



PLANNING WOODLAND ROADS

FOREST STEWARDSHIP MANAGEMENT NOTE #5

INTRODUCTION

Alpena-Montmorency
CONSERVATION DISTRICT

In addition to being necessary for timber harvesting, woodland road development can be an effective means of improving several types of woodland benefits (#3). But careless road development can lead to many problems. To be successful, woodland roads must be carefully planned, constructed, and maintained.

This Note summarizes possible benefits and problems associated with woodland roads, provides general guidelines for layout of woodland road systems, and reviews legal considerations for crossing wetlands and streams.

POTENTIAL BENEFITS OF WELL-DESIGNED WOODLAND ROADS

1. IMPROVED RECREATIONAL OPPORTUNITIES:

Roads facilitate hiking, skiing, hunting, snowmobiling, biking, and they complement recreational trails (FSMN #32).

2. IMPROVED WILDLIFE HABITAT:

Roads can be seeded with forage species (FSMN #7).

Roads provide travel routes for animals.

Roadsides can produce berries and other wildlife food plants.

Roads diversify vegetation structure, promoting local wildlife diversity (FSMN #41).

3. IMPROVED ACCESS PROMOTES MANAGEMENT EFFICIENCIES:

Landowners are more likely to keep an eye on their land.

Foresters need less time to do their work.

Loggers will pay more for stumpage.

Problems (fire, pests, etc.) can be better managed.

Firewood can be more easily obtained.

Other enterprises (e.g., maple sugaring) can be made more efficient.

4. IMPROVED ENVIRONMENTAL PROTECTION:

Logging damage to timber, soil, and water can be reduced (FSMN #6).

POTENTIAL PROBLEMS OF POORLY DESIGNED WOODLAND ROADS

1. ENVIRONMENTAL DAMAGE:

Soil compaction and erosion can be severe (#1,8).

Sedimentation of water bodies can destroy aquatic life (FSMN #6,31).

2. WILDLIFE PROBLEMS:

Increased human activity can disturbance some species.

3. HUMAN PROBLEMS:

Unauthorized use can damage soil and disturb wildlife and owners (FSMN #2).

Visual quality can be reduced (FSMN #33).

GENERAL GUIDELINES FOR LAYOUT OF WOODLAND ROADS

1. CUSTOM COMPROMISE APPROACH - To maximize the potential benefits of woodland roads and to minimize their potential problems, their location must be customized to the landowners' goals and to the limitations of the specific property. Environmental considerations should be given priority. Beyond this, compromises must often be made between timber, recreation, and cost considerations.

2. ROAD SYSTEM COMPONENTS - Although the distinctions are not always clearcut, woodland road systems generally consist of three main parts: (1) Skid roads that are used to bring harvested logs to landings, (2) Log landings that are used to stockpile harvested logs, and (3) Haul roads that are used to remove stockpiled logs from the property. As haul roads receive the heaviest use, they need to be designed to higher standards than skid roads.

3. ENVIRONMENTAL PROTECTION

- Avoid steep slopes, wetlands, and depressed topography, such as valley bottoms, where water tends to collect.
- Consult topographic and soil survey maps (FSMN #4). County Soil Surveys describe the limitations of each soil type for erosion potential as well as for various construction and engineering properties.
- Give preference to ridge tops or side slopes so water can be diverted from the road. Angle roads across slopes rather than going directly up hills. South- and east-facing slopes tend to be the drier than north- and west-facing slopes.
- Where wetlands must be crossed, winter roads that allow access during frozen ground conditions can be used (#5). Permanent roads in wetlands must be very carefully built to avoid blocking drainage patterns (#12).
- Keep road grade below 10%, except for short distances (less than 300 feet), where grades of 15-20% are allowable. To calculate grade (% slope), divide the vertical rise by the horizontal distance traveled and multiply by 100. Avoid long, steady grades and long flat (less than 2% grade) stretches that permit the buildup of water. Grades of 3-5% are best.
- Where grades are less than ideal, water diversion structures should be used at recommended intervals (FSMN #6).
- Observe recommended buffer distances between roads and water bodies and wetlands; for 0-10% slopes, minimum filter strip width should be 50-100 feet; steeper slopes should have wider buffers (#5).
- Avoid stream crossings, but where streams must be crossed, keep road at right angle to the stream to minimize distance (unless slope at right angle is too steep). See Legal Considerations below and FSMN #6.
- To reduce erosion resulting from unauthorized traffic, locate road heads where gates can effectively block traffic.
- Where traffic levels permit, stabilize roads by establishing herbaceous vegetation on them (FSMN #7).

