

Chapter 7

Protection of Critical Water Resources

I. Background

A. Introduction

This chapter addresses the protection of environmentally sensitive water resources and riparian zones that have special or unique benefits to the residents of the region. It identifies those water resources that can benefit from the kinds of protection available under the Water Quality Management Plan (WQMP). It also makes a series of recommendations for consideration by state and local management agencies that can be used to protect special resources.

A series of environmentally sensitive water resource categories have been identified in this planning process as candidates for priority protection under the WQMP. These categories represent regionally important resources for which sufficient information exists to allow for the development of management recommendations and/or strategies. Resources that met these requirements include surface drinking water supplies, ground water drinking supplies, regional resource waters, riparian zones, and flood plains.

A number of protective measures were identified by a plan development work group as possible means of enhancing water quality protection in the region under the auspices of the WQMP. Different measures address different threats to water resources. In order to clarify which measures apply under specific conditions, a threat-by-threat analysis was produced. The threats analysis for the four priority critical resource categories is discussed in Appendix 7-1. The efforts of the plan development work group are documented in Appendix 13-4.

This chapter outlines recommendations for actions by state and local management agencies for the protection of the critical water resources identified in this chapter. These recommendations include measures geared specifically to the protection of critical resources and measures identified elsewhere in more detail in the WQMP. These latter measures are recommended for priority consideration and implementation by local jurisdictions to address the critical areas identified in this chapter.

B. Critical Area Definition

Categories selected represent regionally important resources for which sufficient information exists to allow for the development of management

strategies. As noted above, these include surface drinking water supplies, ground water drinking supplies, regional resource waters, and riparian zones and flood plains. The following discussion identifies how each of these categories is defined.

B.1 Surface Drinking Water Supplies

Many surface impoundments exist throughout the region that are designated by Ohio EPA as being “potential water supplies”. This definition applies to all bodies of water greater than five acres in size that are in public ownership. Given the plentiful and secure volumes of water available from suppliers in the region who use Lake Erie water, many of these public reservoirs will not be used for public water supplies in the foreseeable future. However, **Surface Water Drinking Supplies** represent those waters that are currently being used for active drinking water withdrawals. Protection of these waters and the watersheds that drain into them is a top priority within the region.

Some surface impoundments, mainly on the perimeter of the urban boundaries of the region, may be considered for water supply use sometime in the future. All such impoundments should be subject to all of the recommendations that apply to existing use impoundments as soon as any public entity initiates planning for developing the resource for water supply.

Ohio EPA maintains a data base of publicly owned lakes and impoundments that are sufficiently large as to have potential for use as public water supplies. All of these bodies of water are designated for protection under the State’s water quality standards. This designation helps to minimize pollutant impacts from point source discharges. The designation cannot directly minimize contributions from nonpoint sources of pollution.

In order to provide for added protection of drinking water reservoirs, all such impoundments currently in use in the region were identified and mapped. The identification of existing water supply reservoirs was made by reviewing the Northeast Ohio Water Plan prepared by the Ohio Department of Natural Resources in 1992. Table 7-1 lists these reservoirs. Figure 7-1 locates them regionally. Additional lakes and reservoirs should be added to this list in the future whenever water planning efforts begin to consider the development of new water supplies in bodies of water not already on the list.

Many lakes and reservoirs in the region support recreational uses. Local officials should look to nominate any of these water bodies for inclusion on the protected list whenever there is evidence that existing controls may not be adequate to protect the continued use of the resource for recreational use or drinking water purposes.

Table 7-1: Inland Drinking Water Reservoirs Affected by the NOACA WQMP

Reservoir(s)	Watershed	County	Community
Wellington Reservoir	Black River	Lorain	Wellington Village
Oberlin Reservoir	Black River	Lorain	City of Oberlin
Lake Medina	Rocky River	Medina	City of Medina
Coe and Baldwin Lakes	Rocky River	Cuyahoga	City of Berea
East Branch Reservoir	Cuyahoga River	Geauga	City of Akron
LaDue Reservoir	Cuyahoga River	Geauga	City of Akron
Lake Rockwell	Cuyahoga River	Portage	City of Akron

Inland Surface Drinking Water Supplies in Northeast Ohio

Northeast Ohio 208 Water Quality Management Plan

Prepared by:
Northeast
Ohio
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Coordinating
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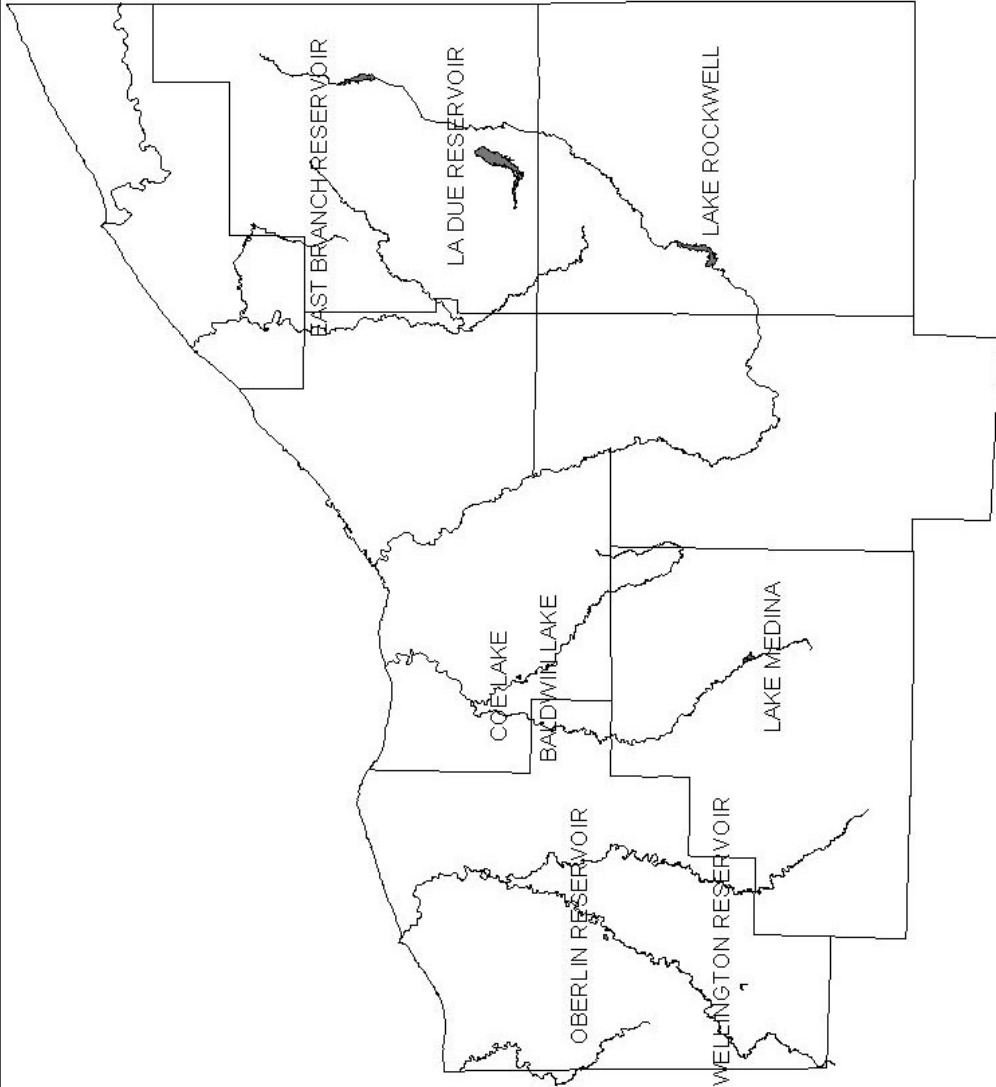


Figure 7-1

B.2 Groundwater Drinking Water Supplies

The identification of groundwater areas in need of protection is much less precise than surface waters. While one can pinpoint the locations of groundwater withdrawals for municipal drinking water systems, areas where individual water wells are used cover a much broader area. It is important in groundwater protection to manage aquifer recharge areas where rainwater first enters the ground. The definition of aquifer recharge areas requires extensive subsurface geological information that is seldom available. Therefore, those areas which are dependent on groundwater for a sizeable portion of local water supply are identified here in general terms only.

Groundwater supply areas are less specific than surface water supply areas. This reflects the broad spread nature of groundwater aquifers. While it is true that groundwater flows pay little attention to political boundaries, the groundwater resource areas are described here on a political jurisdiction basis. This is appropriate because groundwater management is usually centralized in county level agencies. These usually include the health departments, the sanitary engineer, and the planning commission. Also, the Ohio EPA and ODNR assist local governments to manage and protect groundwater supplies and most of their work is organized on a county basis. The Generalized Groundwater Drinking Water Supply areas identified for consideration for priority protection are listed in Table 7-2. Recommendations that provide groundwater protection apply to all communities that rely on public or private groundwater supplies. Those communities that can have a direct impact on the quality of the groundwater supply being used in a neighboring community should also implement groundwater protective measures even if they themselves do not rely on groundwater.

