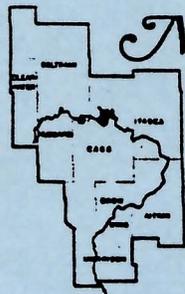




**A REVIEW  
OF  
MODEL LAND USE  
REGULATIONS**

prepared for



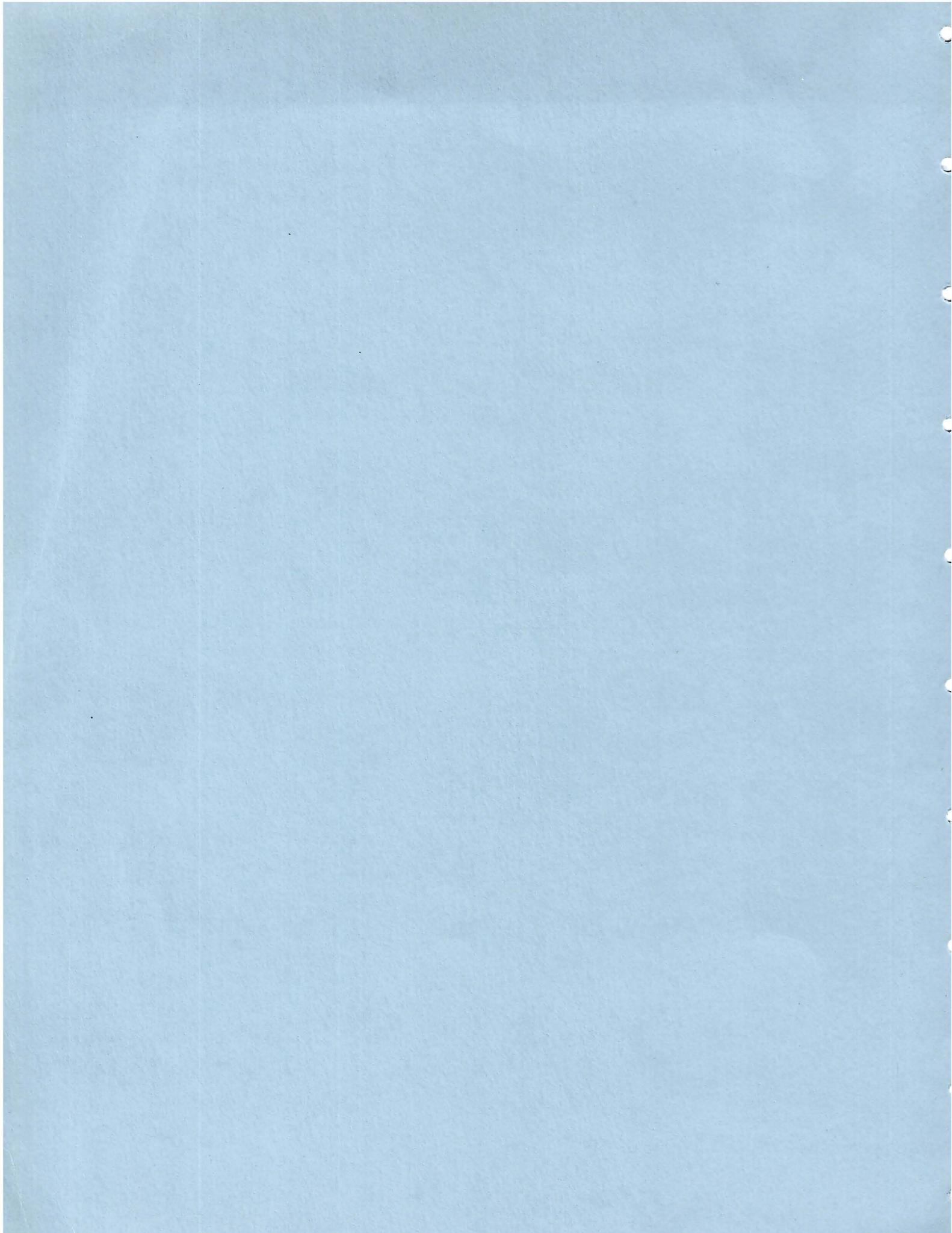
**Mississippi Headwaters  
Board**



prepared by



**National Park Service  
Midwest Region  
Rivers and Trails Conservation Assistance Program**



**A REVIEW OF MODEL LAND USE REGULATIONS  
FOR THE  
MISSISSIPPI HEADWATERS BOARD**

Prepared for:  
Mississippi Headwaters  
Board  
Walker, Minnesota

Prepared by:  
National Park Service  
Midwest Regional Office  
Division of Planning and  
Environmental Quality

January, 1990



## EXECUTIVE SUMMARY

The Mississippi Headwaters Board (MHB) was created to better plan and protect the upper 466 miles of the Mississippi River in north central Minnesota. The board's creation was an alternative to National Wild and Scenic River designation for 400 miles of the river. The Department of the Interior agreed to withhold its recommendation for designation of the river provided that the Mississippi Headwaters Board prepared a management plan and implementing programs for the protection of the river. In 1981 the board adopted a plan and model zoning ordinance. The model zoning ordinance was adopted by all eight counties included in the Mississippi Headwaters Board.

The Mississippi Headwaters Board is nearing its tenth anniversary, and has chosen to use this notable anniversary to prepare a review and update of its plan and implementing programs. As a part of this review, the National Park Service through the Rivers and Trails Conservation Assistance Program reviewed the existing model zoning ordinance and proposed changes to the model ordinance. To facilitate this review the model and proposed changes were compared to ten river protection regulations and guidelines from various locations around the country. The ten examples used for comparison were the Minnesota Department of Natural Resources, rules for the Lower Saint Croix National Scenic Riverway; National Park Service, Sample Zoning Ordinance - Missouri National Recreational River; Michigan Department of Natural Resources, Stream Site landowner's guidebook; Northeastern Illinois Planning Commission, Model Stream and Wetland Protection Ordinance; New York Department of Environmental Conservation, Stream Corridor Management Manual; National Park Service and Conference of Upper Delaware Townships, Upper Delaware Scenic and Recreational River Management Plan; Maryland Chesapeake Bay Critical Area Commission, Criteria for Local Critical Area Program Development; Florida Department of Community Affairs, Suwannee River Model Floodplain Ordinance; Suwannee River Water Management District, rules for Surface Water Management and Works of the District; and Oregon State Parks and Recreation Division, Oregon Scenic Waterways Program, Landowner's Guide.

The Mississippi Headwaters Board model ordinance was compared with the ten other examples in several categories: lot specifications, streambank and floodplain protection requirements, types of uses allowed, requirements for agricultural and forestry practices, requirements for roads and utilities, subdivision controls, signage restrictions, and requirements for docks and marinas. This review finds that the Mississippi Headwaters Board model ordinance provides protection

equal to or more restrictive than the other examples. There are two topics in which the other models usually exceed the MHB model, they are flood hazard prevention and stormwater management.

This report recommends several changes to the model ordinance which would address the few deficiencies found by the review. Changes recommended for lot specifications are a new setback for blufflines, a reduction in the difference between building and septic system setbacks, and addition of procedures to allow construction of buildings more than 35 feet in height. Recommended changes to streambank and floodplain protection requirements include a limit on the elapse time between grading and start of construction, prohibitions on building in the floodway, adding requirements to ensure that alterations to the natural topography do not displace flood waters, setting limitations on the maximum amount of impervious surfaces on a lot, and adding a requirement that stormwater runoff rates do not increase after development. Some changes which might be made to agriculture and forestry requirements are requiring a buffer strip for agriculture, a fencing requirement to keep livestock out of the river, a requirement for a soil conservation and water quality management plan for any land cleared for agricultural purposes, and a requirement for a minimum buffer for clearcutting activities. The subdivision requirements could be changed to require the inclusion of flood heights on plats, the installation of underground utilities if feasible, and the provision of open space and river access to all lot owners. The model ordinance requirements for boat access sites could be improved through the inclusion of requirements for stormwater management and standards for parking and sanitary facilities.

