

DRAFT FOR CONSIDERATION BY THE HIGHLANDS COUNCIL  
AT THE JUNE 12, 2008 COUNCIL MEETING

Restoration of Streams and Riparian Areas

**Issue Overview**

Streams transport floodwater, stormwater and suspended materials, support aquatic ecosystems, protect fish and wildlife habitat, and provide recreation opportunities and aesthetic beauty. Riparian areas moderate fluctuations in water temperature, help maintain ground water recharge and stream base flow, stabilize stream banks, and provide flood storage areas. During high flow or overland runoff events, riparian areas reduce erosion and sediment loads to surface water and remove excess nutrients and contaminants from flood water. Riparian areas also provide habitat for a variety of wildlife and support terrestrial and aquatic food webs through deposition of woody debris.

Stream and riparian area quality and function are influenced by intensity and type of land use. Anthropogenic disturbance to these systems disrupt the transport, storage, and quality of water that is critical to ecological functions. Land use change, increased impervious surfaces, and riparian vegetation removal decrease infiltration capacity within riparian areas, increase overland storm or flood water runoff, erode stream banks, alter stream profile, degrade water quality, alter stream flow regime, and damage aquatic fish and benthic communities.

The Highland Act requires that the Regional Management Plan protect, enhance, and restore the Region's waters. To meet this goal, several RMP policies and objectives address the requirement for preventing disturbance to high quality systems, and for restoring the Region's streams and riparian areas.

**Program Summary**

The Highlands Regional Master Plan focuses on several areas of action to address the need to protect, restore and enhance Highlands Open Waters and Riparian Areas. The Stream Restoration Program will promote consistent standards for the protection, restoration and acquisition of important waters and riparian areas of the Highlands Region. The program will include guidance for the restoration of degraded streams and riparian areas.

**RMP Policies and Objectives Addressed**

**Policy 1D4.** Highlands Open Waters shall include a protection buffer of 300 feet from the edge of the Highlands Open Water feature. All development shall comply with buffer standards which provide for the protection of Highlands Open Waters reviewed on a site-specific basis during local development review and Highlands Project Review.

**Objective 1D4f.** Implement a Stream Corridor Protection/Restoration plan and Low Impact Development Best Management Practices for any development activity proposed within a Highlands Open Water buffer.

**Objective 1D4i.** Develop through Plan Conformance and implement municipality-wide, stream corridor or subwatershed-based Stream Corridor Protection/Restoration Plans which shall include Steps 1, 2 and 3, and may include Steps 4 and 5:

1. Identify areas where existing development, disturbances or land uses are within the Highlands Open Water buffers and have reduced or impaired the functional values of those buffers
2. Identify opportunities for restoration of areas identified in Step 1 as part of

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mitigation requirements under a Highlands Act waiver or Objectives 1D4e and 1D4f, and public or non-governmental remedial projects;

3. Identify the extent of stream corridor features that are critical to supporting the functions of a healthy Highlands Open Waters buffer and that extend beyond the requirements of Objectives 1D4b and 1D4c. The 300-foot buffer in these areas may be expanded to be most protective of these features which may include, but are not limited to, critical habitat areas, pollutant source areas identified through scientific techniques, and steep slopes;
4. Identify locations where, based on scientific analysis of site-specific conditions (e.g., topography, vegetation cover type, habitat, soil type, upstream land uses and pollution inputs, width of floodplain, rate and volume of run-off), the full 300 foot buffer is not necessary to achieve the protective roles of Highlands Open Water buffers and Riparian Areas for Category 2 surface waters. Identify a buffer that is fully protective of existing functional buffer values and is no less restrictive than any buffer established under State or municipal regulation, including Objectives 1D4b and 1D4c. Conduct a functional value assessment to ensure that there is no net loss in the overall functional value of the subwatershed's stream buffers. Buffer averaging for the purpose of accommodating development proposals is deemed *not* to meet the requirements of this provision;
5. Where a proposed Highlands Redevelopment Area would not meet in full Objectives 1D4b through 1D4h but affects an undisturbed area determined to not be necessary for the protection of the functional values for a Highlands Open Water buffer for a Category 2 surface water as determined through Step 4, modification of the buffer may be allowed to the extent allowed in State or municipal regulation.

**Policy 1D5.** Protect the integrity of the Riparian Areas through the application of RMP standards during local development review and Highlands Project Review.

