



Highlands Regional Master Plan

Monitoring Program Recommendation Report

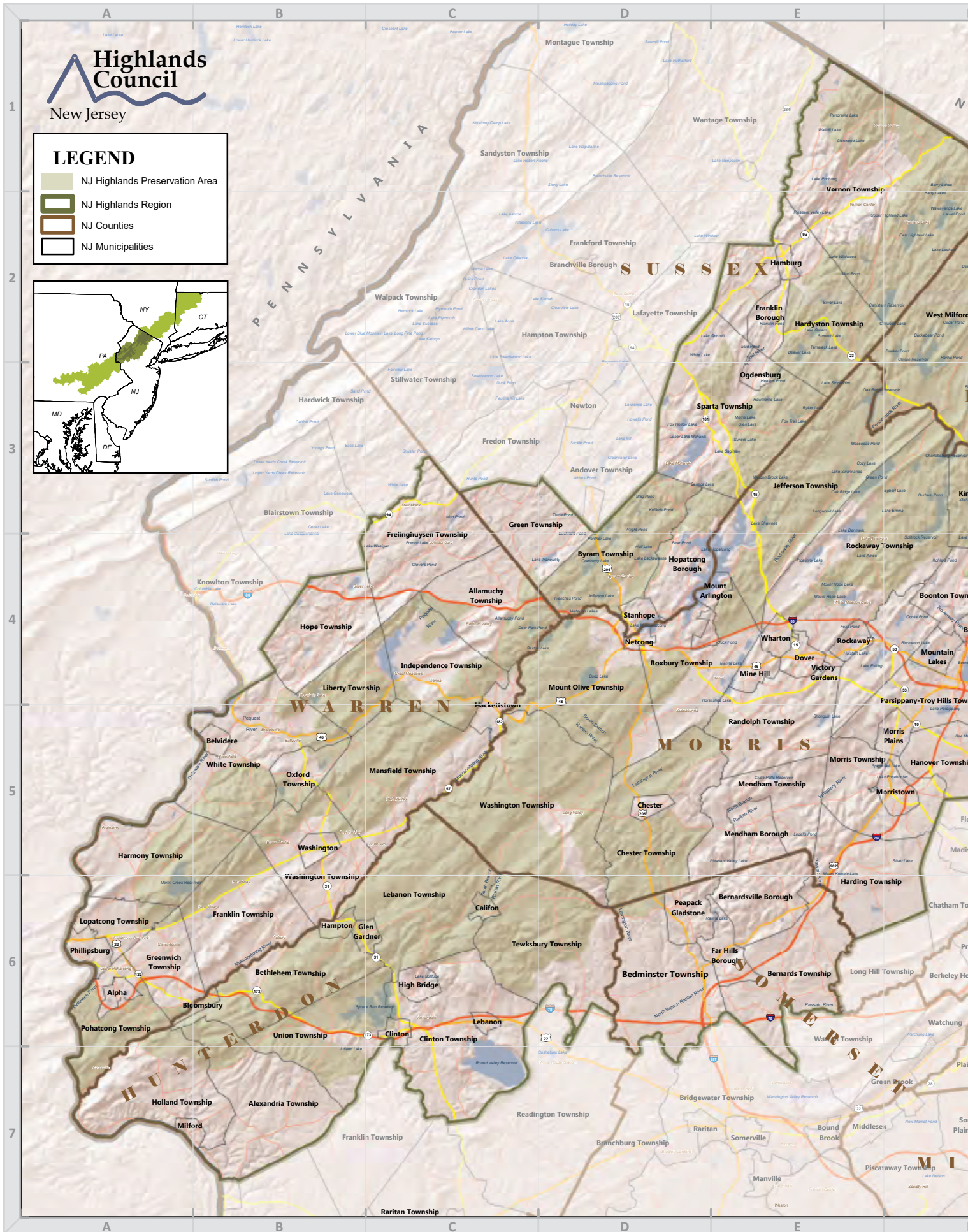
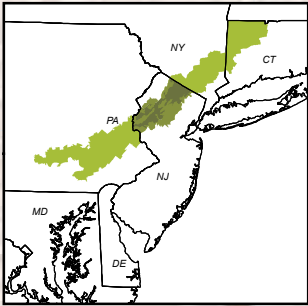
Baseline Report: 2018

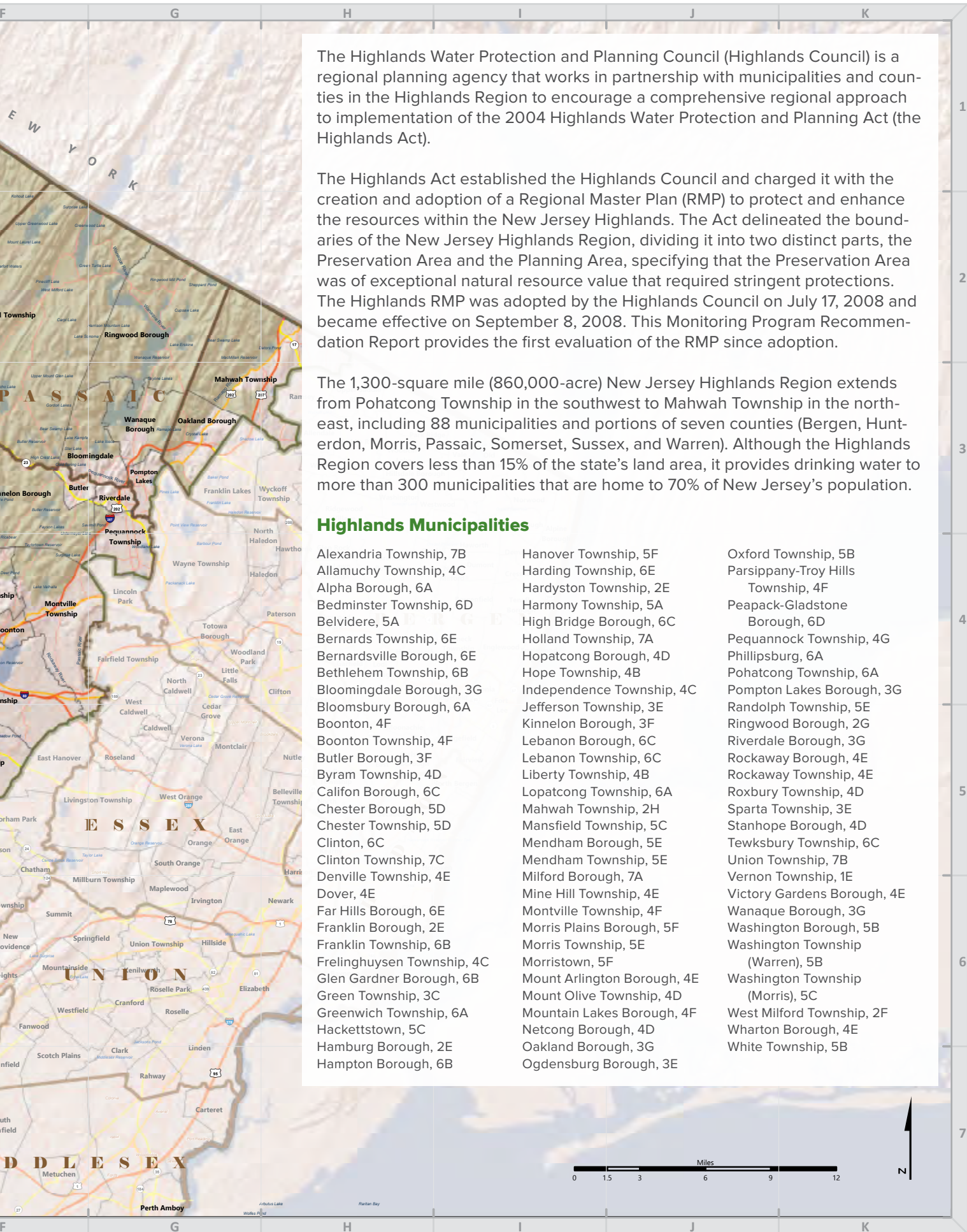
New Jersey Highlands Water
Protection and Planning Council



LEGEND

- NJ Highlands Preservation Area
- NJ Highlands Region
- NJ Counties
- NJ Municipalities





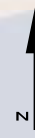
The Highlands Water Protection and Planning Council (Highlands Council) is a regional planning agency that works in partnership with municipalities and counties in the Highlands Region to encourage a comprehensive regional approach to implementation of the 2004 Highlands Water Protection and Planning Act (the Highlands Act).

The Highlands Act established the Highlands Council and charged it with the creation and adoption of a Regional Master Plan (RMP) to protect and enhance the resources within the New Jersey Highlands. The Act delineated the boundaries of the New Jersey Highlands Region, dividing it into two distinct parts, the Preservation Area and the Planning Area, specifying that the Preservation Area was of exceptional natural resource value that required stringent protections. The Highlands RMP was adopted by the Highlands Council on July 17, 2008 and became effective on September 8, 2008. This Monitoring Program Recommendation Report provides the first evaluation of the RMP since adoption.

The 1,300-square mile (860,000-acre) New Jersey Highlands Region extends from Pohatcong Township in the southwest to Mahwah Township in the northeast, including 88 municipalities and portions of seven counties (Bergen, Hunterdon, Morris, Passaic, Somerset, Sussex, and Warren). Although the Highlands Region covers less than 15% of the state's land area, it provides drinking water to more than 300 municipalities that are home to 70% of New Jersey's population.

Highlands Municipalities

- | | | |
|----------------------------|-----------------------------|------------------------------------|
| Alexandria Township, 7B | Hanover Township, 5F | Oxford Township, 5B |
| Allamuchy Township, 4C | Harding Township, 6E | Parsippany-Troy Hills Township, 4F |
| Alpha Borough, 6A | Hardyston Township, 2E | Peapack-Gladstone Borough, 6D |
| Bedminster Township, 6D | Harmony Township, 5A | Pequannock Township, 4G |
| Belvidere, 5A | High Bridge Borough, 6C | Phillipsburg, 6A |
| Bernards Township, 6E | Holland Township, 7A | Pohatcong Township, 6A |
| Bernardsville Borough, 6E | Hopatcong Borough, 4D | Pompton Lakes Borough, 3G |
| Bethlehem Township, 6B | Hope Township, 4B | Randolph Township, 5E |
| Bloomington Borough, 3G | Independence Township, 4C | Ringwood Borough, 2G |
| Bloomsbury Borough, 6A | Jefferson Township, 3E | Riverdale Borough, 3G |
| Boonton, 4F | Kinnelon Borough, 3F | Rockaway Borough, 4E |
| Boonton Township, 4F | Lebanon Borough, 6C | Rockaway Township, 4E |
| Butler Borough, 3F | Lebanon Township, 6C | Roxbury Township, 4D |
| Byram Township, 4D | Liberty Township, 4B | Sparta Township, 3E |
| Califon Borough, 6C | Lopatcong Township, 6A | Stanhope Borough, 4D |
| Chester Borough, 5D | Mahwah Township, 2H | Tewksbury Township, 6C |
| Chester Township, 5D | Mansfield Township, 5C | Union Township, 7B |
| Clinton, 6C | Mendham Borough, 5E | Vernon Township, 1E |
| Clinton Township, 7C | Mendham Township, 5E | Victory Gardens Borough, 4E |
| Denville Township, 4E | Milford Borough, 7A | Wanaque Borough, 3G |
| Dover, 4E | Mine Hill Township, 4E | Washington Borough, 5B |
| Far Hills Borough, 6E | Montville Township, 4F | Washington Township (Warren), 5B |
| Franklin Borough, 2E | Morris Plains Borough, 5F | Washington Township (Morris), 5C |
| Franklin Township, 6B | Morris Township, 5E | West Milford Township, 2F |
| Frelinghuysen Township, 4C | Morristown, 5F | Wharton Borough, 4E |
| Glen Gardner Borough, 6B | Mount Arlington Borough, 4E | White Township, 5B |
| Green Township, 3C | Mount Olive Township, 4D | |
| Greenwich Township, 6A | Mountain Lakes Borough, 4F | |
| Hackettstown, 5C | Netcong Borough, 4D | |
| Hamburg Borough, 2E | Oakland Borough, 3G | |
| Hampton Borough, 6B | Ogdensburg Borough, 3E | |



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Introduction

The 2008 Highlands Regional Master Plan (RMP) is continually updated as a result of new or corrected information received from municipalities as part of the Plan Conformance process. In addition, the Highlands Water Protection and Planning Act requires a more substantive review take place every six years. The RMP outlined a Monitoring Program to meet this requirement:

“The RMP Monitoring Program and associated Monitoring Review Report will evaluate the progress in achieving the goals of the RMP through implementation of policies and programs. The implementation of a monitoring program will ensure that the RMP remains effective and current.”

— Highlands Regional Master Plan, pg. 416

This first-ever *Monitoring Program Recommendation Report (MPRR)* provides a baseline evaluation of the RMP. Recommendations contained in the *MPRR* are the result of an analysis of indicators identified through a public process, combined with an examination of implementation activities to date. In this way, the *MPRR* provides a framework for potential amendments to the RMP along with a six-year work plan for the Highlands Council.





Monksville Reservoir / Ringwood Borough

Report Structure

Topic Areas

Topic Area Chapters are organized around program areas of the RMP and provide the recommendations found in this Report. Each chapter is structured as follows:

- ▶ **Background and Introduction** – A discussion of the significance of a particular topic area to the Highlands Region, followed by prescribed Highlands Act Goals (see the Highlands Act “Goals of regional master plan,” N.J.S.A. 13:20-10) and resulting RMP Programs.
- ▶ **Indicators** – A listing of program-relevant indicators that were identified through the public participation process and refined by Technical Advisory Committees. (Full analysis of all indicators is included in the “Indicator Analysis Reports” section.)
- ▶ **Recommendations** – Recommendations are drawn from a combination of implementation experience and analysis of identified indicators. The Recommendations section of each chapter is organized by a program area of the RMP and provides a summary of implementation activity and indicator findings, followed by program issues and recommendations. Items that require further study and investment are included under the heading, “Science and Research Agenda.”

Indicator Analysis Reports

Complete analysis of indicators identified in the Topic Area chapters. Please note that due to data limitations and/or applicability to the RMP, not all indicators identified through the public process were analyzed for this report. A complete list of all indicators identified is included in Appendix A.

Process Summary

A summary of the process followed in the development of this Report including public outreach, consultation with technical experts and state agencies, and analysis of identified indicators.

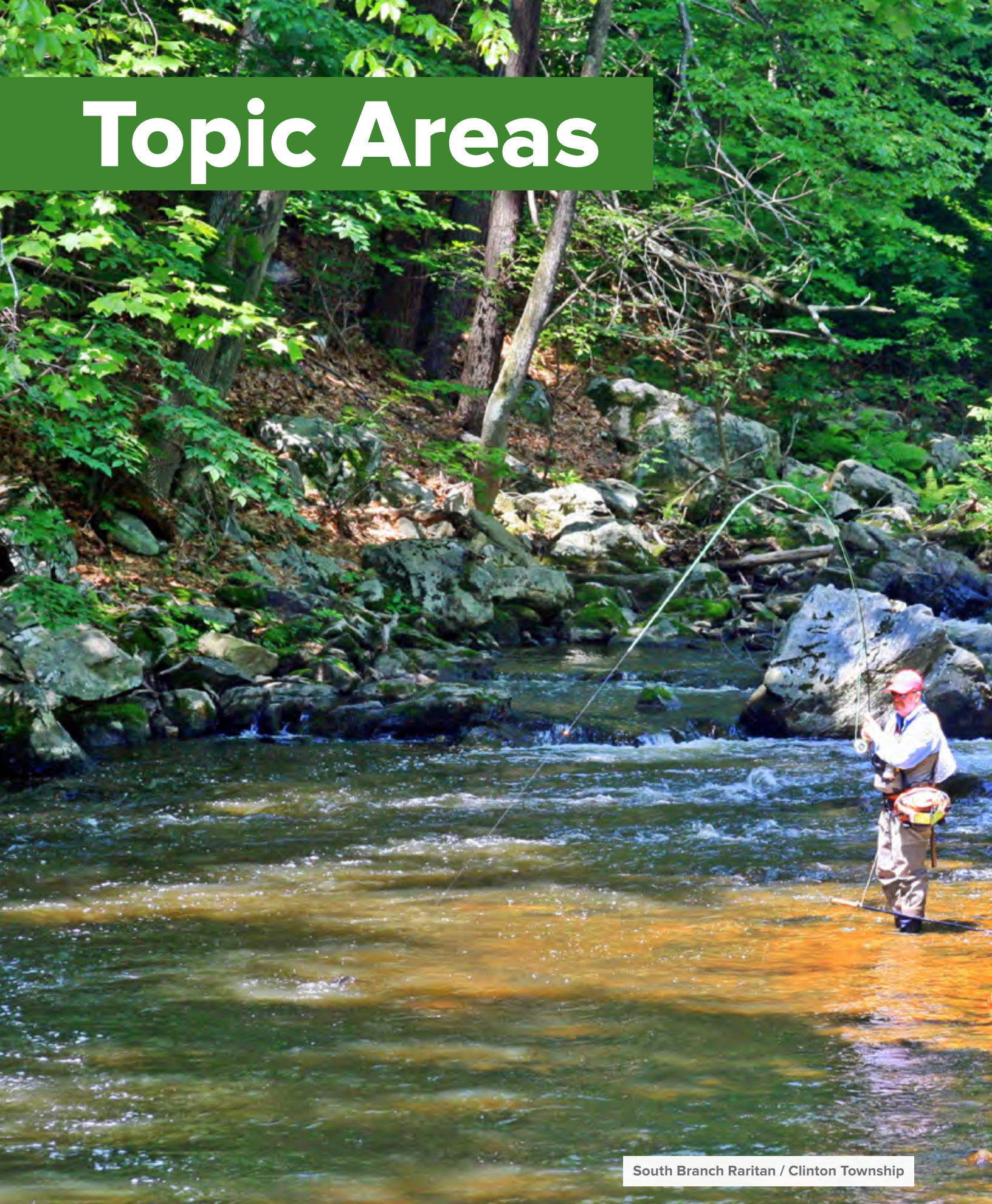
Summary of Recommendations

A complete list of all recommendations contained in this Report including items recommended for further study and investment as part of a Science and Research Agenda.

Supporting Documents

A listing of documents referenced throughout this Report with links to each.

Topic Areas



South Branch Raritan / Clinton Township



Natural Resources / 10



Water Resources / 20



Water and Wastewater Utilities / 26



Agricultural Resources / 32



**Historic, Cultural, Archaeological,
and Scenic Resources / 36**



Transportation and Air Quality / 40



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Natural Resources

The New Jersey Highlands Region supports the greatest diversity of natural resources of any region of the State. The biological diversity of the Highlands Region is comprised of an assemblage and linkage of diverse wetlands, streams and rivers, forests, wildlife habitats, and ridges and valleys. The Highlands Act establishes the protection and enhancement of the significant values of the resources of the Region as the overarching goal of the Regional Master Plan (RMP). Natural resources, such as forests, open waters, wetlands, steep slopes, and critical habitat are the building blocks for all of the goals of the RMP.



Teetertown Ravine Nature Preserve / Lebanon Township

Highlands Act Goals

The Highlands Act charges the Highlands Council with the following goals for natural resource protection in the Highlands Regional Master Plan:

- ▶ Protect, restore and enhance the quality and quantity of surface and ground waters.
- ▶ Preserve extensive, and to the maximum extent possible, contiguous areas of land in its natural state.
- ▶ Protect and enhance 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.
- ▶ Preserve to the maximum extent possible any environmentally sensitive lands and other lands needed for recreation and conservation purposes.
- ▶ Protect and maintain the essential character of the Highlands environment.
- ▶ Preserve outdoor recreation opportunities, including hunting and fishing on publicly owned land.

Highlands Regional Master Plan

The RMP establishes overall strategies necessary to preserve, maintain, and enhance natural resource values. Each resource is interrelated and part of interdependent systems, administered within an integrated ecosystem protection and management framework. The Highlands RMP uses a watershed-based assessment to evaluate resource integrity and protection needs.

Highlands RMP Programs

The RMP includes several programs designed to identify, categorize, assess and thereby effectively manage the natural resources of the region. The full list appears below.

Forest Resource Management and Sustainability

Forests are a defining visible and functional feature of the Highlands Region. The Highlands Region contains some of the most important forests in the state. These forests are vitally important to every element of the Highlands Region. Subprograms included in the RMP in

this area broadly describe forest resource management as a part of the regional system of forest stewardship and guidance.

- ▶ Forest Sustainability
- ▶ Model Municipal Tree Ordinance
- ▶ Guidance for Community Forestry Plans for Highlands
- ▶ Guidance for Forest Conservation and Mitigation Plans
- ▶ Guidance for Forest Stewardship Plans for Preserved Lands

Restoration of Streams and Riparian Areas

Highlands Open Waters and Riparian Areas are a primary focus of the Highlands Act. All springs, streams, including intermittent streams, wetlands, and bodies of surface water, whether natural or artificial (e.g. reservoirs), are identified as Highlands Open Waters. Riparian Areas are the lands associated with and bordering Highlands Open Waters that provide critical functions for the Open Waters. The subprograms outlined here provide guidance for the evaluation, monitoring, planning, and restoration of Highlands Open Waters.

- ▶ Stream and Riparian Functional Assessment
- ▶ Stream Corridor Protection/Restoration Plans
- ▶ Development of Stream Restoration Guidance
- ▶ Development of Riparian Restoration Guidance
- ▶ Implementation of Stream and Riparian Area Restoration Projects

Critical Habitat Conservation and Management

Habitat for rare, threatened or endangered species, regionally significant ecological communities, and vernal pools and associated buffers are evaluated together to assess critical habitat in the Highlands Region. RMP subprograms related to Critical Habitat provide for the evaluation, management, and planning for critical habitat conservation on a local and regional scale.

- ▶ Development of Municipal Conservation and Management Overlay District Ordinance
- ▶ Development of Critical Habitat Conservation and Management Guidance
- ▶ Ensuring Implementation of Critical Habitat Conservation and Management
- ▶ Implementation of Critical Habitat Conservation, Restoration and Management Projects

Land Preservation and Stewardship

Maintaining the land in a natural condition is necessary to preserve and enhance ecosystem integrity and to protect drinking water supplies. The subprograms for Land Preservation present guidance for the evaluation, categorization, valuation, and preservation planning for lands of superior natural resources.

- ▶ Identification of Critical Lands
- ▶ Establishment of Land Preservation Priorities and a Special Environmental Zone
- ▶ Implementation of Strategies for Land Preservation by Maximizing Current Land Preservation Funding Programs
- ▶ Determine the Cost of Five and Ten Year Priorities for Land Acquisition Within the Confidential Inventory

- ▶ Implementation of Strategies for Land Stewardship by Maximizing Current Land Stewardship Funding Programs
- ▶ Establishment of New/Alternative/ Innovative Land Preservation Programs
- ▶ Development of Cluster/ Conservation Design Development Standards
- ▶ Identification of Willing Sellers
- ▶ Establishment of a Land Preservation and Stewardship Technical Assistance Program
- ▶ Establishment of Dedicated Sources of Funding for Land Preservation and Stewardship in the Highlands Region

Carbonate Rock (Karst) Topography

The term “karst” describes a distinctive topography that indicates dissolution of underlying rocks, such as limestone and dolomite, by surface water or ground water over time. This dissolution process can cause surface depressions and the development of features such as sinkholes. Sinkholes can act as funnels, directing surface water runoff to underground water sources, potentially introducing contaminants. The subprograms related to Carbonate Rock provide guidance for identification of critical features, inventorying these features, and developing ordinance provisions for karst areas.

- ▶ Identification of Critical Requirements for Development Ordinances
- ▶ Development of Carbonate Rock Area Guidance Manual
- ▶ Establishment and Maintenance of Karst Inventory

Lake Management Areas

Overdeveloped, damaged, and poorly managed shoreland areas can result in the degradation of water quality, harm a lake ecosystem, decrease natural aesthetic values, and cause an overall loss of property values for lake communities. The subprograms outlined in the RMP related to Lake Management Areas provide local management guidance, mapping of critical management areas, planning for lakes management, and regional outreach.

- ▶ Shoreland Protection Tier
- ▶ Water Quality Management Tier
- ▶ Scenic Resources Tier
- ▶ Implementation of Lake Restoration Plans
- ▶ Lake and Dam Management
- ▶ Education and Awards Program



Jugtown Mountain Preserve / Bethlehem

Steep Slopes

Although no specific program or subprograms were set forth in the RMP to address steep slopes, the identification and classification of steep slopes is important to the effective management of critical natural resources of the Highlands Region.

Steep slopes provide specialized habitats as well as offer popular recreational opportunities. Protection of steep slopes is important in minimizing erosion, degradation of habitats, siltation of waterbodies, loss of topsoil, and prevention of land slumping and landslides. Goal 1E in the RMP provides for the protection and enhancement of the natural, scenic, and other resources of the Highlands Region through protection of steep slopes from inappropriate development and disturbance. The RMP also provides specific project review standards for steep slopes that have been incorporated into the municipal land use ordinances to be adopted through Plan Conformance. The Highlands Council conducted two-foot elevation aerial mapping of the entire region to further refine data for steep slope areas.

In the Recommendations section that follows, a “Steep Slope Protection Areas” program is proposed.

Indicators

Full analyses of indicators listed below are available in the Indicator Reports chapter. Please note that not all indicators identified by the public and Technical Advisory Committees received a full analysis for this report due to data limitations and/or applicability to the RMP. A complete list of all identified indicators is available at the end of this document. Potential future indicators may be noted in the Recommendations section that follows, under “Science and Research Agenda.”

Indicators Analyzed for Natural Resources:

- ▶ **Critical Habitat:** Measures change in extent, preservation, or development of Critical Habitat.
- ▶ **Forest Impacts:** Measures the change in Forest Integrity (total forest area, core forest area and total proportion forest), and preservation and development within total and core forest areas.
- ▶ **Preservation Priority:** Measures changes in preservation and development in the Special Environmental Zone, Conservation Priority Area, and Agricultural Priority Area.
- ▶ **Watershed Resource Value:** Measures change in Watershed Resource Value Class by HUC14 subwatershed.

Indicators that support Natural Resource goals by incorporating appropriate standards into local development projects:

Indicators Related to Natural Resources

- ▶ **Highlands Project Reviews:** A summary of Highlands Project Reviews.
- ▶ **Municipal Plan Conformance:** A matrix of Municipal Plan Conformance Petition data, including submission and Highlands Council disposition, as well as approved Petition components and the current status of municipal completion.

Recommendations

The recommendations that follow are organized by RMP programs and/or subprograms. Where appropriate, multiple programs have been combined for this discussion. Additionally, some program names have been modified to more accurately reflect the program’s purpose in practical application. Please note that not all RMP programs and subprograms have associated recommendations in this report. Items under “Science and Research Agenda” are recommendations that require further study and investment.

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Forest Resource Management and Sustainability

Implementation Activity

The Highlands Council coordinates with appropriate state and federal agencies on forest stewardship plans and forest resiliency advocacy. The Model Highlands Land Use Ordinance (LUO) seeks to implement the RMP Goals, Policies, and Objectives (GPOs) applicable to forests. However, technical guidance documents are required to fully implement the LUO article(s) through Plan Conformance at the municipal level.

In 2014 the Highlands Council authorized production of an Ecosystems Services Valuation and Forest Management Guidance document to assist municipalities in the implementation of the forest management goals of the RMP and requirements of the Highlands Land Use Ordinance. A team of foresters, ecologists, botanists and scientists was awarded a contract and has been developing a set of deliverables to address forest guidance, mitigation, stewardship and ordinances. Furthermore, the team has been tasked to develop a methodology by which a prospective development property can be valued for the forest and other ecosystem services that it provides in a pre-development condition (functional ecosystem valuation [FEV]). This valuation can then

be used to determine appropriate post-development mitigation strategies, whether through preservation or the use of a mitigation banking technique.

Summary findings of related indicator:

- ▶ **Forest Impacts:** Forest impacts were evaluated based on a calculated change in forest integrity score, as defined in the RMP, and also by how the preservation of forested lands has changed since adoption of the RMP. Data analyzed for this indicator showed a slight change in forest integrity score for the region, with some areas positive and others negative. The preservation of forested lands has increased significantly since adoption of the RMP.

Program Issues

- ▶ Limited implementation through Plan Conformance.
- ▶ Delayed development of forest guidance and forest stewardship documents.
- ▶ Limited coordination with agencies directly responsible for promulgating rules to implement the Forest Stewardship Act.

Recommendations

- ▶ Incorporate results of Ecosystems Services Valuation and Forest Management project referenced above into future amendments of the RMP.
- ▶ Reconsider the use of Forest Resource Area as a mapping unit and, instead, rely upon the Total Forest Area data layer to delineate the actual extent of forest in the Region. The RMP currently maps Forest Resource Areas for the Region based on GIS mapping policy. Forest Resource Areas are often found to not actually contain forest.

Science and Research Agenda

- ▶ **Forest Sustainability:** For long-term sustainability of the forest resources in the Highlands Region, there must be proactive management of deer populations, non-native invasive species, and reduction in the rate of forest fragmentation. The Highlands Council should:
 - Develop incentives to encourage invasive species control and deer management.
 - Develop models to evaluate and determine the value of carbon sequestration.
- ▶ **Forest Restoration:** Often development projects attempt to mitigate for forest impacts by proposing to restore forest in a landscape that is not currently forested. These projects often fail for numerous reasons, such as soil compaction, complete disturbance of soil horizons, loss of appropriate soil

biome due to historic agricultural use, and intense invasive species infestation. The Highlands Council should:

- Investigate a mapping methodology to identify those lands where it would be most appropriate to attempt forest restoration, using data sources such as the historic land use maps developed by CC Vermuele in the late 1800s.
 - Develop guidance for reforestation based on specific site characteristics
- ▶ **Forest Mitigation:** To determine how much land should be preserved in mitigation for forest impacts (mitigation ratio), the FEV methodology described above should be field tested to assess usability and functionality of the valuation determination. The field testing should be structured as a professional services contract awarded under an RFP process.

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Restoration of Streams and Riparian Areas

Implementation Activity

The Model Highlands Land Use Ordinance seeks to implement the Goals, Policies, and Objectives (GPOs) applicable to Highlands Open Waters and Riparian Areas (namely, to include a protection buffer of 300 feet from the edge of the discernable bank of the Highlands Open Waters feature and to prohibit or restrict modifications to Highlands Riparian Areas). The Highlands Council encourages restoration of streams and riparian areas by public and private landowners, government agencies, non-profit organizations, and other interested parties wherever feasible.

Summary findings of related indicator:

Watershed Resource Value

The Highlands RMP provides policies designed to establish and maintain an inventory of Highlands Open Waters and their integrity. Watershed Resource Value is defined in the Ecosystem Management Technical Report (2008) as an indicator of watershed condition for the Highlands Region. The Watershed Resource Value is the weighted score of five metrics: 1) percentage of developed lands, 2) percentage habitat for species of concern, 3) percent total forest area, 4) percent total core forest area, and 5) proportion of total forest cover within a given geographic area. Net change in the number of Highlands Region HUC14 subwatersheds with an increase in Watershed Resource Value Class was evaluated.

Program Issues

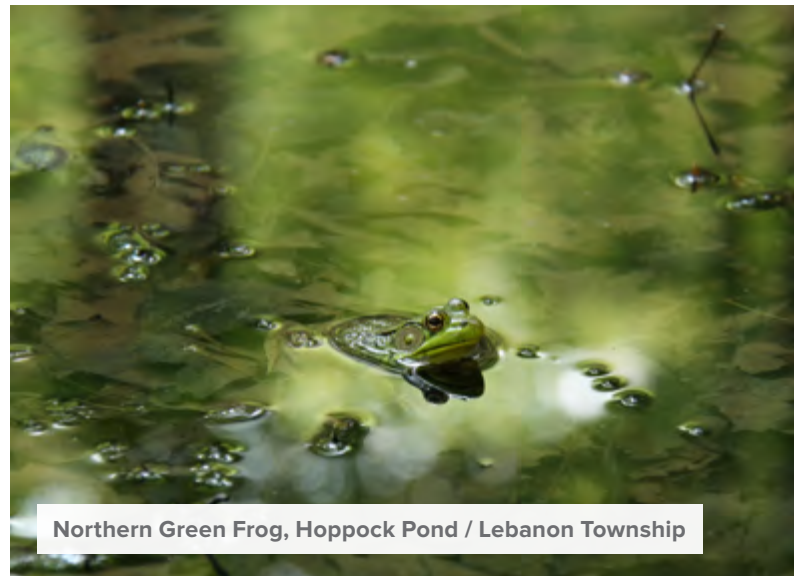
- ▶ Limited implementation of Highlands Land Use Ordinance, stream corridor protection plans, and stormwater management plans.
- ▶ Municipalities lack incentives to use available funding for development of restoration plans.
- ▶ Limited funding is available for plan implementation (including new data collection and maintaining Highlands Open Waters and Riparian Areas inventories).

Recommendations

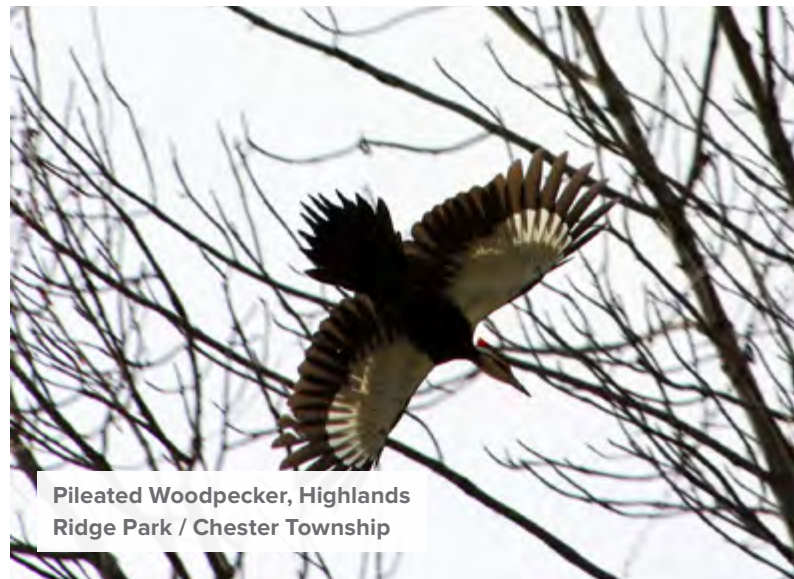
- ▶ Clarify and refine language in certain policies and objectives related to Highlands Open Water Protection Areas and buffers, particularly regarding development applications and buffer functionality. Where a Highlands Open Water buffer lies across a roadway, is upgradient of a development activity, is already disturbed through historic land use activities such as agriculture, or is otherwise non-functional, a more reasonable approach to evaluating the buffer which will still be protective of open waters should be developed. Coordination with NJDEP and other appropriate state and federal agencies will be necessary.
- ▶ Work with municipalities to incentivize the development of stream corridor and/or subwatershed-based Stream Corridor Protection/Restoration Plans. This would include assisting municipalities in identifying areas where existing development, land disturbances, or land uses within Highlands Open Waters buffers Riparian Areas have removed or substantially impaired natural vegetation and have significantly reduced or impaired the functional values of Highlands Open Water buffers.
- ▶ Facilitate coordination between multiple municipalities that share HUC14 subwatersheds to encourage collaboration (sharing available funding and other resources) in the development of subwatershed-based Stream Corridor Protection/Restoration Plans.
- ▶ Periodically review and refine, as necessary, the guidance documents available to municipalities for development of stream corridor restoration plans. These include: Part 1: Functional Value Assessment Methodology Stream Corridor Guidance and Part 2: Protection and Restoration Planning

Science and Research Agenda

- ▶ **Riparian Integrity:** Undertake a full re-calculation of the five indicators of riparian integrity that were used for the 2008 Ecosystem Technical Report (i.e., amount of impervious coverage; degree of agriculture land use; frequency of road crossings;



Northern Green Frog, Hoppock Pond / Lebanon Township



Pileated Woodpecker, Highlands Ridge Park / Chester Township



Bray's Hill Pollinator / Clinton Township

condition of vegetation cover; and habitat for water/wetland dependent species) that were expressed at the HUC14 subwatershed level.

► **Expand Ambient Biological Monitoring Network in Highlands Region:**

The Ambient Biological Monitoring Network (AMNET) program, initiated by NJDEP in 1992, established sampling stations in every subwatershed of the state to evaluate the health of instream benthic macroinvertebrate communities. There are approximately 200 AMNET stations within the Highlands Region. The intent of this agenda item is to coordinate with NJDEP to expand and establish a consistent AMNET to include additional stations in the Highlands Region. The Highlands Council will use the data as input into the continued development of a Regional Stream Integrity model to further refine protection requirements of Highlands Open Waters based on biological and water quality indicators. While this item was on the Science and Research Agenda in the 2008 RMP, limited resources (funding and NJDEP and Highlands Staff) precluded its investigation and implementation. It is recommended that expansion of the AMNET remains on the Highlands RMP Science and Research Agenda.

► **Highlands Open Waters and Riparian Areas Inventory:**

The Highlands Council should develop methods for continued development and refinement

of Highlands Open Waters and Riparian Areas inventories with an emphasis on identification of headwater streams and headwater seeps and springs. This should include the development of a database derived from project review results, which require identification of on-site Highlands Open Water features.

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Critical Habitat Conservation and Management

Implementation Activity

The Highlands Council coordinates with appropriate state and federal agencies on critical wildlife habitat evaluations and impact discussions. The Highlands Plan Conformance program seeks to implement the Goals, Policies, and Objectives (GPOs) applicable to critical habitat; however, technical guidance documents are required to fully implement the Land Use Ordinance (LUO) article(s) at the municipal level. Work on the Critical Habitat Conservation and Management Program, and eventual plan which each municipality shall adopt, is currently only in the initial phases.



White-tailed Deer, Patriot's Path / Chester Borough

Summary findings of related indicator:

- ▶ **Critical Habitat:** Changes to Critical Habitat, with regard to extent, preservation or development, were analyzed for the entire region. Data analyzed for this indicator showed an increase in the extent of Critical Wildlife Habitat across the region, no change in the extent of Significant Natural Areas, and an increase in vernal pool buffers. Preservation is outpacing development in areas of Critical Habitat.

Program Issues

- ▶ Limited implementation through Plan Conformance.
- ▶ Delayed development of critical habitat management guidance.
- ▶ Delayed development of habitat mitigation standards.
- ▶ Limited coordination with agencies directly responsible for expanding mapped critical habitat.

Recommendations

- ▶ Stimulate the Critical Habitat Conservation and Management program through enhanced mapping of critical habitat within municipalities. Currently the mapping for critical habitat is region wide, but if mapping of critical habitat in each municipality by land use/land cover (LU/LC) type were provided, the planning would be more manageable. Highlands Council staff in consultation with NJDEP Endangered and Non-Game Species program could determine an efficient methodology for summarizing LU/LC categories.
- ▶ Redefine Critical Habitat as critical wildlife habitat, vernal pool buffers and NJDEP Natural Heritage Priority Sites, to more accurately reflect the reality of the natural areas contained within. Critical Habitat is currently defined in the RMP as containing three datasets: critical wildlife habitat (NJDEP Landscape Project data), vernal pool buffers, and “Significant Natural Areas.” At the time the RMP was written, Significant Natural Areas were intended to include NJDEP Natural Heritage Program’s Natural Heritage Priority Sites as well as expanded areas; however, to date this has not been feasible.
- ▶ Continue participation and coordination with NJDEP Endangered Non Game Species Program (ENSP) on refinement of the Highlands Region specific Landscape Project Data.
- ▶ Continue participation and coordination with NJDEP ENSP on the Connecting Habitat Across New Jersey (CHANJ) project.

Science and Research Agenda

- ▶ Enhance GIS analysis of critical wildlife habitat on a municipal basis to determine appropriate mitigation and restoration standards.
- ▶ Modify and field test the FEV Methodology (referenced above in “Forest Resource Management and Sustainability”) for use in critical habitat mitigation scenarios, as a professional services contract through the RFP process.

Carbonate Rock Areas

Implementation Activity

The Highlands Council has established standards in the RMP and the Model Land Use Ordinance (LUO) by which Carbonate Rock Areas shall be mapped, inventoried, and regulated. For project reviews, applications proposed in mapped Carbonate Rock Areas shall be required to investigate for karst features. A list of prohibited land uses is provided in the LUO for Carbonate Rock Areas. The Highlands Council has not yet begun to maintain an inventory of karst features as identified through geophysical investigations required during project review due to the limited proposals that have been brought forward in Carbonate Rock Areas.

Summary findings of related indicator:

- ▶ **Highlands Project Reviews:** 28 Highlands project reviews have been conducted.

Program Issues

- ▶ Limited implementation through Plan Conformance.
- ▶ Limited opportunities to coordinate with NJGS and USGS on updated mapping, if applicable.
- ▶ Lack of guidance for implementation of low impact stormwater management.

Recommendations

- ▶ Categorize and maintain an inventory of karst features identified through geophysical investigations conducted during project reviews.
- ▶ Coordinate closely with NJGS and USGS when carbonate rock mapping is updated.
- ▶ Compile a database of municipal carbonate rock ordinances already enacted on a local level. Working with municipalities that have carbonate rock to enact such ordinances may be more applicable than implementing a review or checklist item through Highlands Project Review.

Science and Research Agenda

With respect to Carbonate Rock Areas and the RMP requirements regarding green infrastructure/ low impact development (LID)/ best management practices (BMPs) (particularly regarding enhanced ground water recharge through stormwater management), it is recognized that concentrated infiltration of water on sites that are underlain by karst geology is challenging and must be carefully assessed because infiltrated water may erode the limestone and create more karst conditions. However, the RMP mandates that green infrastructure must be investigated and used to the maximum extent feasible.

As a key element of the Highlands Science and Research Agenda, the Highlands Council should develop a unified approach for stormwater design

in karst terrain. This approach should entail the development of preliminary and detailed site karst investigations, assessment of future ground water contamination risk, development of stormwater BMPs for karst areas, development of design criteria for specific stormwater treatment practices, and sinkhole remediation strategies to incorporate into stormwater management planning and implementation.

Lake Management Areas

Implementation Activity

The RMP seeks to manage land development around lakes. Since its adoption, however, little new development has been occurring, or appears likely to occur, in close proximity to Highlands lakes. The development that is occurring is limited to redevelopment of existing properties that fall under Highlands Act exemptions or outside the scope of review of the Council.

In 2014, the Highlands Council released Lake Management Plan guidance documents to aid municipalities in planning for the management and protection of lakes.

Municipal Plan Conformance

- ▶ No Lake Management Plans have been adopted.

Program Issues

- ▶ Limited implementation through Plan Conformance.
- ▶ Municipalities lack incentives to utilize available funding for development of lake management plans.
- ▶ Lack of guidance for dam maintenance or removal.

Recommendations

- ▶ Encourage lake communities without lake management plans to develop and implement a Lake Management Plan using the Highlands Council's guidance document and grant program.
- ▶ Work directly with lake management commissions and counties to pursue lake management plans that span multiple municipalities.
- ▶ Assist municipalities in identifying funding opportunities, including the USEPA Section 319 (Clean Water Act, Section 319, Nonpoint Source Pollution Program) program for lake remediation activities.
- ▶ Continue to maintain a Highlands Region Lake Management plan database.
- ▶ Prepare a Best Practices Manual for dam and lake maintenance.



Ramapo Mountain State Forest / Wanaque Borough

Topic Area: **Natural Resources**

- ▶ Create a Highlands Financing and Administrative Handbook for dam and lake maintenance and operation, addressing creative public and private financing programs as appropriate for the lake or dam ownership.

must be considered early in the planning and design phases, design approaches are available to customize green infrastructure practices that are appropriate for use on a range of land slopes.

Science and Research Agenda

- ▶ Undertake a lake management study to focus on Lake Hopatcong and Greenwood Lake. The study should focus on preserving the ecological integrity of the lakes, their water quality, and water source potential.

Steep Slope Protection Areas

Proposed new program.

Implementation Activity

Data on the extent of steep slopes throughout the region is provided through the Highlands Council's interactive map available through the Highlands Council website. Steep slope requirements are included in the Model Highlands Land Use Ordinance for adoption by municipalities.

Program Issues

No current program exists.

Recommendations

- ▶ Maintain a database of steep slope protection ordinances, ridgeline ordinances, or other such regulations already in place in various Highlands municipalities.
- ▶ Coordinate with any municipality that wishes to implement such protections in addition to the Highlands Land Use Ordinance.
- ▶ Provide model ordinance language for municipalities interested in protection of ridgelines.

Science and Research Agenda

- ▶ **Addressing green infrastructure initiatives in Steep Slope Protection Area:** The NJDEP Highlands Rules at N.J.A.C 7:38-3.8 permit linear development on a slope with a grade of 20 percent or greater, provided that there is no feasible alternative for the linear development outside the steep slope. The RMP at Policy 1E8 permits linear development in both the Preservation and Planning Areas. As an element of the Highlands Science and Research Agenda, the Highlands Council should develop a plan for addressing green infrastructure initiatives in Steep Slope Protection Areas. Green infrastructure can successfully be implemented on steep slopes to manage urban stormwater. Although the use of green infrastructure practices on steep slopes



Water Resources

The water resources of the Highlands Region are important not only as a potable water supply source, but as a defining element of ecosystem form and function within the Highlands. They include extensive reservoirs with the capacity to provide more than 600 million gallons per day of drinking water, large rivers and lakes, streams that support trout production and offer local recreation opportunities, forested headwater streams and springs, and ephemeral waterbodies that are critical to the survival of a variety of the Region's wildlife.

Most of the water in Highlands Region reservoirs is exported to urban and suburban areas of northern and central New Jersey. The water needs of the Highlands Region itself are primarily served by withdrawals of ground water from local aquifers and by smaller surface water bodies. Maintaining the integrity of water resources of the Highlands Region provides for the protection and sustainability of these resources and the communities that rely upon them.



Lake Hopatcong

Highlands Act Goals

The Highlands Act charges the Highlands Council with the following goals related to water resources in the implementation of the Highlands Regional Master Plan:

- ▶ Protect, restore, and enhance the quality and quantity of surface and ground waters.
- ▶ Preserve extensive contiguous areas of land in its natural state.
- ▶ 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.
- ▶ Promote conservation of water resources.
- ▶ Prohibit or limit construction/development which is incompatible with protection of the Preservation Area.
- ▶ Protect and maintain the essential character of the Highlands environment.

Highlands Regional Master Plan

The Highlands RMP addresses five fundamental issues with regard to water resources in the Highlands Region:

1. The availability of water resources for human and ecological use;
2. The protection and restoration of water resource availability;
3. The protection, restoration, and enhancement of water quality;
4. The management of land development patterns and densities to ensure that the carrying capacity of water resources are not exceeded; and
5. The cost-effective and efficient provision and use of water utility capacity in a manner that ensures compatibility with the carrying capacity of water resources.

Highlands RMP Programs

The RMP includes a variety of programs intended to assist in the achievement of the Water Resource Protection Goals, Policies, and Objectives (GPOs). There are three main programs detailed in the RMP associated with Water Resource Protection. Each is described separately below.

Highlands Restoration: Water Deficits

Where water resources are stressed, management strategies are necessary to reduce and, where feasible, eliminate deficits and ensure that supplies are not further depleted. The Highlands Restoration: Water Deficits program consists of the following subprograms:

- ▶ Analysis of Net Water Availability
- ▶ Verification of Net Water Availability
- ▶ Strategic Approaches to Mitigating Water Deficits
- ▶ Development of Municipal Water Use and Conservation Management Plans
- ▶ Development of HUC14 Water Management Strategies
- ▶ Coordination with the NJDEP Water Allocation Program

The Efficient Use of Water

It is important that New Jersey obtain the maximum benefit from its Highlands water resources through efficient use and, where feasible and appropriate, beneficial reuse and recycling of water. The subprograms under the Water Use Efficiency program include the following:

- ▶ Analysis of Water Use Efficiency for:
 - Public Water Supplies
 - Agriculture and Irrigation
- ▶ Identification of Water Use Efficiency Metrics and Targets
- ▶ Implementation of Water Use Efficiency Measures:
 - General
 - Deficit Areas and Deficit Utilities
- ▶ Ensuring Implementation of Water Use and Conservation Management Plans

Water Quality Restoration

One way to protect and enhance water in the Region is to restore water quality. Water quality is affected by both current and historic land uses. Consistent and reliable assessment and characterization of the water quality in the Region is imperative to implementing management strategies in appropriate areas. Assessment is followed by management planning, which then leads to the implementation of various management practices depending on the types of contaminants, their sources, and the restoration needs identified. The subprograms of the Water Quality Restoration program are listed below.

- ▶ Water Quality Assessment
- ▶ Development and implementation of:

- Total Maximum Daily Loads (in coordination with NJDEP)
- Watershed Restoration Plans (either directly or in cooperation with other affected interests for approval by NJDEP)
- Groundwater Restoration Plans (working with NJDEP and USGS)
- ▶ Implementation of Water Quality Restoration Projects:
 - Agricultural Best Management Practices
 - Stormwater Management Plans
 - Streambank and Riparian Restoration
 - Wildlife
 - Septic System Management
 - Contaminated Site Remediation
- ▶ Education/Outreach

Prime Groundwater Recharge Areas

Although no program or subprograms were set forth in the RMP to directly address Prime Groundwater Recharge Areas (PGWRAs), protection of these lands and the quality and quantity of recharge provided by them is a high priority.

Groundwater recharge does not occur uniformly in all areas of the Highlands Region. Recharge varies by soil type, precipitation, land cover and other factors. Some land areas will provide greater recharge than others, and the best of these have been mapped by the Highlands Council as PGWRAs. They are defined as the areas in each subwatershed that have the highest recharge rates and, in total, provide 40 percent of the total recharge for that subwatershed. RMP Goal 2D (*Maintenance of Hydrologic Integrity through the Protection of Groundwater Recharge*) contains several policies addressing the protection of PGWRAs. The RMP also sets forth specific project review standards for PGWRAs that were further incorporated into the municipal land use ordinances adopted as part of Plan Conformance.

In the Recommendations section that follows, a “Prime Groundwater Recharge Areas” subprogram is proposed under the Highlands Restoration: Water Deficits program.

Indicators

Full analyses of indicators listed below are available in the Indicator Report chapter. Please note that not all indicators identified by the public and Technical Advisory Committees received a full analysis for this report

due to data limitations and/or applicability to the RMP. A complete list of all identified indicators is available at the end of this document. Potential future indicators may be noted in the Recommendations section that follows, under “Science and Research Agenda.”

Indicators Analyzed for Water Resources:

- ▶ **Critical Water Resource Areas:** Measures the change in preservation and development within Wellhead Protection Areas, Prime Ground Water Recharge Areas and Open Water Protection Areas.
- ▶ **Impervious Surface Cover by Subwatershed:** Measures change in impervious surface coverage by HUC14 subwatershed.
- ▶ **Surface Water Quality:** Measures change in designated use support status and impairment by HUC14 subwatershed.
- ▶ **Water Use:** Measures change in water withdrawal by HUC14 subwatershed for major use types, including agricultural, commercial, industrial, irrigation, mining, potable supply, and power generation.

Recommendations

The recommendations that follow are organized by RMP programs and/or subprograms. Where appropriate, multiple subprograms have been combined for this discussion. Additionally, some program names have been modified to more accurately reflect the program’s purpose in practical application. Please note that not all RMP programs and subprograms have associated recommendations in this report. Items listed under “Science and Research Agenda” are recommendations that require further study and investment.

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Highlands Restoration: Water Deficits

Implementation Activities

The Highlands Council has identified the HUC14 subwatersheds that have a deficit water availability. Through the development of Water Use and Conservation Management Plans (WUCMPs), HUC14 subwatershed Net Water Availability and its associated deficits are verified.

To aid municipalities in this effort, the Highlands Council developed a WUCMP Pilot Program. The Pilot Program focused on nine (9) pilot areas in 17 subwatersheds in the Region to test assessment techniques and deficit reduction methods. While the pilot areas were not developed based on municipal boundaries, the pilot WUCMPs are intended to be used as planning

tools to help municipalities develop their own plans. The resulting WUCMPs were published to the HC website and provided to participating municipalities to be used as planning tools.

Until municipal-wide WUCMPs are in place, the Highlands Model Land Use Ordinance and project review procedures require Highlands Council review for municipal development applications proposing a new or increased use of potable or non-potable water averaging 6,000 gallons per day or more. In addition, deficit mitigation measures are required to achieve 125-200% recharge depending on the deficit magnitude and proposed water use.

The Highlands Council continues to coordinate with NJDEP on new and major modifications to water allocation permits to support the reduction and elimination of water deficits.

Summary findings of related indicators:

- ▶ **Water Use:** A HUC14 subwatershed analysis reveals that nearly 70% of HUCs in the Highlands Region experienced either no significant change in water use or a decrease in water use between 2003 and 2011. In addition, overall consumptive uses throughout the region are down 27% for the same period resulting in a positive trend.
- ▶ **Critical Water Resource Areas:** In general, positive trends were observed in both preservation and development within the Critical Water Resource Areas of the region.

Program Issues

- ▶ Limited development and implementation of WUCMPs through Plan Conformance.
- ▶ Limited number of USGS streamflow gauging stations throughout the Highlands Region.
- ▶ Status and potential implications of the New Jersey Statewide Water Supply Plan.
- ▶ No programs or subprograms were set forth in the RMP to directly address PGWRAs.

Recommendations

- ▶ Prioritize development of municipal-wide WUCMPs through Plan Conformance implementation. Develop a system for prioritization and coordinate outreach efforts to municipalities to aid in the development and implementation of WUCMPs.
- ▶ Update RMP net water availability based on data from completed WUCMPs.
- ▶ Continue monitoring water withdrawals throughout the region using data catalogued by the NJGS.

- ▶ Prior to the adoption of any revision to the New Jersey Statewide Water Supply Plan, consult with the NJDEP concerning the possible impact of the Plan on the region, including the improvement of the efficient use of Highlands water resources both within and outside the region.
- ▶ Develop an RMP subprogram to directly address PGWRAs.
- ▶ Develop avoidance/minimization/mitigation strategies and policies associated with development in PGWRAs.
- ▶ Develop site design guidelines for development in PGWRAs, including permissible uses.
- ▶ Develop municipally-based guidance for the local identification of municipally-important groundwater recharge areas.

Science and Research Agenda

“Streamflow” was identified as a Water Resources indicator, but was not analyzed for this report due to data limitations. The following recommendations are designed to provide a foundation for monitoring streamflow.

- ▶ Approach USGS to determine the feasibility of updating the *Low Flow Characteristics of Streams in the Highlands Region* report to determine if any measurable change has been observed in the base flows of the Highlands Region.
- ▶ Evaluate and suggest locations for new gauging stations that would allow for a more effective and accurate analysis of streamflow conditions in the Region. Potential locations may be based on the following criteria:
 - Location of current gauging stations
 - Type of gauging station
 - Installation of stations on more critically vulnerable/important streams (i.e. C1, trout production, etc.)
 - Other recommendations of the USGS.
- ▶ Identify potential funding sources to support the installation, operation and long-term maintenance needs associated with new gauges situated in the region.

The Efficient Use of Water

Implementation Activities:

Through the project review process, the Highlands Council ensures that stormwater is managed using Low Impact Development (LID) strategies to the maximum



Terrace Pond / Abram Hewitt State Forest

extent practicable on all new development projects. The Highlands Council has also developed a Storm-water Management Program that is implemented through the Plan Conformance process which includes guidance materials specific to the region. The Highlands Land Use Ordinance (LUO) incorporates water conservation requirements applicable to all new developments and adoption of WUCMPs, as referenced above, help further the goals of the water use efficiency program.

Summary findings of related indicator:

- ▶ **Water Use:** As stated above, the overall trend in the region for this indicator is positive.

Program Issues:

- ▶ Limited development of WUCMPs (see above).
- ▶ Limited public education regarding water conservation strategies.
- ▶ Lack of water use efficiency metrics and targets.
- ▶ Limited adoption and implementation of the Highlands LUO.

Recommendations

- ▶ Prioritize development of municipal-wide WUCMPs through Plan Conformance implementation. Develop a system for prioritization and coordinate outreach efforts to municipalities to aid in the development and implementation of WUCMPs.

- ▶ Encourage integration of water use efficiency strategies into WUCMPs, such as:
 - Supply-side conservation
 - Demand-side conservation
 - Utility rate schedules that encourage customers to make efficient use of water and discourage excessive use
 - Beneficial reuse of reclaimed water
 - Recycling of water
- ▶ Since irrigation practices associated with golf courses have a relatively large impact on water use in the region, research and develop best management/conservation practices for inclusion in golf course management plans. These practices can also be considered when reviewing water allocation permits associated with golf courses.
- ▶ Continue coordination with the NJDEP on water allocation permit actions.
- ▶ Continue monitoring water withdrawals throughout the region using data catalogued by the NJGS.
- ▶ Continue to ensure, through the project review process, that all proposed new development incorporates LID design, relies on stormwater for irrigation purposes to the maximum extent practicable, and includes water conservation measures in site layout and structures (e.g., water efficient landscaping, rain collection systems, use of gray water); and new commercial development uses internal recycling or beneficial reuse of reclaimed water to the maximum extent practicable.
- ▶ Develop and/or provide educational materials to Highlands municipalities regarding water use efficiency and conservation practices for distribution. Educational materials should also be made publicly available on the Highlands Council website.
- ▶ Determine feasibility of enacting a water user fee imposed on water purveyors who derive water from Highlands Region sources and dedicating funds raised by such fee to assist in compensating landowners in the Highlands Region whose future land use expectations have been impacted by the Highlands Act.
- ▶ Collaborate with the NJDEP (all uses), the NJDA (agricultural uses) and other appropriate stakeholders to select the most appropriate metrics for water use efficiency.
- ▶ Collaborate with the NJDEP to determine existing water use rates for all public community water supply systems using Highlands water, categorize the systems for comparison purposes, and assess the relative efficiency of water uses among common

classes of public community water systems. Private potable well water use rates should also be considered as part of this assessment.

- ▶ Collaborate with the NJDEP, NJDA and Rutgers Cooperative Extension Service to determine existing water use rates for all agricultural and other self-supplied irrigation uses using Highlands water, categorize the uses for comparison purposes, and assess the relative efficiency of water uses among common classes of purposes.

Water Quality Restoration

Implementation Activity

Nonpoint source pollution associated with stormwater runoff leads to water quality degradation of Highlands water resources. Through the project review process, the Highlands Council ensures that stormwater is managed using LID strategies to the maximum extent practicable on all new development projects. The Highlands Council has also developed a Stormwater Management Program that is implemented through the Plan Conformance process, and which includes guidance materials specific to the region.

Summary findings of related indicators:

- ▶ **Surface Water Quality:** A significant number of subwatersheds had insufficient data in the analysis years across all designated use types to provide an accurate and meaningful picture of attainment trends within the Highlands Region.
- ▶ **Impervious Surface Cover:** No discernible trend in change in impervious surface coverage across the Highlands Region can be determined at this time.
- ▶ **Critical Water Resource Areas:** In general, positive trends were observed in both preservation and development within the Critical Water Resource Areas of the region.

Program Issues

- ▶ Insufficient surface water quality data available for Highlands subwatersheds.
- ▶ An update of ground water nitrate data (as a surrogate for nonpoint source impacts to groundwater quality) and models for estimating septic densities has not occurred since the development of the RMP.
- ▶ Lack of watershed-based management plans that identify projects to improve the water quality of the Highlands Region.
- ▶ Limited implementation of Highlands Stormwater Management Program Plan Conformance requirements.

- ▶ Lack of development and implementation of Regional Stormwater Management Plans.

Recommendations

- ▶ Coordinate outreach efforts to conforming municipalities regarding implementation of the grant-funded Highlands Stormwater Management Program components.
- ▶ Following the guidance set forth in the NJDEP Stormwater Best Management Practices Manual, identify high priority HUC14 subwatersheds and a pilot study area for which to develop a Regional Stormwater Management Plan. Further steps would include the identification of participants, data gathering, and the development of implementation and evaluation strategies.
- ▶ Identify and catalogue all existing watershed-based management plans associated in the Highlands Region and determine their implementation status. Provide support for their implementation in conforming municipalities.

Science and Research Agenda

“Groundwater Quality” was identified as a Water Resources indicator, but was not analyzed for this report due to data limitations. The following recommendations are designed to provide a foundation for monitoring groundwater quality.

- ▶ Improve existing monitoring networks and use additional data sources, in coordination with the NJDEP, NJGS and USGS, for monitoring and evaluating both natural conditions and anthropogenic factors in water quality. Additional data sources may include those collected by non-governmental partners so long as it is quality assured.
- ▶ Coordinate with the USGS to review existing USGS logistical regression models for estimating septic densities based on median nitrate concentrations which may be further tested and refined with additional data collection and modeling.
- ▶ Work in conjunction with the NJGS and USGS to design an improved ambient groundwater quality modeling network in support of refining models for estimating septic densities, as well as analyzing temporal and spatial trends in groundwater quantity and quality in the Highlands.
- ▶ Determine, based on sufficient available data, where water quality improvements would be beneficial. Develop and implement watershed-based management plans based on the results.



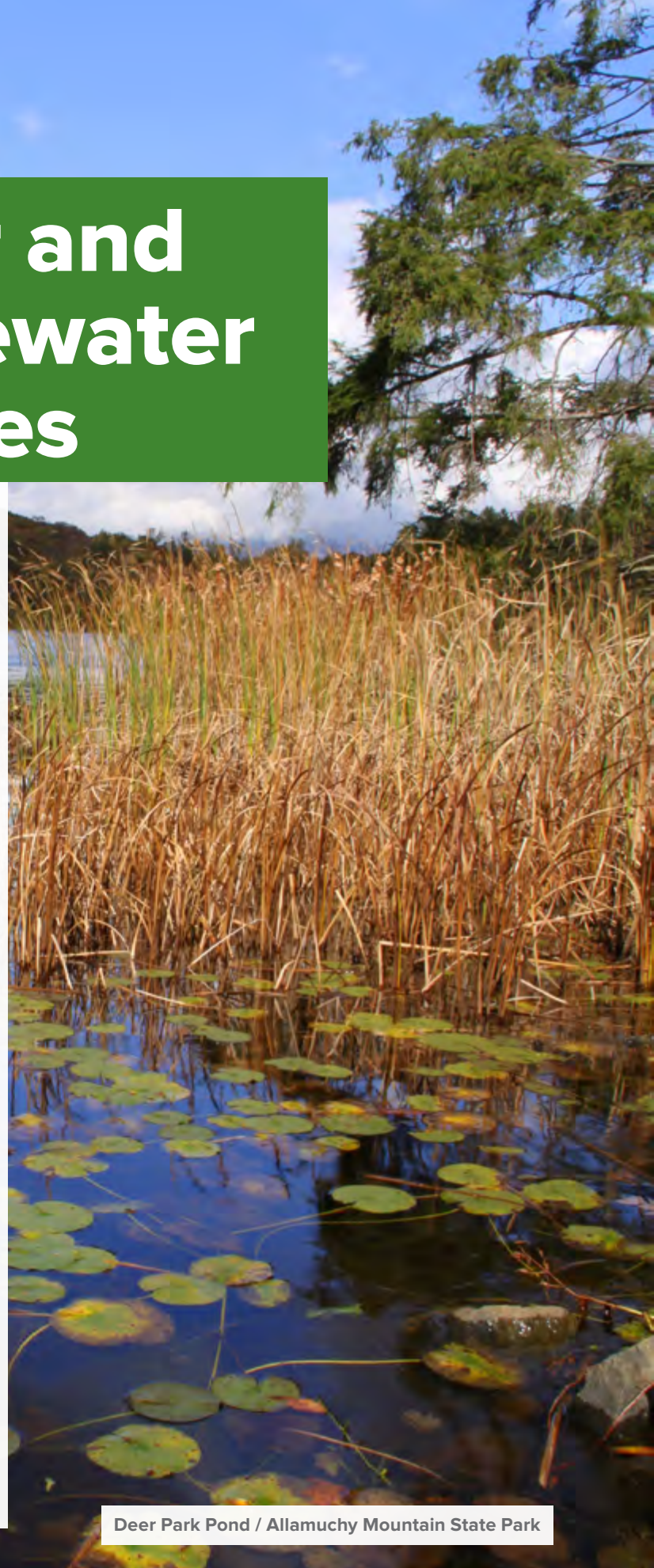
Water and Wastewater Utilities

Two critical components of sustainable communities in the Highlands Region are a reliable supply of potable water and a dependable method of wastewater disposal. Like much of New Jersey, the region is served with potable water through a combination of domestic water sources (typically wells) and public utility systems. Similarly, the disposal of wastewater includes a combination of wastewater treatment plants and individual septic systems.

Of great relevance to the smart growth vision of the Regional Master Plan (RMP) are the “public community water systems (PCWS),” which may be owned and operated by governmental entities (either as municipal operations or utility authorities) or investor-owned utilities. These community systems, whether their source consists of groundwater or surface water withdrawals, may also have the potential for inducing or supporting growth.

The public wastewater collection systems in the Highlands Region predominantly treat residential wastewater. A Highlands Domestic Sewerage Facility (HDSF), which includes publicly owned and investor owned domestic wastewater treatment facilities, provides wastewater treatment to municipalities and has collection systems that may be capable of supporting redevelopment and regional growth opportunities.

Determining the location and amount of utility capacity available to support communities within the Highlands Region will help encourage redevelopment, regional development, economic growth, revitalization and identify areas that may allow densities to support the use of the Highlands Transfer of Development Rights (TDR) program. Planning for future water supply and wastewater service areas requires knowledge of the areas served by existing infrastructure, current levels of use, and an analysis of planned infrastructure.



Deer Park Pond / Allamuchy Mountain State Park

Highlands Act Goals

The Highlands Act charges the Highlands Council with the following goals related to water and wastewater utilities in the implementation of the Highlands Regional Master Plan:

- ▶ Protect, restore, and enhance the quality and quantity of surface and ground waters.
- ▶ Preserve extensive contiguous areas of land in its natural state.
- ▶ 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.
- ▶ Promote conservation of water resources.
- ▶ Prohibit or limit construction/development which is incompatible with protection of the Preservation Area.
- ▶ Protect and maintain the essential character of the Highlands environment.
- ▶ Encourage, consistent with the State Development and Redevelopment Plan and smart growth strategies and principles, appropriate patterns of compatible residential, commercial, and industrial development, redevelopment, and economic growth, in or adjacent to areas already utilized for such purposes, and discourage piecemeal, scattered, and inappropriate development, in order to accommodate growth and economic development in an orderly way while protecting the Highlands environment from adverse impacts.