Table 7-2: Generalized Groundwater Drinking Supply Areas in Northeast Ohio

Community or Geographic Area	Status of Development
Western Medina County	Rural
Eastern Medina County	Rural/Urbanizing
South Central Medina County	Rural/Urbanizing
Western Geauga County	Urbanizing
Eastern Geauga County	Rural/Urbanizing
Eastern Lake County	Rural/Urbanizing

Regional Resource Waters

“Regional Resource Waters” is a general term that refers to a series of stream segments that have unique or special characteristics. The segments selected for priority protection include all waterways designated by Ohio EPA as “State Resource Waters.”

“Regional Resource Waters” are surface waters that lie in National, State, or Metropolitan park systems, wetlands, wildlife refuge areas, and preserves. They also include wild, scenic and recreational rivers, publicly owned lakes and reservoirs.

All river segments identified as “Regional Resource Waters” in this planning process are listed in Table 7-3. This table lists the unique or special characteristics for including each of the selected segments. The segments listed in Table 7-3 include those that are in Portage and Summit Counties and are part of the Chagrin or Cuyahoga River watersheds. The NEFCO WQMP provides recommendations that are coordinated with those in the NOACA WQMP regarding these waters.

Table 7-3: Regional Resource Waters

BASIN	COUNTY	STREAM NAME	TOTAL LENGTH (Miles)	TOTAL DRAINAGE (Sq. Miles)	LOCATIONAL INFORMATION	REASON
Black	Lorain	Wellington Creek	17.6	30.5	RM 16.6 - 14.7 River Mile (RM)	Findley Lake State Park
Black	Lorain	West Branch	37.8	175.4	RM 14.4 - 7.7	Lorain County Metroparks Carlisle Reservation
Chagrin	Cuyahoga	Wiley Creek	2.7	5.18		Exceptional Warm Water Habitat
Chagrin	Cuyahoga	Griswold Creek	6.1	7.29		Exceptional Warm Water Habitat
Chagrin	Cuyahoga	Aurora Branch	16.1	57.64		Exceptional Warm Water Habitat Scenic River
Chagrin / Aurora Branch	Geauga	McFarland Creek	5.8	10.80		Exceptional Warm Water Habitat
Chagrin	Geauga	Silver Creek	6.2	13.36		Cold Water Habitat
Chagrin / Bass Lake	Geauga	Beaver Creek	5.0	3.43		Exceptional Warm Water Habitat
Chagrin	Lake/Geauga	Chagrin River Mainstem	47.9	267.0		Seasonal Salmonid Scenic River
Chagrin	Lake	East Branch and Tributaries	19.4	50.83		Cold Water Habitat Scenic River
Cuyahoga / Tinkers Creek	Cuyahoga	South Branch to Deerlick Run at RM 0.46	0.45		Egbert Rd.. RM 0.45 to mouth	Cleveland Metroparks Bedford Reservation
Cuyahoga	Cuyahoga	Chippewa Creek	8.2	16.55	SR-82 (RM 2.3) to mouth	Cleveland Metroparks Brecksville Reservation
Cuyahoga / Tinkers Creek	Cuyahoga	Deerlick Run	3.8			Cleveland Metroparks Bedford Reservation
Cuyahoga	Cuyahoga	Big Creek	12.0	38.65	within Park Boundaries RM 0.3 - RM 3.2 RM 4.2 - RM 9.6	Cleveland Metroparks Big Creek Reservation
Cuyahoga	Cuyahoga	Tinkers Creek	28.2	96.4	Richmond Rd..(RM 8.75) to Mouth	Cleveland Metroparks Bedford Reservation

Table 7-3: Regional Resource Waters Continued

BASIN	COUNTY	STREAM NAME	TOTAL LENGTH (Miles)	TOTAL DRAINAGE (Sq. Miles)	LOCATIONAL INFORMATION	REASON
Cuyahoga	Cuyahoga	Tinkers Creek	28.2	96.4	I-480 to Witleach	Tinkers Creek State Park/ High Quality Wetlands
Cuyahoga	Cuyahoga	Tinkers Creek	28.2	96.4	Within the Boundary of J. Arthur Herrick Nature Preserve	J. ARTHUR Herrick Nature Preserve
Cuyahoga / Tinkers Creek	Cuyahoga	North Branch to Deerlick Run at RM 0.46				Cleveland Metroparks Bedford Reservation
Cuyahoga / Tinkers Creek	Cuyahoga	SW Branch to Deerlick Run at RM 0.4	0.45		Egbert Rd. RM 0.45 to mouth	Cleveland Metroparks Bedford Reservation
Cuyahoga	Geauga Portage	Cuyahoga River Mainstem	100.1	813.3	Troy Burton Township Line (RM 83.9) to SR-14 (RM 60.8)	State Scenic River
Cuyahoga	Geauga	Cuyahoga West Branch	14.6	35.45		High Quality Wetlands/Candidate for State Scenic River
Cuyahoga	Portage	Lake Rockwell	3.4			Bald Eagle Nesting Site/ City of Akron Water Supply
Cuyahoga	Portage	Tinkers Creek	28.2	96.4	RM 29.3 - 28.9	
Cuyahoga	Summit	Yellow Creek	10.3	30.80	RM 1.5 to mouth	CVNRA
Cuyahoga	Summit	Slipper Run	2.3	1.42		CVNRA
Cuyahoga	Summit	Robinson Run	2.4	0.94		CVNRA
Cuyahoga	Summit	Furnace Run	10.4	20.35	Cuyahoga/Summit Co. Line (RM 8.8) to Mouth	CVNRA
Cuyahoga	Summit	Salt Run	3.4	2.84		CVNRA
Cuyahoga	Summit	Haskell Run	3.0	2.15		CVNRA

Table 7-3: Regional Resource Waters Continued

BASIN	COUNTY	STREAM NAME	TOTAL LENGTH (Miles)	TOTAL DRAINAGE (Sq. Miles)	LOCATIONAL INFORMATION	REASON
Cuyahoga	Summit	Langes Run	2.7	1.41	RM 2.4 to Mouth	CVNRA
Cuyahoga	Summit	Woodward Creek	3.8	3.07	Northampton Road (RM 3.4) to Mouth at Bath Road	CVNRA
Cuyahoga	Summit	Stanford Run	3.0	2.08		CVNRA
Cuyahoga	Summit	Dickerson Run	3.6	2.62	RM 3.1 to Mouth	CVNRA
Cuyahoga	Summit	Cuyahoga River	100.1	813.3	Bath Rd. (RM 37.2) to Rockside Rd. (RM 13.1)	CVNRA
Cuyahoga	Summit	Brandywine Creek	11.5	26.21	Old RR Tracks (RM 2.2) to Mouth	CVNRA
Cuyahoga	Summit	Ritchie Run	2.0	0.61		CVNRA
Cuyahoga	Summit	Boston Run	2.6	2.74	Just North of SR-303	CVNRA
Grand River	Lake/Geauga	Grand River Mainstem	98.5	712.1	RM 65.88 - 8.65	State Scenic & Wild
Lake Erie	Cuyahoga	Euclid Creek	9.5	23.15	Lakeshore Blvd. to the mouth	Cleveland Metroparks
Lake Erie	Cuyahoga	Euclid Creek	9.5	23.15	Anderson Rd. (RM 5.6) to US-20 (RM 2.4)	Cleveland Metroparks Euclid Creek Reservation
Lake Erie	Cuyahoga	Doan Brook	9.7	9.65		Shaker Lakes National Environmental Landmark
Lake Erie	Lake	Mentor Creek & Mentor Marsh				Mentor Marsh
Rocky River	Cuyahoga	East Branch Rocky River	34.5	80.04	RM 15.15-RM 0.0	Cleveland Metroparks Rocky River Reservation
Rocky River	Cuyahoga	Rocky River	48	293.8	Includes the West Branch	Seasonal Salmonid

Table 7-3: Regional Resource Waters Continued

BASIN	COUNTY	STREAM NAME	TOTAL LENGTH (Miles)	TOTAL DRAINAGE (Sq. Miles)	LOCATIONAL INFORMATION	REASON
Rocky River	Cuyahoga	East Branch Rocky River	34.5	80.04	Headwaters - RM 23.3	Cleveland Metroparks Hinckley Reservation
Rocky River	Cuyahoga	Baldwin Creek	9.2	11.94		City of Berea Water Supply