**Objective 1D5b.** Limit disturbance of existing natural vegetation or increases in impervious area within High and Moderate Integrity Riparian Areas in any LUC Zone to the minimum alteration feasible in areas beyond the Highlands Open Water buffer requirements; protect the water quality of adjacent Highlands Open Waters; and maintain or restore habitat value of the Riparian Area.

**Objective 1D5g.** Require identification and implementation of opportunities where the restoration and enhancement of previously impaired Riparian Areas are feasible and appropriate as mitigation to any allowable modification to Riparian Area requirements.

**Objective 1D6b.** Consistent with Policy 1H1, identify opportunities for and implement Riparian Area restoration practices on public and private lands that give priority to ecological and watershed protection measures.

**Stream and Riparian  
Functional Assessment**

The Highlands Council guidance for assessing stream corridor and riparian area condition will provide a comprehensive methodology for conducting a stream and riparian functional assessment to value or "score" specific stream reaches and riparian areas. Assessed stream and riparian area value or "score" will dictate

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both the prioritization for preservation of lands draining to high quality streams and riparian areas and the extent and type of restoration required for impaired streams and riparian areas. The functional value assessment will provide a measurable and scientific approach to ensure improvements to one or more of the functional values that stream buffers provide while ensuring that there is no net loss of any of the functional elements resulting from a proposed restoration project. The use of a functional value assessment provides a tool to set measurable management objectives for restoration and enhancement of impaired Highlands Open Waters and Riparian Areas.

**Stream Corridor  
Protection/Restoration  
Plans**

The Highlands Council will develop technical guidance for use by municipalities during Plan Conformance to develop and implement municipality-wide stream corridor or subwatershed-based Stream Corridor Protection/Restoration Plans. Two key element of these plans shall be: 1) to identify areas where existing development, disturbances, or land uses are within Highlands Open Waters buffers and have reduced or impaired the functional values of those buffers; and 2) to identify opportunities for restoration of those areas as part of mitigation requirements under a Highlands Act waiver or RMP Objectives 1D4e and 1D4f, and public or non-governmental remedial projects.

**Development of Stream  
Restoration Guidance**

The Highlands Council will develop technical guidance for use by municipalities for the restoration of impaired streams. Highlands Council guidance for stream restoration may include goals and design guidelines for restoration of channel profile, flood control, sediment control, improved drainage, bank stabilization, improvement of aquatic habitat, and restoration of the ecological functions and processes of a stream and its adjacent riparian area and floodplain. Existing guidance manuals, *Stream Restoration Design*, developed by the Natural Resources Conservation Service, and *Stream Corridor Restoration*, developed by the Federal Interagency Stream Corridor Restoration Working Group, will be used as two examples for the Council's work.

**Development of  
Riparian Restoration  
Guidance**

The Highlands Council will develop or adapt technical guidance for use by municipalities for the restoration of impaired riparian areas. Highlands Council guidance for stream restoration may include goals and design guidelines for restoration of riparian vegetation, improvement of riparian wildlife habitat, increased riparian buffer width, reduction of impervious surface coverage, and restoration of the ecological functions and processes of a riparian area with its adjacent stream and upland terrestrial habitat. *Stream Corridor Restoration*, developed by the Federal Interagency Stream Corridor Restoration Working Group will be used as one example for the Council's work.

**Implementation of  
Stream and Riparian  
Area Restoration  
Projects**

The Highlands Council will encourage restoration of streams and riparian areas by public and private landowners, government agencies, non-profit organizations and other interested parties wherever feasible. Opportunities for restoration include, but are not limited to:

- Redevelopment projects in areas containing previously degraded streams and riparian areas;
- Transportation projects where restoration of previously degraded streams

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and riparian areas can be cost-effectively incorporated into the capital project;

- Implementation of Watershed Restoration Plans approved by the NJ Department of Environmental Protection;
- Park development capital projects, where restoration of prior damage can be cost-effectively incorporated into the capital project.

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The following GPO section shows the final version of GPOs previously considered by the Highlands Council on May 22, 2008, with highlighted sections indicating proposed changes based on Council discussion.

**Subpart b. Highlands Open Waters and Riparian Areas**

Highlands Open Waters and their associated riparian areas are a primary focus of the Highlands Act and must be protected, enhanced and restored to ensure achievement of the Act's goals for water quality, water supply and ecological sustainability. The Highlands Regional Master Plan focuses on four areas of action to address the need to protect, restore and enhance Highlands Open Waters and Riparian Areas:

- Identify and inventory each type of resource area;
- Evaluate the integrity of each type of resource area;
- Establish resource protection measures; and
- Establish programs to promote consistent standards for the protection, restoration and acquisition of important waters and riparian areas of the Highlands Region.