The changes suggested above are minor in comparison to the overall scope of the ordinance. This model with the recommended changes is one of the best stream protection regulations in the country. As such it may be used as a model for other localities. In addition, the review of the other ordinances and guidelines may be useful to planners attempting to develop stream protection ordinances.

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## SECTION I: INTRODUCTION

### PURPOSE

This report will compare the model land use regulations prepared by the Mississippi Headwaters Board (MHB) with several other model land use regulations or guidelines for riparian areas. The purpose of this document is to advise the MHB on the suitability of the existing model regulations and proposed amendments, and to recommend further changes which would strengthen the protection afforded the Upper Mississippi River. This report will compare both the current specific requirements of the MHB's model ordinance and the proposed changes to that ordinance with similar requirements in riparian land use regulations and guidelines from around the country. Ten other regulatory documents are used for comparison.

### BACKGROUND

The Mississippi Headwaters Board was created when the State of Minnesota sought an alternative to Federal Wild and Scenic Rivers designation of the Upper Mississippi River. In 1975 the Congress authorized a Department of the Interior study of the upper 466 miles of the Mississippi as a potential National Wild and Scenic River. The study found almost 400 miles eligible for the National Wild and Scenic River System and, in 1977, legislation was introduced for designation of these 400 miles. The legislation was subsequently amended to call for a more detailed study, and designation was deferred indefinitely. As an alternative to Federal designation, the eight counties of the headwaters area joined together to better plan and protect the Mississippi River. These counties formed a joint powers agreement as allowed by Minnesota law. The resulting group was entitled the Mississippi Headwaters Board. In 1981 the MHB adopted a management plan and model zoning ordinance for the 466 miles of the Mississippi in the eight counties. All eight counties subsequently adopted the model ordinance.

The Mississippi Headwaters Board is currently engaged in an update of the management plan and model ordinance. The MHB has requested technical assistance from the National Park Service in this update. This document represents one task in a cooperative planning effort to better protect the outstanding resources which made the Upper Mississippi eligible for the National Wild and Scenic Rivers System. Other tasks include an updated resource

inventory, a boundary review, a revised management plan, and finally, State legislation implementing the recommended changes.

## SECTION II: MISSISSIPPI HEADWATERS BOARD MODEL ORDINANCE AND PROPOSED REVISIONS

The model ordinance prepared by the Mississippi Headwaters Board regulates land use and density along the river and provides performance standards for some conditionally permitted uses. The ordinance designates two river zones, one with a density of 1 unit per 10 acres and the other with a density of 1 unit per 5 acres. The ordinance also sets, for each zone, building setbacks (200 and 150 feet respectively), minimum lot widths (330 feet in both zones), sewage system setbacks (150 and 125 feet respectively), and maximum residential structure height (35 feet in both zones). The uses that are permitted in both zones are single family residential, related essential services (commercial), agriculture, forestry, signage for health, safety, and recreation, temporary docks, and pedestrian public river access. One use, private roads and minor streets, is permitted in the higher density zone, but conditionally permitted in the lower density zone. Uses which are conditionally permitted in both zones are mobile homes, public roads, utility lines, signs not visible from the river, campgrounds and other recreation uses both public and private, resorts, public access with boat launches, permanent docks, and travel trailers and campers. Uses which are conditionally permitted in the higher density zone, but not the lower density zone, are underground mining, planned cluster developments, planned unit developments, and boathouses. All other uses are not permitted.

The model ordinance also addresses setbacks for sewage systems, protection of vegetation in the building setback zone, grading, filling or other alterations in the river bed, and subdivision of land. Performance standards are provided for forestry practices, utility lines, and roads.

The model ordinance has been used for the past eight years by the counties in the headwaters area. Based upon this experience, the staff of the MHB and the county zoning administrators identified several changes to the model ordinance which would improve administration of the ordinance. Changes recommended by the zoning administrators and board staff include several new definitions, new performance standards for campgrounds and resorts, and new performance standards for docks, public access areas, and signs. Substandard lots platted before 1981 are also addressed. Proposed changes on this topic include the requirement that adjacent lots in common ownership be combined, and the creation of a third zone, with smaller lot sizes. This third zone would allow for the development of existing substandard lots according to performance standards for that zone. Changes are also proposed in the permitted, conditionally permitted, and

nonpermitted status of several uses. Mobile homes would become a permitted use in both existing zones. Private roads and minor streets would become a permitted use in the higher density zone. Bed and breakfast establishments would be allowed as a conditional use. However, underground mining and boathouses would no longer be allowed as conditional uses. Planned cluster developments and planned unit developments would no longer be permitted.

Several other minor wording changes have been proposed and several changes in administrative requirements have been recommended. It has also been recommended that the boundaries of the river corridor be modified and that zoning similar to that required by the Mississippi Headwaters Board be adopted by the municipalities along the river.

The proposed changes will provide performance standards for all conditional uses and remove from the ordinance those zoning methods which have never been used, such as planned unit development. The changes also attempt to address the problem of existing substandard lots through two changes. One is a requirement to combine lots when feasible. The other is the designation of a limited area where development of existing substandard lots is permitted in accordance with specific standards.

### SECTION III: OTHER RIVER PROTECTION ORDINANCES AND GUIDELINES

The Mississippi Headwaters Board requested planning assistance from the National Park Service to assess the proposed changes to the model ordinance and to assess the requirements of the model ordinance with respect to other shoreline protection measures in use around the country. Several model ordinances, plans, and guidelines from around the country were selected for this comparative analysis. The sources selected for the analysis include the following documents.

The Minnesota Department of Natural Resources, rules for the Lower Saint Croix National Scenic Riverway.

These rules were promulgated to "protect and preserve the outstanding scenic, recreational, geologic, fish and wildlife, historic, cultural, and other similar values of the Lower Saint Croix National Scenic Riverway in a manner consistent with the National Wild and Scenic Rivers Act..." The rules set minimum standards which are to be embodied in local government ordinances. The standards include the following: establishment of urban and rural districts; designation of compatible land uses; minimum dimensions of lots suitable for building; placement of structures in relation to shorelines, slopes, and blufflines; standards for height and color of structures; type and placement of sanitary and waste disposal facilities; subdivision of shorelands and blufflands; regulation of marinas and other intrusions in public waters; and administration and enforcement provisions.

National Park Service, Sample Zoning Ordinances - Missouri National Recreation River.

These were prepared by the National Park Service to provide guidance to local governments along the Missouri National Recreation River, a unit of the National Wild and Scenic Rivers System. The purpose of the ordinances is to designate suitable land use along the river and to regulate lot size and river frontage width, location and operation of irrigation equipment, location of structures in respect to the river, and alterations of natural vegetation and topography. The ordinances are also intended to conserve and protect the recreation, fish and wildlife, aesthetic, historic, and cultural values of the river corridor.

Michigan Department of Natural Resources, Stream Site landowner's guidebook.

This document was prepared to "give those concerned about the enjoyment and protection of Michigan rivers some basic information about issues they should consider in planning for the use and enjoyment of their riverfront properties... [T]his booklet is designed to help prospective and present property owners avoid mistakes concerning location and construction of buildings, and management of vegetation along river banks." Topics discussed in the booklet include selection of building sites, design considerations for single family structures, vegetation management, stream bank erosion and stabilization, and subdivision layout.

Northeastern Illinois Planning Commission, Model Stream and Wetland Protection Ordinance.

This is a technical assistance document prepared by the commission to assist local governments with the protection of streams, wetlands, and other surface water resources. "Since state and federal regulations are not adequate currently to protect these resources, local regulation is all the more important...It is also at the local level that effective day-to-day decisions can be made in support of a high quality growth management process." "This ordinance creates a 'Lowland Conservancy Overlay District' as a complement to a jurisdiction's (municipal or county) zoning ordinance. Within a designated overlay district, special criteria and procedures are applied so that the development process results in protection and conservation of streams, wetlands and related resource areas."

