

Policy Consideration: **Steep Slope Protection Requirements**
Status: **For Consideration by the Highlands Council at
the September 21, 2006 Work Session**
Date: **September 19, 2006**

I. STAFF POLICY RECOMMENDATIONS

- 1) Establish a **Steep Slope Area** as those lands that exhibit a grade of 15% or greater for inclusion in the RMP and Land Use Capability Map.

Rationale: Slope is a measurement of the steepness of terrain. Disturbance of steep slopes can aggravate erosion and sedimentation, resulting in the loss of topsoil, a valuable natural resource. It can also result in the degradation of water quality, alteration of drainage patterns, and the intensification of flooding. There is strong evidence in the scientific literature to suggest that slopes exceeding 15% are susceptible to an increased incidence of soil losses when disturbed.

The Highlands Act calls for a prohibition on development on steep slopes in the **Preservation Area** that have a grade of 20% or greater, and the implementation of standards for development on slopes in the Preservation Area exhibiting a grade between 10 and 20%. These standards are contained within the New Jersey Department of Environmental Protection (NJDEP) regulations applicable to the Preservation Area (N.J.A.C. 7:38-3.8). The Highlands Act also requires that the RMP identify areas that are significantly constrained by environmental limitations such as **steep slopes** (Section 11.6.c).

- 2) The following standards shall be incorporated into the **Regional Protection Zone** of the Land Use Capability Map (LUCM) in furtherance of the goals and requirements of the Highlands Act to protect and enhance Highlands resources:

- Include Steep Slope Areas with a grade of 15% or greater that are located in close proximity to a surface water feature

Rationale: The Highlands Act requires the development of a Land Use Capability Map and minimum standards based upon the Resource Assessment and Smart Growth Component. Sections 11.a.(1) , 11.a.(6) and 12. The mapping of the Steep Slope Protection Area achieves the goal of the Act to identify areas that are significantly constrained by environmental limitations such as steep slopes, to ensure that the level of protection afforded to these critical areas is adequate and appropriate. The results are used as one input to the Land Use Capability Map. Applicable Resource Protection and Smart Design standards can then be assigned to the extent they are appropriate and necessary to maintain water quality and ecological integrity.

- 3) The following **Resource Protection Standards** are recommended for the RMP in furtherance of the goals and requirements of the Highlands Act to protect and enhance Highlands natural resources, including:

- Discourage development activities and land uses in an area of Steep Slope.

- Require inclusion of the Steep Slope Protection Area within municipal zoning and land use ordinances.

Rationale: The RMP Standards support the necessity to determine the amount and type of human development and activity the Highlands Region can sustain while still maintaining the ecological value of the Highlands Region. Section 11.a.(1)(a). The Highlands Act requires the development of Land Use Capability Map and minimum standards based upon the Resource Assessment and Smart Growth Component. Sections 11.a.(1) , 11.a.(6) and 12.

- 4) The following **Smart Design Standards** are recommended for the RMP in furtherance of the goals and requirements of the Highlands Act to encourage appropriate conservation based design throughout the region.

Include the following steep slope thresholds for design standards:

- **Severe Slope Constraints** – Those areas that include slope greater than 20% or greater than 10% if within a Riparian Area.
- **Moderately Severe Slope Constraints** - Those areas that include slope between 10-20% and are not within a Riparian Area but are forested, susceptible to erosion, proximate to a riparian area, and have shallow depth to bedrock or a Soil Capability Class indicative of wet or stony soils.
- **Moderate Slope Constraints** - Those areas that include slope between 10-20% and are not within or proximate to a Riparian Area and are non-forested, but are susceptible to erosion, and have shallow depth to bedrock or a Soil Capability Class indicative of wet or stony soils.
- **Low Slope Constraints** - Those areas that include slope between 10-20% and are not within or proximate to a Riparian Area, are non-forested, and are not susceptible to erosion, and do not have shallow depth to bedrock or a Soil Capability Class indicative of wet or stony soils.

Establish minimum design standards to minimize impacts to steep slopes based on the following minimum standards:

- Avoid disturbance of soils or vegetation within a **severe** or **moderately severe** slope.
- Minimize disturbance to a Moderate or Low slope using Low Impact Development (LID) Best Management Practices (BMPs) standards.

Rationale: Section 11 of the Highlands Act requires a Resource Assessment of Highlands resources in order to maintain the overall ecological values of the Highlands Region. The Highlands Act requires the development of Land Use Capability Map and minimum standards based upon the Resource Assessment and Smart Growth Component. Sections 11.a.(1) , 11.a.(6) and 12. RMP standards are assigned based on the degree to which slope may impact or impair surface water quality to better inform the amount and type of human

development and activity the Highlands Region can sustain while still maintaining the ecological value of the Highlands Region. Section 11.a.(1)(a).