Regional Resource Streams in Northeast Ohio

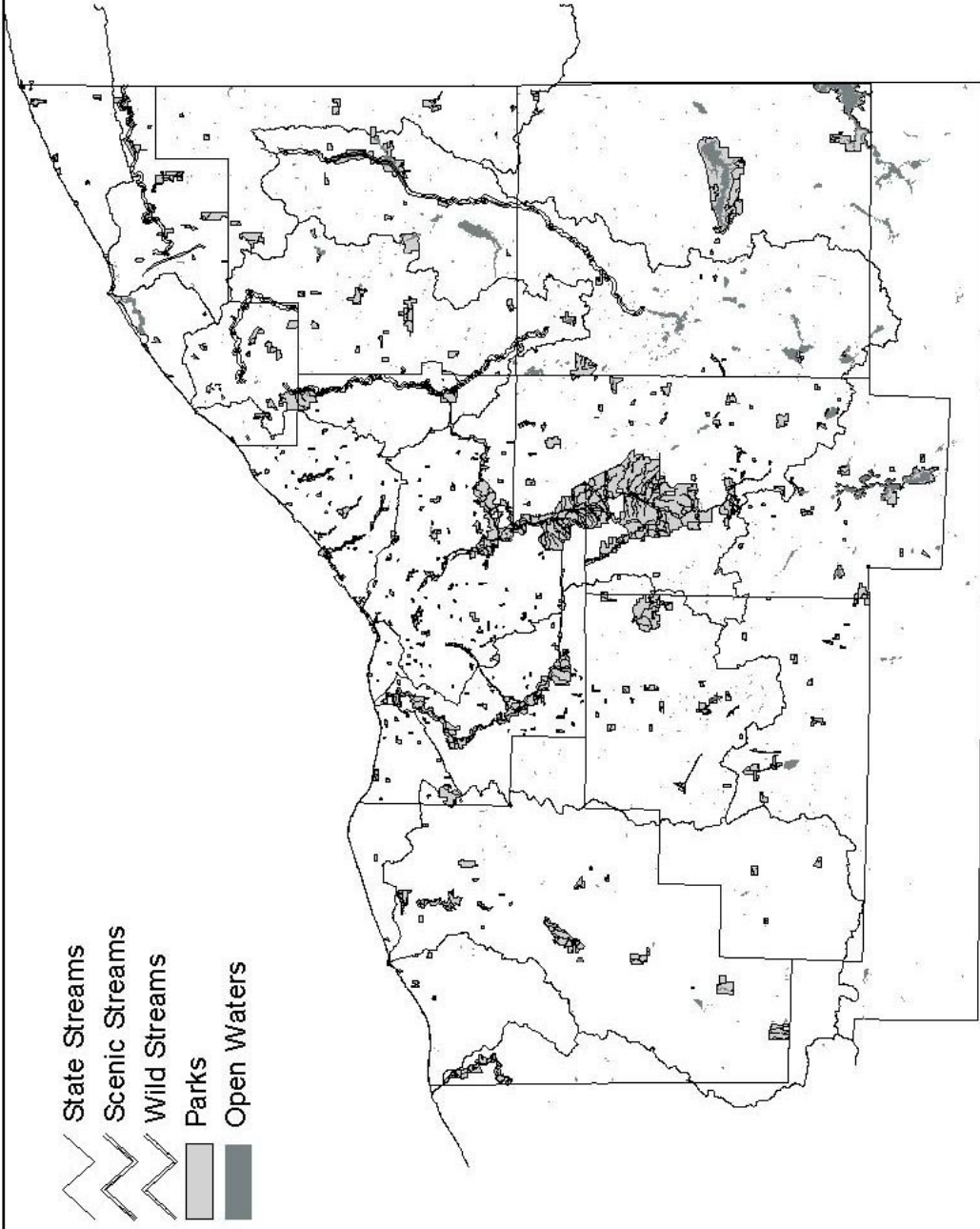


Figure 7-2

B.3 Riparian Lands and Floodplain Areas

Riparian lands and floodplain areas are lands adjacent to all streams. Flood management efforts seek to minimize development in the floodplain so as to minimize property damages caused by flooding. This means that maintenance of floodplain capacity is the primary objective of flood management efforts. Riparian zone management programs seek to minimize disturbances within the riparian corridor so as to maintain channel stability, pollutant removal capacity, and habitat for both terrestrial and aquatic organisms. The width of the riparian zone needing protection varies depending on the size of the stream at any given point. Small streams require the maintenance of a 25 foot vegetated corridor measured from the top of the bank on both sides of the stream. Medium-sized streams, those draining a land area between 0.5 and 20 square miles, need a protected corridor that is 75 feet wide on each bank. Streams that have a drainage area from 20 to 300 square miles require the protection of 120 feet on each side. Large rivers, those over 300 square miles in drainage area, need a 300 foot corridor along each bank.

When a local jurisdiction acts to protect riparian zone areas within its community, a precise mapping effort is needed to define riparian set backs appropriate to the locale.

C. The Analysis of Threats

Designating appropriate protective measures for critical water-based resources begins with the determination of what is threatening a given resource. It is recognized that the gamut of threats that exists in our society cannot all be addressed through water quality planning initiatives. However, for many resources, water quality planning can be an important tool for providing much of the needed protection.

The listing of threats for each of the priority categories contains an itemization of those threats which have affected similar resources in the past or which are currently threatening resources in the region and expectations of what might go wrong in the future. It is important to realize that not all resources in a given category are subject to all of the threats listed. The geographic location of a special resource is a primary determinate of the type or types of threats that are applicable. Whether a resource is located in an agricultural or urban area is very important. Fully developed areas may no longer be threatened by development as too little of the watershed remains to be developed. Headwater streams are subject to very different pressures from large rivers. In some locations, some aspects of critical resource protection may already be in place. For instance, the riparian corridors through major park areas tend to be protected over much of their course. Therefore, a community should undertake a more detailed analysis of land uses before settling on the optimum list of protective measures for a given resource.

The analysis of threats to local waterways must also consider which threats are currently operative as differentiated from those that may develop in the future. For example as noted in Chapter 3, many areas throughout the region are experiencing substantial urban development at the present time. Other areas are expected to urbanize over time, while very little growth can be anticipated far out into the future in some outlying areas.

Each locality must be evaluated with this factor in mind. One must also factor in the relative importance of various threats. An example is that road salt runoff is a factor at a given location only if the road density in the upland areas of a watershed is high enough to require the spreading of large quantities of salt. A determination at each location has to be made about how important such a factor is today as well as how it is going to be in the future.

Table 7-4 summarizes the threats that have been identified as applicable to each of the four priority resource categories.

Table 7-4: Threats to Critical Water Resources

Threats to Surface Drinking Water Supplies

1. Increased rates of sedimentation and storm water runoff due to shifts in land cover/land use in upper watershed.
2. Increased loadings of toxic materials including heavy metals and pesticides.
3. Increased salinity due to road salt runoff.
4. Increased nutrient loadings emanating from faulty on-site systems, small package plants, lawn care, and/or altered agricultural practices.
5. Loss of riparian function in the upper watershed that serves to reduce flowing pollutant loads.

Threats to Ground Water Drinking Supplies

1. Bacterial contamination due to faulty on-site system operation and maintenance.
2. Concentrated leaks, spills, or dumping of hazardous materials.
3. Overdevelopment of the resource either through overpumping or by over-developing recharge areas.
4. Saline intrusion due to over pumping at depth.
5. Salinity problems resulting from road salt contamination.

Threats to State Resource Waters

1. Loss of riparian vegetation within a State Scenic or Wild River segment.
2. Stream channel instability problems related to the overdevelopment of the upper watershed and/or the loss of significant riparian vegetation in the watershed.
3. Habitat alteration due to increased storm water runoff from inadequately controlled development and from increased sediments loads related to poor construction practices.
4. Water warming due to loss of riparian vegetation in upstream reaches or to increased surface runoff volumes.
5. Impairment or threat of impairment of recreational uses due to bacterial loadings.

Threats to Riparian Zones and Flood Plains

1. Loss of zone effectiveness due to vegetation removal from expanded agriculture or resulting from development within the zone.
2. Channel instability introduced by uncontrolled storm water runoff from upstream sites.
3. Development in the zone that requires engineered protection due to channel flooding or stream bank instability.

II. Recommendations

This section outlines recommendations for actions by state and local management agencies for the protection of critical water resources identified in this chapter. These recommendations include measures geared specifically to the protection of critical resources and measures identified elsewhere in more detail (see Chapters 5 and 6). These latter measures are recommended for priority consideration and implementation by local jurisdictions to address the critical areas identified in this chapter.

The background section of this chapter addresses the critical resource problems and their causes. This section identifies potential solutions to ensure the long term sustainability of these critical resources. As work progressed in this planning process, several themes emerged which established the framework and principles underlying the recommendations. Specifically:

- o **Northeast Ohio depends on its water resources.** They are economically and ecologically important to the health and welfare of its citizens. These water resources provide drinking water from both surface and groundwater sources. They provide very important recreational benefits as well as contribute to a diverse ecosystem that provides important functional and economic benefits. However, changes in land use and population shifts have increased demands for these water resources and threaten many of these critical resources.
- o **Nonpoint problems are both water quality and quantity based.** Nonpoint pollution is a result of what activities take place on the land surface and water dynamics that occur as a result (e.g., how water runs off the land surface or is absorbed into the ground). Consequently, all land use activities have the potential to contribute to nonpoint pollution problems. In particular, there is an emerging realization that unchecked storm water runoff from impervious surfaces is in some cases a major cause of threats to critical resources. This occurs due to the alteration of the surface runoff regime, and alteration of the hydrologic processes involved in groundwater recharge.
- o **The solution to nonpoint source and storm water runoff problems are watershed specific.** Therefore, successful solutions must be carried out using a watershed approach that often involves multiple governmental jurisdictions. Also, the nonpoint management programs that need to be utilized in any given watershed will vary depending upon the type of water resource present, the threats to those resources that exist locally, the existing land use, the future land use trends, the governmental structure having jurisdiction over land use decisions, the financial resources available, and the level of citizen involvement.

- o **Because Ohio is a home rule state, local government has a particularly important role in protecting critical resources.** Yet both the technical/administrative capacity and regulatory base (ordinances in villages and cities and resolutions in townships and counties) for protecting critical resources and as well as financial resources to carry out local programs may be limited.
- o **Improved linkages between different levels of government and existing protective mechanisms (PTI/HSDS process) are needed** to ensure that actions taken by one level of government do not end up resulting in cumulative long term irreversible impacts on critical resources.
- o Generally, because of the complexity of the problems and multiple jurisdictions involved, most likely no one protective mechanism will solve the problem. More likely **a suite of mechanisms will be necessary** and in many cases may be preferred to give locally based and supported initiatives maximum flexibility in achieving their protection goals and needs.