Highlands Regional Master Plan

The Highlands RMP addresses the following fundamental issues with regard to water and wastewater utilities in the Highlands Region:

- ▶ Identify areas currently served by existing water supply and wastewater facilities;
- ▶ Identify proposed wastewater service areas for wastewater facilities;
- ▶ Limit the expansion of water and wastewater infrastructure in the Preservation Area;
- ▶ Ensure all existing and future development in the Highlands Region that use public water supply systems and/or public wastewater systems are served by adequate and appropriate infrastructure;

- ▶ Ensure that onsite wastewater systems discharges do not exceed the natural carrying capacity of groundwater to attenuate loadings, exacerbate existing nitrate impairment, or contribute to potential nitrate impairment for subwatersheds of the Highlands Region; and
- ▶ Improve and refine the groundwater resource management element.

Highlands RMP Programs

The RMP includes a Water and Wastewater Utility program and a Wastewater System Maintenance program intended to assist in the achievement of the water and wastewater utilities Goals, Policies, and Objectives.

Water and Wastewater Utilities

The Water and Wastewater Utilities program provides a sequenced approach to determining the existing and potential capacity for service provision within the Highlands Region, identification of appropriate and inappropriate areas for utility services, and how capacity will be allocated among Existing Areas Served and proposed areas for new services both adjacent to and distinct from Existing Areas Served. Provision is made for incorporation of resource constraints and the protection of sensitive environmental features. The Water and Wastewater Utilities program consists of the following subprograms:

- ▶ Verification of Available Facility Capacity for Water Supply and Wastewater Utilities
- ▶ Identification of Resource and Regulatory Constraints on Utility Capacity
- ▶ Identification of Additional Constraints on Utility Capacity
- ▶ Protection of Environmental Resources Within Service Areas
- ▶ Build-out Analysis for the Existing Area Served in the Highlands and Non-Highlands Approved Service Areas
- ▶ Proposed Service Areas, Infrastructure Needs and Densities in Highlands Existing Community Zones
- ▶ Build-out Analysis for Proposed Services Areas in Highlands Existing Community Zones
- ▶ Proposed Service Areas, Infrastructure Needs and Densities in Highlands Protection and Conservation Zones
- ▶ Potential Service Areas for Clusters, Redevelopment Areas, Exempt Parcels and Public Health Exemptions

Topic Area: Water & Wastewater Utilities

- ▶ Utility Series Element
- ▶ Project Review Standards

Wastewater System Maintenance

This program helps ensure that on-site and small community wastewater treatment systems are properly maintained, using methods that complement the NJDEP's regulatory programs and requirements. It is focused primarily on septic system maintenance and on small community-based systems (e.g., package plants). The Wastewater System Maintenance program consists of the following subprograms:

- ▶ Routine Maintenance of Residential Septic Systems
- ▶ Life-cycle Maintenance of Residential Septic systems
- ▶ Upgrading & Replacement of Residential Cesspools and Other Inadequate Wastewater Systems
- ▶ Upgrading of Septic Systems to Address Threats to Human Health and Ground Water Quality
- ▶ Alternative Management Approaches for New Septic Systems
- ▶ Requirements for New Small Community Wastewater Systems

- ▶ Management of Existing Small Community Wastewater Systems

Indicators

Full analyses of indicators listed below are available in the Indicator Report chapter. Please note that not all indicators identified by the public and Technical Advisory Committees received a full analysis for this report due to data limitations and/or applicability to the RMP. A complete list of all identified indicators is available at the end of this document. Potential future indicators may be noted in the Recommendations section that follows, under "Science and Research Agenda."

Indicators Analyzed for Water & Wastewater Utilities:

- ▶ **Domestic Sewerage Facilities Capacity and Demand:** Measures change in domestic wastewater sewerage facility current available capacity and discharge by facility.
- ▶ **Public Community Water Systems Capacity and Demand:** Measures change in public community water systems monthly capacity and demand.
- ▶ **Wastewater Utility Existing Areas Served (EAS):** Measures change in extent of wastewater utility existing areas served.



Monksville Reservoir Spillway and Release

- ▶ **Water Supply Existing Areas Served (EAS):**
Measures change in extent of public water supply existing areas served.

Indicators Related to Water & Wastewater Utilities:

- ▶ **Municipal Plan Conformance:** A matrix of Municipal Plan Conformance Petition data, including submission and Highlands Council disposition, as well as approved Petition components and the current status of municipal completion.

Recommendations

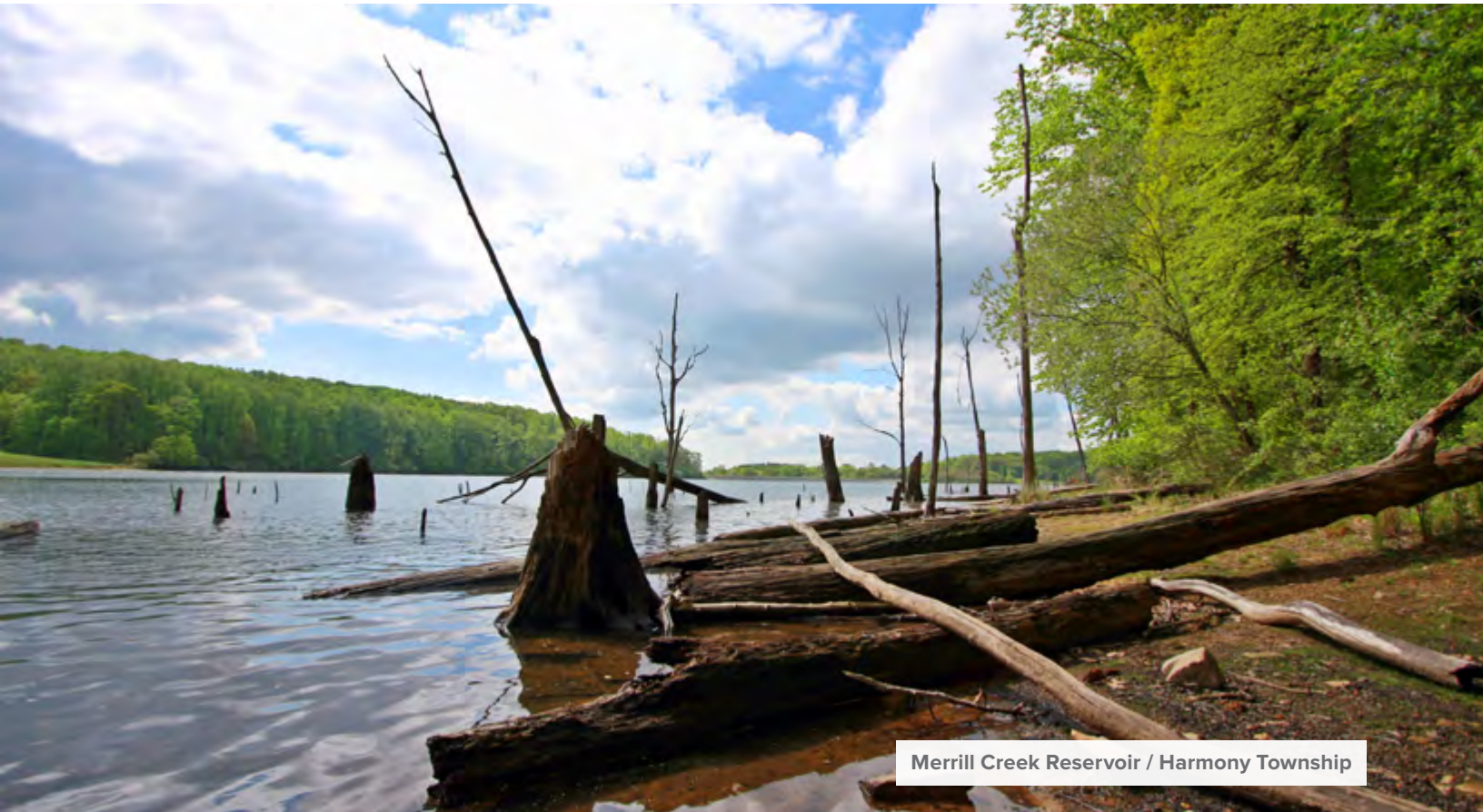
The recommendations that follow are organized by RMP programs and/or subprograms. Where appropriate, multiple programs have been combined for this discussion. Additionally, some program names have been modified to more accurately reflect the program’s purpose in practical application. Please note that not all RMP programs and subprograms have associated recommendations in this report. Items under “Science and Research Agenda” are recommendations that require further study and investment.

Water and Wastewater Utilities

Implementation Activity

In 2009, the Highlands Council conducted a regional build-out analysis for all municipalities within the Highlands Region. In 2015, the Highlands Council provided a grant program to support municipalities in updating build-out information. These build-out analyses allowed municipalities to verify EAS by water and wastewater utilities and the available capacity to accommodate additional growth.

The Highlands Council has been coordinating with utilities, municipalities, counties, and the NJDEP on the development of Wastewater Management Plans (WMPs). WMPs verify available facility capacity for water supply and wastewater capacity, and direct growth to the Existing Community Zones and Lake Community Zones, where utilities are more readily provided and away from sensitive environmental features. Municipalities and utilities provide feedback on the accuracy of the EAS since they have more reliable local knowledge.



Summary findings of related indicators:

- ▶ **Water Supply EAS:** Most of the water supply EAS lies within the Planning Area, specifically in the Existing Community Zone. The extent of the mapped service area has increased since 2008.
- ▶ **Wastewater Utility EAS:** Since adoption of the RMP in 2008, the data for the Highlands Region shows an overall decrease in wastewater EAS. This apparent decrease does not represent an actual abandonment of wastewater systems; instead it reflects more accurate mapping of EAS as compared to the original dataset. Most of the wastewater EAS, like water supply, is in the Existing Community Zone of the Planning Area.
- ▶ **Public Community Water Systems Capacity and Demand:** The analysis indicates that larger facilities tend to have more available capacity, while smaller facilities are more likely to have a capacity deficit. Of all the public community water systems in the Highlands, 12% of all facilities have no remaining capacity. In general, the demand trend among large systems is seasonally consistent year over year. Demand among smaller systems appears to be declining since 2007.
- ▶ **Domestic Sewerage Facilities Capacity and Demand:** Data indicates that since adoption of the RMP in 2008, most Highlands Domestic Sewerage

Facilities (HDSFs) have seen negligible variability in available capacity. In 2015, only six facilities out of 43 HDSFs had a deficit in available capacity.

Program Issues

- ▶ The development of Highlands WMPs has been delayed due to a complex and lengthy coordination process and changes in NJDEP regulations.
- ▶ Limited funding for upgrading infrastructure.

Recommendations

- ▶ Develop procedures that improve coordination with WMP partners to accelerate development and adoption of WMPs.
- ▶ Update EAS data for both wastewater and water utilities on a regular schedule.
- ▶ Continue to coordinate with NJDEP on water allocation decisions and project reviews that demand public water and/or wastewater utilities, particularly regarding sensitive resources.
- ▶ Identify and prioritize areas that are in need of upgraded infrastructure.
- ▶ Investigate opportunities for creating grant programs to assist with infrastructure upgrades.



Rockaway River / Wharton Borough

Science and Research Agenda:

- ▶ Link deficit utilities with critical resources to identify the areas where water quality is degraded due to either over-pumping for public water supply or discharge of treated wastewater into surface water.
- ▶ Analyze water efficiency to gauge and predict the amount of water lost in transmission, metering, and operations.

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Wastewater System Maintenance

Implementation Activity

In 2009, the Highlands Council issued a draft septic maintenance plan and ordinance for public comment. Due to the complexity of the plan and concerns over costs and administration of the program, further development was discontinued. In 2013, the Highlands Council approved funding of up to \$50,000 to assist Morris County in the development of the County Resource for the Administration of Private Septics (CRAPS) program. CRAPS is a web-based program and database for septic system management and monitoring to assist municipalities with the periodic inspection and maintenance of their septic systems.

The Highlands Council is working with municipalities to develop alternative and innovative Wastewater Treatment Plans to address wastewater issues. The Council is coordinating with NJDEP and local municipalities in the development of these plans.

Summary findings of related indicator:

- ▶ **Municipal Plan Conformance Implementation:** No municipalities have adopted a Highlands Municipal Septic Management Plan and ordinance.

Program Issues

- ▶ Lack of final Highlands Municipal Septic System Maintenance Plan Ordinance.
- ▶ Difficulty identifying septic system failures.
- ▶ Administration and enforcement of septic system management programs are cost prohibitive for municipalities, resulting in a reluctance to adopt such programs.
- ▶ Municipalities with failing systems and no access to treatment can lead to a public health and safety risk.
- ▶ Some municipalities may perceive a septic system maintenance ordinance as an undue burden on property owners.

Recommendations

In an effort to spur the implementation of the septic maintenance program of the RMP, the following is recommended:

- ▶ Maintain an inventory of existing municipal septic system maintenance plans and ordinances and the status of their implementation.
- ▶ Evaluate effectiveness of local implementation of septic system maintenance plans and ordinances.
- ▶ Develop a septic system best management practices manual for municipalities, including:
 - Educational materials on the proper operation and maintenance for property owners who have septic systems;
 - Model septic management and maintenance ordinances; and
 - Guidance on available grant funding to develop an inventory of septic systems.
- ▶ Assist in and provide funding for the development of wastewater alternative treatment plans, particularly for developed Preservation Area municipalities currently not serviced by adequate wastewater treatment facilities, to address issues of public health and safety.
- ▶ Provide guidance to municipalities to assist in identifying sites appropriate for wastewater facilities.

Science and Research Agenda

- ▶ Develop a GIS mapping protocol for inventorying the locations of septic systems failures to identify and prioritize areas that may need infrastructure investments.



Agricultural Resources

Agriculture is a vital component of the economy, culture and landscape of the Highlands Region. It provides economic benefits through agricultural production and helps maintain the rural character of Highlands communities. The loss of both farmland and farmers over recent decades emphasizes the crucial need to promote and encourage a positive agricultural business climate. In order to encourage such a climate and enhance agricultural viability, agricultural operations need to have the ability to adapt to ever-changing market conditions.



Farm / Washington Township, Morris County

Highlands Act Goals

The Highlands Act charges the Highlands Council with providing for the following goals related to agriculture in the implementation of the Highlands Regional Master Plan:

- ▶ Preserve farmland (“and historic resources,” per the Act).
- ▶ Promote compatible agricultural, horticultural, recreational, and cultural uses and opportunities within the framework of protecting the Highlands environment.

Highlands Regional Master Plan

The RMP’s approach to agricultural resources focuses on both the preservation of agricultural lands and the support of agriculture as an industry in the Highlands Region. The goals, policies and objectives contained within the RMP are designed to preserve lands for farm operations, protect and strengthen agriculture as an industry, and provide incentives and funding opportunities to encourage best management practices (BMPs) that protect and enhance the resources of the Highlands Region.

Highlands RMP Programs

The RMP recommends a variety of programs to assist in the achievement of the Agricultural Resources goals, policies, and objectives. These programs range from inventorying agricultural lands and monitoring easements, to establishing preservation and stewardship programs, to developing initiatives to expand Highlands farmers’ consumer base and thus the demand for Highlands agricultural products. In cases where development is approved on farmland, the RMP requires use of cluster development standards as a means to retain a portion of the acreage for continued agricultural use. The RMP recommends various educational and technical assistance programs, as well as coordination with other county, state, and federal agencies where existing roles and missions align. The full list appears below, organized according to program type.

Agricultural Sustainability, Viability, and Stewardship

Cataloguing Lands/Acquisition Activities

- ▶ Inventory of Agricultural Lands
- ▶ Willing Sellers

- ▶ Funding Opportunities
- ▶ Monitoring
- ▶ Stewardship

Preservation and Stewardship Programs

- ▶ Implementation of Strategies to Promote Preservation in the Agricultural Resource Areas and the Agricultural Priority
- ▶ Cluster/Conservation Design Development
- ▶ Establishment of Alternative/Innovative Agriculture Preservation Programs
- ▶ Establishment of Alternative/Innovative Agriculture Stewardship Programs
- ▶ Implementation of Strategies to Sustain and Enhance the Viability of the Agricultural Industry
- ▶ Identification of Subwatersheds with Elevated Nitrate Levels and Development of Management Plans
- ▶ Establishment of Incentives for Voluntary ImperVIOUS Cover Limitations on Agricultural Lands

Coordination Efforts

- ▶ Serve as a Regional Clearinghouse for Farmland Preservation, Stewardship and Technical Assistance
- ▶ Right to Farm

Indicators

Full analyses of indicators listed below are available in the Indicator Report chapter. Please note that not all indicators identified by the public and Technical Advisory Committees received a full analysis for this report due to data limitations and/or applicability to the RMP. A complete list of all identified indicators is available at the end of this document. Potential future indicators may be noted in the Recommendations section that follows, under “Science and Research Agenda.”

Indicators Analyzed for Agricultural Resources:

- ▶ **Agricultural Land Use and Preservation Index:** Measures change in acreage of total farmland, preserved farmland, and the share of total farmland that is preserved, as well as the change in total farmland and preserved farmland within the Highlands Agricultural Resource Area.

Indicators Related to Agricultural Resources:

- ▶ **Implementation Funding:** Indicates investments made toward the implementation of the Regional Master Plan (RMP) and a breakdown of how funding is used toward implementation of the RMP.

- ▶ **Open Space Program:** Tracks Highlands Open Space Partnership Funding Program applications, approved acquisitions, and funding availability.
- ▶ **Transfer of Development Rights (Highlands Development Credit) Program:** Tracks Highlands Development Credit (HDC) allocations, number and status of applications for purchase of HDCs, and funding availability for purchase. Tracks Transfer of Development Rights (TDR) feasibility grants and eligible/designated TDR receiving areas.

Recommendations

The recommendations that follow are organized by RMP programs and/or subprograms. Where appropriate, multiple programs have been combined for this discussion. Additionally, some program names have been modified to more accurately reflect the program's purpose in practical application. Please note that not all RMP programs and subprograms have associated recommendations in this report. Items under "Science and Research Agenda" are recommendations that require further study and investment.

Agricultural Sustainability, Viability, and Stewardship

Implementation Activity

The Highlands Council has provided funding for county-based farming assistance programs, including integrated pest management, marketing, agritourism, and the funding of a commercial kitchen.

Summary findings of related indicators:

- ▶ **Agricultural Land Use and Preservation Index:**
The Highlands Region consists of nearly 110,000 acres of farmland, compared to just under 114,000 acres of farmland in portions of the seven Highlands Counties with lands outside the Region. In both areas (i.e., inside and outside the Region), nearly 41% of the farmland was preserved per State Agriculture Development Committee (SADC) standards. Moreover, the Highlands Agricultural Resource Area (ARA) consisted of nearly 100,000 acres of farmland, of which 69% was within the Planning Area. 44.4% of the ARA is preserved farmland, 63% of which is in the Planning Area.



Musconetcong Valley Farm / Bethlehem

Topic Area: Agricultural Resources

- ▶ **Implementation Funding:** Hunterdon, Sussex and Warren counties have received a total in \$418,000 in grant funding for the county-based farming assistance programs mentioned above.

Program Issues

- ▶ Limited implementation of existing RMP programs.

Recommendations

- ▶ Promote sustainable agriculture and the expansion of agricultural uses and opportunities within the framework of protecting the Highlands Region. This should include continued technical and funding assistance to Highlands municipalities, counties, and County Agriculture Development Boards (CADBs) that demonstrate the ability to fulfill the goals of the program. Program areas could include:
 - ▶ Integrated Crop Management and Integrated Pest Management: maintain and expand the program for famers throughout the Highlands Region.
 - ▶ Market Development/Niche Crops: develop and promote new markets for Highlands agricultural products (new products, value-added products, and niche crops) and develop and promote agritourism initiatives and activities.
 - ▶ Agritourism: Develop a fuller understanding of the dynamics of the region's economy and the most optimal opportunities for development and deployment of Highlands agritourism initiatives.
 - ▶ Value Added Facilities: The region serves as an important source of fresh, high quality, local food for northern New Jersey. The Highlands Council should advocate for and assist with the siting of value added facilities responsible for aggregating, processing, and distributing multiple products grown in the Region and beyond.
 - Community Kitchens
 - Co-packing facilities
 - Freezer/cooler capacity
 - Animal processing facilities
 - ▶ Agricultural Loan Bank: Coordinate with SADC to establish an Agricultural Loan Bank to collateralize debt for farm equipment purchases based on the pre-Act value of the subject property where said value was adversely impacted by the Highlands Act.
 - ▶ Agricultural Advisory Committee: Establish an Agricultural Advisory Committee of the Highlands Council.

Science and Research Agenda

- ▶ **Agricultural Property Values:** Measure the change in median per-acre value of property sales and assessed value for preserved and non-preserved farmland.



Apple Orchard / Chester Township



Historic, Cultural, Archaeological, and Scenic Resources

The Highlands is endowed with abundant natural, cultural, historic, scenic, and recreational resources. These resources are important for preserving the Region's heritage, for the beauty they provide, for their contribution to the character of the region, and for the benefits they bring for recreation and tourism.

The Region contains important historic, cultural, and archaeological resources that provide an understanding of how the land and the people of the Highlands have changed over time. These resources are also important for fostering an appreciation for the events that contributed to the development of the towns, villages, and cities of the Highlands Region. Historic resources, including buildings, structures, districts, areas, and sites are significant to the history and culture of the region over time, and connect communities with their pasts.

Scenic resources come from a variety of visual compositions. There is a unique topography forming ridgelines and mountainsides, contributing interesting formations and scenic panoramas. The landscape is full of streams and rivers, forested lands, agricultural settings, and long-ago established settlements.



Hoff Vannatta Farmstead / Harmony Township

Highlands Act Goals

The Highlands Act charges the Highlands Council with the following goals related to historic, cultural, archaeological, and scenic resource protection in the Highlands Regional Master Plan:

- ▶ Preserve extensive contiguous areas of land in its natural state.
- ▶ 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.
- ▶ Preserve farmland and historic resources.
- ▶ Preserve outdoor recreation opportunities on publicly owned land.
- ▶ Promote compatible agricultural, horticultural, recreational, and cultural uses and opportunities within the framework of protecting the Highlands environment.
- ▶ Protect and maintain the essential character of the Highlands environment.
- ▶ For Planning Area, encourage, consistent with the State Development and Redevelopment Plan and smart growth strategies and principles, appropriate patterns of compatible residential, commercial, and industrial development, redevelopment, and economic growth.

Highlands Regional Master Plan

The RMP's approach to protecting and advancing historic and scenic resources in the Highlands Region focuses on preservation and protection activities. The goals, policies, and objectives enumerated in the RMP involve identifying and inventorying historic and scenic resources, preventing negative impacts from outside development, reliance on established standards for protection and preservation, and coordinating with existing organizations and all levels of government. Both historic resources and scenic resources are recognized as critical for Highlands tourism opportunities, heritage tourism, agritourism, and ecotourism.

Highlands RMP Programs

Historic, Cultural, and Archaeological Resource Protection

The RMP includes several programs designed to identify where historic, archaeological, and cultural resources exist and to provide guidance and support to local government in managing and protecting resources within their borders. The full list appears below:

- ▶ Identification of Historic, Archaeological and Cultural Resources
- ▶ Protection and Management of Historic Resources
- ▶ Education and Outreach

Scenic Resource Protection

The scenic resource protection programs listed below establish a procedure for identifying regionally significant scenic resources within the Highlands Region and provide methods to preserve these vistas, byways, ridgelines, rivers and streams, cultural landscapes, and natural features.

- ▶ Inventory of Highlands Scenic Resources
- ▶ Scenic Resource Protection Mechanisms

Indicators

Full analyses of indicators listed below are available in the Indicator Report chapter. Please note that not all indicators identified by the public and Technical Advisory Committees received a full analysis for this report due to data limitations and/or applicability to the RMP. A complete list of all identified indicators is available at the end of this document. Potential future indicators may be noted in the Recommendations section that follows, under "Science and Research Agenda."

Indicators Analyzed for Historic, Cultural, Archaeological, and Scenic Resources:

- ▶ **Preserved Lands and Trails:** Measures change in preserved lands and publicly accessible trails.
- ▶ **Note:** Because implementation of RMP programs related to Historic, Cultural, Archaeological, and Scenic Resources has been so limited, no directly related indicators have been identified at this time. Should the recommendations on the following pages proceed to implementation, indicators should be identified for tracking and monitoring.



Shippen Manor / Oxford Township

Recommendations

The recommendations that follow are organized by RMP programs and/or subprograms. Where appropriate, multiple programs have been combined for this discussion. Additionally, some program names have been modified to more accurately reflect the program’s purpose in practical application. Please note that not all RMP programs and subprograms have associated recommendations in this report. Items under “Science and Research Agenda” are recommendations that require further study and investment.

Historic, Cultural, and Archaeological Resource Protection

Implementation Activity

New Jersey’s Historic Preservation Office (SHPO) maintains an inventory of historic resources that includes properties and historic districts in New Jersey for which a formal action was taken by the State Historic Preservation Officer or designee. The listings are updated quarterly to reflect ongoing additions and corrections. The RMP establishes a Historic and Cultural Resource Inventory, which is a subset of SHPO’s inventory,

including only those resources that are in the Highlands Region. The Highlands inventory is updated whenever the SHPO inventory is updated.

Funding is available through the Highlands Plan Conformance Grant Program for historic preservation initiatives, such as Historic Preservation Master Plan elements, historic surveys, historic preservation ordinances, and heritage tourism planning. Additionally, the Model Highlands Land Use Ordinance includes an optional historic preservation component; however, this section is not currently required as part of Plan Conformance.

The Highlands Plan Conformance Grant Program has funded historic preservation initiatives in one county (Passaic County) and four municipalities (Phillipsburg, Califon, High Bridge and Chester Borough). No municipalities have adopted a historic preservation component of the Highlands Land Use Ordinance.

Program Issues

- ▶ Historic, cultural, and archaeological resource protection requirements contained within the RMP have not been included as a mandatory requirement in the Model Highlands Land Use Ordinance.
- ▶ Highlands Council does not have a current inventory of historic preservation measures that municipalities have adopted outside of Plan Conformance, so there is no accounting for the number of historic preservation ordinances that have been implemented in the region.
- ▶ Lack of outreach and education related to historic, cultural, and archaeological resources.

Recommendations

- ▶ Amend the Plan Conformance Program (including model municipal documents) to make the review of impacts on historic, cultural, and archaeological resources a required component, in compliance with the stated goals, policies, and objectives of the RMP.
- ▶ Consider amending the language of the RMP to more strongly reflect the intention of the Highlands Act goal to “preserve historic sites and other historic resources.”
- ▶ Gather information related to historic preservation efforts in each Highlands municipality and county and prepare, and keep up-to-date, an inventory of Certified Local Governments, historic preservation plans, surveys, and ordinances for Highlands municipalities and counties.
- ▶ In coordination with SHPO, initiate an education and outreach program for the Highlands Region, as described in the RMP.

Topic Area: Historic, Cultural, Archaeological, and Scenic Resources

- ▶ In coordination with the NJ Historic Trust, establish a mechanism for tracking public spending on historic, cultural, and archaeological resources.
- ▶ Monitor the preservation and development of historic, cultural and archaeological resources

Scenic Resource Protection

Implementation Activity

The Highlands Council adopted a *Procedure for Nomination, Evaluation and Inventory of Highlands Regionally Significant Scenic Resources* in October 2008, subsequent to the adoption of the RMP in July 2008. No new scenic resources have been proposed under this procedure.

Summary findings of related indicators:

- ▶ **Preserved Lands and Trails:** According to the most recent data available, 36% of the Highlands Region is permanently preserved. Of these lands, 37% are state-owned open space. Many of these properties are currently included in the baseline inventory of scenic resources.

Program Issues

- ▶ Lack of outreach to constituent municipalities and counties to encourage nomination of significant scenic resources.
- ▶ The Highlands Scenic Design Advisory Board, as defined in the *Procedure*, has not yet been established.
- ▶ The Baseline Scenic Resource Inventory has not been updated as new lands are preserved.

Recommendations

- ▶ Review the *Procedure for Nomination, Evaluation and Inventory of Highlands Regionally Significant Scenic Resources* to determine if modifications are appropriate.
- ▶ Develop a municipally oriented outreach effort to assist in the identification and nomination of potential Highlands scenic resources.
- ▶ Establish a protocol for monitoring and updating the Scenic Resource Inventory as lands are preserved.
- ▶ Initiate an outreach effort to each of the Highlands Counties and other interested organizations to assist in the identification and nomination of potential Highlands scenic resources.



The Red Mill / Clinton Town



Darress Theater / Boonton Town



Transportation and Air Quality

The Highlands Regional transportation system is a complex network of roads, highways, railways, and bridges, which support various modes of travel, including private automobile, buses, truck, passenger and freight rail, airport, bicycle, and walking. The Regional Master Plan recognizes that mobility is a key element of the character of the Highlands Region and includes a goal in the Planning Area for the promotion of a sound, balanced transportation system that is consistent with smart growth strategies and principles.

Clean air is a defining element of the unique character of the Highlands Region and air quality is influenced by mobile and stationary sources both within and outside the Region. Air quality is directly correlated with on-road mobile sources such as automobiles, buses and trucks; however, air toxins come from many other sources, including industrial facilities, utilities, commercial businesses, residential activities, and non-road mobile sources. While air quality is affected by activities in areas beyond the borders of the Highlands Region and the State, it is important that municipalities and counties address local air quality concerns to ensure that National Ambient Air Quality Standards (NAAQS) are met.



Morristown, NJ

Highlands Act Goals

The Highlands Act charges the Highlands Council with the following goals related to transportation and air quality in the implementation of the Highlands Regional Master Plan:

- ▶ Protect and maintain the essential character of the Highlands environment.
- ▶ Encourage, consistent with the State Development and Redevelopment Plan and smart growth strategies and principles, appropriate patterns of compatible residential, commercial, and industrial development, redevelopment, and economic growth, in or adjacent to areas already utilized for such purposes, and discourage piecemeal, scattered, and inappropriate development, in order to accommodate local and regional growth and economic development in an orderly way while protecting the Highlands environment from the individual and cumulative adverse impacts.
- ▶ Promote a sound, balanced transportation system that is consistent with smart growth strategies and principles and which preserves mobility in the Highlands Region.

Highlands Regional Master Plan

RMP transportation goals, policies, and objectives focus on safe and efficient transportation modes and levels of service, coordination with state and regional transportation agencies, and protection against adverse effects to natural resources and community character.

The goal for air quality focuses on reduction of air pollution.

Highlands RMP Programs

Transportation Safety and Mobility

The Transportation program of the RMP addresses multiple areas such as identifying roadway capacity constraints, addressing safety concerns, assessing agricultural and freight needs, and promoting efficient land use patterns that look comprehensively at land use and transportation planning. The program also looks to enhance a multi-modal transportation system that facilitates the movement of people and goods without

adversely affecting ecosystem integrity and community character. The Transportation Safety and Mobility program consists of the following subprograms:

- ▶ Linking Transportation and Land Use
- ▶ Regional Transportation Safety and Pedestrian Security
- ▶ Mobility of Agriculture and Freight Access
- ▶ Transportation and Tourism Economy
- ▶ Transportation Project Review
- ▶ Roadway Capacity Monitoring

Air Quality

The Air Quality program focuses on meeting the National Ambient Air Quality Standard (NAAQS). This program also supports the State Energy Master Plan as a means to plan and evaluate for energy efficiency and greenhouse gas reductions. The program includes both development and redevelopment strategies that can indirectly enhance air quality. The Air Quality program consists of the following subprograms:

- ▶ Encourage Capital Facilities That Meet Standards
- ▶ Monitoring
- ▶ Land Use Planning
- ▶ Resource Protection and Site Design Standards

Indicators

Full analyses of indicators listed below are available in the Indicator Report chapter. Please note that not all indicators identified by the public and Technical Advisory Committees received a full analysis for this report due to data limitations and/or applicability to the RMP. A complete list of all identified indicators is available at the end of this document. Potential future indicators may be noted in the Recommendations section that follows, under “Science and Research Agenda.”

Indicators Analyzed for Transportation and Air Quality:

- ▶ **Air Quality Index:** Measures change in the number of days, annually, that air quality fails to meet satisfactory National Ambient Air Quality Standards.
- ▶ **Commutation Patterns Index:** Measures change in commuting behavior, including travel mode and commute time.
- ▶ **Freight Index:** Measures change in active freight lines and spurs.

- ▶ **Transit Lands Area:** Measures change in Transit Lands Area; change in land use, construction activity, population density, and jobs within the Transit Lands Area.

Indicators Related to Transportation and Air Quality:

- ▶ **Participation and Outreach:** Measures the number and type of events, meetings, and activities the Highlands Council has held for public outreach, education, interagency coordination, site visits, and the like.

Recommendations

The recommendations that follow are organized by RMP programs and/or subprograms. Where appropriate, multiple programs have been combined for this



Railroad / Bethlehem

discussion. Additionally, some program names have been modified to more accurately reflect the program’s purpose in practical application. Please note that not all RMP programs and subprograms have associated recommendations in this report. Items under “Science and Research Agenda” are recommendations that require further study and investment.

Transportation Safety and Mobility

Implementation Activity

Each of the Transportation programs described in the RMP identifies areas where the Highlands Council may coordinate with various other agencies. These agencies include New Jersey Transit, New Jersey Department of Transportation (NJDOT), North Jersey Transportation Planning Authority (NJTPA), New Jersey Economic Development Authority (NJEDA), NJ Division of Travel and Tourism, and more broadly, state agencies, local governments, and stakeholders. Implementation in this area has been limited.

In addition, the RMP identified multiple existing and planned transportation studies in the Highlands Region for further evaluation. There has been no formal evaluation of these projects and studies since the adoption of the RMP. At the time the RMP was written, each of the referenced projects anticipated results (construction or study completion) by 2017 or earlier.

Summary findings of related indicators:

- ▶ **Participation and Outreach:** Since passage of the Highlands Act in 2004, the Highlands Council has hosted or participated in over 2,200 outreach activities, including 685 municipal and county outreach meetings, 482 interagency meetings, 109 committee meetings, 111 site visits, and 820 other outreach and education events.
- ▶ **Commutation Patterns:** From 2000 to 2013, there has been a decline in the use of single-occupancy vehicles for work commute and an increase in bus and bicycle use for commuting. Additionally, data suggests more people work from home.
- ▶ **Freight Index:** Active freight lines and freight spurs have declined in the Highlands Region from 2009-2013.

Program Issues

- ▶ Undefined role of Highlands Council in influencing strategic plans for other agencies.
- ▶ Lack of Highlands Region specific recommendations and requirements in strategic plans for other agencies.

Topic Area: Transportation and Air Quality

- ▶ Highlands Act Exemptions #9 (repair of transportation or infrastructure systems) and #10 (transportation safety projects) eliminate Highlands Act or RMP consistency reviews, such that the Act generally has no effect on transportation projects.
- ▶ Lack of evaluation criteria or guidelines for how to monitor transportation projects and studies impacting the Highlands Region, such as those identified in the RMP.

Recommendations

- ▶ Coordinate with NJ Transit, NJDOT, NJTPA, NJEDA, NJ Division of Travel and Tourism, and other agencies to determine an appropriate role for the Highlands Council in transportation planning and design standards. This may include the establishment of Highlands Region specific considerations and how they may be incorporated into larger scale strategic plans. Additionally, the transportation datasets developed by the Highlands Council through the Technical Report and RMP development process may be revisited and updated using approaches established by other agencies with more robust transportation planning efforts.
- ▶ Define an evaluation criteria and methodology for transportation projects and studies impacting the Highlands Region.

- ▶ Update the status of the specific transportation projects and studies identified in the RMP. Further evaluation of these projects and studies, including the local and regional impact of the projects on economic and environmental Highlands resources.
- ▶ Using a defined evaluation criteria, identify and evaluate projects and studies that will have a significant impact in the Highlands Region and may be influenced by the RMP.

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Linking Transportation and Land Use, Regional Transportation Safety and Pedestrian Security, Transportation Project Review

Implementation Activity

As of January 2017, one conforming municipality has developed a circulation plan element for Plan Conformance. Several jurisdictions are examining scenic byway designations and Passaic County has incorporated its own scenic byway standards into its Heritage Tourism Plan.



Byram Township

Summary findings of related indicator:

- ▶ **Commutation Patterns Index:** From 2000 to 2013, there is a decline in the use of single-occupancy vehicles for work commute and an increase in bus and bicycle use for commuting. Additionally, data suggests more people work from home.

Program Issues

- ▶ Lack of adoption of the circulation plan element for conforming municipalities.
- ▶ Highlands Council RMP program relies on inter-agency coordination, which generally limits the Council's impact related to on-the-ground projects.
- ▶ Exemptions #9 (repair of transportation or infrastructure systems) and #10 (transportation safety projects) largely prevent the Highlands Act and RMP from directly influencing transportation projects, including areas that may be ideal for implementing green streets.
- ▶ There are no walkable and bicycle friendly site design standards defined for RMP consistency through Highlands Project Review.
- ▶ Transportation is not addressed significantly in assessing Highlands tourism needs and opportunities. Scenic byways and Highlands Region amenities are not linked meaningfully in planning efforts.

Recommendations

The Highlands Act and RMP intend to promote a sound and balanced transportation system that is consistent with smart growth strategies and principles and looks to enhance a multi-modal transportation system. By regulatory and enforcement responsibility, the Highlands Council is limited in its ability to provide new opportunities and enhancement of existing walkable and bicycle friendly transportation networks. It is recommended that the RMP incorporate additional avenues for the Highlands Council to implement these networks:

- ▶ Develop site design guidelines related to walkable and bicycle friendly design to be incorporated into Highlands Project Review. This may include sidewalk specifications, bicycle considerations, proper lighting, and other items. Review standards for potential inclusion as amendment to the NJ Residential Site Improvement Standards.
- ▶ Establish green streets planning grants and guidelines as part of Plan Conformance, which may supplement circulation plan elements. Alternatively, these guidelines may be appropriate for designated centers and redevelopment areas.

- ▶ Ensure inclusion of scenic byways in Highlands tourism planning and consider a program to provide Highlands trail blazing signage that appropriately unifies tourism travel networks.

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Freight Access

Implementation Activity

No implementation.

Summary findings of related indicator:

- ▶ **Freight Index (rail):** Active freight lines and freight spurs have declined in the Highlands Region from 2009-2013.

Program Issues

- ▶ No freight access/mobility guidelines for Highlands Centers.
- ▶ No freight access/mobility guidelines for Redevelopment Areas.

Recommendations:

The Highlands Act and the RMP recognize the importance of sustainable economic development in areas with access to existing infrastructure. In an effort to improve both transportation congestion and air quality, the RMP looks towards the use of the existing freight rail system. To increase the likelihood of directing future development and redevelopment to areas with access to this infrastructure, it is recommended that a program be developed to expand the current Highlands Center designation process to include review of areas with significant freight rail access, with the potential for inclusion of such areas within Center boundaries. The recommendation is to include the following in the RMP and the center designation procedures adopted by the Highlands Council:

- ▶ Coordinate with NJDOT and NJTPA to identify freight rail access points and their relationship to existing infrastructure to support development consistent with the RMP.
- ▶ Develop commercial and industrial specific procedures for Highlands Centers and Redevelopment Areas and include, in guidance documents, a particular focus on developing in close proximity to existing rail (freight) access points.
- ▶ Identify opportunities for retaining existing (unused) rail rights of way for potential reuse.

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Air Quality

Implementation Activity

Indirect activities that are considered to positively impact local air quality, including the requirement of native landscaping and low impact development practices through Highlands Project Review, and preservation of forested land through Landowner Equity and land preservation programs.

Summary findings of related indicators:

- ▶ **Air Quality Index:** Since the adoption of the RMP, the trend for Highlands counties is fewer unhealthy Air Quality Index (AQI) days over time. By the data used in this indicator, all of Northern New Jersey has improved since 2004, which is the earliest date in the analysis.
- ▶ **Implementation (Participation and Outreach):** Since passage of the Highlands Act in 2004, the Highlands Council has hosted or participated in over 2,200 outreach activities, including 685 municipal and county outreach meetings, 482 interagency meetings, 109 committee meetings, 111 site visits, and 820 other outreach and education events.

Program Issues

- ▶ Highlands Council action items outlined in the program are redundant with other topic areas of the RMP.
- ▶ Standards are established and monitored by other agencies, including the United States Environmental Protection Agency (USEPA) and NJDEP.
- ▶ Third party green building certification entities typically deal directly with landowners and developers.

Recommendations

Clean air is a defining characteristic of the Highlands Region. Maintaining this high quality resource is captured by the sound land use planning established in greater detail throughout the RMP. The RMP also defers to meeting NAAQS and State Energy Master Plan Goals, without defining specific practices or standards to go above and beyond state and federal guidelines. It is recommended that the Highlands Council coordinate with agencies to establish additional criteria and incentives for improving air quality in the Highlands Region, with a clearly defined role for the Highlands Council.

- ▶ Coordinate with NJDEP and USEPA to identify specific causes of air quality pollution in the Highlands Region and specific activities the Highlands Council can take to work toward alleviating these problems, including air quality monitoring.

- ▶ Coordinate with NJDEP and USEPA on “raising the bar” in the Highlands Region and creating additional guidelines for municipalities, commercial, and industrial operations within the region. This may also include coordination with the U.S. Green Building Council, Energy Star, and other green building certification entities to identify additional incentives for Highlands municipalities and developers to work toward building design that goes beyond state and federal air quality standards.
- ▶ The process by which the Highlands Council determines whether there is a need for a climate change topic area to be included in the RMP first begins with a review of the Highlands Act to determine the legislative authority provided to the Council. If further analysis is warranted and authorized by the Council, this would then be followed by a factual analysis and the preparation of a white paper on the topic area, reviewing existing data and information on the matter. Should the Highlands Council conclude that sufficient support exists to proceed, the Council will prepare a Technical Report on the issue. A Technical Report would seek to review regional causes and potential impacts of climate change on the Highlands Region and seeks to understand the potential role of the Highlands Council and RMP. An analysis of the Council’s relationship to national and state programs and regulations, and an evaluation of the Council’s authority and ability to pursue a meaningful part in a climate change discussion would be integral to any technical report produced.



Future Land Use

The Highlands Act recognizes the significant natural resource and economic value of the New Jersey Highlands Region and the risks inherent in existing land use patterns and environmental regulation trends. The increase in development between 1995 and 2004 and the resulting loss of forested lands and wetlands spurred passage of the Highlands Act to protect this nationally significant area through a regional approach to land use planning.

Balancing the need to protect and preserve Highlands resources with the need for a sustainable quality of life means providing for smart growth, improved transportation, protection of local economies, preservation of open space and recreational areas, and promotion of sustainable agriculture.

Natural Area Preserve / Hopatcong Borough

Highlands Act Goals

The Highlands Act charges the Highlands Council with the following goals related to future land use in the implementation of the Highlands Regional Master Plan in the Preservation Area:

- ▶ Preserve extensive and, to the maximum extent possible, contiguous areas of land in its natural state, thereby ensuring the continuation of a Highlands environment that contains the unique and significant natural, scenic, and other resources representative of the Highlands Region.
- ▶ Preserve farmland and historic sites, and other historic resources.
- ▶ Preserve outdoor recreation opportunities, including hunting and fishing, on publicly owned land.
- ▶ Promote brownfield remediation and redevelopment.
- ▶ Prohibit or limit to the maximum extent possible construction or development that is incompatible with preservation of this unique area.

The Highlands Act charges the Highlands Council with the following goals related to future land use in the implementation of the Highlands Regional Master Plan in the Planning Area:

- ▶ Preserve to the maximum extent possible any environmentally sensitive lands and other lands needed for recreation and conservation purposes;
- ▶ Protect and maintain the essential character of the Highlands environment;
- ▶ Preserve farmland and historic sites, and other historic resources;
- ▶ Preserve outdoor recreation opportunities, including hunting and fishing, on publicly owned land;
- ▶ Promote brownfield remediation and redevelopment;
- ▶ Encourage, consistent with the State Development and Redevelopment Plan and smart growth strategies and principles, appropriate patterns of compatible residential, commercial, and industrial development, redevelopment, and economic growth, in or adjacent to areas already utilized for such purposes, and discourage piecemeal, scattered, and inappropriate development in order to accommodate local and regional growth and economic development in an orderly way while protecting the Highlands environment from the individual and cumulative adverse impacts.

Highlands Regional Master Plan

The Regional Master Plan (RMP) serves as a foundation to guide future land use planning decisions related to resource protection, conservation of agricultural landscapes, and economic growth and development. The RMP contemplates a future regional and community character that is a measured extension of existing conditions where the functional values of the land and water resources of the Region are maintained and, wherever possible, restored and enhanced. Five fundamental principles govern the future of the Highlands Region:

1. Protect and preserve the resources of the natural and built environment, especially land and water resources;
2. Restore and enhance those aspects of the natural and built environment that have been compromised by prior use and development;
3. Maintain and enhance the fiscal and economic viability of the Region and its constituent communities;
4. Distribute the benefits and burdens of implementing the Regional Master Plan equitably among all affected interests both within and outside the Highlands Region; and
5. Ensure that all new growth and development is sustainable over the long term based on water, energy, and other critical resources, is complementary to its environment, harmonious with historical settlement patterns, and is compatible with the history and character of the regional communities of place.

Highlands RMP Programs

The RMP establishes six programs and several subprograms to implement the Goals, Policies and Objectives related to Future Land Use.

Land Use Capability Analysis

Land use capability mapping resulted in a series of five maps intended to provide information sufficient to determine, at a regional scale, the potential for land use based on a variety of factors. These maps include:

- ▶ Land Use Capability Zone Map
- ▶ Land Use Capability Water Availability Map
- ▶ Land Use Capability Public Community Water Systems Map

Topic Area: Future Land Use

- ▶ Land Use Capability Domestic Sewerage Facilities Map
- ▶ Land Use Capability Septic System Yield Map
- ▶ Additionally, the program provides technical and planning assistance, calculation of land use capability and natural resource limitations based on land use factors, and the opportunity for RMP updates and adjustments.

Cluster/Conservation Design Development

Cluster design allows development on lots smaller than that typically required by zone standards, as long as there is no increase in the total number of lots permitted. Remaining land areas are aggregated and set aside for open space, passive recreation, or agricultural purposes. The program is intended to balance multiple needs, including, but not limited to, maximizing the protection of environmental and agricultural resources, accommodating limited development, and ensuring consideration of existing community character. The Cluster/Conservation Design Development program includes the following subprograms:

- ▶ Develop Cluster/ Conservation Development General Provisions
- ▶ Cluster Design for Environmental Protection and Agricultural Preservation
- ▶ Buffer Strips, Setbacks, and Protection of Natural Lands

Redevelopment

Future growth in the Highlands Region is directed toward reuse and redevelopment of previously developed areas. The redevelopment program assists interested parties, municipalities, counties, state, and federal agencies in identifying where redevelopment opportunities may exist and pursuing appropriate redevelopment within each RMP zone in both the Planning and Preservation Areas. The Redevelopment program consists of the following subprograms:

- ▶ Preservation Area Redevelopment
- ▶ Planning Area Redevelopment
- ▶ Redevelopment and Infill Analysis Tool
- ▶ Site Development Standards – Redevelopment
- ▶ General Assistance for Eligible Projects

Smart Growth and Community Design Handbook

Guidance toward future community development is to be provided through a collaborative effort between state and local agencies and technical and planning experts to prepare a handbook on smart growth and community design. The Handbook, along with an

outreach program, is intended to be shared throughout the Highlands Region with municipal planners, landscape architects, architects, property owners, and local officials.

Housing and Community Facilities

The housing program facilitates a range of housing opportunities, specifically including affordable housing, farm labor housing, green alternatives, and housing suited to the various types of communities located in the Highlands Region. A jobs to housing balance and monitoring of development activity are envisioned, as well as planning incentives to support necessary smart growth and community facilities. The Housing and Community Facilities program consists of the following subprograms:

- ▶ Housing Affordability
- ▶ Farm Labor Housing
- ▶ Housing Approaches - Smart Growth, Housing, Community Facilities, Green and Energy Efficient Facilities
- ▶ Housing Metrics - Jobs to Housing Balance and Regional Development Activity Monitoring
- ▶ General Assistance for Eligible Projects

Low Impact Development

Low impact development (LID) includes a variety of site development and landscaping techniques that lessen the negative environmental impacts of development. The program operates through Plan Conformance requirements, Highlands Project Review, and the development and dissemination of guidance to encourage use of green techniques for all types of development. The overall intent of LID is to allow the natural features of the land to guide site design, stormwater management, and resource protection. The LID program consists of the following subprograms:

- ▶ Site Design and Development
- ▶ Open Space and Landscaping
- ▶ Water Conservation
- ▶ Stormwater Management
- ▶ Pervious Pavements
- ▶ Green Roofs
- ▶ Narrower Roads
- ▶ Rain Gardens
- ▶ Natural Landscaping
- ▶ Rain Barrels
- ▶ Re-Use Basins
- ▶ Curbless Roads



- ▶ Swale Blocks
- ▶ Reverse Soil Compaction

Indicators

Full analyses of indicators listed below are available in the Indicator Report chapter. Please note that not all indicators identified by the public and Technical Advisory Committees received a full analysis for this report due to data limitations and/or applicability to the RMP. A complete list of all identified indicators is available at the end of this document. Potential future indicators may be noted in the Recommendations section that follows, under “Science and Research Agenda.”

Indicators Analyzed for Future Land Use:

- ▶ **Conservation Zone:** Measures change in the Land Use Capability Map - Conservation Zone of business activity, sewer and public water service areas, developed lands, and Transit Lands. Also measures change in agricultural, forested, and preserved lands.
- ▶ **Existing Community Zone:** Measures change in the Existing Community Zone (ECZ) of business activity, sewer and public water service areas, developed lands, and Transit Lands. Also measures change in agricultural, forested, and preserved lands.
- ▶ **Highlands Centers and Redevelopment Areas:** Measures change in Highlands Designated Centers and Redevelopment Areas of business activity,

sewer and public water service areas, developed lands, and Transit Lands. Also measures change in agricultural, forested, and preserved lands.

- ▶ **Protection Zone:** Measures change in the Protection Zone of business activity, sewer and public water service areas, developed lands, and Transit Lands. Also measures agricultural, forested, and preserved lands.

Indicators Related to Future Land Use:

- ▶ **Highlands Project Reviews:** A summary of Highlands Project Reviews.
- ▶ **Implementation Funding:** Indicates investments made toward the implementation of the Regional Master Plan (RMP) and breakdown of how funding is used toward implementation of the RMP.
- ▶ **Transit Lands Area:** Measures change in Transit Lands Area; change in land use, construction activity, population density, and jobs within the Transit Lands Area.

Recommendations

The recommendations that follow are organized by RMP programs and/or subprograms. Where appropriate, multiple programs have been combined for this discussion. Additionally, some program names have been modified to more accurately reflect the program’s purpose in practical application. Please note that not all RMP programs and subprograms have associated

recommendations in this report. Items under “Science and Research Agenda” are recommendations that require further study and investment.

Land Use Capability Analysis

Implementation Activity

Each of the five land use capability maps, which together make up the Land Use Capability Map Series, were created during the writing of the 2008 Regional Master Plan. The Land Use Capability Map (LUCM) Series is continually updated through the RMP Map Update Program, as well as through Map Adjustment requests made by municipalities during the Plan Conformance process.

Summary findings of related indicators:

- ▶ **Land Use Capability Zones (Existing Community Zone, Conservation Zone, and Protection Zone):** The analysis indicates a higher concentration of newly developed land within the Existing Community Zone, coupled with minimal development occurring in the Conservation and Protection Zones. Increased land preservation was noted within the Protection and Conservation Zones, while little land preservation occurred within the Existing Community Zone.
- ▶ **Transit Lands Area:** The Highlands RMP provides policies designed to encourage the use of smart growth principles and promote an integrated approach to addressing transportation and land use planning. To quantify these smart growth principles, the *RMP Transportation System Preservation and Enhancement Technical Report* assigned transportation scores to the region based on access to the existing transportation system. For this indicator, land use, construction activity, population density, and jobs were analyzed within the Highlands Region, as well as Transit Lands Area within the Preservation and Planning Areas, to assess change over time.

Program Issues

- ▶ Outside of site specific updates, the LUCM Series has not received a region-wide update since its creation in 2008;
- ▶ A component directing opportunities for future smart growth development, as required by the Act, has not been created.

Recommendations

The Highlands Act requires that the Highlands RMP include a resource assessment that determines the amount and type of human development and activity

that the Highlands Region can sustain while still maintaining overall ecological values. Furthermore, the Act requires a Smart Growth component that, based on a resource assessment, plans for appropriate development, redevelopment, and economic growth. Currently the RMP relies on the Land Use Capability Zone Map to address both of these requirements.

- ▶ Develop a plan and schedule to update the Land Use Capability Map Series region-wide based on the availability and updates to the base datasets used.
- ▶ Update the LUCZ Map to create a three-map LUCZ set depicting past and present on-the-ground conditions, as well as a map reflecting areas appropriate for sustainable growth.
- ▶ Based on the resource assessment conducted under the Land Use Capability Map Series, establish a region-wide Sustainable Growth map depicting areas within the region that are appropriate for future development and redevelopment activity, and areas that are more appropriate for conservation and protection.

Science and Research Agenda

- ▶ Compile all Highlands municipal zoning maps and associated ordinances, as necessary, to develop a region-wide map that accurately depicts municipal zoning districts and permitted densities. This map should be updated regularly with local changes in zoning.

Redevelopment

Implementation Activity

The Highlands Council established draft procedures for the designation of redevelopment areas within the Preservation Area. To date, 12 Highlands Redevelopment Areas have been designated.

Summary findings of related indicator:

- ▶ **Designated Highlands Centers and Redevelopment Areas:** Designated Highlands Redevelopment Areas provide relief for development activities within the Preservation Area. These areas were evaluated in concert with Designated Highlands Centers to maintain confidentiality of employment data and demonstrated an increase in economic and development activity.

Program Issues

- ▶ Redevelopment procedures have not been adopted as part of the Regional Master Plan.

Topic Area: Future Land Use

- ▶ Redevelopment procedures have not been drafted for the Highlands Planning Area.

Recommendations

The Highlands RMP envisions redevelopment in the Planning Area in accordance with the designated LUCM zone. In LUCM Protection and Conservation Zones, Highlands Council review and approval is required for conforming municipalities. Highlands Council review is not required for the Existing Community Zone, though a call-up provision provides for Council review should a proposed redevelopment not conform with the Goals, Policies, and Objectives of the RMP.

- ▶ Develop and adopt procedures for designating Highlands Redevelopment Areas within the Planning Area.
- ▶ Adopt Highlands Redevelopment Procedures as an addendum to the Regional Master Plan through the established Highlands Regional Master Plan Amendment Procedures.

Low Impact Development (LID)

Implementation Activity

Typically municipal project review occurs through the formal submission of an application as a requirement of a municipality’s Highlands Referral Ordinance. However, the Highlands Council routinely conducts informal pre-application meetings with potential applicants to discuss existing features present on the subject property. Project review is based on the Goals, Policies, and Objectives in the RMP. All proposed projects require the use of LID techniques to minimize or mitigate the project’s impact on Highlands resources. Low impact development is an element of smart growth that lets the natural features of the land guide site design and development. Low impact development techniques for managing stormwater, for example, are designed to more closely mimic the natural hydrologic characteristics of the land and reduce the adverse effects of runoff. Such requirements are developed as part of guidance documents produced by the Highlands Council, which are discussed in this report under their respective topic areas.

Summary findings of related indicator:

- ▶ **Highlands Project Reviews:** To date, 28 Highlands project reviews have been conducted.

Program Issues

- ▶ A formal project review guidance document has not been created to synthesize the Goals, Policies, and Objectives of the RMP for minimum standards required of a project submission for Highlands Council review.

- ▶ No objective standard exists to assess the extent or effectiveness of proposed LID strategies during project review.
- ▶ The Highlands Act C.13:20-24 calls for the Highlands Council and the Commissioner of Community Affairs to review the Residential Site Improvement Standards for potential modification in the Highlands Region. No modifications have been made to date.

Recommendations

The Highlands Council uses Plan Conformance, Highlands Project Review, and the development and dissemination of guidance materials to encourage the use of LID strategies for all types of development. LID begins with a process that analyzes the land first and allows the natural features of the land to guide site design. Incorporating LID strategies, such as pervious pavement, bioretention basins/rain gardens, vegetated swales, green roofs and cisterns into site design should be required for proposed development in the region.

- ▶ Develop and adopt procedures for Highlands Project Review that include an existing features analysis and a site’s ability to incorporate LID or mitigate impacts off site.
- ▶ Develop guidance for Highlands-specific LID pertaining to site design and stormwater management.
- ▶ Develop an objective grading or ranking system for the use of LID strategies.
- ▶ Identify permanently preserved public and nonprofit lands as vital components of green infrastructure that contributes to the overall health of the region.
- ▶ Coordinate with the Department of Community Affairs and the Residential Site Improvement Standards Board for the development of standards specific to the Highlands Region.

Cluster Development (Highlands Center Designation)

Implementation Activity

Requirements for the use of cluster development techniques are included in the Highlands model Land Use Ordinance adopted by conforming municipalities. To date, no project review resulting from the implementation of the Land Use Ordinance has included cluster development.

Since 2008, the Highlands Council has reviewed and designated 15 Highlands Centers throughout the region and funded studies for potential centers in municipalities conforming in the Planning Area. Additional grant

funding is provided to municipalities with designated Highlands Centers for enhanced planning within the adopted Center.

Summary findings of related indicators:

► **Highlands Centers and Redevelopment Areas:**

Since 2008, the Highlands Council has designated 15 Highlands Centers and 12 Highlands Redevelopment Areas. These areas have experienced, and continue to see, the greatest intensity of development and highest concentration of employment of all conforming municipalities.

► **Highlands Project Reviews:** The Highlands Council has completed 28 Project Reviews, none of which have incorporated cluster or non-contiguous cluster development.

► **Transit Lands Area:** The Highlands RMP provides policies designed to encourage the use of smart growth principles and promote an integrated approach to addressing transportation and land use planning. To quantify these smart growth principles, the *RMP Transportation System Preservation and Enhancement Technical Report* assigned transportation scores to the region based on access to the existing transportation system. For this indicator, land use, construction activity, population density, and jobs were analyzed within the Highlands Region, as well as Transit Lands Area within the Preservation and Planning Areas, to assess change over time.

Program Issues

- Highlands Center designation is not formally recognized in the RMP as a program;
- Guidelines for Highlands Center Designation have not been adopted as a component of the RMP;
- Cluster Development guidelines have not been developed beyond the provisions included in the model Highlands Land Use Ordinance (LUO).

Recommendations

The process for Highlands Center Designation is rooted in the Highlands Act, which requires the RMP to include a Smart Growth Component that provides opportunities for development, redevelopment, and economic growth, while taking into account public investment priorities, infrastructure investments, economic development, revitalization, housing, transportation, energy resources, waste management, recycling, brownfields, and design. Highlands Center designation occurs through the Plan Conformance petition process and results in the development of a center-specific land use ordinance as the means by which to implement the permissible uses, and development and resource protection standards. Certain provisions of the RMP

are not applicable within Highlands Centers, however, center planning must be designed to ensure responsible development and protection of critical resources.

Cluster development, as currently implemented through the RMP and the Highlands LUO, requires that 80% of the total project area be set aside in perpetuity for conservation and/or agricultural purposes. Where served by a public or community on-site wastewater system, the provisions encourage a set-aside of 90% of the land area. Where Preservation Area cluster development is reliant on septic systems, parent lot sizes capable of accommodating such requirements are few and far between. To increase the likelihood of implementation of the cluster development option, it is recommended that the cluster development program be revisited and revised to incorporate procedures for the use of the cluster and non-contiguous cluster option within and adjacent to Highlands Centers, increasing the likelihood of this option being utilized. The following recommendations expand on this approach:

- Amend the RMP to incorporate a Highlands Center Designation Program and guidelines adopted in accordance with RMP Amendment Procedures.
- Incorporate procedures for cluster and non-contiguous cluster development within the Highlands Center Designation Program and guidelines, including the use of smart growth principles, and low impact development techniques that consider existing community character with respect to architectural style, scale, massing, and arrangement.
- Revisit the cluster and non-contiguous cluster development program in the RMP to encourage use.
- Encourage the use of alternative wastewater treatment systems for cluster development in areas that are not currently served by traditional systems. (Ensure coordination with the NJDEP.)
- Establish guidelines for the designation of core, node, village, freight, and hamlet center typologies, particularly incorporating the potential for smaller scale cluster development and the use of alternative wastewater treatment systems. (Ensure coordination with the NJDEP.)
- Assess the Highlands Region for State Development and Redevelopment Plan and de-facto centers that may not voluntarily conform to the RMP (i.e. Dover, Morristown, Washington Borough). Establish procedures to recognize the importance of these centers to the region by providing planning assistance grants and conformance incentives.

Housing and Community Facilities

Implementation Activity

The Highlands Council entered into a Memorandum of Agreement with the Council on Affordable Housing (COAH) consistent with the directives in Executive Order 114 (EO114) to provide for revised affordable housing obligations based on Plan Conformance status and the Highlands Council build-out analysis. An initial grant program was provided to municipalities in 2009, which was subsequently amended in 2015 to address the 2015 Supreme Court ruling. Under the 2015 affordable housing grant program, 41 conforming municipalities received approval for grants up to \$25,000 per municipality. Seventy-five Highlands municipalities submitted to COAH for substantive certification under COAH's 3rd Round Rules, 69 have subsequently submitted motions for declaratory judgement to the courts.

Summary findings of related indicator:

- ▶ **Implementation Funding:** The Highlands Council has provided \$300,673 in Affordable Housing Grants to municipalities.

Program Issues

The RMP identifies compliance with the Fair Housing Act as a component of plan conformance and provides brief guidance on potential opportunities for the provision of affordable housing in the region.

On July 17, 2008, amendments to the Fair Housing Act were adopted, placing new requirements on the Highlands Region. These new requirements included the provision that all new residential development in the region reserve for occupancy by low- and moderate-income households at least 20 percent of the units constructed to the extent that it is economically feasible. In addition, these amendments provided that the Highlands Council should identify and coordinate regional affordable housing opportunities in cooperation with municipalities in areas with convenient access to infrastructure, employment opportunities, and public transportation. Coordination of these affordable housing opportunities may include methods to regionally provide housing in line with regional concerns, such as transit needs or opportunities, environmental concerns, or such other factors as the Council may permit, provided, however, that such provision may not result in more than a 50 percent change in the fair share obligation of any municipality.

On September 5, 2008, Governor Corzine signed EO114 directing the Highlands Council and COAH to coordinate on affordable housing issues. To implement this directive, the Highlands Council and COAH entered into a Memorandum of Agreement setting forth provi-

sions regarding the timing of the submission of Fair Share Plans and the adjustments to housing obligations due to the passage of the Highlands Act and the RMP. In addition, the Highlands Council prepared a draft Affordable Housing Technical Report. However, due to on-going changes in affordable housing regulations, the technical report was never adopted.

On August 12, 2009, the Council on Affordable Housing (COAH) adopted the Regional Affordable Housing Development Program, which permitted the transfer of affordable housing obligations within the Highlands Region where certain conditions were met. The program was subsequently invalidated by the courts due to administrative adoption issues.

In 2013, the Supreme Court of New Jersey overturned COAH's 3rd Round Methodology for determining municipal obligations. In 2015, the Supreme Court took further action, placing the authority for review in the hands of the court system. At the time of this report, municipal affordable housing obligations are being determined through the courts on a case-by-case basis.

To provide guidance to conforming municipalities regarding the requirements of the Fair Housing Act related to the RMP, in 2009 the Highlands Council provided instructions for the preparation of Housing Plans to meet the requirements of the RMP (the Module 3 Instructions). Based on the subsequent Supreme Court decision, in 2015 the Highlands Council issued updated Module 3 instructions along with a revised grant program for conforming municipalities.

Recommendations

- ▶ Review the authority provided to the Highlands Council by the Fair Housing Act to determine what responsibility the Council has towards the adoption and implementation of standards to regionally provide affordable housing, in line with regional concerns;
- ▶ Update the draft Affordable Housing Technical Report of the RMP to provide technical assistance to municipalities, and adopt it through the RMP Amendment Procedures process;
- ▶ Amend the RMP to incorporate the updated results of the Affordable Housing Technical Report as well as to reflect the changes in affordable housing laws and regulations since RMP adoption;
- ▶ Work with municipalities to continue to support the implementation of the Fair Housing Act and incorporate any legislative revisions into the RMP, as appropriate.



Landowner Equity

An essential component in the protection of the important natural resources of the Highlands Region is the preservation of privately owned lands. To ensure fairness to property owners, the Highlands Act calls for several means of recompense. The Highlands Act specifies that funding should be made available for the “acquisition of exceptional natural resource lands.” The Highlands Act directs the Highlands Council to identify sensitive lands where development should not occur and provide strategies for preserving those lands through acquisition, transfer of development rights programs, or other means. The Act also directs the Council to identify lands where development potential has been adversely affected and, as a result, where the owners of such properties would benefit from acquisition or preservation of their lands.

In addition, the Highlands Act includes 17 exemptions that address landowner equity concerns by allowing property owners to develop their properties without applying the enhanced environmental protections of the Act in a number of circumstances. Also, the Highlands Rules adopted by the New Jersey Department of Environmental Protection subsequent to the passing of the Highlands Act include four waivers that provide additional opportunities for landowner equity.



Preserved Farm / Alpha Borough

Highlands Act Goals

The following Highlands Act goals for implementation of the Highlands Regional Master address landowner equity indirectly:

- ▶ 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.
- ▶ Preserve farmland and historic sites and other historic resources.
- ▶ Promote brownfield remediation and redevelopment.
- ▶ Encourage, consistent with the State Development and Redevelopment Plan and smart growth strategies and principles, appropriate patterns of compatible residential, commercial, and industrial development, redevelopment, and economic growth, in or adjacent to areas already utilized for such purposes, and discourage piecemeal, scattered, and inappropriate development, in order to accommodate local and regional growth and economic development in an orderly way while protecting the Highlands environment from the individual and cumulative adverse impacts.