4. TIMBER MANAGEMENT

- Use "loop" or "herringbone" patterns to good access with less road length.
- Landowners and contractors should walk the entire length of proposed routes together before construction to discuss matters affecting the owners' objectives and construction costs and to locate problems not identifiable on maps or aerial photographs (#3).
- Old roads are often easier to use, but building new roads is better if the old roads are poorly located.
- Roads are most efficient when they provide access off both sides. therefore, avoid locating roads next to property boundaries.
- Make roads 10-12 feet wide, wider on curves and turnouts.
- Curves should be gradual (35-foot radius for short-bodied vehicles; 50-foot radius for tractor trailers) and located on as level a grade as possible.
- Provide turnouts to permit passing and parking on long roads.
- Provide ample space for turning around on dead ends.

- Log landings should be located on well-drained soils away from water bodies and wetlands and planned as part of the overall road system. See References #2 and #5 for further guidelines.

5. RECREATION AND AESTHETICS

- Carefully consider the location of roads in relation to places of special interest to landowners, such as scenic areas or favored hunting spots. In general, roads should be located close to, but not through, such areas.
- Plan loops rather than dead ends wherever possible.
- In areas where timber is being managed by selective harvesting, consider cutting fewer trees along roads to reduce understory growth and maintain visibility.
- Layout roads in gentle curves rather than straight lines.
- See FSMN #33 for aesthetic considerations.

THE CONSTRUCTION PHASE OF WOODLAND ROAD DEVELOPMENT

During the road development process, consideration must also be given to construction details. The "BMP's" (#5) provide voluntary construction standards for woodland roads in Michigan and should be consulted for specifications, along with other publications (4,7-11). Methods of diverting water from roads are discussed elsewhere in this series (FSMN #6).

LEGAL CONSIDERATIONS FOR CROSSING WETLANDS AND STREAMS

If possible, woodland roads should not cross wetlands or streams, but where this is unavoidable, special care must be taken to protect these valuable resources. The three Michigan laws summarized below are especially relevant, but other state, federal and local laws may also apply. For further information, contact your local Department of Natural Resources office or the Land and Water Management Division (Permit Coordinator), Michigan Department of Natural Resources, P.O. Box 30028, Lansing MI 48909, 517/335-2694 or 335-4235.

1. MICHIGAN'S INLAND LAKES AND STREAMS ACT (Act 346 of 1972, as amended)

This law regulates construction and other activities on most inland bodies of water in the state, including intermittent streams so long as there are definite banks, a bed, and visible evidence of flowing water during part of the year. Forest roads are not exempt from this law, and a permit is required to construct, enlarge, extend, remove, or place a structure across permanent or intermittent streams.

2. MICHIGAN'S SOIL EROSION AND SEDIMENTATION ACT (Act 347 of 1972, as amended)

This law requires a permit for earth change activities that disturb one or more acres of land or that occur within 500 feet of a lake or a stream. However, Section 16. of this act exempts logging, mining, and farming. There is controversy over whether "logging" refers only to timber harvesting per se or also to other aspects of logging operations such as roads and landings.

3. MICHIGAN'S WETLANDS PROTECTION ACT (Act 203 of 1979 as amended)

This law regulates construction activities in wetlands, including most marshes, bogs, wet meadows, shrub swamps, and wooded swamps. Forest road development and timber harvesting do not require permits if the roads are constructed and maintained in a manner to assure that any adverse effect on the wetland will be minimized. This means, for example, that the amount of fill should be minimized by crossing at narrow places and that natural drainage rates should be maintained by using upstream collector ditches, adequately-sized and properly placed culverts, and downstream discharge ditches (#12).

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