Table 7-5 provides a linkage among the critical resource categories to be protected, the threats that apply to each category, and the protective measures that are recommended for application under the WQMP. Groundwater protection is largely provided under auspices of the Safe Drinking Water Act. The measures recommended for managing individual on-site treatment systems and the septage that they generate have been discussed in Chapter 5. The need to carefully monitor road salt application in groundwater supply areas was discussed in Chapter 6. The Riparian Corridor Protection Program outlined in Chapter 7 is the program that is needed to maintain this critical resource in developing areas. The individual recommendations that follow specify how other measures are to be implemented in order to provide protection to surface water drinking supplies and regional resource waters.

Table 7-5: Protective Measures for Critical Water Resources

Threats to Critical Water Resources

1. Increased rates of sedimentation and storm water runoff due to shifts in land cover/land use in upper watershed.
 - Conservation design procedures for storm water management.
 - Storm water management ordinances.
 - Soil erosion on construction sites ordinances.
2. Increased loadings of toxic materials including heavy metals and pesticides.
 - Conservation design procedures for storm water management.
 - Antidegradation rule.
 - Riparian zone ordinances or resolutions.
 - Open space development controls.
3. Increased salinity due to road salt runoff.
 - Road salt minimization & storage management programs.
4. Increased nutrient loadings emanating from faulty on-site systems, small package plants, lawn care, and/or altered agricultural practices.
 - Antidegradation rule.
 - Storm water management ordinances.
 - Riparian zone ordinances or resolutions.
 - Regional BMP plan for home and small commercial sewage systems.
 - Septage disposal plans.
 - Link-deposit program loans or financial aid.
 - Open space development controls.
5. Loss of riparian function in the upper watershed that would serve to reduce flowing pollutant loads.
 - Conservation design procedures for storm water management.
 - Riparian zone ordinances or resolutions.
 - Open space development controls.

Threats to Ground Water Drinking Supplies

1. Bacterial contamination due to faulty on-site system operation and maintenance.
 - Better regional management practices and programs for individual residential and commercial sewage disposal systems.
2. Concentrated leaks, spills, or dumping of hazardous materials.
 - Better regional management practices and programs for individual residential and commercial sewage disposal systems.
 - Septage Disposal Planning.
3. Over development of the resource either through overpumping or by overdeveloping recharge areas.
 - Better regional management practices and programs for individual residential and commercial sewage disposal systems.
 - Open space development controls.
4. Salinity problems resulting from road salt contamination.
 - Road salt minimization & storage management programs.

Table 7-5: (Continued)

Threats to Regional Resource Waters

1. Loss of riparian vegetation within a State Scenic or Wild River segment.
 - Riparian zone ordinance.
2. Stream channel instability and water warming problems related to the overdevelopment of the upper watershed and/or the loss of significant riparian vegetation in the watershed.
 - Conservation design procedures for storm water management.
 - PTI application process revisions to address hydrologic impacts of development.
 - Antidegradation Rule.
 - Storm water management ordinance.
 - Riparian zone ordinance.
 - Financial loans.
3. Habitat alteration due to increased storm water runoff from inadequately controlled development and from increased sediments loads related to poor construction practices.
 - Conservation design procedures for storm water management.
 - PTI application process revisions to address hydrologic impacts of development.
 - Antidegradation Rule.
 - Storm water management ordinance.
 - Riparian zone ordinance.
 - Soil erosion and sediment control at construction sites.
4. Impairment or threat of impairment of recreational uses due to bacterial loadings.
 - Assimilative capacity set aside for exceptional waters.
 - Better regional management practices and programs for individual residential and commercial sewage disposal systems.

Threats to Riparian Zones and Flood Plains

1. Loss of zone effectiveness due to vegetation removal due to expanded agriculture or resulting from development within the zone.
 - Riparian zone ordinance.
2. Loss of habitat diversity due to channel instability introduced by uncontrolled storm water runoff from upstream sites.
 - Conservation design procedures for storm water management.
 - PTI application process revisions to address hydrologic impacts of development.
 - Storm water management ordinance.
3. Development in the zone that requires engineered protection due to channel flooding or stream bank instability.
 - Riparian zone ordinance.

A. Permit to Install Measure Recommendations

Recommendation 7-1: Ohio EPA is requested to adopt changes to its Permit to Install (PTI) application procedure for new or increased discharges from municipal and industrial facilities to areas identified as critical areas in the WQMP area as follows:

- a) a PTI applicant would be required to assess potential land use disturbances and off-site hydrologic and hydraulic impacts associated with the potential discharge;**
- b) a PTI applicant would be required to develop measures to mitigate off-site hydrologic and hydraulic impacts to those critical resources, and agree to rigorously implement those measures.**

This measure, if adopted, would revise Ohio EPA's PTI application procedure to identify applicant requirements to address water quantity and water quality effects of the proposal on critical resources and watersheds. It seeks to improve linkages between the local regulation base for storm water management and to enhance the consideration of nonstructural and structural practices to reduce and manage runoff from development sites. The current PTI application process does not require applicants to address proposed measures for limiting storm water quality and quantity impacts that may impact critical resources directly or indirectly. This measure seeks to alleviate the hydrologic impacts associated with the dense urban development that is possible with sanitary sewer service. It recognizes that storm water runoff increases with development unless closely controlled. As storm water runoff increases, streams are hydrologically and hydraulically modified. This threatens their biological, aesthetic and recreational values, values that are sought to be protected by the PTI process. By linking the PTI application process with local storm water management requirements in areas where new development or redevelopment is occurring, it is expected that protection of critical resources will be enhanced due to the more rigorous implementation of storm water best management practices. This measure does not apply to PTI applications that seek to correct existing problems related to existing development.

This measure requires a rule making change at the state level. Under the proposal, Ohio EPA would require any PTI applicant to identify measures and procedures for reducing off-site impacts to critical resources. Among the measures to be considered by the applicant are the nonpoint source programs recommended in Chapter 6. (See Recommendations 6-1 to 6-6).

Recommendation 7-2: The WQMP encourages local officials to augment state-initiated assimilative capacity set-asides for the Regional Resource Waters within their jurisdictions by petition to the Ohio EPA through Ohio EPA's Total Maximum Daily Load (TMDL) process. Local officials are encouraged to request an additional set aside of up to 20% of the assimilative capacity as an expression of their commitment to maintain high quality water resources where those resources have local importance. This recommendation involves the following designation steps:

Step 1: An affected local jurisdiction or group of affected jurisdictions proposes an

assimilative capacity set-aside of one or more designated Regional Resource Waters within its (their) jurisdiction(s);

Step 2: The proposed set-aside would be evaluated through the NOACA Continuing Planning Process for consistency with 208 plan guidelines, and circulated to all affected local jurisdictions for comment.

Step 3: Based upon the evaluation and recommendation by the NOACA Continuing Planning Process, the NOACA Board would propose an amendment to the WQMP seeking the designation of each accepted set aside.

Step 4: Ohio EPA would consider this amendment for certification and implementation under the TMDL process.

Section 303(d) of the Clean Water Act and Chapter 40 of the Code of Federal Regulations, Part 130 require states to develop total maximum daily loads (TMDLs) for waters not meeting designated uses under technology-based controls for pollution. The TMDL process quantitatively assesses the impairment factors so that states can establish water-quality based controls to reduce pollution from both point and nonpoint sources, and to restore and protect the quality of their water resources.

The Ohio EPA currently has the ability to establish assimilative capacity set-asides pursuant to the Ohio Administrative Code Chapter 3745-1-05. At the present time, set-asides are developed on a case-by-case basis for proposals of new pollutant loadings to high quality waters protected by the State's Antidegradation Policy. The Director of the Ohio EPA may propose changes to the Ohio Administrative Code to incorporate the new pollutant set-asides. The objective of Recommendation 7-2 is to reserve a portion of the assimilative capacity for all pollutants regulated by Water Quality Standards (Ohio Administrative Code Chapter 3745-1) in streams designated as Regional Resource Waters in the WQMP under the TMDL process. This reserve capacity would not be allocated to any pollution source.

Implementation of the set-asides would limit or prevent threats caused by the impacts from new development proposed in areas designated for special protection through constraints on future Permits-to-Install (PTI) decisions. The use of this measure preserves the aesthetic, aquatic, and recreational benefits associated with specific stream segments. These benefits directly help to sustain the property values of properties contiguous to these river segments.

This measure would be adopted and implemented under the auspices of this WQMP through a partnership between areawide agencies, the local community and the Ohio EPA. Through this partnership, local officials would nominate specific set-asides for their specific geographic resources which would be evaluated by the Continuing Planning Process for consistency with the WQMP, included in updates to the WQMP, and supported/enforced through Ohio EPA's TMDL and PTI review processes. The step review process that has been developed requires that the NOACA Board make a recommendation to Ohio EPA on each nomination request after coordination with all upstream communities so as to identify the full economic and social impacts prior to the Board's recommendation.