- 5) The following **Pre-Conformance Strategies** are recommended in furtherance of the goals and requirements of the Highlands Act to ensure successful implementation of the RMP prior to the conformance period, including:

- Develop technical guidelines and procedures for development of Steep Slope Protection standards for inclusion in municipal zoning and land use ordinances.

Rationale: RMP Implementation Strategies support the necessity to determine what activities, data and programs will be required of both the Highlands Council and municipal and county stakeholders during the Plan Conformance process as well as what initiatives will require longer term planning goals. Sections 11.a.(3), 14 and 15. The RMP is a “living document” and will continue to be refined and developed in support of regional planning goals. In order to facilitate regional planning goals it is imperative that the RMP have State, County, and local support from all levels of government and the support of the stakeholders of the Highlands Region.

- 6) The following **Conformance Strategies** are recommended in furtherance of the goals and requirements of the Highlands Act to ensure successful implementation of the RMP during the conformance period, including:

- Require that municipal conformance approval include the Steep Slope Protection Area and protection standards in conformance with the RMP.
- Require inclusion of Steep Slope Protection Area and standards into Municipal and/or County Master Plans, Zoning and Land Use Ordinances, as appropriate.

Rationale: RMP Implementation Strategies support the necessity to determine what activities, data and programs will be required of both the Council and municipal and county stakeholders during the Plan Conformance process as well as what initiatives will require longer term planning goals. Sections 11.a.(3), 14 and 15. The RMP is a “living document” and will continue to be refined and developed in support of regional planning goals. In order to facilitate regional planning goals it is imperative that the RMP have State, County, and local support from all levels of government and the support of the stakeholders of the Highlands Region.

- 7) The following **5-year Resource Protection and Planning Goals** are recommended in furtherance of the goals and requirements of the Highlands Act to ensure continued refinement and development of the RMP, including:

- Identify steep slopes within the Highlands Region using refined topographic mapping.

Rationale: The Highlands Act requires the Highlands Council to periodically revise and update the RMP at least once every six years. Section 8.a. RMP Implementation Strategies support the necessity to determine what activities, data and programs will be

required of both the Council and municipal and county stakeholders during the Plan Conformance process as well as what initiatives will require longer term planning goals. The RMP is a “living document” and will continue to be refined and developed in support of regional planning goals. In order to facilitate regional planning goals it is imperative that the RMP have State, County, and local support from all levels of government and the support of the stakeholders of the Highlands Region. Sections 11.a.(3), 14 and 15.

8) The following **Coordination and Consistency Considerations** are recommended to promote active participation in the implementation of the RMP among state and federal agencies:

- Develop a coordinated regulatory review program with the NJDEP to ensure consistency of permit actions, open space acquisition priorities, surface water quality standards and restoration activities consistent with the resource protection goals of the RMP.
- Coordinate with the Natural Resource Conservation Service to develop standards for soil erosion and sediment control plans consistent with the resource protection goals of the RMP.

Rationale: RMP Implementation Strategies support the necessity to determine what local, State, and federal programs and policies may best be coordinated to promote the goals, purposes, policies, and provisions of the RMP. Sections 11.a.(4). The RMP is a “living document” and will continue to be refined and developed in support of regional planning goals. In order to facilitate regional planning goals it is imperative that the RMP have State, County, and local support from all levels of government and the support of the stakeholders of the Highlands Region.

9) The following **Local Participation Considerations** are recommended to promote the understanding and support for the RMP resource protection goals at the local level:

- Develop educational program for municipal officials on methods to identify and protect steep slopes.

Rationale: RMP Implementation Strategies support the necessity to provide for the maximum feasible local government and public input into the Highlands Council's operations. Section 11.a.(3)(emphasis added). The RMP is a “living document” and will continue to be refined and developed in support of regional planning goals. In order to facilitate regional planning goals it is imperative that the RMP have State, County, and local support from all levels of government and the support of the stakeholders of the Highlands Region.

II. REQUIREMENTS OF THE HIGHLANDS ACT AND RMP GOALS RELATED TO HIGHLANDS STEEP SLOPE PROTECTION REQUIREMENTS:

Goals of the Highlands Act:

In accordance with Section 10 of the Highlands Act, the overarching goal of the Regional

Master Plan “with respect to the entire Highlands Region shall be to protect and enhance the significant values of the resources thereof in a manner which is consistent with the purposes and provisions of this act.” Section 10.a.

