

CHAPTER IV GOALS, POLICIES, AND OBJECTIVES

PART 1. NATURAL RESOURCES

Subpart 6 Carbonate Rock (Karst) Topography

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Introduction

Karst is a type of land surface, or topography, that is formed at the surface of carbonate rock formations (such as limestone and dolomite) when water dissolves the rock over time. This process causes surface depressions and the development of such features as sinkholes, sinking streams, enlarged bedrock fractures, caves, and underground streams. Sinking streams range in size from intermittent streams to perennial rivers. They may sink through a segment of the stream bed or through a discrete opening such as a fracture or cave entrance, and then reappear further downstream. Sinkholes function as funnels, directing surface water runoff into karst aquifers with little or no attenuation of any transported contaminants. Stormwater basins, septic system leaching fields and sewers may also contribute contaminants directly to ground water through karst features. Soils in sinkhole bottoms may be thin or non-existent. In addition to ground water concerns, communities in karst areas must contend with safety concerns as sinkholes can have damaging effects to large manmade objects. The Highlands Region has several large areas with carbonate rock formations, usually valleys such as the Musconetcong, South Branch Raritan and Lamington, and karst features exist in some – but not all – of these areas.

GOAL 1.6.1 PROTECTION OF GROUND WATER QUALITY AND PUBLIC SAFETY REGARDING KARST FEATURES IN THE HIGHLANDS

Policy 1.6.1.1 To map areas of the Highlands Region that are underlain by carbonate rocks to define a Carbonate Rock Area.

Policy 1.6.1.2 To identify and delineate land areas that drain surface water into the Carbonate Rock Area, as changes in the quantity, quality and rate of discharge of surface water runoff from upslope lands can impair ground water resources in the Carbonate Rock Area.

Policy 1.6.1.3 To establish and maintain an inventory of karst features in the Highlands Region.

Policy 1.6.1.4 To ensure that municipalities in, or draining to, the Carbonate Rock Area protect public health and safety and the quality of ground waters from inappropriate land uses and pollutant discharges.

Objective 1.6.1.4.1 *Identification of critical requirements for development ordinances to be adopted by municipalities, with technical guidance.*

Objective 1.6.1.4.2 *Applications for site plan or subdivision approval will include a multi-phased geotechnical site investigation (e.g., test borings, test pits, etc.) to locate any potential karst features and potential hazards to public health and safety, structures and ground water quality.*

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Objective 1.6.1.4.3 *Municipal and Highlands Council development reviews and requirements shall ensure that all potential hazards to public health and safety, structures and ground water quality are fully addressed and mitigated in the construction plans and subsequent approval process, with the maximum emphasis on nonstructural measures, including, but not limited to, avoidance of modifications to the karst features.*

Objective 1.6.1.4.4 *Public works projects, including but not limited to water supply, sewerage, stormwater and transportation facilities, shall be constructed and maintained such that the potential for damage from karst features and the contamination of ground water are avoided.*

**Subpart 7
Lake Management**

Introduction

The management of lands surrounding lakes is an important issue for the Highlands Region. Overdeveloped, damaged and poorly managed shoreland areas can result in the degradation of water quality, harm to the lake ecosystem, a decrease of natural aesthetic values, and an overall loss of property values for lake communities. Lakes can be harmed by pollutant sources in the watershed area draining to them. Polluted lakes can, in turn, damage downstream streams and rivers. Most existing lake communities are fully built out, predate modern environmental protection requirements, and have limited potential for major land use changes. Some have sewer systems, but many rely on septic systems (or even cesspools) on inadequately sized lots, where direct contamination of the lakes is possible. Past NJDEP studies indicate that nearly every public lake (privately-owned lakes were not evaluated) is experiencing unacceptable contamination, often including excessive bacteria and nutrients. In addition, many lake communities have been evolving from summer communities to year-round communities, and many are experiencing greatly intensified land uses as the original buildings are torn down and replaced by much larger structures. Addressing land uses within lake communities allows for potential opportunities to improve community value, to both protect natural resources and to enhance and restore the quality of lake environments in the Region, and in some cases to allow for in-fill development where appropriate.

GOAL 1.7.1 PROTECTION OF HIGHLANDS REGION LAKES FROM THE IMPACTS OF PRESENT AND FUTURE DEVELOPMENT

Policy 1.7.1.1 To establish tiers of lake management appropriate to management strategies that help protect lake water quality and community value from the impacts of present and future development.

Objective 1.7.1.1.1 *Lake management programs shall use the following management tiers around Highlands Region lakes of greater than 10 acres in size:*

- *A shoreland protection tier consisting of an area measured 300-foot perpendicular from the shoreline of the lake;*
- *A water quality management tier consisting of an area measured 1,000-foot perpendicular from the shoreline of the lake, but outside of the shoreland protection tier;*
- *A scenic resources tier consisting of an area measured 300 to 1000-foot perpendicular from the shoreline of the lake, scaled based upon the view distance from the opposite shoreline, and determined through the size and layout of the lake,*

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with wider portions of lakes having longer view distances;

- *A lake watershed tier, consisting of the entire land area draining to the lake, through the evaluation of drainage areas using LiDAR topographic analyses or other topographic data where LiDAR data are not available.*

Policy 1.7.1.2. To establish management strategies to help protect lake water quality and ecosystem values from the impacts of present and future development.

