

Best Management Practices

Introduction

The following sections of this Manual provide the listing and application of Best Management Practices established for silviculture operations in Florida. The BMPs are arranged by specific application to various land types, waterbody types, forestry activities and special conditions. It should be noted that the Special Management Zone concept, described in the previous section, is also a BMP and is frequently referenced under the various BMP applications.

The Best Management Practices in this Manual are generally presented as individual practices within a particular category. However, the basic BMP concept is the implementation of all practices that apply to a given forestry operation. In that regard, no single practice is designed to accomplish the total BMP objective. For example, applying the SMZ criteria to a stream within a forestry operation without regard for other applicable BMPs, could significantly reduce the effectiveness of the SMZ to protect water quality. On a given forestry operation, the effectiveness of any particular practice, as well as overall BMP effectiveness, is largely dependent upon the implementation of all applicable BMPs throughout all aspects of the operation.





Application of BMPs: Public Lands

Unlike forest management on private lands, the need to derive economic return may not be the dominant force that leads to public land ownership or drives public land management. Often, the acquisition and management of public land has as its objective, to maximize ecological restoration, preserve existing natural resources and facilitate optimum public use.

When such is the case, the BMPs in this manual must be considered as minimum standards that, by themselves, will not always achieve public land management goals. Consequently, public land management agencies charged with developing and implementing management plans for public lands should do so in conformance with this Manual, and to the greatest extent practical, with the following enhancements:

Areas within the Special Management Zone designated as a Primary Zone should be managed as a no-cut zone. Any timber harvesting within these no-cut zones should be limited to operations that are in association with ecological restoration or wildlife habitat enhancement practices. However, isolated wetlands and intermittent streams on state forests shall be exempt from OFW derived Primary Zones. Each individual state forest, within the forest management plan, shall prescribe management practices for isolated wetlands and intermittent streams on a case by case basis.

The Special Management Zone is only one of the BMP concepts that may warrant additional consideration by land managers prior to implementation on public lands. Public land management agencies are advised and encouraged to augment the BMPs where appropriate, particularly on lands that are managed for non-forestry objectives. Protection of forested wetlands within these lands should be given special consideration.

In addition, such agencies should maintain environmental/ecological inventories of public lands and actively implement and study alternatives that exceed the BMPs in this manual. Results should be well documented to help facilitate future BMP revisions. Copies of enhanced management plans or any such studies should be forwarded to the Florida Department of Agriculture and Consumer Services, Florida Forest Service.

Note: *Public land management agencies must often adhere to specific legislative provisions or policies when developing and implementing management plans on certain public lands. In particular, the USDA Forest Service is constrained by the Clean Water Act, the National Forest Management Act, and National Environmental Policy Act to develop and implement a Land and Resource Management Plan that will govern management of certain federally-owned forested land. Similar constraints may occur in legislation that governs acquisition and management of lands owned or controlled by local, regional, or state agencies.*

To the extent that adherence to these BMPs do not conflict with legislatively established management goals, objectives, requirements, or mandates, public agencies are required to incorporate these BMPs into management plans. In addition, to the greatest extent practical, public agencies are encouraged to incorporate the above BMP enhancements wherever applicable.

Application of BMPs: Wetlands

For regulatory purposes, wetlands are defined by the presence or absence of specific types of vegetation, soils and hydrologic conditions. However, it is not the intent nor within the scope of this Manual, to define wetlands for regulatory purposes or to use any particular regulatory definition. Wetlands, for the purpose of this Manual, are listed by type in Appendix 5.

In addition, areas of pine flatwoods may contain certain wetland types listed in this Manual, such as cypress ponds. However, for the purpose of this Manual, pine flatwoods are not considered wetlands. Conversely, the presence of pine species within swamps, sloughs or floodplains does not necessarily make these areas “pine sites.”

Because of the generally wet soil conditions associated with forested wetlands, some of these areas can be very sensitive to forestry activities, particularly during flooding or periods of soil saturation. For silviculture operations in general, wetlands are probably most susceptible to changes in hydrology or hydroperiod, which can result from improper forest road construction, logging operations, and certain types of site preparation activities.

In general, the BMPs that apply to any other land type also apply to wetlands. For example, a stream within a wetland area would receive a SMZ, and a road or stream crossing constructed within a wetland would be required to apply the appropriate BMPs. However, because of the sensitivity of some types of wetlands to certain forestry related activities, the following special BMPs also apply.