Highlands Regional Master Plan

The RMP's approach relative to landowner equity focuses on guiding future development away from environmentally sensitive areas to other parts of the Highlands Region more suitable for development. Landowners in areas identified as sensitive are provided opportunities for compensation such as fee simple acquisition and purchase, or transfer of development rights. For landowners who held deeds prior to the passage of the Highlands Act, the valuation of land for equity programs is based on the development potential prior to the establishment of the Act (commonly referred to as the "dual appraisal methodology" in accordance with N.J.S.A. 13:8C-26.j(1) or 38.j(1)). Landowners throughout the Highlands Region may also qualify for exemptions, permits, or waivers. These options allow for land development that is either not required to comply with the Highlands Act or is found to be consistent with the Highlands Act and the goals, policies, and objectives (GPOs) of the RMP.

Highlands RMP Programs

The RMP included one program with several subprograms related to Landowner Equity, as listed below.

Highlands Transfer of Development Rights (TDR)

- ▶ Creation of the Highlands Development Credit
- ▶ Allocation of Highlands Development Credits to qualifying Sending Zones
- ▶ Highlands Development Credit Certificates; Sale and Use of HDCs
- ▶ Receiving Zone Eligibility and Designation Process; Highlands Council Identification of Potential Voluntary TDR Receiving Zones
- ▶ Creation of the Highlands Development Credit Bank

The TDR Program guides new growth and development away from lands with little or no capacity to accommodate human development without adversely affecting the integrity of the Highlands ecosystems. This program establishes procedures and standards by which eligible property owners may apply for an allocation of Highlands Development Credits (HDCs). The program provides for the designation of Receiving Zones anywhere in New Jersey where HDCs may be transferred and used for development purposes. The Highlands Act originally allowed for establishment of Receiving Zones in any of the seven Highlands Counties, but an amendment adopted in May 2010 allowed for Receiving Zones to be established anywhere in the state of New Jersey. The TDR program also created a Highlands Development Credit Bank to serve as the administrator of the Highlands TDR Program.

The RMP calls for additional programs that are either directly related to Landowner Equity or indirectly support Landowner Equity through preservation programs. These include initiatives to:

- ▶ Provide detailed guidance on Highlands Exemptions and Waivers
- ▶ Provide public outreach and education for the Highlands TDR Program
- ▶ Establish a process for designating voluntary receiving zones in areas more suitable for growth, which process shall allow for significant public input; and develop and implement a Voluntary TDR Receiving Zone Feasibility Grant Program to encourage and support municipalities interested in identifying and evaluating opportunities to create TDR Receiving Zones

- ▶ Implement strategies for land preservation by maximizing current land preservation funding programs; implement strategies to promote preservation in the Agricultural Resource Areas and the Agricultural Priority Areas
- ▶ Establish new/alternative/innovative land preservation programs; Establish alternative/innovative agriculture preservation programs and stewardship programs
- ▶ Identify willing sellers
- ▶ Establish dedicated sources of funding for land preservation and stewardship in the Highlands Region, and funding opportunities for farmland preservation, which may include:
 - A Highlands water user fee;
 - A reserve fund to capitalize the Highlands TDR Program;
 - A program to secure significant federal funding in support of land preservation and stewardship;
 - A program to seek funding for preservation and stewardship from unique funding sources;
 - A rate surcharge on public water supply systems that use Highlands water; and
 - A Highlands Conservation Trust to secure funds from alternate funding sources.

Indicators

Full analyses of indicators listed below are available in the Indicator Report chapter. Please note that not all indicators identified by the public and Technical Advisory Committees received a full analysis for this report due to data limitations and/or applicability to the RMP. A complete list of all identified indicators is available at the end of this document. Potential future indicators may be noted in the Recommendations section that follows, under “Science and Research Agenda.”

Indicators Analyzed for Landowner Equity:

- ▶ **Exemptions:** Identifies the number and type of issued exemptions by year in the Highlands Region.
- ▶ **Open Space Program:** Tracks Highlands Open Space Partnership Funding Program applications, approved acquisitions, and funding availability.
- ▶ **Transfer of Development Rights (Highlands Development Credit) Program:** Tracks Highlands Development Credit (HDC) allocations, number and status of applications for purchase of HDCs, and funding availability for purchase. Tracks Transfer of Development Rights (TDR) feasibility grants and eligible/designated TDR receiving areas.

Indicators Related to Landowner Equity:

- ▶ **Preservation Priority:** Measures changes in preservation and development in the Special Environmental Zone, Conservation Priority Area and Agricultural Priority Area.
- ▶ **Preserved Lands and Trails:** Measures change in preserved lands and publicly accessible trails.
- ▶ **Agricultural Land Use and Preservation Index:** Measures change in acreage of total farmland, preserved farmland, and the share of total farmland that is preserved, as well as the change in total farmland and preserved farmland within the Highlands Agricultural Resource Area.
- ▶ **Regional Factbook:** A detailed assessment of the data contained in the Municipal Fact Book (Fiscal Impact Assessment deliverable), from a regional perspective.

Recommendations

The recommendations that follow are organized by RMP programs and/or subprograms. Where appropriate, multiple programs have been combined for this discussion. Additionally, some program names have been modified to more accurately reflect the program’s purpose in practical application. Please note that not all RMP programs and subprograms have associated recommendations in this report. Items under “Science and Research Agenda” are recommendations that require further study and investment.

Highlands Transfer of Development Rights (TDR) Program

Implementation Activity

The Highlands Council adopted its TDR Program as part of the Highlands Regional Master Plan and established the Highlands Development Credit Bank (HDC Bank) in June 2008. In September 2008, the Initial Purchase Program (IPP) was created using funding made available through Executive Order 114. In 2016, the Highlands Council created a new HDC Purchase Program as part of N.J.A.C. 7:70 and opened its first funding round.

To date, the Highlands Council has allocated more than 2,600 Highlands Development Credits (HDCs) and closed on the purchase of more than 500 credits, representing over 600 acres and \$8.2 million to property owners.

Topic Area: Landowner Equity

The Highlands Council has approved 20 TDR Receiving Zone Feasibility Grants. In 2013, the Highlands Council modified this grant program to include a fiscal impact and demand analysis component. To date, no receiving areas have been created. In addition, the results of the TDR Feasibility Grant program have shown that while municipalities may be willing to accept the increased density associated with TDR, the demand to support receiving areas does not appear to exist.

Summary findings of related indicators:

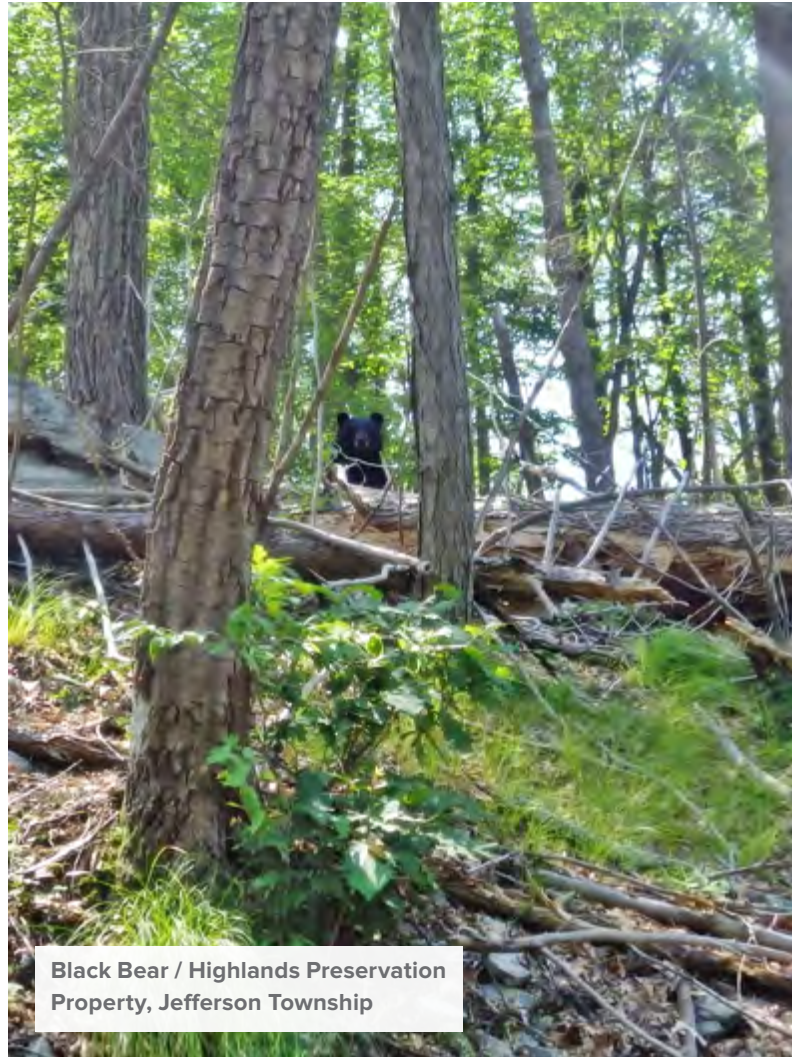
- ▶ **Transfer of Development Rights (Highlands Development Credit) Program:** HDC Allocations: As of February 1, 2017, 2,608.25 HDCs have been allocated by the Highlands Council. The average number of HDCs per residential allocation is 11.29, while the average allocation per non-residential allocation is 30.51.
- ▶ **HDC Purchases:** Including anticipated approvals and closings through 2017, it is projected that the HDC Purchase Programs will provide \$23,960,000 of Highlands Council funding to Highlands Region landowners, resulting in the preservation of 2,246.1 acres. 1,497.50 HDCs will be purchased by the HDC Bank through this process.

Program Issues

- ▶ To date, the HDC Bank has operated as the only purchaser of credits; a private market for credits has failed to materialize.
- ▶ The Highlands Council created the HDC Purchase Program through N.J.A.C. 7:70, which is not addressed in the RMP.
- ▶ The initial credit value was established in the 2008 TDR Technical Report and has not been revisited despite significant changes to the real estate market in the region.
- ▶ The allocation of HDCs to non-residential properties appears to over-value properties in certain cases due to a lack of locational adjustments.
- ▶ To date, no Highlands TDR receiving areas have been established.
- ▶ The TDR Feasibility Grant program has yet to identify an area with sufficient demand to support a receiving area.
- ▶ Although the Highlands Act permits a municipality to charge development impact fees within designated receiving areas, this inherently increases the cost of development therein.

Recommendations

- ▶ Amend the RMP to reflect adoption of the HDC Purchase Program as outlined in N.J.A.C. 7:70.



Black Bear / Highlands Preservation Property, Jefferson Township

- ▶ Revisit the 2008 TDR Technical Report to:
 - Determine whether a change to the initial credit value is warranted;
 - Explore the feasibility of creating a variable-value for credits (such as sending area “not to exceed” amounts, receiving area cost tied to demand and availability, and other variables); and
 - Review and potentially update the non-residential HDC allocation methodology to determine whether inclusion of location adjustments is warranted.
- ▶ To further incentivize the creation of TDR receiving areas, additional financial incentives to local governments that designate TDR receiving areas should be identified. The creation of an RMP program for local incentives may (amongst other things) permit the HDC Bank to release a limited number of the Bank’s credits to receiving zone municipalities, provided such release does not substantially impair the private market. Receiving zone municipalities

could be allowed to sell these credits to provide additional funding to address the financial impacts of the receiving areas.

- ▶ Continue with an expansion of interagency coordination to increase funding priorities and permit coordination for receiving zone municipalities.
- ▶ Consider requesting that the benefits of the Highlands TDR programs be recognized under the LEED (Leadership in Energy and Environmental Design) certification program of the US Green Building Council (USGBC). The USGBC allows the submission of potential pilot credits for their programs under LEED Certification. There are a number of credit categories that could be proposed as pilot credits for projects receiving TDR credits, including sustainable sites credits, regional priority credits, and credits for innovation in design or operations.

Science and Research Agenda

- ▶ Update 2008 TDR Technical Report regarding the initial credit value.
- ▶ As part of the update to 2008 TDR Technical Report, review and compare non-residential allocation values.
- ▶ Update the TDR Technical Report to conduct a market demand analysis of the northern New Jersey area to determine if there is (or will be) sufficient market demand to support any TDR receiving areas and, secondly, to identify those areas which could support a TDR receiving area so that the Council may direct its support and resources toward them.

Land Preservation

The Land Preservation Program appears in the RMP in the Natural Resources section. However, because the Highlands Council identifies sensitive lands where development should not occur and provides strategies for preserving those lands through acquisition, transfer of development rights programs, or other means, recommendations related to the Land Preservation program are included here.

Implementation Activity

The RMP identified Conservation Priority Areas, Agricultural Priority Areas, and the lands with the highest priority for preservation as the Special Environmental Zone of the Land Use Capability Zone map series. The Highlands Council tracks preservation within the region and provides that information to the public through interactive mapping and GIS tools as well as periodic land preservation status reports.

In 2016, the Highlands Council created the Highlands Open Space Partnership Funding Program as part of N.J.A.C. 7:70 and opened its first funding round.

Summary findings of related indicators:

- ▶ **Open Space Program, Transfer of Development Rights (Highlands Development Credit) Program:** Including anticipated approvals and closings through 2017, it is projected that the Open Space and HDC Purchase Programs will provide \$26,695,653 of Highlands Council funding to Highlands Region landowners, resulting in the preservation of 4,820.5 acres of land in the region.
- ▶ **Preservation Priority:** Preservation of critical lands (Conservation Priority Areas, Agricultural Priority Areas, Special Environmental Zones) has outpaced development of those lands from 2008-2016. The vast majority of these lands remains privately owned and undeveloped. Critical lands are prioritized for preservation under N.J.A.C. 7:70.



Turkey Hill Preserve / Bethlehem

Topic Area: Landowner Equity

- ▶ **Preserved Lands and Trails:** According to the most recent data available, 36% of the Highlands Region is permanently preserved. Of these lands, 37% consists of state-owned open space. Many of these properties are currently included in the baseline inventory of scenic resources.
- ▶ **Highlands Regional Factbook:** There are currently 308,090 acres of preserved lands in the Highlands Region.
- ▶ Identify and update available and potential funding sources (state, federal, and other) for the implementation of Landowner Equity and Land Preservation programs.

Program Issues

- ▶ The Open Space Partnership Funding Program (matching grant program) created by the Highlands Council with the adoption of N.J.A.C. 7:70 has not been incorporated into the RMP.
- ▶ The underlying data on which the identification of critical lands was based has subsequently been updated.
- ▶ The Highlands Council currently holds and will continue to acquire a significant number of conservation easements on land within the region. A consistent program for monitoring, enforcement, and stewardship of these easements is necessary to maintain these properties.
- ▶ The dual appraisal methodology written into the Highlands Act originally expired in 2009, but has been twice extended by the Legislature with a current expiration date of June 30, 2019. The RMP specified support for extending expiration of the methodology “to a minimum of five years beyond adoption of the RMP.”

Recommendations

- ▶ Expand the Landowner Equity section of the RMP to incorporate both land preservation and farmland preservation goals as currently reflected in the natural resource and agriculture sections of the RMP. Rename RMP section, “Landowner Equity and Land Preservation.”
- ▶ Amend the RMP to reflect adoption of the Open Space Partnership Funding Program as outlined in N.J.A.C 7:70.
- ▶ Update Conservation Priority Areas, Agricultural Priority Areas, and Special Environmental Zone following the methodology in the Highlands Land Preservation and Stewardship Technical Report, and recalculate 5- and 10-year estimated preservation costs.
- ▶ Develop a comprehensive program to address the long-term stewardship of conservation easements held by the Highlands Council.
- ▶ Update Policy 1H6 of the RMP to specify indefinite support of the dual appraisal methodology.



Sustainable Economic Development

The Highlands Region is characterized by a diverse economy, offering a desirable quality of life and an attractive place to live, work, and recreate. The long-term viability of the region is dependent upon maintaining this economic vitality. A sustainable economic future must be crafted by balancing the resource protection mandates of the Highlands Act and the Regional Master Plan with the economic, fiscal, social, and cultural needs of Highlands communities. These characteristics are not mutually exclusive, and realization of both natural resource and economic health is envisioned by both the Act and the RMP.

Economic stability in the region must be based on a mix of land use strategies and advancement of an array of economic outlets. Tourism, agricultural viability, redevelopment, smart growth approaches, improved land use efficiencies, transit-oriented development, and low-impact development are encouraged by the RMP, while piecemeal, scattered sprawl is recognized as an inefficient use of land and an impediment to achieving a sustainable regional economy.



Dover Town

Highlands Act Goals

The Highlands Act charges the Highlands Council with the following goals related to sustainable economic development in the implementation of the Highlands Regional Master Plan:

- ▶ Preserve farmland and historic sites and other historic resources.
- ▶ Preserve outdoor recreation opportunities on publicly owned land.
- ▶ Promote brownfield remediation and redevelopment.
- ▶ Promote compatible agricultural, horticultural, recreational, and cultural uses and opportunities within the framework of protecting the Highlands environment.
- ▶ Protect and maintain the essential character of the Highlands environment.
- ▶ For Planning Area, encourage, consistent with the State Development and Redevelopment Plan and smart growth strategies and principles, appropriate patterns of compatible residential, commercial, and industrial development, redevelopment, and economic growth.
- ▶ For Planning Area, promote a sound, balanced transportation system that is consistent with smart growth strategies and principles and which preserves mobility in the Highlands Region.

Highlands Regional Master Plan

The RMP's approach to sustainable economic development in the Highlands Region is focused on fitting economic activity within the unique places that comprise the Highlands Region. The goals enumerated in the RMP call for public investment in facilities and institutions, pursuit of agriculture, tourism, and recreation as economic drivers, expansion of innovative technologies, and support for local development initiatives, such as downtown revitalization.

Highlands RMP Programs

The Sustainable Economic Development Program describes the tools, incentives, and assistance available to support sustainable economic development in the Highlands Region. The objective of the programs is to ensure long-term, sustainable economic viability and to build upon the strengths of the existing regional

economy. These programs range from economic development planning and advancement of tourism opportunities to monitoring economic successes. The full list appears below, organized according to program type.

Sustainable Regional Economy

Planning Initiatives

- ▶ Economic Planning
- ▶ Tourism Opportunities

Monitoring Activities

- ▶ Economic Monitoring – Agricultural Vitality
- ▶ Economic Monitoring – Economic Tracking
- ▶ Regional Master Plan Funding

Indicators

Full analyses of indicators listed below are available in the Indicator Report chapter. Please note that not all indicators identified by the public and Technical Advisory Committees received a full analysis for this report due to data limitations and/or applicability to the RMP. A complete list of all identified indicators is available at the end of this document. Potential future indicators may be noted in the Recommendations section that follows, under “Science and Research Agenda.”

Indicators Analyzed for Economic Development:

- ▶ **Regional Factbook:** A detailed assessment of the data contained in the Municipal Fact Book (Fiscal Impact Assessment deliverable) from a regional perspective.

Indicators Related to Economic Development:

- ▶ **Implementation Funding:** Indicates investments made toward the implementation of the Regional Master Plan (RMP) and breakdown of how funding is used toward implementation of the RMP.
- ▶ **Preserved Lands and Trails:** Measures change in preserved lands and publicly accessible trails.
- ▶ **Municipal Plan Conformance:** A matrix of Municipal Plan Conformance Petition data, including submission and Highlands Council disposition, as well as approved Petition components and the current status of municipal completion.

In addition to the indicators listed above, the Highlands Fiscal Impact Assessment (FIA), which was conducted as part of the RMP Monitoring program, provides significant information related to Sustainable Economic Development. The FIA provides an analysis of a wide range of economic and fiscal data for the Highlands Region and for comparison regions in New Jersey, New

York and Pennsylvania. It evaluates ways in which the Act and the RMP may have influenced the economy and the fiscal resources of Highlands Region municipalities.

Recommendations

The recommendations that follow are organized by RMP programs and/or subprograms. Where appropriate, multiple programs have been combined for this discussion. Additionally, some program names have been modified to more accurately reflect the program's purpose in practical application. Please note that not all RMP programs and subprograms have associated recommendations in this report. Items under "Science and Research Agenda" are recommendations that require further study and investment.

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Sustainable Regional Economy – Planning Initiatives

Implementation Activity

The Highlands Council has funded the completion of eight (8) municipal sustainable economic development plans, with a total expenditure of approximately \$145,000, as well as sustainable agriculture grants to three (3) counties totaling \$418,000. Funding continues to be made available through the Highlands Plan Conformance Grant Program for the development of sustainable economic development plans and related economic development studies.

Summary findings of related indicators:

- ▶ **Implementation Funding:** Highlands RMP Implementation Funding tracks expenditures dedicated to Plan Conformance activities. Preparation of sustainable economic development plans are included in this category.
- ▶ **Preserved Lands and Trails:** This indicator catalogs public and private land, and water areas available for recreation and/or presently protected as open space and recreation facilities. The Highlands RMP provides policies designed to ensure that public funds and other resources are focused on protection of Highlands resources by establishing criteria for the identification of critical lands, the priorities for land preservation, and implementation strategies for land preservation and stewardship.

Program Issues

- ▶ The RMP does not offer a comprehensive approach to economic planning in the Highlands Region.

- ▶ The RMP does not adequately address methods and strategies to redevelop grayfields and other areas with redevelopment potential.
- ▶ Support for tourism as an industry in the Highlands Region is lacking.
- ▶ There is no consistent coordination of tourism programs and initiatives in the Highlands Region.
- ▶ Recreation, as a vital component of the tourism economy, has not been adequately addressed.
- ▶ The RMP does not adequately support municipal efforts to create an attractive economic environment for businesses.

Recommendations

- ▶ In coordination with Highlands counties and destination marketing organizations (DMOs), develop regional economic development plans.
- ▶ In coordination with the NJ Division of Travel and Tourism, establish a Highlands-focused tourism program.
- ▶ Gather and organize data related to tourism visitation and spending, as well as investments in the tourism industry.
- ▶ Add a section to the Regional Master Plan to address recreation as a major category of interest, as envisioned by the Highlands Act. This section should address the Highlands Act goal to "preserve outdoor recreation opportunities, including hunting and fishing, on publicly owned land." It should also address the goal to "promote the continuation and expansion of . . . recreational, and cultural uses and opportunities."
- ▶ Based on the resource assessment conducted under the Land Use Capability Map Series and updated information regarding built resources, establish a region-wide Smart Growth Capability map depicting areas within the region that are appropriate for future economic development and redevelopment activity. Built resources should include established centers, transportation infrastructure, recreational facilities, utility infrastructure, and other characteristics that support sustainable growth.
- ▶ Develop a comprehensive economic development plan for the Highlands Region. The plan should include:
 - A broad characterization of the Highlands Region in the form of an economic profile (including the Fiscal Impact Assessment).
 - Identification of Highlands Region economic development potential.

Topic Area: Sustainable Economic Development

- Economic development strategies for short-term, long-term, and continuous activities to support identified goals and objectives.
- An implementation schedule to advance each strategy and serve as a means for future monitoring.
- ▶ In coordination with efforts associated with the Agricultural Resources topic area, actively support agriculture as a sustainable Highlands industry and facilitate agritourism as a key component of those efforts.
- ▶ Expanded property values, and property tax revenues based on monitoring recommendations made in the FIA.
- ▶ Expand Highlands Council efforts to partner with other entities in support of sustainable economic development in the Highlands Region.
- ▶ Develop a Cost-Benefit Analysis of the RMP to measure the full costs associated with the implementation of the RMP as well as the full range of benefits from its implementation.

Sustainable Regional Economy – Monitoring Activities

Implementation Activity

As part of the effort associated with the monitoring of the Regional Master Plan, the Highlands Council contracted to have a Fiscal Impact Assessment (FIA) prepared. The FIA was prepared in three phases: 1) Regional Economic Evaluation of the Highlands Region; 2) Real Estate and Demographic Evaluation of the Highlands Region; and 3) Fiscal and Financial Analysis. Additionally, a Municipal Fact Book was prepared to report on land and demographic conditions in each Highlands municipality and county, as well as a regional view.

Summary findings of related indicator:

- ▶ **Municipal Plan Conformance:** The Municipal Plan Conformance indicator tracks submission, approval, and implementation of both the required and optional components of Plan Conformance. Sustainable Economic Development plans are a required component tracked through this indicator.

Program Issues

- ▶ The RMP neither identifies economic development metrics nor establishes a baseline. The FIA establishes a baseline, but no protocols are currently in place for on-going monitoring.
- ▶ The Highlands Council has thus far had limited involvement in coordinating with either local (e.g., chambers of commerce) or state (e.g., Economic Development Authority) level entities to advance the goals and objectives of sustainable economic development programs.

Recommendations

- ▶ Establish a protocol to monitor data contained in the FIA, including specifically: total employment, building permits, housing sale values, commercial sales, vacant land sales, household income, equal-



Implementation

When the legislature enacted the Highlands Act, thus creating the Highlands Water Protection and Planning Council and charging it with developing the Regional Master Plan (RMP), its intent was clear. The RMP was to provide a comprehensive “blueprint” for the future of the Highlands Region; a plan by which to ensure protection of the Region’s vital water and other critical natural resources, while at the same time providing for areas of growth and development supported by adequate infrastructure. The Council’s follow-up mission is to guide and assist in seeing that vision realized.

Implementation of the RMP includes a multi-faceted array of possible actions intended to ensure that RMP goals, policies and objectives may be achieved. The RMP recommends numerous strategies and programs involving not only the Highlands Council, but including a variety of other entities.



Sparta Glen Brook Restoration / Sparta Township

Highlands Act Goals

The overarching goal of the RMP with respect to the entire Highlands Region is to protect and enhance the significant values of the resources thereof in a manner which is consistent with the purposes and provisions of the Highlands Act.

Highlands Regional Master Plan

RMP Approach to Achieving Highlands Act Goals: The RMP seeks effective implementation of the goals of the Highlands Act through coordination with State, county and local governments, supported by an effective education, outreach, and local participation program.

Highlands RMP Programs

The RMP categorizes the components of the Implementation Program as indicated below.

Regional Master Plan Conformance, Consistency, and Coordination

- ▶ Plan Conformance – including the administrative, grants, and technical assistance aspects
- ▶ RMP Updates
- ▶ Map Adjustments
- ▶ Federal, State, and Regional Agency Coordination
- ▶ Local Participation
- ▶ Public Education
- ▶ Highlands Project Review
- ▶ Project Review Process
- ▶ Project Review Standards
- ▶ Improvement of the Regional Master Plan
- ▶ Water Resources and Ecosystem Science Agenda
- ▶ Regional Master Plan Monitoring

Implementation Prioritization

The RMP prioritizes implementation items using three levels: immediate, intermediate, and on-going, as outlined below.

Immediate Priorities

- ▶ Grant Programs for Plan Conformance
- ▶ Minimum Requirements for RMP Plan Conformance Programs (e.g., resource management plans)
- ▶ Technical Assistance, Model Ordinances, Guidance Materials for Plan Conformance
- ▶ Highlands TDR Program
- ▶ Petition to State Planning Commission for RMP Endorsement

Intermediate Priorities

- ▶ State and Federal Agency Coordination
- ▶ Educational Programs
- ▶ Research Initiatives

On-going Priorities

- ▶ Program Funding – State and Federal Sources
- ▶ Establishment of Highlands Water User Fee
- ▶ Technical Assistance Documents and Guidance Manuals
- ▶ Resource Planning and Management Initiatives
- ▶ Monitoring Programs
- ▶ Award Programs

Indicators

Full analyses of indicators listed below are available in the Indicator Report chapter. Please note that not all indicators identified by the public and Technical Advisory Committees received a full analysis for this report due to data limitations and/or applicability to the RMP. A complete list of all identified indicators is available at the end of this document. Potential future indicators may be noted in the Recommendations section that follows, under “Science and Research Agenda.”

- ▶ **Highlands Project Review:** Highlands Council staff members have successfully completed 28 Project Reviews to date and, along the way, have assisted numerous developers in bringing projects into conformance with the RMP before design plans are even put on paper.
- ▶ **Municipal and County Plan Conformance:** To date, monitoring results indicate significant progress on municipal Plan Conformance, with 61 petitions submitted and 50 approved. Importantly, this places most Highlands municipalities in the Implementation Phase of Plan Conformance, meaning that Highlands land use policies are in the process of taking hold at the municipal level where their effect will ultimately be felt. For a number of the munic-



Shepherds Lake / Ringwood State Park

ipalities remaining outside of Plan Conformance, the full conformance process is less applicable and should be streamlined accordingly. County Plan Conformance has seen mixed participation and limited results thus far, and should be altered to more directly address the legal authority and capabilities of counties and particularly county planning agencies while maintaining the integrity of the process.

- ▶ **Public Participation, Outreach, Interagency Coordination:** These areas are embedded throughout nearly everything the Highlands Council undertakes. The chart provided to summarize these efforts does not clearly illustrate the extent, importance, or impact of any one of these aspects on the actions of the Highlands Council or the progress toward achieving RMP goals and policies. The Council recognizes the need to gather much more informative data in these regards and to improve on the way this information – and its resultant impacts – are presented. In addition, specifically with regard to the Outreach component, results to date are quite limited. It is apparent that efforts are needed to significantly expand the outreach and education component of the Highlands Council mission.
- ▶ **RMP Implementation Funding:** The Highlands Council has provided grant funding toward a variety of implementation programs, including the municipal and county Plan Conformance program.

Progress is evident and it is clear that the provision of such funding is vital to achieving many of the goals, policies, and objectives of the RMP. It should be noted that though many municipalities have made significant strides in Plan Conformance implementation, a number of conforming municipalities have not. Continued coordination between Highlands Council staff and municipal contacts is necessary to address stalled planning efforts and facilitate new progress.

Recommendations

The following recommendations are intended to strengthen the Plan Conformance process. In instances where easing of some Plan Conformance requirements are recommended, it is the intent of the Highlands Council not to subvert the Goals of the Highlands Act and RMP but to provide flexibility in the process so as to encourage municipal and county conformance to the greatest extent practical.

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Municipal Plan Conformance

Implementation Activity

To date, 61 municipalities have submitted petitions for Plan Conformance, of which 50 have been approved.

Summary findings of related indicator:

- ▶ **Municipal Plan Conformance:** 50 municipalities are in the process of implementing the various components of their approved Petitions for Plan Conformance. 28 municipalities have adopted Highlands land use ordinances, including 7 which have adopted the Highlands Area Land Use Ordinance.

Program Issues

The 2008 Plan Conformance Guidelines adopted as a component of the RMP are not suited to the municipalities that have not yet conformed. Certain aspects of the 2008 requirements have also been found unnecessary to ensure protection of the Region’s resources and should be removed to ease the process of developing a complete Petition for Plan Conformance.

Recommendation

During the review of municipal Plan Conformance petitions, the Highlands Council recognized that the “one size fits all” approach envisioned under the adopted Plan Conformance Guidelines was not the most efficient or effective way to implement the RMP. While the guidelines provided for tailoring of petition materials to fit the circumstances of each municipality, as well as waivers for petition items that were inapplicable in particular cases, they did not foresee the cases in which the bulk of the typical implementation requirements would not apply, or would not achieve results that would further the goals or objectives of the RMP. For example, where a municipality’s Preservation Area consists entirely of preserved state parkland, there is no need for the adoption of Highlands land use ordinances to regulate development. In such cases, the Highlands Council used the waiver provisions provided within the guidelines to allow for a streamlined petition submittal and approval with few, if any, of the usual implementation conditions. Where potential development in a municipality is de minimus, moreover, adoption of the full gamut of Highlands land use planning materials would constitute a significant burden and cost to taxpayers, with limited or no additional protection of Highlands resources. Accordingly, the Highlands Council developed an approach by which a municipality could adopt an ordinance that would refer development applications to the Highlands Council, thereby making it unnecessary for such municipalities to adopt lengthy land development ordinances.

Given the number and characteristics of the municipalities remaining to conform in the Region, it is recommended that the Highlands Council adopt revised Plan Conformance guidelines that include these considerations at the outset. The Highlands Council would then provide the specific list of items required to further the goals, policies, and objectives of the RMP to the municipality for submission of a complete municipal petition for review and consideration.

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County Plan Conformance

Implementation Activity

To date, five of the seven Highlands counties have submitted Petitions for Plan Conformance.

Summary findings of related indicator:

- ▶ **County Plan Conformance:** To date, only two of the five county Petitions submitted to the Highlands Council have been approved.

Program Issues

- ▶ The 2008 Plan Conformance Guidelines adopted as a component of the RMP do not accurately reflect the practices and approaches taken by the Highlands Council during the Plan Conformance approval process.
- ▶ County Plan Conformance participation has been limited.

Recommendations

The RMP and the 2008 Plan Conformance Guidelines treat county Plan Conformance similar to municipal Plan Conformance. However, counties do not regulate land uses in the same way as municipalities. The approach to Plan Conformance for counties would be more effective if a more proactive planning-based (rather than a regulatory-based) approach was taken. Expansion of the county Plan Conformance grant program to more specifically address county-wide economic development, stormwater management, resource management, and agricultural development issues will strengthen the program and encourage broader county participation.

This report recommends revision of the county Plan Conformance Guidelines to meet the requirements of the Highlands Act to include such revisions of the county master plan and development regulations, as applicable to the development and use of lands, as may be necessary in order to conform them with the goals, requirements, and provisions of the regional master plan, where within county authority as provided under the NJ County Planning Act.

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Preservation Area Conformance

Implementation Activity

To date, 51 of the 52 Preservation Area municipalities have submitted Petitions for Plan Conformance, of which 44 have been approved. These municipalities are in varying stages of implementation.



Darlington School House / Mahwah

Summary findings of related indicator:

- ▶ **Municipal Plan Conformance:** While most of the approved Preservation Area municipalities have completed 75-100% of the initial implementation requirements, seven have not begun to move forward. In addition, one Preservation Area municipality has not petitioned for Plan Conformance.

Program Issues

The Highlands Act requires municipalities containing Preservation Area to petition for Plan Conformance and to bring their master plan and regulations into conformance with the RMP. There are eight municipalities that have not met this requirement. While development in these municipalities is very limited and, in any case regulated by the NJDEP under the Highlands Rules, the RMP does contain additional standards and requirements not included in the NJDEP Highlands Rules. The Highlands Council also has binding call-up authority over local government approvals in the Preservation Area; however, the option must be exercised within just 15 days of the local approvals. Any person submitting an application for development in the Preservation Area is required to notify the Highlands Council of such action.

Recommendation

The Highlands Council should continue to coordinate with the NJDEP in its review of any Highlands Preservation Area Applications in the Region.

The Highlands Council should periodically remind all municipal and land use board secretaries of the local development application notification requirement found in the Highlands Act. Notices to such effect were provided to all municipalities shortly following adoption of the Act. The same notice requirements are also included in all Highlands referral ordinances and Land Use Ordinances adopted by municipalities, thus far.

The Highlands Council should determine some course of action to address instances of municipal failure to conform, as required under the Highlands Act. The Act provides for the Highlands Council to assume control of local land use activities in such cases. However, this option is neither desirable, nor particularly practical.

RMP Monitoring Program

Implementation Activity

In 2014 the Highlands Council initiated the process for monitoring and updating the RMP.

Program Issues

The Highlands Act requires a periodic review and update of the RMP. The RMP sets forth a monitoring program, but does not clearly establish the process and requirements for the periodic revisions and updates.

Recommendations

- ▶ Amend RMP Chapter 6, Subpart B to clearly document the process for the development and approval of the RMP Monitoring Program Recommendations Report, outlining the content, metrics, analysis, and public comment components.
- ▶ Adopt the RMP Amendment Procedures, currently adopted by the Highlands Council as guidelines, as a component of the RMP.

RMP GIS Data Updates

Implementation Activity

The Highlands Council practices a continuous data update effort, including:

- ▶ **LiDAR Data:** The Highlands Council commissioned the collection of LiDAR data for the region in 2006. In 2017 the Highlands Council partnered with the NJDEP and USGS to update its LiDAR data for the region.

Topic Area: Implementation

- ▶ RMP Updates: Factual corrections to the RMP are provided to the Highlands Council by municipalities through the Plan Conformance process. All proposed corrections are carefully researched, documented and checked for accuracy before they are accepted. To date, there have been 556 RMP Updates processed covering an area of 7,623 acres.
- ▶ Land Preservation: Updated monthly.
- ▶ Historic Sites: Updated with each new release from the State Historic Preservation Office.
- ▶ Water and Wastewater Utility Service Areas: Updated when new data is received from Highlands Region municipalities.
- ▶ Parcel Data: Continuously updated as the Office of GIS receives updates from New Jersey counties.
- ▶ Critical Habitat: Updated as the NJDEP updates Landscape Project data and vernal pool data.
- ▶ A significant number of other data layers have been updated and should continue to be updated with the release of new Land Use Land Cover data.

Program Issues

The RMP identifies the importance of maintaining accurate data for purposes of implementation and continued relevance as a planning tool. This objective is complicated by the fact that RMP data sources, such as NJDEP and other state and federal agencies, update their data on divergent schedules. In addition many Highlands datasets are composites of multiple data sources, each with different base data update schedules. The Highlands Council itself does not have a stated policy regarding the timeframes at which various data should be updated.

Recommendations

Highlands GIS Data is vital to nearly every aspect of the RMP. For continued monitoring of the region's resources, these data sets will need to be continuously updated as new and more accurate information becomes available.

Establish a policy and schedule for updating all RMP datasets, including:

- ▶ Updates to the Land Use Capability Zone Map Series as a product of each 6-year monitoring report.
- ▶ Updates to all Land Use Land Cover based data in conjunction with each monitoring program.
- ▶ Updates to Land Use Land Cover data between monitoring programs, if appropriate.
- ▶ Updates to all mapping datasets from other sources, when feasible and appropriate.

- ▶ Continued participation in the State's ongoing efforts to collect LiDAR data on a regular basis.

Public Participation, Outreach, Interagency Coordination

Implementation Activity

The Highlands Council has maintained a regular schedule of monthly meetings that are open to the public at its offices in Chester, NJ. Extensive information regarding the work of the Council is available to the public any time via the Highlands Council website, which is frequently updated. In addition, the Council has prioritized interagency coordination in implementation of the Highlands Act, working closely with state partners as well as municipal and county professionals. In more recent years, the Council has increased its participation at state and local events, outreach to specific constituent groups, and the number of training sessions offered for professionals. The Highlands Council maintains a very active constituent service program, which provides prompt response to individuals with specific questions.

Summary Findings of Related Indicator:

- ▶ **Local Participation, Outreach and Education, Inter-Agency Coordination:** Since the passage of the Highlands Act in 2004, the Highlands Council has hosted or participated in over 2,200 outreach activities.

Program Issues

- ▶ While the Highlands Council has provided opportunities for public participation and emphasized inter-agency coordination, as well as collaboration with municipal and county partners, outreach and education for the general public has been lacking.
- ▶ Although the RMP prescribes development of outreach and education programs, no comprehensive strategy has been developed and very few educational efforts have been moved forward.

Recommendation

The Highlands Council should develop a comprehensive outreach and education program that addresses the needs of varied constituent audiences, including, but not limited to: residents/property owners, business owners, real estate professionals, appraisers, community groups, and local governments. This includes development of an educational curriculum that covers foundational components of the Highlands Act, RMP, and the work of the Council. The program should be flexible enough to be customized and delivered to constituent groups to address specific informational needs.

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Indicator Analysis Report Key

The individual indicator reports in this document are presented in a consistent format, with the exception of the Implementation section. A brief explanation of each section is provided below.

ICON SET

At the top of each report, a set of icons indicate topic area relevance. A darkened icon indicates the indicator is either directly or indirectly related to the specified topic area recommendations.



RMP GOALS AND PROGRAMS

Indicators are presented with a list of relevant goals and programs, as established in the 2008 RMP.

DESCRIPTION AND BACKGROUND

A brief description of the indicator is followed by background information regarding RMP policies related to the indicator being analyzed.

UNIT AND FREQUENCY OF ANALYSIS

Data sets and how they were used for the analysis are explained.

STATUS AND TREND

Results of analysis are summarized.

DATA CONFIDENCE

An assessment of the effectiveness of the data and analysis performed is provided.

MILESTONES

Milestones to monitor going forward are suggested.

SECONDARY INDICATORS

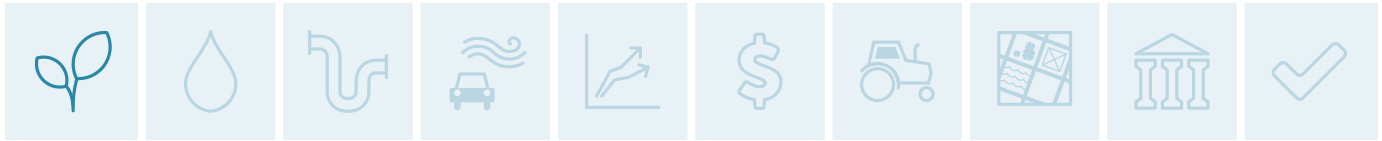
Related indicators are listed.



Natural Resources Indicators

- **Critical Habitat**
- **Forest Impacts**
- **Preservation Priority**
- **Watershed Resource Value**

Critical Habitat



RMP GOALS

1D Protection and enhancement of critical wildlife habitats, significant natural areas, and vernal pools.

RMP PROGRAMS

- Critical habitat conservation and management

DESCRIPTION

Measures change in extent, preservation, or development of Critical Habitat.

BACKGROUND

The Highlands RMP provided policies designed to protect, restore, and enhance three categories of Critical Habitat: Critical Wildlife Habitat, Significant Natural Areas and Vernal Pools.

- Critical Wildlife Habitat – defined in the RMP using the NJDEP Landscape Project to determine areas of key concern for species conservation, including habitats of animal species identified as endangered, threatened, of special concern, or of regional conservation priority in the Highlands Region.
- Significant Natural Areas – defined in the RMP using the NJDEP Natural Heritage Priority Sites.
- Vernal Pools – defined in the RMP as NJDEP-certified vernal pools plus a 1,000-foot protection buffer.

For this indicator, these three categories were analyzed in relation to preserved and developed lands within the Highlands Preservation and Planning Areas to assess what has been preserved or developed over time. Additionally, changes in the overall mapped areas of Critical Wildlife Habitat and vernal pool buffers were analyzed.

UNIT AND FREQUENCY OF ANALYSIS

Data sets and how they were used for the analysis of each category are described below. Each data set is intersected with the Highlands Planning and Preservation Areas, as well as developed and preserved lands data.

Critical Wildlife Habitat

The 2008 Critical Wildlife Habitat layer is derived from the NJDEP Landscape Project version 3.0, while the 2016 Critical Wildlife Habitat layer is derived from version 3.1. The 3.1 methodology encompasses a greater extent of Rare, Threatened, and Endangered species habitats, mapping methodology updates, and an expanded listing of species, which largely accounts for the increase in mapped Critical Wildlife Habitat acreage seen in the below analysis.

- Change in preserved lands was assessed by comparing what was preserved at the time of the RMP (2008) to what was preserved as of July 2016. This dataset is tracked by the Highlands Council.
- Change in developed lands from 2002 to 2012 was assessed by using the Anderson Codes found in the Land Use/Land Cover (LULC) data released by the NJDEP, refined by those defined as “Developed” in the Regional Land Use Conditions and Smart Design Technical Report (Appendix M, Highlands Land Classification Data Layer Relationship).

Significant Natural Areas

Significant Natural Areas were defined by the Highlands Council with the release of the RMP and have remained unchanged in their extent. Accordingly, this indicator does not show growth in these areas, but does show the changes that have occurred within them with regards to development or preservation.

- Change in preserved lands was assessed by comparing what was preserved at the time of the RMP (2008) to what was preserved as of July 2016. This dataset is tracked by the Highlands Council.
- Change in developed lands from 2002-2012 was assessed by using the Anderson Codes found in the LULC data released by the NJDEP, refined by those defined as “Developed” in the Regional Land Use Con-

ditions and Smart Design Technical Report (Appendix M, Highlands Land Classification Data Layer Relationship).

Vernal Pools

Data on vernal pools was received from the NJDEP in 2008 and 2013. A 1,000-foot buffer is placed around each vernal pool as prescribed in the RMP.

- Change in preserved lands was assessed by comparing what was preserved at the time of the RMP (2008) to what was preserved as of July 2016. This dataset is tracked by the Highlands Council.
- Change in developed lands from 2002-2012 was assessed by using the Anderson Codes found in the LULC data released by the NJDEP, refined by those defined as “Developed” in the Regional Land Use Conditions and Smart Design Technical Report (Appendix M, Highlands Land Classification Data Layer Relationship).

STATUS

As of 2016, using the most recent data available for each category of Critical Habitat, 68% of the Highlands Region is classified as Critical Wildlife Habitat, 4% as Significant Natural Areas, and 3% as certified vernal pool buffers. In some portions of the Region these areas overlap.

TREND

Since adoption of the RMP in 2008, lands designated as Critical Habitat have increased in extent across the Region. Increases in areas identified as Critical Wildlife Habitat are due to a mapping methodology change implemented by the NJDEP in the Landscape Project version 3.1, resulting in increased mapped Critical Wildlife Habitat in 2016. In addition, although an increase in development has occurred in the areas mapped as Critical Wildlife Habitat, a more significant increase in preservation of these lands also occurred (Table 1 and 2).

Significant Natural Areas boundaries have not changed since 2008. Even though the boundaries have not changed, there has been increased preservation of these areas, but also increased development within these areas (Table 3), with significantly more total development and more total preservation occurring in the Planning Area than the Preservation Area.

The NJDEP continues to certify vernal pools and in 2013 the number of certified pools was greater than in 2008. Accordingly, there is an increase in the mapped acreage of vernal pool buffers. Both preservation of lands containing vernal pool buffers and development within these buffers has increased since 2008 across the Region (Table 4).

Table 1: Change in Extent of Critical Habitat within the Highlands Region

Total Critical Wildlife Habitat Areas

	Total Acres		Change		
	2013	2016	Trend	Acres	Percent
Planning Area	204,924	236,486	Increase	31,562	15.4%
Preservation Area	324,349	344,452	Increase	20,102	6.2%
Highlands Region	529,274	580,938	Increase	51,664	9.8%

Total Significant Natural Area Acres

	Total Acres		Change		
	2008	2016	Trend	Acres	Percent
Planning Area	14,455	14,455	N/A	N/A	N/A
Preservation Area	18,927	18,927	N/A	N/A	N/A
Highlands Region	33,382	33,382	N/A	0	0.0%

Total Vernal Pool Buffer Acres

	Total Acres		Change		
	2008	2013	Trend	Acres	Percent
Planning Area	8,737	12,668	Increase	3,932	45.0%
Preservation Area	11,176	13,809	Increase	2,633	23.6%
Highlands Region	19,913	26,477	Increase	6,565	33.0%

Table 2: Change in Preserved and Developed Lands within Critical Wildlife Habitat

Change in Preserved Lands, 2008-2016

	Total Acres	Preserved Acres		Change		
	2008	2008	2016	Trend	Acres	Percent*
Planning Area	204,924	60,365	75,317	Increase	14,953	7.3%
Preservation Area	324,349	175,141	194,369	Increase	19,228	5.9%
Highlands Region	529,274	235,506	269,686	Increase	34,180	6.5%

Change in Developed Lands, 2008-2012 (2002 and 2012 LULC)

	Total Acres	Developed Acres		Change		
	2008	2008	2012	Trend	Acres	Percent*
Planning Area	204,924	6,687	12,480	Increase	5,793	2.8%
Preservation Area	324,349	7,005	12,122	Increase	5,117	1.6%
Highlands Region	529,274	13,692	24,602	Increase	10,910	2.1%

*Percent Change represents the percent gain of developed lands over Total Acres of Critical Wildlife Habitat within the Region.

DATA CONFIDENCE

The analysis of change in preserved lands was performed using data catalogued by the Highlands Council from 2008 and 2016. This dataset was found to be satisfactory for analyzing change in total acres of preserved lands.

It should be noted that in 2012, the NJDEP changed its Landscape Project mapping methodology from the 2008 version used in the RMP, resulting in a significant increase in mapped Critical Wildlife Habitat. Additionally, the NJDEP continuously identifies and certifies additional vernal pools. The 2013 data used in this analysis includes additional vernal pools as compared to the 2008 version used in the RMP.

According to the NJDEP, a new Landscape Project version based on 2012 LULC data and new species occurrences is slated for release as a draft product by the end of 2016 or early 2017. This version, once final, should be utilized to update the Highlands Critical Habitat map.

MILESTONES

- Increase in preservation of critical habitat
- Decline in rate of development of critical habitat

SECONDARY INDICATORS

Species of Special Concern Lost in Habitat Conversion: Measures the number of species of concern potentially present in converted habitat lands.

Habitat Restoration: Measures the number and location of areas with habitat restoration plans or projects.

Table 3: Change in Preserved and Developed Lands within Significant Natural Areas

Change in Preserved Lands, 2008-2016

	Total Acres			Change		
	2008	2008	2016	Trend	Acres	Percent*
Planning Area	14,455	4,187	14,455	Increase	10,268	71.0%
Preservation Area	18,927	13,349	18,919	Increase	5,570	29.4%
Highlands Region	33,382	17,536	33,374	Increase	15,838	47.4%

*Percent Change represents the percent gain of preserved lands over Total Acres of Significant Natural Areas within the Region.

Change in Developed Lands, 2008-2012

	Total Acres			Change		
	2008	2008	2012	Trend	Acres	Percent*
Planning Area	14,455	1	108	Increase	108	0.7%
Preservation Area	18,927	7	80	Increase	73	0.4%
Highlands Region	33,382	8	188	Increase	180	0.5%

*Percent Change represents the percent gain of preserved lands over Total Acres of Significant Natural Areas within the Region.

Table 4: Change in Preserved and Developed Lands within certified Vernal Pool buffers

Change in Preserved Lands 2008-2013 (2008 and 2016 Preserved Land data)

	Total Acres			Change		
	2008	2008	2016	Trend	Acres	Percent*
Planning Area	8,737	2,323	8,296	Increase	5,973	68.4%
Preservation Area	11,176	6,792	10,966	Increase	4,174	37.3%
Highlands Region	19,913	9,115	19,262	Increase	10,146	51.0%

*Percent Change represents the percent gain of preserved lands over Total Acres of certified Vernal Pool buffers within the Region.

Change in Developed Lands 2008-2012 (2002 and 2012 LULC)

	Total Acres			Change		
	2008	2008	2012	Trend	Acres	Percent*
Planning Area	8,737	1,676	1,944	Increase	268	3.1%
Preservation Area	11,176	970	1,102	Increase	132	1.2%
Highlands Region	19,913	2,646	3,046	Increase	400	2.0%

*Percent Change represents the percent gain of preserved lands over Total Acres of certified Vernal Pool buffers within the Region.

Forest Impacts



RMP GOALS

- 1A** Protection of large areas of contiguous forested lands of the Highlands Region to the maximum extent possible.
- 1B** Protection and enhancement of forests in the Highlands Region.

RMP PROGRAMS

- Forest Sustainability

DESCRIPTION

Measures the change in Forest Integrity (total forest area, core forest area and total proportion forest), and preservation and development within total and core forest areas.

BACKGROUND

The Highlands RMP provides policies designed to protect, restore, and enhance forested areas.

- Forest Integrity – defined in the Ecosystem Management Technical Report (2008) using NJDEP Land Use/Land Cover (LULC) to evaluate the effects of forest fragmentation across the Highlands Region landscape.
- Forest Preservation and Development – defined as part of the MPRR process as change in preservation or development in total and core forest area.

For this indicator, changes in the overall mapped areas of total forest were analyzed. Additionally, total and core forest areas were analyzed in relation to preserved and developed lands within the Highlands Region to assess what has been preserved or developed over time.

UNIT AND FREQUENCY OF ANALYSIS

Data sets and how they were used for the analysis are described below. Each data set is intersected with the HUC14 subwatersheds, as well as preserved lands and developed data.

Forest Integrity Score

The Forest Integrity Score, as defined in the Ecosystem Management Technical Report (2008) for each Highlands Region HUC14 subwatershed, was derived from the 2002 NJDEP Land Use/Land Cover (LULC) and calculated using the methodology prescribed in the technical report. The Forest Integrity Score was updated following the same methodology used for updating the Watershed Resource Value Classes using the 2012 LULC data.

Total and Core Forest Areas

Change in extent of the total and core forest areas, as defined in the RMP, is not shown as part of this indicator; however, the change in extent does inform the Forest Integrity Score (above). Changes in preserved and developed acres were calculated within the Total and Core Forest Areas using the same methodology used in the RMP.

- Change in preserved lands was assessed by comparing what was preserved at the time of the RMP (2008) to what was preserved as of July 2016. This dataset is tracked by the Highlands Council. For the purposes of this analysis, a change of greater than 3% (increase or decrease) within any HUC14 subwatershed is considered significant.
- Change in developed lands from 2002-2012 was assessed by using the Anderson Codes found in the LULC data released by the NJDEP and refined by those defined as “Developed” in the Regional Land Use Conditions and Smart Design Technical Report (Appendix M, Highlands Land Classification Data Layer Relationship). For the purposes of this analysis, a change of greater than 3% (increase or decrease) within any HUC14 subwatershed is considered significant.

STATUS

As of 2016, using the most recent data available for Forest Integrity, of the 183 Highlands Region HUC14s, 105 are ranked as High Forest Integrity Score, 65 HUC14s are ranked Moderate Forest Integrity Score, and 14 HUC14s are ranked Low Forest Integrity Score (Figure 1). Within the Highlands Region, 49% of the original total forest area and 72% of the original core forest area is currently preserved. Meanwhile, 2% of the original total forest area and less than 1% of the original core forest areas have been developed.

TREND

Since the adoption of the RMP in 2008, the Forest Integrity Score for 22 HUC14s has changed, including 10 HUCs that increased in rank and 12 that decreased (Figure 2). Most of the ranking increases were from Low to Moderate, while one HUC increased from Low to High Forest Integrity Score. All of the score decreases were from a High to Moderate Forest Integrity Score.

During the same period, 112 HUCs saw a significant increase (greater than 3%) of preservation within the total forest area, and 101 saw a significant increase of preservation within the core forest area. Meanwhile, 9 HUCs saw a significant increase in development within their total forest area, but 4 of those HUCs have minor acreage within the Highlands Region (Figure 3). No HUCs saw a significant increase in development within the core forest area. None of the Highlands HUCs realized a significant decrease in development within total or core forest areas.

DATA CONFIDENCE

The Forest Integrity Score was analyzed using NJDEP LULC data from 2002 and 2012. This dataset was found to be satisfactory for analyzing change in core and total forest area.

Acknowledging that the delineation of HUC14 subwatersheds dataset has recently changed in the Highlands Region, the 2005 Subwatershed (HUC14) dataset used for the 2008 RMP was also used for this analysis in order to maintain consistency for comparison purposes.

The analysis of change in preserved lands was performed using data catalogued by the Highlands Council from 2008 and 2016. The 2008 Regional Master Plan preserved lands data was based on the best available information at that time. As part of the Plan Conformance process, preserved lands data was further verified through the Module 1 and Module 2 Build-Out update. This update process allowed input from professionals throughout the Region, which in turn created a more accurate representation of the preserved lands layer. The Highlands Council GIS department continually updates the preserved lands layer by both removing and adding lands as new data is made available. This dataset was found to be satisfactory for analyzing change in total acres of preserved lands.

The analysis of change in developed lands was performed using NJDEP LULC data from 2002 and 2012. This dataset was found to be satisfactory for analyzing change in developed acres of core and total forest area.

MILESTONES

- Increase in Forest Integrity Score rank.
- Increase in preservation of total and core forest area.

SECONDARY INDICATORS

(None)

Figure 1: Forest Integrity Score, 2012

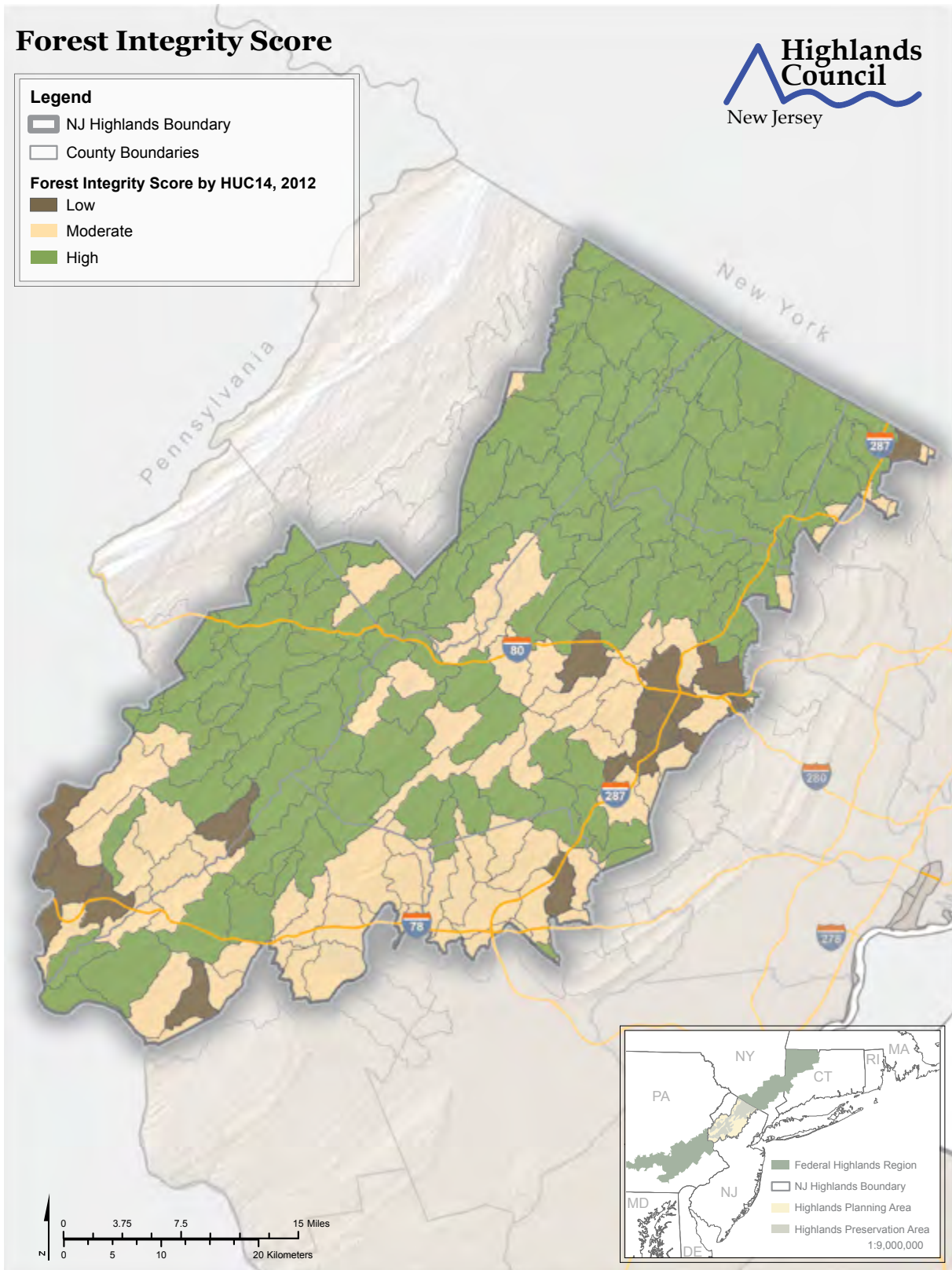


Figure 2: Forest Integrity Score Change, 2002-2012

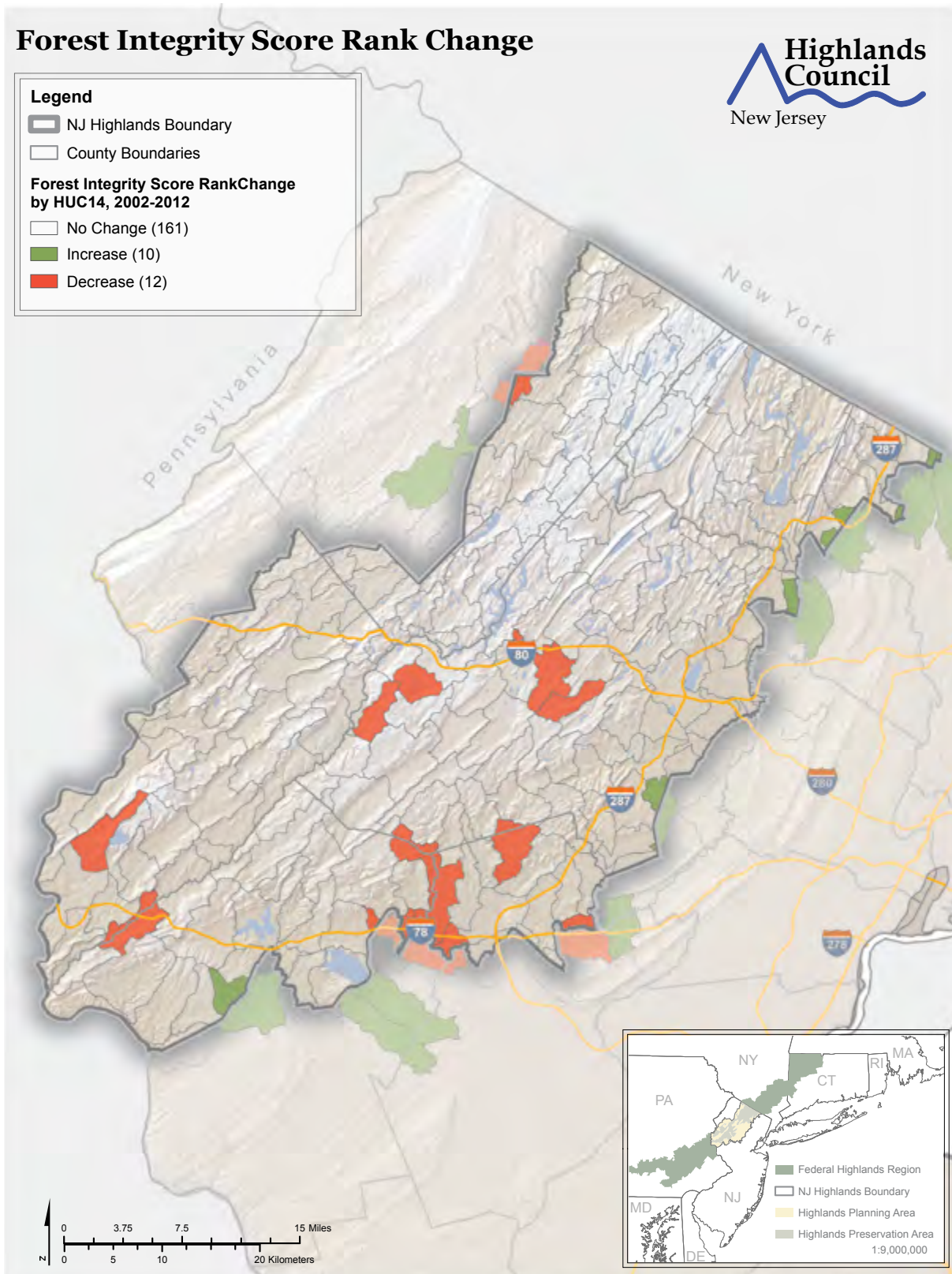


Figure 3: Change in Development in Total Forest Area, 2002-2012

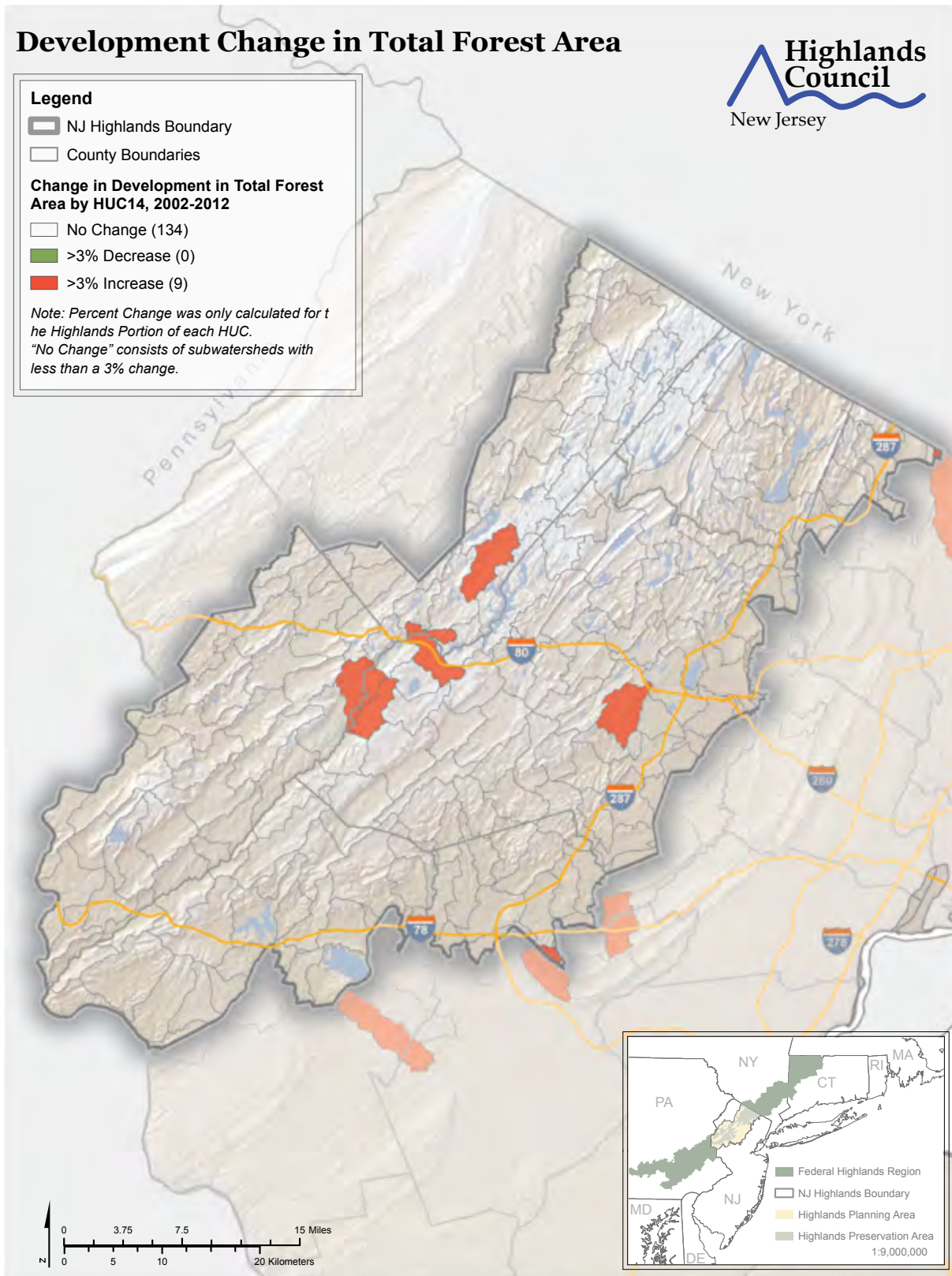
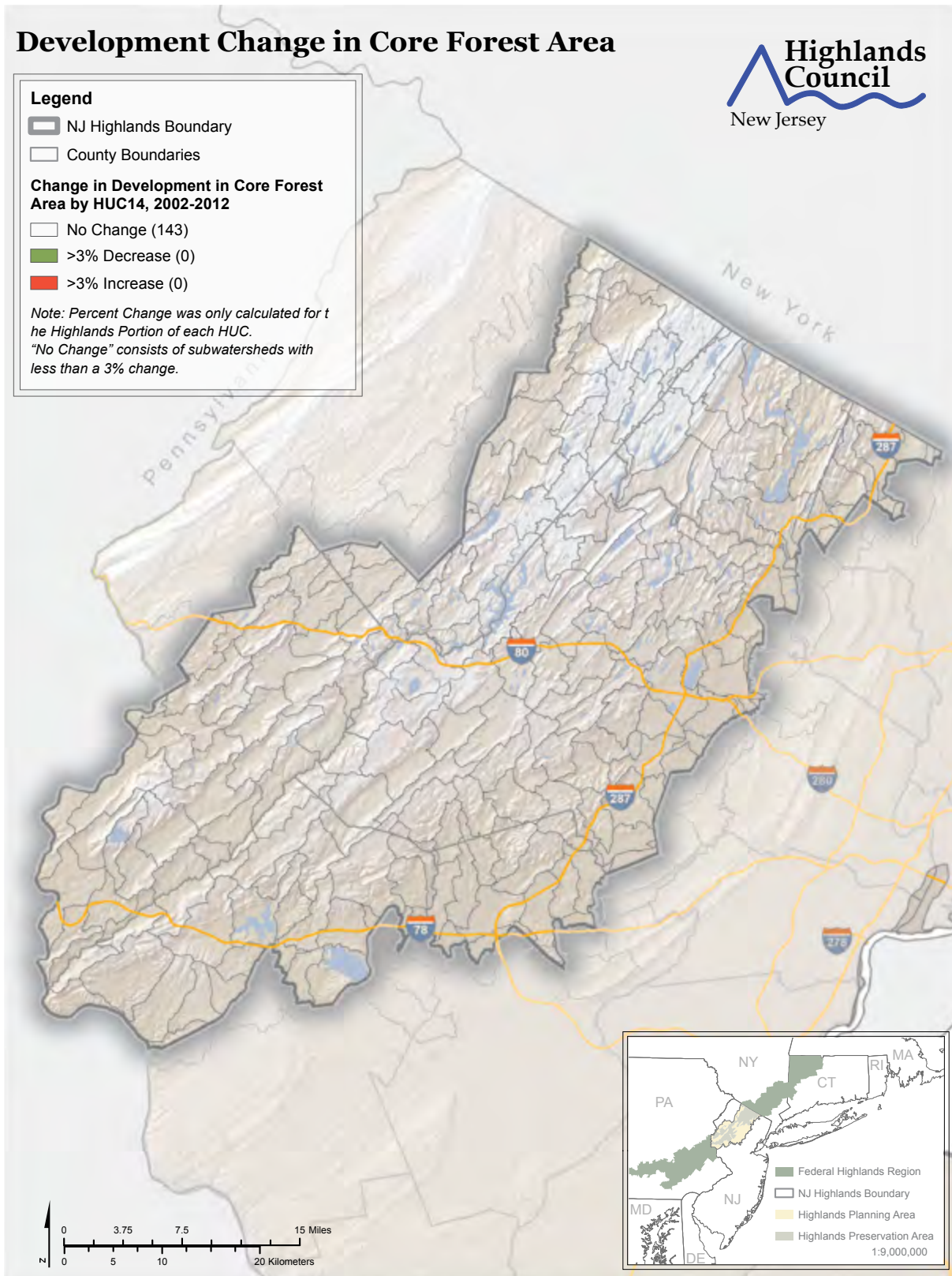


Figure 4: Change in Development in Core Forest Area, 2002- 2012



Preservation Priority



RMP GOALS

1H Protection of critical resources through land preservation and stewardship of open space throughout the Highlands Region.