New York Department of Environmental Conservation, Stream Corridor Management Manual.

This manual was prepared to provide local government officials "appropriate guidance as to the availability and use of planning, technical, regulatory, and other tools" for conserving and enhancing the quality of streams and related areas. Topics covered in the manual are many and varied. Stream problems, assessment of land use impacts on water quality and quantity, planning and problem solving methodology, stream conservation options, best management practices, and program implementation are all addressed. A series of appendices provide examples of management techniques from several regions of the country.

Upper Delaware Scenic and Recreational River Management Plan.

This document was prepared by the Conference of Upper Delaware Townships and the National Park Service and is the plan for administration of a unit of the National Wild and

Scenic Rivers System which flows through private lands. The plan describes compatible land use development and relies upon local government adoption of land use regulations to implement these land use controls. The plan includes "general guidelines to provide local, State and Federal governments with guidance in the preparation of and enforcement of land and water use regulations designed to implement the legislation designating the Upper Delaware as a Scenic and Recreational River." Topics addressed in the land use guidelines include protection of water quality, preservation of natural features, provision of recreational uses, provision for agricultural uses, conservation of river resources, and maintenance of land use patterns.

The Maryland Chesapeake Bay Critical Area Commission, Criteria for Local Critical Area Program Development.

In this document are rules promulgated by the State of Maryland to guide local governments in the preparation of Critical Area resource protection programs by setting minimum standards for those programs. The purposes of the programs are to "minimize adverse impacts on water quality that result from pollutants that are discharged from structures or conveyances or that have run-off from surrounding lands; conserve fish, wildlife, and plant habitat; and establish land use policies for development in the Chesapeake Bay Critical Area which accommodate growth and also address the fact that, even if pollution is controlled, the number, movement, and activities of persons in that area can create adverse environmental impacts." Topics covered by these criteria include land use development, development of water dependent facilities, shore erosion protection works, forest and woodland protection, agriculture, surface mining, natural parks, and habitat protection.

Florida Department of Community Affairs, Suwannee River Model Floodplain Ordinance.

The Suwannee River was determined to be eligible for the National Wild and Scenic Rivers System, but was not designated as such. Instead, the Governor of Florida appointed a resource planning and management committee of State agencies, regional agencies, local governments, and private citizens which prepared a management plan for the river by November, 1981. A model floodplain ordinance was prepared and adopted by local governments along the river as part of the implementation of the plan. The purposes of the model ordinance are to conserve and maintain the outstanding ecological, recreational, and aesthetic value of the Suwannee River and its tributaries; require proper

construction techniques that will protect against flood damage; control the alteration of natural floodplains, stream channels, and natural protective barriers; control filling, grading, dredging, and other development which may increase erosion or flood damage; prevent or regulate the construction of barriers which will unnaturally divert flood waters or which may increase flood hazards to other lands; protect individuals from unlimited utilization of lands which are unsuited for intended purposes because of flood hazards; maintain water quality; and protect wetlands.

Suwannee River Water Management District, rules for Surface Water Management and Works for the District.

The rules of the Suwannee River Water Management District complement the implementation of the model floodplain ordinance by the local governments. The major purposes of the rules are to regulate development to prevent water quality degradation, ensure proper storm water management, and reduce flood hazards, with nonstructural flood control methods given preference by policy. The rules also set minimum criteria for all development in the floodplain to maintain floodway conveyance and minimize soil erosion. Developments which do not meet these minimum standards must be put through an extensive permitting process.

Oregon State Parks and Recreation Division, Oregon Scenic Waterways Program, Landowner's Guide.

This was produced by the Oregon State Parks and Recreation Division to describe the requirements of the Oregon Scenic Waterways Program for landowners living along streams managed under the program. Topics discussed in this document include compatibility with adjacent uses and visual impact, river classifications, standards for buildings, standards for visual screening, standards for various land uses, water rights, mining, prospecting, buffer strips, farming, grazing, recreation facilities, roads, timber harvesting, historical and archeological resources, and conservation options. The guide is a general document; each river in the Oregon system has its own set of rules for management.

SECTION IV: COMPARISON OF THE MISSISSIPPI HEADWATERS BOARD  
MODEL WITH OTHER RIVER PROTECTION ORDINANCES AND GUIDELINES

Lot Specifications

The following tables compare the ten models with the MHB ordinance on lot dimensions, building densities, building setbacks, sewage system setbacks, and building heights. A review of the tables clearly shows that in most requirements the MHB model ordinance is the most stringent. The minimum lot widths (Table 1) are larger than in any other example. The building density limits (Table 2) are surpassed only by the Resource Conservation Area requirements of Maryland's Chesapeake Bay Critical Area rules. The building setbacks from the waterline (Table 3) are as large as any fixed width requirement in the examples. However, the variable width setback recommended in the New York State Stream Corridor Management Manual is a possible alternative which takes into account the slopes along bluffs. Another possible treatment for bluff lands is to require a 100 foot setback from the stream or 40 foot setback from the bluff line as was done in the rules for the Lower St. Croix. The septic system setbacks (Table 4) in the MHB ordinance are more stringent than nine of the examples; only the Lower St. Croix Rules require a larger setback for septic systems and then only outside of "urban areas". The Lower St. Croix rules make septic systems conform more nearly to the building setbacks. The MHB model allows the septic system to occupy one-quarter of the building setback in zoning class 1. This would seem to reduce the effectiveness of the building setback by reducing tree cover between the building and the river. The Lower St. Croix rules also provide for a setback from the bluff edge for septic systems. The building height requirements (Table 5) in the MHB model are the same as three of the four examples which contain this requirement. The fourth example sets a maximum of 30 feet. A possible modification to the building height requirement is to allow buildings in excess of 35 feet as a conditional use. This idea, borrowed from the Upper Delaware plan, would add flexibility to the requirement.

**TABLE 1**  
**COMPARISON OF LOT DIMENSION REQUIREMENTS**

<u>DOCUMENT</u>	<u>REQUIREMENT</u>
Mississippi Headwaters Board	30' wide, no depth requirement
State of Minnesota, Lower St. Croix	Rural: 200' wide; Urban w/ utilities: 100'; Urban w/o utilities: 150'; no depth requirements
National Park Service, Missouri National Recreation River	Rural: 200' wide; Urban w/ utilities: 100'; Urban w/o utilities: 150'; no depth requirement
Michigan Stream Site Guide	None
Northeastern Illinois Planning Commission	None
New York State Stream Corridor Management Manual	None
Upper Delaware National Scenic and Recreational River	150' wide, 35' from roads; no depth requirement
Maryland Chesapeake Bay Critical Area Rules	None, but Intensely Developed Areas identified in part by average lot sizes less than 100' wide

TABLE 1 (continued)  
COMPARISON OF LOT DIMENSION REQUIREMENTS

<u>DOCUMENT</u>	<u>REQUIREMENT</u>
Florida Department of Community Affairs, Suwannee River	None
Suwannee Water Management District Rules	None
Oregon Scenic Waterways Landowner's Guide	None

**TABLE 2**  
**COMPARISON OF BUILDING DENSITY REQUIREMENTS**

<u>DOCUMENT</u>	<u>REQUIREMENT</u>
Mississippi Headwaters Board	Zoning Class 1: 1 unit per 10 acres; Zoning Class 2: 1 unit per 5 acres
State of Minnesota, Lower St. Croix	Rural: 1 unit per 2.5 acres; Urban w/ utilities: 20,000 square feet; Urban w/o utilities: 1 unit per acre
National Park Service, Missouri National Recreational River	Rural: 1 unit per 5 acres; Urban w/ utilities: 20,000 square feet; Urban w/o utilities: 1 unit per 1 acre
Michigan Stream Site Guide	20,000 square feet recommended
Northeastern Illinois Planning Commission	None
New York State Stream Corridor Management Manual	1 unit per 4 acres, recommended
Upper Delaware National Scenic and Recreational River	1 unit per 2 acres average in corridor