Objective 1.7.1.2.1. *Implementation of standards regarding lake ecosystem and water quality in the shoreland protection tier to address direct and proximate impacts upon the lake, including but not limited to shoreline modification and development (including limits to the hardscaping of shorelines using bulkheads, rip-rap and walls), docks, piers, boathouses, dredging, vegetation removal, and increased impervious cover. Pollutant discharges shall also be addressed, including the potential for contamination from septic systems, cesspools and other wastewater management systems within the tier that are failing or are inadequately designed and constructed. As such systems fail, landowners should be required to provide upgraded treatment to minimize pollutant movement to the lake.*

Objective 1.7.1.2.2. *Implementation of standards regarding land use compatibility and water quality in the water quality management tier, to prevent or minimize continuous pollutant sources that can contribute pollutants overland or through ground water to the lake from greater distances than the shoreland protection tier.*

Objective 1.7.1.2.3 *Implementation of standards regarding the protection of visual and scenic resources in the scenic resources tier, including but limited to requirements for vegetative screening of buildings, building height limitations, and limits on tree and understory removal for reasons other than public health and safety or as the minimum necessary to make reasonable use of the designated building envelope for the parcel proposed for development.*

Objective 1.7.1.2.4 *Implementation of lake restoration plans to restore, protect and, where possible, enhance lake water quality through management of pollutant sources in the lake watershed tier, including but not limited to the development, adoption and implementation of TMDLs by NJDEP pursuant to the Water Quality Management Planning Rules, N.J.A.C. 7:15.*

Policy 1.7.1.3. To require that conforming municipalities adopt and implement the standards applicable to the shoreland protection, water quality management and scenic resources tiers for application to lakes with public recreational access or ownership (i.e., with shorelines that are not entirely privately-held and managed through a lake association).

Policy 1.7.1.4 To require that conforming municipalities develop and adopt lake restoration plans, with sufficient input from lake community residents and landowners, for each of the municipality's developed lakes with public recreational access or ownership, to include watershed delineation, description of point and nonpoint sources of pollution in the watershed, lake monitoring schedules, existing and proposed in-lake management techniques, and recommended watershed best management practices. TMDLs adopted by the NJDEP to address known pollution problems may be used as lake restoration plans.

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Objective 1.7.1.4.1 *Provide Lake Management Plan guidance to municipalities that includes watershed delineation mapping methodology, point and nonpoint source pollution references, example lake monitoring schedule with monitoring goals and methods, existing successful in-lake management techniques, and best management practices. Provide conformance grant funding as necessary to develop plans.*

Objective 1.7.1.4.2 *Replace septic systems and cesspools on small lots in close proximity to lakes with upgraded individual treatment systems, communal septic systems or community-based wastewater systems wherever feasible and cost-effective. Community-based systems should not provide for additional land development capacity except for exempt lots within that existing lake community that are not environmentally constrained, or for lots in a Planned Community Zone that are not environmentally constrained and are contiguous to the existing lake community.*

GOAL 1.7.2 PROTECT THE UNIQUE CHARACTER OF HIGHLANDS LAKE COMMUNITIES

Policy 1.7.2.1 To provide guidance regarding evaluation of and standards for lake character and aesthetics that shall be adopted by municipal ordinance for application to publicly-owned lake communities, or that may be voluntarily adopted by privately-owned lake communities within their by-laws and regulations.

Policy 1.7.2.2 To encourage increased public access to publicly-owned lakes, within the lake's carrying capacity and while maintaining the lake character.

Policy 1.7.2.3 To discourage or control teardowns that result in altered lake community character, and to encourage community-supported limitations in lot coverage and building height for new construction.

Policy 1.7.2.4 To establish and implement performance and development standards for shoreline uses which achieve compatibility among shoreline activities and nearby neighborhoods.

Policy 1.7.2.5 To encourage municipalities to utilize recreational sites as opportunities to educate the public to the ecological value of lake environs.

Policy 1.7.2.6 To encourage municipalities to explore appropriate means to provide public recreation at the shoreline and on the water while ensuring retention of opportunities for passive recreation (e.g., natural areas, open space).

GOAL 1.7.3 MAINTAIN PUBLIC AND PRIVATE LAKES, OR RESTORE LAKE BEDS AND DOWNSTREAM AREAS WHEN LAKES ARE DRAINED

Policy 1.7.3.1 To develop innovative financing and administrative mechanisms for the maintenance and operation of public and private dams and lakes, where those dams and lakes provide a continuing public or private purpose.

Policy 1.7.3.2 To restore appropriate habitats in the lake beds and to prevent, mitigate or restore downstream habitats from damages due to lake drainage, when dams are allowed to fail or are deliberately breached or removed.