“Highlands Open Waters” are defined by the Highlands Act as all springs, streams including intermittent streams, wetlands, and bodies of surface water, whether natural or artificial (excluding swimming pools), located wholly or partially within the boundaries of the Highlands Region. Highlands Riparian Areas are the lands associated with and bordering Highlands Open Waters that provide critical hydrologic, ecologic and pollutant attenuation functions for the open waters. Highlands Open Waters and Riparian Areas exist in a wide variety of settings, ranging from preserved lands to urban areas. Some support very high quality ecosystems, while others are degraded by existing land uses, stream corridor modifications, stormwater flows and pollutant loadings.

A high priority is for municipalities to develop and implement a Stream Corridor Protection/Restoration Plan that achieves the policies and objectives below, as refined using local scientific knowledge, with incorporation of local planning goals where they do not conflict with these policies and objectives. The Stream Corridor Protection/Restoration Plan will be used as a basis for both development review and restoration activities. Where a Stream Corridor Protection/Restoration Plan has not been approved by the Council, site-by-site development applications in municipalities will be required to strictly adhere to the RMP goals, policies and objectives below.

<b>GOAL 1D</b>	<b>PROTECTION, RESTORATION, AND ENHANCEMENT OF HIGHLANDS OPEN WATERS AND RIPARIAN AREAS.</b>
<b>Policy 1D1</b>	To establish and maintain an inventory of Highlands Open Waters and their integrity. “Highlands Open Waters” are all springs, streams including intermittent streams, wetlands, and bodies of surface water, whether natural or artificial, located wholly or partially within the boundaries of the Highlands Region, but shall not mean swimming pools.
<b>Objective 1D1a</b>	The Watershed Resource Value of Highlands HUC14 subwatersheds shall be established through an analysis of the relative amount of developed lands, habitat quality for threatened and endangered wildlife species, total forest and core forest in each HUC14 subwatershed.

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<b>Policy 1D2</b>	To establish and maintain an inventory of Highlands Riparian Areas and their integrity.
<b>Objective 1D2a</b>	Highlands Riparian Areas shall consist of the floodprone areas, wetlands, soils that are hydric, alluvial or have a shallow depth to ground water, and wildlife passage corridors that are associated with Highlands Open Waters.
<b>Objective 1D2b</b>	The integrity value of Highlands Riparian Areas within each Highlands HUC14 subwatershed shall be established through an analysis of the relative amount of impervious cover, agricultural land use, density of road crossings of streams, vegetative condition, and habitat for wetland/water dependent threatened and endangered wildlife species of the riparian areas.
<b>Policy 1D3</b>	To periodically review and update, as necessary, the Watershed Resource Value and Riparian Area Integrity Values.
<b>Policy 1D4</b>	Highlands Open Waters shall include a protection buffer of 300 feet from the edge of the discernable bank of the Highlands Open Water feature, or from the centerline where no discernable bank exists. With respect to wetlands and other Highlands Open Waters features (e.g., seeps, springs, etc.), the feature shall include a protection buffer of 300 feet from the delineated Letter of Interpretation (LOI) line issued by the NJDEP for wetlands, or from a field-delineated boundary for other features. Any proposed disturbance shall, through local development review and Highlands Project Review, comply with Highlands Open Waters buffer standards.
<b>Objective 1D4a</b>	Require that all applications for approval through local development review and Highlands Project Review include the identification and mapping of Highlands Open Waters.
<b>Objective 1D4b</b>	Preservation Area buffers for Highlands Open Waters shall comply with the Highlands Preservation Area rules at N.J.A.C. 7:38, which provide that all major Highlands developments are prohibited within a Highlands Open Water and its adjacent 300-foot buffer in the Preservation Area except for linear development, which may be permitted provided that there is no feasible alternative for the linear development outside the Highlands Open Waters or its buffer. Structures or other land improvements existing within a Highlands Open Waters buffer in the Preservation Area on August 10, 2004 may remain, provided that the area of disturbance is not increased other than through a Highlands Preservation Area Approval (HPAA).
<b>Objective 1D4c</b>	Require that proposed development within all Highlands Open Waters buffers (Preservation and Planning Areas) conforms through local development review and Highlands Project Review with the buffer requirements of N.J.A.C. 7:8 (Stormwater Management rules), N.J.A.C. 7:13 (Flood Hazard Area rules), and N.J.A.C. 7:7 (Freshwater Wetland rules), and with any applicable requirements of a Regional Stormwater Plan adopted pursuant to N.J.A.C. 7:8 (Stormwater Management Rules).
<b>Objective 1D4d</b>	Structures or other land improvements existing within a Highlands Open Waters buffer of the Planning Area on August 10, 2004 may remain, provided that the area of disturbance shall not be increased unless approved through local development review or Highlands Project Review in compliance with RMP policies and objectives.
<b>Objective 1D4e</b>	In the Protection and Conservation Zones of the Planning Area, proposed disturbances of Highlands Open Water buffers shall only occur in disturbed areas, unless a waiver is granted by the Highlands Council. Such proposed disturbances must demonstrate full utilization of the following performance standards in the listed order, to demonstrate