Drainage and Conversion

- Ditching in association with road construction and maintenance, fireline plowing or other activities in wetlands, must not significantly change the hydrologic condition of wetlands or the overall drainage pattern of the site.
- Do not significantly alter the natural drainage or flow patterns on forest lands immediately adjacent to wetlands, particularly isolated wetlands, such as cypress ponds or gum ponds. Logging slash must not be pushed into or piled around ponds or other isolated wetlands.
- Do not conduct intensive mechanical site preparation such as bedding, raking and windrowing in wetlands.
- Avoid fireline plowing in wetlands (see Fireline Construction).

Roads

- When constructing roads in wetlands, refer to the Roads section of the manual in addition to the following BMPs.
- Avoid fill road construction, especially in floodplains or other wetlands





with flowing water. Roads constructed at ground level are less likely to restrict flowing water.

- Do not construct permanent roads in wetlands except to serve large and frequently used areas, provide access for a crossing, or provide fire protection.
- When crossing wetlands, insure that fill roads are properly and adequately culverted and do not act to impound or divert normal stormflow, flood flow or sheet flow (see Stream Crossings).

Harvesting

- For harvesting timber in wetlands: **wetland area** means the acres of each contiguous wetland within a contiguous ownership; **selectively cut** means to harvest in accordance with the Management Criteria for the Primary Zone of the SMZ (see Special Management Zones); **leave trees** are large, mast producing and/or cavity trees that represent the older age classes within the stand. For stands where cypress trees are predominant, cypress trees should be selected for leave trees to the extent that safety and harvesting operations allow, and the number of leave trees per acre should be the upper limit of the ranges listed below. In addition, pond cypress trees should be cut at a point on the stem that approximates the average high water mark (except for skid trails or roads). The average high water mark can usually be identified by the water stain line, the lichen line or the area at which the stem begins to swell (buttress).

A) Harvesting in a wetland area less than 200 acres must meet the following criteria:

- 1)** retain all snags within the wetland area, to the extent that safety and harvesting operations allow; and,
- 2a)** retain at least 3 to 5 leave trees per acre: if a wetland flow-way is present, leave trees should be left along it's center line; otherwise leave trees should be randomly distributed throughout the wetland; **or,**
- b)** retain at least 10% of the harvest area as selectively cut: the 10% area may be left anywhere on-site. However, for wetlands with a well defined stream, an SMZ (as specified in the SMZ section) will be required for the stream, and may be used as part or all of the 10%; for flowing wetlands the 10% should be left along the center line of the wetland flow-way to the greatest extent possible.

Note: 2b) is the preferred option where it is applicable

B) Harvesting in a wetland area 200 acres and larger must meet the following criteria:

- 1)** retain all snags within the wetland area, to the extent that safety and harvesting operations allow; and,
- 2)** retain at least 1 to 2 leave trees per acre: leave trees should be left

along the center line of the wetland flow-way if applicable; otherwise leave trees should be randomly distributed throughout the wetland.

3) clearcut areas cannot exceed 160 acres in size.

4) clearcuts should be separated from any other clearcut by a 200' selectively cut buffer or by a 200' wide area which has an average tree height of at least 20 feet. However, multiple clearcuts within any 160 acre harvest unit may be separated by a 100 foot buffer. Limited timber harvesting is allowed within the 100 foot buffer provided that trees left in the buffer are equivalent to the number and size specified in the leave tree requirements described above. Under this scenario, the trees left in the 100 foot buffer will satisfy the "leave tree" requirements for the clearcut area associated with it, and no other leave trees would be required. For wetlands with a well defined stream(s), the Primary Zone left along the stream may be used to contribute toward the 200' requirement. For flowing wetlands, trees left along the center line of the wetland flow-way should be used to separate clearcut areas where applicable.

C) A harvest unit which contains five or more small isolated wetlands, each less than two acres in size, must retain 20% of the number of isolated wetlands unharvested¹. For example, if the harvest unit contains ten, two acre cypress ponds, eight may be clearcut and two must be left uncut until the regenerated stands on the other eight attain an average tree height of at least 20 feet.

Skidding

- Minimize skidder and other heavy equipment operation in wetlands during wet conditions to avoid widespread excessive soil rutting. Although some minor rutting may occur in a typical wetland harvesting operation, skidders and other heavy equipment operations should be planned for dry seasons and/or dry periods as much as possible. When excessively wet harvesting conditions are unavoidable, low ground pressure equipment such as dual-tire skidders, tracked machines or special techniques such as "mat-logging" or "shovel-logging" should be employed where practical and economically feasible.
- To the greatest extent possible: forestry operations in wetlands which exhibit seasonal inundation or saturation should be limited to dry conditions only, and forestry operations in wetlands which are continually saturated or inundated should be limited to low-water conditions.
- When skidding in wetlands with organic soils, concentrate skid trails to as small an area as possible, and minimize the number of trails on a given site (see Timber Harvesting).