TABLE 2 (continued)  
COMPARISON OF BUILDING DENSITY REQUIREMENTS

<u>DOCUMENT</u>	<u>REQUIREMENT</u>
Maryland Chesapeake Bay Critical Area Rules	Intensely Developed Area: more than 4 units per acre allowed; Limited Development Area: between 4 units per acre and 1 unit per 5 acres; Resource Conservation Area: no more than 1 unit per 20 acres
Department of Community Affairs, Suwannee River	None
Suwannee River Water Management District Rules	None
Oregon Scenic Waterways Landowner's Guide	None

**TABLE 3  
COMPARISON OF BUILDING SETBACK REQUIREMENTS**

<u>DOCUMENT</u>	<u>REQUIREMENT</u>
Mississippi Headwaters Board	Zoning Class 1: 200'; Zoning Class 2: 150'
State of Minnesota, Lower St. Croix	Rural: 200' from stream or 100' from bluff edge; Urban: 100' from stream or 40' from bluff edge
National Park Service, Missouri National Recreational River	Rural: 200'; Urban 100'
Michigan Stream Site Guide	150' recommended
Northeastern Illinois Planning Commission	75'
New York State Stream Corridor Management Manual	Varies with slope - 50' to 450' for construction, 25' to 225' for forestry
Upper Delaware National Scenic and Recreational River	100'

**TABLE 3 (continued)**  
**COMPARISON OF BUILDING SETBACKS**

<u>DOCUMENT</u>	<u>REQUIREMENT</u>
Maryland Chesapeake Bay Critical Area Rule	Intensely Developed Areas: None; Limited Development and Resource Conservation Areas: 25' for agriculture, 100' all other activity
Florida Department of Community Affairs, Suwannee River	75'
Suwannee River Water Management District	75'
Oregon Scenic Waterway Landowner's Guide	None stated, standards for individual rivers

**TABLE 4**  
**COMPARISON OF SEWAGE SYSTEM SETBACK REQUIREMENTS**

<u>DOCUMENT</u>	<u>REQUIREMENTS</u>
Mississippi Headwaters Board	Zoning Class 1: 150'; Zoning Class 2: 125'
State of Minnesota, Lower St. Croix	Rural: 200' from water line or 40' from bluff line; Urban: 100' from water line or 40' from bluff line
National Park Service, Missouri National Recreation River	40'
Michigan Stream Site Guide	100'
Northeastern Illinois Planning Commission	75' as per building setback
New York State Stream Corridor Management Manual	None
Upper Delaware National Scenic and Recreational River	no setback, relies on other regulations

**TABLE 4 (continued)**  
**COMPARISON OF SEWAGE SYSTEM SETBACK REQUIREMENTS**

<u>DOCUMENT</u>	<u>REQUIREMENTS</u>
Maryland Chesapeake Bay Critical Area Rules	Requires connection to public system in Intensely Developed Area; no other standard listed
Florida Department of Community Affairs, Suwannee River	75' per building setback
Suwannee River Water Management District rules	75' per building setback
Oregon Scenic Riverway Landowner's Guide	None

**TABLE 5**  
**COMPARISON OF BUILDING HEIGHT REQUIREMENTS**

<u>DOCUMENT</u>	<u>REQUIREMENT</u>
Mississippi Headwaters Board	35'
State of Minnesota, Lower St. Croix	35'
National Park Service, Missouri National Recreational River	35'
Michigan Stream Sites Guide	None
Northeastern Illinois Planning Commission	None
New York State Stream Corridor Management Manual	None
Upper Delaware National Scenic and Recreational River	35', with structures over 35' conditional use
Maryland Chesapeake Bay Critical Area Rules	None
Florida Department of Community Affairs, Suwannee River	None
Suwannee River Water Management District Rules	None
Oregon Scenic Waterways Landowner's Guide	30' facing river

## Summary

Overall, the requirements of the MHB model ordinance compare favorably with those of the ten other examples. Possible areas of improvement include adding building and septic system setbacks for bluff lands or a variable setback based on slope, reducing the differences between building and septic system setbacks; and possible conditional use provisions for structures over 35 feet in height.

### Streambank and Floodplain Protection Requirements

Requirements for vegetation protection, streambank alterations, floodplain management, and stormwater management in the ten examples were compared to the MHB model ordinance. These requirements represent direct measures to protect natural stream channels and water quality.

#### Vegetative Protection

Protection of natural vegetation along streams helps to control erosion, reduce flood effects, control water temperature, provide fish and wildlife habitat, and maintain natural scenery. The vegetation protection requirements of each example are summarized below.

Mississippi Headwaters Board. Cutting of trees within the building setback is not allowed except for forestry purposes and removal of dead and diseased trees. The selective cutting of trees having less than a 4 inch diameter at breast height (DBH) is allowed. Trimming of trees is allowed for specific purposes. Plans for clearcutting anywhere in the area of the Mississippi River zoning district are to be submitted to and reviewed by the board. The model ordinance contains standards for the review of the clearcutting plan.

State of Minnesota, Lower St. Croix River. A permit is required to remove trees within the building setback. Removal of trees having greater than a 6 inch DBH is not allowed if the trees are screening a structure. Removal of dead or diseased trees is allowed, as is trimming and pruning along transportation and utility rights-of-way.

National Park Service, Missouri National Recreational River. The standards of this example are similar to those of the Lower St. Croix.

Michigan Stream Site Guide. A greenbelt of 50 feet from ordinary high water is recommended. The guide contains recommendations for pruning which allow a view from a home while maintaining a vegetative screen between the home and the river.

Northeastern Illinois Planning Commission. A 25 foot strip of natural vegetation must be retained from the waters edge. Selective harvest and pruning is allowed to provide a filtered view from the structure and reasonable access to the stream. A landscaping plan must be submitted with development proposals.

New York State, Stream Corridor Management Manual. A buffer strip of natural vegetation of 50 to 450 feet based on slope is recommended.

Upper Delaware National Scenic and Recreational River. The preferred erosion control method is to place limits on land clearing. Depending upon the slope of the lot, no more than 10 to 20 percent of it may be cleared.

Chesapeake Bay Critical Area Rules. These provide for a 100 foot buffer around shoreline and wetland areas (reduced to 25 feet for agriculture), protection of wetlands, and forest management plans for the entire critical area. Additional criteria are provided for forest and woodland protection. These criteria include limitations on land clearing for the three development categories described in the rules. The criteria also require the replacement in kind of forest removed. There will be no net loss of woodlands in the Resource Conservation Areas.

Florida Department of Community Affairs, Suwannee River. Vegetation is to be left undisturbed in the 75 foot building setback, except for selective cutting for reasonable access.

Suwannee River Water Management District Rules. An undisturbed buffer of vegetation is required. Nominal width of the buffer is 75 feet. However, with development other than single family residential, agriculture, and forestry, the width is variable and must be calculated based on soil type. Selective cutting is allowed in order to remove dead or diseased trees and to provide reasonable access to the river.

Oregon Scenic Waterways Landowner's Guide. Buffer strips are required and should result in the riparian zone being left

undisturbed. Pruning, to permit a filtered view from a structure, is allowed.

### **Stream Bank Alterations**

This topic includes a number of stream bank and river bed protection subjects, including grading, dredging, filling, and construction of erosion control structures. The stream bank and bed alteration provisions of each example are summarized below.