B. Financial Incentives Recommendations

Recommendation 7-3: Ohio EPA's Division of Environmental & Financial Assistance (DEFA) is requested to amend its policies regarding the Water Pollution Control Loan Fund (WPCLF) to make enhancements to its financial incentives program to give priority to the protection of critical water resources identified in the WQMP.

Recommendation 7-3a: Ohio EPA's Division of Environmental & Financial Assistance (DEFA) is requested to amend its policies regarding the Water Pollution Control Loan Fund (WPCLF) so as to reduce the interest rate charged to certain applicants who agree to expand and enhance their septage handling capability. The interest rate sought is to a level which would allow an applicant to save interest costs in an amount equal to the capital cost of the septage receiving facilities included in new WPCLF construction loans. This request applies to facilities accepting septage from areas tributary to critical resource areas identified in Tables 7-5 to 7-7 as threatened by the lack of adequate septage handling capacity.

The Water Pollution Control Loan Fund, administered by Ohio EPA-DEFA, can provide special interest rate incentives to cities/counties which agree to incorporate the installation of septage receiving/treatment facilities into pending treatment plant or collection improvement loans. This interest rate discount will provide an incentive to communities contemplating POTW improvements to add or expand such septage handling facilities to their proposed projects. Since the discount would be added to projects already planned to be constructed, the interest rate discount provides a "semi-grant" by absorbing the capital cost of the septage facilities. These facilities can, in turn be used by communities to generate revenue to either offset the additional treatment cost resulting from accepting septage at their POTWs or, in some cases, may even result in a net reduced operating cost. The establishment of septage disposal plans are essential to the successful implementation of the management recommendations presented in Chapter 5 to ensure proper operation and maintenance of individual sewage disposal systems (those used for residential dwellings and small business operation in unsewered areas). There is concern that with the enforcement of federal Part 503 Septage Regulations, many of the current land application haulers may cease operations. It is essential to establish a network of publicly owned treatment plants with septage receiving capabilities to dispose of septage generated in each county.

Recommendation 7-3b: Ohio EPA-Division of Environmental and Financial Assistance (DEFA) through its Water Pollution Control Loan Fund (WPCLF) Link Deposit Program is requested to provide low-interest financial assistance to individuals and private organizations for implementation of individual sewage disposal system improvements mandated by local health departments to reduce nonpoint source pollution in areas tributary to critical resource waterways. The objective of this mechanism is to use WPCLF monies to deposit in local lending institutions that are linked to low interest rate loans to individuals for system repairs and replacements.

This protective mechanism allows local health departments and the Ohio EPA to facilitate the replacement of failing systems by providing below market interest loans for residential and small business sewage system owners. Ohio EPA-DEFA purchases certificates of deposit and accepts a reduced interest from participating local banking institutions. These funds are then provided by the participating banks as reduced interest loans to the owners making sewage system improvements at three percentage points below the rate the individual would normally receive. The lending institution uses its own loan criteria in deciding whether or not to offer an applicant a loan and will set the term of the loan. Homeowners and businesses may use these loans to make necessary improvements under orders from the District Board of Health or the Ohio EPA or to make voluntary improvements. To participate in the program a county health board must first develop a management plan, and then identify interested local banking institutions. The Ohio EPA enters into formal agreements with each participating bank. The relationship between the Ohio EPA and the county health board is outlined in a memorandum of understanding that is signed by both parties.

Once a lending institution agrees to participate and meet the Ohio EPA requirements regarding the use of the funds, the local health department can begin issuing “Certificates of Qualification” to individuals for the Link Deposit Loan Program. The individual then takes the Certificate of Qualification to a participating lending institution. Upon receipt of a certificate, the lending institution can accept a low interest loan application. The application is reviewed by the bank and, if approved, the bank applies to Ohio EPA for deposit funds. Once the WPCLF deposit funds are received, the bank disburses the loan monies to the homeowners as construction proceeds. The homeowner then repays the loan to the bank.

At the present time, the lending institution assumes all loan risks. The loan program would benefit if extra incentives could be made available to low and moderate income households. There are no such provisions in the program at this time, however.

Under this program, loans are available for the repair or replacement of a failing on-site system. Loans cannot be made to cover the cost of installing on-site systems associated with new construction. In some limited cases, loans can also be made to facilitate the abandonment of an on-site system and the connection to a sanitary sewer. Current federal policy restricts the use of federal funds for this purpose. However, state funds can be so used.

Recommendation 7-3c: Ohio EPA-Division of Environmental and Financial Assistance (DEFA) through its Water Pollution Control Loan Fund (WPCLF) Link Deposit Program is requested to provide low-interest financial assistance to be utilized as an

economic incentive for residential subdivisions and other development projects that utilize open space design techniques in areas that are tributary to critical resource areas identified in the WQMP.

Ohio EPA's Water Pollution Control Loan Fund assistance can provide an economic incentive to lay out and construct subdivisions and other development projects in a manner reflecting open space design techniques, avoiding adverse environmental impacts on a variety of resources, and promoting protection of environmentally sensitive areas and resources. The basic criteria include proximity to the water resource, land use compatibility, timing of nomination of project for WPCLF financing, and environmental protection elements of the development proposal. The purpose of providing WPCLF assistance in this context is twofold: a) to protect a water resource that is fully attaining a warmwater, exceptional warmwater or cold water habitat designation or a high quality wetland, or b) restore a water resource to full attainment with one of the aforementioned designated habitat uses or a wetland area to a high quality wetland. The management plan is very specific that financed improvements must serve to accomplish either one of these purposes. Recommendation 7-3c seeks Ohio EPA prioritization of this form of assistance to projects addressing critical resources identified in this WQMP.

In this context, WPCLF assistance to developers will encourage them to design and build projects that will provide appropriate scale housing (or other structure) densities while protecting environmentally sensitive areas, minimizing impervious surface area, and reducing soil loss from construction sites. By meeting the WPCLF criteria, developers may be eligible to borrow WPCLF funds at a below market rate for up to 20 years. In addition, the costs and time to develop projects will be lessened by specific actions such as eliminating stream crossings and reducing the area covered by impervious surface material. House lots adjacent to open spaces traditionally sell faster and at premium prices.

The open space concept encourages 50-70% of a subdivision to remain as conservation areas, therefore, the watershed will have less impervious surfaces, less lawn chemicals and more natural wildlife habitat than that provided under typical zoning and land uses proposed for the project site. Minimal construction activity in the project area will also result in less soil erosion and sedimentation into local streams.

Most rural zoning requirements have minimum lot sizes established for home sewage systems. Open space housing lots are normally smaller than the required minimum. Negotiations and innovative approaches may be key to resolving these types of issues in accordance with the minimum criteria established for the WPCLF program. Guidelines for construction of these are discussed in Chapter 6 (see Recommendation 6-4).

In some circumstances, county and municipal building and zoning codes must be amended before developers will be able to take advantage of this program. All communities are encouraged to make such amendments if necessary.

C. Water Protection Measures Recommendations

Chapter 5 presented a program for improved management of home sewage disposal systems and semi-public systems by local health departments. Chapter 6 recommended a suite of nonpoint source and storm water management regulations for adoption by local jurisdictions. These measures control erosion/sedimentation and storm water runoff from construction sites, the protection of riparian corridors, and the minimization of road salt usage. Communities can also take part in the Watershed Resource Restoration Sponsor Program sponsored by Ohio EPA-DEFA to use interest payments on DEFA loans to help protect critical resource waters. The WQMP encourages local jurisdictions to pursue these actions on a priority basis in the critical resources areas identified in this chapter.

Recommendation 7-4: Local jurisdictions are encouraged to pursue on a priority basis the implementation of nonpoint source recommendations outlined in Chapter 6 and the management of home sewage disposal systems in Chapter 5 in areas tributary to critical water resources.

D. Construction Site Management Measures Recommendations

Chapter 6 identified the need for construction site erosion and sediment control programs for implementation by local jurisdictions. The WQMP encourages local jurisdictions to pursue these actions on a priority basis in the critical resources areas identified in this chapter.

Recommendation 7-5: EPA is requested to prioritize the enforcement of the National Pollutant Discharge Elimination System permits for construction site activities in developing communities which are tributary to Regional Resource Waters and Surface Drinking Water Supplies identified in the WQMP that are not adequately protected by local construction site management programs.

III. Policies for Encouraging Local Actions for the Protection of Critical Water Resources

This section sets forth areawide policies for supporting the program of critical resource protections spelled out in this chapter.

Policy 7-1: NOACA resolves that the surface drinking water reservoirs listed in Table 7-1 as critical regional water resources possess unique or special characteristics that warrant priority protective action by local jurisdictions whose land area is tributary.

Policy 7-2: NOACA resolves that the stream segments listed in Table 7-3 as Regional Water Resources possess unique or special characteristics that warrant priority protective action by local jurisdictions whose land area is tributary.

Policy 7-3: NOACA resolves that the groundwater drinking supplies in areas listed in Table 7-2 are critical regional water resources that possess unique or special characteristics that warrant priority protective action by Ohio EPA. Local jurisdictions are encouraged to work with Ohio EPA and local health departments to implement programs developed to protect the groundwater supplies.

Policy 7-4: NOACA encourages local and county jurisdictions to pursue implementation of the home sewage and semi-public sewage disposal management recommendations outlined in Chapter 5 and the nonpoint source management recommendations outlined in Chapter 6 on a priority basis in areas tributary to the critical water resource areas identified in this plan.