Mat (Shovel) Logging:

- Minimize the width of skid trail mats – mats should not exceed 20 feet in width, on the average, except for sections of the trail where it is necessary for equipment to pass – in these sections the minimum width may be doubled.
- Minimize the number of skid trail mats – typically, trails should not be spaced closer than 200 feet, on the average. Where conditions prohibit tracked machines from operating off the mat, spacing may be reduced to 50 feet in order to minimize site disturbance. However, under no conditions should skid trail mats exceed 25% of the harvest area.
- Timber for skid trail mats should be laid down in the direction of the trail under normal conditions.
- Use only one layer of timber for skid trail mats, except where multiple layers are necessary to prevent site disturbance.
- Where multiple layers of timber are necessary to construct the skid trail mat, the bottom layer may be laid down perpendicular to the trail, and may exceed 20 feet in width to maximize weight distribution.
- Merchantable material in skid trail mats should be removed after logging operation is complete.
- For stream crossings with skid trail mats, refer to the stream crossing section of the BMP Manual.

Note: *Ditching and drainage activities as well as the placement of fill material in wetlands generally requires a permit from regulatory agencies. Individuals engaged in such activities are advised to contact the appropriate agency for specific guidance (Appendices 13 and 14). In addition, state water quality standards may apply to wetlands that are connected to streams, lakes, or other waterbodies.*

Note: *Typically, cypress planting is not necessary on a large scale basis; however, where site conditions or other factors conducive to natural regeneration of stands are limited, planting of cypress seedlings may augment reforestation efforts.*

¹*Retaining isolated wetlands that have the following characteristics may improve the habitat value for wetland dependent species within the landscape:*

Intermittent surface water.

Wetland margin dominated by native wetland plants.

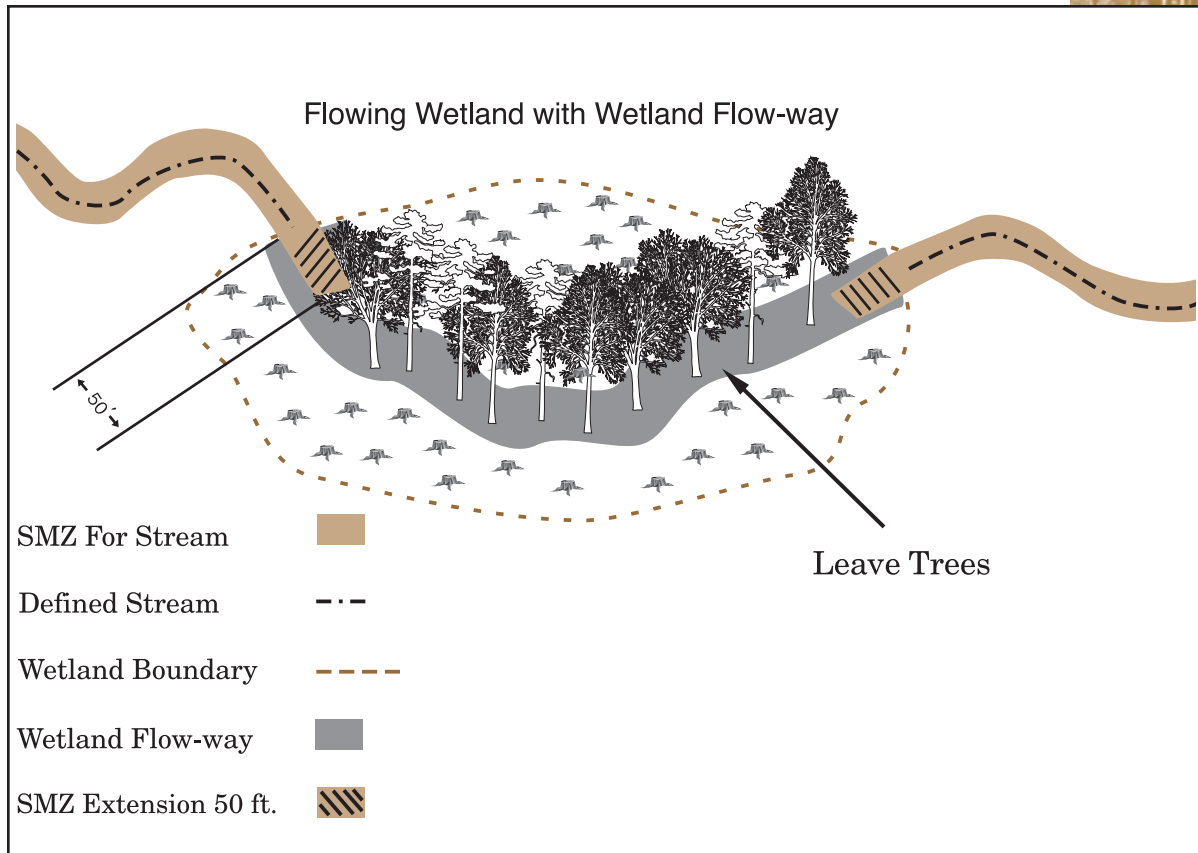
High species and age class diversity in standing timber.