RMP PROGRAMS

- Land Preservation

DESCRIPTION

Measures changes in preservation and development in the Special Environmental Zone, Conservation Priority Area and Agricultural Priority Area.

BACKGROUND

The Highlands RMP provides policies designed to ensure that public funds and other resources are focused on the protection of Highlands resources by establishing criteria for the identification of critical lands, priorities for land preservation, implementation strategies for land preservation and stewardship, and a process to ensure that sufficient financial and institutional resources are available for land preservation and stewardship. The following areas have been designated as the highest priority lands for preservation in the Highlands Region.

- Special Environmental Zone (SEZ) – defined in the Highlands Act as “...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...”
- Conservation Priority Area (CPA) – defined in the Land Preservation and Stewardship Technical Report as lands within the Highlands Region which have the highest ecological resource values based upon a combination of 33 ecological indicators that measure the quantity and quality of the following regional resource values: forests, watershed condition, critical habitat, prime ground water recharge areas, open waters and riparian areas, and steep slopes.

- Agricultural Priority Area (APA) – defined in the Sustainable Agricultural Technical Report as those lands in the Highlands Region which have the highest agricultural resource values. Policies associated with the APA provide a prioritization mechanism for future farmland preservation in the Region and support contiguity between preserved farmland and priority agricultural lands.

For this indicator, the above-identified three areas were analyzed to assess what has been preserved or developed in the Preservation and Planning Areas since the adoption of the RMP. As these lands are developed, they may no longer be eligible for preservation nor will they necessarily maintain the same environmental characteristics that resulted in their Preservation Priority designation at the time of the RMP. As such, land development is a critical measurement of this indicator.

UNIT AND FREQUENCY OF ANALYSIS

Data sets and how they were used for the analysis are described below. Each data set is intersected with the Highlands Planning and Preservation Areas, as well as developed and preserved lands data.

Special Environmental Zone

The 2008 SEZ, as defined in the RMP, has remained unchanged in its extent for the purposes of this analysis.

- Change in preserved lands was assessed by comparing what was preserved at the time of adoption of the RMP (2008) to what was preserved as of July 2016. This dataset is tracked by the Highlands Council.
- Change in developed lands from 2002 to 2012 was assessed by using the Anderson Codes found in the Land Use/Land Cover (LULC) data released by the NJDEP, refined by those defined as “Developed” in the Regional Land Use Conditions and Smart Design Technical Report (Appendix M, Highlands Land Classification Data Layer Relationship).

Conservation Priority Area

The 2008 CPA, as defined in the RMP, has remained unchanged in its extent for the purposes of this analysis.

- Change in preserved lands was assessed by comparing what was preserved at the time of adoption of the RMP (2008) to what was preserved as of July 2016. This dataset is tracked by the Highlands Council.
- Change in developed lands from 2002 to 2012 was assessed by using the Anderson Codes found in the LULC data released by the NJDEP, refined by those defined as “Developed” in the Regional Land Use Conditions and Smart Design Technical Report (Appendix M, Highlands Land Classification Data Layer Relationship).

Agricultural Priority Area

The 2008 APA, as defined in the RMP, has remained unchanged in extent for the purposes of this analysis.

- Change in preserved lands was assessed by comparing what was preserved at the time of adoption of the RMP (2008) to what was preserved as of July 2016. This dataset is tracked by the Highlands Council.
- Change in developed lands from 2002 to 2012 was assessed by using the Anderson Codes found in the LULC data released by the NJDEP, refined by those defined as “Developed” in the Regional Land Use Conditions and Smart Design Technical Report (Appendix M, Highlands Land Classification Data Layer Relationship).

STATUS

As of 2016, using the most recent data available for each of the above priority areas, 2% of the Highlands Region is classified as SEZ, of which 23% has been preserved, 3% has been developed, and 74% remains in private ownership and is undeveloped. The CPA makes up 30% of the Highlands Region, with 8% of those lands preserved, 23% developed, and 69% remains privately owned and undeveloped. Within the APA, 12% is preserved, 3% is developed, and 85% remains privately owned and undeveloped.

TREND

Since adoption of the RMP in 2008, preservation of SEZ lands has increased. While development of SEZ lands has also increased, it has increased at a significantly lower rate than the rate of preservation (Table 1).

In the CPA, preservation and development both increased since 2008; however, preservation outpaced development. Moreover, preservation of CPA lands in the Preservation Area increased at a higher rate than in the Planning Area, while development increased at the same rate in both areas of the Region (Table 2).

Preservation and development both increased in APA as well, although preservation again outpaced development. The APA lands in the Preservation Area saw a greater

increase in preservation than those in the Planning Area, while the increase in development in both areas was about equal (Table 3).

DATA CONFIDENCE

The analysis of change in preserved lands was performed using data catalogued by the Highlands Council from 2008 and 2016. The 2008 Regional Master Plan preserved lands data was based on the best available information at that time. As part of the Plan Conformance process, the preserved lands data was further verified through the Module 1 and Module 2 Build Out update. This update process allowed input from professionals throughout the Region, which created a more accurate representation of the preserved lands layer. The Highlands Council GIS department continually updates the preserved lands layer by both removing and adding lands as new data is made available. This dataset was found to be satisfactory for analyzing change in total acres of preserved lands.

The analysis of change in developed lands was performed using NJDEP Land Use/Land Cover data from 2002 and 2012 in conjunction with the Highlands Regional Matrix formulated and presented in the Highlands Region Build-out Technical Report (2008). This dataset was found to be satisfactory for analyzing change in developed acres.

The SEZ, CPA, and APA data layers were all created by the Highlands Council in the course of developing the RMP and have not been changed since the initial analysis. Accordingly, these datasets were found to be satisfactory as a basis for analysis.

MILESTONE

- Increased preservation of Preservation Priority areas (Special Environmental Zone, Conservation Priority Area and Agricultural Priority Area).

SECONDARY INDICATORS

- **Recreation Land Use Patterns:** Measures use patterns of state and federal recreation and conservation lands.
- **Resilient Landscape Preservation:** A comparative analysis of Open Space Institute (OSI) Resilient Landscape lands to Highlands Protection Zone lands, including change in land use or preservation.

Table 1: Change in Preserved & Developed Lands within Special Environmental Zone (SEZ)

Change in Preserved Lands 2008-2016							Change in Developed Lands 2008-2012 (2002 & 2012 LULC)								
Region	Total SEZ Acres		Total Preserved Acres		Change			Region	Total SEZ Acres		Total Developed Acres		Change		
	2008	2008	2008	2016	Trend	Acres	Percent*		2008	2008	2012	Trend	Acres	Percent*	
Planning Area	-	-	-	-	N/A	N/A	N/A	Planning Area	-	-	-	N/A	N/A	N/A	
Preservation Area	19,138	81	4,488	4,488	Increase	4,406	23.0%	Preservation Area	19,138	505	642	Increase	137	0.7%	
Highlands Region	19,138	81	4,488	4,488	Increase	4,406	23.0%	Highlands Region	19,138	505	642	Increase	137	0.7%	

*Percent Change of Total Acres represents the percent gain of preserved lands over Total Acres of Special Environmental Zone within the Region.

*Percent Change of Total Acres represents the percent gain of developed lands over Total Acres of Special Environmental Zone within the Region.

Table 2: Change in Preserved & Developed Lands within Conservation Priority Area (CPA)

Change in Preserved Lands 2008-2016							Change in Developed Lands 2008-2012 (2002 & 2012 LULC)								
Region	Total CPA Acres		Total Preserved Acres		Change			Region	Total CPA Acres		Total Developed Acres		Change		
	2008	2008	2008	2016	Trend	Acres	Percent*		2008	2008	2012	Trend	Acres	Percent*	
Planning Area	96,094	241	2,525	2,525	Increase	8,101	8.4%	Planning Area	96,094	17,174	19,615	2,441	2.5%	8.4%	
Preservation Area	159,026	8,342	18,759	18,759	Increase	16,234	10.2%	Preservation Area	159,026	33,928	37,948	4,019	2.5%	10.2%	
Highlands Region	255,120	8,582	21,284	21,284	Increase	24,334	9.5%	Highlands Region	255,120	51,102	57,563	6,461	2.5%	9.5%	

*Percent Change of Total Acres represents the percent gain of preserved lands over Total Acres of Conservation Priority Area within the Region.

*Percent Change of Total Acres represents the percent gain of preserved lands over Total Acres of Conservation Priority Area within the Region.

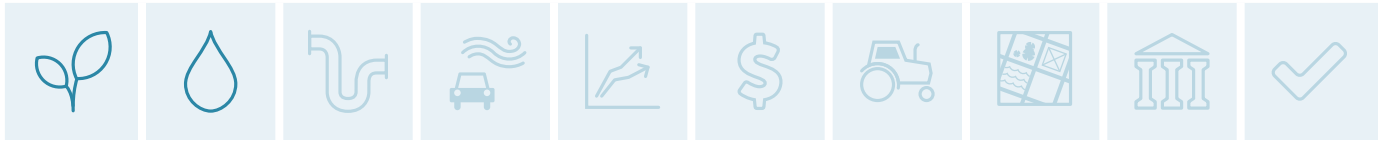
Table 3: Change in Preserved & Developed Lands within Agricultural Priority Areas (APA)

Change in Preserved Lands 2008-2016							Change in Developed Lands 2008-2012 (2002 & 2012 LULC)*								
Region	Total APA Acres		Total Preserved Acres		Change			Region	Total CPA Acres		Total Developed Acres		Change		
	2008	2008	2008	2016	Trend	Acres*	Percent		2008	2008	2012	Trend	Acres**	Percent	
Planning Area	131,183	-	14,636	14,636	Increase	14,636	11.2%	Planning Area	131,183	24,279	28,303	Increase	4,023	3.1%	
Preservation Area	63,694	-	8,379	8,379	Increase	8,379	13.2%	Preservation Area	63,694	13,041	14,902	Increase	1,861	2.9%	
Highlands Region	194,877	-	23,015	23,015	Increase	23,015	11.8%	Highlands Region	194,877	37,321	43,205	Increase	5,884	3.0%	

*Any perceived loss of preservation reflects an accuracy update to the preserved lands file and not an "un-preservation" of land.

*The Agricultural Priority Areas data layer was created in 2008. This analysis compares change in developed lands within these areas covering a period between 2002 and 2012. **Agricultural Properties can be developed as development includes farmhouses, barns, greenhouses and other farming related structures.

Watershed Resource Value



RMP GOALS

1D Protection, restoration and enhancement of Highlands open waters and riparian areas.

RMP PROGRAMS

- Stream Corridor Protection/Restoration Plans

DESCRIPTION

Measures change in Watershed Resource Value Class by HUC14 subwatershed.

BACKGROUND

The Highlands RMP provides policies designed to establish and maintain an inventory of Highlands Open Waters and their integrity.

Watershed Resource Value is defined in the Ecosystem Management Technical Report (2008) as an indicator of watershed condition for the Highlands Region. The Watershed Resource Value is the weighted score of five metrics:

1. Percentage of developed lands
2. Percent habitat for species of concern
3. Percent total forest area
4. Percent total core forest area
5. Proportion of total forest cover within a given geographic area.

UNIT AND FREQUENCY OF ANALYSIS

Data sets and how they were used for the analysis are described below.

Watershed Resource Value

The Watershed Resource Value, as calculated during the development of the RMP in 2008 for each Highlands Region HUC14 subwatershed, was derived from the 2002 NJDEP Land Use/Land Cover (LULC), NJDEP Landscape Project version 3.0, and NJDOT Roads and Utility Right-of-Way (ROW) data and calculated using the methodology prescribed in the technical report.

The 2016 Watershed Resource Value was calculated using a partially updated methodology that was necessary due to technical limitations with the prior method of calculating total core forest and total proportion forest. This new methodology was also run with 2008 data and compared to the RMP dataset to confirm the results were within 0.5% of the original analysis for core forest and 7% for total proportion forest. The remaining metrics were calculated using the same methodology as previously employed using 2012 LULC data, Landscape Project 3.1, and 2015 NJDOT Roads and Utility ROW data. A Watershed Resource Value Class, based on the Calculated Value, was assigned using the original “Data Value Breaks and Value Classes for each Watershed Indicator” table in the Ecosystem Management Technical Report (2008).

STATUS

As of 2016, using the most recent data available for Watershed Resource Value, 65% of the Highlands Region HUC14s, or 119 total HUC14 subwatersheds, have a High Watershed Resource Value, 25 HUC14s have a Moderate Watershed Resource Value, and 39 HUC14s have a Low Watershed Resource Value (Figure 1).

TREND

Since the adoption of the RMP in 2008, 151 HUCs, or approximately 83% of the HUC14s in the Highlands Region, exhibited no change in Watershed Resource Value Class. A total of 32 HUC14s, or approximately 17%, exhibited a shift in Watershed Resource Value Class (Figure 2). Of these, 18 HUC14s experienced an increase in Value Class, while 14 experienced a decrease. Of the HUC14s where the Value Class increased, each only increased by one tier; with 11 increasing from Moderate to High Value Class, and 7 increasing from Low to Moderate. Of those that decreased, 5 decreased two tiers from a High to a Low Value Class.

DATA CONFIDENCE

2016 Watershed Resource Values are compared to the original RMP Watershed Resource Values for this indicator, though the methodologies for determining these values varies slightly (as described above).

Acknowledging that the delineation of HUC14 subwatersheds dataset has recently changed in the Highlands Region, the 2005 Subwatershed (HUC14) dataset used in the 2008 RMP was also used for this analysis in order to maintain consistency for comparison purposes.

The analysis of change in developed and forested lands was performed using NJDEP Land Use/Land Cover data from 2002 and 2012 in conjunction with the Highlands Regional Matrix, formulated and presented in the Highlands Region Build-out Technical Report (2008).

It should be noted that in 2012, the NJDEP changed its Landscape Project mapping methodology from the 2008 version used in the RMP, resulting in a significant increase in mapped Critical Wildlife Habitat.

According to the NJDEP, a new Landscape Project version based on 2012 LULC data and new species occurrences is slated for release as a draft product during 2017. This version, once final, should be used to update the Highlands Watershed Resource Value map.

MILESTONES

- Positive net change in the number of Highlands Region HUC14 subwatersheds with an increase in Watershed Resource Value Class.

SECONDARY INDICATORS

The five metrics used to calculate the watershed resource value can be used to further refine the analysis. These metrics are:

1. Percentage of developed lands,
2. Percentage of subwatershed containing habitat for species of concern,
3. Percent total forest area,
4. Percent total core forest area,
5. Proportion of total forest cover within a given geographic area.

Figure 1: Watershed Resource Value Status, 2012

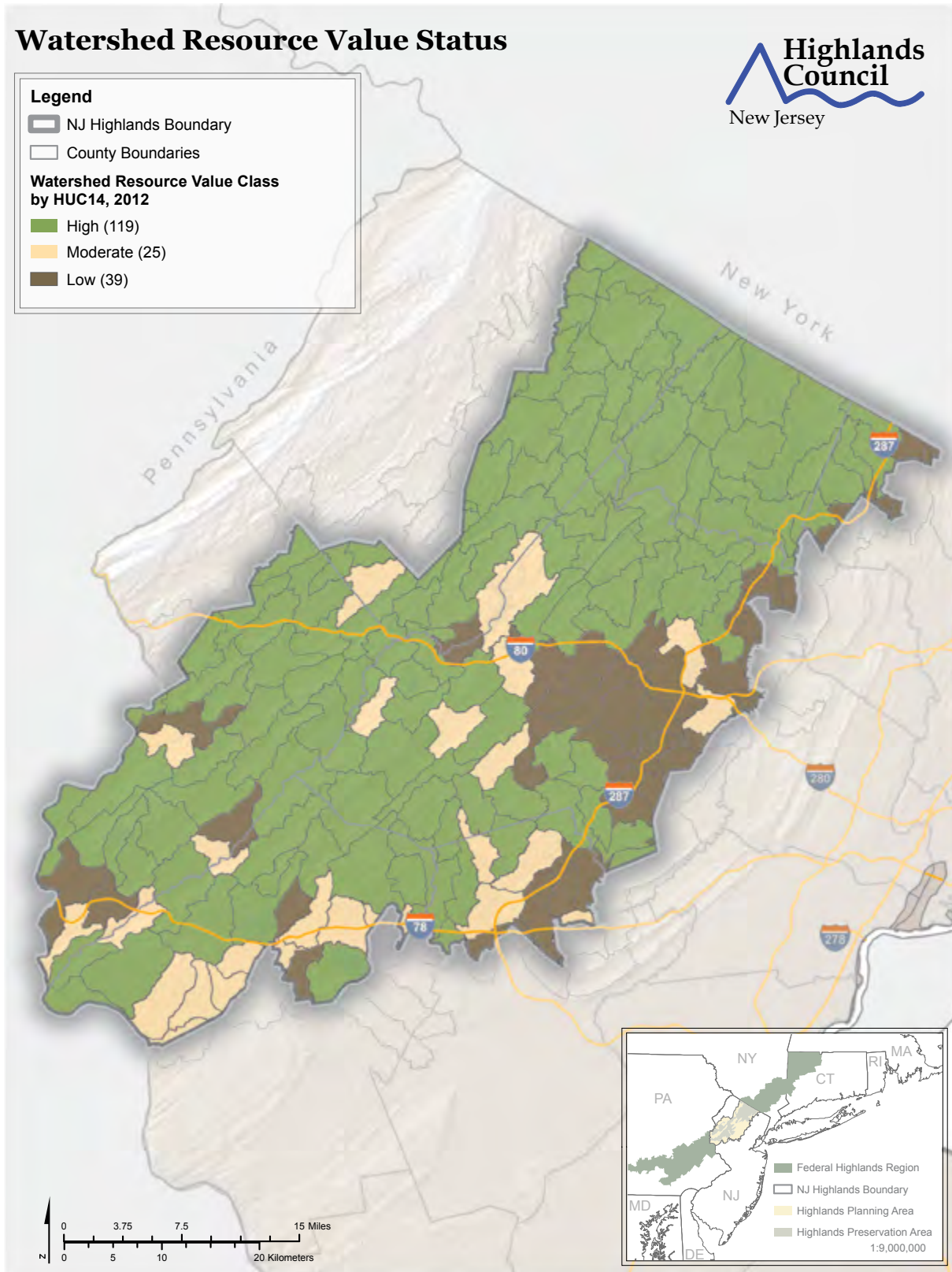
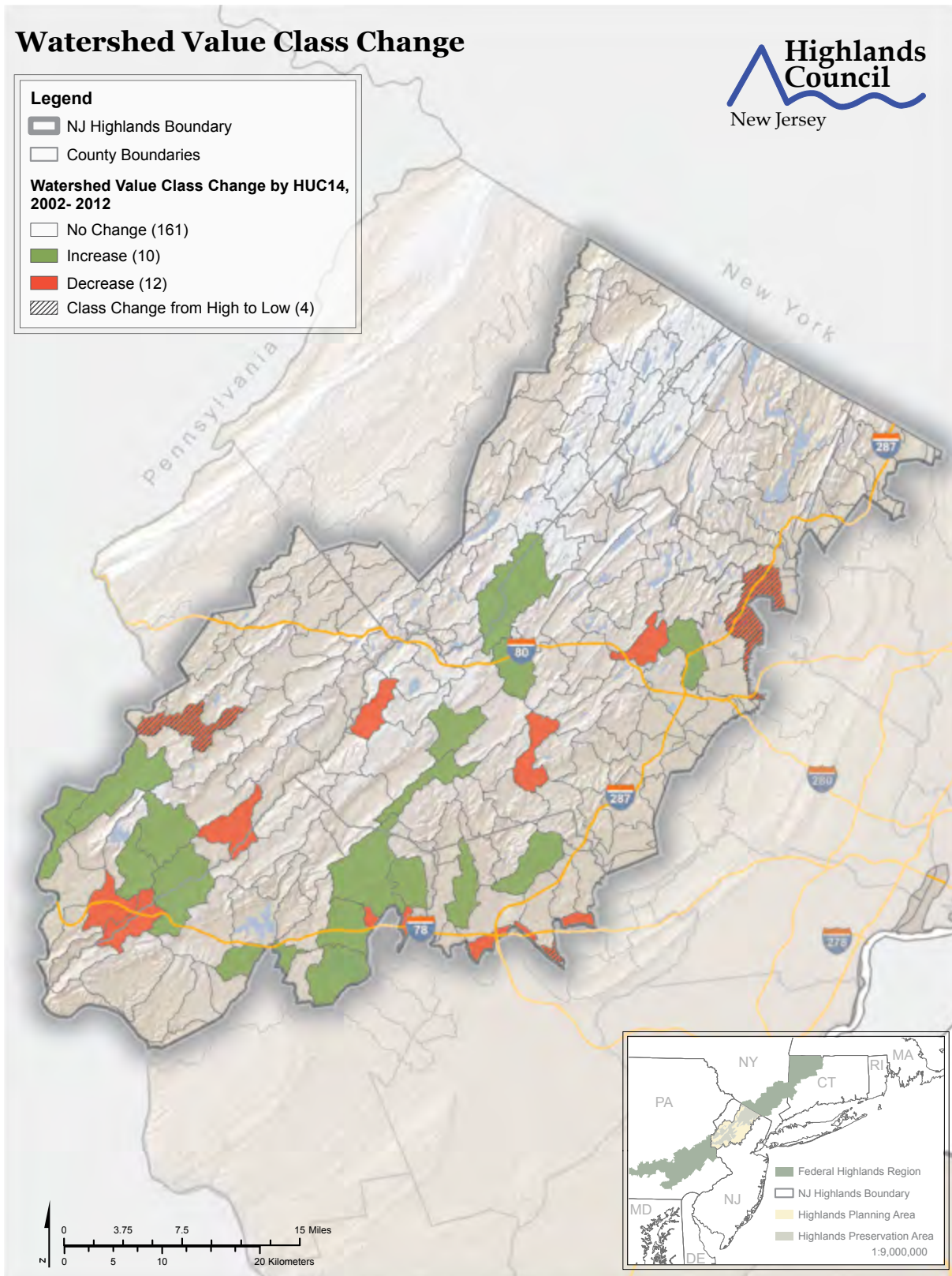


Figure 2: Watershed Resource Value Trend, 2002-2012

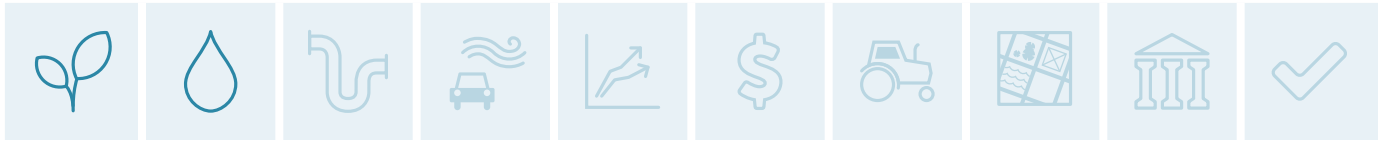




Water Resources Indicators

- **Critical Water Resource Areas**
- **Impervious Surface Cover
by Subwatershed**
- **Surface Water Quality**
- **Water Use**

Critical Water Resource Areas



RMP GOALS

1D Protection, restoration, and enhancement of Highlands Open Waters and Riparian Areas.

2D Maintenance of hydrologic integrity through the protection of groundwater recharge.

2E Improvement of groundwater recharge through regional management efforts.

2H Limitation on the type and amount of human development in the Wellhead Protection Areas of public water supply wells.

RMP PROGRAMS

- Restoration of Streams and Riparian Areas
- Land Preservation and Stewardship
- Water Quality Restoration

DESCRIPTION

Measures the change in preservation and development within Wellhead Protection Areas, Prime Ground Water Recharge Areas and Open Water Protection Areas.

BACKGROUND

The Highlands RMP provides policies designed to ensure that public funds and other resources are focused on the protection of Highlands resources by identifying Critical Water Resource Areas where protection and restoration of water resources will be encouraged through mitigation and management opportunities.

- Wellhead Protection Areas - defined in the RMP as a mapped area around a public water supply well that delineates the horizontal extent of groundwater captured by a public water supply well pumping at a specific rate over a specific time.
- Prime Ground Water Recharge Areas – defined in the RMP as the areas in each subwatershed that have the highest recharge rates and, in total, provide 40 percent of total recharge by volume for that subwatershed.

- Open Water Protection Areas – identified by the Highlands Council in accordance with the provisions of the Highlands Act (N.J.S.A. 13:20-32b(1)) that selects all Highlands Open Waters (all intermittent, ephemeral or perennial streams, springs, wetlands and surface waters) and all adjacent lands within a 300 foot buffer.

For this indicator, Critical Water Resource Areas were analyzed in relation to the Highlands Preservation and Planning Areas, as well as Plan Conformance status, to assess what has been preserved or developed over time.

UNIT AND FREQUENCY OF ANALYSIS

Data sets and how they were used for the analysis are described below. Each data set is intersected with the Highlands Planning and Preservation Areas, as well as Plan Conformance status.

Wellhead Protection Areas

The Wellhead Protection Areas layer is taken from NJDEP data for community and non-community wellheads.

- Change in Wellhead Protection Area extent was assessed by comparing the NJDEP dataset available at the time of the RMP (2006) to the current dataset (2015).
- Change in preserved lands was assessed by comparing what was preserved at the time of RMP adoption (2008) to what was preserved as of July 2016. This dataset is tracked by the Highlands Council.
- Change in developed lands from 2002-2012 was assessed by using the Anderson Codes found in the LULC data released by the NJDEP, refined by those defined as “Developed” in the Regional Land Use Conditions and Smart Design Technical Report (Appendix M, Highlands Land Classification Data Layer Relationship).

Prime Ground Water Recharge Areas

Prime Ground Water Recharge Areas were defined by the Highlands Council with the release of the RMP and have remained unchanged in their extent. Accordingly, this indicator does not show growth in these areas, but does show the changes that have occurred within them with regard to preservation or development.

Table 1: Change in Extent, Preserved, and Developed Lands within Highlands Wellhead Protection Areas

Wellhead Protection Area - Change in Wellhead Protection Areas 2006-2015

Region	Total Acres (2006)	Total Acres (2015)	Net Change	Net Acres Gained/Lost	Percent Change
Highlands Planning Area	122,368.10	146,250.39	Increase	23,882.29	19.5%
Highlands Preservation Area	54,037.45	73,177.63	Increase	19,140.18	35.4%
Total Highlands Region	176,405.55	219,428.02	Increase	43,022.47	24.4%
Conforming Area	85,732.90	108,977.80	Increase	23,244.90	27.1%
Non-Conforming Area	90,672.70	110,450.30	Increase	19,777.60	21.8%

*Percent Change of Total Acres represents the percent gain of Total Acres of Highlands Wellhead Protection Area lands within the Region.

Wellhead Protection Area - Change in Preserved Lands 2008-2016

Region	Total Acres (2006)	Total Acres Preserved (2008)	Total Acres Preserved (2016)	Net Change	Net Acres Gained/Lost	Percent Change of Total Acres	Percent WHPA Preserved (2016)
Highlands Planning Area	122,368.10	15,812.10	17,299.20	Increase	1,487.10	9.4%	11.8%
Highlands Preservation Area	54,037.45	16,322.80	18,394.10	Increase	2,071.30	12.7%	25.1%
Total Highlands Region	176,405.55	32,134.90	35,693.30	Increase	3,558.40	11.1%	16.3%
Conforming Area	85,732.90	18,989.70	21,160.50	Increase	2,170.80	11.4%	19.4%
Non-Conforming Area	90,672.70	13,145.20	14,532.70	Increase	1,387.50	10.6%	13.2%

*Percent Change of Total Acres represents the percent gain of preserved lands over Total Acres of Highlands Wellhead Protection Area lands within the Region as of 2006.

Wellhead Protection Area - Change in Developed Lands 2008-2012 (2002 and 2012 LULC)

Region	Total Acres (2006)	Total Acres Developed (2002)	Total Acres Developed (2012)	Net Change	Net Acres Gained/Lost	Percent Change of Total Acres	Percent WHPA Developed (2012)
Highlands Planning Area	122,368.10	53,078.20	56,574.70	Increase	3,496.50	6.6%	38.7%
Highlands Preservation Area	54,037.45	13,502.00	15,186.40	Increase	1,684.40	12.5%	20.8%
Total Highlands Region	176,405.55	66,580.20	71,761.10	Increase	5,180.90	7.8%	32.7%
Conforming Area	85,732.90	28,172.40	30,713.90	Increase	2,541.50	9.0%	28.2%
Non-Conforming Area	90,672.70	38,407.70	41,047.20	Increase	2,639.50	6.9%	37.2%

*Percent Change of Total Acres represents the percent gain of developed lands over Total Acres of Highlands Wellhead Protection Area lands within the Region as of 2006.

- Change in preserved lands was assessed by comparing what was preserved at the time of RMP adoption (2008) to what was preserved as of July 2016. This dataset is tracked by the Highlands Council.
- Change in developed lands from 2002-2012 was assessed by using the Anderson Codes found in the LULC data released by the NJDEP, refined by those defined as “Developed” in the Regional Land Use Conditions and Smart Design Technical Report (Appendix M, Highlands Land Classification Data Layer Relationship).

cator does not show growth in these areas, but does show the changes that have occurred within them with regard to preservation or development.

- Change in preserved lands was assessed by comparing what was preserved at the time of RMP adoption (2008) to what was preserved as of July 2016. This dataset is tracked by the Highlands Council.
- Change in developed lands from 2002-2012 was assessed by using the Anderson Codes found in the LULC data released by the NJDEP, refined by those defined as “Developed” in the Regional Land Use Conditions and Smart Design Technical Report (Appendix M, Highlands Land Classification Data Layer Relationship).

Open Water Protection Areas

Open Water Protection Areas were defined by the Highlands Council with the release of the RMP and have remained unchanged in their extent. Accordingly, this indi-

Table 2: Change in Preserved and Developed Lands within Highlands Prime Ground Water Recharge Areas

Prime Ground Water Recharge Areas - Change in Preserved Lands 2008-2016

Region	Total PGWRA Acres (2008)	Total Acres Preserved (2008)	Total Acres Preserved (2016)	Net Change	Net Acres Gained/Lost	Percent Change	Percent PGWRA Preserved (2016)
Highlands Planning Area	92,967.58	21,629.80	27,425.20	Increase	5,795.40	26.8%	29.5%
Highlands Preservation Area	122,835.32	59,315.40	66,835.40	Increase	7,520.00	12.7%	54.4%
Total Highlands Region	215,802.89	80,945.20	94,260.60	Increase	13,315.40	16.4%	43.7%
Conforming Area	127,886.60	60,182.70	68,470.60	Increase	8,287.90	13.8%	53.5%
Non-Conforming Area	87,916.29	20,762.50	25,790.00	Increase	5,027.50	24.2%	29.3%

*Percent Change of Total Acres represents the percent gain of preserved lands over Total Acres of Highlands Prime Ground Water Recharge Area lands within the Region.

Prime Ground Water Recharge Areas - Change in Developed Lands 2008-2012 (2002 and 2012 LULC)

Region	Total PGWRA Acres (2008)	Total Acres Developed (2002)	Total Acres Developed (2012)	Net Change	Net Acres Gained/Lost	Percent Change	Percent PGWRA Developed (2012)
Highlands Planning Area	92,967.58	1,243.10	2,746.80	Increase	1,503.70	121.0%	3.0%
Highlands Preservation Area	122,835.32	1,173.50	2,086.30	Increase	912.80	77.8%	1.7%
Total Highlands Region	215,802.89	2,416.60	4,833.10	Increase	2,416.50	100.0%	2.2%
Conforming Area	127,886.60	1,376.70	2,576.80	Increase	1,200.10	87.2%	2.0%
Non-Conforming Area	87,916.29	1,039.90	2,256.30	Increase	1,216.40	117.0%	2.6%

*Percent Change of Total Acres represents the percent gain of developed lands over Total Acres of Highlands Prime Ground Water Recharge Area lands within the Region.

STATUS

As of 2016, using the most recent data available for each Critical Water Resource Area, 25.5% of the Highlands Region is classified as Wellhead Protection Area, of which 16.3% is preserved, while 32.7% is developed. Prime Ground Water Recharge Areas make up 25% of the Highlands Region, with 43.7% of those lands preserved and 2.2% developed. Finally, 49% of the Region is classified as Highlands Open Water Protection Area, of which 40.9% is preserved and 19.7% is developed.

TREND

Since adoption of the RMP in 2008, the extent of Wellhead Protection Areas has increased by 24.4% (Table 1). Preservation of Wellhead Protection Areas has increased in both the Planning Area and Preservation Area. The greatest increase in percent and net acres preserved is in the Preservation Area. Moreover, nearly two-thirds of all the new Wellhead Protection Area preservation has occurred within conforming municipalities. Development has also increased in both areas. Although the greatest percent change was seen in the Preservation Area, the net and total acres of Wellhead Protection Areas developed in the Planning Area significantly outpaced that of the Preservation Area.

Within Prime Ground Water Recharge Areas, preservation increased across both the Planning Area and Preservation Area, with the Preservation Area representing much

of the net and total acres preserved. Nearly two-thirds of new preservation has occurred in conforming municipalities (Table 2). While percent change in development of Prime Ground Water Recharge Areas lands appears to outpace preservation, this is reflective of the relatively small amount of overall Prime Ground Water Recharge Areas acreage that is developed, as developed areas are not typically designated as Prime Groundwater Recharge Areas. From a net acreage perspective, preservation exceeds development by over five-fold.

Preservation and development both increased within Open Water Protection Areas, with preservation of land achieving greater gains over the analysis period (Table 3). From a net acreage perspective, the Planning and Preservation Area saw similar increases in preservation of lands within Open Water Protection Area, while the Planning Area outpaced the Preservation Area in net Open Water Protection Area acres developed. Meanwhile, new preservation and development was comparable across both conforming and non-conforming municipalities.

DATA CONFIDENCE

The analysis of change in preserved lands was performed using data catalogued by the Highlands Council from 2008 and 2016. The 2008 Regional Master Plan preserved lands information was based on the best available information at that time. As part of the Plan Conformance process, the preserved lands data was further verified

Table 3: Change in Preserved and Developed Lands within Highlands Open Water Protection Areas

Open Water Protection Areas - Change in Preserved Lands 2008-2016

Region	Total OWP Acres Total (2008)	Total Acres Preserved (2008)	Total Acres Preserved (2016)	Net Change	Net Acres Gained/Lost	Percent Change	Percent OWPA Preserved (2016)
Highlands Planning Area	213,969.97	52,646.11	61,597.31	Increase	8,951.20	17.0%	28.8%
Highlands Preservation Area	207,721.07	102,422.80	111,001.78	Increase	8,578.98	8.4%	53.4%
Total Highlands Region	421,691.04	155,068.91	172,599.09	Increase	17,530.18	11.3%	40.9%
Conforming Area	233,798.34	105,644.41	114,650.19	Increase	9,005.78	8.5%	49.0%
Non-Conforming Area	187,892.71	49,424.51	57,948.90	Increase	8,524.39	7.4%	30.8%

*Percent Change of Total Acres represents the percent gain of preserved lands over Total Acres of Highlands Open Water Protection Area lands within the Region.

Open Water Protection Areas- Change in Developed Lands 2008-2012 (2002 and 2012 LULC)

Region	Total OWP Acres Total (2008)	Total Acres Developed (2002)	Total Acres Developed (2012)	Net Change	Net Acres Gained/Lost	Percent Change	Percent OWPA Developed (2012)
Highlands Planning Area	213,969.97	50,147.10	54,394.60	Increase	4,247.50	8.5%	25.4%
Highlands Preservation Area	207,721.07	25,893.20	28,478.00	Increase	2,584.80	10.0%	13.7%
Total Highlands Region	421,691.04	76,040.30	82,872.60	Increase	6,832.30	9.0%	19.7%
Conforming Area	233,798.34	36,330.60	39,631.30	Increase	3,300.70	9.1%	17.0%
Non-Conforming Area	187,892.71	39,709.70	43,241.30	Increase	3,531.60	8.9%	23.0%

*Percent Change of Total Acres represents the percent gain of developed lands over Total Acres of Highlands Open Water Protection Area lands within the Region.

through the Module 1 & Module 2 Build Out update. This update process allowed input from professionals throughout the region, which in turn created a more accurate representation of the preserved lands layer. The Highlands Council GIS department continually updates the preserved lands layer by both removing and adding lands as new data is made available. This dataset was found to be satisfactory for analyzing change in total acres of preserved lands.

The analysis of change in developed lands was performed using NJDEP Land Use/Land Cover data from 2002 and 2012 in conjunction with the Highlands Regional Matrix formulated and presented in the Highlands Region Build Out Technical Report (2008). This dataset was found to be satisfactory for analyzing change in developed acres.

MILESTONE

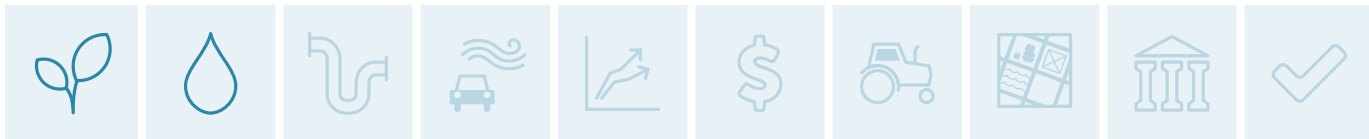
- Increased preservation and limited development in Wellhead Protection Areas, Prime Ground Water Recharge Areas, and Open Water Protection Areas.

SECONDARY INDICATORS

Water Deficits: Measures change in land use or preservation in water deficit areas.

Riparian Integrity: Measures change in integrity score class.

Impervious Surface Cover by Subwatershed



RMP GOALS

2D Maintenance of hydrologic integrity through the protection of groundwater recharge.

2F Assessment and restoration of surface and groundwater quality of the Highlands Region.

2G Protection, restoration and enhancement of the water quality of the Highlands Region.

6N Use of smart growth principles, including low impact development, to guide development and redevelopment in the Highlands Region.

RMP PROGRAMS

- Land Preservation and Stewardship
- Water Quality Restoration
- Low Impact Development

DESCRIPTION

Measures change in impervious surface coverage by HUC14 subwatershed.

BACKGROUND

The Highlands RMP provides policies designed to ensure that public funds and other resources are focused on protection of Highlands resources by limiting impervious cover, particularly in critical resource areas.

Impervious Surface is defined in the RMP as any structure, surface, or improvement that reduces or prevents absorption of stormwater into land, and includes porous paving, paver blocks, gravel, crushed stone, decks, patios, elevated structures, and other similar structures, surfaces, or improvements. To be considered an impervious surface, the structure, surface, or improvement must have the effect of reducing or preventing stormwater absorption. Impervious Surface is used as an indicator of water quality, as increased impervious surface typically has a direct correlation to decreased water quality.

The RMP references the Center for Watershed Protection's definition of sensitive streams as typically having impervious surface cover from 0 to 10%, resulting in higher quality water and aquatic habitat; impacted streams have a watershed impervious surface cover of 11 to 25% and show signs of degradation; and non-supporting streams have surrounding land uses with greater than 25% impervious surface cover, with often severe degradation of water quality and limited ability to support an aquatic community.

For this indicator, impervious surface coverage was analyzed in relation to Highlands Region HUC14 subwatersheds to assess change over time.

UNIT AND FREQUENCY OF ANALYSIS

Data sets and how they were used for the analysis are described below. Each data set is intersected with the Highlands Region and the HUC14 subwatersheds, as well as plan conformance status.

Impervious Surface Coverage

Impervious surface coverage is derived from the NJDEP Land Use/Land Cover (LULC) by measuring change in impervious surface (IS) between the 2002 and 2012 data sets by Highlands Region HUC14 subwatershed. IS coverage was broken into four classes (<2%, 2-10%, 10-25%, and >25%) and change represents an increase or decrease of IS such that the subwatershed shifts to a different class. Where subwatersheds are partially within the Highlands Region, only the portion within the Region was analyzed.

STATUS

As of 2016, using the most recent data available (2012 LULC), approximately 7% of the Highlands Region is classified as covered in impervious surface. Most (60%) of the Highlands subwatersheds fall in the range of 2 to 10% impervious surface coverage, followed by less than a quarter of the subwatersheds having 10 to 25%, almost 13% having less than 2% impervious surface coverage, and those with greater than 25% making up just over 5% of Highlands Region subwatersheds (Figure 1).

TREND

Since adoption of the RMP in 2008 (using 2002 LULC data), the Highlands Region saw a 0.23% increase in impervious surface cover, with less than 4% of the

Table 1: Conformance Status of Highlands Region HUC14 Subwatersheds with Impervious Cover Change

HUC14		Change Direction	Municipality	Conformance Status
02030105050050	Pottersville trib (Lamington River)	Increase	Chester Township (Preservation Area)	Conforming
			Bedminster Township (Both)	Conforming Preservation Area only
02030105060080	Middle Brook (NB Raritan River)	Increase	Chester Township (Preservation Area)	Conforming
			Bedminster Township (Both)	Conforming Preservation Area only
			Peapack-Gladstone (Planning Area)	Non-Conforming
2030105020050	Beaver Brook (Clinton)	Increase	Clinton Town (Planning Area)	Conforming
			Clinton Township (Both)	Conforming
			Lebanon Township (Preservation Area)	Conforming
			Tewksbury Township (Preservation Area)	Conforming
2030103010110	Passaic R Upr (Plainfield Rd to Dead R)	Increase	Bernards Township (Planning Area)	Non-Conforming
2030105120050	Middle Brook EB	Increase	Bernards Township (Planning Area)	Non-Conforming
02040105090010	Pequest R (Drag Strip--below Bear Swamp)	Decrease	Allamuchy (Both)	Conforming Preservation Area only
			Frelinghuysen (Both)	Non-Conforming
			Hope (Planning)	Non-Conforming
			Independence (Both)	Non-Conforming
			Liberty (Both)	Non-Conforming
02040105090030	Pequest R (Furnace Bk to Cemetary Road)	Decrease	Independence (Both)	Non-Conforming
			Liberty (Preservation Area)	Non-Conforming
			Mansfield (Preservation Area)	Non-Conforming
			Oxford (Preservation Area)	Conforming
			White (Preservation Area)	Non-Conforming

Region’s subwatersheds seeing a change in impervious coverage class (Figure 2). While five subwatersheds saw an increase in impervious coverage class, two of these contain relatively small Highlands Region portions of much larger subwatersheds, located along the Region’s eastern border, and two more are largely within the Planning Area of the Highlands Region. Finally, two subwatersheds saw a decrease in impervious coverage class. Of note, many of the municipalities within the two subwatersheds that saw an impervious cover class decrease, do not conform to the RMP for their Planning Area lands (Table 1).

DATA CONFIDENCE

Acknowledging that the delineation of HUC14 subwatersheds dataset has recently changed in the Highlands Region, the 2005 Subwatershed (HUC14) dataset used in the 2008 RMP was also used for this analysis in order to maintain consistency for comparison purposes.

The analysis of change in impervious surface cover was performed using NJDEP Land Use/Land Cover data from 2002 and 2012. This dataset was found to be satisfactory for analyzing change in impervious surface.

MILESTONES

- As an indicator of water quality, a decrease in the number of HUC14 subwatersheds with an impervious coverage greater than 10%.

- As an indicator of water quality, an increase in the number of HUC14 subwatersheds with an impervious coverage less than 10%.

SECONDARY INDICATORS

Impervious Surface Cover by LUCZ: Measures change in impervious surface coverage by LUCZ.

Impervious Surface Cover by Municipality: Measures change in impervious surface coverage by municipality.

Figure 1: Impervious Surface Coverage, 2012

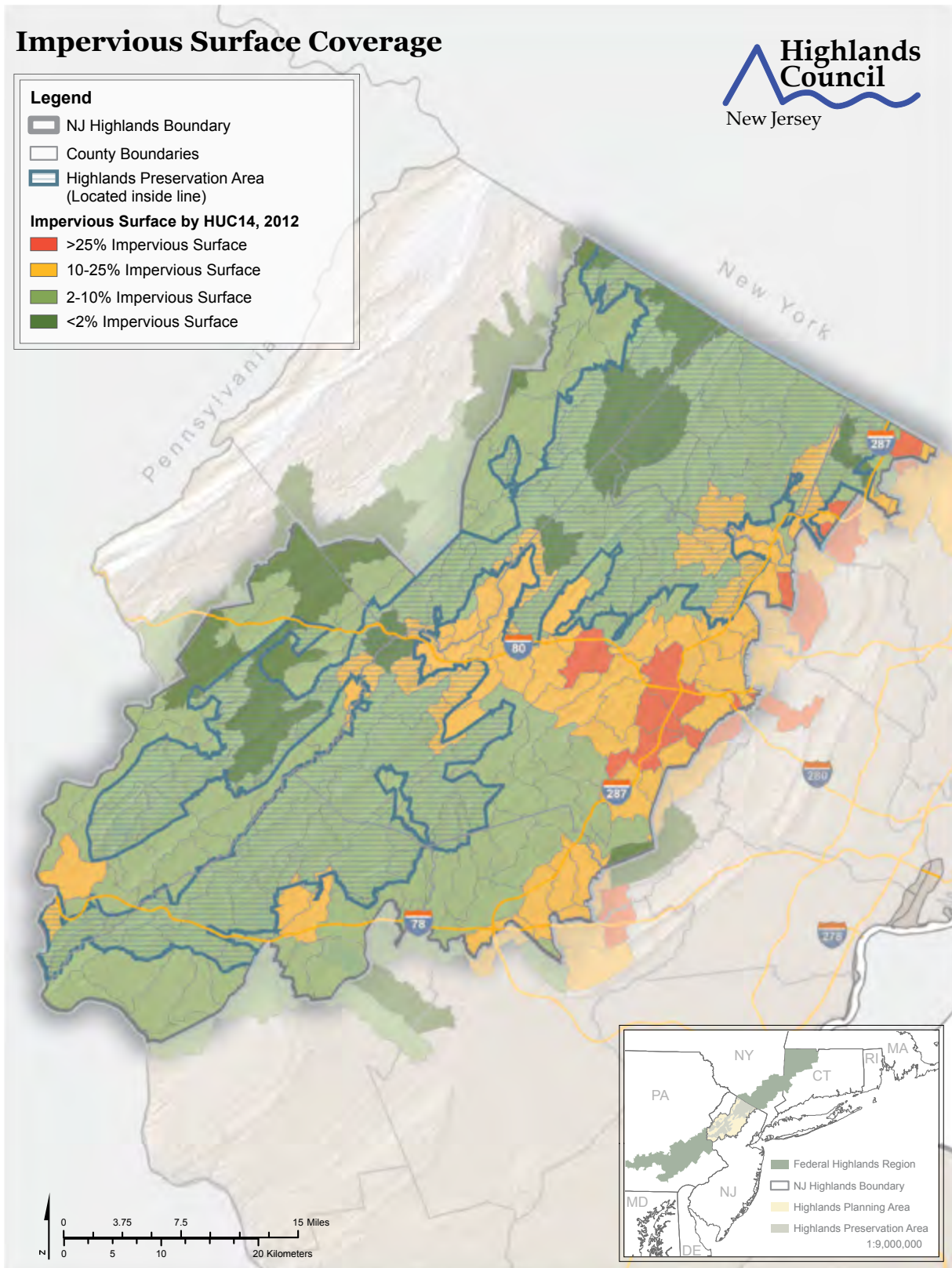
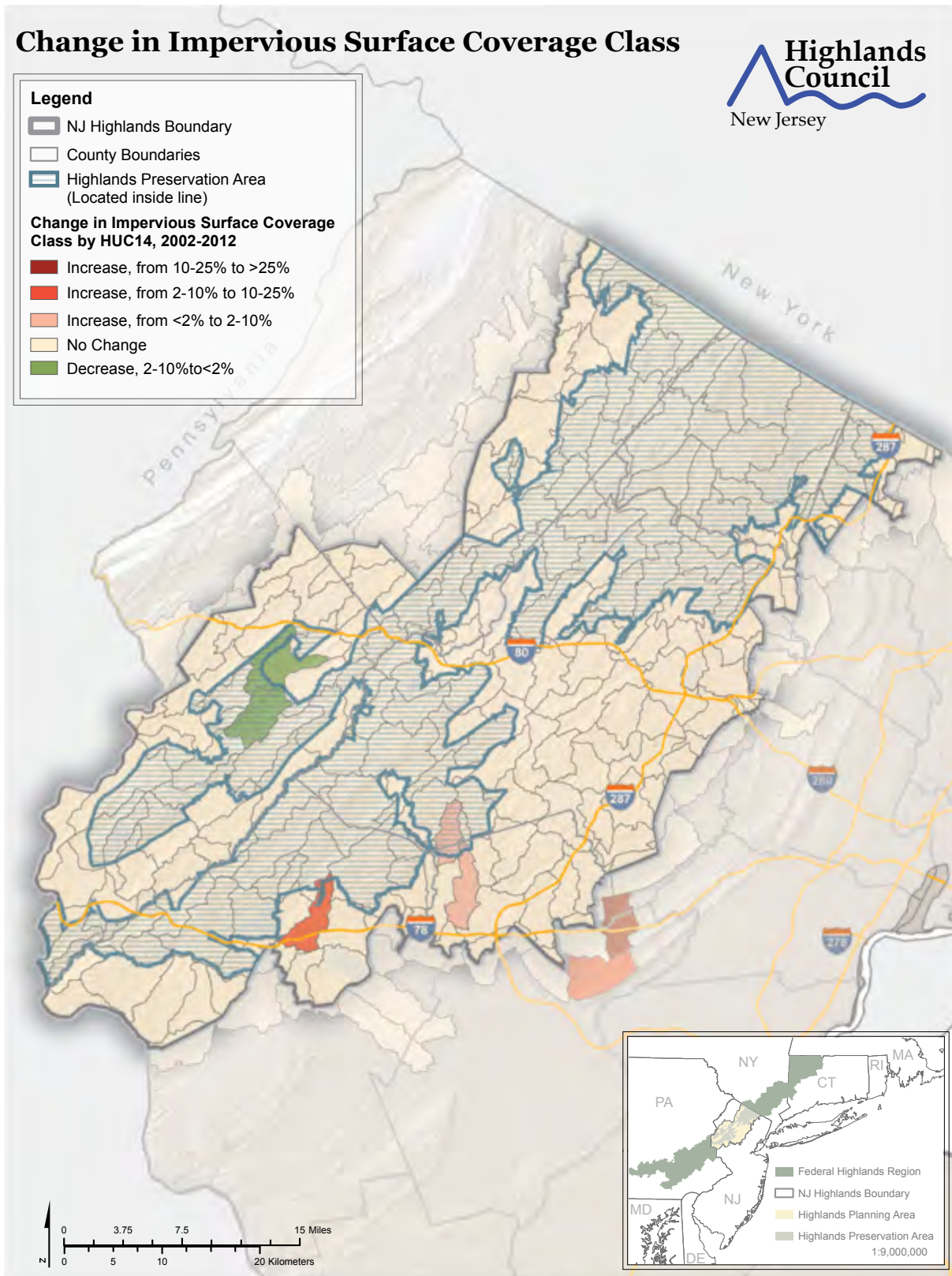
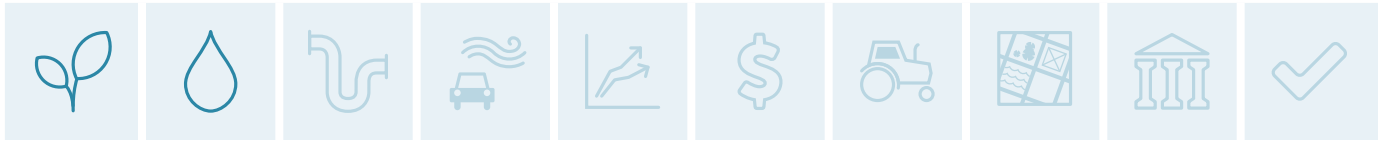


Figure 2: Change in Impervious Surface Cover Classification, 2002-2012



Surface Water Quality



RMP GOALS

- 1L** Protection of Highlands Region lakes from the impacts of present and future development.
- 1M** Protect the unique character of Highlands lake communities.
- 2F** Assessment and restoration of surface and ground-water quality of the Highlands Region.
- 2G** Protection, restoration and enhancement of the water quality of the Highlands Region.

RMP PROGRAMS

- Water Quality Restoration

DESCRIPTION

Measures change in designated use support status and impairment by HUC14 subwatershed.

BACKGROUND

The Highlands RMP provides policies emphasizing the protection, enhancement, and restoration of water resources throughout the region, including surface waters that support aquatic ecosystem sustainability and provide necessary water supplies for the state.

- Surface Water Quality – the NJDEP’s Surface Water Quality Standards (SWQSS) establish designated uses and specify the water quality criteria necessary to achieve these uses and protect the state’s waters. The Statewide Integrated Water Quality Monitoring and Assessment Reports describe progress toward attainment of the designated uses of surface waters of the state, including aquatic life, recreation, drinking water, fish consumption, shellfish consumption, industrial, and agricultural uses.
- Total Maximum Daily Loads (TMDLs) – defined by the NJDEP as a pollutant budget for an impaired waterbody: in other words, the maximum amount of a pollutant that a waterbody can receive and still meet SWQSS. A TMDL serves as a planning tool and poten-

tial starting point for restoration or protection activities with the ultimate goal of attaining or maintaining water quality standards.

For this indicator, designated use support was analyzed by HUC14 subwatershed in relation to the Highlands Region to assess change in surface water quality over time. In addition, a list of impaired waterbodies in the Highlands Region requiring development of a TMDL is included as a reference that can be monitored over time to determine progress.

UNIT AND FREQUENCY OF ANALYSIS

Data sets and how they were used for the analysis are described below. Each data set is intersected with the Highlands Region and HUC14 subwatersheds.

Surface Water Quality

This measure is described in the Designated Use Support data, which is published in the NJDEP Division of Water Monitoring and Standards Statewide Integrated Water Quality Monitoring and Assessment Report (Integrated Report), available every two years (reporting the previous 5 years) from 2006 to 2014.

- The attainment status by designated use type was compared over time to identify any significant trend or change in quality by HUC14 subwatershed. Change in designated use support could not be assessed for subwatersheds with insufficient information as reported in either the 2006 or 2014 Integrated Report. Therefore, this trend analysis includes only subwatersheds with sufficient information.
- As data is reported by HUC14 subwatershed, this analysis includes information for the entirety of the subwatershed, even in cases where they are only partially within the Highlands Region.

Total Maximum Daily Loads

This measure is taken from NJDEP’s 303(d) List of Water Quality Limited Waters (303(d) List). The 303(d) List is part of the Integrated Report and identifies pollutant causes of water quality impairment that require TMDL development.

Table 1: Highlands Region 2014 Two-Year TMDL Schedule

WMA	Assessment Unit Number	Assessment Unit Name	Parameter
4	02030103140010-01	Hohokus Bk (above Godwin Ave)	Total Phosphorus
4	02030103140040-01	Saddle River (above Ridgewood gage)	Total Suspended Solids
8	02030105010060-01	Raritan R SB (Califon br to Long Valley)	pH
8	02030105020050-01	Beaver Brook (Clinton)	Total Phosphorus
8	02030105020070-01	Raritan R SB (River Rd to Spruce Run)	Total Phosphorus, Total Suspended Solids
8	02030105040030-01	Holland Brook	Total Phosphorus
8	02030105050020-01	Lamington R (Hillside Rd to Rt 10)	Total Phosphorus
8	02030105050070-01	Lamington R (HallsBrRd-HerzogBrk)	pH, Total Phosphorus
8	02030105050090-01	Rockaway Ck (below McCrea Mills)	Total Phosphorus
8	02030105050100-01	Rockaway Ck SB	Total Phosphorus, Total Suspended Solids
8	02030105060040-01	Raritan R NB (Peapack Bk to McVickers Bk)	Total Suspended Solids

STATUS

As of 2016, using the most recent data available (data collection period for the 2014 Integrated Report was January 1, 2008 through December 31, 2012), more than half of the Highlands Region's HUC14 subwatersheds did not support general aquatic life and recreational uses. Less than half of the Highlands Region's subwatersheds did not support aquatic life (trout specifically), but a high percentage of subwatersheds either had insufficient data to determine attainment status for this use or do not contain trout-producing streams. Meanwhile, just under half of the region's subwatersheds fully support drinking water supply use, but again, a high percentage of subwatersheds had insufficient data to determine attainment status for this use (Figure 2). Finally, 78% of the Region's subwatersheds had insufficient data to determine fish consumption attainment, but the use skewed toward not supporting for subwatersheds with sufficient data.

As of 2014, using the most recent data available for TMDL reporting (data collection period January 1, 2008 through December 31, 2012), there were 11 impaired waterbodies in the Highlands Region listed as requiring the development of a TMDL (Table 1). It should be noted however, that as of the writing of this report, the most recent 303(d) List was still in draft form. The most common water quality parameters in violation of the New Jersey's Surface Water Quality Standards, for which Highlands Region TMDL development is required, are total phosphorous, total suspended solids, and pH, all located in Watershed Management Areas (WMAs) 4 (Lower Passaic and Saddle Rivers) and 8 (North and South Branch Raritan River).

The status of all TMDLs that have been developed by the NJDEP can be found online at www.nj.gov/dep/wms/bears/tmdls.html. TMDL status is listed as proposed, established, approved or adopted. Further details regarding these designations are available at this link.

TREND

Since adoption of the RMP in 2008, when considering only those subwatersheds that had sufficient data in both the 2006 and 2014 Integrated Reports, aquatic life (general and trout) and drinking water uses showed more subwatersheds trending negative, from fully supporting to not supporting, than those trending positive, from not supporting to fully supporting (Figure 1 and 3). Meanwhile, recreation use experienced more positive trending than negative during the same period. There was insufficient data during the analysis period to complete a trend analysis for fish consumption use attainment. Overall, there were no readily apparent patterns in the location of improving or declining subwatersheds. Moreover, a significant number of subwatersheds had insufficient data in the analysis years (2006 and 2014 Integrated Report data) across all designated use types to provide an accurate and meaningful picture of attainment trends within the Highlands Region.

DATA CONFIDENCE

Acknowledging that the delineation of HUC14 subwatersheds dataset has recently changed in the Highlands Region, the 2005 subwatershed (HUC14) dataset used in the 2008 RMP was also used for the display of this analysis in order to maintain consistency for comparison purposes, even though the data is reported using the newer 2010 subwatershed designations.

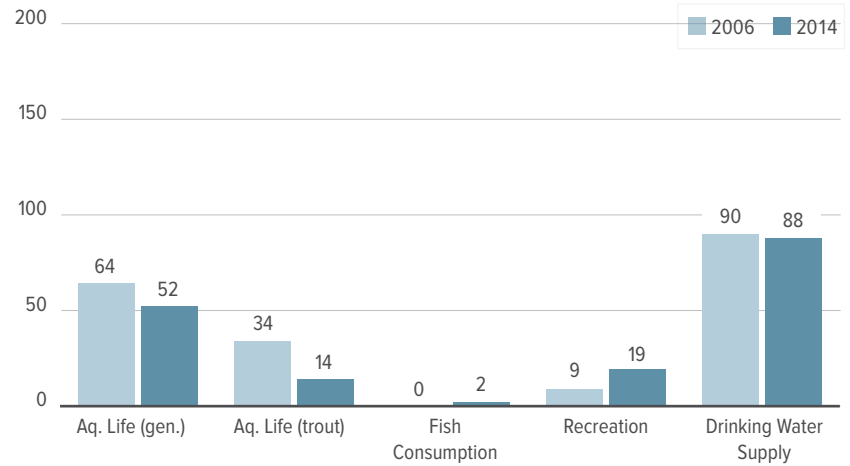
The NJDEP Division of Water Monitoring and Standard's Integrated Report contains a significant amount of insufficient data across all designated uses; thus, the datasets are unsatisfactory for analyzing change in designated use attainment in many cases. It is also important to note that the most recent Integrated Report (2014) was still listed as draft as of the writing of this report and therefore it is possible that there may be changes made to that report. In

Figure 1: Change in Designated Use Support (2006-2014)

Fully Supporting

	2006	2014	Diff.
Aq. Life (gen.)	64	52	-12
Aq. Life (trout)	34	14	-20
Fish Consumption	0	2	2
Recreation	9	19	10
Drinking Water Supply	90	88	-2

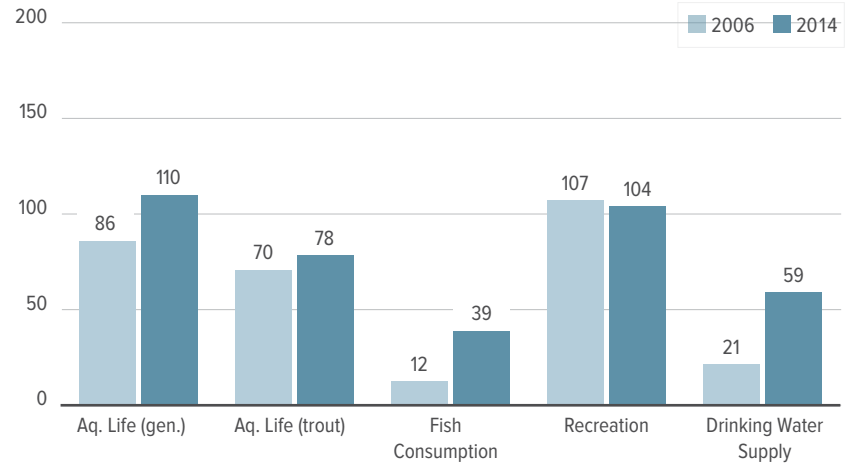
Number of Subwatersheds



Not Supporting

	2006	2014	Diff.
Aq. Life (gen.)	86	110	24
Aq. Life (trout)	70	78	8
Fish Consumption	12	39	27
Recreation	107	104	-3
Drinking Water Supply	21	59	38

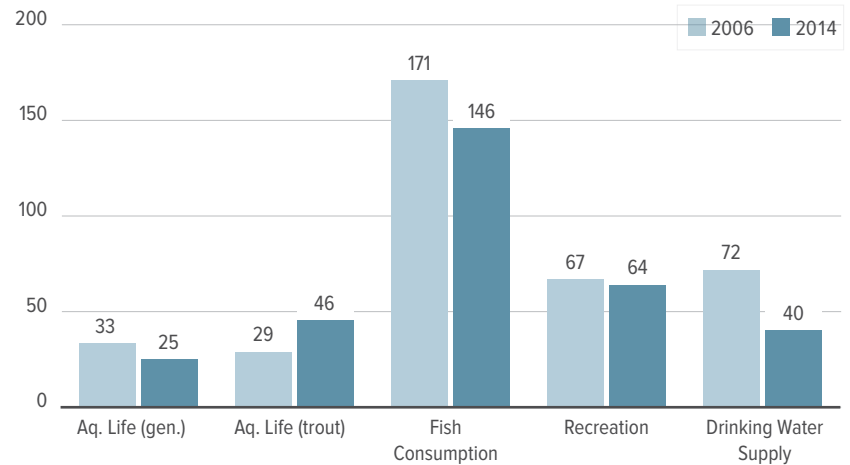
Number of Subwatersheds



Insufficient Data

	2006	2014	Diff.
Aq. Life (gen.)	33	25	-8
Aq. Life (trout)	29	46	17
Fish Consumption	171	146	-25
Recreation	67	64	-3
Drinking Water Supply	72	40	-32

Number of Subwatersheds



In addition, the data collection period for incorporation into the 2014 Integrated Report was January 1, 2008 through December 31, 2012. In general, there is a two year overlap in the data collection period from report to report. Including more recent data in the analysis of this indicator may aid in the development of more significant use attainment trends.

