476-4587
Craig Mountain	Craigmont	(208) 924-5571
Maggie Creek	Kamiah	(208) 935-2141
Ponderosa	Deary	(208) 877-1121
Payette Lakes	McCall	(208) 634-7125
Southwest	Boise	(208) 334-3488
South Central	Jerome	(208) 324-2561
Eastern Idaho	Idaho Falls	(208) 525-7167
Mica	Coeur d'Alene	(208) 769-1577