Policy 7-5: A local or county jurisdiction that agrees to implement one or more of the critical water resource protection recommendations outlined in this WQMP are recognized as a designated management agency for critical resource protection in this plan.

Policy 7-6: Local and county jurisdictions are encouraged to pursue implementation of the critical water resource protection recommendations outlined in this WQMP by cooperating on an interjurisdictional watershed basis as outlined in Chapter 9.

Policy 7-7: NOACA encourages state and federal funding agencies to provide on a priority basis nonpoint source and watershed grants to support implementation of critical water resource protection recommendations by designated management agencies recognized in this plan.

Policy 7-8: NOACA will support local government implementation of the protective measures for critical regional water resources with technical and planning support through the continuing planning process (see Chapter 10).

IV. Strategy for Implementing Critical Resource Protections

Implementation of the programs recommended in this chapter will require an active sustained effort at promoting and supporting local implementation initiatives. This is an effort that will require the sustained interest and cooperation of a number of agencies with nonpoint source technical resources, including the areawide planning agencies, county level support agencies such as the county soil and water conservation districts, county sanitary engineers, county engineers, county planning agencies, the NEORS and others, state agencies including Ohio EPA, ODNR, ODH, ODOT, the Ohio Lake Erie Commission and the OWDA among others, and the watershed planning organizations discussed in Chapter 9.

The presentation of the plan to local jurisdictions for review and comment provides an initial opportunity for promoting these recommendations, but the continuing planning process must take into account ongoing work.

Appendix 7-1

Identification of Protective Measures to Address Threats To Critical Resources

Selection of Protective Measures to Address Threats to Critical Resources

A series of protective measures were identified in the planning process as potential means of enhancing water quality protection in the region under the auspices of the Water Quality Management Plan Update. These are grouped into to five categories:

Permit to Install Measures

1. PTI Application Process Requirements to Address Hydrologic Impacts of Development;
2. Antidegradation Rule to Protect High Quality Waters;
3. Local Assimilative Capacity Set Aside for Exceptional Waters;

Financial Incentive Measures

4. Revolving Loan Fund Assistance
 - a. Septage Disposal Financial Assistance Enhancements;
 - b. Link Deposit Program Enhancements;
 - c. Open Space Development Controls.

Waterway Protection Measures

5. Subdivision Regulations to Allow Conservation Design for Storm Water Management;
6. Riparian Zone Protection Regulations;
7. Road Salt Minimization and Storage Management Programs;

Construction Site Management Measures

8. Storm Water Management Ordinances;
9. Soil Erosion and Sediment Control Ordinances;

Individual On-site Sewage Disposal System Management Measures

10. Better Regional Management Practices and Programs for Individual Residential and Commercial Sewage Disposal Systems;
11. Septage Disposal Plans.

Chapter 6 contains a discussion of the Riparian Zone Ordinance, Road Salt Minimization Program, Storm Water Management Ordinance, and Soil Erosion and Sediment Control Measures. Chapter 5 addresses the management of home sewage disposal and semi-public sewage disposal systems. The remaining protective measures were discussed in Part II of Chapter 7.

The potential of a protective measure to effectively address threats and to avoid the further degradation of a water resource is a function of several factors. This evaluation of specific water bodies includes a determination of the subset of all threats that are applicable to that specific water resource. "Operative" threats are classified as impacting if they exist right now. This can include threats that are often associated with growing urbanization if that growth is occurring now or if it is imminent. Threats are classified as "threatening" if they are only likely to develop at some time in the near future or are expected to have a limited damage potential in the watershed under analysis.

Given the information about the threats that are affecting a given water body, specific protective measures necessary for the protection of that resource can be identified. This identification has a similar hierarchy to the impacting/threatening nature of the threats. In a given locale, a protective measure that has been identified as being applicable is considered to be a priority if its application is both needed and feasible, if it addresses a substantial portion of all of the threats operative at the locale, and if there is a reasonable base of information to guide the implementation of the measure. Supplemental measures are those which can be expected to affect a threat that has a more limited potential to impact water quality at a given location either because too little land area is affected by that specific threat to be truly significant or the damage that could result from the threat has already occurred so as to be entrenched in the watershed now and for a long future.

Table 7-6 identifies protective measures addressing threats to surface drinking water supplies. Table 7-7 identifies protective measures for groundwater drinking supplies. Table 7-8 identifies the protective measures applicable to Regional Resource Waters. The priority measures that apply to the protection of resource waters tend to be grouped according to the development state of the affected watershed. For example, a specific subset of all measures tends to apply to virtually all streams that are located in predominantly rural streams. Another set of measures tends to apply to most urbanized watersheds. A third, and separate, group of measures are applicable to watersheds which are urbanizing. These subsets of measures have been assigned to specific resource waters depending on which category best describes that resource's current state.

The riparian zone/floodplain analysis does not have a specific listing of geographic areas because riparian protection must be applied to all areas undergoing stream side development. Such development is commonplace throughout the region. All communities need to take action to protect vegetated riparian areas and to reinstate vegetative buffers in disturbed areas whenever opportunities arise. Floodplain management programs are also needed along all streams and rivers in order to both minimize flood related losses and to maintain channel capacity so as not to aggravate downstream flooding.

Table 7-6: Protective Measures for Threats to Surface Drinking Water Supplies

Community Water Supply (watershed type)	Reservoir(s) (Watershed)	Threats		Protective Measures	
		Primary	Secondary	Priority	Supplemental
Wellington (rural)	Wellington Reservoir (Black)	4,5		6,10	2,4b
Oberlin (urban/urbanizing)	Oberlin Reservoir (Black)	1,5	4	6,8	2,9
Medina (urban/urbanizing)	Lake Medina (Rocky)	2,5	4,3	2,6,8	9,10
Berea (urban)	Coe and Baldwin Lakes (Rocky)	1,2,3	4	2,8	
Akron (rural)	East Branch Reservoir (Cuyahoga)	4		2,9	
Akron (rural/urbanizing)	LaDue Reservoir (Cuyahoga)	1,2	4,5	6,8	2,9,10
Akron (rural/urbanizing)	Lake Rockwell (Cuyahoga)	1,4,5	2	2,6,8	9,10

Threats

1. Increased rates of sedimentation and storm water runoff due to shifts in land cover/land use in upper watershed.
2. Increased loadings of toxic materials including heavy metals and pesticides.
3. Increased salinity due to road salt runoff.
4. Increased nutrient loadings emanating from faulty on-site systems, small package plants, lawn care, and/or altered agricultural practices.
5. Loss of riparian function in the upper watershed would serve to increase flowing pollutant loads.

Protective Measures

2. Antidegradation Rule.
- 4a. Septage disposal plans.
- 4b. Link-deposit program.
- 4c. Open space development controls.
5. Conservation design procedures for storm water management.
6. Riparian zone ordinances or resolutions.
7. Road salt minimization & storage management programs.
8. Storm water management ordinances.
9. Soil erosion on construction sites ordinances.
10. Regional BMP plan for home and small commercial sewage systems.

Table 7-7: Threats to Ground Drinking Water Supplies

Community or Geographic Area	Threats		Protective Measures	
	Primary	Secondary	Priority	Supplemental
Western Medina County (rural)	4	1,2,3	10	
Eastern Medina County (rural/urbanizing)	1,3	2	10	4a
Eastern Lake County (rural/urbanizing)	1,3,5	2	7,10	4a
Western Geauga County (urbanizing)	1,3	2,5	7,10	4a
Eastern Geauga County (rural/urbanizing)	1,3	2	10	
South Central Medina County (rural/urbanizing)	1,3	2	10	4a

Threats

1. Bacterial contamination due to faulty on-site system operation and maintenance
2. Concentrated leaks, spills, or dumping of hazardous materials.
3. Over development of the resource either through over pumping or by over developing recharge areas.
4. Saline intrusion due to over pumping at depth.
5. Salinity problems resulting from road salt contamination.

Protective Measures

- 4a. Septage disposal plans.
7. Road salt minimization & storage management programs.
10. Better regional management practices and programs for individual residential and commercial sewage disposal systems.