MILESTONES

- Increase in the number of HUC14 subwatersheds with fully supporting designated use status as a result of improved surface water quality.

SECONDARY INDICATORS

Fish Consumption Advisories: Measures change in the number of fish consumption advisory locations.

Fish IBI Assessment: Measures change in the Fish Index of Biotic Integrity Assessment of Highlands Region waters.

Figure 2: Drinking Water Attainment Status, 2014

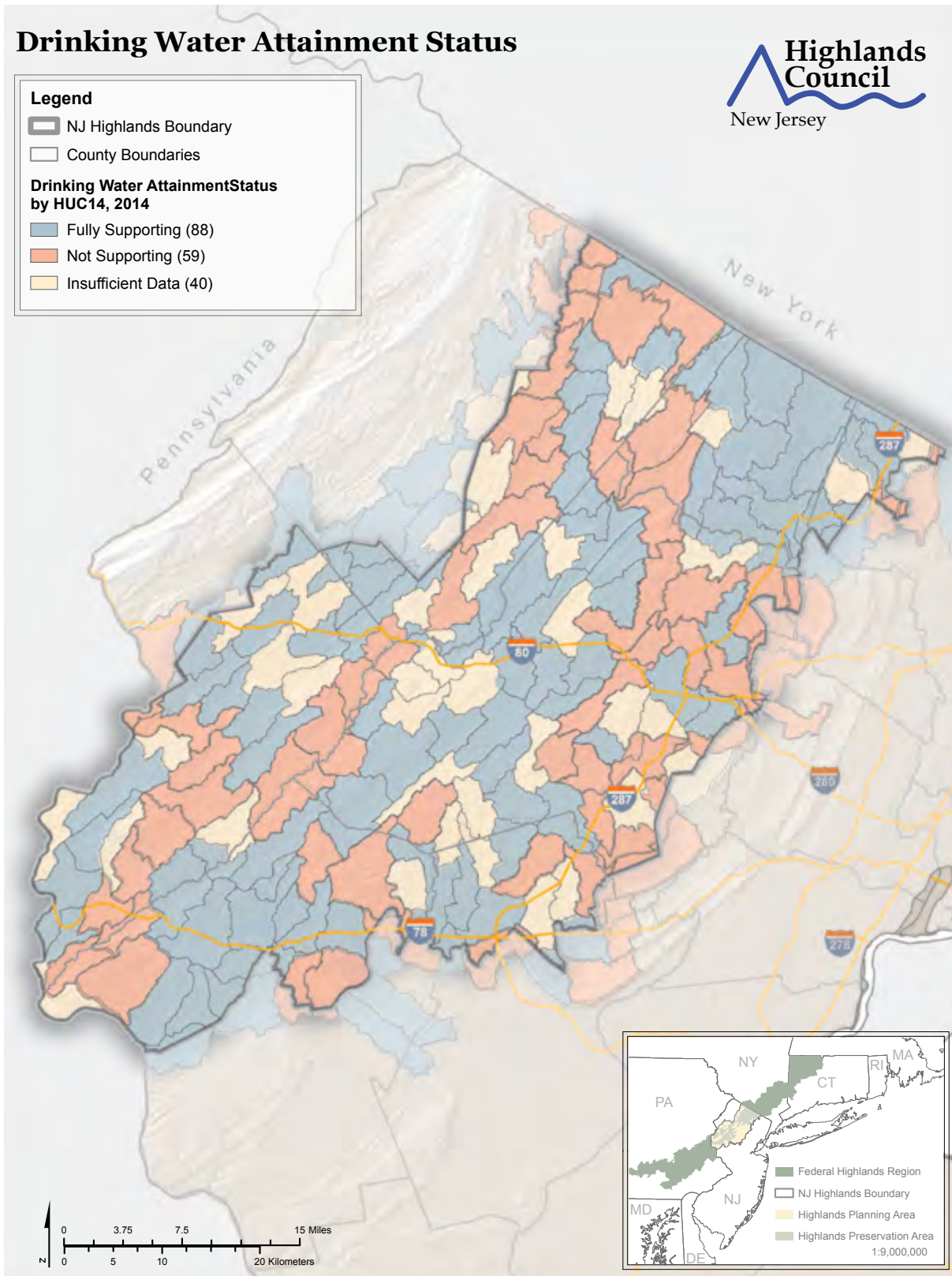
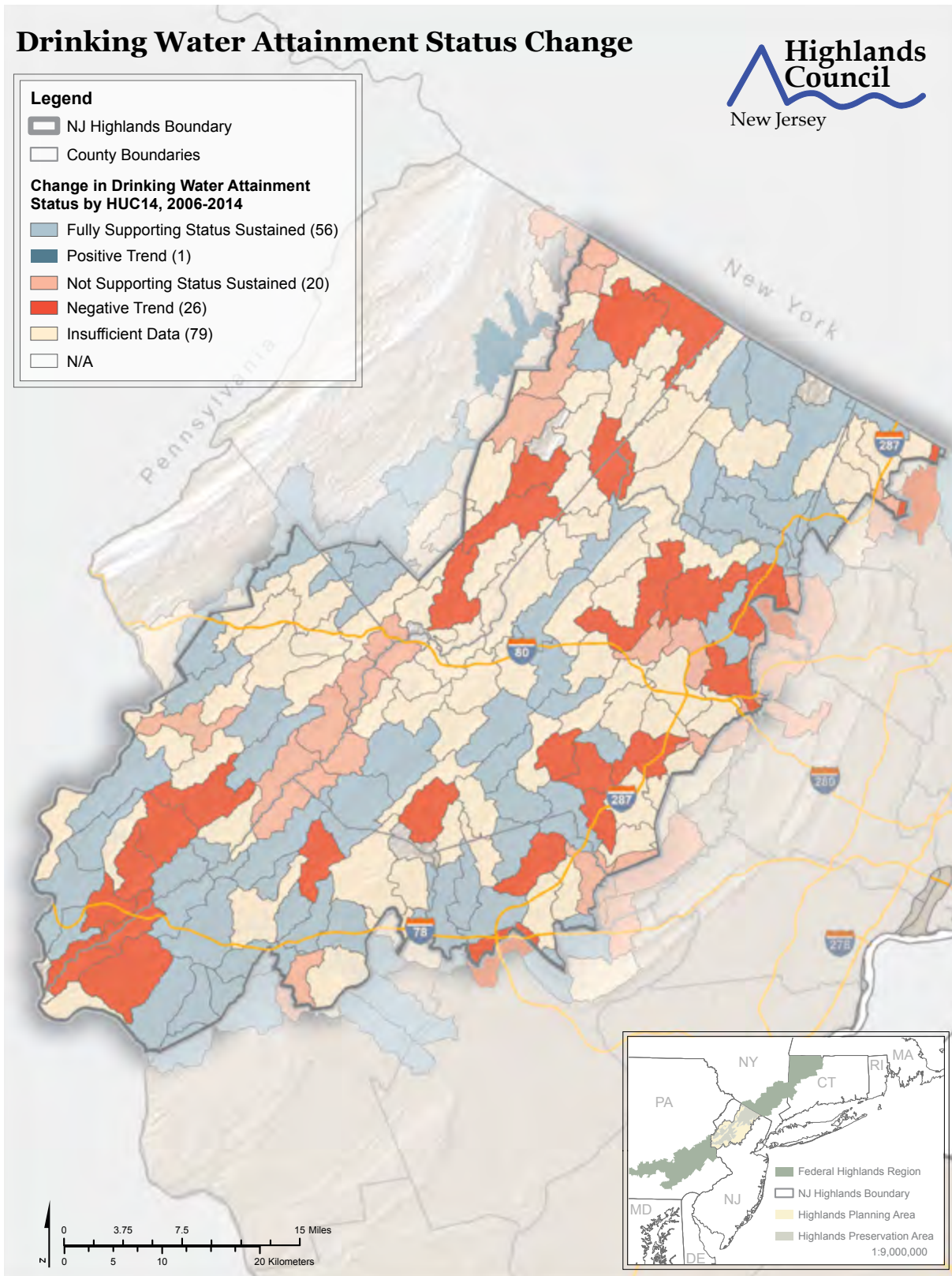


Figure 3: Change in Drinking Water Attainment Status, 2006-2014



Water Use



RMP GOALS

2B Protection, restoration and enhancement of water quality and quantity of surface and ground waters (sections 10.b(1) and 10.c(1)), and to determine “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...” (section 11.a.(1)(a)).

2J All existing and future development in the Highlands Region that use public water supply systems are served by adequate and appropriate infrastructure.

RMP PROGRAMS

- Highlands Restoration: Water Deficits, The Efficient Use of Water

DESCRIPTION

Measures change in water withdrawal by HUC14 subwatershed for major use types, including agricultural, commercial, industrial, irrigation, mining, potable supply, and power generation.

BACKGROUND

The Highlands RMP provides policies designed to ensure that public funds and other resources are focused on protection of Highlands resources by providing guidance on water use efficiency, conservation, and availability to establish sustainable thresholds in support of current needs and future population growth.

- Water Use - defined by the NJDEP Bureau of Water Allocation (BWA) as all water use withdrawal sites covered by all the permits, registrations and certifications it has issued for the Highlands Region.

For this indicator, water withdrawals were analyzed in relation to the Highlands Region and HUC14 subwatersheds to assess change in water use over time.

UNIT AND FREQUENCY OF ANALYSIS

Data sets and how they were used for the analysis are described below. Each data set is intersected with the Highlands Region and HUC14 subwatersheds.

NJ Water-Tracking Data Model (NJWaTr)

This data is obtained from the NJGS; model tracks all water withdrawals, returns, transfers, and usage across the state. Most recent data available is from 2011.

- Highlands Region total overall water withdrawal including median, minimum and maximum, as well as trend, was calculated for each HUC14 subwatershed for the years 2003 through the 2011 data collection period. Additionally, water withdrawals by major use type (agricultural, commercial, industrial, irrigation, mining, potable supply, and power generation) are compared over the duration of the data collection period.

STATUS

As of 2016, using the most recent data available for water use (2011), Highlands Region water withdrawals totaled 3,590 million gallons per year (MGY). Potable water supply accounts for the largest amount of Highlands Region withdrawals at 3,391 MGY.

TREND

A HUC14 subwatershed analysis reveals that nearly 70% of HUCs in the Highlands Region experienced either no significant change in water use or a decrease in water use between 2003 and 2011 (Figure 1). In addition, overall consumptive uses throughout the region are down 27% for the same time period (Table 1).

Among consumptive uses (Table 1), potable supply has consistently remained the largest use and decreased 23% between 2003 and 2011. Mining, a relatively small water use, was the only consumptive use to increase over the time period. The notable change in power generation – going from the second highest consumptive use in 2003, to zero use in 2011 – is due to a variety of factors including the cancellation and/or sale of Water Allocation Permits. Currently, industrial and agricultural uses constitute the highest non-potable consumptive uses, but represent relatively small uses comparatively. All consumptive uses generally trended downward between 2003 and 2011 (Figures 2 and 3).

Table 1: Water use trends by consumptive purpose (MGY*), 2003-2011

		Agriculture	Commercial	Industrial	Irrigation	Mining	Potable Supply	Power Generation	Total
2003	MGY	109.90	9.09	138.79	13.52	5.88	4,415.86	228.20	4,921.24
	Percent	2.2%	0.2%	2.8%	0.3%	0.1%	89.7%	4.6%	100.0%
2004	MGY	107.50	9.78	125.06	15.46	6.41	4,213.74	36.85	4,514.80
	Percent	2.4%	0.2%	2.8%	0.3%	0.1%	93.3%	0.8%	100.0%
2005	MGY	121.04	10.21	142.77	27.63	4.22	4,695.84	15.98	5,017.70
	Percent	2.4%	0.2%	2.8%	0.6%	0.1%	93.6%	0.3%	100.0%
2006	MGY	123.02	9.02	116.82	18.68	4.06	4,120.10	138.62	4,530.33
	Percent	2.7%	0.2%	2.6%	0.4%	0.1%	90.9%	3.1%	100.0%
2007	MGY	125.27	10.63	83.49	25.37	3.37	4,003.54	8.54	4,260.19
	Percent	2.9%	0.2%	2.0%	0.6%	0.1%	94.0%	0.2%	100.0%
2008	MGY	123.77	10.99	87.99	23.87	3.84	3,815.29	0.21	4,065.98
	Percent	3.0%	0.3%	2.2%	0.6%	0.1%	93.8%	0.0%	100.0%
2009	MGY	102.38	13.40	77.80	13.31	2.93	3,533.32	0.11	3,743.25
	Percent	2.7%	0.4%	2.1%	0.4%	0.1%	94.4%	0.0%	100.0%
2010	MGY	121.49	9.11	88.96	24.91	4.01	3,525.64	0.11	3,774.22
	Percent	3.2%	0.2%	2.4%	0.7%	0.1%	93.4%	0.0%	100.0%
2011	MGY	89.82	5.59	84.68	12.46	6.62	3,390.96	-	3,590.14
	Percent	2.5%	0.2%	2.4%	0.3%	0.2%	94.5%	0.0%	100.0%
Change 2003-2011	MGY	(20.08)	(3.49)	(54.11)	(1.06)	0.74	(1,024.89)	(228.20)	(1,331.10)
	Percent	-18.3%	-38.5%	-39.0%	-7.9%	12.6%	-23.2%		-27.0%
2003-2011	Median	121.04	9.78	88.96	18.68	4.06	4,003.54	8.54	4,260.19
	Minimum	89.82	5.59	77.80	12.46	2.93	3,390.96	-	3,590.14
	Maximum	125.27	13.40	142.77	27.63	6.62	4,695.84	228.20	5,017.70

*Million Gallons per Year

DATA CONFIDENCE

The analysis of change in water use was performed using data catalogued by the NJGS from 2003 through 2011. This dataset was found to be satisfactory for analyzing change in water use from a time period prior to the adoption of the RMP to a short period following; however, including more recent data on water use would improve the statistical significance of the trends. Additional water use data for 2012 and 2013 is scheduled to be released shortly by the NJGS.

Acknowledging that the delineation of HUC14 subwatersheds dataset has recently changed in the Highlands Region, the 2005 Subwatershed (HUC14) dataset used in the 2008 RMP was also used for displaying the results of this analysis in order to maintain consistency for comparison purposes. Water use numbers were calculated based on the newer HUC14 subwatershed delineation as this is how the NJWaTr database tracks use.

MILESTONE

- Decrease in water use

SECONDARY INDICATORS

Non-Revenue Water: Measures amount of water lost in transmission, metering, and operations.

Water Use Efficiency: Measures change in per capita and consumptive use of water.

Figure 1: Water Use Trend, 2003-2011

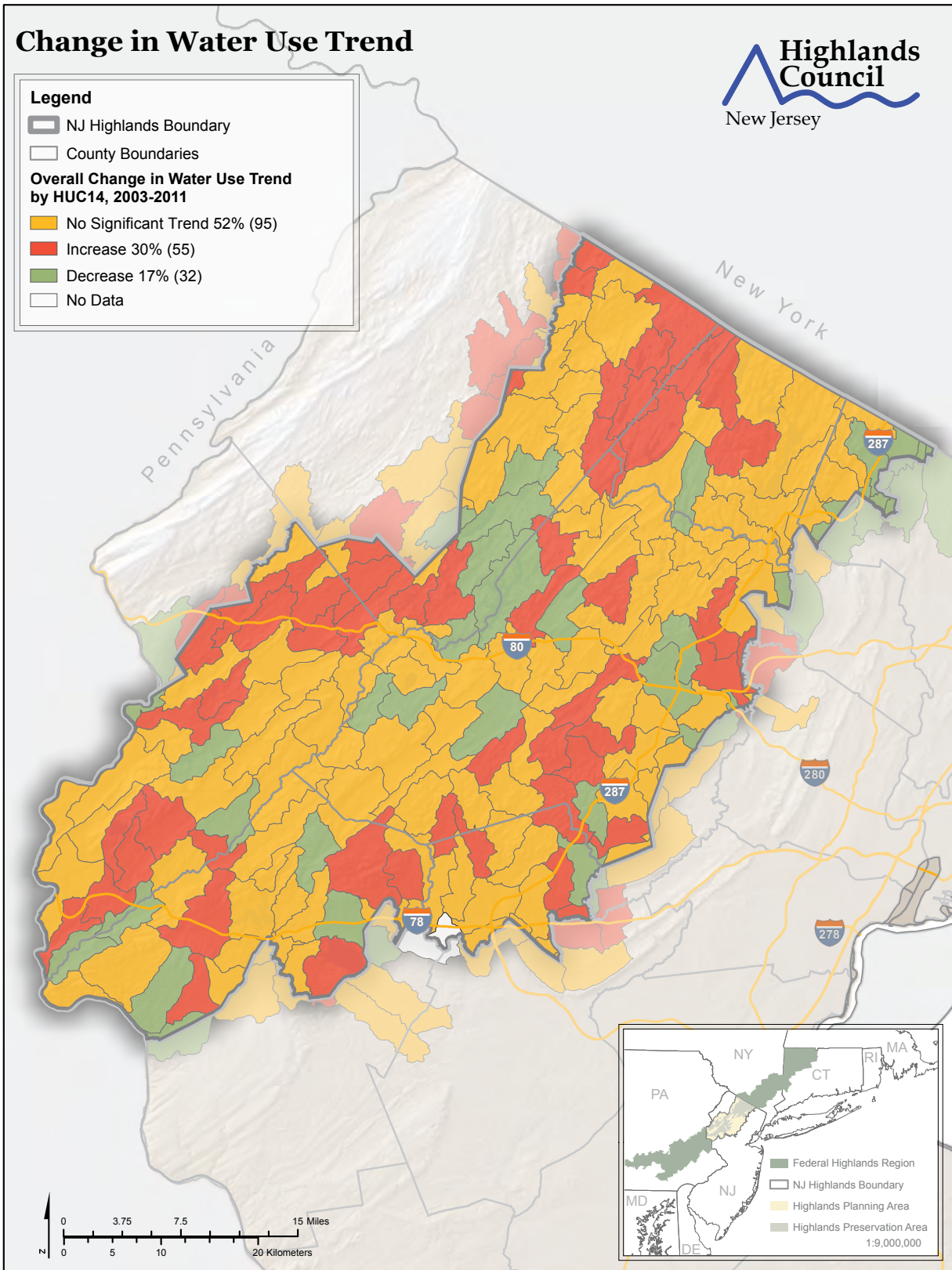
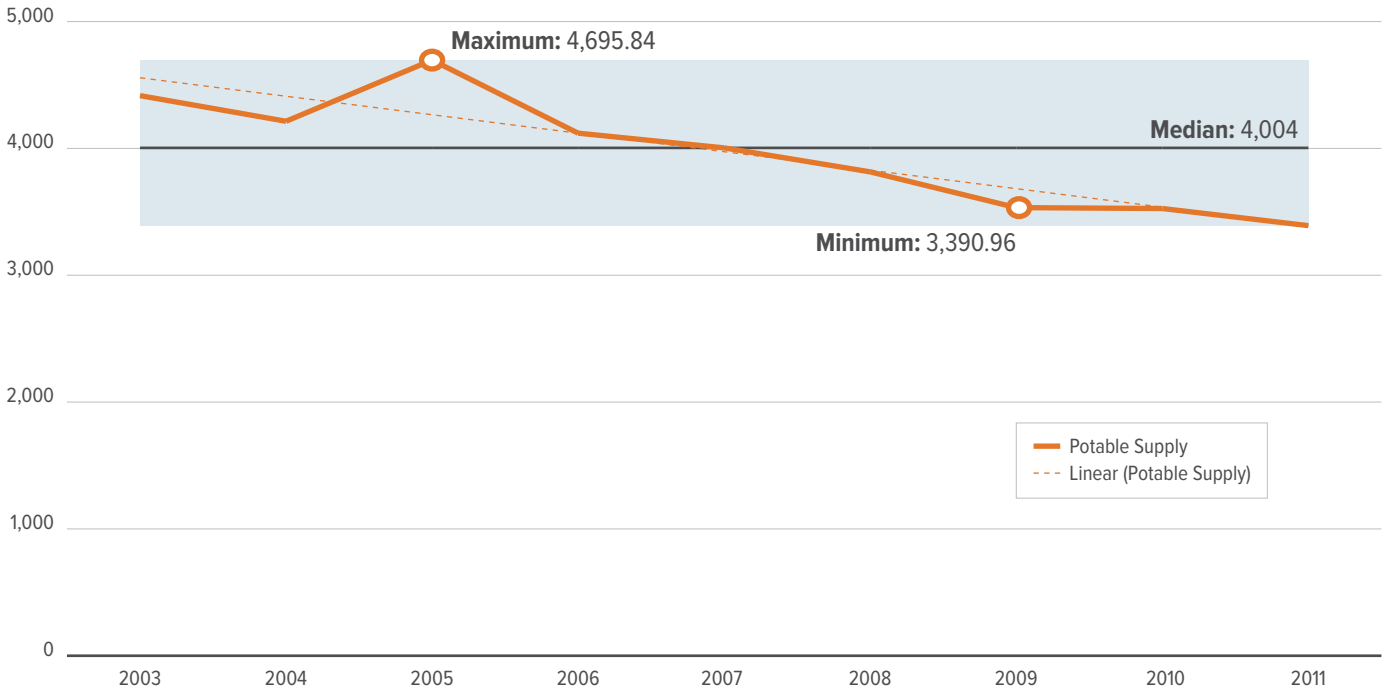
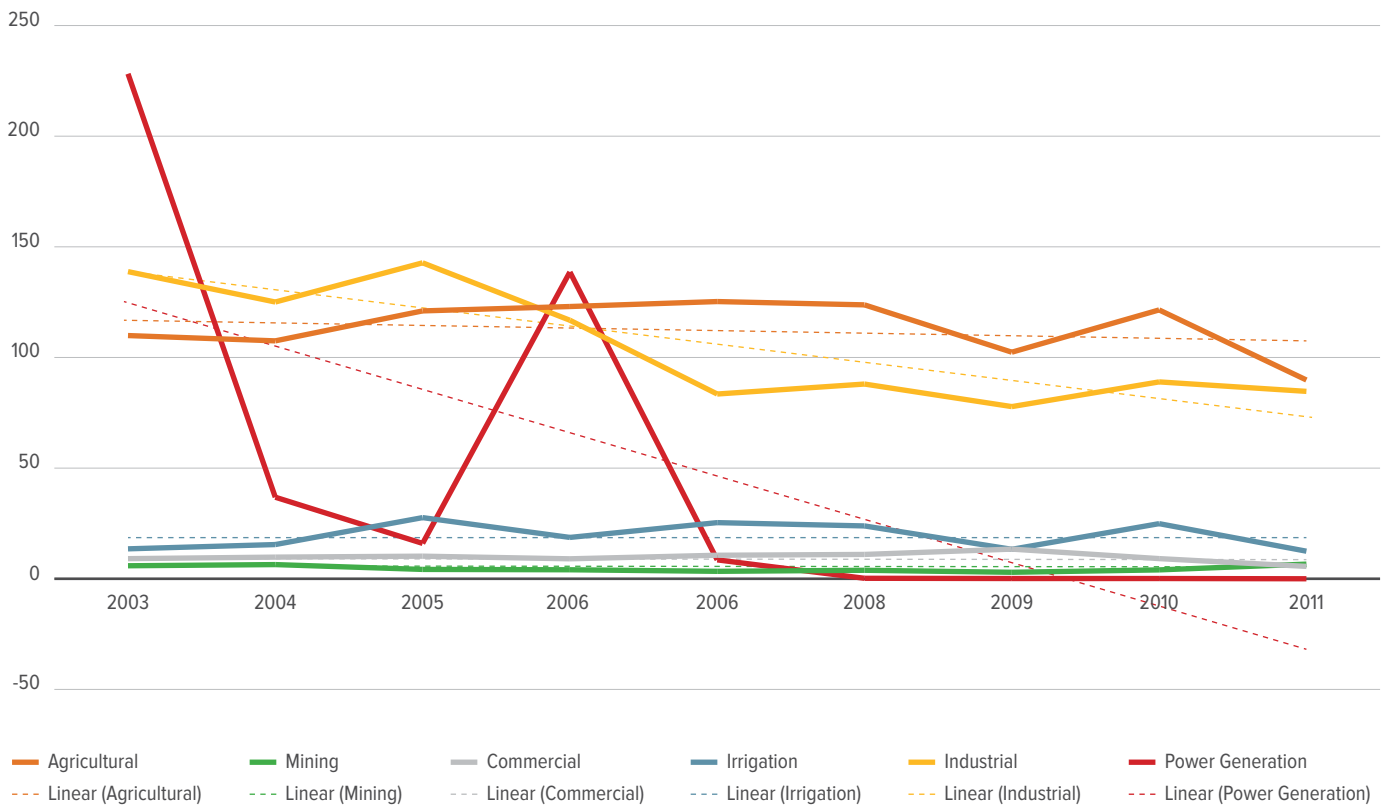


Figure 2: Potable supply water use across the Highlands Region, 2003-2011

Water Use in Million Gallons per Year (MGY)



Water Use in Million Gallons per Year (MGY)

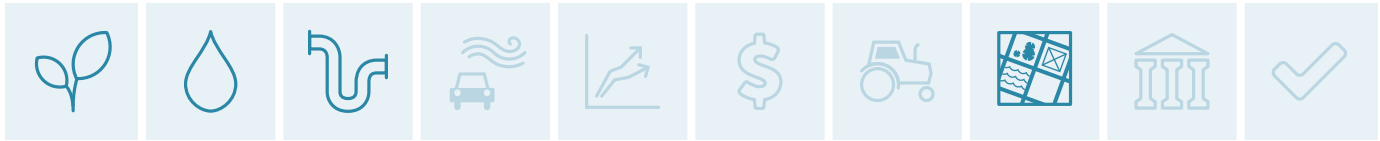




Water and Wastewater Utilities Indicators

- **Domestic Sewerage Facilities
Capacity and Demand**
- **Public Community Water Systems
Capacity and Demand**
- **Wastewater Utility Existing Areas Served**
- **Water Supply Existing Areas Served**

Domestic Sewerage Facilities Capacity and Demand



RMP GOALS

2K All existing and future development in the Highlands Region that use public wastewater treatment systems are served by adequate and appropriate infrastructure.

RMP PROGRAMS

- Water and Wastewater Utilities (Verification of Available Facility Capacity for Water Supply and Wastewater Utilities; Identification of Resource and Regulatory Constraints on Utility Capacity; Protection of Environmental Resources within Service Areas; Build Out Analysis for the Existing Area Served in the Highlands, and Non-Highlands Approved Service Area; Proposed Service Areas, Infrastructure Needs and Densities)
- Wastewater System Maintenance (Verification of Available Facility Capacity for Water Supply and Wastewater Utilities; Identification of Resource and Regulatory Constraints on Utility Capacity; Protection of Environmental Resources within Service Areas; Build Out Analysis for the Existing Area Served in the Highlands, and Non-Highlands Approved Service Area; Proposed Service Areas, Infrastructure Needs and Densities)

DESCRIPTION

Measures change in domestic wastewater sewerage facility current available capacity and discharge by facility.

BACKGROUND

The Highlands RMP provides policies designed to ensure that all existing and future developments that use public wastewater treatment are served by adequate and appropriate infrastructure. The basis for measuring the effectiveness of these policies is to identify areas currently served by existing wastewater facilities, identify areas that are appropriate for future expansion of infrastructure, and then determine available wastewater system capacity and ability to support additional development.

- Highlands Domestic Sewerage Facility (HDSF) - defined in the RMP as publicly owned and investor-owned domestic wastewater treatment facilities that provide wastewater treatment to municipalities and have collection systems that may be capable of supporting redevelopment and regional growth opportunities. These facilities generally have New Jersey Department of Environmental Protection (NJDEP) permitted discharge capacities of more than either 0.150 million gallons per day (MGD) for discharge to surface water or 0.075 MGD for discharge to ground water.

For this indicator, Highlands Domestic Sewerage Capacity was analyzed within the Highlands Region to assess change in capacity over time.

UNIT AND FREQUENCY OF ANALYSIS

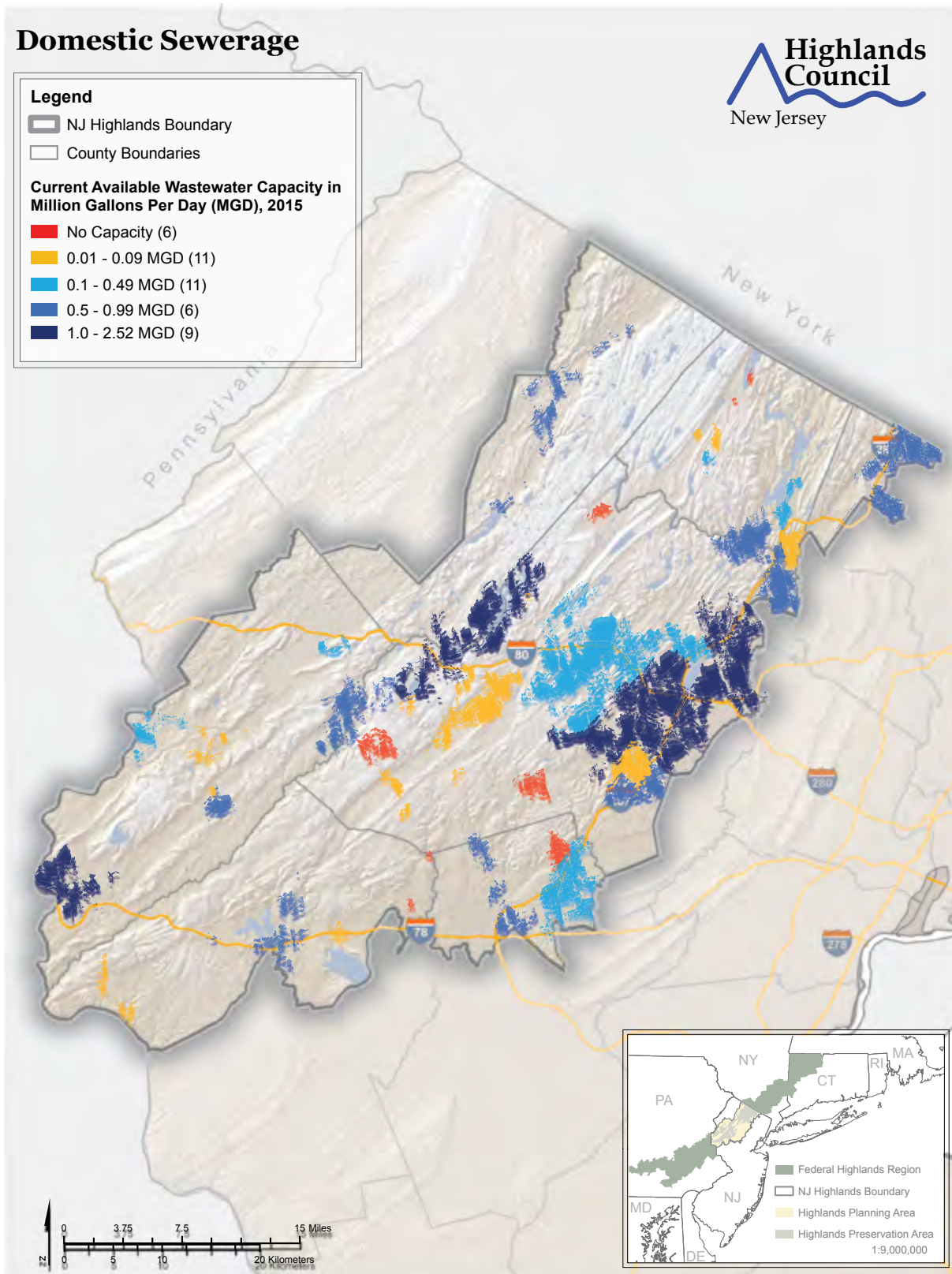
Data sets and how they were used for the analysis are described below. Each data set is intersected with the Highlands Region.

Highlands Domestic Sewerage Capacity

Wastewater treatment capacity for each HDSF was estimated for the pro rata portion of the service area inside of the Highlands Region by subtracting the maximum three-month period from the total permitted capacity.

- Wastewater Discharge – a NJDEP dataset depicting actual sewage flows for the maximum three-month period from 2004 to 2015.
- Domestic Sewerage Capacity – a NJDEP dataset depicting total permitted capacity from 2004 to 2015.

Figure 1: Highlands Domestic Sewerage Capacity, 2015



STATUS

As of 2016, using the most recent data available (2015), there were 43 HDSFs representing a total wastewater treatment capacity of approximately 121.64 MGD and a total discharge flow at the maximum three-month (M3M) rate of 81.14 MGD (Figure 1). Some of these facilities have service areas that extend beyond the Highlands Region, so a pro rata allocation based on the relative portion of the service area in and outside of the Highlands Region was used to estimate a Highlands Region treatment capacity of approximately 78.45 MGD and a total discharge flow at the M3M rate of 50.80 MGD, or approximately 67% of the total treatment capacity. Individual facilities have M3M rates ranging from 60% to 169% of total treatment capacity (with any value over 100% indicating a deficit), and from a deficit of 0.05 MGD to a surplus of 2.52 MGD of current available capacity.

TREND

Since adoption of the RMP in 2008, most HDSFs have seen negligible variability in available capacity. A few facilities see more dramatic variability year over year, including Parsippany-Troy Hills Wastewater Treatment Plant, Rockaway Valley Regional Sewerage Authority, and Two Bridges Sewerage Authority. This variability may indicate a need for further research to determine a possible cause. In addition, 18 facilities demonstrate an 11-year average (2004-2015) that is negative or in the lowest capacity tier, also warranting further research with regard to potential cause and location within the Highlands Region relative to critical resources.

DATA CONFIDENCE

The data for domestic sewerage facilities capacity and demand was provided to the Highlands Council by the NJDEP for each facility. While the data is accurate for each system, values for facilities extending outside the Highlands Region had a pro rata value applied to them to estimate the percentage of capacity and demand inside the Highlands Region. The demand of a sewerage facility is not necessarily spread evenly over the entire service area; thus this method may introduce some level of error for the domestic sewerage facilities in question. This data shows that many facilities have capacity to handle more sewage. This available capacity may be beneficial for areas experiencing failing septic systems and areas with existing cesspools.

MILESTONE

- Stabilize or decrease demand in areas where the wastewater facility is over permit level, while reducing the number of facilities that have a deficit capacity.

SECONDARY INDICATORS

- Wastewater Management Planning
- Change in land use in Sewer Service Areas
- Density of Sewer Service Areas

Public Community Water Systems Capacity and Demand



RMP GOALS

2J All existing and future development in the Highlands Region that use public water supply systems are served by adequate and appropriate infrastructure.

RMP PROGRAMS

- Verification of available facility capacity for water supply and wastewater utilities
- Identification of resource and regulatory constraints on utility capacity
- Identification of additional constraints on utility capacity
- Build-out analysis for the existing area served in the Highlands and non-Highlands approved service area
- Proposed service areas, infrastructure needs and densities in Highlands Existing Community Zones
- Build-out analysis for proposed service areas in Highlands Existing Community Zones
- Proposed service areas, infrastructure needs and densities in Highlands Protection and Conservation Zones
- Potential service areas for clusters, redevelopment areas, exempt parcels and public health exemptions
- Utility services element

DESCRIPTION

Measures change in public community water systems monthly capacity and demand.

BACKGROUND

The Highlands RMP provides policies designed to ensure that public funds and other assets are focused on the protection of Highlands resources by directing future growth where water infrastructure and capacity are available.

- Public Community Water System (PCWS) - defined in the RMP as having at least 15 service connections used by year-round residents or regularly serving at least 25 year-round residents. PCWS facilities may be sourced from ground water or surface water withdrawals and may be owned and operated by governmental entities (either as municipal operations or as utility authorities) or investor-owned utilities. There are 138 PCWS facilities in the Highlands; however, 61 were not included in this analysis either because they have no flow information or are too small to require water allocation permits and, therefore, are not required to report withdrawal rates. The remaining systems were grouped into 77 unique utilities according to Bureau of Water Allocation (BWA) permit number.

For this indicators only the Highlands portions of each PCWS were analyzed to assess public water capacity and demand over time.

UNIT AND FREQUENCY OF ANALYSIS

Data sets and how they were used for this analysis are described below. Each data set is intersected with the Highlands Region.

Public Community Water System (PCWS)

Data related to PCWS capacity and demand is maintained by NJDEP. Total water system size and permitted monthly capacity for each PCWS by Public Water System Identification number (PWSID) was derived from NJDEP Data Miner for the years 2004-2011. Monthly PCWS withdrawal data for each PWSID grouped by BWA permit number was derived from the NJ Water – Tracking Data Model (NJWaTr) for the years 2004-2011. Reservoir systems were excluded from the analysis to be consistent with the initial analysis.

Figure 1: Public Community Water System Current Available Capacity, 2011

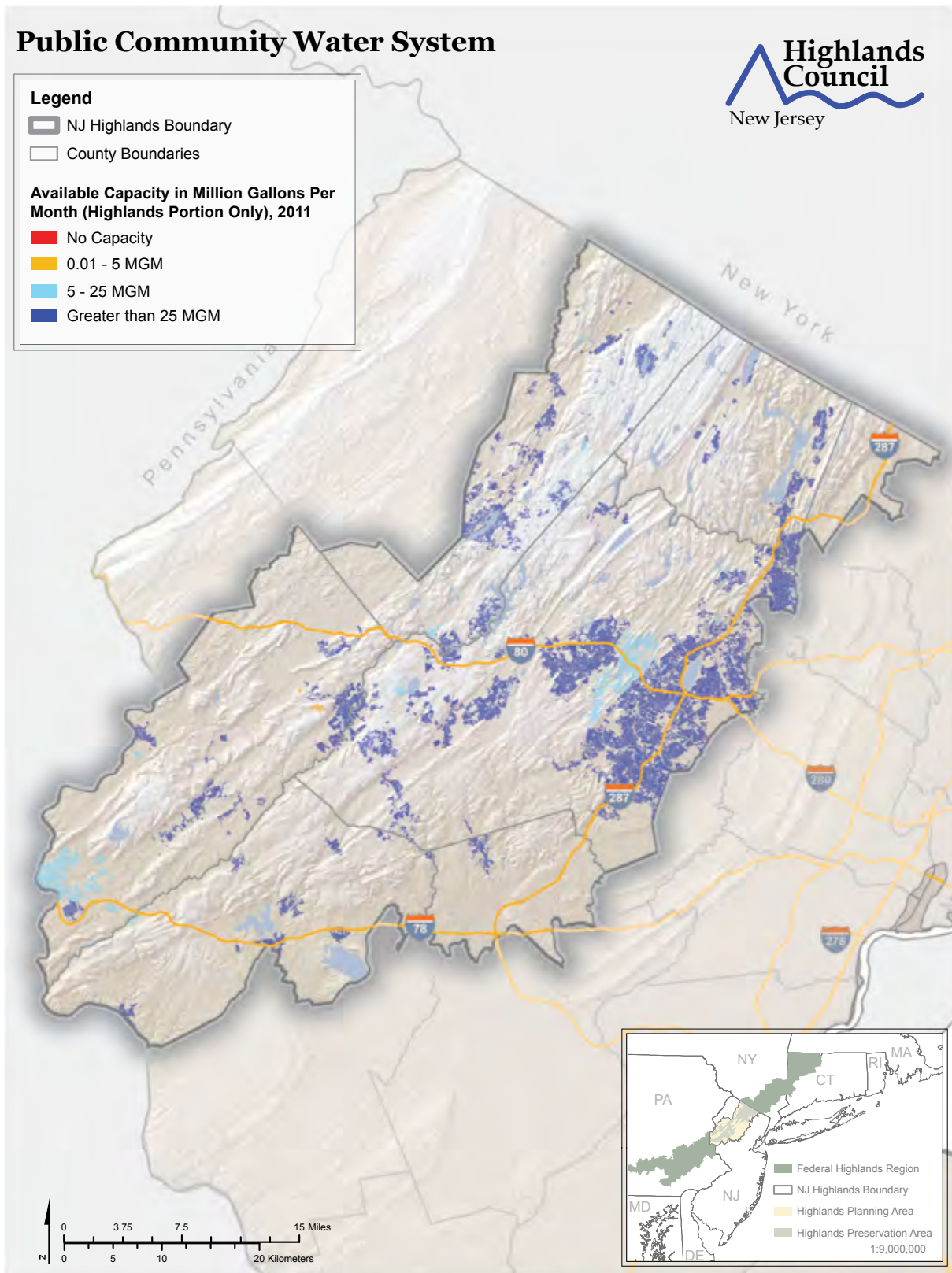


Figure 2: Average Monthly Demand for Large Systems

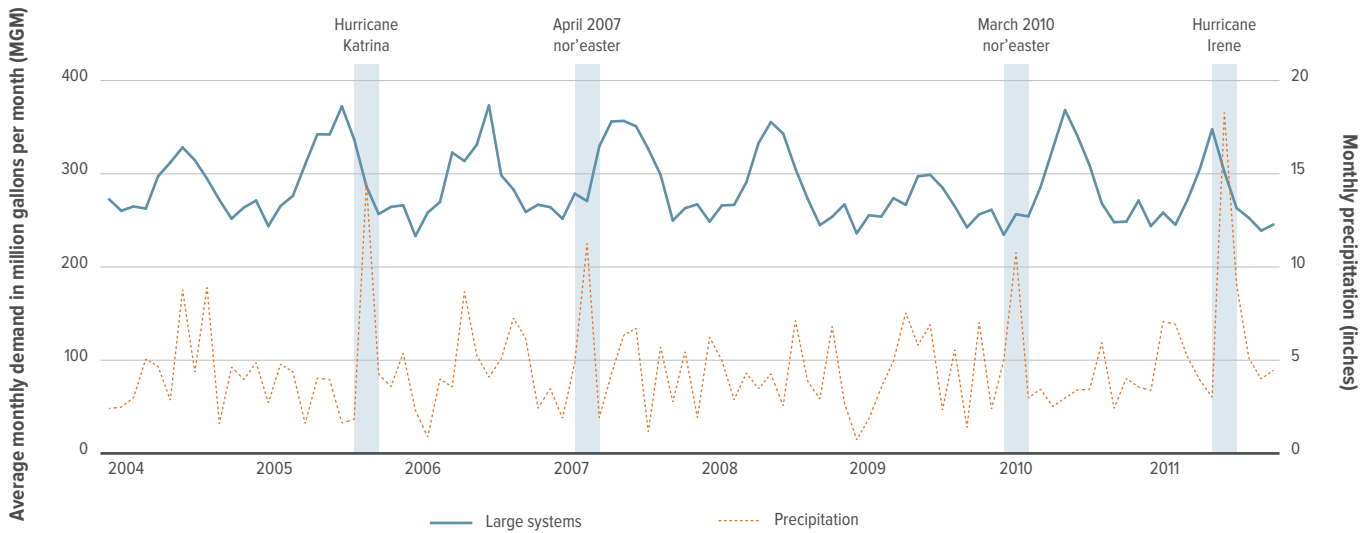


Figure 3: Average Monthly Demand for Small Systems

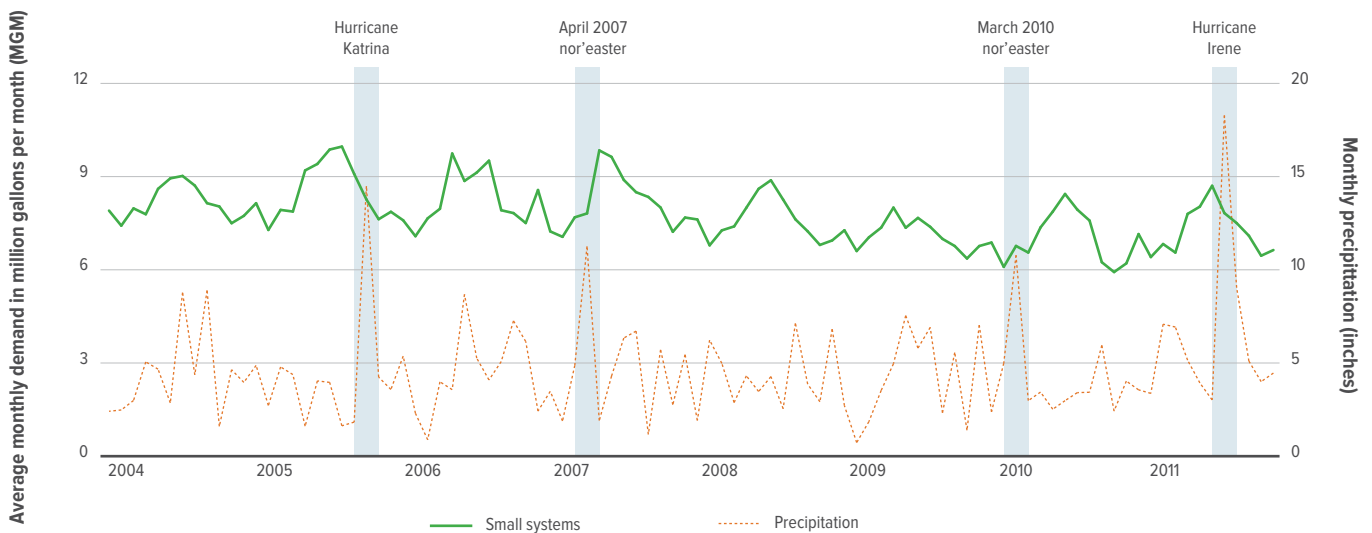
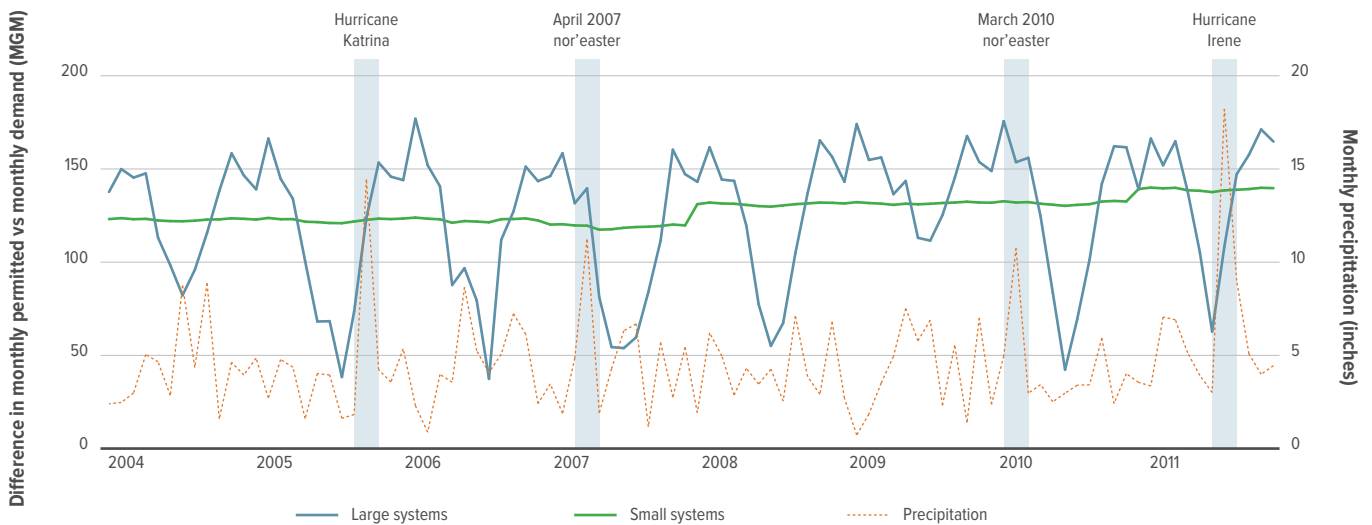


Figure 4: Average Available Capacity (Difference in Monthly Permitted Capacity and Demand)



Monthly withdrawals were compared to permitted monthly capacity of PWSID, grouped by BWA permit number, to demonstrate average available capacity for 2011, as well as a 10-year average available capacity trend. The PCWSs were also grouped according to size, with withdrawals over 365 million gallons per year (MGY) representing a “large” system and those under 365 MGY representing a “small” system. Where a PCWS crossed the boundary of the Highlands Region, only the portion within the Highlands is utilized.

Monthly Precipitation

Monthly precipitation data is maintained by the Office of the NJ State Climatologist.

Precipitation was tracked in relation to PCWS available capacity and demand to ascertain correlation for the 2004-2011 analysis period.

STATUS

As of 2016, using the most recent data available for each BWA permit (2011), the demand for water from these systems is an estimated average of nearly 6.5 billion gallons per month (BGM), with large systems averaging 270.6 MGM and small systems averaging 7.2 MGM. Based on the analysis, 36% of the systems in the Highlands Region have available capacity greater than 25 MGM, 52% have less than 25 MGM, and 12% have no capacity. As demonstrated in Figure 1, those with large capacity tend to be larger systems covering larger geographic areas, while those with little to no capacity are smaller systems. The largest of these systems are NJ American Water Company divisions (Elizabethtown and Short Hills), which have extensive service areas both within and outside of the Highlands Region but rely primarily on surface water supplies and non-Highlands Region ground water. The remaining large facilities primarily serve areas within the Highlands Region.

TREND

Since adoption of the RMP in 2008, average monthly demand of large systems ranges from a low of 230 MGM in winter months to a peak of 370 MGM in summer months (Figure 2). In general, the demand trend among the large systems is seasonally consistent year over year, with the summer of 2009 showing the only real demand anomaly. Meanwhile, average monthly demand of small systems ranges from 5.9 MGM in the fall and winter months to a peak just under 10 MGM in summer months (Figure 3). Demand among smaller systems appears to be declining since 2007, which should continue to be monitored over time to determine if this is an ongoing trend. Corresponding to demand, the average monthly available capacity increases and declines seasonally; and has been generally consistent year over year for large systems, while average available monthly capacity for small systems has increased since 2007 (Figure 4). There does not appear to be a direct correlation between PCWS demand and

precipitation; noting in particular, that precipitation levels were not above average in the summer of 2009 when the low summer peak demand anomaly was recorded.

DATA CONFIDENCE

Public Community Water System datasets used for this indicator were developed and are maintained by the NJDEP. These datasets were found to be satisfactory for analyzing change in capacity and demand of PCWS over time.

MILESTONE

- Decrease in public community water systems monthly demand.

SECONDARY INDICATORS

- **Water Use Efficiency:** Measures change in per capita and consumptive use of water.
- **Non-Revenue Water:** Measures amount of water lost in transmission, metering, and operations.

Wastewater Utility Existing Areas Served



RMP GOALS

2I Limitation of the expansion of water and wastewater infrastructure in the Preservation Area.

RMP PROGRAMS

- Verification of available facility capacity for water supply and wastewater utilities
- Identification of resource and regulatory constraints on utility capacity
- Identification of additional constraints on utility capacity
- Build-out analysis for the existing area served in the Highlands and non-Highlands approved service area
- Proposed service areas, infrastructure needs and densities in Highlands Existing Community Zones
- Build-out analysis for proposed service areas in Highlands Existing Community Zones
- Proposed service areas, infrastructure needs and densities in Highlands Protection and Conservation Zones
- Potential service areas for clusters, redevelopment areas, exempt parcels and public health exemptions
- Utility services element

DESCRIPTION

Measures change in extent of wastewater utility existing areas served.

BACKGROUND

The Highlands RMP provides policies designed to ensure that public funds and other assets are focused on the protection of Highlands resources by limiting the expansion of wastewater infrastructure in the Preservation Area and Environmentally Constrained areas of the Planning Area.

- Wastewater Utility Existing Area Served (EAS) - defined in the RMP as those areas currently served by “in the ground” infrastructure, rather than planned facilities.

For this indicator, wastewater utility EAS was analyzed to assess change in extent of EAS, over time, in the Highlands Region.

UNIT AND FREQUENCY OF ANALYSIS

Data sets and how they were used for the analysis are described below. Each data set is intersected with the Highlands Planning and Preservation Areas, Land Use Capability Zone (LUCZ), designated Highlands Centers, and Highlands Redevelopment Areas; as well as Plan Conformance status.

Wastewater Utility EAS

The wastewater utility EAS dataset used for this indicator was developed and is maintained by the Highlands Council and measures the areas served by public wastewater systems at the parcel level.

The measure of change in wastewater utility EAS is accomplished by comparing the EAS in 2008 (original data) to EAS in 2016 (current data).

STATUS

As of 2016, using the most recent data available for wastewater utilities (2016), nearly 72,000 acres of the Highlands Region is served by wastewater utilities, representing 8.3% of the region’s total land area (Table 1). Of that total, 91% lies within the Planning Area. From a land use capability perspective, 87% of the wastewater utility EAS within the Highlands Region is located in the Existing Community Zone (ECZ).

Table 1: Wastewater Existing Areas Served (EAS), Highlands Region, 2008-2016

	Total Acres ¹	2008		2016		Change		
		Acres	Percent	Acres	Percent	Trend	Acres	Percent
Highlands Region	859,269	74,798	8.7%	71,698	8.3%	Decrease	-3,100	-4.1%
Planning Area	444,278	68,411	15.4%	64,946	14.6%	Decrease	-3,465	-5.1%
Non-Conforming	336,867	49,519	14.7%	48,350	14.4%	Decrease	-1,169	-2.4%
Conforming	107,401	18,892	17.6%	16,596	15.5%	Decrease	-2,295	-12.2%
Preservation Area	414,990	6,386	1.5%	6,751	1.6%	Increase	365	5.7%
Non-Conforming	50,627	250	0.5%	349	0.7%	Increase	99	39.5%
Conforming	364,374	6,137	1.7%	6,403	1.8%	Increase	266	4.3%
Land Use Capability Zone								
Existing Community Zone	132,998	64,554	48.5%	62,605	47.1%	Decrease	-1,949	-3.0%
Existing Community Environmentally Constrained Sub-zone	30,904	2,976	9.6%	3,042	9.8%	Increase	66	2.2%
Lake Community Sub-zone	12,221	4,356	35.6%	3,029	24.8%	Decrease	-1,327	-30.5%
Conservation Zone	65,413	555	0.8%	349	0.5%	Decrease	-207	-37.2%
Conservation Environmentally Constrained Sub-zone	112,736	72	0.1%	125	0.1%	Increase	53	72.9%
Protection Zone	414,389	2,268	0.5%	2,540	0.6%	Increase	273	12.0%
Wildlife Management Area Sub-zone	48,960	16	0.0%	7	0.0%	Decrease	-9	-54.4%
Highlands Centers & Redevelopment Areas								
Highlands Centers	15,560	7,531	48.4%	6,063	39.0%	Decrease	-1,468	-19.5%
Outside Highlands Centers	843,708	67,267	8.0%	65,635	7.8%	Decrease	-1,632	-2.4%
Highlands Redevelopment Areas	168	62	36.9%	62	36.9%	-	0	0.1%
Outside Highlands Redevelopment Areas	859,101	74,736	8.7%	71,636	8.3%	Decrease	-3,100	-4.1%

¹The Highlands LUCZ data excludes roads; therefore, LUCZ acreage totals will differ from overall Highlands Region acreage totals.

The majority of the Planning Area’s wastewater utility EAS (74%) is in non-conforming communities. While the majority of the Preservation Area’s EAS (95%) is in conforming areas.

TREND

Since adoption of the RMP in 2008, the data for the Highlands Region show an overall decrease in wastewater EAS; however this does not represent an actual abandonment of wastewater systems. Rather, it is due to an improvement in the accuracy of EAS mapping compared to the initial dataset. Changes in wastewater utility EAS were consistent throughout the region regardless of conformance status. Considering land use capability, ECZ, Lake Community sub-zone, Conservation Zone and designated Highlands Centers saw a decrease in wastewater utility EAS, while Existing Community Environmentally Constrained sub-zone, Conservation Environmentally Constrained sub-zone, and Protection Zone saw increases (Table 1).

DATA CONFIDENCE

The wastewater utility EAS dataset used for this indicator was developed and is maintained by the Highlands Council for the Highlands Region. The 2008 RMP Wastewater Utilities EAS information was based on the best available information at that time. The Highlands Council GIS department continually updates the Wastewater EAS layer by both removing and adding lands as new data is made available, making the layer as accurate as possible. Updates to this dataset removed lands that were previously mapped as having wastewater service but later found not to be current EAS. These updates largely account for the reduction in EAS throughout the region.

The Highlands LUCZ, designated Highlands Centers, and Highlands Redevelopment Areas datasets were developed and are maintained by the Highlands Council. The Highlands LUCZ data excludes roads; therefore, LUCZ acreage totals will differ from overall Highlands Region acreage totals. These datasets were found to be satisfactory for analyzing change within the different areas.

MILESTONE

- No increase in wastewater utility existing areas served in the Preservation Area or in Environmentally Constrained areas of the Planning Area.

SECONDARY INDICATORS

(None)

Water Supply Existing Areas Served



RMP GOALS

2I Limitation of the expansion of water and wastewater infrastructure in the Preservation Area.

RMP PROGRAMS

- Verification of available facility capacity for water supply and wastewater utilities
- Identification of resource and regulatory constraints on utility capacity
- Identification of additional constraints on utility capacity
- Build-out analysis for the existing area served in the Highlands and non-Highlands approved service area
- Proposed service areas, infrastructure needs and densities in Highlands Existing Community Zones
- Build-out analysis for proposed service areas in Highlands Existing Community Zones
- Proposed service areas, infrastructure needs and densities in Highlands Protection and Conservation Zones
- Potential service areas for clusters, redevelopment areas, exempt parcels and public health exemptions
- Utility services element

DESCRIPTION

Measures change in extent of public water supply existing areas served.

BACKGROUND

The Highlands RMP provides policies designed to ensure that public funds and other resources are focused on protection of Highlands resources by limiting the expansion of water supply infrastructure in the Preservation Area and Environmentally Constrained areas of the Planning Area.

- Public Water Utility Existing Area Served (EAS) - defined in the RMP as those areas currently served by “in the ground” infrastructure, rather than planned facilities.

For this indicator, public water utility EAS was analyzed to assess change in the extent of EAS over time in the Highlands Region.

UNIT AND FREQUENCY OF ANALYSIS

Data sets and how they were used for the analysis are described below. Each data set is intersected with the Highlands Planning and Preservation Areas, Land Use Capability Zone (LUCZ), designated Highlands Centers, and Highlands Redevelopment Areas; as well as Plan Conformance status.

Public Water Utility EAS

The public water utility EAS dataset used for this indicator was developed and is maintained by the Highlands Council, and measures the areas served by public water systems at the parcel level.

The measure of change in public water utility EAS is calculated by comparing the EAS in 2008 (original data) to EAS in 2016 (current data).

STATUS

As of 2016, using the most recent data available for water supply utilities (2016), over 94,000 acres of the Highlands Region is served by public water supply utilities, representing 11% of the region’s total land area (Table 1). Of that total, 86.7% lies within the Planning Area. From a land use capability perspective, 82% of the water supply utility EAS within the Highlands Region is located in the Existing Community Zone.

Indicators: Water and Wastewater Utilities

The majority of the Planning Area's public water supply EAS (72%) is in non-conforming communities. While the majority of the Preservation Area's EAS (94%) is in conforming areas.

TREND

Since adoption of the RMP in 2008, the overall extent of the Highlands Region water supply utility EAS has expanded (Table 1). The region's water supply utility EAS increased in both the Planning and Preservation Areas. Considering land use capability, all zones saw an increase in water supply EAS except for the Wildlife Management Area Sub-zone which saw a decrease of 18 acres. The majority of municipalities (56) with water supply utility EAS realized an increase in extent, with Vernon and Parsippany-Troy Hills Townships realizing the largest increase in total acres. Of the municipalities that saw a decrease in water supply EAS (28), Roxbury Township and Montville Township realized the largest decrease in total acres. This decrease is primarily due to an improvement in accuracy

of the mapped EAS from the initial dataset and does not represent an abandonment of public water systems (Table 2).

DATA CONFIDENCE

The public water utility EAS dataset used for this indicator was developed and is maintained by the Highlands Council. The 2008 RMP Public Water Supply EAS information was based on the best available information at that time. The Highlands Council GIS department continually updates the Public Water Supply EAS layer by both removing and adding lands as new data is made available, making the layer as accurate as possible. Updates to this dataset removed lands that were previously mapped as having public water service, but later found to be based on inaccurate information. These updates largely account for the reduction in EAS throughout the region.

The Highlands LUCZ, designated Highlands Centers and Highlands Redevelopment Areas datasets were developed and are maintained by the Highlands Council and have been found to be satisfactory for the purpose of this

Table 1: Water Supply Utility Existing Areas Served (EAS), Highlands Region, 2008-2016

	Total Acres ¹	2008		2016		Change		
		Acres	Percent	Acres	Percent	Trend	Acres	Percent
Highlands Region	859,269	86,325	10.0%	94,220	11.0%	Increase	7,895	9.1%
Planning Area	444,278	76,958	17.3%	81,666	18.4%	Increase	4,708	6.1%
Non-Conforming	336,867	55,020	16.3%	58,523	17.4%	Increase	3,504	6.4%
Conforming	107,401	21,938	20.4%	23,142	21.5%	Increase	1,204	5.5%
Preservation Area	414,990	9,366	2.3%	12,554	3.0%	Increase	3,187	34.0%
Non-Conforming	50,627	562	1.1%	804	1.6%	Increase	242	43.1%
Conforming	364,374	8,804	2.4%	11,749	3.2%	Increase	2,945	33.5%
Land Use Capability Zone								
Existing Community Zone	132,998	75,229	56.6%	77,138	58.0%	Increase	1,908.83	2.5%
Existing Community Environmentally Constrained Sub-zone	30,904	1,173	3.8%	3,614	11.7%	Increase	2,441	208.1%
Lake Community Sub-zone	12,221	4,426	36.2%	5,393	44.1%	Increase	968	21.9%
Conservation Zone	65,413	1,145	1.8%	1,164	1.8%	Increase	19	1.7%
Conservation Environmentally Constrained Sub-zone	112,736	187	0.2%	327	0.3%	Increase	139	74.2%
Protection Zone	414,389	4,131	1.0%	6,568	1.6%	Increase	2,438	59.0%
Wildlife Management Area Sub-zone	48,960	33	0.1%	15	0.0%	Decrease	-18	-54.6%
Highlands Centers & Redevelopment Areas								
Highlands Centers	15,560	6,931	44.5%	6,572	42.2%	Decrease	-359	-5.2%
Outside Highlands Centers	843,708	79,393	9.4%	87,648	10.4%	Increase	8,254	10.4%
Highlands Redevelopment Areas	168	0	0.0%	4	2.2%	Increase	4	N/A
Outside Highlands Redevelopment Areas	859,101	86,325	10.0%	94,216	11.0%	Increase	7,891	9.1%

¹The Highlands LUCZ data excludes roads therefore, LUCZ acreage totals will differ from overall Highlands Region acreage totals.