The Highlands Act establishes specific goals relating to protection of Highlands steep slopes. Those goals with respect to the Preservation Area shall be to:

- protect, restore, and enhance the **quality and quantity of surface and ground waters.** Section 10.b.(1). (emphasis added).
- preserve **extensive and, to the maximum extent possible, contiguous areas of land in its natural state**, thereby ensuring the continuation of a Highlands environment which contains the **unique and significant natural**, scenic, and other resources representative of the Highlands Region. Section 10.b.(2). (emphasis added).
- protect the natural, scenic, and other resources of the Highlands Region, including but not limited to contiguous forests, wetlands, vegetated stream corridors, **steep slopes**, and critical habitat for fauna and flora. Section 10.b.(3). (emphasis added).
- prohibit or limit to the maximum extent possible construction or development which is **incompatible with preservation of this unique area.** Section 10.b.(9). (emphasis added).

In addition, the goals relating to protection of Highlands steep slopes with respect to the Planning Area shall be to:

- protect, restore, and enhance the **quality and quantity of surface and ground waters.** Section 10.c.(1). (emphasis added).
- preserve to the maximum extent possible any **environmentally sensitive lands** and other lands needed for recreation and **conservation purposes.** Section 10.c.(2). (emphasis added).
- protect and maintain the **essential character of the Highlands environment.** Section 10.c.(3). (emphasis added).

Requirements of the Highlands Act:

Resource Assessment

The Highlands Act requires the development of a Resource Assessment for the Highlands Region which “(a) determines the amount and type of human development and activity which the ecosystem of the Highlands Region can sustain while still maintaining the overall ecological values thereof, with special reference to **surface and ground water quality** and supply; contiguous forests and woodlands; endangered and threatened animals, plants, and biotic communities; ecological factors relating to the protection and enhancement of agricultural or horticultural production or activity; air quality; and other appropriate considerations affecting the ecological integrity of the Highlands Region.” Section 11.a.(1)(a)(emphasis added).

Smart Growth Component

The Highlands Act also includes specific requirements relating to protection of open waters requiring the development of a Smart Growth component that includes “an assessment, based upon the resource assessment prepared pursuant to paragraph (1) of subsection a. of this section, of opportunities for appropriate development, redevelopment, and economic growth, and a transfer of development rights program.... In preparing this component, the council shall: (a) prepare a **land use capability map;**

- (b) identify **existing developed areas** capable of sustaining redevelopment activities and investment;
- (c) identify **undeveloped areas** in the planning area, which are **not significantly constrained by environmental limitations** such as **steep slopes**, wetlands, or dense forests, are not prime agricultural areas, and are located near or adjacent to existing development and infrastructure, that could be developed; . . .
- (g) identify **special critical environmental areas and other critical natural resource lands** where development should be limited. Section 11.a.(6)”(emphasis added).

Preservation Area Assessment

For the Preservation Area, Section 12 of the Highlands Act requires “a **land use capability map** and a comprehensive statement of policies for planning and managing the development and use of land in the preservation area, which shall be based upon, comply with, and implement the **environmental standards” adopted by NJDEP and the Resource Assessment prepared the Highlands Council** under Section 11. Section 12.(emphasis added).

Section 12 specifically requires implementation “that will ensure the continued, uniform, and consistent protection of the Highlands Region in accordance with the goals, purposes, policies, and provisions of this act, and shall include:

- a. a preservation zone element that **identifies zones within the preservation area where development shall not occur** in order to protect water resources and environmentally sensitive lands and which shall be permanently preserved through use of a variety of tools, including but not limited to land acquisition and the transfer of development rights; and
- b. minimum standards governing municipal and county master planning, development regulations, and other regulations concerning the development and use of land in the preservation area, including, but not limited to, standards for minimum lot sizes and stream setbacks, **construction on steep slopes**, maximum appropriate population densities, and **regulated or prohibited uses** for specific portions of the preservation area. Section 12. (emphasis added).

Preservation Area Requirements

The NJDEP’s rules at N.J.A.C. 7:38-3.8 rules implement Section 34.j. which requires “a prohibition on development, except linear development for infrastructure, utilities, and the rights-of-way therefor, provided that no other feasible alternative, as determined by the department, exists for the linear development, on steep slopes in the preservation area with a grade of 20% or greater, and standards for development on slopes in the preservation area exhibiting a grade of between 10% and 20%. The standards shall assure that developments on slopes exhibiting a grade of between 10% and 20% preserve and protect steep slopes from the negative consequences of development on the site and the cumulative impact in the Highlands Region. The standards shall be developed to prevent soil erosion and sedimentation, protect water quality, prevent stormwater runoff, protect threatened and endangered animal and plant species sites and designated habitats, provide for minimal practicable degradation of unique or irreplaceable land types, historical or archeological areas, and existing scenic attributes at the site and within the surrounding area, protect upland forest, and restrict impervious surface; and shall take into consideration differing soil types, soil erodability, topography, hydrology, geology, and vegetation types.”