Mississippi Headwaters Board. A permit is required for grading and filling. The permit requirements would minimize the movement of earth, erosion, tree clearing, and destruction of natural amenities. Any grading or filling which is determined to be unnecessary would not be permitted. The smallest amount of soil should be exposed for the shortest period of time and temporary ground cover must be installed until permanent ground cover can be established. Measures must be taken during construction to prevent erosion, trap sediment, and stabilize fill. Changes to the course, current, and cross-section of the Mississippi River are prohibited (unless permitted by the State). Drainage or filling of wetlands is also prohibited.

State of Minnesota, Lower St. Croix River. No alteration of slopes greater than 12 percent is allowed if erosion or scaring will occur. Earth moving, erosion, vegetative cutting, draining or filling of wetlands, and destruction of natural amenities must be minimized. Temporary ground cover must be used until permanent ground cover is installed. Methods to prevent erosion, trap sediment, and stabilize fill must be employed.

National Park Service, Missouri National Recreational River.  
None.

Michigan Stream Site Guide. This guide discourages building on slopes greater than 12 percent and discourages filling floodplains and wetlands. Recommended erosion control procedures include retaining natural vegetation, planting grass on graded sites, and using temporary cover.

Northeastern Illinois Planning Commission. This example contains extensive requirements for soil movement, channel alterations, and stream bank armoring. Special permits are required for grading and excavating, and a site grading and excavating plan is required for all construction. There is a 15 day limit between grading and start of construction. Temporary soil cover is required until permanent cover is installed. Grading and excavation should result in the minimum alteration of the natural topography. Deposition of spoil in wetlands is prohibited.

Modifications of stream channels are allowed only if off-site hydrologic problems are causing erosion or flooding, there is a danger to persons and property, the modification would correct or improve the functioning of a previous modification, or an area-wide stormwater plan adopted by the local government calls for the modification. The use of stream bank armoring for erosion control is allowed only if other methods are not working. Even then, these structures may not be placed in wetlands; they must minimize impacts to other properties; and they must not change the horizontal or vertical configuration of the land.

New York State Stream Corridor Management Manual. The document describes best management practices (BMPs) to minimize adverse effects of channelization, dredging and gravel removal, and snagging and clearing operations, while protecting stream banks and controlling erosion.

Upper Delaware National Scenic and Recreational River. Erosion hazard areas are protected through building setbacks and vegetation plantings. Limitations are placed on the percentage of a lot that may be cleared, with more restrictive limits in steep slope areas.

Chesapeake Bay Critical Area Rules. Local governments must identify erosion prone areas and adopt regulations on shore protection works. The rules encourage non-structural methods of erosion control, except in rapidly eroding areas.

Florida Department of Community Affairs, Suwannee River. Erosion and sedimentation must be controlled through site design, appropriate grading techniques, landscaping, sedimentation basins, and special vegetation cover.

Suwannee River Water Management District. A permit from the district is required unless the following conditions are met: the amount of clearing is limited to the area of the building and accessory structures, no wetlands are affected, and no structures which obstruct flood flows are built.

Oregon Scenic Waterways Landowner's Guide. Grading, filling and similar activities are addressed through a permitting process. The permitting process attempts to protect riparian zones and buffer strips, and to limit the amount of cleared land to the minimum amount required for construction.

### **Floodplain Management**

A common purpose of stream corridor protection regulations is to

protect human life and property in flood prone areas. A summary of the floodplain management requirements of each of the examples is given below.

Mississippi Headwaters Board. Changing or diminishing the course, current, or cross-section of the Mississippi River, headwaters lakes, or wetlands is prohibited (unless permitted by State agency). Limitations are placed on subdividing floodprone lands. The proposed performance standards for campground and resorts require that such plans show the location of structures with respect to floodplain and floodways.

State of Minnesota, Lower St. Croix River. Changing or diminishing the course, current, or cross-section of public waters is prohibited (unless permitted by State agency). Structures may not be built in the floodway. Local governments must adopt floodplain management ordinances. Impervious surfaces shall not exceed 20 percent of lot area. Limitations are placed on subdividing floodprone lands.

National Park Service, Missouri National Recreational River. Structures are prohibited in the floodway. The local floodplain regulations are incorporated by reference. Limitations are placed on subdividing floodprone lands.

Michigan Stream Sites Guide. None.

Northeastern Illinois Planning Commission. Proposed developments must demonstrate that they will not increase flooding or reduce natural flood storage capacity.

New York State Stream Corridor Management Manual. Flood prevention recommendations refer only to stormwater management.

Upper Delaware National Scenic and Recreational River. None.

Chesapeake Bay Critical Area Rules. New development must be designed to reduce frequency and severity of flood waters that may result from new development.

Florida Department of Community Affairs, Suwannee River. New construction must be built one foot above 100 year flood elevation. New construction must not increase flooding in adjacent areas. Sewage systems must be designed to withstand flooding.

Suwannee River Water Management District Rules. New development must not reduce floodway conveyance or increase flood elevations. Buildings must be built on pilings one foot above 100 year flood

elevations.

Oregon Scenic Waterways Landowner's Guide. None.

### **Stormwater Management**

Stream protection regulations often address stormwater management in efforts to reduce flooding and water pollution. The following paragraphs summarize the stormwater management provisions of the examples.

Mississippi Headwaters Board. The topic of stormwater management is partially addressed in the subdivision requirements and the proposed performance standards for campgrounds and resorts. The proposed standards for campgrounds and resorts require an examination of drainage features, soil erosion potential and pollution including sedimentation. The requirements for subdivisions place limits on the subdivision of land which has inadequate drainage.

State of Minnesota, Lower St. Croix River. Limits are placed on the subdivision of land which has inadequate drainage.

National Park Service, Missouri National Recreational River. The model ordinance limits impervious surfaces to 20 percent of lot area. Limits are placed on the subdivision of land which has inadequate drainage.

Michigan Stream Sites Guide. This guide recommends against building in floodplains, wetlands, and swales. Water draining from yards and impervious surfaces should not flow directly into the stream.

Northeastern Illinois Planning Commission. New development must demonstrate that it will not increase stormwater runoff velocity. A hydrologic controls/drainage plan is required. The plan should preserve open channel drainageways, provide for drainage without increased erosion or other detrimental effect, and limit post development stormwater quantity/quality to predevelopment conditions.

New York State Stream Corridor Management Manual. This manual describes best management practices for stormwater runoff. These best management practices include storing stormwater in depressions, wetlands, or other drainageways for gradual release; minimizing paved surfaces; coordinating with areawide stormwater management plans and facilities; limiting off site stormwater

runoff to predevelopment amounts; using open space areas for the storage of excess stormwater; designing facilities to handle 10 year storm event, with provisions to detain 100 year event; and periodic maintenance of drainage facilities which could be facilitated by the inclusion of maintenance easements in new development site plans.

Upper Delaware National Scenic and Recreational River. The amount of runoff is to be limited by maintaining natural cover; cleared areas are limited to 10 to 20 percent of the lot depending upon slope.

Chesapeake Bay Critical Area Rules. Intensely Developed Areas must reduce pollutant loadings of stormwater by 10 percent compared to existing levels. Limited Development and Resource Conservation Areas must maintain predevelopment runoff rates and provide for filtration of stormwater. Impervious surfaces are limited of 15 percent of a lot.

Florida Department of Community Affairs, Suwannee River. New development, except single family residential, must provide facilities that will store and convey stormwaters without causing damage to persons and property.

Suwannee River Water Management District Rules. These rules provide detailed standards for stormwater facilities. Facilities must be designed to prevent erosion and maintain existing flood elevations. Water that is discharged must meet State water quality standards. Facilities must minimize impacts to fish, wildlife, wetlands, and other natural resources. Off-site runoff rates must be the same as the predevelopment rates. The design storm used for agriculture, forestry, conservation, and recreation use planning is a 10 year, 24 hour storm. The design standard for all other uses is a 100 year storm. Stormwater facilities must be designed to retain the first one inch of runoff and treat that runoff to reduce pollution. However, this design standard is increased to 1.5 inches for facilities discharging into Outstanding Florida Waters and further increased to two inches for developments in stream to sink basins.