Table 2: Water Supply Utility Existing Areas Served (EAS) by Municipality, Highlands Region, 2008-2016

Municipality Name*	Total Acres			Change	
	Municipality	2008 EAS	2016 EAS	Trend	Acres
Roxbury Township	14,041.04	3,654.41	3,110.49	Decrease	-543.93
Montville Township	12,231.87	3,403.60	3,172.73	Decrease	-230.87
Phillipsburg Town	2,132.90	1,283.89	1,133.04	Decrease	-150.84
Bedminster Township	16,875.45	959.80	834.71	Decrease	-125.09
Clinton Town	917.90	435.33	333.47	Decrease	101.86
Califon Borough	628.69	277.26	175.83	Decrease	-101.42
Hanover Township	6,878.38	3,065.01	2,972.85	Decrease	-92.16
Mahwah Township	16,564.22	3,739.08	3,656.17	Decrease	-82.90
Morris Plains Borough	1,656.86	1,060.60	985.82	Decrease	-74.77
High Bridge Borough	1,555.43	531.83	457.82	Decrease	-74.00
Hampton Borough	971.49	249.35	184.83	Decrease	-64.52
Mansfield Township	19,001.50	671.79	607.66	Decrease	-64.13
Chester Township	18,694.62	128.11	64.12	Decrease	-63.99
Wharton Borough	1,361.61	654.03	598.67	Decrease	-55.36
Union Township	13,168.83	157.28	102.91	Decrease	-54.36
Washington Borough	1,258.63	755.37	703.22	Decrease	-52.16
Franklin Township	15,051.07	341.04	293.05	Decrease	-47.99
Pohatcong Township	8,779.53	427.20	385.13	Decrease	-42.07
Pequannock Township	4,548.70	2,257.82	2,216.89	Decrease	-40.93
Glen Gardner Borough	990.57	236.34	205.40	Decrease	-30.94
Milford Borough	818.04	307.97	277.90	Decrease	-30.07
Chester Borough	1,020.19	387.64	360.25	Decrease	-27.39
Hamburg Borough	747.23	346.26	328.60	Decrease	-17.65
Bethlehem Township	13,287.24	17.39	1.30	Decrease	-16.09
Peapack-Gladstone Borough	3,696.37	622.36	607.14	Decrease	-15.22
Alpha Borough	1,097.86	351.77	336.56	Decrease	-15.22
Netcong Borough	610.70	292.51	288.75	Decrease	-3.76
Alexandria Township	17,759.51	6.54	6.54	No Change	0.00
Victory Gardens Borough	92.87	72.98	72.98	No Change	0.00
Lebanon Township	20,270.39	64.00	64.06	Increase	0.07
Mountain Lakes Borough	1,860.69	826.30	827.09	Increase	0.78
Hackettstown Town	2,374.32	1,140.08	1,145.24	Increase	5.16
Bloomsbury Borough	632.32	107.33	114.99	Increase	7.65
Belvidere Town	950.38	321.43	331.85	Increase	10.42
Morristown Town	1,923.58	1,269.93	1,284.09	Increase	14.16
Mendham Borough	3,826.43	1,384.32	1,399.05	Increase	14.73
Allamuchy Township	12,973.16	395.33	417.53	Increase	22.21
Bernardsville Borough	8,264.63	1,104.79	1,130.32	Increase	25.54
Boonton Township	5,436.71	231.43	260.49	Increase	29.06
Denville Township	8,151.50	2,769.48	2,801.06	Increase	31.58
Lebanon Borough	576.88	255.25	293.88	Increase	38.63
Far Hills Borough	3,149.28	130.14	170.03	Increase	39.89
Butler Borough	1,318.47	838.29	878.39	Increase	40.10

*Municipalities not listed do not have a Water Supply Utility EAS.

Table 2 (cont'd): Water Supply Utility Existing Areas Served (EAS) by Municipality, Highlands Region, 2008-2016

Municipality Name*	Total Acres			Change	
	Municipality	2008 EAS	2016 EAS	Trend	Acres
Rockaway Borough	1,356.80	817.93	862.03	Increase	44.09
Franklin Borough	2,832.90	478.33	524.76	Increase	46.43
Boonton Town	1,590.05	834.14	881.32	Increase	47.17
Oxford Township	3,877.90	80.60	127.98	Increase	47.38
Dover Town	1,745.21	938.47	990.78	Increase	52.31
Independence Township	12,785.73	421.47	474.48	Increase	53.01
Harding Township	13,162.05	570.72	626.99	Increase	56.27
Bernards Township	15,569.56	5,710.19	5,771.09	Increase	60.90
Ogdensburg Borough	1,437.48	247.78	310.05	Increase	62.27
Riverdale Borough	1,323.43	653.90	719.63	Increase	65.73
Kinnelon Borough	12,309.11	771.99	843.34	Increase	71.36
Oakland Borough	5,611.72	1,934.61	2,014.12	Increase	79.51
Tewksbury Township	20,325.71	152.54	237.12	Increase	84.58
Washington Township (Morris)	28,726.42	2,289.31	2,374.84	Increase	85.53
Clinton Township	21,706.29	2,390.30	2,490.22	Increase	99.92
Wanaque Borough	5,967.60	882.81	987.17	Increase	104.36
Mine Hill Township	1,917.68	381.35	489.64	Increase	108.28
Pompton Lakes Borough	2,000.31	837.90	968.03	Increase	130.13
Bloomington Borough	5,916.97	625.94	760.67	Increase	134.73
Washington Township (Warren)	11,547.49	1,008.79	1,144.56	Increase	135.77
Lopatcong Township	4,720.98	737.65	883.10	Increase	145.45
White Township	17,793.30	10.02	195.56	Increase	185.55
Hopatcong Borough	7,948.32	582.37	771.85	Increase	189.48
Mendham Township	11,526.74	1,400.36	1,599.42	Increase	199.06
West Milford Township	51,848.00	635.41	837.32	Increase	201.91
Mount Olive Township	19,991.96	1,942.16	2,155.68	Increase	213.52
Holland Township	15,324.44	18.71	246.50	Increase	227.78
Morris Township	10,118.38	4,753.91	5,006.74	Increase	252.83
Mount Arlington Borough	1,794.68	174.58	471.73	Increase	297.15
Ringwood Borough	18,230.38	507.19	846.71	Increase	339.52
Greenwich Township	6,780.17	135.38	542.84	Increase	407.46
Byram Township	14,536.31	257.62	674.47	Increase	416.85
Hardyston Township	20,884.77	21.16	446.82	Increase	425.66
Stanhope Borough	1,341.39	0	436.15	Increase	436.15
Jefferson Township	27,383.64	942.18	1,477.26	Increase	535.08
Rockaway Township	29,370.73	1,899.56	2,439.25	Increase	539.70
Sparta Township	24,822.12	2,631.98	3,172.89	Increase	540.91
Randolph Township	13,541.69	4,621.41	5,197.94	Increase	576.53
Parsippany-Troy Hills Township	16,223.31	5,365.55	6,250.33	Increase	884.79
Vernon Township	44,769.04	120.70	1,308.46	Increase	1,187.77

*Municipalities not listed do not have a Water Supply Utility EAS.

Indicators: **Water and Wastewater Utilities**

analysis. The Highlands LUCZ data excludes roads; therefore, LUCZ acreage totals will differ from overall Highlands Region acreage totals. These datasets were found to be satisfactory for analyzing change within the different areas.

MILESTONE

- No increase in water supply utility existing areas served in the Preservation Area or in Environmentally Constrained areas of the Planning Area.

SECONDARY INDICATORS

Water Use Efficiency: Measures change in per capita and consumptive use of water.



Agricultural Resources Indicators

- **Agricultural Land Use and
Preservation Index**

Agricultural Land Use and Preservation Index



RMP GOALS

3A Protection and enhancement of agricultural resources and the agricultural industry in the Highlands Region.

3B Protection and enhancement of agricultural sustainability and viability of the agricultural industry within the Highlands Region.

RMP PROGRAMS

- Agricultural Sustainability
- Viability
- Stewardship

DESCRIPTION

Measures change in acreage of total farmland, preserved farmland, and the share of total farmland that is preserved, as well as the change in total farmland and preserved farmland within the Highlands Agricultural Resource Area.

BACKGROUND

The Highlands RMP provides policies designed to ensure that public funds and other resources are focused on protection of Highlands resources. The RMP identifies high quality agricultural lands in need of preservation and seeks sufficient financial and institutional resources to ensure the preservation, sustainability, and viability of agricultural resources in the Highlands Region.

- Farmland - defined in the NJDEP Land Use/Land Cover (LULC) as all lands used primarily for the production of food and fiber, including and some of the structures associated with this production. Farmland, or agricultural land, can include cropland and pastureland, orchards, vineyards, nurseries and horticultural areas, confined feeding operations, and other agricultural activities.
- Agricultural Resource Area – defined in the RMP as the spatially delineated portion of the Highlands Region that includes a prevalence of active farms, including farming landscapes that account for 250

acres or more of contiguous farmland, farms that include Important Farmland Soils, a prescribed extent of the lands adjoining a farm that are in agricultural use, and concentrations of preserved farmland.

For this indicator, preservation was analyzed in relation to total farmland within the Highlands Region and portions of Highlands Counties outside the Region, as well as by Agricultural Resource Area (ARA) and Highlands Preservation and Planning Areas to assess change in total farmland acreage and farmland preservation over time.

UNIT AND FREQUENCY OF ANALYSIS

Data sets and how they were used for the analysis are described below.

Farmland

Farmland is derived from the NJDEP LULC dataset, refined by those defined as “Agriculture” in the Regional Land Use Conditions and Smart Design Technical Report (Appendix M, Highlands Land Classification Data Layer Relationship).

Change in farmland was assessed by comparing the agriculture extent pre-Highlands Act (2002) to the most recent data available (2012) for the Highlands Region and portions of Highlands Counties outside the Region.

Preserved Farmland

The preserved farmland dataset is maintained by the NJ Department of Agriculture (NJDA) State Agriculture Development Committee (SADC) Farmland Preservation Program and includes spatial data for farms that are preserved, have final approval from the SADC, or are under the eight-year easement program.

Change in SADC preserved farmland was assessed by comparing extent at a point closest to the time of the Act (2005) to the most recent data available (2016) for the Highlands Region and portions of Highlands Counties outside the Region.

Preserved Lands

The preserved lands dataset is maintained by the Highlands Council and includes preserved open space and preserved farmland in a combination of federal, State, county, municipal, nonprofit, and private ownership, and represents a catalog of the public and private land and

Table 1: Change in Total Farmland and Preserved Farmland in the Highlands Region Counties

	Total Farmland		Total Farmland Change, 2002-2012			2005		2016		Preserved Farmland Change, 2005-2016		
	2002	2012	Trend	Acres	Percent	Preserved Farmland ¹ (Acres)	Percent of 2002 Total Farmland	Preserved Farmland ¹ (Acres)	Percent of 2016 Total Farmland	Trend	Acres	Percent
Highlands Region	117,551	109,206	Decrease	(8,345)	-7.1%	26,104 629 Parcels	22.2%	44,694 1,479 Parcels	40.9%	Increase	18,590	71.2%
Highlands Counties (outside the Highlands Region)	123,347	113,870	Decrease	(9,477)	-7.7%	34,505 689 Parcels	28.0%	46,486 1,317 Parcels	40.8%	Increase	11,981	34.7%
Total	240,898	223,076	Decrease	(17,822)	-7.4%	60,609 1,318 Parcels	25.2%	91,180 2,796 Parcels	40.9%	Increase	30,571	50.4%

¹Note that Preserved Farmland includes only those lands maintained as part of the NJDA SADC dataset of farms that are preserved, farms that have final approval from the SADC, and farms under the eight-year easement program.

Table 2: Change in Total Farmland and Total Preserved Farmland within the Highlands Agricultural Resource Area (ARA)

	Total Farmland within the ARA		Total ARA Farmland Change, 2002-2012			2008	2016	ARA Preserved Land Change, 2005-2016		
	2002	2012	Trend	Acres	Percent	Total Preserved Farmland within the ARA	Total Preserved Farmland within the ARA	Trend	Acres	Percent
Highlands Region	106,999	99,921	Decrease	(7,078)	-6.6%	31,043	44,322	Increase	13,280	42.8%
Planning Area	74,992	69,415	Decrease	(5,577)	-7.4%	19,535	27,686	Increase	8,151	42%
Preservation Area	32,007	30,507	Decrease	(1,500)	-4.7%	11,507	16,636	Increase	5,129	45%

water areas available for recreation or presently protected as open space and recreation facilities. Only those lands that were preserved as farmland were used for this indicator.

Change in preserved farmlands was assessed by comparing extent at the time of the RMP (2008) to the most recent data available (2016).

Agricultural Resource Area

The 2008 ARA extent, as defined in the RMP, has remained unchanged. Accordingly, this indicator does not show growth in these areas, but does show the changes that have occurred within them with regard to active farmland acreage or preservation and refined by Highlands Planning and Preservation Areas.

STATUS

As of 2016, using the most recent data available (either 2012 LULC or 2016 for SADC and preserved lands), the Highlands Region consists of nearly 110,000 acres of farmland, compared to just under 114,000 acres of farmland in the portions of the seven Highlands Counties outside the Region. In both areas (i.e., inside and outside the Region), nearly 41% of the farmland was preserved per SADC standards. Moreover, the Highlands ARA consisted of nearly

100,000 acres of farmland, of which 69% was within the Planning Area. 44.4% of the ARA is preserved farmland, 63% of which is in the Planning Area.

TREND

Since adoption of the RMP in 2008, total farmland has decreased at a similar rate inside and outside the Region within the seven Highlands Counties. While preserved farmland increased in both areas, it increased at a higher rate within the Highlands Region. The share of total farmland that is preserved also increased for both areas (Table 1). At the same time, total farmland decreased within the ARA, at a slightly higher rate within the Planning Area than the Preservation Area (Table 2). Meanwhile, total preserved farmland within the ARA increased; again, at a slightly higher rate within the Planning Area than the Preservation Area.

DATA CONFIDENCE

The analysis of change in agricultural land use was performed using NJDEP Land Use/Land Cover data from 2002 and 2012. This dataset was found to be satisfactory for analyzing change in farmland acreage within the Highlands Region and portions of Highlands Counties outside the Region.

Indicators: **Agricultural Resources**

The analysis of change in preserved farmland was performed with data catalogued by the NJDA SADC, which was found to be satisfactory for analyzing change in total acres of preserved farmland within the Highlands Region and portions of Highlands Counties outside the Region.

The analysis of change in preserved farmland within the Highlands Region was performed using data catalogued by the Highlands Council from 2008 and 2016. The 2008 Regional Master Plan preserved lands information was based on the best available information at that time. As part of the Plan Conformance process, preserved lands data was further verified through the Module 1 and Module 2 Build-Out update. This update process allowed input from professionals throughout the region, which resulted in a more accurate representation of the preserved lands layer. The Highlands Council GIS department continually updates the preserved lands layer by both removing and adding lands as new data is made available, making the layer as accurate as possible. This dataset was found to be satisfactory for analyzing change in total acres of preserved farmland within the Highlands Region.\

MILESTONES

- No net decrease in farmland, particularly in the Highlands Agricultural Resource Area.
- Increase in preserved farmland within the Highlands Agricultural Resource Area.

SECONDARY INDICATORS

(None)



Historic, Cultural, Archaeological, and Scenic Resources Indicators

- **Preserved Lands and Trails**

Preserved Lands and Trails



RMP GOALS

1H Protection of critical resources through land preservation and stewardship of open space throughout the Highlands Region.

RMP PROGRAMS

- Identification of Critical Lands
- Implementation of strategies for land preservation by maximizing current land preservation funding programs
- Determine the cost of 5 and 10 year priorities for land acquisition within the confidential inventory
- Establishment of new/alternative/innovative land preservation programs
- Development of cluster/conservation design development standards
- Identification of willing sellers
- Establishment of a land preservation and stewardship technical assistance program
- Establishment of dedicated sources of funding for land preservation and stewardship in the Highlands Region

Table 1: Change in Highlands Preserved Lands (in acres)

	2008	2016	Change in Acres	Percent Increase
Preservation Area	187,658	207,754	20,097	10.7%
Planning Area	85,829	105,018	19,189	22.4%
Totals	273,487	312,772	39,285	14.4%

All figures rounded to the nearest whole number.

DESCRIPTION

Measures change in preserved lands and publically accessible trails.

BACKGROUND

The Highlands RMP provides policies designed to ensure that public funds and other resources are focused on protection of Highlands resources by establishing criteria for the identification of critical lands, the priorities for land preservation, and implementation strategies for land preservation and stewardship.

- Preserved Lands - defined in the Land Preservation and Stewardship Technical Report as preserved open space or preserved farmland in a combination of federal, state, county, municipal, nonprofit, and private ownership.
- Trails – defined in the NJ Trails Plan (NJDEP, 2009) as a publically accessible path, track, or unpaved lane or road used for a variety of outdoor recreation purposes, including walking, bicycling, hiking, canoeing/kayaking, horseback riding, off-road vehicle driving, or mountain biking.

This indicator catalogs public and private land and water areas available for recreation and/or presently protected as open space and recreation facilities. For this indicator, Preserved Lands were analyzed for change within the Highlands Preservation and Planning Areas to assess what has been preserved over time. Due to data limitations, an analysis of trails will be added to the Science and Research Agenda.

UNIT AND FREQUENCY OF ANALYSIS

Data sets and how they were used for the analysis are described below. Each dataset is intersected with the Highlands Preservation and Planning Areas.

Table 2: Change in Highlands Preserved Lands by Open Space Class

	2007		2016		Change		
	# of Properties	Acres	# of Properties	Acres	# of Properties	Acres	Percent (Acres)
County	943	32,620	1,045	35,558	102	2,938	9.0%
Easement	2	55	-	-	(2)	(55)	*
Farmland	709	33,766	965	45,663	256	11,896	35.2%
Federal	155	9,281	212	10,223	57	942	10.1%
Municipal	3,791	34,104	3,730	39,785	(61)	5,682	16.7%
Non-Profit	235	10,005	384	13,198	149	3,193	31.9%
Private	-	-	424	5,671	424	5,671	**
State	2,083	107,836	2,330	115,284	247	7,448	6.9%
Highlands TDR	-	-	25	639	25	639	**
Watershed Management Areas	314	45,819	339	46,751	25	932	2.0%
Totals	8,232	273,487	9,454	312,772	1,222	39,285	14.4%

*This category was absorbed by other classes in later accounting, so the change was not calculated. **These are new categories since the RMP, they are included in the total increase, but percent change was not calculated.

Preserved Lands

The Highlands Preserved Lands dataset is a compilation of data sources from federal, state, county, local, and nonprofit groups; including, but not limited to the NJ Highlands Council, the NJDEP, Highlands county and municipal governments, NJ State Agriculture Development Committee, the National Park Service, The Nature Conservancy, and the New Jersey Conservation Foundation.

- Change in Preserved Lands by open space class was assessed by comparing what was preserved at the time of the RMP adoption (2008) to what was preserved as of July 2016. This dataset is tracked by the Highlands Council.
- Open space classes are defined in the Highlands Region Land Preservation Status Report (Highlands Council, 2016) based on the primary steward of the land, including state, water supply watershed lands, federal, farmland, municipal, county, nonprofits, and private land stewards.

Trails

A satisfactory dataset for trails does not exist at this time; therefore, an analysis of change in publicly accessible trails will be added to the Science and Research Agenda.

STATUS

As of 2016, using the most recent data available for Preserved Lands (July 2016), 36% of the Highlands Region is permanently preserved. State-owned open space constitutes the largest segment of Highlands Preserved Lands acreage (37%). Water supply watershed lands, farmland easements, and municipal and county open space make up between 11 and 15 percent of Highlands Preserved Lands acreage each, while federal and nonprofit open space each make up 3% and 4%, respectively. At this time, Transfer of Development Rights (TDR) easements make up only 0.2% of Highlands Preserved Lands.

TREND

Since the adoption of the RMP in 2008, Preserved Lands have increased over 14%, with slightly more acreage preserved in the Preservation Area than the Planning Area (Table1). Farmland easements made up the largest share (net and percent) of total Highlands Region preservation. Following farmland easements, in terms of net acres acquired between 2008 and 2016, preservation by the State of New Jersey increased the most, followed in order by municipal governments, nonprofits, and counties (Table 2). Note that private lands, which include open space that has been preserved through deed restrictions/development easements on property owned by individuals or private companies, were added as a category to the Preserved Lands map after the adoption of the RMP; therefore, the increase in acreage within this class does not necessarily reflect new acquisitions since 2008.

DATA CONFIDENCE

The analysis of change in preserved lands was performed using data catalogued by the Highlands Council from 2008 and 2016. The 2008 Regional Master Plan preserved lands information was based on the best available information at that time. As part of the Plan Conformance process, preserved lands data was further verified through the Module 1 and Module 2 Build-Out update. This update process allowed input from professionals throughout the region, which resulted in a more accurate representation of the preserved lands layer. The Highlands Council GIS department continually updates the preserved lands layer by both removing and adding lands as new data is made available, making the layer as accurate as possible. This dataset was found to be satisfactory for analyzing change in total acres of preserved lands.

As previously noted, a satisfactory dataset for trails does not exist at this time; therefore, an analysis of change in publically accessible trails will be added to the Science and Research Agenda.

MILESTONES

- Increase in preserved lands.
- Increase in publically accessible trails.

SECONDARY INDICATORS

- **Distribution of Recreational Capacity:** Measures recreational facilities per unit of population.
- **Passive and Active Recreation:** Measures the proportion of recreational amenities that are passive versus active.
- **Recreational Amenities:** Inventory of the number and location of recreational amenities.



Transportation and Air Quality Indicators

- **Air Quality Index**
- **Commutation Patterns Index**
- **Freight Index**
- **Transit Lands Area**

Air Quality Index



RMP GOALS

9A Reduction of air pollution through use of alternative and efficient modes of transportation and the use of renewable energy sources.

RMP PROGRAMS

- Air Quality Monitoring

DESCRIPTION

Measures change in the number of days, annually, that air quality fails to meet satisfactory National Ambient Air Quality Standards.

BACKGROUND

The Highlands RMP provides policies that are focused on air quality monitoring, energy efficient design, and smart growth planning strategies that reduce air pollution.

- National Ambient Air Quality Standards - defined by the United States Environmental Protection Agency (USEPA), National Ambient Air Quality Standards (NAAQS) are set for pollutants that are harmful to public health and the environment above certain thresholds. These include ozone (O₃), particulate matter (PM), carbon monoxide (CO), sulfur dioxide (SO₂), nitrogen dioxide (NO₂) and lead (Pb).
- Air Quality Index - defined by the USEPA, the Air Quality Index (AQI) is used to report daily air quality by measuring the levels of five pollutants, and assigning an indexed value that represents the potential health concerns at varying indexed pollutant levels.

For this indicator, AQI value measurements were analyzed for the Highlands Region counties and compared to northern New Jersey (non-Highlands Region) counties to assess air quality change over time.

UNIT AND FREQUENCY OF ANALYSIS

Data sets and how they were used for the analysis are described below. These datasets are county-level data and cannot be measured exclusively according to the boundaries of the Highlands Region.

National Ambient Air Quality Standards

As defined by and derived from USEPA data, NAAQS attainment was evaluated as of October 1, 2015.

Air Quality Index

As defined by and derived from USEPA data, AQI was evaluated for the years 2004 through 2015. The USEPA defines AQI values of 101 or greater as unsatisfactory because air quality at this level is considered unhealthy for sensitive groups, including individuals with respiratory ailments, older adults, and children.

STATUS

As of 2016, using the most recent data available for air quality, the entire State, including the seven counties that are part of the Highlands Region, is classified as nonattainment for the 8-hour ozone NAAQS. In northern New Jersey, only Warren County is nonattaining for any of the other criteria pollutants, as a portion of the county is considered nonattaining for sulfur dioxide, in-part due to emissions from two nearby power plants in Pennsylvania.

Non-Highlands Region counties had more unhealthy AQI days than northern New Jersey Highlands Region counties in 2015, at twenty-seven and sixteen respectively. However, the annual number of unhealthy AQI days can fluctuate greatly. Therefore, comparing the average of AQI days for both areas from 2010-2015 indicates Highlands Counties had 8 and non-Highlands counties had 11 unhealthy AQI days (Table 1).

TREND

Since adoption of the RMP in 2008, the nonattainment classification for northern New Jersey counties has remained unchanged with regard to 8-hour ozone (all counties) and sulfur dioxide (part of Warren County). In September of 2013, all northern New Jersey counties that had previously been classified as nonattaining for particulate matter were reclassified to an attainment maintenance status, including the Highlands Region counties of Bergen, Morris, Passaic and Somerset. This reclassifi-

Table 1: Number of days by County with an AQI at or above 101, 2004-2015

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Average 2004 - 2015
Highlands Counties													
Bergen County	11	23	22	21	17	12	15	13	8	7	6	12	14
Hunterdon County	16	34	22	28	19	3	24	15	10	4	2	4	15
Morris County	8	19	26	28	14	1	8	10	10	6	1	3	11
Passaic County	7	20	9	17	8	2	9	7	6	2		7	9
Warren County							4	30	2	6	6	1	8
Non-Highlands Counties													
Essex County	3	3				1	17	13	13	5	5	5	7
Hudson County		2											2
Middlesex County	10	29	22	27	19	1	27	16	20	1	4	9	15
Monmouth County	8	22	13	17	11	5	10	10	15	4	1	6	10
Union County	11	22	16	21	12	3	13	13	12	8	7	18	13

Data is not available for Somerset and Sussex Counties
 Source: United States Environmental Protection Agency, Air Quality Index Report, 2004-2015

cation occurred despite a 2012 revision of the particulate pollution standard, which strengthened the standard from 15.0 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) to 12.0 $\mu\text{g}/\text{m}^3$.

The annual number of unhealthy AQI days can fluctuate greatly, but overall they declined between 2004 and 2015 for all of northern New Jersey (Figure 1). While Highlands counties generally saw fewer unhealthy AQI days over the twelve-year period from 2004-2015, the trends in air quality from year-to-year in Highlands and non-Highlands northern New Jersey counties mirrored each other closely (Table 1).

DATA CONFIDENCE

AQI data was not available for Somerset and Sussex Counties.

Assessing AQI at the county level allows for local variations in air quality to go unrecognized. Moreover, air quality is strongly influenced by factors outside the control of a local or regional governing body, including air temperature, wind patterns, particle-emitting activities in other jurisdictions or states, and other factors. This is evidenced by the fact that the change in NAAQS attainment and unhealthy AQI days has been comparable for both Highlands and non-Highlands counties in northern New Jersey, despite great disparities in land use, population density, and industrial intensity in the two geographies. Given the ambiguous nature of the contributing factors to air quality, it is difficult to ascertain the direct impact of the RMP in reducing air pollution.

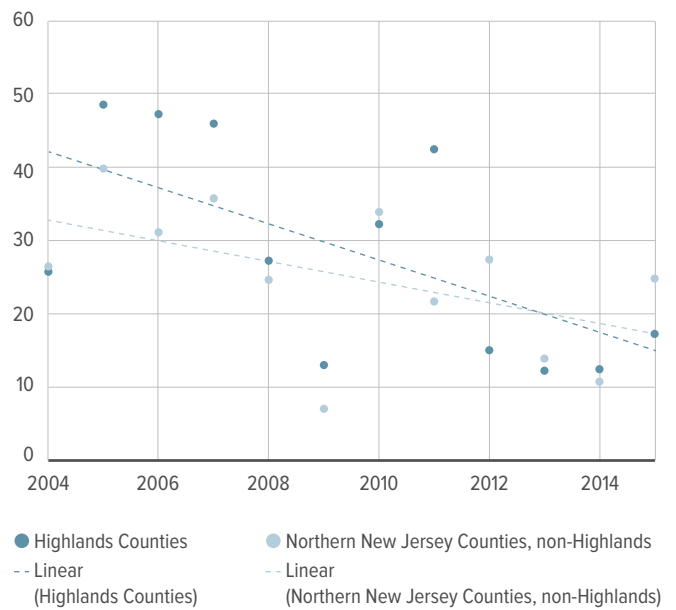
MILESTONE

- Reduction in number of unhealthy air quality days.

SECONDARY INDICATORS

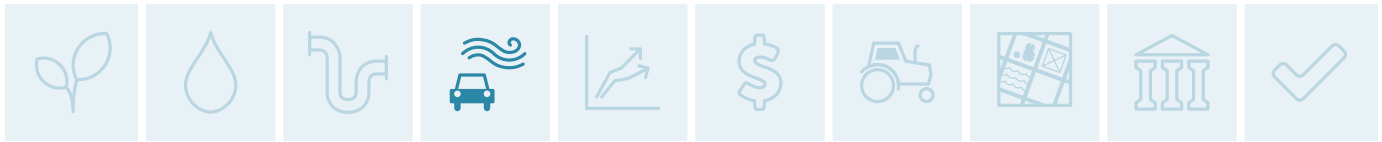
(None)

Figure 1. AQI Trends, 2004-2015
 Days w/AQI 101+



Source: NJ DEP, Air Quality Index Report, Daily Summary, 2004-2015. Retrieved from the Bureau of Air Monitoring, June 27, 2017

Commutation Patterns Index



RMP GOALS

5A Provision of safe and efficient mobility within the Highlands, and between the Highlands and destinations outside of the region.

5D A multi-modal transportation system which facilitates the movement of people and goods within and through the Highlands Region without adversely affecting ecosystem integrity and community character.

5E Minimization of travel demand and vehicle miles of travel.

RMP PROGRAMS

- Linking Transportation and Land Use, Regional Transportation Safety and Pedestrian Security, Roadway Capacity Monitoring

DESCRIPTION

Measures change in commuting behavior, including travel mode and commute time.

BACKGROUND

The Highlands RMP provides policies that promote a balanced, efficient transportation system and are consistent with smart growth strategies.

- Commutation Patterns - defined by the US Census Bureau as the means of transportation, or mode of travel, a resident takes from home to work, and includes driving alone, carpool, bus, rail, bike, foot, other, and working from home.
- Commute Time – defined by the US Census Bureau as the mean travel time for a resident to commute from home to work.

For this indicator, commuting behavior was analyzed within Northern New Jersey (non-Highlands Region) and the Highlands Region, broken down by Planning Area, Preservation Area, and Highlands Centers to assess change over time. Highlands Centers have been incorporated into this analysis because both the RMP and State

Development and Redevelopment Plan advocate center-based planning that encourages transit alternatives, which can contribute to reductions in air pollution.

UNIT AND FREQUENCY OF ANALYSIS

Each data set is intersected with the Northern New Jersey (non-Highlands Region) and the Highlands Region, broken down by Planning Area, Preservation Area, and Highlands Centers.

Commutation Patterns

Commutation patterns by travel mode were analyzed using US Census Bureau Decennial Census and American Community Survey data.

- Census tract data for 2000 and 2013 were compared by the northern New Jersey and Highlands geographies.

Commute Time

Residential commute time was analyzed using US Census Bureau Decennial Census and American Community Survey data.

- Census tract data for 2000 and 2013 were compared by the northern New Jersey and Highlands geographies.
- Commuting times were aggregated by the percentage of census tract residents with commute times under 30 minutes, between 30 and 60 minutes, and over 60 minutes. Residents who worked at home were excluded from the commuting times analysis.

Relativity of Data

To put commuting patterns in relative terms, in 2013, the Highlands Region had 411,442 commuters, compared with 2,444,893 in Northern New Jersey (outside the Highlands Region). Therefore, in all comparisons, the total number of people represents approximately a six to one (6:1) ratio of North Jersey residents to Highlands Region residents.

STATUS

As of 2013, the share of Highlands Region residents commuting by single-occupancy vehicle was greater than that for the remainder of northern New Jersey. The share of residents commuting by single-occupancy vehicle was between 81% and 84% across the Highlands Region and its sub-geographies (Table 1). The share of Highlands

Table 1: Resident commutation pattern, North Jersey, 2000-2013

		Northern New Jersey (non-Highlands)	Highlands Region	Planning Area	Preservation Area	Highlands Centers
Total Commuters	2000	2,298,397	402,489	288,431	114,058	43,748
	2013	2,444,893	411,442	298,435	113,007	43,523
Driving to Work Alone	2000	68.55%	82.22%	81.65%	83.67%	81.97%
	2013	66.54%	80.89%	80.15%	82.83%	80.36%
	Net Change	-2.01%	-1.33%	-1.50%	-0.83%	-1.61%
Commuting by Carpool	2000	10.98%	8.62%	8.81%	8.14%	10.52%
	2013	8.49%	8.02%	8.48%	6.80%	10.01%
	Net Change	-2.50%	-0.60%	-0.33%	-1.34%	-0.51%
Commuting by Bus	2000	7.72%	1.33%	1.31%	1.39%	0.75%
	2013	8.81%	1.76%	1.80%	1.43%	0.81%
	Net Change	1.09%	0.43%	0.48%	0.04%	0.07%
Commuting by Rail	2000	3.20%	1.51%	1.81%	0.75%	1.07%
	2013	3.36%	1.24%	1.43%	0.65%	1.40%
	Net Change	0.16%	-0.27%	-0.38%	-0.10%	0.33%
Commuting by Bike	2000	0.24%	0.08%	0.09%	0.03%	0.11%
	2013	0.34%	0.17%	0.21%	0.07%	0.19%
	Net Change	0.10%	0.10%	0.12%	0.04%	0.08%
Commuting by Foot	2000	3.65%	1.63%	1.79%	1.20%	1.84%
	2013	3.74%	1.58%	1.66%	1.35%	1.44%
	Net Change	0.09%	-0.05%	-0.13%	0.14%	-0.40%
Commuting by Other	2000	0.68%	0.60%	0.66%	0.43%	0.42%
	2013	1.62%	0.51%	0.47%	0.62%	0.44%
	Net Change	0.95%	-0.08%	-0.20%	0.20%	0.02%
Working at Home	2000	2.66%	3.80%	3.61%	4.26%	3.07%
	2013	3.74%	5.43%	5.06%	6.10%	4.94%
	Net Change	1.07%	1.64%	1.45%	1.84%	1.87%

Sources: United States Census Bureau, Decennial Census, 2000; American Community Survey 5-Year Estimates, 2009-2013

Region residents commuting as part of a carpool was slightly less than the share of residents of northern New Jersey commuting by this mode. Among all geographies, residents of Highlands Centers were the most likely to commute by carpool, while residents of the Preservation Area were least likely.

In the same period, the share of residents in the Highlands Region commuting by public transportation (bus or train) was significantly lower than areas outside the Highlands Region in northern New Jersey. Residents of the Highlands Region were also less likely than residents of northern New Jersey to commute using active transportation modes, such as biking and walking. Meanwhile, residents of the Highlands Region were more likely to work from home than residents in the remainder of northern New Jersey and residents of the Preservation Area were the most likely to work from home.

As of 2013, residents of the Highlands Region have comparable commute times to those outside the Region in northern New Jersey (Table 2). Of all the analyzed geographies, residents of the Preservation Area have the smallest share of residents commuting 30 minutes or fewer, while they have the greatest share traveling in both the 30- to 60-minute and greater-than-60-minute categories. Conversely, Planning Area residents have the greatest share of residents commuting 30 minutes or fewer, while they have the lowest share traveling in both the 30- to 60-minute and greater-than-60 -minute categories.

TREND

Since adoption of the RMP in 2008, commuter patterns in northern New Jersey saw a slight trend away from auto-oriented trips to other modes and working from home (Table 1). During this period, commuting by single-occupancy vehicle declined among Highlands Region residents to a slightly lesser extent than the remainder of northern New Jersey, but still represented a majority

Table 2: Resident commute times, North Jersey, 2000 - 2013

	Commutes under 30 Minutes			Commutes between 30 and 60 Minutes			Commutes over 60 Minutes		
	2000	2013	Net Change	2000	2013	Net Change	2000	2013	Net Change
Northern New Jersey (non-Highlands Region)	55.12%	52.48%	-2.64%	30.24%	31.57%	1.34%	14.65%	15.95%	1.30%
Highlands Region	51.39%	50.85%	-0.54%	33.82%	33.45%	-0.37%	14.79%	15.70%	0.91%
Planning Area	55.27%	54.45%	-0.82%	30.96%	30.83%	-0.13%	13.77%	14.73%	0.96%
Preservation Area	41.53%	41.27%	-0.26%	41.09%	40.42%	-0.66%	17.39%	18.31%	0.92%
Highlands Centers	50.69%	51.66%	0.98%	33.94%	31.41%	-2.53%	15.37%	16.93%	1.55%

Sources: United States Census Bureau, Decennial Census, 2000; American Community Survey 5-Year Estimates, 2009-2013

proportion of modal choice for both geographies. The share of Highlands Region residents commuting as part of a carpool declined slightly, compared to a more significant decline for the remainder of northern New Jersey.

Over the same period, commuting by bus increased for residents of the Highlands Region and the remainder of northern New Jersey. However, commuting by rail declined in the Highlands Region, compared to a slight increase for the remainder of northern New Jersey. The share of residents commuting by rail increased the most in Highlands Centers. Meanwhile, commuting by bicycle also increased for both the Highlands Region and the remainder of northern New Jersey. Commuting by foot decreased within the Highlands Region, but increased for the remainder of northern New Jersey. Finally, the share of residents working from home increased in all geographies, with the greatest increases in the Preservation Area and Highlands Centers.

Despite the improvements in mode share, commuting times increased for all residents of northern New Jersey as a whole since the adoption of the RMP, though less significantly in the Highlands Region (Table 2). The share of commute times under 30 minutes decreased most significantly for Northern NJ; and while the Highlands Region also saw an overall decrease of residents with a commute time under 30 minutes, residents of Highlands Centers saw an increase in this commute time category. Meanwhile, residents with commute times between 30 and 60 minutes increased for northern New Jersey, but declined for the Highlands Region and more significantly for Highlands Center residents. Finally, all geographies saw an increase in residents with commute times over 60 minutes. Increase in commute times is influenced by many factors, including changes in destination and shifts in mode.

Commuting patterns in the Highlands Region indicate that a smaller percentage of residents are relying on single-occupancy vehicles in 2013 than in 2000. However, while the use of buses and bicycles in commuting has increased, the larger shift appears to be towards residents working at home. While commute times have increased,

they have done so at a lower rate seen for the remainder of northern New Jersey, indicating that additional residents may be living closer to their places of employment. However, this decline may also be attributed to residents who have abandoned long commutes in favor of working at home and are no longer included in commute time datasets.

DATA CONFIDENCE

Census tract level data from the 2000 Decennial Census and 2013 American Communities Survey was used to analyze commuter mode choice and commute times. Census tract level data provides a small geography that can capture local variations in commuter behavior. However, it should be noted that the boundaries of the Highlands Planning and Preservation Areas often bisect Census tracts thus analyses of these areas contain Census tracts that fall partially outside their respective boundaries. The same is true for Highlands Centers, many of which occupy areas of multiple Census tracts.

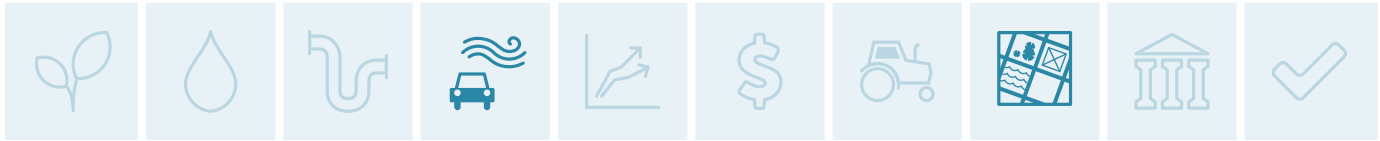
MILESTONES

- Increase in use of public transportation and alternative transportation modes, such as walking or biking.
- Decrease in use of single-occupancy vehicles.
- Decrease in commute times.

SECONDARY INDICATORS

Alternative Transportation Program Participation: Measures change in the number of Highlands Region employees participating in or offering programs such as carpools, vanpools, and employer shuttles.

Freight Index



RMP GOALS

5A Provision of safe and efficient mobility within the Highlands, and between the Highlands and destinations outside of the region.

RMP PROGRAMS

- Mobility of Agriculture and Freight Access
- Linking Transportation and Land Use

DESCRIPTION

Measures change in active freight lines and spurs.

BACKGROUND

The Highlands RMP provides policies that encourage the movement of goods from the roadway network to the freight rail network, wherever possible, in order to reduce highway congestion, improve safety, and protect the environment. For this indicator, active freight line and spur mileage was analyzed within the Highlands Preservation and Planning Areas and compared to northern New Jersey to assess mileage change over time.

Table 1: Active freight lines and spurs, 2009¹ and 2013

	Active Miles					
	Line		Change		Spur	Total
	2009	2013	Net	Percent	2013	2013
All Northern New Jersey	698	654	(45)	-6.4%	219	872
Northern New Jersey (non-Highlands)	515	476	(40)	-7.7%	200	676
Highlands Region	183	178	(5)	-2.7%	18	196
Planning Area	137	133	(5)	-3.6%	17	149
Preservation Area	45	45	-	0.0%	2	47

¹Active freight spur miles not available for 2009; ²Total active freight includes line and spurs.
Source: North Jersey Transportation Planning Authority, Rail Data, 2013

UNIT AND FREQUENCY OF ANALYSIS

The dataset is intersected with the Highlands Planning and Preservation Areas, the Highlands Region, as well as northern New Jersey.

Freight Lines and Spurs

Freight lines and spurs data is sourced from the North Jersey Transportation Planning Authority (NJTPA) and measures change in active miles of freight lines from 2009 to 2013, the two available data points. Active miles of freight spurs are a baseline, as data was first available in 2013.

STATUS

As of 2013 there were 177.79 active miles of freight lines and 18.11 miles of spurs in the Highlands Region, with most of those lines and spurs running through the Planning Area (Table 1). The majority of active freight lines and spurs in Northern New Jersey, however, are concentrated outside of the Highlands Region near the ports.

TREND

Since 2009, mileage of active freight lines declined across Northern New Jersey, but less significantly so in the Highlands Region. (Table 1)

DATA CONFIDENCE

The dataset was satisfactory for analyzing change of active freight lines between 2009 and 2013. However, the data does not capture line rehabilitations that improved track capacity, such as those completed on the Chester Branch and Kenvil Team Track in Morris County. In addition, measuring active freight lines does not account for variations in volume of freight rail traffic, which may be significant.

MILESTONES

- Increase in the mileage of active freight rail lines and spurs in the Highlands Region.

SECONDARY INDICATORS

Freight Activity: Measures change in freight rail activity within Highlands Region counties.

Transit Lands Area



RMP GOALS

5C Transportation improvements within the Highlands Region that are consistent with the Highlands Regional Master Plan.

5E Minimization of travel demand and vehicle miles of travel.

RMP PROGRAMS

- Linking Transportation and Land Use

DESCRIPTION

Measures change in Transit Lands Area; change in land use, construction activity, population density, and jobs within the Transit Lands Area.

BACKGROUND

The Highlands RMP provides policies designed to encourage the use of smart growth principles and promote an integrated approach to addressing transportation and land use planning. To quantify these smart growth principals, the RMP Transportation System Preservation and Enhancement Technical Report assigned transportation scores to the region based on access to the existing transportation system. The highest scores were awarded to lands located near train stations and existing bus routes, which provide the greatest opportunity for transit alternatives. Areas of the Highlands Region with a Transportation Score ≥ 3 , for the purpose of this indicator, are collectively referred to as the “Transit Lands Area.” This name is adopted from Figure 11 “Baseline Transportation – Transit Data Layer” of the Technical Report.

For this indicator, land use, construction activity, population density, and jobs were analyzed within the Highlands Region, as well as Transit Lands Area within the Preservation and Planning Areas to assess change over time.

UNIT AND FREQUENCY OF ANALYSIS

Data sets and how they were used for this analysis are described below. Each data set is intersected with the Highlands Region, as well as Transit Lands Area within the Highlands Planning and Preservation Areas.

Transit Lands Area (Transportation Score ≥ 3)

As modeled after Table 14 of the Transportation System Preservation and Enhancement Technical Report (measures proximity to train stations, bus routes, transportation corridors, intersections and interchanges, and park and rides), Transit Lands Area is any area with an “Assigned Value of Transportation Systems” of 3 or more.

- Change in Transit Lands Area was measured by comparing total acreage of original (2008) to current data (2016).
- Change in land use from 2002-2012 was assessed by using the Anderson Codes found in the Land Use/Land Cover (LULC) data released by the NJDEP, refined by those defined as “Developed,” “Residential,” and “Commercial and Industrial” in the Regional Land Use Conditions and Smart Design Technical Report (Appendix M, Highlands Land Classification Data Layer Relationship). Land Use was analyzed relative to the original 2008 Transit Lands Area.
- Building permit data was obtained from the New Jersey Department of Community Affairs (NJDCA) and was analyzed to include only permits that were issued certificates of occupancy (COs) in 2013 and 2014, as COs represent actual constructed residential units and non-residential square footage, vs. approved and permitted projects that are never completed. Geo-referenced data only became available in 2013, and 2015 data was not complete at the time of analysis. Accordingly, only a 2013/14 baseline can be provided at this time, but this data should be annually updated for future MPRR indicator analyses. Construction activity was analyzed relative to the original 2008 Transit Lands Area.
- Change in population density was measured using block-level data from the United States Census Bureau Decennial Census, 2000 and 2010. Population density was analyzed relative to the original 2008 Transit Lands Area.

Table 1: Developed land use in Transit Lands Area, Highlands Region, 2007-2012

		2007			2012		Change	
		Total Acres	Acres	Percent	Acres	Percent	Acres	Percent
Developed Land	Highlands Region	859,271.95	232,131.94	27.01%	236,524.87	27.53%	4,392.93	1.89%
	Transit Lands Area	46,854.14	42,233.97	90.14%	42,180.88	90.03%	(53.09)	-0.13%
	Planning Area	42,676.70	38,364.82	89.90%	38,294.98	89.73%	(69.84)	-0.18%
	Preservation Area	4,177.44	3,869.15	92.62%	3,885.89	93.02%	16.74	0.43%
Residential Land	Highlands Region	859,271.95	164,006.69	19.09%	166,968.80	19.43%	2,962.11	1.81%
	Transit Lands Area	46,854.14	26,962.92	57.55%	26,913.47	57.44%	(49.45)	-0.18%
	Planning Area	42,676.70	24,316.12	56.98%	24,276.60	56.88%	(39.52)	-0.16%
	Preservation Area	4,177.44	2,646.80	63.36%	2,636.88	63.12%	(9.92)	-0.37%
Commercial & Industrial Land	Highlands Region	859,271.95	21,451.19	2.50%	21,917.72	2.55%	466.53	2.17%
	Transit Lands Area	46,854.14	10,741.78	22.93%	10,696.80	22.83%	(44.98)	-0.42%
	Planning Area	42,676.70	9,884.13	23.16%	9,819.66	23.01%	(64.47)	-0.65%
	Preservation Area	4,177.44	857.65	20.53%	877.14	21.00%	19.49	2.27%

- Change in employment was analyzed using geocoded jobs data in the Highlands Region from the United States Department of Labor, Bureau of Labor Statistics Quarterly Census of Employment and Wages (QCEW) for 2004, 2008 and 2013. Employment was analyzed relative to the original 2008 Transit Lands Area.

STATUS

Using the most recent data available, Transit Lands Area represents 5% of the Highlands Region. Most of the Transit Lands Area is in the Planning Area (Table 1). In general, the Transit Lands Area is far more developed, compared to the Highlands Region as a whole.

Moreover, the Transit Lands Area has a higher concentration of residential development and commercial and industrial development, relative to the Highlands Region overall.

The Transit Lands Area contained 17.5% of new development square footage according to certificates of occupancy issued in the Highlands Planning Area between 2013 and 2014 (Table 2). Similarly, the Transit Lands Area contained over 21% of square footage for additions to existing structures. Overall, certificates of occupancy were issued at a rate of 2.45 per square mile of Transit Lands Area, compared to 1 per square mile for the Highlands Region as a whole (Table 3). In the Planning Area, certificates of occupancy were issued at an even higher rate of 4 per square mile.

At 844 people per square mile, Transit Lands Area has a greater population density than the 610 people per square mile in the overall Highlands Region (Table 4). In particular, population in the Transit Lands Area in the Planning Area

is more than twice as dense on average as the Highlands Region. Meanwhile, the population in the Transit Lands Area in the Preservation Area is still less dense than the region as a whole.

Despite covering just 5% of the Highlands Region land area, the Transit Lands Area hosts almost 36% of all jobs located in the region (Table 5). Moreover, almost 97% of Transit Lands Area jobs are in the Planning Area.

TREND

Since adoption of the RMP in 2008, the Transit Lands Area decreased by just under 8% (Table 6).

Developed lands in the Transit Lands Area did not change significantly since the adoption of the RMP (Table 1). While the rate of change in developed land was higher in the Highlands Region as a whole, the Transit Lands Area was already significantly developed, and change in developed land use does not capture redevelopment that may occur. The share of residential, commercial, and industrial development within Transit Lands Area remained relatively stable during this same period as well, while these land uses increased in the Highlands Region overall.

As noted above, issuance of certificates of occupancy was strong in the Transit Lands Area in 2013 and 2014. As georeferenced data only became available in 2013, construction activity should be monitored moving forward to demonstrate trend.

Population density declined slightly in the Transit Lands Area (Table 4), while it increased in the Highlands Region overall. While population density increased significantly

Table 2: Square footage of certificates of occupancy in Transit Lands Area, Highlands Region, 2013-2014

	Residential	Non-Residential	Total	
New Development	Northern New Jersey Total	12,017,941	5,649,482	17,667,423
	Outside of Highlands Region	8,676,818	4,677,453	13,354,271
	Highlands Region	3,341,123	972,029	4,313,152
	Outside Transit Land Area	2,940,936	615,725	3,556,661
	Transit Land Areas	400,187	356,304	756,491
	Preservation Area	357,828	331,718	689,546
	Planning Area	42,359	24,586	66,945
Additions	Northern New Jersey Total	2,942,115	1,503,538	4,445,653
	Outside of Highlands Region	1,990,488	1,375,795	3,366,283
	Highlands Region	951,627	127,743	1,079,370
	Outside Transit Land Area	754,387	97,388	851,775
	Transit Land Areas	197,240	30,355	227,595
	Preservation Area	184,307	25,350	209,657
	Planning Area	12,933	5,005	17,938

for Transit Lands Area located in the Preservation Area, this is at least partially related to the relatively small portion of Transit Lands Area in the Preservation Area.

The rate of job growth in the Transit Lands Area mirrored that of the Highlands Region as a whole (Table 5). While the geographies saw relatively similar job growth between 2004 and 2008 in total jobs, the Transit Lands Area represented almost 37% of the Highlands Region’s total job growth. Moreover, while the Highlands Region saw a net loss of over 14,000 jobs between 2008 and 2013, Transit Lands Area added just over 1,000 jobs.

DATA CONFIDENCE

The Transit Lands Area layer is maintained by the Highlands Council and has been influenced by inconsistent data over time. A decrease in Transit Lands Area may be attributed to a loss of accessible and accurate private bus line data and, potentially, a loss of actual bus routes. This, along with other data inconsistencies over time, suggest that the data confidence in the change of extent of Transit Lands Area since the adoption of the RMP is considered low.

Conversely, activity within the Transit Lands Area is deemed generally acceptable for analysis purposes, despite data inconsistencies over time. The analysis of land use, construction activity, population density, and

Table 3: New development certificates of occupancy per square mile in Transit Lands Area, Highlands Region, 2013-2014

	Square Miles	Certificates of Occupancy Per Square Mile		
		Residential	Non-Residential	Total
Northern New Jersey Total	3,624	0.75	0.21	0.96
Outside of Highlands Region	2,283	0.78	0.16	0.94
Highlands Region	1,341	0.70	0.30	1.00
Outside Transit Land Area	1,269	0.64	0.27	0.91
Transit Land Areas	73	1.70	0.75	2.45
Preservation Area	67	1.57	0.72	2.29
Planning Area	7	2.92	1.08	4.00

Table 4: Population density in Transit Lands Area, Highlands Region, 2000-2010

	Population Density		Change	
	2000	2010	Net	Percent
Highlands Region	569.20	610.61	41.41	7.28%
Transit Lands Areas	851.55	843.55	-8.00	-0.94%
Planning Area	1240.85	1226.32	-14.53	-1.17%
Preservation Area	241.53	279.31	37.78	15.64%

jobs utilized the original Transit Lands Area layer for comparative purposes, and thus minimizes the effect of these data inconsistencies.

The analysis of change in land use was performed using NJDEP Land Use/Land Cover data from 2002 and 2012. This dataset was found to be satisfactory for analyzing change in land use within the Transit Lands Area.

Building permit data from the NJDCA, while comprehensive, presented issues in joining to existing tax lot data; therefore some permits may have been left out of this analysis. This can largely be attributed to varying standards in entering block and lot numbers by local officials. While corrections were attempted, there was still some error in this data. Accordingly, it should be noted that 5% of the records could not be georeferenced due to this clerical error in the record. The 175 unmatched permit records in the Highlands Region were broken down by county area as follows: Bergen (3), Hunterdon (3), Morris (104), Passaic (3), Somerset (2), Sussex (12), and Warren (48).

Population density was measured using block-level data from the United States Census Bureau Decennial Census, 2000 and 2010; which is deemed satisfactory for analyzing change within the Transit Lands Area. In order

Table 5: Jobs in Transit Lands Area, Highlands Region 2004-2013

	Jobs			Change 2004-2008		Change 2008-2013	
	2004	2008	2013	Net	Percent	Net	Percent
Highlands Region	337,209	348,711	334,351	11,502	3.41%	(14,360)	-4.12%
Transit Lands Areas	114,482	118,696	119,707	4,214	3.68%	1,011	0.85%
Planning Area	300,778	313,113	302,172	12,335	4.10%	(10,941)	-3.49%
Transit Lands Areas	111,430	114,720	115,790	3,290	2.95%	1,070	0.93%
Preservation Area	36,431	35,598	32,179	(833)	-2.29%	(3,419)	-9.60%
Transit Lands Areas	3,052	3,976	3,913	924	30.28%	(63)	-1.58%

Table 6: Transit Lands Area, Highlands Region, 2008-2015

	Acres		Change	
	2008	2015	Net	Percent
Transit Lands Area	46,854	43,222	(3,632.14)	-7.75%

to ensure that a consistent geographic area was being analyzed despite changes in Census block boundaries, all 2000-edition blocks overlapping with Transit Lands Area and their geographically corresponding 2010 blocks were considered for this analysis.

The analysis of change in number of jobs was performed at a fine geographic scale using geocoded data points from the Quarterly Census of Employment and Wages, which is deemed satisfactory for analyzing change within the Highlands Transit Lands Area.

MILESTONE

- Increase in Transit Lands Area, as well as increases in development, construction activity, population density, and jobs within Transit Lands Area.

SECONDARY INDICATORS

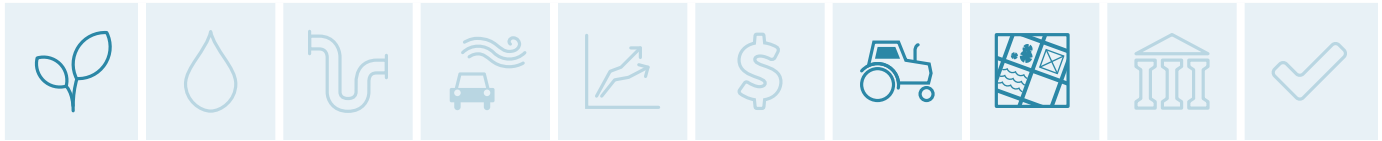
(None)



Future Land Use Indicators

- **Conservation Zone**
- **Existing Community Zone**
- **Highlands Designated Centers and Highlands Redevelopment Areas**
- **Protection Zone**

Conservation Zone



RMP GOALS

6A Use the Highlands Land Use Capability Map Series as a framework for determining the character, location, and magnitude of new growth and development in the Highlands Region.

6D Protection and enhancement of agricultural uses and preservation of associated land and water resources in Highlands Areas In the Conservation Zone.

RMP PROGRAMS

- Calculation of Land Use Capability
- Natural Resource Limitations on Land Use Capability

DESCRIPTION

Measures change in the Land Use Capability Map - Conservation Zone of business activity, sewer and public water service areas, developed lands, and Transit Lands. Also measures change in agricultural, forested, and preserved lands.

BACKGROUND

The Highlands RMP includes a Land Use Capability Zone (LUCZ) Map to address the requirements of the Highlands Act and provide regional guidance for the implementation of Plan policies. Inherent in the definition of each LUCZ is a determination of the overall carrying capacity for development. The zones distinguish between resource constrained lands, where development will be limited, and those lands characterized by existing patterns of human development where, dependent on land or capacity constraints, additional growth may be appropriate. RMP policies for each LUCZ correlate to the zone’s underlying capacity.

- Conservation Zone - defined in the RMP, the Conservation Zone (CZ) encompasses areas with a high concentration of agricultural lands and associated woodlands and environmental features, where development potential may be constrained by limited avail-

able infrastructure to support development (e.g., water availability, the existence of concentrated environmental resources that are easily impaired by development, or the protection of important agricultural resources).

For this indicator, land use characteristics, sewer and public water service areas, and business activities were analyzed in relation to the CZ.

UNIT AND FREQUENCY OF ANALYSIS

Data sets and how they were used for the analysis are described below. Each data set is intersected with the CZ, including a further dissection of the CZ by Highlands Preservation and Planning Area and Plan Conformance status.

Developed Lands

Developed Lands are derived from the NJDEP Land Use/Land Cover (LULC) dataset, refined by those defined as “Developed” in the Regional Land Use Conditions and Smart Design Technical Report (Appendix M, Highlands Land Classification Data Layer Relationship).

Change in developed lands was assessed by comparing pre-Highlands Act conditions (2002) to the most recent data available (2012).

Agricultural Lands

Agricultural Lands are derived from the NJDEP LULC dataset, refined by those defined as “Agriculture” in the Regional Land Use Conditions and Smart Design Technical Report (Appendix M, Highlands Land Classification Data Layer Relationship).

Change in agricultural lands was assessed by comparing pre-Highlands Act conditions (2002) to the most recent data available (2012).

Forested Lands

Forested Lands are derived from the NJDEP LULC dataset, refined by those defined as “Forested” in the Regional Land Use Conditions and Smart Design Technical Report (Appendix M, Highlands Land Classification Data Layer Relationship).

Change in forested lands was assessed by comparing pre-Highlands Act conditions (2002) to the most recent data available (2012).

Preserved Lands

The preserved lands dataset is maintained by the Highlands Council, and includes preserved open space or preserved farmland in a combination of federal, State, county, municipal, nonprofit, and private ownership, and represents a catalog of the public and private land and water areas available for recreation or presently protected as open space and recreation facilities.

Change in preserved lands was assessed by comparing extent at the time of the RMP (2008) to the most recent data available (2016).

Transit Lands

The Transit Lands dataset is maintained by the Highlands Council and includes areas in close proximity to train stations, bus routes, transportation networks, intersections and interchanges, and park and rides.

Change in Transit Lands was assessed by comparing extent at the time of the RMP (2008) to the most recent data available (2016).

Sewer Service Area

The Sewer Service Area (SSA) dataset is derived from NJDEP data and maintained by the Highlands Council and measures areas served by wastewater service at the tax parcel level.

Change in SSA was assessed by comparing the area mapped at the time of the RMP (2008) to the most recent data available (2016).

Public Water Service Area

The Public Water Service Area (PWSA) dataset is derived from NJDEP data and maintained by the Highlands Council and measures areas served by public water systems at the tax parcel level.

Change in PWSA was assessed by comparing the area mapped at the time of the RMP (2008) to the most recent data available (2016).

Business Activity

The Business Activity dataset is derived from Quarterly Census of Economics and Wages (QCEW) maintained by the US Bureau of Labor Statistics and measures total employment.

Change was assessed by comparing total employment at the time of the Act (2004) to the most recent complete dataset available (2013).

STATUS

As of 2016, using the most recent data available, half of the CZ is in agricultural land use and nearly a third is forested, while just 13% is developed and under 1% is in Transit Lands. Approximately one-third of CZ land is

preserved, with an even higher percentage of CZ Preservation Area lands permanently preserved. Less than 1% of the CZ is in sewer or public water service areas. Finally, while the CZ represents roughly 22% of the Highlands Region land area, it contains only 4% of total jobs in the Region.

TREND

Since adoption of the RMP in 2008, developed land increased within the CZ, with the Planning Area realizing nearly 5% more development than the Preservation Area (Table 1). Transit Lands also increased, and while a larger percent increase occurred in the Preservation area, the net acreage increase was more substantial in the Planning Area (Table 5). Meanwhile, agricultural land use decreased and forested land remained steady over the analysis period (Table 2 and 3). Preserved lands increased significantly and, while the increase was realized at similar rates across the Planning and Preservation Area, the Planning Area accounted for nearly two-thirds of net acres preserved from 2008 to 2016 (Table 4). The CZ saw an overall decrease in SSA, with only conforming areas in the Highlands Planning and Preservation Areas realizing a modest net acreage increase (Table 6). PWSA also decreased overall in the CZ; however, the Preservation Area realized a modest net PWSA acreage increase (Table 7). Both the Highlands Region and the CZ realized a modest increase in employment from 2004 to 2013, but while the Region realized this growth largely within the Planning Area, the CZ saw a decline in jobs in the Planning Area (Table 8). Consequently, the Preservation Area captured most of this zone's job growth over the same period.

DATA CONFIDENCE

The analysis of change in land use (developed, agricultural, and forested) was performed using NJDEP Land Use/Land Cover data from 2002 and 2012. This dataset was found to be satisfactory for analyzing change in land use within the Highlands Conservation Zone.

The analysis of change in preserved lands was performed using data catalogued by the Highlands Council from 2008 and 2016. The 2008 Regional Master Plan preserved lands information was based on the best available information at that time. As part of the Plan Conformance process, preserved lands data was further verified through the Module 1 and Module 2 Build-Out update. This update process allowed input from professionals throughout the region, which resulted in a more accurate representation of the preserved lands layer. The Highlands Council GIS department continually updates the preserved lands layer by both removing and adding lands as new data is made available, making the layer as accurate as possible. This dataset was found to be satisfactory for analyzing change in total acres of preserved lands within the Conservation Zone.

Indicators: Future Land Use

The Transit Lands Area layer is maintained by the Highlands Council and is deemed generally acceptable for analysis purposes, despite some data inconsistencies over time.

The analysis of change in number of jobs was performed at a fine geographic scale using geocoded data points from the Quarterly Census of Employment and Wages maintained by the US Bureau of Labor Statistics, which is deemed satisfactory for analyzing change in employment within the Conservation Zone.

MILESTONES

- Minimal increase in development that does occur should be primarily in the Planning Area of the (Conservation Zone) CZ.
- Minimal or no net decrease in agriculture; loss of agricultural land should occur primarily in the Planning Area of the CZ.
- Increase in forested land in the Preservation Area and minimal to no net decrease in the Planning Area of the CZ.
- Increase in preserved land, primarily in the Preservation Area of the CZ.
- Increase in Transit Lands within the CZ.
- Minimal to no net increase in Sewer Service Area (SSA) and Public Water Service Area (PWSA) increases in SSA and PWSA should primarily occur in the Planning Area of the CZ.
- Increase in jobs.

SECONDARY INDICATORS

(None)

Table 1: Change in Developed Lands, Highlands Conservation Zone (CZ), 2002-2012

	Total Acres	2002		2012		Change		
		Acres	Percent	Acres	Percent	Trend	Acres	Percent
Conservation Zone	190,861	20,010	10.48%	24,763	12.97%	Increase	4,752	23.7%
Planning Area	133,903	13,683	10.22%	17,234	12.87%	Increase	3,550	25.9%
Non-Conforming	109,555	11,113	10.14%	13,989	12.77%	Increase	2,876	25.9%
Conforming	24,348	2,570	10.55%	3,244	13.32%	Increase	675	26.2%
Preservation Area	56,958	6,327	11.11%	7,529	13.22%	Increase	1,202	19.0%
Non-Conforming	10,496	1,294	12.32%	1,447	13.79%	Increase	154	11.9%
Conforming	46,462	5,033	10.83%	6,082	13.09%	Increase	1,048	20.8%

Table 2: Change in Agricultural Lands, Highlands Conservation Zone (CZ), 2002-2012

	Total Acres	2002		2012		Change		
		Acres	Percent	Acres	Percent	Trend	Acres	Percent
Conservation Zone	190,861	101,131	52.99%	94,014	49.26%	Decrease	-7,117	-7.04%
Planning Area	133,903	72,798	54.37%	67,250	50.22%	Decrease	-5,548	-7.62%
Non-Conforming	109,555	59,017	53.87%	54,613	49.85%	Decrease	-4,404	-7.46%
Conforming	24,348	13,780	56.60%	12,637	51.90%	Decrease	-1,143	-8.30%
Preservation Area	56,958	28,333	49.74%	26,763	46.99%	Decrease	-1,570	-5.54%
Non-Conforming	10,496	5,056	48.17%	4,807	45.80%	Decrease	-249	-4.93%
Conforming	46,462	23,277	50.10%	21,957	47.26%	Decrease	-1,320	-5.67%

Table 3: Change in Forested Lands, Highlands Conservation Zone (CZ), 2002-2012

	Total Acres	2002		2012		Change		
		Acres	Percent	Acres	Percent	Trend	Acres	Percent
Conservation Zone	190,861	60,526	31.71%	60,823	31.87%	Increase	297	0.49%
Planning Area	133,903	40,684	30.38%	40,755	30.44%	Increase	72	0.18%
Non-Conforming	109,555	33,874	30.92%	33,794	30.85%	Decrease	-80	-0.24%
Conforming	24,348	6,809	27.97%	6,961	28.59%	Increase	152	2.23%
Preservation Area	56,958	19,842	34.84%	20,067	35.23%	Increase	225	1.13%
Non-Conforming	10,496	3,706	35.31%	3,803	36.24%	Increase	97	2.62%
Conforming	46,462	16,136	34.73%	16,264	35.00%	Increase	128	0.79%

Table 4: Change in Preserved Lands, Highlands Conservation Zone (CZ), 2008-2016

	Total Acres	2008		2016		Change		
		Acres	Percent	Acres	Percent	Trend	Acres	Percent
Conservation Zone	190,861	47,409	24.84%	64,499	33.79%	Increase	17,090	36.05%
Planning Area	133,903	30,333	22.65%	41,376	30.90%	Increase	11,043	36.40%
Non-Conforming	109,555	24,724	22.57%	33,448	30.53%	Increase	8,723	35.28%
Conforming	24,348	5,609	23.04%	7,928	32.56%	Increase	2,319	41.35%
Preservation Area	56,958	17,075	29.98%	23,123	40.60%	Increase	6,048	35.42%
Non-Conforming	10,496	2,597	24.74%	3,268	31.14%	Increase	672	25.87%
Conforming	46,462	14,479	31.16%	19,854	42.73%	Increase	5,376	37.13%

Table 5: Change in Transit Lands, Highlands Conservation Zone (CZ), 2008-2016

	Total Acres	2008		2016		Change		
		Acres	Percent	Acres	Percent	Trend	Acres	Percent
Conservation Zone	190,861	1,490	0.78%	1,594	0.84%	Increase	104	6.96%
Planning Area	133,903	1,360	1.02%	1,446	1.08%	Increase	86	6.31%
Non-Conforming	109,555	924	0.84%	1,004	0.92%	Increase	80	8.67%
Conforming	24,348	436	1.79%	442	1.82%	Increase	6	1.31%
Preservation Area	56,958	130	0.23%	147	0.26%	Increase	18	13.85%
Non-Conforming	10,496	20	0.19%	24	0.23%	Increase	4	17.93%
Conforming	46,462	109	0.24%	124	0.27%	Increase	14	13.11%

Table 6: Change in Sewer Service Area (SSA), Highlands Conservation Zone (CZ), 2008-2016

	Total Acres	2008		2016		Change		
		Acres	Percent	Acres	Percent	Trend	Acres	Percent
Conservation Zone	190,861	812	0.43%	529	0.28%	Decrease	-283	-35%
Planning Area	133,903	701	0.52%	430	0.32%	Decrease	-271	-39%
Non-Conforming	109,555	550	0.50%	190	0.17%	Decrease	-360	-65%
Conforming	24,348	151	0.62%	240	0.99%	Increase	89	59%
Preservation Area	56,958	111	0.19%	99	0.17%	Decrease	-12	-11%
Non-Conforming	10,496	30	0.28%	8	0.08%	Decrease	-21	-71%
Conforming	46,462	81	0.18%	90	0.19%	Increase	9	11%

Table 7: Change in Public Water Service Area (PWSA), Highlands Conservation Zone (CZ), 2008-2016

	Total Acres	2008		2016		Change		
		Acres	Percent	Acres	Percent	Trend	Acres	Percent
Conservation Zone	158,251	1,409	0.89%	1,311	0.83%	Increase	-98	-6.98%
Planning Area	133,903	1,076	0.80%	1,060	0.79%	Decrease	-16	-1.52%
Non-Conforming	109,555	743	0.68%	809	0.74%	Increase	66	8.82%
Conforming	24,348	333	1.37%	251	1.03%	Decrease	-82	-24.61%
Preservation Area	56,958	386	0.68%	483	0.85%	Increase	97	25.05%
Non-Conforming	10,496	17	0.16%	46	0.44%	Increase	29	173.44%
Conforming	46,462	369	0.80%	437	0.94%	Increase	68	18.28%

Table 8: Change in Employment, Highlands Conservation Zone (CZ), 2004-2013

	Acres		2004			2013			CZ Change		
	Total	CZ	Total Jobs	CZ Jobs	CZ % of Total	Total Jobs	CZ Jobs	CZ % of Total	Trend	Net	Percent
Highlands Region	859,269	190,861	1,344,939	55,049	4.09%	1,350,499	55,653	4.12%	Increase	604	1.10%
Planning Area	444,278	133,903	1,200,848	47,823	3.98%	1,216,132	45,558	3.75%	Decrease	-2,265	-4.74%
Non-Conforming	336,867	109,555	924,451	38,629	4.18%	928,719	39,055	4.21%	Increase	426	1.10%
Conforming	107,401	24,348	276,397	9,194	3.33%	287,413	6,503	2.26%	Decrease	-2,691	-29.27%
Preservation Area	414,990	56,958	144,091	7,226	5.01%	134,367	10,095	7.51%	Increase	2,869	39.70%
Non-Conforming	50,627	10,496	8,615	992	11.51%	10,812	1,441	13.33%	Increase	449	45.26%
Conforming	364,374	46,462	135,476	6,234	4.60%	123,555	8,654	7.00%	Increase	2,420	38.82%

Existing Community Zone



RMP GOALS

6A Use the Highlands Land Use Capability Map Series as a framework for determining the character, location, and magnitude of new growth and development in the Highlands Region.