Table 7-8 Regional Resource Water Protective Measures

COUNTY	BASIN	NAME	REASON	THREATS		MEASURES		
				IMPACTING	THREATENING	PRIORITY	SUPPLEMENTAL	
Summit	Cuyahoga	Boston Run (rural)	CVNRA	1,4		2,6,10		
Summit	Cuyahoga	Brandywine Creek (urbanizing)	CVNRA	1,2,3	4	3,5,6,8,9	1,2,4c	
Summit	Cuyahoga	Cuyahoga River (urban)	CVNRA					
Summit	Cuyahoga	Dickerson Run (rural)	CVNRA	1,4		2,6,10		
Summit	Cuyahoga	Yellow Creek (urbanizing)	CVNRA	1,2,3	4	3,5,6,8,9	1,2,4c	
Summit	Cuyahoga	Furnace Run (urbanizing)	CVNRA	1,2,3	4	3,5,6,8,9	1,2,4c	
Summit	Cuyahoga	Haskell Run (rural)	CVNRA	1,4		2,6,10		
Portage	Cuyahoga	Lake Rockwell (urbanizing)	Bald Eagle Nesting Site/ City of Akron Water Supply	1,2,3	4	3,5,6,8,9	1,2,4c	
Summit	Cuyahoga	Langes Run (rural)	CVNRA	1,4		2,6,10		
Summit	Cuyahoga / Haskell Run	Ritchie Run (rural)	CVNRA	1,4		2,6,10		

Table 7-8 Continued

COUNTY	BASIN	NAME	REASON	THREATS		MEASURES		
				IMPACTING	THREATENING	IMPACTING	PRIORITY	SUPPLEMENTAL
Summit	Cuyahoga	Robinson Run (rural)	CVNRA	1,4		1,4	2,6,10	
Summit	Cuyahoga	Salt Run (rural)	CVNRA	1,4		1,4	2,6,10	
Summit	Cuyahoga	Slipper Run (rural)	CVNRA	1,4		1,4	2,6,10	
Summit	Cuyahoga	Stanford Run (rural)	CVNRA	1,4		1,4	2,6,10	
Summit	Cuyahoga	Woodward Creek (rural)	CVNRA	1,4		1,4	2,6,10	
Cuyahoga	Lake Erie	Doan Brook (urban)	Shaker Lakes National Environmental Landmark	2,3	4		2,6	10
Geauga Portage	Cuyahoga	Cuyahoga River (rural)	State Scenic River	1,4			2,6,10	
Geauga	Cuyahoga	Cuyahoga West Branch (rural)	High Quality Wetlands/Candidate for State Scenic River	1,4			2,6,10	
Cuyahoga	Cuyahoga	Tinkers Creek (urban)	Tinkers Creek State Park/ High Quality Wetlands	2,3	4		2,6	10

Table 7-8 Continued

COUNTY	BASIN	NAME	REASON	THREATS		MEASURES	
				IMPACTING	THREATENING	PRIORITY	SUPPLEMENTAL
Cuyahoga	Cuyahoga	Tinkers Creek (urban)	Cleveland Metroparks Bedford Reservation	2,3	4	2,6	10
Cuyahoga	Lake Erie	Euclid Creek (urban)	Cleveland Metroparks	2,3	4	2,6	10
Cuyahoga	Cuyahoga	Big Creek (urban)	Cleveland Metroparks	2,3	4	2,6	10
Cuyahoga	Cuyahoga / Tinkers Creek	Deerlick Run (?)	Cleveland Metroparks Bedford Reservation				
Cuyahoga	Cuyahoga / Tinkers Creek	SW Branch to Deerlick Run at RM 0.4 (?)	Cleveland Metroparks Bedford Reservation				
Cuyahoga	Cuyahoga / Tinkers Creek	South Branch to Deerlick Run at RM 0.46 (?)	Cleveland Metroparks Bedford Reservation				
Cuyahoga	Cuyahoga / Tinkers Creek	North Branch to Deerlick Run at RM 0.46 (?)	Cleveland Metroparks Bedford Reservation				

Table 7-8 Continued

COUNTY	BASIN	NAME	REASON	THREATS		MEASURES		
				IMPACTING	THREATENING	PRIORITY	SUPPLEMENTAL	
Cuyahoga	Cuyahoga	Chippewa Creek (urbanizing)	Cleveland Metroparks Brecksville Reservation	1,2,3	4		3,5,6,8,9	1,2,4c
Lake	Lake Erie	Mentor Creek & Mentor Marsh (urbanizing)	State Nature Preserve	1,2,3	4		3,5,6,8,9	1,2,4c
Lake/Geauga	Grand	Grand River (rural)	State Scenic & Wild	1,4			2,6,10	
Cuyahoga	Rocky	Rocky River (urban)	Seasonal Salmonid	2,3	4		2,6	10
Cuyahoga	Rocky	East Branch Rocky River (urbanizing)	Cleveland Metro Parks	1,2,3	4		3,5,6,8,9	1,2,4c
Cuyahoga	Rocky	East Branch Rocky River (urban)	Cleveland Metro Parks Millstream Reservation	2,3	4		2,6	10
Cuyahoga	Rocky / East Branch	Baldwin Creek (urban)	Cleveland Metro Parks Rocky River Reservation	2,3	4		2,6	10
Lake/Geauga	Chagrin	Chagrin River (urbanizing)	Seasonal Salmonid	1,2,3	4		3,5,6,8,9	1,2,4c

Table 7-8 Continued

COUNTY	BASIN	NAME	REASON	THREATS		MEASURES	
				IMPACTING	THREATENING	PRIORITY	SUPPLEMENTAL
Lake	Chagrin	East Branch and Tributaries (urbanizing)	Cold Water Habitat	1,2,3	4	3,5,6,8,9	1,2,4c
Cuyahoga	Chagrin	Griswold Creek (urbanizing)	Exceptional Warm Water Habitat	1,2,3	4	3,5,6,8,9	1,2,4c

Threats

1. Loss of riparian vegetation within a State Scenic or Wild River segment.
2. Stream channel instability problems related to the over development of the upper watershed and/or the loss of significant riparian vegetation in the watershed.
3. Habitat alteration due to increased storm water runoff from inadequately controlled development and from increased sediments loads related to poor construction practices.
4. Water warming due to loss of riparian vegetation in upstream reaches or to increased surface runoff volumes.

Protective Measures

1. PTI Application Process to address hydrologic impacts.
2. Antidegradation Rule
3. Local assimilative capacity set asides
- 4c. Open space development.
5. Conservation design for storm water management.
6. Riparian zone ordinances or resolutions.
8. Storm water management ordinances.
9. Soil erosion on construction sites ordinances.
10. Regional BMP plan for home and small commercial sewage systems.

Appendix 7-1

Identification of Protective Measures to Address Threats To Critical Resources

Selection of Protective Measures to Address Threats to Critical Resources

A series of protective measures were identified in the planning process as potential means of enhancing water quality protection in the region under the auspices of the Water Quality Management Plan Update. These are grouped into to five categories:

Permit to Install Measures

1. PTI Application Process Requirements to Address Hydrologic Impacts of Development;
2. Antidegradation Rule to Protect High Quality Waters;
3. Local Assimilative Capacity Set Aside for Exceptional Waters;

Financial Incentive Measures

4. Revolving Loan Fund Assistance
 - a. Septage Disposal Financial Assistance Enhancements;
 - b. Link Deposit Program Enhancements;
 - c. Open Space Development Controls.

Waterway Protection Measures

5. Subdivision Regulations to Allow Conservation Design for Storm Water Management;
6. Riparian Zone Protection Regulations;
7. Road Salt Minimization and Storage Management Programs;

Construction Site Management Measures

8. Storm Water Management Ordinances;
9. Soil Erosion and Sediment Control Ordinances;

Individual On-site Sewage Disposal System Management Measures

10. Better Regional Management Practices and Programs for Individual Residential and Commercial Sewage Disposal Systems;
11. Septage Disposal Plans.

Chapter 6 contains a discussion of the Riparian Zone Ordinance, Road Salt Minimization Program, Storm Water Management Ordinance, and Soil Erosion and Sediment Control Measures. Chapter 5 addresses the management of home sewage disposal and semi-public sewage disposal systems. The remaining protective measures were discussed in Part II of Chapter 7.

The potential of a protective measure to effectively address threats and to avoid the further degradation of a water resource is a function of several factors. This evaluation of specific water bodies includes a determination of the subset of all threats that are applicable to that specific water resource. “Operative” threats are classified as impacting if they exist right now. This can include threats that are often associated with growing urbanization if that growth is occurring now or if it is imminent. Threats are classified as “threatening” if they are only likely to develop at some time in the near future or are expected to have a limited damage potential in the watershed under analysis.

Given the information about the threats that are affecting a given water body, specific protective measures necessary for the protection of that resource can be identified. This identification has a similar hierarchy to the impacting/threatening nature of the threats. In a given locale, a protective measure that has been identified as being applicable is considered to be a priority if its application is both needed and feasible, if it addresses a substantial portion of all of the threats operative at the locale, and if there is a reasonable base of information to guide the implementation of the measure. Supplemental measures are those which can be expected to affect a threat that has a more limited potential to impact water quality at a given location either because too little land area is affected by that specific threat to be truly significant or the damage that could result from the threat has already occurred so as to be entrenched in the watershed now and for a long future.

Table 7-6 identifies protective measures addressing threats to surface drinking water supplies. Table 7-7 identifies protective measures for groundwater drinking supplies. Table 7-8 identifies the protective measures applicable to Regional Resource Waters. The priority measures that apply to the protection of resource waters tend to be grouped according to the development state of the affected watershed. For example, a specific subset of all measures tends to apply to virtually all streams that are located in predominantly rural streams. Another set of measures tends to apply to most urbanized watersheds. A third, and separate, group of measures are applicable to watersheds which are urbanizing. These subsets of measures have been assigned to specific resource waters depending on which category best describes that resource's current state.

The riparian zone/floodplain analysis does not have a specific listing of geographic areas because riparian protection must be applied to all areas undergoing stream side development. Such development is commonplace throughout the region. All communities need to take action to protect vegetated riparian areas and to reinstate vegetative buffers in disturbed areas whenever opportunities arise. Floodplain management programs are also needed along all streams and rivers in order to both minimize flood related losses and to maintain channel capacity so as not to aggravate downstream flooding.