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the necessity of an encroachment into Highlands Open Water buffers: 1) avoid the disturbance of Highlands Open Waters buffers; 2) minimize impacts to Highlands Open Waters buffers; and 3) mitigate all adverse impacts to Highlands Open Waters buffers so that there is no net loss of the functional value of the buffer, in compliance with **Objective 1D4h**. Minimization and mitigation opportunities shall be considered only upon a clear and convincing demonstration by the applicant that the protection buffer cannot be avoided and in no case shall the remaining buffer be reduced to less than 150 feet from the edge of the Highlands Open Waters, unless a waiver is granted by the Highlands Council and the proposed disturbance complies with **Objective 1D4c**.

**Objective 1D4f**

In the Existing Community Zone of the Planning Area, proposed disturbances of Highlands Open Water buffers shall only occur in previously disturbed areas, unless a waiver is granted by the Highlands Council and the proposed disturbance complies with **Objective 1D4c**. Such disturbances shall employ performance standards such that all proposed disturbances of Highlands Open Water buffers shall employ low impact development best management practices to mitigate all adverse modification to Highlands Open Waters buffers so that there is no net loss of the functional value of the buffer, in compliance with **Objective 1D4h**.

**Objective 1D4g**

Encourage opportunities to restore and enhance Highlands Open Waters buffers of all zones in both the Preservation and Planning Areas. Restoration activities shall be targeted to ensure improvements to one or more of the functional values that the buffers provide while ensuring that there is no net loss of any of the functional elements, in compliance with **Objective 1D4h**. Specifically during site redevelopment, techniques may include, but are not limited to: disconnecting the direct drainage of impervious surfaces to Open Waters; retrofitting of stormwater management facilities to achieve the water quality, quantity, and recharge standards of the Stormwater Management Rules as specified in N.J.A.C. 7:8; reducing the temperature of stormwater discharges; and minimizing concentrated stormwater discharges through or into protection buffers.

**Objective 1D4h**

Key functional values that Highlands Open Water protection buffers provide or contribute to include but are not limited to habitat, storm water and flood water retention and filtration, water quality protection, temperature moderation, aquatic ecosystem integrity and channel integrity. The mitigation requirement of no net loss of functional value shall ensure improvements to one or more function and that there shall be no net loss of any function in the mitigation design. For the Highlands Open Water buffer functional value assessment, require that the applicant demonstrate improvement or no net loss of functions as follows:

**1) Habitat** – no net loss of instream food sources and no net loss of terrestrial and aquatic habitat functional value due to a shift to a less valuable overall vegetative condition in the protection buffer based on the following continuum from highest to lowest: forest or wetland, scrub/shrub, pasture or meadow, agriculture, maintained lawn, unpaved impervious surface, and other structures;

**2) Water Quality** – a degradation of this functional value will occur if, as a result of the proposed land conversions, pollutant loads increase to the Highlands Open Waters.

**3) Temperature Moderation** – a loss in temperature moderation functional value will occur if changes to the existing vegetation result in reduced shading of the Highlands Open Waters or stormwater that discharges to Highlands Open Waters. Further, a loss in temperature moderation functional value may occur with the heating of stormwater

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by new structures and other impervious surface. Mitigation approaches include removing or relocating impervious surfaces away from the Highlands Open Waters or ensuring that stormwater temperature is reduced through shading or other techniques;

**4) Channel Integrity** – a loss of channel integrity functional value will occur if the project will result in: the loss of bank stabilizing vegetation; the placement of infrastructure that can be feasibly located outside the stream corridor; an increase in the peak rate of stream flow generated, or in localized scour potential, that will increase stream bank and stream bed erosion; or the removal or burial of aquatic habitat in any substantial part of a stream bed or for threatened or endangered species.