Oregon Scenic Waterway Landowner's Guide. None.

### Summary

The MHB model ordinance compares favorably with the other examples in terms of vegetation protection. The MHB ordinance also is comparable or better than the other examples in terms of grading, clearing, and stream bank alterations. Some of the

other examples do have criteria for shoreline hardening structures such as riprap, but it seems that responsibility for regulating these structures belongs to the State. The proposed changes to the MHB ordinance do not address construction on steep slopes, a topic which several of the other examples contain. One possible addition to the grading and filling section may be to require a specified time limit between grading the site and beginning construction.

The MHB model does not address flood hazards to any great degree. The need to address this topic in detail may be obviated by the very low densities allowed in the ordinance. However, some additions may be made to ensure that development activities do not create flood hazards. The grading and filling section might be further modified by the addition of a standard requiring that changes to the natural topography do not create a flood hazard or displace floodwaters. It may also be useful to prohibit construction of buildings in the floodway.

Stormwater management is another topic which is not addressed in detail in the MHB ordinance. This is due, no doubt, to the very low development densities allowed by the ordinance. The water quality and flood protection provided by the low densities may be enhanced by establishing an allowable limit on the amount of impervious surfaces. In some of the other examples, a limit on impervious surfaces was set at 15 to 20 percent of the lot area. The tentative stormwater management criteria in the campground and resort performance standards could be strengthened by adding a requirement that predevelopment and post development stormwater runoff must be equivalent. Similar stormwater requirements might be added for public access areas with boatramps.

### Land Use

The most marked difference among the several stream corridor protection examples used in this study is in the regulation of land use. Several examples, such as the MHB model ordinance, regulate the uses permitted in the river protection zone. Many other examples create "overlay zones" which add restrictions to the existing zoning. The Northeastern Illinois Planning Commission model is an example of this type of regulation. Other examples function as separate ordinances which complement existing zoning, such as the Suwannee River examples. Still other examples used in this study establish criteria which guide local governments in writing or revising zoning. The Maryland Chesapeake Bay Critical Area rules are an example of these criteria.

Among those examples which do include use restrictions, there is variability. The MHB allows or conditionally allows over 15 uses, while the Upper Delaware plan allows or conditionally allows over 30 uses. This contrasts with just three permitted uses on the Missouri National Recreational River and five permitted uses in rural areas of the Lower St. Croix. The trade off for the expanded number of uses is a longer ordinance containing performance standards for the numerous conditional uses. The revisions already proposed for the MHB ordinance resolve many concerns regarding the large number of uses allowed or conditionally allowed in the ordinance.

### Agriculture and Forestry

Two uses usually allowed under river corridor protection programs are agriculture and forestry. Forestry practices are regulated in six of the eleven examples, including the MHB ordinance. Agricultural practices are mentioned in six of the eleven. The MHB ordinance does not address agricultural practices.

#### **Forestry**

The Mississippi Headwaters Board ordinance applies several criteria to clearcutting within the area subject to the ordinance. Clearcutting operations must minimize damage to soils, slopes, and other topographic features in order to prevent erosion and sedimentation. Skidding must also be conducted in a manner which minimizes erosion and sedimentation. Clearcuts must be kept to the minimum size necessary, and as much forest cover as is reasonably possible should be retained. Clearcutting must be conducted between September 15 and May 15. If replanting is required, it must be completed in the same spring or next spring. Forestry practices must include consideration of methods for improving wildlife habitat. The site must be properly prepared to minimize fire hazard, insect and disease hazards, and soil damage, and to improve plant reproduction, wildlife habitat, and aesthetics. Clearcutting within the building setback may only occur on lands managed for forestry purposes. A written management plan must be prepared for the area. Management of the area should lead to an aesthetically pleasing river-front area with a variety of naturally suited long-lived species.

The New York State Stream Corridor Management Manual provides best management practices for timber harvesting. These practices include maintaining a 10 foot buffer along streams (50 foot

buffer if area is to be clearcut and 100 foot buffer on slopes of 10 percent or more), keeping skidders 50 feet away from streams, felling trees away from the stream, keeping roads and skid trails out of wetlands, diverting running water off roads and primary skid trails, and siting log landings out of wet areas and at least 200 feet from streams. Logging on steep slopes should only be done when soils are dry or frozen, and roads and skid trails should be restored. There are also BMPs for stream crossings which are applicable to forestry activities.

The Upper Delaware Scenic and Recreational River plan provides guidelines for forestry practices. Programs to monitor forestry activities are to be set up at the local level. Clearcutting should be controlled by limiting clearcuts to two acres, or making plans for clearcutting subject to professional review. In addition, selective cutting practices should be used in a zone 50 feet from the river and 50 percent of the crown cover should remain. Soil erosion must be controlled.

The Chesapeake Bay Critical Area Rules have a section on forest and woodland protection. Local governments are required to develop forest preservation plans. These plans shall guide efforts to maintain and increase natural vegetation in the critical area. For all areas larger than five acres, a forest management plan is required prior to harvesting forest resources. The plan shall identify sediment control measures. A 100 foot buffer along water courses and wetlands is required. Harvesting within the buffer is allowed only for fire and pest management, to improve wildlife habitat, to allow for water dependent facilities or erosion protection measures, or to ensure that anadromous fish runs are not blocked by fallen trees.

The Suwannee River Water Management District Rules address forestry practices which affect surface water quality and flooding. Roads, bridges, culverts, drainage facilities, and stream diversions require permits from the district. The permits are issued if the following conditions are met: the construction does not increase flood hazards, it meets State water quality requirements, it does not permanently convert wetlands to non-wetland ecosystems, and best management practices are used. These best management practices include constructing roads in such a way as to minimize erosion and sedimentation, building roads that do not exceed 25 feet in width (40 feet including ditches), leaving a buffer strip along streams, and leaving a 35 foot vegetative buffer between outfalls from drainage ditches and surface water bodies.

An explanatory manual accompanying the District rules recommends a buffer zone of 35 feet from perennial streams and lakes.

Selective cutting is allowed in the 35 foot buffer.

The Oregon Scenic Waterways Landowner's Guide suggests techniques such as selective harvest, directional felling, and the use of low impact equipment when harvesting in the buffer strip.

### Agriculture

The National Park Service model ordinance for the Missouri National Recreational River gives as a purpose for the ordinance, the regulation of irrigation pipes, pumps, and intakes. However, it provides no specific requirements to implement this purpose.

The New York State Stream Corridor Management Manual contains best management practices for agriculture. Recommended practices include installing diversion terraces and using grassed waterways and filter strips. Best management practices are also included for fertilizer and pesticide application, pasture management and animal waste management, field tillage, and cropping.

The Upper Delaware Scenic and Recreational River plan requires conformation of local zoning with State agricultural districts. Local governments must ensure that agriculture is the principal use in agricultural districts. Intensive livestock operations are prohibited, or are made a conditional use, in the river corridor.

The Chesapeake Bay Critical Area Rules has a section on agriculture. The purpose of the rule is to maintain agricultural land use where appropriate and to minimize its contribution to the pollutant loadings in streams. Furthermore, the rules require local governments to ensure that creation of new farmland does not drain, dike, or fill wetlands; clear forests on steep slopes and highly erodible soils; or destroy habitat associated with rare or endangered species. The rules are also meant to assure that BMPs for nutrients, animal wastes, pesticides, and sediment runoff are used; and that animal feeding operations minimize contamination to water bodies. A 25 foot buffer is required between agricultural activities and streams and wetlands. Livestock are not allowed to graze, feed, or water in the buffer. The rules require that all farms in the critical area have an approved Soil Conservation and Water Quality Plan in place within five years of adoption of the rules.