6F Support of compact development, mixed use development and redevelopment and maximization of water, wastewater and transit infrastructure investments for future use of land and development within the Existing Community Zone.

RMP PROGRAMS

- Calculation of Land Use Capability
- Natural Resource Limitations on Land Use Capability

DESCRIPTION

Measures change in the Existing Community Zone (ECZ) of business activity, sewer and public water service areas, developed lands, and Transit Lands. Also measures change in agricultural, forested, and preserved lands.

BACKGROUND

The Highlands RMP includes a Land Use Capability Zone (LUCZ) Map to address the requirements of the Highlands Act and provide regional guidance for the implementation of Plan policies. Inherent in the definition of each LUCZ is a determination of the overall carrying capacity for development. The zones distinguish between resource constrained lands, where development will be limited, and those lands characterized by existing patterns of human development where, dependent on land or capacity constraints, additional growth may be appropriate. RMP policies for each LUCZ correlate to the zone’s underlying capacity.

- Existing Community Zone - defined in the RMP, the Existing Community Zone (ECZ) are lands characterized by existing patterns of human development where, dependent on land or capacity constraints, additional growth may or may not be appropriate.

For this indicator, land use characteristics, sewer and public water service areas, and business activities were analyzed in relation to the ECZ.

UNIT AND FREQUENCY OF ANALYSIS

Data sets and how they were used for the analysis are described below. Each data set is intersected with the ECZ, including a further dissection of the ECZ by Highlands Preservation and Planning Area and Plan Conformance status.

Developed Lands

Developed Lands are derived from the NJDEP Land Use/Land Cover (LULC) dataset, refined by those defined as “Developed” in the Regional Land Use Conditions and Smart Design Technical Report (Appendix M, Highlands Land Classification Data Layer Relationship).

Change in developed lands was assessed by comparing pre-Highlands Act conditions (2002) to the most recent data available (2012).

Agricultural Lands

Agricultural Lands are derived from the NJDEP LULC dataset, refined by those defined as “Agriculture” in the Regional Land Use Conditions and Smart Design Technical Report (Appendix M, Highlands Land Classification Data Layer Relationship).

Change in agricultural lands was assessed by comparing pre-Highlands Act conditions (2002) to the most recent data available (2012).

Forested Lands

Forested Lands are derived from the NJDEP LULC dataset, refined by those defined as “Forested” in the Regional Land Use Conditions and Smart Design Technical Report (Appendix M, Highlands Land Classification Data Layer Relationship).

Change in forested lands was assessed by comparing pre-Highlands Act conditions (2002) to the most recent data available (2012).

Preserved Lands

The preserved lands dataset is maintained by the Highlands Council, and includes preserved open space or preserved farmland in a combination of federal, State, county, municipal, nonprofit, and private ownership, and represents a catalog of the public and private land and water areas available for recreation or presently protected as open space and recreation facilities.

Change in preserved lands was assessed by comparing extent at the time of the RMP (2008) to the most recent data available (2016).

Transit Lands

The Transit Lands dataset is maintained by the Highlands Council and includes areas in close proximity to train stations, bus routes, transportation networks, intersections and interchanges, and park and rides.

Change in Transit Lands was assessed by comparing extent at the time of the RMP (2008) to the most recent data available (2016).

Sewer Service Area

The Sewer Service Area (SSA) dataset is derived from NJDEP data and maintained by the Highlands Council, and measures areas served by wastewater service at the tax parcel level.

Change in SSA was assessed by comparing the area mapped at the time of the RMP (2008) to the most recent data available (2016).

Public Water Service Area

The Public Water Service Area (PWSA) dataset is derived from NJDEP data and maintained by the Highlands Council, and measures areas served by public water systems at the tax parcel level.

Change in PWSA was assessed by comparing the area mapped at the time of the RMP (2008) to the most recent data available (2016).

Business Activity

The Business Activity dataset is derived from Quarterly Census of Economics and Wages (QCEW) maintained by the US Bureau of Labor Statistics and measures total employment.

Change was assessed by comparing total employment at the time of the Act (2004) to the most recent complete dataset available (2013).

STATUS

As of 2016, the most recent data available, more than three-quarters of the ECZ was developed, with even larger portions of Preservation Area ECZ developed. Nearly 22% of the ECZ is Transit Lands, most of which is in

the Planning Area. Almost a quarter of the ECZ is forested, but less than 1.5% is in agricultural use. Almost 12% of the ECZ is preserved, with a slightly higher proportion of preservation occurring in the Planning Area than the Preservation Area. Just under 39% of the ECZ is in a sewer service area and 47% is in a public water service area; and for both utilities, the Planning Area contains more service area. Finally, while the ECZ represents roughly 21% of the Highlands Region land area, it contains 87% of total jobs in the Region. The ECZ within the Planning Area contains most of the Planning Area's employment, while the ECZ in the Preservation Area contains only half of all jobs in that geography – in other words, half of the Preservation Area's employment occurs outside of the ECZ. In that regard, the 2016 Fiscal Impact Assessment of the Highlands RMP suggests that true jobs figures in the Preservation Area are difficult to ascertain based on how jobs are reported in the Quarterly Census of Employment and Wages where construction jobs are reported at the office location rather than the actual site of construction.

TREND

Since adoption of the RMP in 2008, developed land increased within the ECZ, with the Planning Area realizing a greater net increase, but a similar rate of development as the Preservation Area (Table 1). At the same time as it realized an increase in development, the ECZ saw a decrease in Transit Lands (Table 5). Meanwhile, agricultural land uses and forested land decreased over the analysis period (Table 2 and 3). While forest and agricultural uses declined, preserved land increased (Table 4). The ECZ saw an overall decrease in SSA, with only the non-conforming area of the Preservation Area realizing a modest net acreage increase (Table 6). PWSA also decreased overall in the ECZ; however, the Preservation Area and the non-conforming portion of the Planning Area realized a net PWSA acreage increase (Table 7). Both the Highlands Region and the ECZ realized an increase in employment from 2004 to 2013, but while the Region realized employment growth largely within the Planning Area that was ultimately tempered by declines in the Preservation Area, the ECZ saw job growth across all geographies (Table 8).

DATA CONFIDENCE

The analysis of change in land use (developed, agricultural, and forested) was performed using NJDEP Land Use/Land Cover data from 2002 and 2012. This dataset was found to be satisfactory for analyzing change in land use within the Existing Community Zone.

The analysis of change in preserved lands was performed using data catalogued by the Highlands Council from 2008 and 2016. The 2008 Regional Master Plan preserved lands information was based on the best available information at that time. As part of the Plan Conformance process, preserved lands data was further verified through the Module 1 and Module 2 Build-Out update.

Indicators: Future Land Use

This update process allowed input from professionals throughout the region, which resulted in a more accurate representation of the preserved lands layer. The Highlands Council GIS department continually updates the preserved lands layer by both removing and adding lands as new data is made available, making the layer as accurate as possible. This dataset was found to be satisfactory for analyzing change in total acres of preserved lands within the Existing Community Zone.

The Transit Lands Area layer is maintained by the Highlands Council and is deemed generally acceptable for analysis purposes, despite some data inconsistencies over time.

The analysis of change in number of jobs was performed at a fine geographic scale using geocoded data points from the Quarterly Census of Employment and Wages maintained by the US Bureau of Labor Statistics, which is deemed satisfactory for analyzing change in employment within the Existing Community Zone.

MILESTONES

- Increase in development in Existing Community Zone (ECZ) lands.
- Minimal or no net decrease in agriculture in the ECZ.
- Minimal to no net decrease in forested land in the ECZ.
- Increase in preserved land in the ECZ.
- Increase in Transit Lands in the ECZ.
- Increases in SSA and PWSA, primarily in the Planning Area of the ECZ.
- Increase in jobs in the ECZ.

SECONDARY INDICATORS

(None)

Table 1: Change in Developed Lands, Highlands Existing Community Zone (ECZ), 2002-2012

	Total Acres	2002		2012		Change		
		Acres	Percent	Acres	Percent	Trend	Acres	Percent
Existing Community Zone	178,181	129,812	72.85%	135,549	76.07%	Increase	5,737	4.42%
Planning Area	152,420	107,230	70.35%	111,609	73.23%	Increase	4,379	4.08%
Non-Conforming	107,206	75,760	70.67%	78,892	73.59%	Increase	3,131	4.13%
Conforming	45,213	31,470	69.60%	32,718	72.36%	Increase	1,248	3.97%
Preservation Area	25,762	22,582	87.66%	23,940	92.93%	Increase	1,358	6.01%
Non-Conforming	1,097	924	84.18%	964	87.84%	Increase	40	4.34%
Conforming	24,664	21,658	87.81%	22,976	93.16%	Increase	1,318	6.08%

Table 2: Change in Agricultural Lands, Highlands Existing Community Zone (ECZ), 2002-2012

	Total Acres	2002		2012		Change		
		Acres	Percent	Acres	Percent	Trend	Acres	Percent
Existing Community Zone	178,181	3,267	1.83%	2,614	1.47%	Decrease	-653	-19.99%
Planning Area	152,420	2,770	1.82%	2,206	1.45%	Decrease	-564	-20.37%
Non-Conforming	107,206	2,074	1.93%	1,675	1.56%	Decrease	-399	-19.25%
Conforming	45,213	696	1.54%	531	1.17%	Decrease	-165	-23.72%
Preservation Area	25,762	497	1.93%	409	1.59%	Decrease	-88.9	-17.86%
Non-Conforming	1,097	12.7	1.15%	15.3	1.40%	Increase	2.7	21.07%
Conforming	24,664	485	1.97%	393	1.59%	Decrease	-91.5	0.00%

Table 3: Change in Forested Lands, Highlands Existing Community Zone (ECZ), 2002-2012

	Total Acres	2002		2012		Change		
		Acres	Percent	Acres	Percent	Trend	Acres	Percent
Existing Community Zone	178,181	44,633	25.05%	41,520	23.30%	Decrease	-3,113	-6.98%
Planning Area	152,420	37,804	24.80%	35,302	23.16%	Decrease	-2,501	-6.62%
Non-Conforming	107,206	26,134	24.38%	24,435	22.79%	Decrease	-1,699	-6.50%
Conforming	45,213	11,670	25.81%	10,868	24.04%	Decrease	-802	-6.87%
Preservation Area	25,762	6,829	26.51%	6,217	24.13%	Decrease	-612	-8.96%
Non-Conforming	1,097	215	19.55%	213	19.37%	Decrease	(2.0)	-0.95%
Conforming	24,664	6,615	26.82%	6,005	24.35%	Decrease	-610	-9.22%

Table 4: Change in Preserved Lands, Highlands Existing Community Zone (ECZ), 2002-2012

	Total Acres	2002		2012		Change		
		Acres	Percent	Acres	Percent	Trend	Acres	Percent
Existing Community Zone	178,181	19,093	10.72%	20,647	11.59%	Increase	1,554	8.14%
Planning Area	152,420	17,076	11.20%	18,495	12.13%	Increase	1,419	8.31%
Non-Conforming	107,206	12,340	11.51%	13,840	12.91%	Increase	1,500	12.16%
Conforming	45,213	4,736	10.48%	4,655	10.30%	Decrease	-81.3	-1.72%
Preservation Area	25,762	2,018	7.83%	2,153	8.36%	Increase	135	6.70%
Non-Conforming	1,097	83.1	7.57%	95.2	8.68%	Increase	12.1	14.58%
Conforming	24,664	1,934	7.84%	2,057	8.34%	Increase	123	6.36%

Table 5: Change in Transit Lands, Highlands Existing Community Zone (ECZ), 2002-2012

	Total Acres	2002		2012		Change		
		Acres	Percent	Acres	Percent	Trend	Acres	Percent
Existing Community Zone	178,181	42,177	23.67%	38,717	21.73%	Decrease	-3,460	-8.20%
Planning Area	152,420	39,830	26.13%	36,580	24.00%	Decrease	-3,251	-8.16%
Non-Conforming	107,206	29,520	27.54%	28,520	26.60%	Decrease	-1,000	-3.39%
Conforming	45,213	10,311	22.80%	8,059	17.83%	Decrease	-2,251	-21.83%
Preservation Area	25,762	2,347	9.11%	2,137	8.30%	Decrease	-210	-8.93%
Non-Conforming	1,097	295	26.85%	268	24.43%	Decrease	-26.5	-8.99%
Conforming	24,664	2,052	8.32%	1,869	7.58%	Decrease	-183	-8.92%

Table 6: Change in Sewer Service Area (SSA), Highlands Existing Community Zone (ECZ), 2002-2012

	Total Acres	2002		2012		Change		
		Acres	Percent	Acres	Percent	Trend	Acres	Percent
Existing Community Zone	178,181	82,489	46.29%	68,493	38.44%	Decrease	-13,995	-16.97%
Planning Area	152,420	76,410	50.13%	63,213	41.47%	Decrease	-13,197	-17.27%
Non-Conforming	107,206	55,490	51.76%	47,147	43.98%	Decrease	-8,343	-15.04%
Conforming	45,213	20,920	46.27%	16,067	35.54%	Decrease	-4,854	-23.20%
Preservation Area	25,762	6,078	23.59%	5,280	20.50%	Decrease	-798	-13.14%
Non-Conforming	1,097	170	15.51%	202	18.41%	Increase	31.8	18.69%
Conforming	24,664	5,908	23.95%	5,078	20.59%	Decrease	-830	-14.05%

Table 7: Change in Public Water Service Area (PWSA), Highlands Existing Community Zone (ECZ), 2002-2012

	Total Acres	2002		2012		Change		
		Acres	Percent	Acres	Percent	Trend	Acres	Percent
Existing Community Zone	178,181	84,526	47.44%	83,730	46.99%	Decrease	-797	-0.94%
Planning Area	152,420	76,795	50.38%	74,157	48.65%	Decrease	-2,638	-3.44%
Non-Conforming	107,206	53,614	50.01%	54,252	50.61%	Increase	638	1.19%
Conforming	45,213	23,181	51.27%	19,905	44.02%	Decrease	-3,276	-14.13%
Preservation Area	25,762	7,731	30.01%	9,573	37.16%	Increase	1,841	23.82%
Non-Conforming	1,097	498	45.37%	519	47.27%	Increase	20.9	4.19%
Conforming	24,664	7,233	29.33%	9,054	36.71%	Increase	1,821	25.17%

Table 8: Change in Employment, Highlands Existing Community Zone (ECZ), 2004-2013

	Acres		2004			2013			HC/HRA Change		
	Total	HC/HRA	Total Jobs	HC/HRA Jobs	HC/HRA % of Total	Total Jobs	HC/HRA Jobs	HC/HRA % Pf Total	Trend	Net	Percent
Highlands Region	859,269	178,181	1,344,939	1,156,728	86.01%	1,350,499	1,176,273	87.10%	Increase	19,545	1.69%
Planning Area	444,278	152,420	1,200,848	1,099,732	91.58%	1,216,132	1,111,506	91.40%	Increase	11,774	1.07%
Non-Conforming	336,867	107,206	924,451	837,929	90.64%	928,719	838,302	90.26%	Increase	373	0.04%
Conforming	107,401	45,213	276,397	261,803	94.72%	287,413	273,204	95.06%	Increase	11,401	4.35%
Preservation Area	414,990	25,762	144,091	56,996	39.56%	134,367	64,767	48.20%	Increase	7,771	13.63%
Non-Conforming	50,627	1,097	8,615	2,796	32.46%	10,812	5,723	52.93%	Increase	2,927	104.69%
Conforming	364,374	24,664	135,476	54,200	40.01%	123,555	59,044	47.79%	Increase	4,844	8.94%

Highlands Designated Centers and Highlands Redevelopment Areas



RMP GOALS

6H Guide development away from environmentally sensitive and agricultural lands and promote development and redevelopment in or adjacent to existing developed lands.

6J Accommodation of regional growth and development needs through the reuse and redevelopment of previously developed areas, including brownfields, grayfields, and underutilized sites.

6K Concentrate residential, commercial and industrial development, redevelopment, and economic growth in existing developed areas in locations with limited environmental constraints, access to existing utility, and transportation infrastructure.

6N Use of smart growth principles, including low impact development, to guide development and redevelopment in the Highlands Region.

RMP PROGRAMS

- Calculation of Land Use Capability
- Preservation Area Redevelopment
- Planning Area Redevelopment
- Smart Growth and Community Design Handbook

DESCRIPTION

Measures change in Highlands Designated Centers and Redevelopment Areas of business activity, sewer and public water service areas, developed lands, and Transit Lands. Also measures change in agricultural, forested, and preserved lands.

BACKGROUND

The Highlands RMP includes a Land Use Capability Zone (LUCZ) Map to address the requirements of the Highlands Act and provide regional guidance for the implementation of RMP policies. The development of the LUCZ Map included a determination of the overall carrying capacity for development. The zones distinguish between resource constrained lands, where development will be limited, and those lands characterized by existing patterns of human development where, dependent on land or capacity constraints, additional growth may be appropriate. RMP policies for each LUCZ correlate to the zone's underlying capacity.

Highlands Designated Centers

A Highlands Center is an area within a municipality where development and redevelopment is encouraged and fostered. Highlands Centers are intended to support economic balance in the Highlands Region, providing for sustainable economic growth, while protecting critical natural and cultural resources. To date the Highlands Council has approved 15 Designated Centers.

Highlands Redevelopment Area

As defined in the RMP, Highlands Redevelopment Areas are designated by the Highlands Council and are currently limited to brownfield sites and areas containing at least 70% impervious surface suitable for increased development. Designated Redevelopment Areas are eligible for consideration for a Highlands Preservation Area Approval (HPAA) with a Redevelopment Waiver from the NJDEP. Highlands Redevelopment Areas may also be considered in the Planning Area; however, no such designations have been made and procedures for a designation do not exist at this time. Infill is permissible in a Designated Highlands Redevelopment Area, as long as the area meets the designation requirements. A Highlands Redevelopment Area may be designated for the entire property, a portion of the

Table 1: Change in Developed Lands, Highlands Centers (HC) and Redevelopment Areas (HRA), 2002-2012

	Total Acres	2002		2012		Change		
		Acres	Percent	Acres	Percent	Trend	Acres	Percent
Highlands Centers & Redevelopment Areas	15,731	9,618	61.14%	10,197	64.83%	Increase	579	6.02%
Planning Area	15,551	9,528	61.27%	10,103	64.96%	Increase	575	6.03%
Non-Conforming	N/A ¹	N/A	N/A	N/A	N/A	N/A ¹	N/A	N/A
Conforming	15,551	9,528	61.27%	10,103	64.96%	Increase	575	6.03%
Preservation Area	179	90.1	50.29%	94.5	52.74%	Increase	4.4	4.86%
Non-Conforming	16.9	13.5	79.71%	13.3	78.84%	Decrease	-0.1	-1.09%
Conforming	162	76.6	47.22%	81.2	50.02%	Increase	4.5	5.92%

¹Currently, neither Highlands Centers nor Redevelopment Areas can be located within the Non-Conforming Planning Area.

property, or for collections of contiguous parcels in part or in whole. To date the Highlands Council has approved 11 Redevelopment Areas.

For this indicator, land use characteristics, sewer and public water service areas, and business activities were analyzed in relation to Highlands Centers and Highlands Redevelopment Areas.

UNIT AND FREQUENCY OF ANALYSIS

Data sets and how they were used for the analysis are described below. Each data set is intersected with Highland Centers and Highlands Redevelopment Areas, including a further dissection by Highlands Preservation and Planning Area, as well as Plan Conformance status.

Developed Lands

Developed Lands are derived from the NJDEP Land Use/Land Cover (LULC) dataset, refined by those defined as “Developed” in the Regional Land Use Conditions and Smart Design Technical Report (Appendix M, Highlands Land Classification Data Layer Relationship).

Change in developed lands was assessed by comparing pre-Highlands Act conditions (2002) to the most recent data available (2012).

Agricultural Lands

Agricultural Lands are derived from the NJDEP LULC dataset, refined by those defined as “Agriculture” in the Regional Land Use Conditions and Smart Design Technical Report (Appendix M, Highlands Land Classification Data Layer Relationship).

Change in agricultural lands was assessed by comparing pre-Highlands Act conditions (2002) to the most recent data available (2012).

Forested Lands

Forested Lands are derived from the NJDEP LULC dataset, refined by those defined as “Forested” in the Regional Land Use Conditions and Smart Design Technical Report (Appendix M, Highlands Land Classification Data Layer Relationship).

Change in forested lands was assessed by comparing pre-Highlands Act conditions (2002) to the most recent data available (2012).

Preserved Lands

The preserved lands dataset is maintained by the Highlands Council, and includes preserved open space or preserved farmland in a combination of federal, State, county, municipal, nonprofit, and private ownership, and represents a catalog of the public and private land and water areas available for recreation or presently protected as open space and recreation facilities.

Change in preserved lands was assessed by comparing extent at the time of the RMP (2008) to the most recent data available (2016).

Transit Lands

The Transit Lands dataset is maintained by the Highlands Council and includes areas in close proximity to train stations, bus routes, transportation networks, intersections and interchanges, and park and rides.

Change in Transit Lands was assessed by comparing extent at the time of the RMP (2008) to the most recent data available (2016).

Sewer Service Area

The Sewer Service Area (SSA) dataset is derived from NJDEP data and maintained by the Highlands Council, measuring areas served by wastewater service at the tax parcel level.

Table 2: Change in Agricultural Lands, Highlands Centers (HC) and Redevelopment Areas (HRA), 2002-2012

	Total Acres	2002		2012		Change		
		Acres	Percent	Acres	Percent	Trend	Acres	Percent
Highlands Centers & Redevelopment Areas	15,731	760	4.83%	672	4.27%	Decrease	-87.2	-11.48%
Planning Area	15,551	752	4.83%	669	4.30%	Decrease	-82.5	-10.98%
Non-Conforming	N/A ¹	N/A	N/A	N/A	N/A	N/A ¹	N/A	N/A
Conforming	15,551	752	4.83%	669	4.30%	Decrease	-82.5	-10.98%
Preservation Area	179	7.8	4.38%	3.2	1.77%	Decrease	-4.7	-59.44%
Non-Conforming	16.9	2.4	14.17%	3.2	18.76%	Increase	0.8	32.55%
Conforming	162	5.4	3.35%	0.0	0.00%	Decrease	-5.4	14.33%

¹Currently, neither Highlands Centers nor Redevelopment Areas can be located within the Non-Conforming Planning Area.

Change in SSA was assessed by comparing the area mapped at the time of the RMP (2008) to the most recent data available (2016).

Public Water Service Area

The Public Water Service Area (PWSA) dataset is derived from NJDEP data and maintained by the Highlands Council and measures areas served by public water systems at the tax parcel level.

Change in PWSA was assessed by comparing the area mapped at the time of the RMP (2008) to the most recent data available (2016).

Business Activity

The Business Activity dataset is derived from Quarterly Census of Economics and Wages (QCEW) maintained by the US Bureau of Labor Statistics and measures total employment.

Change was assessed by comparing total employment at the time of the Act (2004) to the most recent complete dataset available (2013).

STATUS

As of 2016, using the most recent data available, almost two-thirds of the 15 Highlands Designated Centers and 11 Highlands Redevelopment Areas land is developed; more than one-third of these areas are Transit Lands. Just over 16% of the Highlands Centers and Highlands Redevelopment Area land area is forested and 4.3% is in agricultural use. Under 4% of the Highlands Centers and Highlands Redevelopment Area land area is preserved. Just under 39% of Highlands Centers and Highlands Redevelopment Area land area is in a SSA; 42% is in a PWSA. Finally, while Highlands Centers and Highlands Redevelopment Areas represent less than 2% of the Highlands Region land area, they contain just over 11% of total jobs in the Region.

TREND

Since adoption of the RMP in 2008, developed land increased within Highlands Centers and Highlands Redevelopment Areas (Table 1). At the same time as it experienced an increase in development, Highlands Centers and Highlands Redevelopment Areas saw a decrease in Transit Lands (Table 5). Meanwhile, agricultural land uses, forested land, and preserved land also decreased over the analysis period (Table 2 - 4). The Highlands Centers and Highlands Redevelopment Areas land area saw an overall decrease in SSA and PWSA (Table 6 and 7). Both the Highlands Region and the Highlands Centers and Highlands Redevelopment Areas experienced an increase in employment from 2004 to 2013, but the Highlands Center and Highlands Redevelopment Area land area saw both greater net growth and rate of growth (Table 8).

DATA CONFIDENCE

The analysis of change in land use (developed, agricultural, and forested) was performed using NJDEP LULC data. This dataset was found to be satisfactory for analyzing change in land use within Highlands Centers and Highlands Redevelopment Areas.

The analysis of change in preserved lands was performed using data catalogued by the Highlands Council. The 2008 Regional Master Plan preserved lands information was based on the best available information at that time. As part of the Plan Conformance process, preserved lands data was further verified through the Module 1 and Module 2 Build-Out update. This update process allowed input from professionals throughout the region, which resulted in a more accurate representation of the preserved lands layer. The Highlands Council GIS department continually updates the preserved lands layer by both removing and adding lands as new data is made available, making the layer as accurate as possible. This dataset was found to be satisfactory for analyzing change in total acres of preserved lands within the Highlands Centers and Highlands Redevelopment Areas

Table 3: Change in Forested Lands, Highlands Centers (HC) and Redevelopment Areas (HRA), 2002-2012

	Total Acres	2002		2012		Change		
		Acres	Percent	Acres	Percent	Trend	Acres	Percent
Highlands Centers & Redevelopment Areas	15,731	2,970	18.88%	2,563	16.30%	Decrease	-406	-13.68%
Planning Area	15,551	2,909	18.70%	2,549	16.39%	Decrease	-359	-12.35%
Non-Conforming	N/A ¹	N/A	N/A	N/A	N/A	N/A ¹	N/A	N/A
Conforming	15,551	2,909	18.70%	2,549	16.39%	Decrease	-359	-12.35%
Preservation Area	179	61.0	34.06%	14.1	7.86%	Decrease	-47.0	-76.93%
Non-Conforming	16.9	0.2	1.30%	0.2	1.31%	No Change	0.0	0.00%
Conforming	162	60.8	37.47%	13.9	8.54%	Decrease	-47.0	-77.21%

¹Currently, neither Highlands Centers nor Redevelopment Areas can be located within the Non-Conforming Planning Area.

The Transit Lands Area layer is maintained by the Highlands Council and is deemed generally acceptable for analysis purposes, despite some data inconsistencies over time.

The analysis of change in number of jobs was performed at a fine geographic scale using geocoded data points from the QCEW maintained by the US BLS, which is deemed satisfactory for analyzing change in employment within Highlands Centers and Highlands Redevelopment Areas.

MILESTONES

- Increase in development.
- Minimal or no net decrease in agriculture.
- Minimal to no net decrease in forested land.
- Increase in preserved land.
- Increase in Transit Lands.
- Increase in Sewer Service Area and Public Water Service Area
- Increase in jobs.

SECONDARY INDICATORS

Brownfield Redevelopment Sites: Measures change in development according to Certificate of Occupancy activity at Brownfield Redevelopment sites.

Table 5: Change in Transit Lands, Highlands Centers (HC) and Redevelopment Areas (HRA), 2002-2012

	Total Acres	2002		2012		Change		
		Acres	Percent	Acres	Percent	Trend	Acres	Percent
Highlands Centers & Redevelopment Areas	15,731	6,562	41.71%	6,082	38.66%	Decrease	-480	-7.31%
Planning Area	15,551	6,315	40.61%	5,782	37.18%	Decrease	-533	-8.45%
Non-Conforming	N/A ¹	N/A	N/A	N/A	N/A	N/A ¹	N/A	N/A
Conforming	15,551	6,315	40.61%	5,782	37.18%	Decrease	-533	-8.45%
Preservation Area	179	247	137.70%	300	167.55%	Increase	53.5	21.68%
Non-Conforming	16.9	0.0	0.00%	0.0	0.00%	No Change	0.0	0.00%
Conforming	162	247	152.05%	300	185.01%	Increase	53.5	21.68%

¹Currently, neither Highlands Centers nor Redevelopment Areas can be located within the Non-Conforming Planning Area.

Table 6: Change in Sewer Service Area (SSA), Highlands Centers (HC) and Redevelopment Areas (HRA), 2002-2012

	Total Acres	2002		2012		Change		
		Acres	Percent	Acres	Percent	Trend	Acres	Percent
Highlands Centers & Redevelopment Areas	15,731	8,924	56.73%	6,125	38.94%	Decrease	-2,800	-31.37%
Planning Area	15,551	8,860	56.98%	6,063	38.99%	Decrease	-2,798	-31.57%
Non-Conforming	N/A ¹	N/A	N/A	N/A	N/A	N/A ¹	N/A	N/A
Conforming	15,551	8,860	56.98%	6,063	38.99%	Decrease	-2,798	-31.57%
Preservation Area	179	64.0	35.70%	62.0	34.58%	Decrease	-2.0	-3.14%
Non-Conforming	16.9	0.0	0.00%	0.0	0.00%	No Change	0.0	0.00%
Conforming	162	64.0	39.42%	62.0	38.18%	Decrease	-2.0	-3.14%

¹Currently, neither Highlands Centers nor Redevelopment Areas can be located within the Non-Conforming Planning Area.

Table 7: Change in Public Water Service Area (PWSA), Highlands Centers (HC) and Redevelopment Areas (HRA), 2002-2012

	Total Acres	2002		2012		Change		
		Acres	Percent	Acres	Percent	Trend	Acres	Percent
Highlands Centers & Redevelopment Areas	15,731	8,019	50.98%	6,599	41.95%	Decrease	-1,420	-17.71%
Planning Area	15,551	7,999	51.44%	6,572	42.26%	Decrease	-1,427	-17.84%
Non-Conforming	N/A ¹	N/A	N/A	N/A	N/A	N/A ¹	N/A	N/A
Conforming	15,551	7,999	51.44%	6,572	42.26%	Decrease	-1,427	-17.84%
Preservation Area	179	20.4	11.39%	27.1	15.15%	Increase	6.7	32.97%
Non-Conforming	16.9	0.0	0.00%	0.0	0.00%	0.0	0.0	0.00%
Conforming	162	20.4	12.58%	27.1	16.73%	Increase	6.7	32.97%

¹Currently, neither Highlands Centers nor Redevelopment Areas can be located within the Non-Conforming Planning Area.

Table 4: Change in Preserved Lands, Highlands Centers (HC) and Redevelopment Areas (HRA), 2002-2012

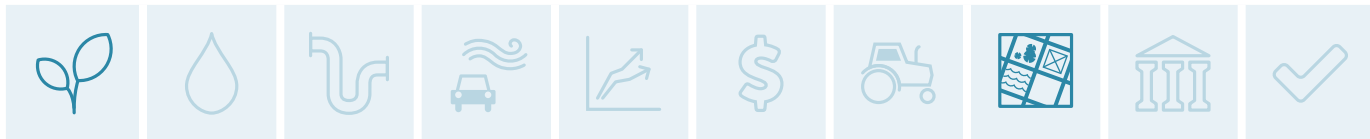
	Total Acres	2002		2012		Change		
		Acres	Percent	Acres	Percent	Trend	Acres	Percent
Highlands Centers & Redevelopment Areas	15,731	1,425	9.06%	535	3.40%	Decrease	-890	-62.46%
Planning Area	15,551	1,425	9.16%	533	3.43%	Decrease	-892	-62.58%
Non-Conforming	N/A ¹	N/A	N/A	N/A	N/A	N/A*	N/A	N/A
Conforming	15,551	1,425	9.16%	533	3.43%	Decrease	-892	-62.58%
Preservation Area	179	0.4	0.24%	1.9	1.05%	Increase	1.4	1009.74%
Non-Conforming	16.9	0.0	0.00%	0.0	0.00%	No Change	0.0	0.00%
Conforming	162	0.4	0.27%	1.9	1.16%	Increase	1.4	334.18%

Table 8: Change in Employment, Highlands Centers (HC) and Redevelopment Areas (HRA), 2004-2013

	Acres		2004			2013			HC/HRA Change		
	Total	HC/HRA	Total Jobs	HC/HRA Jobs	HC/HRA % of Total	Total Jobs	HC/HRA Jobs	HC/HRA % of Total	Trend	Net	Percent
Highlands Region	859,269	15,731	1,344,939	129,066	9.60%	1,350,499	150,538	11.15%	Increase	21,472	16.64%
Planning Area	444,278	15,551	1,200,848	128,995	10.74%	1,216,132	149,797	12.32%	Increase	20,802	16.13%
Non-Conforming	336,867	N/A ¹	924,451	N/A	N/A ¹	928,719	N/A ¹	N/A ¹	N/A ¹	N/A ¹	N/A ¹
Conforming	107,401	15,551	276,397	128,995	46.67%	287,413	149,797	52.12%	Increase	20,802	16.13%
Preservation Area	414,990	179	144,091	71.0	0.05%	134,367	741	0.55%	Increase	670	943.66%
Non-Conforming	50,627	16.9	8,615	N/A ²	N/A ²	10,812	N/A ²	N/A ²	N/A ²	N/A ²	N/A ²
Conforming	364,374	162	135,476	71.0	0.05%	123,555	741	0.60%	Increase	670	943.66%

¹Currently, neither Highlands Centers nor Redevelopment Areas can be located within the Non-Conforming Planning Area. ²Due to the small number of total records, employment information could not be shared to maintain business confidentiality.

Protection Zone



RMP GOALS

6A Use the Highlands Land Use Capability Map Series as a framework for determining the character, location, and magnitude of new growth and development in the Highlands Region.

6B Preservation of the land and water resources and ecological function of Highlands areas in the Protection Zone.

RMP PROGRAMS

- Calculation of Land Use Capability
- Natural Resource Limitations on Land Use Capability

DESCRIPTION

Measures change in the Protection Zone of business activity, sewer and public water service areas, developed lands, and Transit Lands. Also measures agricultural, forested, and preserved lands.

BACKGROUND

The Highlands RMP includes a Land Use Capability Zone (LUCZ) Map to address the requirements of the Highlands Act and provide regional guidance for the implementation of Plan policies. Inherent in the definition of each LUCZ is a determination of the overall carrying capacity for development. The zones distinguish between resource constrained lands, where development will be limited, and those lands characterized by existing patterns of human development where, dependent on land or capacity constraints, additional growth may be appropriate. RMP policies for each LUCZ correlate to the zone's underlying capacity.

- Protection Zone - defined in the RMP, the Protection Zone (PZ) consists of high natural resource value lands that are important to maintaining water quality, water quantity, and sensitive ecological resources and processes. Land acquisition is a high priority in the Protection Zone and development activities will be extremely limited; any development will be subject to stringent

limitations on consumptive and depletive water use, degradation of water quality, and impacts to environmentally sensitive lands.

For this indicator, land use characteristics, sewer and public water service areas, and business activities were analyzed in relation to the PZ.

UNIT AND FREQUENCY OF ANALYSIS

Data sets and how they were used for the analysis are described below. Each data set is intersected with the PZ, including a further dissection of the PZ by Highlands Preservation and Planning Area, and Plan Conformance status.

Developed Lands

Developed Lands are derived from the NJDEP Land Use/Land Cover (LULC) dataset, refined by those defined as "Developed" in the Regional Land Use Conditions and Smart Design Technical Report (Appendix M, Highlands Land Classification Data Layer Relationship).

Change in developed lands was assessed by comparing pre-Highlands Act conditions (2002) to the most recent data available (2012).

Agricultural Lands

Agricultural Lands are derived from the NJDEP LULC dataset, refined by those defined as "Agriculture" in the Regional Land Use Conditions and Smart Design Technical Report (Appendix M, Highlands Land Classification Data Layer Relationship).

Change in agricultural lands was assessed by comparing pre-Highlands Act conditions (2002) to the most recent data available (2012).

Forested Lands

Forested Lands are derived from the NJDEP LULC dataset, refined by those defined as "Forested" in the Regional Land Use Conditions and Smart Design Technical Report (Appendix M, Highlands Land Classification Data Layer Relationship).

Change in forested lands was assessed by comparing pre-Highlands Act conditions (2002) to the most recent data available (2012).

Preserved Lands

The preserved lands dataset is maintained by the Highlands Council, and includes preserved open space or preserved farmland in a combination of federal, State, county, municipal, nonprofit, and private ownership, and represents a catalog of the public and private land and water areas available for recreation or presently protected as open space and recreation facilities.

Change in preserved lands was assessed by comparing extent at the time of the RMP (2008) to the most recent data available (2016).

Transit Lands

The Transit Lands dataset is maintained by the Highlands Council and includes areas in close proximity to train stations, bus routes, transportation networks, intersections and interchanges, and park and rides.

Change in Transit Lands was assessed by comparing extent at the time of the RMP (2008) to the most recent data available (2016).

Sewer Service Area

The Sewer Service Area (SSA) dataset is derived from NJDEP data and maintained by the Highlands Council and measures areas served by wastewater service at the tax parcel level.

Change in SSA was assessed by comparing the area mapped at the time of the RMP (2008) to the most recent data available (2016).

Public Water Service Area

The Public Water Service Area (PWSA) dataset is derived from NJDEP data and maintained by the Highlands Council and measures areas served by public water systems at the tax parcel level.

Change in PWSA was assessed by comparing the area mapped at the time of the RMP (2008) to the most recent data available (2016).

Business Activity

The Business Activity dataset is derived from Quarterly Census of Economics and Wages (QCEW) maintained by the US Bureau of Labor Statistics and measures total employment.

Change was assessed by comparing total employment at the time of the Act (2004) to the most recent complete dataset available (2013).

STATUS

As of 2016, the most recent data available, three-quarters of the PZ is forested land, while less than 3% is in agricultural use, just less than 14% is developed, and less than

1% is in Transit Lands. Just less than half of the PZ land is preserved, with an even higher percentage of PZ Preservation Area lands permanently preserved. Sewer or public water service areas cover a very modest portion of the PZ. Finally, while the PZ represents roughly 54% of the Highlands Region land area, it contains only 9% of total jobs in the Region.

TREND

Since adoption of the RMP in 2008, developed land increased within the PZ, with the Planning Area realizing 3% more development than the Preservation Area (Table 1). Meanwhile, Transit Lands decreased overall, with the highest net and percent decreases in conforming areas (Table 5). Agricultural land uses also declined, with a slightly larger decline in the Planning Area (Table 2). Forested land declined as well, with the greatest net acreage loss realized in the conforming portions of the Preservation Area (Table 3). Preserved lands increased, with the Preservation Area accounting for over two-thirds of net acres preserved from 2008 to 2016 (Table 4). The PZ saw an overall increase in SSA, with only the Preservation Area and non-conforming portions of the Planning Area realizing net acreage increases (Table 6). PWSA also increased overall in the PZ, with the Planning Area realizing almost twice as much net increase than the Preservation Area (Table 7). While the Highlands Region realized a modest increase in employment from 2004 to 2013, the PZ realized a nearly 11% decline (Table 8). The Planning Area PZ did realize a net growth in employment of nearly 12%, which was offset by more substantial declines in the Preservation Area PZ.

DATA CONFIDENCE

The analysis of change in land use (developed, agricultural, and forested) was performed using NJDEP Land Use/Land Cover data from 2002 and 2012. This dataset was found to be satisfactory for analyzing change in land use within the Highlands Protection Zone.

The analysis of change in preserved lands was performed using data catalogued by the Highlands Council from 2008 and 2016. The 2008 Regional Master Plan preserved lands information was based on the best available information at that time. As part of the Plan Conformance process, preserved lands data was further verified through the Module 1 and Module 2 Build-Out update. This update process allowed input from professionals throughout the region, which resulted in a more accurate representation of the preserved lands layer. The Highlands Council GIS department continually updates the preserved lands layer by both removing and adding lands as new data is made available, making the layer as accurate as possible. This dataset was found to be satisfactory for analyzing change in total acres of preserved lands within the Highlands Protection Zone.

Indicators: Future Land Use

The Transit Lands Area layer is maintained by the Highlands Council and is deemed generally acceptable for analysis purposes, despite some data inconsistencies over time.

The analysis of change in number of jobs was performed at a fine geographic scale using geocoded data points from the Quarterly Census of Employment and Wages maintained by the US Bureau of Labor Statistics, which is deemed satisfactory for analyzing change in employment within the Highlands Protection Zone.

MILESTONES

- Minimal increase in development in the Protection Zone (PZ); any development that does occur should be in the Planning Area of the PZ.
- Minimal or no net decrease in agriculture in the PZ; any loss of agricultural land should occur in the Planning Area of the PZ.
- Increase in forested land in the Preservation Area and minimal to no net decrease in the Planning Area of the PZ.
- Increase in preserved land, primarily in the Preservation Area of the PZ.
- Increase in Transit Lands within the PZ.
- Minimal to no net increase in Sewer Service Area (SSA) and Public Water Service Area (PWSA); any increase in SSA and PWSA should be for health and safety reasons.
- No net job loss.

SECONDARY INDICATORS

(None)

Table 1: Change in Developed Lands, Highlands Protection Zone (PZ), 2002-2012

	Total Acres	2002		2012		Change		
		Acres	Percent	Acres	Percent	Trend	Acres	Percent
Protection Zone	469,190	56,053	11.95%	64,383	13.72%	Increase	8,330	14.9%
Planning Area	144,263	22,573	15.65%	26,333	18.25%	Increase	3,760	16.66%
Non-Conforming	109,697	17,395	15.86%	20,234	18.45%	Increase	2,839	16.32%
Conforming	34,566	5,178	14.98%	6,099	17.64%	Increase	921	17.78%
Preservation Area	324,927	33,480	10.30%	38,050	11.71%	Increase	4,570	13.65%
Non-Conforming	38,802	4,344	11.20%	4,930	12.71%	Increase	586	13.48%
Conforming	286,125	29,136	10.18%	33,120	11.58%	Increase	3,984	13.67%

Table 2: Change in Agricultural Lands, Highlands Protection Zone (PZ), 2002-2012

	Total Acres	2002		2012		Change		
		Acres	Percent	Acres	Percent	Trend	Acres	Percent
Protection Zone	469,190	13,692	2.92%	12,878	2.74%	Decrease	-815	-5.95%
Planning Area	144,263	6,125	4.25%	5,597	3.88%	Decrease	-529	-8.63%
Non-Conforming	109,697	4,645	4.23%	4,186	3.82%	Decrease	-459	-9.89%
Conforming	34,566	1,481	4.28%	1,411	4.08%	Decrease	-69	-4.69%
Preservation Area	324,927	7,567	2.33%	7,281	2.24%	Decrease	-286	-3.78%
Non-Conforming	38,802	1,776	4.58%	1,693	4.36%	Decrease	-83	-4.67%
Conforming	286,125	5,791	2.02%	5,588	1.95%	Decrease	-203	-3.51%

Table 3: Change in Forested Lands, Highlands Protection Zone (PZ), 2002-2012

	Total Acres	2002		2012		Change		
		Acres	Percent	Acres	Percent	Trend	Acres	Percent
Protection Zone	469,190	359,771	76.68%	352,001	75.02%	Decrease	-7,770	-2.16%
Planning Area	144,263	99,678	69.09%	96,399	66.82%	Decrease	-3,280	-3.29%
Non-Conforming	109,697	76,399	69.65%	73,826	67.30%	Decrease	-2,573	-3.37%
Conforming	34,566	23,279	67.35%	22,573	65.30%	Decrease	-707	-3.04%
Preservation Area	324,927	260,093	80.05%	255,602	78.66%	Decrease	-4,491	-1.73%
Non-Conforming	38,802	29,224	75.32%	28,865	74.39%	Decrease	-359	-1.23%
Conforming	286,125	230,869	80.69%	226,737	79.24%	Decrease	-4,131	-1.79%

Table 4: Change in Preserved Lands, Highlands Protection Zone (PZ), 2008-2016

	Total Acres	2008		2016		Change		
		Acres	Percent	Acres	Percent	Trend	Acres	Percent
Protection Zone	469,190	206,843	44.09%	227,863	48.57%	Increase	21,020	10.16%
Planning Area	144,263	37,931	26.29%	44,757	31.02%	Increase	6,826	18.00%
Non-Conforming	109,697	28,918	26.36%	34,090	31.08%	Increase	5,171	17.88%
Conforming	34,566	9,012	26.07%	10,667	30.86%	Increase	1,655	18.36%
Preservation Area	324,927	168,912	51.98%	183,105	56.35%	Increase	14,194	8.40%
Non-Conforming	38,802	13,652	35.18%	15,523	40.01%	Increase	1,871	13.70%
Conforming	286,125	155,259	54.26%	167,582	58.57%	Increase	12,323	7.94%

Table 5: Change in Transit Lands, Highlands Protection Zone (PZ), 2008-2016

	Total Acres	2008		2016		Change		
		Acres	Percent	Acres	Percent	Trend	Acres	Percent
Protection Zone	469,190	3,187	0.68%	2,911	0.62%	Decrease	-276	-8.66%
Planning Area	144,263	1,485	1.03%	1,413	0.98%	Decrease	-72.4	-4.87%
Non-Conforming	109,697	1,199	1.09%	1,216	1.11%	Increase	17.1	1.42%
Conforming	34,566	286	0.83%	197	0.57%	Decrease	-89.4	-31.24%
Preservation Area	324,927	1,701	0.52%	1,498	0.46%	Decrease	-203	-11.96%
Non-Conforming	38,802	219	0.56%	221	0.57%	Increase	2.4	1.12%
Conforming	286,125	1,483	0.52%	1,277	0.45%	Decrease	-206	-13.89%

Table 6: Change in Sewer Service Area (SSA), Highlands Protection Zone (PZ), 2008-2016

	Total Acres	2008		2016		Change		
		Acres	Percent	Acres	Percent	Trend	Acres	Percent
Protection Zone	469,190	2,351	0.50%	2,668	0.57%	Increase	317	13%
Planning Area	144,263	1,365	0.95%	1,303	0.90%	Decrease	-62	-4.52%
Non-Conforming	109,697	851	0.78%	1,014	0.92%	Increase	163	19.17%
Conforming	34,566	514	1.49%	289	0.84%	Decrease	-225	-43.71%
Preservation Area	324,927	986	0.30%	1,365	0.42%	Increase	379	38.44%
Non-Conforming	38,802	69	0.18%	138	0.36%	Increase	69	100.66%
Conforming	286,125	917	0.32%	1,227	0.43%	Increase	310	33.77%

Table 7: Change in Public Water Service Area (PWSA), Highlands Protection Zone (PZ), 2008-2016

	Total Acres	2008		2016		Change		
		Acres	Percent	Acres	Percent	Trend	Acres	Percent
Protection Zone	178,828	2,468	1.38%	4,463	2.50%	Increase	1,995	80.84%
Planning Area	144,263	2,247	1.56%	3,969	2.75%	Increase	1,722	76.66%
Non-Conforming	109,697	2,026	1.85%	3,475	3.17%	Increase	1,450	71.56%
Conforming	34,566	221	0.64%	494	1.43%	Increase	273	123.30%
Preservation Area	324,927	1,648	0.51%	2,534	0.78%	Increase	885	53.69%
Non-Conforming	38,802	115	0.30%	240	0.62%	Increase	124	107.44%
Conforming	286,125	1,533	0.54%	2,294	0.80%	Increase	761	49.64%

Table 8: Change in Employment, Highlands Protection Zone (PZ), 2004-2013

	Acres		2004			2013			PZ Change		
	Total	PZ	Total Jobs	PZ Jobs	PZ % of Total	Total Jobs	PZ Jobs	CZ % Pf Total	Trend	Net	Percent
Highlands Region	859,269	469,190	1,344,939	132,807	9.87%	1,350,499	118,562	8.78%	Decrease	-14,245	-10.73%
Planning Area	444,278	144,263	1,200,848	52,938	4.41%	1,216,132	59,057	4.86%	Increase	6,119	11.56%
Non-Conforming	107,401	109,697	924,451	47,538	5.14%	928,719	51,351	5.53%	Increase	3,813	8.02%
Conforming	414,990	34,566	276,397	5,400	1.95%	287,413	7,706	2.68%	Increase	2,306	42.70%
Preservation Area	336,867	324,927	144,091	79,869	55.43%	134,367	59,505	44.29%	Decrease	-20,364	-25.50%
Non-Conforming	50,627	38,802	8,615	4,827	56.03%	10,812	3,648	33.74%	Decrease	-1,179	-24.43%
Conforming	364,374	286,125	135,476	75,042	55.39%	123,555	55,857	45.21%	Decrease	-19,185	-25.57%



Landowner Equity Indicators

- **Exemptions**
- **Open Space Program**
- **Transfer of Development Rights Program**

Exemptions



RMP GOALS

7F Ensure that Highlands Act exemptions are properly issued and monitored

RMP PROGRAMS

- Implementation

DESCRIPTION

Identifies the number and type of issued exemptions by year in the Highlands Region.

BACKGROUND

The Highlands Regional Master Plan (RMP) provides policies designed to mitigate the impacts of its implementation on landowner expectations regarding future land use. These policies seek to leverage tools such as Transfer of Development Rights (TDR), land acquisition, and exemptions and waivers.

Exemptions - defined in the Highlands Act, there are seventeen (17) exemptions that allow property owners to develop their properties without applying the enhanced environmental standards adopted by the New Jersey Department of Environmental Protection (NJDEP) in the Highlands Region or the standards and policies contained in the Highlands RMP.

- Preservation Area exemptions are issued by the NJDEP in accordance with Highlands Rules (N.J.A.C. 7:38). The NJDEP and the Highlands Council collaborate on certain exemptions (namely Exemptions 9 and 11), where the Highlands Council determines whether the proposed project is consistent with the goals of the Highlands Act.
- Planning Area exemptions are issued by the Highlands Council in accordance with the Highlands Act and the RMP.
- Through a Memorandum of Understanding (MOU) between the NJDEP and the Highlands Council, a certification program has been developed to authorize

municipalities to issue certain Highlands Act exemptions (exemptions 1, 2, 4, 5, 6, 7 and 8). The program is available to municipalities that have an approved Plan Conformance petition, have completed a training certification class, and adopted an approved Highlands exemption ordinance. Currently (February 2017) 27 municipalities are certified to issue certain exemptions locally.

UNIT AND FREQUENCY OF ANALYSIS

Data sets and how they were used for the analysis are described below. Each data set is intersected with the Highlands Preservation and Planning Areas.

Highlands Council and Municipally-issued

Exemptions

The Highlands Council maintains tracking information for exemptions issued in the Planning Area, as well as those issued by municipalities in both the Planning and Preservation Areas under the authority of the MOU.

Exemption information will be used to demonstrate number and type of exemptions issued in the Highlands Region over time.

NJDEP-issued Exemptions

The NJDEP provides certain tracking information for Preservation Area Highlands Applicability Determination (HAD) exemption applications and issuances. (See Data Confidence section below for further explanation).

Exemption information will be used to demonstrate number and type of exemption applications received and determinations issued in the Highlands Region over time.

STATUS

As of 2016, using the most recent data available, the Highlands Council has issued 31 exemptions in the Planning Area (Table 1) and certified municipalities have issued a total of 358 exemptions in the Planning and Preservation Areas (Table 2). The NJDEP received 1,172 applications for exemptions for the Preservation Area (Table 3) from 2004 through 2013; exemption information at that time did not track which of these applications ultimately received an exemption. From 2014 to 2016, NJDEP issued 113 exemptions.

Table 1: Exemptions Issued by the Highlands Council, 2011-2016

Exemption	2011	2012	2013	2014	2015	2016	Total
1 Single Family Individuals Own Use	0	0	0	0	0	0	0
2 Single Family 1 Acre - 1/4 Acre	0	0	0	0	0	0	0
4 Reconstruction	0	6	4	3	3	2	18
5 Single Family Improvements	0	0	0	1	0	0	1
6 Church or School	0	0	1	1	1	0	3
7 Woodlands Management	0	0	0	0	0	0	0
8 Trails	0	0	0	0	0	0	0
9 Maintenance, Repair Infrastructure	0	0	0	0	0	1	1
10 Construction select Transportation	0	0	0	0	0	0	0
11 Maintenance, Repair of Utilities	0	0	4	2	1	0	7
12 Reactivation rail lines/beds	0	0	0	0	0	0	0
13 Public infrastructure pre-Act	0	0	0	0	0	0	0
14 Mining, quarrying, production	0	0	0	0	0	0	0
15 Remediation contaminated sites	0	1	0	0	0	0	1
Total	0	7	9	7	5	3	31

TREND

Since adoption of the RMP in 2008, the Highlands Council has issued a consistent, yet nominal amount of exemptions in the Planning Area. Exemptions are not required in the non-conforming Planning Area; exemptions related to single and two family homes (and associated exemptions 1, 2, and 5) are not subject to RMP Plan Conformance in the Planning Area. In addition, Highlands Council staff also provides consultation to constituents regarding exempt activities without actually issuing exemptions. Along with the fact that exemptions are by right (not by permit), these all contribute to both a low demand for exemptions and low issuance of exemptions in the Planning Area.

More than half of the exemptions issued by the Highlands Council are for Exemption #4, which relates to the reconstruction of (generally non-residential) buildings within 125% of the footprint, up to 1/4 acre of new impervious surface. Maintenance and repairs of public utilities (Exemption #11) are the second most common Highlands Council issued exemptions. These exemption applications are expected to continue, as additional municipalities adopt Highlands related ordinances for projects that will require exemptions.

Municipally-issued exemptions in the Planning Area are few in number, relative to the Preservation Area, likely due in part to similar reasons that account for the low number

Table 2: Exemptions Issued by Municipalities, 2013-2016

<i>Exemption in the Highlands Planning Area</i>		2013	2014	2015	2016	Total
1 Single Family Individuals Own Use		0	0	0	0	0
2 Single Family 1 Acre - 1/4 Acre		0	3	0	0	3
4 Reconstruction		1	1	1	1	4
5 Single Family Improvements		0	2	6	0	8
6 Church or School		0	0	0	0	0
7 Woodlands Management		0	0	0	0	0
8 Trails		0	0	0	0	0
Total		1	6	7	1	15
<i>Exemption in the Highlands Preservation Area</i>		2013	2014	2015	2016	Total
1 Single Family Individuals Own Use		0	4	1	0	5
2 Single Family 1 Acre - 1/4 Acre		0	6	12	10	28
4 Reconstruction		0	8	11	13	32
5 Single Family Improvements		1	77	140	57	275
6 Church or School		0	1	0	1	2
7 Woodlands Management		0	0	0	0	0
8 Trails		0	0	1	0	1
Total		1	96	165	81	343
Total for Planning and Preservation Area		2	102	172	82	358

of Highlands Council-issued Planning Area exemptions. Municipalities that are authorized to issue exemptions, but are not conforming for the Planning Area, would only issue exemptions for the Preservation Area. The highest occurrence of municipally-issued exemptions in the Preservation Area occurred in 2015. Nearly 80% of all municipally-issued exemptions are for Exemption #5, which applies to single family dwelling units. These exemptions are generally issued by towns as landowners apply for building or other municipal permits regarding home improvements.

NJDEP-received exemption applications were highest in the 5 years directly after the passage of the Highlands Act. The decline in applications and exemption issuances since 2008 may be attributed to increased information sharing by the NJDEP and Highlands Council to constituents, including the Highlands Council's constituent call response team, so landowners and municipalities understand when it is necessary to submit an exemption application. NJDEP exemption applications and issuances will likely continue to decline over time, as certain exemptions are inherently more applicable in the years immediately following the Act, additional municipalities become certified to issue exemptions, and the knowledge base of the Highlands Region constituents regarding the exemption process continues to increase over time.

Table 3: Exemptions Applications Received or Issued by the NJDEP, 2004-2016

Exemption	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
1 Single Family Individuals Own Use	27	52	35	28	15	8	3	0	4	1	1	3	0	177
2 Single Family 1 Acre - 1/4 Acre	20	62	48	40	37	22	13	9	11	19	10	9	9	309
3 Development with prior approval	50	41	16	7	2	4	0	1	22	14	1	1	2	161
4 Reconstruction	15	59	33	44	27	29	24	19	3	6	5	23	17	304
5 Single Family Improvements	8	6	7	0	5	7	5	3	3	6	1	1	2	54
6 Church or School	5	18	9	7	3	2	3	3	1	4	0	1	0	56
7 Woodlands Management	0	1	0	0	0	0	0	1	0	0	0	0	0	2
8 Trails	0	0	2	0	1	1	0	1	0	0	0	0	0	5
9 Maintenance, Repair Infrastructure	2	12	9	5	5	5	5	1	1	4	0	0	0	49
10 Construction select Transportation	1	2	1	2	3	1	2	0	1	0	0	2	0	15
11 Maintenance, Repair of Utilities	1	13	7	16	17	12	11	16	2	4	3	10	9	121
12 Reactivation rail lines/beds	0	1	0	0	0	1	0	0	0	0	0	3	0	5
13 Public infrastructure pre-Act	4	2	0	0	0	0	0	0	0	0	0	0	0	6
14 Mining, quarrying, production	0	2	1	0	1	4	1	0	0	2	0	0	0	11
15 Remediation contaminated sites	1	1	1	0	1	1	1	1	0	0	0	0	0	7
16 Federal military lands	0	1	0	0	0	0	0	0	0	0	0	0	0	1
17 MHD fair share development pre-Act	1	1	0	0	0	0	0	0	0	0	0	0	0	2
Total	135	274	169	149	117	97	68	55	48	60	21	53	39	1285

2004-2011 data provided by NJDEP: exemption applications. 2012-2013 data provided by Highlands Council: exemption applications. 2014-2015 data provided by NJDEP: exemptions issued.

DATA CONFIDENCE

Highlands Council and municipal exemption issuance data is maintained by the Highlands Council. Issued exemptions account for a fraction of exempt activities that occur throughout the Highlands Region on an annual basis. Municipalities may issue building permits for applications they know to be exempt and there is no requirement for a landowner to report exempt activities to the Highlands Council. There is a high confidence in tracking Highlands Council and municipally-issued exemptions, but there is low confidence in this dataset as representative of all exempt activities in the applicable areas of the Highlands Region.

The NJDEP exemption figures are derived from three datasets. 2004-2011 data was provided by NJDEP and tracks applications, not issuances, so it is not directly comparable to the Highlands Council and municipal-issued exemption data. The Highlands Council identified exemption applications through its mail correspondence tracking for 2012-2013, which again is not directly comparable to issuances. NJDEP provided issued exemption data for 2014-2016. In addition, NJDEP has provided guidance to municipalities indicating that they may issue permits for activities “upon inspection” that appear to be exempt. This leads to an underreporting of exempt activities. Therefore, given these variables, there is low confidence in this dataset for exact numbers, though the data is gen-

erally acceptable as representative for this analysis. As with the Highlands Council and municipally-issued exemptions, this count should not be considered representative of all exempt activities undertaken in the applicable area of the Highlands Region.

MILESTONES

- Unidentified at present

SECONDARY INDICATORS

(None)

Open Space Program



RMP GOALS

1E Protection of critical resources through land preservation and stewardship of open space throughout the Highlands Region.

7A Protection of lands that have limited or no capacity to support human development without compromising the ecological integrity of the Highlands Region, through mechanisms including but not limited to a region-wide transfer of development rights program.

RMP PROGRAMS

- Establishment of New/Alternative/ Innovative Land Preservation Programs
- See also: Open Space Partnership Funding Program and Highlands Development Credit Purchase Program rule (N.J.A.C 7:70)

DESCRIPTION

Tracks Highlands Open Space Partnership Funding Program applications, approved acquisitions, and funding availability.

BACKGROUND

The Highlands Regional Master Plan (RMP) provides policies designed to protect Highlands resources through land preservation. The RMP also provides mechanisms to mitigate the impacts of its implementation on landowner expectations regarding future land use, including the use of preservation programs that provide opportunities for compensation such as fee simple or conservation easement acquisition.

- Highlands Open Space Partnership Funding Program - defined in the adopted Highlands Open Space Partnership Funding Program and Highlands Development Credit Purchase Program Rule (N.J.A.C 7:70), which established procedures to provide funding in partnership with the State of New Jersey, local government units, and charitable conservancies, to acquire lands (including farmland) that further the goals of the Highlands Act and the RMP.

Table 1: Partnership Funding Program Applications

# of Applications	\$ Requested	Valuation	Acres for Preservation
31	\$13,490,477.00	\$33,444,181.00	4630

Table 2: Partnership Funding Program Acquisitions

# of Approved Purchases	\$ Approved	Valuation	Acres for Preservation
5	\$2,735,653.00	\$7,254,740.00	2574

Table 3: Partnership Funding Program Funding Sources

Source	\$ Allocated	\$ Spent*	\$ Remaining
PSE&G Mitigation Funding	\$2,735,653.00	\$0.00	\$2,735,653.00

*As of March 2017, approved Purchases have not been closed. Closing timeline: late 2017.

UNIT AND FREQUENCY OF ANALYSIS

Data sets and how they were used for the analysis are described below.

Highlands Open Space Program Tracking Sheet

The Open Space Program Tracking Sheet is maintained by the NJ Highlands Council and tracks the source and utilization of open space funding. It also tracks information about the Highlands Open Space Partnership Funding Program, including total requests to the Highlands Council, total match for each application, total property valuation, total acreage of easements, and more.

STATUS

Thirty-one (31) eligible applications were received for the first funding round (September 2016 deadline) of the Open Space Partnership Funding Program. These applications represent 4,630 acres, with a total request of nearly \$13.5 million dollars, matched by nearly \$20 million dollars in funds secured by the applicants (Table 1). Five (5) of the 31 applications were approved for purchase in March 2017. These properties represent 2,574 acres, and over \$4.5 million dollars will match the Highlands Council's share of \$2.7 million dollars (Table 2). Mitigation Funding was allocated to the Open Space Program to fund these acquisitions (Table 3).

DATA CONFIDENCE

The Highlands Open Space Program Tracking Sheet is maintained by the NJ Highlands Council and is deemed satisfactory for this analysis.

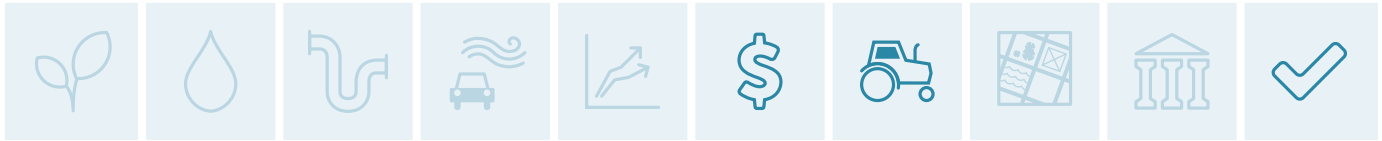
MILESTONES

- Establishment of the Highlands Open Space Partnership Funding Program, including sustained funding sources and increase in total acquisitions over time.

SECONDARY INDICATORS

(None)

Transfer of Development Rights Program



RMP GOALS

7A Protection of lands that have limited or no capacity to support human development without compromising the ecological integrity of the Highlands Region, through mechanisms including but not limited to a region-wide Transfer of Development Rights (TDR) program.