**Objective 1D4i**

Develop through Plan Conformance and implement municipality-wide, stream corridor or subwatershed-based Stream Corridor Protection/Restoration Plans which shall include Steps 1, 2 and 3, and may include Steps 4 and 5:

1. Identify areas where existing development, disturbances or land uses are within the Highlands Open Water buffers and have reduced or impaired the functional values of those buffers
2. Identify opportunities for restoration of areas identified in Step 1 as part of mitigation requirements under a Highlands Act waiver or Objectives 1D4e and 1D4f, and public or non-governmental remedial projects;
3. Identify the extent of stream corridor features that are critical to supporting the functions of a healthy Highlands Open Waters buffer and that extend beyond the requirements of Objectives 1D4b and 1D4c. The 300-foot buffer in these areas may be expanded to be most protective of these features which may include, but are not limited to, critical habitat areas, pollutant source areas identified through scientific techniques, and steep slopes;
4. Identify locations where, based on scientific analysis of site-specific conditions (e.g., topography, vegetation cover type, habitat, soil type, upstream land uses and pollution inputs, width of floodplain, rate and volume of run-off), the full 300 foot buffer is not necessary to achieve the protective roles of Highlands Open Water buffers and Riparian Areas for Category 2 surface waters. Identify a buffer that is fully protective of existing functional buffer values and is no less restrictive than any buffer established under State or municipal regulation, including Objectives 1D4b and 1D4c. Conduct a functional value assessment to ensure that there is no net loss in the overall functional value of the subwatershed's stream buffers. Buffer averaging for the purpose of accommodating development proposals is deemed *not* to meet the requirements of this provision;
5. Where a proposed Redevelopment Area would not meet in full Objectives 1D4b through 1D4h but affects an undisturbed area determined to not be necessary for the protection of the functional values for a Highlands Open Water buffer for a Category 2 surface water as determined through Step 4, modification of the buffer may be allowed to the extent allowed in State or municipal regulation.

**Objective 1D4j**

The Highlands Council may require on a case-by-case basis, through Highlands Project Review, an expansion of the 300-foot buffer to protect the habitat of a water or wetlands-dependant rare, threatened or endangered species, to the minimum expansion necessary to achieve protection of that species.

**Policy 1D5**

Protect the integrity of the Riparian Areas through the application of RMP standards during local development review and Highlands Project Review.

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<b>Objective 1D5a</b>	Require that all applications for approval through local development review and Highlands Project Review include the identification and mapping of Highlands Riparian Areas, including those identified by the Highlands Council and by site-specific analysis.
<b>Objective 1D5b</b>	Limit disturbance of existing natural vegetation or increases in impervious area within High and Moderate Integrity Riparian Areas in any LUC Zone to the minimum alteration feasible in areas beyond the Highlands Open Water buffer requirements; protect the water quality of adjacent Highlands Open Waters; and maintain or restore habitat value of the Riparian Area.
<b>Objective 1D5c</b>	Prohibit modifications to Riparian Areas in the Protection Zone except where a waiver is approved by NJDEP or the Highlands Council.
<b>Objective 1D5d</b>	Restrict modifications to Riparian Areas in the Existing Community Zone, other than those addressed by <b>Objective 1D5b</b> , that would alter or be detrimental to the water quality and habitat value of a Riparian Area.
<b>Objective 1D5e</b>	Implement Low Impact Development Best Management Practices for any development activity proposed within a Riparian Area, which minimize both alterations of natural vegetation and increases in impervious area, in compliance with <b>Policies 6N3 and 6N4</b> and provide for mitigation through restoration of impaired Riparian Areas in the same HUC14 subwatershed.
<b>Objective 1D5f</b>	Require that development within Riparian Areas conforms through local development review and Highlands Project Review to any applicable requirements of a Regional Stormwater Plan adopted pursuant to N.J.A.C. 7:8 (Stormwater Management Rules).
<b>Objective 1D5g</b>	Require identification and implementation of opportunities where the restoration and enhancement of previously impaired Riparian Areas are feasible and appropriate as mitigation to any allowable modification to Riparian Area requirements.
<b>Policy 1D6</b>	To establish priorities for preservation of Riparian Areas.
<b>Objective 1D6a</b>	Assign high priority to land acquisition and development restrictions for lands within both High Resource Value Watersheds and High Integrity Riparian Areas.
<b>Objective 1D6b</b>	Consistent with Policy 1H1, identify opportunities for and implement Riparian Area restoration practices on public and private lands that give priority to ecological and watershed protection measures.