The Suwannee River Water Management District Rules affecting agriculture are the same as those for forestry. It is interesting to note here that should a field lie fallow for three years, it is no longer considered an agricultural operation and loses all advantages allowed agricultural activities under the

rules.

The Oregon Scenic Waterways Landowner's Guide recommends buffer strips along the river bank to control erosion. Buildings should be set back from the river to avoid flood hazards. Livestock should be fenced away from the riverbank to avoid erosion, and watering areas should be sited at locations less likely to erode.

### **Summary**

The MHB ordinance could be improved in several small ways regarding forestry practices. The most significant change would be to require a minimum buffer during clearcutting. Florida recommends 35 feet, Maryland recommends 100 feet, and New York State recommends 50 to 100 feet depending upon slope.

The MHB ordinance could also be modified to ensure protection of the river from new agricultural activities. Performance standards for clearing land for agricultural purposes could be included in the ordinance. Possible standards include a buffer strip requirement, a fencing requirement to keep livestock out of the buffer, and a requirement for a soil conservation and water quality management plan. The requirement for a plan is similar to the existing requirement for forestry management plans.

### **Roads and Utilities**

Roads and utilities are narrow linear features which have similar impacts on stream corridors. If improperly sited, they can have significant impacts on scenery. Both roads and utilities frequently cross rivers and can have impacts at the crossings. Therefore, some river protection programs address these special land uses. Six of the models address roads and bridges, only two have sections on utilities.

#### **Roads**

Mississippi Headwaters Board. The model ordinance lists several considerations which must be addressed prior to issuance of a conditional use permit. These considerations include avoiding steep slopes, intrusions into stream valleys and open exposures of water, and high points and ridge lines. Roads should be sited at least 200 feet from the river, outside of wetlands, and along edges of forests rather than through them. New roads should avoid soils that are prone to erosion and slippage, or have high

water tables. New roads should be designed to "rest lightly on the land." Construction activities must control erosion and sedimentation, must not isolate wetlands or impair natural drainage, nor disrupt fish and wildlife spawning or nesting. Permits from the State are required for river crossings and for work in wetlands.

State of Minnesota, Lower St. Croix Rules. These rules incorporate, by reference, the requirements of the wild, scenic, and recreational rivers system concerning river crossings. They also require a State permit for river crossings, and encourage crossings at existing bridges or utilities.

New York State, Stream Corridor Management Manual. This manual describes best management practices for at grade stream crossings, culverts and bridge placement. Stream crossing BMP's address topics such as proper location, approach considerations, and crossing alignment. Culverts and bridge crossing BMP's address topics such as proper culvert size, type of flooring (preferably the natural stream bed), concentration of flow during low water periods, fish migration, and stabilization of streambank disturbances.

Upper Delaware National Scenic and Recreational River. The plan prohibits the construction of new four lane roads and bridges in the river corridor. Road widening in scenic segments is discouraged. Local governments are encouraged to waive minimum pavement width requirements for local roads if that would preserve scenery and vegetation.

Florida Department of Community Affairs, Suwannee River. This model ordinance calls for roads to be built at natural grade if possible, and to accommodate natural flood flow.

The Suwannee River Water Management District Rules. These rules address roads and stream crossings in a limited fashion. The rules would apply to the management of storm water from a road constructed with the approval of the district. Furthermore, stream crossing for agriculture or forestry purposes, which are covered by a less stringent general permit, must not increase stream scour, stream velocity, or flood hazards. Roads must be designed to prevent erosion and sedimentation.

Oregon Scenic Waterway Landowner's Guide. This guide recommends siting roads away from the river bank. This protects the stream side buffer strip from excessive intrusion.

## Utilities

Mississippi Headwaters Board. The requirements for utility transmission corridors are similar to the requirements for roads, with some additional stipulations. When siting utility corridors, the utility should avoid creating tunnel vistas. Utility transmission lines should avoid river zoning classification 1 areas, commercial or managed forests, and open space recreation areas. The applicant must evaluate underground placement alternatives. The height and width of the facility, the materials used in its construction, and its color should be as compatible with the natural area as possible. The cleared portion of the right-of-way should be kept to a minimum. Rights-of-way should be maintained to allow the growth of natural vegetation of value for habitat if it does not pose a hazard or restrict reasonable use by the utility. When vegetation is removed it should be replaced by native grasses, herbs, shrubs, and trees. Chemical control of vegetation is discouraged.

State of Minnesota, Lower St. Croix. These rules incorporate, by reference, the rules relating to utility crossings of state-owned lands and public waters. The performance standards in those rules shall apply to local government approvals to cross other lands. A State permit is required to cross state-owned lands and public waters.

Upper Delaware National Scenic and Recreational River. New electric power, oil, and gas transmission lines, except for local service, are not permitted.

### Summary

The Mississippi Headwaters Board requirements for roads, stream crossings, and utility lines exceed those in the other examples. No changes are recommended.

### Subdivision Controls

Regulating the subdivision of land ensures that proposed developments meet minimum community standards for health, safety, access, and environmental protection. Subdivision regulations can be used to protect environmentally sensitive areas such as rivers and wetlands. The MHB ordinance and four other examples contain subdivision controls.

Mississippi Headwaters Board. Copies of all proposed plats are submitted to the Department of Natural Resources for a 30 day review. Plats may not subdivide land which is unsuitable for development due to flooding, inadequate drainage, soil or rock formations which severely limit development, severe erosion potential, unfavorable topography, or inadequate water supply or sewage treatment capabilities. It is assumed that the requirements for planned cluster development will be removed if planned cluster developments and planned unit developments are made no longer permitted.

State of Minnesota, Lower St. Croix. All plats must be approved by the Commissioner of Natural Resources. Only lots suitable for residential development may be subdivided. Plats may not subdivide land which is unsuitable due to flooding, inadequate drainage, soil and rock formations with severe limitations for development, severe erosion potential, unfavorable topography, or inadequate water supply or sewage disposal capabilities. Criteria are provided for planned cluster developments.

National Park Service, Missouri National Recreational River. Land which is unsuitable for development for reasons of flooding, inadequate drainage, soil and rock formations with severe limitations for development, severe erosion potential, unfavorable topography, or inadequate water supply or sewage disposal capabilities may not be subdivided.

Michigan Stream Sites Guide. This guide recommends clustering residential units. It further recommends adequate sewage disposal facilities, underground utilities, access to water for all lot owners, and a 50 foot natural vegetation strip along streams.

Department of Community Affairs, Suwannee River. Plat maps for proposed developments show the 100-year and 10-year flood elevations, floodwater contours at two foot intervals, roads, original topography and proposed grading, ditches, and drainage structures. All plats must display a flood hazard warning.

### **Summary**

The MHB, Lower St. Croix, and Missouri River requirements are basically similar, due no doubt to a common origin. The Michigan example provides some interesting recommendations. The Suwannee River ordinance concentrates on flood hazards. The MHB ordinance requirements for subdivisions could be expanded to require delineation of flood heights on plats, if known; construction of

underground utilities if feasible; and provision of open space or river access to all lot owners.

### Signage

Signage controls may be considered in river plans in order to protect the natural scenery. Only three of the examples studied in this report addressed signage; the MHB model, the Lower St. Croix rules and the Upper Delaware Scenic and Recreational River plan.

Mississippi Headwaters Board. The model ordinance allows signs necessary for public health, safety and recreation use. Other signs not visible from the river are treated as conditional uses. The proposed revisions for the model ordinance contain performance standards for this conditional use: signs must not interfere with the visibility of drivers or obstruct traffic signs; they must not contain flashing lights, lights directed toward a neighboring residence, or lights directed toward the water (except emergency lights or marina lights); they must not contain conspicuous animated parts; and they must not be mounted on a dock or float. Requests for signs are reviewed for relationship to a permitted use, the aesthetics of the sign in relationship to the surrounding area, plans for continuing maintenance and upkeep, and similarity to other signs in the area. Signs necessary for public health and safety, and homeowner name placards and real estate advertizing signs less than six square feet, are allowed.