Local Participation Component

A component to provide for the maximum feasible local government and public input into the council's operations, which shall include a framework for developing policies for the planning area in conjunction with those local government units in the planning area who choose to conform to the regional master plan. Section 11.a.(3).

Coordination and Consistency Component

A coordination and consistency component which details the ways in which local, State, and federal programs and policies may best be coordinated to promote the goals, purposes, policies, and provisions of the regional master plan, and which details how land, water, and structures managed by governmental or nongovernmental entities in the public interest within the Highlands Region may be integrated into the regional master plan. Section 11.a.(4).

III. TECHNICAL BASIS AND JUSTIFICATION FOR STAFF RECOMMENDATIONS

In furtherance of the requirements and goals of the Highlands Act as summarized above, the Highlands Steep Slope Protection Requirements of the Ecosystem Management Element of the RMP are intended to protect the natural, scenic, and other resources of the Highlands Region, including but not limited to steep slopes.

The Ecosystem Management program element is intended to identify natural and ecological resources in need of protection for inclusion in the Land Use Capability Map and RMP implementation policies. It also evaluates the effects of land development and other stresses on those resources, and establishes the overall strategies and policies necessary to protect, enhance and restore, where appropriate, their value.

It is critical to protect steep slopes as their disturbance can aggravate erosion and sedimentation, resulting in the loss of topsoil, a valuable natural resource. It can also result in the disturbance of habitats, degradation of surface water quality, silting of wetlands, alteration of drainage patterns, obstruction of drainage structures, and the intensification of flooding. These processes, when severe, can also result in land slumping and landslides that can damage both developed property and ecosystems. The identification and classification of steep slopes is of great importance in order to effectively manage critical natural resources in the Highlands.

The RMP includes an inventory of steep slopes within the Highlands Region and establishes the extent of Steep Slope Protection Area needed to maintain existing uses, avoid further impairment of open waters and allow for opportunities to restore ecological integrity where appropriate. The extent of the Steep Slope Protection Area informs development of the RMP and Land Use Capability Map.

The approach is based on the best available science and the results of the Resource Assessment performed in support of the RMP, and reinforced through the scientific literature and existing state or federal regulatory programs, where applicable. In addition, as required by Section 12 of the Highlands Act for the Preservation Area, the approach is based upon, comply with, and implement the environmental standards adopted by NJDEP and the Resource Assessment performed by the Highlands Council. This requirement of the Highlands Act authorizes the Highlands Council to integrate results of these two elements of the Act into a unified approach for the protection of Highlands resources.

IV. GLOSSARY

This section defines the terms that are used to develop the approach and methods that informed the proposed policy actions for this RMP element. Topic specific glossaries will contribute to the general RMP glossary of terms.

Low Impact Development (LID) Best Management Practices (BMPs) – Low Impact Development is an environmentally sensitive approach to storm water management that emphasizes conservation and the use of existing natural site features integrated with distributed, small scale storm water controls to more closely mimic natural hydrologic patterns in residential, commercial and industrial settings. LID best management practices involve comprehensive land planning and engineering design to maintain and enhance the hydrologic regime of urban lands and development within watersheds. LID standards and best management practices are supported by the New Jersey Stormwater Management Rules, N.J.A.C. 7:8 and the “New Jersey Stormwater Best Management Practices Manual” developed by the New Jersey Department of Environmental Protection, in coordination with the New Jersey Department of Agriculture, the New Jersey Department of Community Affairs, the New Jersey Department of Transportation, municipal engineers, county engineers, consulting firms, contractors, and environmental organizations.

Slope - Slope is a measurement of the steepness of terrain. It is the ratio of vertical rise to horizontal distance expressed as a percentage.

Soil Erodibility (K) - the inherent susceptibility of soil particles or aggregates to become detached or transported by erosive agents such as rainfall, runoff, or wind.

Percent Slope - Percent slope of the terrain is the ratio of vertical rise to horizontal distance expressed as a percentage. Slopes of concern are those that exceed 10%, with additional thresholds of 15% and 20%.

Soil Erodibility - Soil erodibility (K) is the inherent susceptibility of soil particles or aggregates to become detached or transported by erosive agents such as rainfall, runoff, or wind. K values are expressed as decimal points and the units are called “erodibility units.”

Soil Capability Class - The NRCS SSURGO data set includes a soil capability class and subclass ranking system. Soil capability classes and subclasses shall be mapped using the County Soil Surveys to identify those areas with steep slopes, where soils are classified as Class IIe, IIs, or higher.