Table 7-6: Protective Measures for Threats to Surface Drinking Water Supplies

Community Water Supply (watershed type)	Reservoir(s) (Watershed)	Threats		Protective Measures	
		Primary	Secondary	Priority	Supplemental
Wellington (rural)	Wellington Reservoir (Black)	4,5		6,10	2,4b
Oberlin (urban/urbanizing)	Oberlin Reservoir (Black)	1,5	4	6,8	2,9
Medina (urban/urbanizing)	Lake Medina (Rocky)	2,5	4,3	2,6,8	9,10
Berea (urban)	Coe and Baldwin Lakes (Rocky)	1,2,3	4	2,8	
Akron (rural)	East Branch Reservoir (Cuyahoga)	4		2,9	
Akron (rural/urbanizing)	LaDue Reservoir (Cuyahoga)	1,2	4,5	6,8	2,9,10
Akron (rural/urbanizing)	Lake Rockwell (Cuyahoga)	1,4,5	2	2,6,8	9,10

Threats

1. Increased rates of sedimentation and storm water runoff due to shifts in land cover/land use in upper watershed.
2. Increased loadings of toxic materials including heavy metals and pesticides.
3. Increased salinity due to road salt runoff.
4. Increased nutrient loadings emanating from faulty on-site systems, small package plants, lawn care, and/or altered agricultural practices.
5. Loss of riparian function in the upper watershed would serve to increase flowing pollutant loads.

Protective Measures

2. Antidegradation Rule.
- 4a. Septage disposal plans.
- 4b. Link-deposit program.
- 4c. Open space development controls.
5. Conservation design procedures for storm water management.
6. Riparian zone ordinances or resolutions.
7. Road salt minimization & storage management programs.
8. Storm water management ordinances.
9. Soil erosion on construction sites ordinances.
10. Regional BMP plan for home and small commercial sewage systems.

Table 7-7: Threats to Ground Drinking Water Supplies

Community or Geographic Area	Threats		Protective Measures	
	Primary	Secondary	Priority	Supplemental
Western Medina County (rural)	4	1,2,3	10	
Eastern Medina County (rural/urbanizing)	1,3	2	10	4a
Eastern Lake County (rural/urbanizing)	1,3,5	2	7,10	4a
Western Geauga County (urbanizing)	1,3	2,5	7,10	4a
Eastern Geauga County (rural/urbanizing)	1,3	2	10	
South Central Medina County (rural/urbanizing)	1,3	2	10	4a

Threats

1. Bacterial contamination due to faulty on-site system operation and maintenance
2. Concentrated leaks, spills, or dumping of hazardous materials.
3. Over development of the resource either through over pumping or by over developing recharge areas.
4. Saline intrusion due to over pumping at depth.
5. Salinity problems resulting from road salt contamination.

Protective Measures

- 4a. Septage disposal plans.
7. Road salt minimization & storage management programs.
10. Better regional management practices and programs for individual residential and commercial sewage disposal systems.

Table 7-8 Regional Resource Water Protective Measures

COUNTY	BASIN	NAME	REASON	THREATS		MEASURES		
				IMPACTING	THREATENING	PRIORITY	SUPPLEMENTAL	
Summit	Cuyahoga	Boston Run (rural)	CVNRA	1,4		2,6,10		
Summit	Cuyahoga	Brandywine Creek (urbanizing)	CVNRA	1,2,3	4	3,5,6,8,9	1,2,4c	
Summit	Cuyahoga	Cuyahoga River (urban)	CVNRA					
Summit	Cuyahoga	Dickerson Run (rural)	CVNRA	1,4		2,6,10		
Summit	Cuyahoga	Yellow Creek (urbanizing)	CVNRA	1,2,3	4	3,5,6,8,9	1,2,4c	
Summit	Cuyahoga	Furnace Run (urbanizing)	CVNRA	1,2,3	4	3,5,6,8,9	1,2,4c	
Summit	Cuyahoga	Haskell Run (rural)	CVNRA	1,4		2,6,10		
Portage	Cuyahoga	Lake Rockwell (urbanizing)	Bald Eagle Nesting Site/ City of Akron Water Supply	1,2,3	4	3,5,6,8,9	1,2,4c	
Summit	Cuyahoga	Langes Run (rural)	CVNRA	1,4		2,6,10		
Summit	Cuyahoga / Haskell Run	Ritchie Run (rural)	CVNRA	1,4		2,6,10		

Table 7-8 Continued

COUNTY	BASIN	NAME	REASON	THREATS		MEASURES	
				IMPACTING	THREATENING	PRIORITY	SUPPLEMENTAL
Summit	Cuyahoga	Robinson Run (rural)	CVNRA	1,4		2,6,10	
Summit	Cuyahoga	Salt Run (rural)	CVNRA	1,4		2,6,10	
Summit	Cuyahoga	Slipper Run (rural)	CVNRA	1,4		2,6,10	
Summit	Cuyahoga	Stanford Run (rural)	CVNRA	1,4		2,6,10	
Summit	Cuyahoga	Woodward Creek (rural)	CVNRA	1,4		2,6,10	
Cuyahoga	Lake Erie	Doan Brook (urban)	Shaker Lakes National Environmental Landmark	2,3	4	2,6	10
Geauga Portage	Cuyahoga	Cuyahoga River (rural)	State Scenic River	1,4		2,6,10	
Geauga	Cuyahoga	Cuyahoga West Branch (rural)	High Quality Wetlands/Candidate for State Scenic River	1,4		2,6,10	
Cuyahoga	Cuyahoga	Tinkers Creek (urban)	Tinkers Creek State Park/ High Quality Wetlands	2,3	4	2,6	10

Table 7-8 Continued

COUNTY	BASIN	NAME	REASON	THREATS		MEASURES	
				IMPACTING	THREATENING	PRIORITY	SUPPLEMENTAL
Cuyahoga	Cuyahoga	Tinkers Creek (urban)	Cleveland Metroparks Bedford Reservation	2,3	4	2,6	10
Cuyahoga	Lake Erie	Euclid Creek (urban)	Cleveland Metroparks	2,3	4	2,6	10
Cuyahoga	Cuyahoga	Big Creek (urban)	Cleveland Metroparks	2,3	4	2,6	10
Cuyahoga	Cuyahoga / Tinkers Creek	Deerlick Run (?)	Cleveland Metroparks Bedford Reservation				
Cuyahoga	Cuyahoga / Tinkers Creek	SW Branch to Deerlick Run at RM 0.4 (?)	Cleveland Metroparks Bedford Reservation				
Cuyahoga	Cuyahoga / Tinkers Creek	South Branch to Deerlick Run at RM 0.46 (?)	Cleveland Metroparks Bedford Reservation				
Cuyahoga	Cuyahoga / Tinkers Creek	North Branch to Deerlick Run at RM 0.46 (?)	Cleveland Metroparks Bedford Reservation				

Table 7-8 Continued

COUNTY	BASIN	NAME	REASON	THREATS		MEASURES		
				IMPACTING	THREATENING	PRIORITY	SUPPLEMENTAL	
Cuyahoga	Cuyahoga	Chippewa Creek (urbanizing)	Cleveland Metroparks Brecksville Reservation	1,2,3	4		3,5,6,8,9	1,2,4c
Lake	Lake Erie	Mentor Creek & Mentor Marsh (urbanizing)	State Nature Preserve	1,2,3	4		3,5,6,8,9	1,2,4c
Lake/Geauga	Grand	Grand River (rural)	State Scenic & Wild	1,4			2,6,10	
Cuyahoga	Rocky	Rocky River (urban)	Seasonal Salmonid	2,3	4		2,6	10
Cuyahoga	Rocky	East Branch Rocky River (urbanizing)	Cleveland Metro Parks	1,2,3	4		3,5,6,8,9	1,2,4c
Cuyahoga	Rocky	East Branch Rocky River (urban)	Cleveland Metro Parks Millstream Reservation	2,3	4		2,6	10
Cuyahoga	Rocky / East Branch	Baldwin Creek (urban)	Cleveland Metro Parks Rocky River Reservation	2,3	4		2,6	10
Lake/Geauga	Chagrin	Chagrin River (urbanizing)	Seasonal Salmonid	1,2,3	4		3,5,6,8,9	1,2,4c

Table 7-8 Continued

COUNTY	BASIN	NAME	REASON	THREATS		MEASURES	
				IMPACTING	THREATENING	PRIORITY	SUPPLEMENTAL
Lake	Chagrin	East Branch and Tributaries (urbanizing)	Cold Water Habitat	1,2,3	4	3,5,6,8,9	1,2,4c
Cuyahoga	Chagrin	Griswold Creek (urbanizing)	Exceptional Warm Water Habitat	1,2,3	4	3,5,6,8,9	1,2,4c

Threats

1. Loss of riparian vegetation within a State Scenic or Wild River segment.
2. Stream channel instability problems related to the over development of the upper watershed and/or the loss of significant riparian vegetation in the watershed.
3. Habitat alteration due to increased storm water runoff from inadequately controlled development and from increased sediments loads related to poor construction practices.
4. Water warming due to loss of riparian vegetation in upstream reaches or to increased surface runoff volumes.

Protective Measures

1. PTI Application Process to address hydrologic impacts.
2. Antidegradation Rule
3. Local assimilative capacity set asides
- 4c. Open space development.
5. Conservation design for storm water management.
6. Riparian zone ordinances or resolutions.
8. Storm water management ordinances.
9. Soil erosion on construction sites ordinances.
10. Regional BMP plan for home and small commercial sewage systems.