State of Minnesota, Lower St. Croix. Signs necessary for public health and safety may be allowed, as well as signs limiting public access to private property, and signs not visible from the river in summer months.

National Park Service, Missouri National Recreational River. The ordinance allows signs necessary for public health and safety, or those which designate areas available for public use in the building setback zone.

Upper Delaware National Scenic and Recreational River. This plan requires local governments to prevent unnecessary signage. Possible methods which local governments may use include prohibiting off-premises advertising signs; regulating signs as a conditional use with standards to harmonize with the landscape as well as restricting flashing, oscillating or illuminated signs; limiting signs to 32 square feet and prohibiting flashing, oscillating, or illuminating features; or limiting signs to one

per 1,000 feet of river front. Alternatives for on-premises signs include the limitation of signs larger than 10 square feet to 1 per river or road frontage, linking maximum sign size to lot size, or regulating business identification signs as a conditional use. Public signs, safety signs, announcement signs, temporary signs, professional signs, home occupation signs, farm product signs, political signs, construction signs, and for sale/rent signs do not need permits, but should be less than 10 square feet in size.

### Summary

The MHB model ordinance originally restricted signs as a use. The proposed changes to the ordinance provide performance standards for signs identified as conditional uses, thus correcting a previous omission. The text of the proposed change equals or exceeds the requirements of any of the other examples.

### Docks and Marinas

These are common river facilities with special planning requirements. The proposed MHB model ordinance revisions provide performance standards for permanent docks. Four other examples also addressed boat docks or marinas.

Mississippi Headwaters Board. Docks are a conditional use under the model ordinance. Performance standards for permanent docks are included in the proposed changes to the ordinance. The standards address such topics as maintenance requirements, susceptibility to ice damage and storm waves, construction techniques (pilings in preference to rock cribs), length (minimum necessary to reach navigable river depth but never more than 50 feet), and width (maximum of 6 feet). Additional permits may be needed from the Department of Natural Resources.

The MHB ordinance also addresses public boat access sites and the proposed changes to the ordinance provide performance standards for these sites as well. Standards listed in the proposed revisions state that boat ramps should be built without recourse to pilings, dredging, or other special site preparations; the ramps shall be no more than 24 feet wide, 20 feet long or reach a water depth of 4 feet; excavation should be no more than 60 cubic yards and fill no more than 30 cubic yards; and erosion must be controlled during and after construction. Boat ramps must not be built in posted fish spawning areas.

State of Minnesota, Lower St. Croix River. The rules allow temporary docks of the minimum size needed to facilitate launching or mooring of boats in the open water season. Marinas are also regulated in these rules. The location, size, screening, shoreline protective structures, fueling facilities, and sanitary facilities are regulated. Permits are also required from State and Federal governments.

National Park Service, Missouri National Recreational River. The ordinance allows temporary or seasonal docks, provided they extend the minimum distance into the river for mooring and launching.

Michigan Stream Site Guide. The guide recommends log-sod covers for docks. These docks provide more natural looking shorelines, stream bank protection, and excellent cover for fish.

Upper Delaware National Scenic and Recreational River. The plan addresses boat liveries and requires a minimum size of two acres for these facilities. The plan recommends that liveries have adequate off-street parking at a rate of 1 space per raft, 1 space per 2 canoes, or 1 space per 4 tubes; facilities should have 1 sanitary receptacle per 40 watercraft; operators must provide trash receptacles; the site design should include visual screening; and the boundaries should be marked to limit trespass and other impacts to adjacent properties.

Chesapeake Bay Critical Area Rules. These rules contain requirements for water dependant facilities such as marinas, ports, commercial fishing activities, and certain industrial activities. New or expanded marinas are allowed in Intensely Developed and Limited Development areas. All water dependent projects, including marinas, must meet a recognized private right or public need. Also, adverse effects on water quality, fish, plant and wildlife habitat must be minimized; water circulation and salinity must not be altered; the site must have adequate flushing; impacts to wetlands, aquatic plant beds, and other important aquatic habitats must be minimized; impacts from non-point source pollution, sewage discharge, and boat cleaning and maintenance must be minimized; shellfish must not be disturbed or rendered unfit for harvest; the least disturbing form of dredging should be used and spoil must not be disposed of in the buffer or Habitat Protection Areas; and interference with the natural transport of sand must be minimized. Non-water dependent facilities associated with a water dependent facility should be built outside the buffer.

## Summary

The proposal to modify the MHB model ordinance by adding performance standards for docks and boat access corrects a deficiency in the current model. The standards for boat access could be improved by adding standards to prevent stormwater runoff from parking areas (see section on stormwater above), and standards for parking and sanitary facilities.

## Additional Items

In reviewing the 10 examples of river protection ordinances, guides, and rules, several items not included in the MHB ordinance were noted. These items are mostly procedural, but may ensure closer compliance. The first item is a provision for emergency work. The Northeastern Illinois Planning Commission model allows exceptions for emergency work to preserve life or property. All work performed must be reported within 10 days, and must then receive a special use permit to perform any corrective actions determined to be needed by the permitting agencies.

The other item which may be added to the MHB ordinance is a requirement for performance bonds. The Northeastern Illinois Planning Commission model requires applicants to post performance bonds to cover costs of failure and/or repair of any improvements made on a site. This bond would protect the local government from unanticipated costs of correcting damages or protecting natural resources due to poorly designed or constructed projects.

## SECTION V: CONCLUSIONS

The model ordinance prepared for the Mississippi Headwaters Board is a comprehensive river protection measure. The revisions currently proposed for the ordinance further enhance the ordinance. The original ordinance and the proposed revisions compare favorably with the ten river protection ordinances and guidelines which were reviewed. As a result of the comparison of the MHB ordinance with the ten other examples, a few minor changes to the MHB ordinance are recommended.

It is recommended that changes to the lot specifications be made to provide setbacks for blufflines or variable setback on slopes, reduce the difference between building and septic system setbacks, and add procedures to handle a structure over 35 feet in height as a conditional use.

The MHB ordinance has vegetation protection provisions which are the equal or better than most of the other models. However, flood hazards and stormwater management are not discussed in great detail in the MHB model. Some additions which would strengthen the ability of the ordinance to limit flood hazards and pollution include the following: a limit on the elapsed time between grading and the start of construction; a requirement that flood waters will not be displaced as a result of changes to the natural topography; a prohibition on building in floodways; a maximum limit on the amount of impervious surfaces allowed (15 to 20 percent of the lot); and a requirement that stormwater runoff rates do not increase after development.

The MHB model might be improved in regards to forestry and agriculture. Possible changes include establishing a minimum buffer for clearcutting activities, a buffer strip for agriculture, a fencing requirement to keep livestock out of the river, and requiring a soil conservation and water quality management plan for any land cleared for agricultural purposes.

The subdivision requirements in the MHB ordinance could be enhanced. It could be required that plats delineate flood heights, and that developers install underground utilities, if feasible, and provide open space or river access to all lot owners.

The MHB model's proposed modifications provide performance standards for docks and boat access sites. These proposed performance standards for boat access areas could be improved through the addition of standards to prevent stormwater runoff from parking areas draining directly into the river, and

including standards for numbers of parking spaces and sanitary facilities.

Two other interesting features which the MHB might wish to consider are performance bonds and procedures for emergency work. Performance bonds would cover the costs of maintaining public safety and health, or protecting natural resources from poorly designed or constructed projects. Procedures for emergency work would allow work that would protect life or property to be performed without lengthy delays in permitting.

The proposed changes listed above are minor when compared to the overall scope of the ordinance. The original model ordinance with the changes already proposed provides among the best stream protection regulations in the country.