Presence of snags and den trees.

Unique plant communities.

Where natural hydrology is least disturbed.

Figure 4





Application of BMPs: Canals

Best Management Practices for canals are designed to provide additional protection to Florida's water resources. Since canals are often connected to streams, lakes or other waterbodies, forestry activities adjacent to canals have the potential to impact water quality through such connections.

For the purposes of this Manual, the term canal does not include natural streams that have been hydrologically modified by dredging or straightening to enhance their efficiency to transport water. Although such "modified streams" may have been significantly altered, they are still geographically located to receive and transport storm water and thus are connected directly to other waters. In most cases, they continue to perform important natural stream functions particularly if they have associated wetlands. For these reasons, BMPs for modified streams (including SMZ criteria) are identical to those for any other naturally occurring perennial or intermittent stream, except for maintenance activities (see Canal Maintenance section).

Canals, for the purposes of this manual, are totally man-made and generally independent from natural drainage features. As artificial systems, canals exhibit only periodic and limited characteristics of natural streams and usually receive periodic maintenance. Canals do not include forestry road-side ditches or upland field ditches.

BMPs for Canals

- During normal silvicultural operations, do not operate heavy equipment within canals or in such a manner as to result in damage to the canal bank.
- Avoid canal crossings when possible. Where necessary, construct crossings in accordance with the Stream Crossings section of this manual.
- Do not conduct bedding, chopping or other site preparation activities in such a way that results in direct surface water discharge into a canal.
- Avoid dropping logging slash in canals; remove significant amounts of logging slash from canals.
- Do not discharge pesticides not approved for aquatic use, fertilizer, or other pollutants into canals. Do not dispose of chemical containers and/or equipment rinse water in canal waters.

Canal Maintenance

- Maintenance for modified streams and canals should be minimized. When necessary, conduct canal re-dredging during periods of low flow. Minimize disturbance to canal banks and retain as much “streamside” vegetation as possible.
- Use appropriate erosion, sediment and turbidity control practices to reduce sediment transport.
- When conducting road maintenance adjacent to a canal, do not discharge road spoil on the canal-side of the road.

Note: *Before conducting canal Maintenance, contact the appropriate regulatory agency(s) - such activities normally require authorization and/or permits (Appendix 13).*





Application of BMPs: Sinkholes

Sinkholes are important waterbodies because geologically and hydrologically active sinks may form a direct connection between the land surface and groundwater with little or no filtration through soil layers. Consequently, any pollutants that enter a sinkhole have the potential to contaminate groundwater. Sinkholes support a unique combination of plants and animals that are very sensitive to pollution, temperature and sunlight changes and may depend on leaf litter and organic debris for food sources.

In addition to the water resource concerns for sinkholes, there are also safety concerns. Ground conditions near sinkholes may be very unstable geologically and prone to collapse. Heavy equipment operation in and around these areas could result in damage to or loss of equipment, structures, and physical harm to workers and operators.

BMPs for Sinkholes

- For sinkholes with perennial or intermittent open water, or which connect to an intermittent or perennial stream, apply the appropriate Special Management Zone to the sinkhole (See Application of SMZs).
- Do not place any debris, trash, or waste in any sinkhole or in any surface drainage feature that flows into a sinkhole.
- Avoid mechanical operations such as harvest or site preparation, fertilization, or pesticide use in sinkholes.
- When working adjacent to sinkholes, do not alter land surface slope to direct surface drainage into the sinkhole - apply mechanical site preparation such as bedding on the contour.