7B Provision for compensation through a region-wide program of TDR to landowners whose properties have limited or no capacity to support additional development based upon analyses conducted by the Highlands Council and who are disproportionately burdened by the provisions of the Highlands Act.

7C Creation of a Highlands Development Credit Bank.

7D Establishment of sufficient Highlands receiving zones to create a positive market for TDR credits.

7E Maximization of the transfer and use of HDCs.

RMP PROGRAMS

- Highlands Development Credit Created
- Allocation of Highlands Development Credits
- Highlands Development Credit Certificates
- Sale and Use of HDCs
- Receiving Zone Eligibility
- Highlands Council Identification of Potential Voluntary TDR Receiving Zones in the Planning Area
- Highlands Development Credit Bank Created

DESCRIPTION

Tracks Highlands Development Credit (HDC) allocations, number and status of applications for purchase of HDCs, and funding availability for purchase. Tracks Transfer of Development Rights (TDR) feasibility grants and eligible/ designated TDR receiving areas.

BACKGROUND

The Highlands Regional Master Plan (RMP) provides policies designed to mitigate the impacts of its implementation on landowner expectations regarding future land use. These policies seek to leverage tools such as TDR, land acquisition, and exemptions and waivers.

- Highlands Development Credit Program – The Highlands Act requires the establishment of a Highlands Transfer of Development Rights (TDR) Program. As a result, the Highlands Development Credit (HDC) Program was developed in the Transfer of Development Rights Technical Report (2008).
- Highlands Development Credit Bank – Pursuant to the Highlands Act, the Highlands Council established the HDC Bank to perform several functions, including recording and tracking all HDC activities and serving as a buyer and seller of HDCs.
- TDR Feasibility Grant Program – Pursuant to the Highlands Act, the Highlands Council established the Highlands TDR Receiving Zone Feasibility Grant Program to help municipalities assess the feasibility of establishing voluntary TDR Receiving Zones in their communities.

UNIT AND FREQUENCY OF ANALYSIS

Data sets and how they were used for the analysis are described below.

HDC Universe Record

The HDC Universe Record is maintained by the Highlands Council and provides a count of the total eligible (potentially available) HDCs from sending zones in the Highlands Region. This record uses GIS analysis to estimate available HDCs and was updated in 2016.

Table 1: HDC Eligibility and Allocations

	Properties	HDCs	HDC Value	Total Acreage
HDC Eligible Properties	2,262	31,865	\$509,836,000	64,552
Properties w/ Issued HDC Allocations	135	2,608	\$41,732,000	5,045

Table 2: HDC Bank Purchase Program Applications and Purchases

	HDC Purchase Program Applications	Total HDCs	Value of Total HDCs	Total Acreage
	104	2,089	\$33,428,000	2,742
Status	HDC Bank Purchase	Total HDCs	Value of Total HDCs	Total Acreage
Closed	21	518	\$8,292,000	603
Approved, Closing Pending	27	598	\$9,560,000	948
Recommended Purchases (April 2017)	18	382	\$6,108,000	695
Total	66	1,498	\$23,960,000	2,246

Table 3: HDC Purchase Program Income and Expenditures

<i>Funding Source for the HDC Purchase Program</i>	Amount
Executive Order 114 - State TDR Bank	\$10,000,000
PSE&G (Mitigation Funding) - Original Allocation	\$9,000,000
US Fish and Wildlife - Highlands Conservation Act Grant Program	\$2,420,000
NJDEP Highlands Penalties (Preservation Area Enforcement) Funds	\$204,432
PSE&G (Mitigation Funding) - Additional Allocation	\$6,108,000
Total Funding	\$27,732,432
Expenses	Amount
Executive Order 114 - Bonding Debt Service Costs	\$1,000,000
HDC Bank Purchases (Initial Purchase Program, including closing costs)	\$8,317,301
HDC Bank Purchases (2016-2017 Purchase Program)	TBD
Total Expenses	\$9,317,301
Available Balance for HDC Purchase Program	\$18,415,131

HDC Tracking Sheet and Registry

The HDC Tracking Sheet and Registry is maintained by the Highlands Council and tracks HDC allocations, relinquishments, and credit sale prices.

HDC Bank Registry

The HDC Bank Registry is maintained by the Highlands Council and tracks applications to the HDC Bank for purchase of HDCs, as well as HDC Bank and private HDC transactions. This data includes total HDCs sold, costs, and acreage.

HDC Funding Source Record

The HDC Funding Source Record is maintained by the Highlands Council and tracks the source and amount of funding allocated to HDC credit acquisition.

TDR Feasibility Grant Record

The TDR Feasibility Grant Record is maintained by the Highlands Council and tracks designated TDR receiving areas, as well as the location, expenditures, and status of Highlands TDR Feasibility Grants.

STATUS

It is estimated that the Preservation Area of the Highlands Region has nearly 32,000 potential HDCs available, which are tied to over 2,000 properties and cover over 64,000 acres. As of February 1, 2017, HDC allocations have been issued to 135 properties (6% of total eligible properties). These properties represent over 2,600 HDCs (8% of eligible HDCs) and 5,000 acres (8% of eligible acreage).

To date, all HDC purchases have been conducted by the HDC Bank, including 21 completed sales, 28 approved and pending closing, and 18 more were recommended for purchase in April 2017. These represent nearly 1,500 HDCs and over 2,200 acres (Table 2). Funding for the HDC Bank Purchase Program totals over \$27.7 million through five funding sources, with expenditures of \$9.3 million to date (Table 3).

As of February 1, 2017, the Highlands TDR Receiving Zone Feasibility Grant Program has provided grants to 20 municipalities with nearly \$250,000 in expenditures thus far (Table 4). To date, one feasibility study has shown TDR to be viable without caveat and one potentially viable with reasonable infrastructure improvements. Of the remaining grants, six were determined to be infeasible due to insufficient market demand or infrastructure capacity. The remainder are in progress or have been closed by the grantee before feasibility could be determined. No Highlands TDR receiving zones have been designated to date.

DATA CONFIDENCE

Highlands Development Credit Program records are maintained by the Highlands Council and have been deemed satisfactory for the purposes of this analysis.

MILESTONES

- Increase in the number of HDC allocations issued.
- Increase in the number of HDCs sold overall and on the private market.
- Adequate HDC Bank funding to meet demand.
- Increase in the number of Highlands TDR Receiving Zone Feasibility Grant Program participants.
- Increase in the number of designated TDR receiving zones.

Table 4: Highlands TDR Receiving Zone Feasibility Grant Program

Location	County	Grant Amount	Expenditures	Balance	Status
Bergenfield Borough	Bergen	\$40,000	\$0	\$40,000	
Bogota Borough	Bergen	\$38,000	\$19,000	\$0	Incomplete, closed
Chester Borough	Morris	\$40,000	\$25,725	\$0	Not Feasible
Clifton City	Passaic	\$60,000	\$20,000	\$0	Incomplete, closed
Clinton Town	Hunterdon	\$23,500	\$11,750	\$0	Water Capacity Issues
Hackettstown	Warren	\$25,000	\$0	\$25,000	Part of Plan Conformance Center Planning
Harmony Township	Warren	\$25,000	\$12,500	\$0	Incomplete, closed
High Bridge	Hunterdon	\$40,000	\$0	\$40,000	
Hopatcong Borough	Sussex	\$25,000	\$12,500	\$0	Not Feasible
Jersey City	Hudson	\$40,000	\$0	\$40,000	
Long Hill Township	Morris	\$25,000	\$12,500	\$0	Incomplete, closed
Lopatcong Township	Warren	\$24,500	\$24,500	\$0	Not Feasible
Newton	Sussex	\$40,000	\$27,544	\$0	Not Feasible, insufficient demand
Oakland Borough	Bergen	\$25,000	\$20,176	\$0	Possible, Wastewater Management Plan must be in place
Paterson City	Passaic	\$50,000	\$0	\$50,000	
Passaic City	Passaic	\$40,000	\$3,999	\$36,002	
Pohatcong Township	Warren	\$25,000	\$0	\$25,000	Part of Plan Conformance Center Planning
Tewksbury Township	Hunterdon	\$25,000	\$10,395	\$0	Not feasible, insufficient capacities
Vernon Township	Sussex	\$40,000	\$19,948	\$20,052	Not Feasible, insufficient demand
Washington Borough	Warren	\$25,000	\$25,000	\$0	Possible
Total	20 Grants	\$676,000	\$245,536	\$276,054	

SECONDARY INDICATORS

- **HDC Incentive Mechanisms:** Measures the number and type of HDC incentive mechanisms.
- **HDC Value:** Measures change in overall and median value of HDCs.



Sustainable Economic Development Indicators

- **Regional Fact Book**

Regional Fact Book



RMP GOALS

6A Use the Highlands Land Use Capability Map Series as a framework for determining the character, location, and magnitude of new growth and development in the Highlands Region.

8A Sustainable economic development in the Highlands Region.

RMP PROGRAMS

- Economic monitoring – Economic tracking

DESCRIPTION

A detailed assessment of the data contained in the Municipal Fact Book (Fiscal Impact Assessment deliverable), from a regional perspective.

BACKGROUND

The Highlands Act calls for a periodic review of the RMP, including a Fiscal Impact Assessment (FIA) of the Act and the RMP's potential impact on population, real estate, economic growth, and municipal finance trends. The FIA is a separate document that was released prior to the final Master Plan Recommendation Report (MPRR).

- Municipal Fact Book - The FIA included a Municipal Fact Book that provides individualized economic and fiscal summary information for each Highlands county and municipality, as well as a summary for the Region. For the purpose of this analysis, northern New Jersey is defined as all of Bergen, Essex, Hudson, Hunterdon, Middlesex, Morris, Passaic, Somerset, Sussex, Union, and Warren counties inclusive of the Highlands Region. For the purposes of this discussion, only the Highlands Region data was reviewed.

UNIT AND FREQUENCY OF ANALYSIS

Data sets and how they were used for the analysis are described below.

Highlands Planning and Preservation Areas

The Highlands Planning and Preservation Areas boundary dataset is maintained by the Highlands Council.

The 2016 Highlands Planning and Preservation Area boundaries were used to calculate total acreage in each area within the Highlands Region.

Preserved Lands

The preserved lands dataset is maintained by the Highlands Council and includes public parks, wildlife management areas, state forests, reservoir watershed lands, and conservation and agricultural easement holdings, with ownership representing federal, state, county, municipal, nonprofit, and private entities.

The 2016 preserved lands dataset was used to calculate total acres preserved within the Highlands Region and intersected with 2014 U.S. Census American Community Survey population data to determine preserved acreage per capita.

Land Use Capability Zones

Land Use Capability Zones (LUCZ) are related to a series of additional data layers, including water and sewer capacity, to help define the land use capability of the various parts of the Highlands Region. The LUCZ dataset is maintained by the Highlands Council and delineates LUCZ boundaries as defined in the RMP.

The 2016 LUCZ dataset was used to calculate total acreage of each LUCZ within the Highlands Region.

Land Use/Land Cover

Land Use/Land Cover (LULC) is an analysis of current land use, as derived from aerial photography compiled by the NJDEP.

The 2012 LULC dataset was used to calculate total acreage within the Highlands Region, Northern NJ, and NJ as a whole for each major land use classification as referenced in the Regional Land Use Conditions and Smart Design Technical Report (Appendix M, Highlands Land Classification Data Layer Relationship).

Land Development Activity

The Land Development Activity dataset includes records of property sales derived from the NJ Department of Treasury - Division of Taxation's MOD-IV record, as well as certificates of occupancy (COs) derived from NJ Department of Community Affairs (DCA) records.

The analysis includes an accounting of residential, commercial, and vacant land sales from the most recently available data for the Highlands Region, including 2013 MOD-IV data and 2013/14 COs.

Demographics

Demographic datasets used for this analysis are maintained by the U.S. Census Bureau and the NJ Department of Education (DOE).

The analysis includes summary of demographic information within the Highlands Region, Northern NJ, and NJ from the most recently available data, including 2010-2014 U.S. Census American Community Survey (ACS) population, household, and median age information, 2010-2014 U.S. Census Longitudinal Employer-Household Dynamics (LEHD) employment information, 2009-2013 U.S. Census ACS income information, and 2010-2016 NJ DOE K-8 school enrollment information.

Property Taxes

The property tax dataset is maintained by the NJ DCA.

The analysis includes a summary of property tax information for the Highlands Region from the most recently available data, 2010-2014.

Watershed Moratorium Offset Aid

The Highlands Act provides for an "appropriation to municipalities for lands subject to moratorium on conveyance of watershed lands" (P.L. 2004, Chapter 120, C.58:29-8). These funds are managed and administered by the NJ Department of the Treasury.

The analysis includes an accounting of total Watershed Moratorium Offset Aid spent within the Highlands Region as of 2016.

STATUS

As of 2016, using the most recent data available, 48% of the Highlands Region falls within the Preservation Area and 52% within the Planning Area. Approximately 36% of the Region's acreage is preserved, representing approximately 0.38 acres per Highlands resident. The majority of the Region's land (51%) has been designated Protection Zone in the Highlands Land Use Capability Map Series. The next largest designations are Existing Community Zone (16%) and Conservation Zone – Environmentally Constrained Subzone (14%). Nearly half of the Highlands Region is forested, while more than a quarter is developed. Comparatively, Northern New Jersey is more

than a third developed, while the entirety of New Jersey, at 25.2%, is slightly less developed than the Highlands Region (27.5%). The Highlands Planning Area accounted for 80% of the Region's single-family homes sales, 90% of improved commercial property sales, and 60% of vacant property sales. Nearly 70% of the Region's COs were issued in the Planning Area and the Region's total COs represented 16% of all Northern New Jersey COs.

The Highlands Region houses 15% of Northern New Jersey's population and represents nearly 15% of all Northern New Jersey jobs. The Region's household size is slightly smaller than Northern New Jersey, but on par with that of the state as a whole. Meanwhile, the Region's median household income is nearly 35% higher than that of New Jersey and 5% higher than Northern New Jersey. Median age is higher in the Highlands Region than the remainder of the state, as well as Northern New Jersey, while average district school enrollment is significantly lower. Residents of the Highlands Region paid property taxes of approximately \$856 per capita with over \$1.8 million dollars of Watershed Moratorium Offset Aid allocated to offset lost tax revenue due to a moratorium of the sale of watershed lands.

TREND

Trend information is available only for demographic and property tax information at this time. Since the adoption of the RMP, using the most recent data available, the Highlands Region's population has increased by less than half a percent and employment has increased by 2.5%. Average household size, median household income, and median age all increased as well, while average school district enrollment decreased. From 2010 to 2014, property taxes per capita increased 2% and the average tax rate increased by 3%, while total equalized municipal value decreased by 3%.

DATA CONFIDENCE

The Highlands Planning and Preservation Areas boundary dataset is maintained by the Highlands Council and is found to be satisfactory for analyzing Highlands Preservation and Planning Area acreage.

The analysis of preserved lands, performed using data catalogued by the Highlands Council, was found to be satisfactory for analyzing total acres of preserved lands within the Highlands Region.

The Highlands LUCZ dataset was developed and is maintained by the Highlands Council and was found to be satisfactory for the purpose of this analysis. The Highlands LUCZ data excludes rights-of-way; therefore, LUCZ acreage totals will differ from overall Highlands Region acreage totals.

Indicators: Sustainable Economic Development

The analysis of land use (agricultural, forested, developed, water and other), performed using NJDEP Land Use/Land Cover data from 2002 and 2012, was found to be satisfactory for analyzing land use within the Highlands Region, Northern New Jersey, and the state as a whole.

Property sales data is maintained by the New Jersey Division of Taxation and is found to be satisfactory for analyzing land use within the Highlands Region.

Certificate of occupancy data from the New Jersey Department of Community Affairs, while comprehensive, could not properly be meshed with existing tax lot data; therefore, some COs may have been left out of this analysis. This is largely attributed to use of varying standards in entering block and lot numbers by local officials. While corrections were attempted, there is still some error in this data. Accordingly, it should be noted that 5 percent of the records could not be georeferenced due to this clerical error in the record. The 175 unmatched permit records in the Highlands Region, broken down by county area, are distributed as follows: Bergen (3), Hunterdon (3), Morris (104), Passaic (3), Somerset (2), Sussex (12), and Warren (48).

Demographic information was largely measured using block-level data from the United States Census Bureau American Community Survey and Longitudinal Employer-Household Dynamics. These data sources were deemed satisfactory for analyzing population, employment, household size and income, and age within the Highlands Region, Northern New Jersey, and the state as a whole.

K-8 school enrollment information is maintained by the New Jersey Department of Education and is found to be satisfactory for analyzing enrollment within the Highlands Region, Northern New Jersey, and the state as a whole.

Property tax information is maintained by the New Jersey Department of Community Affairs and is found to be satisfactory for analyzing property taxes within the Highlands Region.

MILESTONE

- Continuation or improvement of economic and fiscal conditions..

SECONDARY INDICATORS

(None)

Figure 1: Highlands Region Page from Highlands Regional Factbook, Released January 2017

Highlands Region

	Acres*	%
Planning Area	444,269	52%
Preservation Area	415,003	48%
Highlands Region Boundary		

PRESERVED ACREAGE

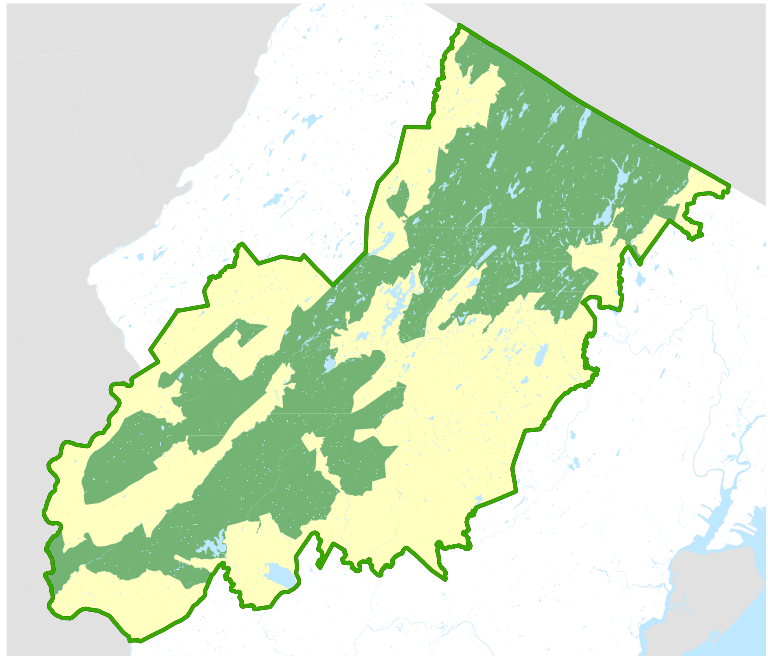
(NJ Highlands Council, 2016)

	Acres*	%
Total	308,090	36%
Highlands Region acreage per capita	0.38	-

LAND USE CAPABILITY ZONES

(NJ Highlands Council, 2016)

	Acres*	%
Protection Zone	420,996	51%
Wildlife Management Area	45,653	6%
Conservation Zone	66,717	8%
Conservation Zone Environmentally Constrained Subzone	112,691	14%
Existing Community Zone	134,023	16%
Existing Community Zone Environmentally Constrained Subzone	30,916	4%
Lake Community Subzone	12,228	1%



View interactive map online at www.nj.gov/njhighlands/gis/

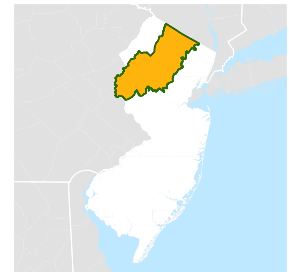
LAND USE LAND COVER

(NJ DEP, 2012)

	Highlands Region	Northern NJ	New Jersey
Agricultural	11.9%	9.8%	16.1%
Forest	45.6%	29.0%	24.7%
Developed	27.5%	36.3%	25.2%
Water	4.0%	12.6%	17.2%
Other	10.9%	12.2%	16.8%

LAND DEVELOPMENT ACTIVITY

		Highlands Region		Northern NJ	New Jersey
		Plan.	Pres.	Total	Total
Land sales (NJ MOD-IV, 2013)					
Single Family Home Sales	Number	4,526	1,209	n/a	n/a
	Average value	\$315 K	\$252 K	n/a	n/a
Improved Commercial Property Sales	Number	114	13	n/a	n/a
	Average value	\$991 K	\$684 K	n/a	n/a
Vacant Land Sales >0.15 acres	Number	224	139	n/a	n/a
	Average value per acre	\$78 K	\$20 K	n/a	n/a
Vacant Land Sales >5 acres	Number	21	28	n/a	n/a
	Average value per acre	\$24 K	\$7 K	n/a	n/a
Certificates of Occupancy Issued (NJ DCA, 2013-2014)		1,693	763	15,404	24,972



\$1,824,164
Municipal Total Watershed Moratorium Offset Aid

DEMOGRAPHICS

	Highlands Region	Northern NJ	New Jersey	Region Change
Population (U.S. Census ACS, 2010-2014)	822,166	5,446,700	8,874,374	+3,133
Total Employment (U.S. Census LEHD, 2010-2014)	357,337	2,458,623	3,833,892	+8,759
Average Household Size (U.S. Census ACS, 2010-2014)	2.67	2.74	2.71	Increase
Median Household Income (U.S. Census ACS, 2009-2013)	\$96,340 (Muni. Avg.)	\$91,916 (Muni. Avg.)	\$71,629	Increase
Median Age (U.S. Census ACS, 2010-2014)	42.3	39.5	39.3	Increase
K-8 School Enrollment (District Average) (NJ DOE, 2010-2016)	1,020 (Districts Avg.)	1,758 (Districts Avg.)	1,471 (Districts Avg.)	-85 (Districts Avg.)

PROPERTY TAXES

(NJ DCA, 2010-2014)

	Highlands Region	Northern NJ	New Jersey	Region Annual Change
Taxes Collected Per Capita	\$856	n/a	n/a	+2%
Total Municipal Equalized Value	\$129.82 B	n/a	n/a	-3%
Average Tax Rate	0.65	n/a	n/a	+3%

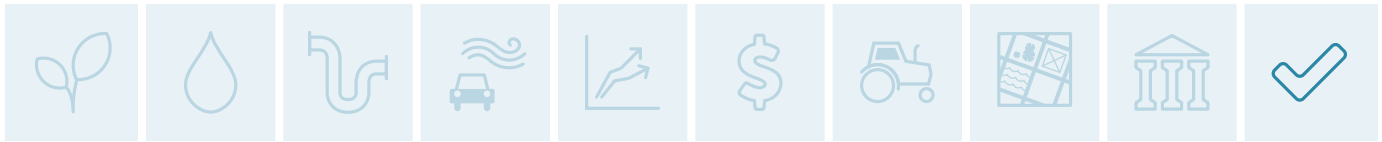
More about Plan Conformance Status at www.nj.gov/njhighlands/planconformance/



Implementation Indicators

- **County Plan Conformance**
- **Highlands Project Review**
- **Highlands RMP Implementation Funding**
- **Local Participation, Outreach & Education, Inter-Agency Coordination**
- **Municipal Plan Conformance**

County Plan Conformance



RMP GOALS

This program addresses RMP provisions regarding changes to county master plans and development review requirements, as needed to achieve plan conformance.

RMP PROGRAMS

- Chapter 6, Part 1 Regional Master Plan Conformance, Consistency and Coordination

DESCRIPTION

Status of county conformance of master plans and development review requirements to the RMP; Adoption/implementation of discretionary components.

BACKGROUND

The Regional Master Plan (RMP) embodies a regional vision for the Highlands Region and will be implemented at all levels of government. Through conformance by municipalities and counties, financial, and technical assistance by the Highlands Council, and State and federal coordination, the RMP will provide for the protection and preservation of significant values of the Highlands Region for the benefit of its residents.

County Plan Conformance is defined in the Act and in Guidelines adopted by the Highlands Council in 2008, counties may seek Plan Conformance through the revision of county plans and development regulations, as applicable to the development and use of land, as may be necessary in order to conform to the goals, requirements, and provisions of the RMP.

- Petition for Plan Conformance: A Petition for Plan Conformance consists of a comprehensive package of documents that maps out the changes required in county plans and development regulations to conform them to the RMP. The Highlands Council provides model documents as well as funding and technical assistance to all Highlands Region jurisdictions for

preparation of Petitions. All submittals are in draft form, intended to demonstrate in detail the full ramifications of Plan Conformance.

- Approval of Petition for Plan Conformance: The Highlands Council reviews Petitions for Plan Conformance for completeness and RMP consistency, working with each jurisdiction individually to tailor all documents (inclusive of detailed maps and supporting data) to local conditions and circumstances. The Highlands Council renders its determination by adoption of a resolution indicating approval, denial, or approval with conditions.
- Highlands Area Land Use Regulations: Adoption of regulatory provisions implementing the land use policies of the Master Plan Highlands Element. Applicable only to the conforming portion of the jurisdiction, the regulations consist of Land Development Regulations for counties.

UNIT AND FREQUENCY OF ANALYSIS

Data sets and how they were used for the analysis are described below.

County Plan Conformance

The Highlands Council maintains a record of efforts by counties in pursuit of Plan Conformance, including dates upon which counties met certain milestones in the Plan Conformance process.

STATUS

As of 2016, using the most recent data available (2016 County Plan Conformance Tracking Sheet), five of the seven Highlands counties filed a Petition for Plan Conformance. Passaic and Somerset Counties have received approval of their petitions and subsequently adopted conforming regulations (Table 1).

The County Plan Conformance program began with requirements similar to those for municipal Plan Conformance, but is recommended to be modified to better reflect actual county purview over land use, as defined by the New Jersey County Planning Act (N.J.S.A. 40:27-1 et seq.). As such, future regulatory changes for Plan Conformance will affect only stormwater and roadway standards for systems under the purview of each Highlands county. Greater emphasis will instead be placed on county planning activities, such as development and adoption of

Indicators: Implementation

Table 1: County Plan Endorsement Status

County	Petition Filed	Petition Approved	Regulations Adopted	Discretionary Components
Bergen	12/7/09	No	No	None
Hunterdon	No	No	No	None
Morris	12/7/09	No	No	None
Passaic	1/11/10	12/16/10	Completed by 12/2013	Heritage/Cultural Tourism Plan
Somerset	12/8/09	3/17/11	Completed by 1/2012	Waived
Sussex	12/22/09	No	No	None
Warren	No	No	No	None

Sustainable Economic Development Plans, Farmland and Open Space Preservation Plans, and Regional Stormwater Plans. In addition, the Highlands Council anticipates better integration of county planning officials into its efforts to implement the RMP by seeking their assistance as influential regional authorities able to organize, coordinate, and assist constituent municipalities in a variety of innovative ways. It is anticipated that revisions to the County Plan Conformance process should yield increased activity in the coming years.

DATA CONFIDENCE

The County Plan Conformance Record is maintained by the Highlands Council and deemed satisfactory for the purpose of this baseline analysis.

MILESTONES

- Increase in County Plan Conformance activity.

SECONDARY INDICATORS

(None)

Highlands Project Review



RMP GOALS

Ensure effective implementation of RMP Policies in local land use decision making where development projects are required to be reviewed by the Highlands Council.

RMP PROGRAMS

- Chapter 6, Part 2 - Highlands Project Review

DESCRIPTION

A summary of Highlands Project Reviews.

BACKGROUND

The Highlands Council is legislatively charged with reviewing proposed projects throughout the Highlands Region for consistency with the goals, requirements, and provisions of the Highlands Regional Master Plan (RMP). The Project Review responsibilities identified in the Highlands Act and specified through State agency coordination include the following:

1. Development applications submitted to Local Government Units: Section 6.r of the Highlands Act identifies the specific responsibility to “comment upon any application for development before a local government unit, on the adoption of any master plan, development regulation, or other regulation by a local government unit, or on the enforcement by a local government unit of any development regulation or other regulation, which power shall be in addition to any other review, oversight, or intervention powers of the council prescribed by this act.” In addition, municipalities, as part of plan conformance, may adopt local land use ordinance amendments that require applications for development to receive a consistency determination from the Highlands Council.
2. Call-up of Local Government Unit approvals: Section 17.a.(1) of the Act states that “[s]ubsequent to adoption of the regional master plan, the council may review, within 15 days after any final local government unit approval, rejection, or approval with conditions

thereof, any application for development in the preservation area” with the ability to override the local decision of certain projects meeting the statutory criteria if inconsistent with the RMP. Within the Planning Area, the Council shall include, as a condition of Plan Conformance, procedures for the Highland Council call-up of Local Government Unit approvals.

3. Capital, State and Local Government Unit projects: Section 16 of the Act states that, for certain types and sizes of projects, “the council may provide comments and recommendations on any capital or other project proposed to be undertaken by any State entity or local government unit in the Highlands Region.”
4. The Highlands Act, in Sections 9 and 11, authorizes the Highlands Council to “identify areas in which redevelopment shall be encouraged” in the Preservation Area and “any areas identified for possible redevelopment pursuant to this subsection shall be either a brownfield site designated by the Department of Environmental Protection or a site at which at least 70% of the area thereof is covered with impervious surface.” These Highlands Redevelopment Area Designations would be reviewed and approved by the Highlands Council and then reviewed for consistency with NJDEP’s waiver provisions in accordance with N.J.A.C. 7:38-6.
5. Highlands Preservation Area Approvals (HPAA): Approvals, authorizations, or permits issued by NJDEP: The NJDEP’s Highlands rules (N.J.A.C. 7:38) also empower the Council to review and comment on proposed projects in the Region.

UNIT AND FREQUENCY OF ANALYSIS

Data sets and how they were used for the analysis are described below.

Highlands Project Review Tracking

All completed project reviews are maintained by the Highlands Council as paper and/or electronic files. With increasing numbers of requests for project reviews, the Highlands Council established a tracking sheet in 2012, which it continues to maintain to provide easy access to project review status and final dispensation.

Table 1: Highlands Project Reviews

Project Type	2012	2013	2014	2015	2016	Total	Dispensation		
							Consistent	Inconsistent	Consistent w/ Conditions
Municipal Development Applications	2	4	8	6	2	22	12	2	8
Call-up, Local Government Approvals	-	-	-	-	-	-	-	-	-
Capital, State & Local Government Projects	-	-	-	-	1	1	1	-	-
Highlands Preservation Area Approvals (HPAAs)	1	-	1	-	-	2	1	-	1
Other NJDEP Approvals, Permits	2	-	-	1	-	3	2	-	1
Total	5	4	9	7	3	28	16	2	10

STATUS

As depicted in Table 1, the Highlands Council has mostly reviewed municipal development applications, finding most of them consistent with the RMP and thus approved (with or without conditions). In addition, the Highlands Council reviewed a small number of capital projects, HPAAs, and other NJDEP permitted projects, deeming all consistent and thus approved (with or without conditions). Overall, Highlands Council project reviews are small in number.

DATA CONFIDENCE

The Highlands Council’s tracking of project reviews is not complete for all years listed. The Highlands Council recognizes that project category placements need to be improved to avoid overlap.

MILESTONES

(None)

SECONDARY INDICATORS

(None)

Highlands RMP Implementation Funding



RMP GOALS

Ensure sufficient funding is available to local jurisdictions to implement all applicable components of the RMP.

RMP PROGRAMS

- Chapter 6, Part 1 Regional Master Plan Conformance, Consistency and Coordination

DESCRIPTION

Indicates investments made toward the implementation of the Regional Master Plan (RMP) and breakdown of how funding is used toward implementation of the RMP.

BACKGROUND

The Highlands Act and RMP provide policies for the prioritization of Highlands Council grants and State funding resources to Highlands jurisdictions and projects that are consistent with, and further the goals of, the RMP.

- Highlands Protection Fund – defined in the Act as the funding mechanism through which the Highlands Council awards grants to participating jurisdictions in support of Plan Conformance or Transfer of Development Rights.
- Other State and Federal Funds – described in the Act, conforming municipalities qualify for State aid and other benefits provided by the State to smart growth projects and/or jurisdictions that receive Plan Endorsement from the State Planning Commission.

UNIT AND FREQUENCY OF ANALYSIS

Data sets and how they were used for the analysis are described below.

- Highlands Implementation Investment Tracking Sheet: maintained by the Highlands Council, the Highlands Implementation Investment Tracking Sheet tabulates public investments appropriated to the Highlands

Table 1: Highlands Council Grant Programs in operation through FY 2016

Grant Program	Total Funding Expended by Awardees
Affordable Housing (COAH - 3rd Round (2006))	\$300,672.60
Municipal Planning Pilot Partnership	\$362,117.36
County Planning Pilot Partnership	\$104,410.00
TDR	\$245,535.98
Initial Assessment (precursor to PC)	\$869,033.59
Water Use and Conservation Management Plan Pilot	\$15,120.00
WUCMP Consultant (pilot)	\$490,149.85
Sustainable Agriculture	\$418,141.48
Plan Conformance	\$5,081,248.26
Total	\$7,886,429.12

Protection Fund for grant making and other funds appropriated to Highlands local governments to assist in implementing the RMP.

- Highlands Council Grant Tracking Sheet: maintained by the Highlands Council, the Highlands Council Grant Tracking Sheet tabulates funding expenditures by Highlands Council grant programs.

STATUS

As of 2016, using the most recent data available (FY2016), \$39.5 million dollars have been appropriated to the Highlands Council for grant programs, of which nearly \$8 million has been expended by grantees through the various grant programs that were in operation through FY2016 (Table 1). \$43.5 million has been appropriated to Highlands local governments to assist in the implementation of the RMP, with funds primarily coming from the New Jersey Environmental Infrastructure Trust and the US Environmental Protection Agency 319 program.

DATA CONFIDENCE

The Highlands Implementation Investment Tracking Sheet and Highlands Council Grant Tracking Sheet are maintained by the Highlands Council and deemed satisfactory for tracking appropriations to Highlands grant programs and local implementation initiatives.

MILESTONES

(None)

SECONDARY INDICATORS

(None)

Local Participation, Outreach & Education, Inter-Agency Coordination



RMP GOALS

- Maximize participation.
- Ensure effective coordination of RMP programs.
- Provide continuing education and outreach to expand knowledge of RMP issues, programs, and opportunities.

RMP PROGRAMS

- State and federal agency coordination;
- Educational programs for public officials, stakeholders, and general public

DESCRIPTION

The number and type of events, meetings, and activities the Highlands Council has held for public outreach, education, inter-agency coordination, site visits, and more.

BACKGROUND

In order to encourage and assist in the implementation of Highlands RMP policies and programs, the Highlands Council engages in various forms of community and inter-governmental outreach.

- Municipal and County Outreach – Municipal and County outreach includes meetings in support of Plan Conformance, including such items as developing Sustainable Econ Development Plans, Highlands Center designations, TDR initiatives, land preservation, easement monitoring, etc.
- Interagency Meetings – Interagency meetings includes coordination with partner State agencies such as NJDEP, the State Planning Commission, the NJ Board of Public Utilities, etc., regarding policy and RMP implementation matters of mutual concern.
- Committee Meetings – Committee meetings include meetings of the various Highlands Council committees, including Plan Development, Local Participation, Natural Resources, Smart Growth & Economic Development,

opment, Interagency, Land Conservation, Finance, Agriculture Subcommittee, TDR, and Agency Coordination.

- Site Visits – Site visits are conducted by Highlands Council staff for the purpose of project review, general surveys, or inspecting a Highlands Development Credit sale property.
- Other Outreach and Education – Other outreach and education include meetings with advocacy groups, presentations to the public or other stakeholders, general information sessions, conferences, etc.

UNIT AND FREQUENCY OF ANALYSIS

Data sets and how they were used for the analysis are described below.

Meetings, Events, and Site Visit Record

The Highlands Council maintains a record of meetings, events, and site visits for which the Council or its staff hosted or participated.

- The record is quantified as the number of meetings per month, grouped into five types of outreach activities: Municipal and County Outreach, Interagency Meetings, Committee Meetings, Site Visits, and Other Outreach and Education.

STATUS

In 2016, using the most recent data available, the Highlands Council hosted or participated in 284 outreach activities, including 50 municipal and county outreach meetings, 65 interagency meetings, 25 committee meetings, 39 site visits, and 105 other outreach and education meetings.

TREND

Since passing of the Highlands Act in 2004, the Highlands Council has hosted or participated in over 2,200 outreach activities, including 685 municipal and county outreach meetings, 482 interagency meetings, 109 committee meetings, 111 site visits, and 820 other outreach and education meetings (Tables 1-5). Municipal and county outreach meetings have occurred somewhat consistently since 2006, with peaks just before and after the adoption of the RMP, related to interest in and education related to Plan Conformance. There was also an upswing in county

Table 1: Municipal and County Outreach Meetings, 2006-2016

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
2006				9	2	6							17
2007	3	19	17	9	11	6	4	2	8	4	4	7	94
2008	9	8	7	7	2	2		6	6	13		3	63
2009	3	11	13	8	7	6	7	10	12	15	8	2	102
2010	6	2	4	8	3	3	6	3	3	5			43
2011	3	7	5	5	8	4	2	6	2	5	4	2	53
2012	2	2	3	3	2	7	8	5	8	5	5	1	51
2013	9	11	8	11	14	10	8	4	5	7	4	7	98
2014	4	6	5	8	6	6	9	8	2	1	4	5	64
2015	2	7	5	9	5	2	5	5	5	2		3	50
2016	2	6	8	4	6	3	2	5	2	4	4	4	50
Total	43	79	75	81	66	55	51	54	53	61	33	34	685

Table 2: Interagency Meetings, 2006-2016

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
2006													
2007		4	4	3	9	6	1	6	4	6		4	47
2008	2							1		8	5	2	18
2009	1	1	1	2	5	2	4	2	2	2	1	3	26
2010		6	4	2	2	5	1	2	1	4		3	30
2011	1	3	6	1	2	1	1	1	4	4	4	3	31
2012	1	1		2	2	4	5	8	7	6	2	4	42
2013	3	5	4	7	6	5	3	1	5	4	4	8	55
2014	8	8	9	8	7	7	6	6	1	9	12	19	100
2015	15	7	3	4	7	4	4	9	4	7	4		68
2016	8	8	4	8	4	6	3	6	5	5	6	2	65
Total	39	43	35	37	44	40	28	42	33	55	38	48	482

and municipal meetings in 2013, related to an outreach effort by the incoming Executive Director and Deputy Executive Director to introduce themselves and staff liaisons to Highlands governing bodies (Table 1). Interagency meetings also occurred consistently since 2007, with a larger number occurring in 2014 related to Master Plan Up-date stakeholder meetings (Table 2). Highlands Council Committee meetings run on a regular annual schedule, but occur only if there are matters to discuss. Committees met regularly until the adoption of the RMP in 2008, then met only occasionally until implementation activities required more regular review and discussion starting in 2014 (Table 3). Site visits began occurring on a regular basis in 2012, and occur as needed based on request or notification about a concern. Other outreach and education meetings have occurred on a consistent basis from the adoption of the RMP in 2008 through 2011, and with increased frequency since 2012.

DATA CONFIDENCE

The Meetings, Events, and Site Visit Record is maintained by the Highlands Council, and deemed satisfactory for the purpose of this baseline analysis. The Highlands Council should consider instituting a more robust record, in particular, including a narrative to accompany anomalies in meeting participation. As a Science and Research

Agenda item, the Highlands Council might also consider instituting a process to capture number of participants in meetings and events, particularly those involving public participants.

MILESTONES

- Consistent participation and hosting of meetings and events by the Highlands Council and its staff.

SECONDARY INDICATORS

Interagency Coordination: Summary of inter-agency coordination activities between the Highlands Council and other agencies.

Indicators: Implementation

Table 3: Committee Meetings, 2006-2016

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
2006		4		1		1							6
2007		3	1	5	2		1	1	3	2		1	19
2008	5	1											6
2009													
2010													
2011												1	1
2012													
2013								2		1			3
2014	3		2	2	2	2	2	3	1	2	3		22
2015	3	2	2	6	2	3	2		2	2	2	1	27
2016	5	2		4	2	2	2	3	1	3	1		25
Total	16	12	5	18	8	8	7	9	7	10	6	3	109

Table 4: Site Visits, 2006-2016

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
2006													
2007													
2008													
2009		1	1									1	3
2010													
2011													
2012	1	2		1		2			1		1	1	9
2013	1		3	3	1	2		2	3	1			16
2014	2	2	2	4	1	2	1	1	2	5	2	2	26
2015			1	2	2		3	2	1	2	2	3	18
2016		1		2	2	10	5	2	4	9	3	1	39
Total	4	6	7	12	6	16	9	7	11	17	8	8	111

Table 5: Other Outreach and Education Meetings, 2006-2016

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
2006			6	4	9	5							24
2007	7	8		4	4	1	1	1	4	5	2	3	40
2008	2	3	3	7	7	3	4	6	9	4	2	7	57
2009	1	9	4	7	7	3	4	6	5	3	3	3	55
2010	1	3	11	6	6	2	9	9	9	6	1	5	68
2011	6	6	10	8	8	7	7	1	5	5	3	3	69
2012	4	5	8	6	8	8	1	7	7	18	7	13	92
2013	10	12	10	19	15	8	12	8	11	10	17	7	139
2014	6	2	4	4	8	11	7	8	4	6	6	7	73
2015	7	8	7	13	9	10	3	6	5	6	7	17	98
2016	3	10	14	16	11	1	7	5	8	5	15	10	105
Total	47	66	77	94	92	59	55	57	67	68	63	75	820

Municipal Plan Conformance



RMP GOALS

This program addresses RMP provisions regarding changes to municipal master plans, zoning ordinances and development review ordinances, as needed to achieve consistency with the RMP ordinances.

RMP PROGRAMS

- Chapter 6, Part 1 Regional Master Plan Conformance, Consistency and Coordination

DESCRIPTION

A matrix of Municipal Plan Conformance Petition data, including submission and Highlands Council disposition, as well as approved Petition components and the current status of municipal completion.

BACKGROUND

The Regional Master Plan (RMP) embodies a comprehensive vision for the Highlands Region and will be implemented at all levels of government. Through conformance by municipalities and counties, financial and technical assistance provided by the Highlands Council, and coordination with state and federal programs, the RMP will provide for the protection and preservation of the significant values of the Highlands Region for the benefit of its residents.

- Municipal Plan Conformance – Municipal Plan Conformance has been defined in the Highlands Act and in Guidelines adopted by the Highlands Council in 2008. Municipalities achieve Plan Conformance through revision of local master plans and land use and development regulations, as may be necessary in order to conform with the goals, requirements, and provisions of the RMP. The Highlands Act requires that municipalities conform to the RMP for lands within the Preservation Area, while Plan Conformance for the Planning Area is voluntary.

The Plan Conformance program consists of three phases: the Petition Phase, Petition Review Phase, and the Implementation Phase.

Petition Phase: A Petition for Plan Conformance consists of a comprehensive package of documents that maps out the changes required in municipal master plans and development regulations to conform them to the RMP.

Petition Review Phase: The Highlands Council reviews Petitions for Plan Conformance for completeness and RMP consistency, working with each jurisdiction individually to tailor all documents (inclusive of detailed maps and supporting data) to local conditions and circumstances. The Highlands Council renders its determination by adoption of resolution indicating approval, denial, or approval with conditions.

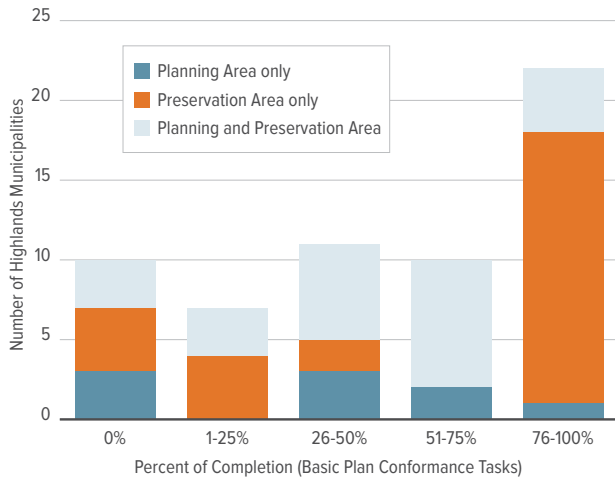
Implementation Phase: The Plan Conformance Implementation Phase begins after a municipality’s Petition is approved by the Highlands Council. All Petitions thus far have been approved with conditions and have been accompanied by a draft Highlands Council grant agreement setting forth priority implementation items along with coinciding budget allocations. An Implementation Plan and Schedule outlines the necessary tasks for completion and tracks expenditure of grant funds. Following completion of priority items, the Highlands Council considers follow-up Plan Conformance tasks for each municipality, which are required only upon Highlands Council allocation of any additional funding needed for their completion.

STATUS

Based on the most recent data available (March 2017), a total of 61 Highlands municipalities have submitted petitions for Plan Conformance to the Highlands Council, of which 50 have been approved. Of the 88 municipalities in the Highlands Region, 52 lie wholly or partially within the Preservation Area and are thus required to conform to the Highlands Act. Of these, 51 have submitted Petitions, of which 44 have been approved. Milestones A, B, and C have thus been very nearly achieved.

As to Milestone D, Figure 1 depicts the relative completeness of basic Initial Plan Conformance implementation items, including a Highlands Environmental Resource Inventory, Master Plan Reexamination Report and Resolution, Checklist Ordinance, Master Plan Highlands Element, Highlands Area Land Use Ordinance, and Zoning Map Amendments. Most Preservation Area-only communities

Figure 1: Initial Plan Conformance Implementation Status Conforming Highlands Municipalities, as of July 2016



are within the 76-100% complete range, while Planning Area and split communities represent a varying range of completeness.

Regarding resource management, the Highlands Council has recently begun the process of approving scopes of work for the municipal storm water management program (13 prepared) and the Water Use and Conservation Management plans (5 prepared).

DATA CONFIDENCE

The Municipal Plan Conformance Record is maintained by the Highlands Council and deemed satisfactory for the purpose of this baseline analysis.

MILESTONES

- Development and submission to the Highlands Council of Petitions for Plan Conformance (based on guidelines provided by the Highlands Council), by all Highlands municipalities having lands within the Preservation Area, as required pursuant to the Highlands Act.
- Development and submission to the Highlands Council of municipal Petitions for Plan Conformance (in accordance with Highlands Council guidelines) for Planning Area lands, as permitted voluntarily pursuant to the Highlands Act.
- Highlands Council review, consideration, and disposition of all submitted Petitions for Plan Conformance pursuant to the Highlands Act, including provision of funding for municipal implementation of Petition components for all approved Petitions.

- Municipal implementation of basic and long-term components required under approved Petitions for Plan Conformance.

SECONDARY INDICATORS

(None)

Table 1: Municipal Plan Conformance Status

	Number of Municipalities Completed	Total Municipalities Applicable+	Percent Completed
Initial Plan Conformance			
Plan Conformance Petition	50	61	82%
Planning Area Petition Ordinance	19	37	51%
Highlands Environmental Resource Inventory	29	57	51%
Master Plan Reexamination Report and Resolution	28	54	52%
Referral Ordinance	24	54	44%
Referral Ordinance Only Approach*	12	50	24%
Master Plan Highlands Element	20	57	35%
Highlands Area Land Use Ordinance	7	39	18%
Zoning Map Amendments	6	39	14%
Additional - Resource Management Planning			
Wastewater Management Plan	4	43	7%
Water Use & Conservation Management Plan & Implementation	0	24	0%
Stormwater Management Planning & Implementation	0	18	0%
Habitat Conservation Management Planning & Implementation	0	34	0%
Forest Management Planning & Implementation	0		
Stream/Lake Management Planning & Implementation	0	41	
Septic System Management/Maintenance Plan		61	0%
Additional - Land Use & Development Planning			
Right to Farm Ordinance	12	61	
Farm / Ag Retention Plan	2	21	
Sustainable Economic Development Plan	2	39	3%
Conservation Easements Monitor/Management Program	0		
Highlands Center Designation(s) Planning & Implementation	10	15	
Highlands Redevelopment Areas Designation(s) Planning & Implementation	0	17	
Transfer of Development Program Participation	0	Optional	
Green Building/Energy Master Plan Element	1	6	
Low Impact Development	0	61	0%
Additional - Other			
Housing Plan	72	59	122%
Exemption Determination Authorization	24	57	42%

+Takes the 88 Munis and excludes any that are coded purple or contain an n/a in the tracking sheet. *Represents Adopted Planning Area Petition Ordinances only, 19 have been approved.

Process Summary

In developing this baseline *Monitoring Program Recommendation Report (MPRR)*, the Highlands Council constructed a process that ensured public participation and technical review, and which could serve as a foundation for ongoing monitoring.

Pinwheel Vista / Vernon Township

Initial Public Comment

An initial public comment period was held from September 15, 2014 through April 30, 2015 to gather public input in support of the development of indicators and milestones that would help provide metrics for measuring progress on achieving the goals of the Highlands Act and RMP. The comment period was announced via public notice and promoted via direct communication with municipalities, counties, and other constituent groups and through media channels.

More than 110 comments were received via a web comment portal and through traditional means. All comments were categorized based on topic areas identified in the RMP. A Comment Response document and Comment Log, including searchable comment database, were posted to the website in May 2016.

Targeted Stakeholder Meetings

Facilitated, small-group, invitation-based meetings were held in late 2014 and early 2015 with representatives from state agencies, county and local government, and non-governmental organizations. These sessions were technical in nature and designed to garner input on potential indicators that emerged from the public comment period and data availability related to the proposed indicators. A briefing book was posted to the Highlands Council website in advance of the sessions and meeting summaries were made public following the sessions.

Stakeholder Outreach Workshops

Workshop-style sessions designed to provide a stakeholder forum for groups that were too large or diverse to accommodate in smaller sessions were held in late 2014 and early 2015. These meetings were open to the public, announced via public notice, and promoted through municipalities, counties and media channels.

In an effort to provide a reasonably convenient location for attendees throughout the Highlands Region, sessions were held at County College of Morris in Randolph (Morris County), Sussex County Technical School in Sparta (Sussex County), and the Oldwick Fire Company Social Hall in Oldwick (Hunterdon County).

Technical Advisory Committee (TAC) Meetings

In early 2015, the Highlands Council worked to identify membership for and establish Technical Advisory Committees (TACs) to help inform development of indicators and milestones. Candidates from government, academia, the nonprofit and for-profit business community, and the general public were considered based on expertise spanning content areas of the Regional Master Plan (RMP). TACs were established for each of the topic areas identified in this report.

Facilitated work sessions designed to review indicator and milestone findings, and provide input toward monitoring activities for the 2015-2025 period, were held at the Highlands Council office in December 2015. Sessions were organized by topic areas reflective of the RMP. A briefing book was posted to the Highlands Council website in advance of the sessions and meeting summaries were subsequently made public.

Indicator Analysis and Methodology

As a result of meetings and work sessions with key stakeholder groups, sister agencies, and technical advisory committees, the list of possible indicators for measuring progress related to the RMP was refined to include only those indicators that were directly related to the RMP and for which valid datasets for measurement were available.

Indicator analysis methodologies were then developed by the project consultant in collaboration with Highlands Council technical staff. Datasets were identified and detailed instructions written for how analysis of the identified indicator is to be performed. The scope and scale of the analysis and projected output were also identified. These documented methodologies ensure a platform for consistent monitoring and measurement over time. Methodologies were then used by the project consultant to independently conduct the analysis with input from and final review by Highlands Council technical staff. Recommendations were then drafted based on indicator analysis results and an examination of RMP implementation activities to date.

Public Outreach Sessions

Facilitated meetings were held in early 2016 to provide the public with an update on the Monitoring Program and a forum to ask questions. Sessions began with a brief overview presentation, with the remaining time available for attendees to review materials related to proposed draft indicators and ask follow-up questions. Materials from these sessions were then posted to the Highlands Council website. These events were open to the public and announced via public notice.

In an effort to provide a reasonably convenient location for attendees throughout the Highlands Region, sessions were held at the Frelinghuysen Arboretum in Morris Township (Morris County), Warren County Technical School in Washington (Warren County), and Passaic County Community College, Haskell (Passaic County).

Public Comment on Draft MPRR

A public comment period for the draft MPRR was open from July 11 through September 10, 2017. A comment response document has been added to this report as Appendix B.

Summary of Recommendations

Recommendations

The following pages contain brief summaries of all recommendations found within this report. Please refer to the topic area chapters for complete analysis leading to recommendations.

Title	Description	RMP Program
Natural Resources		
HUC14 Subwatershed Coordination	Facilitate the coordination of municipalities that share HUC14 subwatersheds to encourage collaboration in development of Stream Corridor Protection / Restoration Plans.	Restoration of Streams and Riparian Areas
Landscape Project Data Development	Continue coordination with NJDEP Endangered Non Game Species Program (ENSP) on refinement of Landscape Project Data.	Critical Habitat Conservation and Management
Connecting Habitat Across New Jersey	Continue participation and coordination with NJDEP ENSP on the Connecting Habitat Across New Jersey (CHANJ) Project.	Critical Habitat Conservation and Management
Carbonate Rock Mapping Updates	Continue coordination with NJGS and USGS when carbonate rock mapping is updated.	Carbonate Rock Areas
Regional Lake Management Plans	Establish a program to work directly with lake management commissions and counties to pursue lake management plans that span multiple municipalities.	Lake Management Areas
Ecosystems Services Valuation and Forest Management Guidance	Incorporate results of Ecosystem Services Valuation and Forest Management Guidance document into future amendments of the RMP.	Forest Management and Sustainability
Stream Corridor Protection / Restoration Plan	Assist and incentivize municipalities to develop stream corridor and/ or subwatershed-based Stream Corridor Protection/ Restoration Plans.	Restoration of Streams and Riparian Areas
Stream Corridor and Restoration Plan Guidance Document	Periodically update guidance documents available to municipalities for development of stream corridor restoration plans.	Restoration of Streams and Riparian Areas
Dam and Lake Management BMPs	Develop BMP Manuals for dam and lake maintenance.	Lake Management Areas
Highlands Financing and Administrative Handbook for Dam and Lake Maintenance	Create a Highlands Financing and Administrative Handbook for dam and lake maintenance and operation.	Lake Management Areas
Carbonate Rock Ordinances	Establish a database of municipal carbonate rock ordinances enacted locally.	Carbonate Rock Areas
Lake Management Plans	Encourage lake communities without lake management plans to develop and implement a Lake Management Plan using Highlands Guidance Documents and grant programs.	Lake Management Areas
Lake Management Plan Database	Maintain a Highlands Region Lake Management Plan Database.	Lake Management Areas
Lake Remediation	Assist municipalities to obtain funding opportunities for lake remediation activities.	Lake Management Areas
Update Forest Resource Areas Mapping	Update Forest Resources Areas for the Highlands Region based on GIS mapping policy and reconsiders the use of Forest Resource Area as a mapping unit and, instead, relies upon Total Forest Resource Area to delineate extent of forest for the Region.	Forest Management and Sustainability
Clarify RMP Definition of Disturbance	Clarify RMP definition of disturbance	Restoration of Streams and Riparian Areas
Critical Habitat Definition- Significant Natural Areas	Remove Significant Natural Areas from the Critical Habitat definition and exchange term Significant Natural Areas for original Natural Heritage Priority Sites.	Critical Habitat Conservation and Management

Summary of Recommendations

Title	Description	RMP Program
Critical Habitat Conservation and Management Mapping	Provide enhanced mapping of critical habitat to municipalities through the summarization of LU/LC categories.	Critical Habitat Conservation and Management
Karst Features Inventory	Establish an inventory of karst features identified through geophysical investigations during project reviews.	Carbonate Rock Areas
Steep Slope Protection Ordinance Database	Develop a database of steep slope protection ordinances, ridgeline ordinances, or other such regulations already in place in Highlands Municipalities and coordinate with any that wish to implement such protections.	Steep Slope Protection Areas
Water Resources		
NJ Statewide Water Supply Plan Coordination	Coordinate with NJDEP prior to the adoption of any revision to the NJ Statewide Water Supply Plan concerning the possible effects and impact of the plan upon the region.	Highlands Restoration: Water Deficits
Metrics for Water Use Efficiency	Coordinate with NJDEP, NJDA, and other appropriate stakeholders to select the most appropriate metrics for water use efficiency.	The Efficient Use of Water
Existing Water Use Rates	Coordinate with NJDEP to determine existing water use rates for all public community water supply systems and private potable wells using Highlands Water and assess the relative efficiency of water uses among common classes of systems.	The Efficient Use of Water
Water Use Rates- Agriculture	Coordinate with NJDEP, NJDA, and Rutgers Cooperative Extension Service to determine existing water use rates for all agricultural and other self-supplied irrigation uses using Highlands water and assess the relative efficiency of water uses among common classes of uses.	The Efficient Use of Water
Water User Fee	Determine the feasibility of enacting a water user fee imposed on water purveyors who derive water from Highlands Region Sources and dedicating funds raised by such fee to assist in compensating landowners in the Highlands Region whose future land use expectations have been impacted by the Act.	The Efficient Use of Water
Highlands Stormwater Management Plans	Coordinate outreach efforts to conforming municipalities regarding implementation of the Highlands Stormwater Management Program and, following guidelines set forth in the NJDEP Stormwater BMP Manual, identify high priority HUC 14 subwatersheds and a pilot study area for which to develop a Regional Stormwater Management Plan.	Water Quality Restoration
Golf Course Management Plans	Develop best management / conservation practices for inclusion in golf course management plans which can be considered with reviewing water allocation permits associated with golf courses.	The Efficient Use of Water
Low Impact Development- Water	Ensure, through the project review process, all proposed development incorporates LID design, relies on stormwater for irrigation purposes, and includes water conservation measures in site layout and structures.	The Efficient Use of Water
Important Groundwater Recharge Areas	Develop municipally-based guidance for the development of local identification of important groundwater recharge areas.	Water Deficits
Water Use and Conservation Management Plan Development	Prioritize development of municipal-wide WUCMPs through plan conformance implementation.	Highlands Restoration: Water Deficits
Water Use Efficiency Strategies	Encourage integration of water use efficiency strategies into WUCMPs.	The Efficient Use of Water
Watershed-based Management Plans	Identify any watershed-based management plans associated with the Highlands Region that have been developed or implemented.	Water Quality Restoration
Water Allocation Permits	Continue coordination with NJDEP on water allocation permit actions.	The Efficient Use of Water
Water Use Efficiency Education	Develop and provide education materials to Highlands municipalities regarding water use efficiency and conservation.	The Efficient Use of Water
Net Water Availability	Update RMP net water availability based on data from completed WUCMPs.	Highlands Restoration: Water Deficits
Prime Groundwater Recharge Areas-Program	Develop a program to directly address Prime Groundwater Recharge Areas.	Water Deficits
Prime Groundwater Recharge Areas Strategies	Develop avoidance, minimization, and mitigation strategies and policies associated with development in PGWRAs and develop site design guidelines for development in PGWRAs.	Water Deficits
Water Withdrawal Monitoring	Continue monitoring water withdrawals throughout the region using data catalogued by NJGS.	Highlands Restoration: Water Deficits

Summary of Recommendations

Title	Description	RMP Program
Water and Wastewater Utilities		
Accelerate Development of WMPs	Develop procedures that improve coordination with WMP partners to accelerate development and adoption of WMPs.	Water and Wastewater Utilities
Water Allocation	Continue coordination with NJDEP on water allocation decisions and project reviews.	Water and Wastewater Utilities
Existing Areas Served (EAS) Mapping	Develop procedures and schedules for updating EAS data on a regular schedule.	Water and Wastewater Utilities
Septic Maintenance BMPs	Develop a best management practices manual for municipalities including education materials on the proper operation and maintenance of septic systems, model septic management and maintenance ordinances, and guidance and grant funding to develop an inventory of septic systems.	Wastewater System Maintenance
Siting Wastewater Facilities	Provide guidance to municipalities to assist in identifying sites appropriate for wastewater facilities.	Wastewater System Maintenance
Infrastructure Upgrades	Identify and prioritize areas that are in need of upgraded infrastructure and investigate opportunities for creating grant programs to assist in infrastructure upgrades.	Water and Wastewater Utilities
Alternative Wastewater Treatment	Fund the development of alternative wastewater treatment plants and feasibility studies, particularly for developed Preservation Area municipalities currently not serviced by adequate wastewater treatment facilities.	Wastewater System Maintenance
Existing Municipal Septic System Maintenance Plans	Establish an inventory of any existing municipal septic maintenance plans and ordinances and the status of their implementation.	Wastewater System Maintenance
Implementation of Septic System Maintenance Plans	Evaluate the effectiveness of local implementation of septic system maintenance plans and ordinances.	Wastewater System Maintenance
Agricultural Resources		
Agricultural Loan Bank	Coordinate with SADC to establish an Agricultural Loan Bank to collateralize debt for farm equipment purchases based on the pre-Act value of the subject property where said value was adversely impacted by the Highlands Act.	Agricultural Sustainability, Viability, and Stewardship
Integrated Crop and Pest Management	Maintain and expand the program for farmers throughout the Highlands Region.	Agricultural Sustainability, Viability, and Stewardship
Market Development / Niche Crops	Develop and promote new markets for Highlands agricultural products and agritourism initiatives and activities.	Agricultural Sustainability, Viability, and Stewardship
Agritourism	Develop a fuller understanding of the dynamics of the region's economy and the most optimal opportunities for development and deployment of Highlands agritourism initiatives.	Agricultural Sustainability, Viability, and Stewardship
Agricultural Advisory Committee	Establish an Agricultural Advisory Committee of the Highlands Council.	Agricultural Sustainability, Viability, and Stewardship
Historic, Cultural, Archaeological, and Scenic Resources		
Historic, Cultural, Archaeological Education	Coordinate with SHPO to initiate an education and outreach program for the Highlands Region.	Historic, Cultural, and Archaeological Resource Protection
Spending on Historic, Cultural, Archaeological Resources	Coordinate with the NJ Historic Trust to establish a mechanism for tracking public spending on historic, cultural, and Archaeological resources.	Historic, Cultural, and Archaeological Resource Protection
Highlands Land Use Ordinance- Historic, Cultural, and Archaeological Component	Amend the Plan Conformance Program (including model documents) to make the review of impacts on the historic, cultural, and archaeological resources a required component.	Historic, Cultural, and Archaeological Resource Protection
Procedures for Nomination, Evaluation, and Inventory of Scenic Resources	Review the Procedures for Nomination, Evaluation, and Inventory of Highlands Regionally Significant Scenic Resources to determine if modifications are appropriate.	Scenic Resources
Scenic Resources Education	Develop a municipally-oriented outreach effort to assist in the identification and nomination of potential Highlands Scenic Resources.	Scenic Resources
Nomination of Scenic Resources	Initiate an outreach effort to each of the Highlands Counties and other interested organizations to assist in the identification and nomination of potential Highlands Scenic Resources.	Scenic Resources
RMP Amendment: Historic, Cultural, Archaeological Resources	Amend the RMP to more strongly reflect the intention of the Highlands Act.	Historic, Cultural, and Archaeological Resource Protection
Municipal Inventory of Historic Preservation Efforts	Gather information related to historic preservation efforts in each Highlands municipality and county and prepares an inventory of Certified Local Governments, historic preservation plans, surveys, and ordinances.	Historic, Cultural, and Archaeological Resource Protection

Summary of Recommendations

Title	Description	RMP Program
Monitor Preservation and Development of Historic, Cultural, and Archaeological Resources	Monitor the preservation and development of historic, cultural, and archaeological resources.	Historic, Cultural, and Archaeological Resource Protection
Scenic Resources Inventory	Establish a protocol for monitoring and updating the Scenic Resources Inventory as lands are preserved.	Scenic Resources
Transportation and Air Quality		
Freight Oriented Development	Coordinate with NJDOT and NJTPA to identify freight rail access points and their relationship to existing infrastructure to support development.	Transportation Safety and Mobility
Interagency Coordination- Transportation	Coordinate with NJ Transit, NJDOT, NJTPA, NJDA, NJ Division of Travel and Tourism, and other agencies to determine the appropriate role for the Highlands Council in transportation planning and design standards.	Transportation Safety and Mobility
Interagency Coordination- Air Quality	Coordinate with NJDEP and USEPA to identify specific causes of air quality pollution in the Highlands Region and specific actions the Highlands Council can take to alleviate these problems, and coordinate with NJDEP and USEPA on “raising the bar” in the Highlands Region creating additional guidelines for municipalities, commercial, and industrial operations within the region.	Air Quality
Climate Change	Assess the need for a Climate Change Technical Report through the development of a white paper on the topic area’s impacts.	Air Quality
Scenic Byways	Ensure inclusion of scenic byways in Highlands tourism planning and consider a program to provide Highlands trail blazing signage that appropriately unifies tourism travel networks.	Transportation Safety and Mobility
Freight Oriented Development- Center Designation	Develop commercial and industrial specific procedures for Highlands Centers and Redevelopment areas with a particular focus on developing in close proximity to existing freight rail access points.	Transportation Safety and Mobility
Reuse of Existing, Unused, Rail Rights of Way	Identify opportunities for retaining existing (unused) rail right of ways for potential reuse.	Transportation Safety and Mobility
Evaluation of Transportation Projects and Studies identified in the RMP	Develop evaluation criteria and methodology for transportation projects and studies impacting the Highlands Region; update the status of specific transportation projects and studies identified in the RMP and; evaluate new near-term, mid-term, and long term projects and studies having significant impact on the Highlands Region.	Transportation Safety and Mobility
Green Streets Planning and Walkable / Bicycle Friendly Site Design	Develop site design guidelines related to walkable and bicycle friendly design to be incorporated into Highlands Project Review and establish green streets planning grants and guidelines as part of plan conformance.	Transportation Safety and Mobility
Future Land Use		
Highlands Specific RSIS	Coordinate with the Department of Community Affairs and the Residential Site Improvement Standards Board for the development of standards specific to the Highlands Region.	Low Impact Development / Project Review
Planning Area Redevelopment Procedures	Develop and adopt procedures for designating Highlands Redevelopment Areas within the Planning Area.	Redevelopment
Redevelopment Procedures	Adopt Redevelopment Procedures as an addendum to the RMP.	Redevelopment
Low Impact Development	Develop and adopt procedures for Highlands Project Review that consider existing features in incorporation of LID or off-site mitigation; develop guidance for Highlands specific LID in site design and stormwater management; develop a grading system for the use of LID strategies.	Low Impact Development / Project Review
Cluster Development- Wastewater	Encourage the use of alternative wastewater treatment systems for cluster development in areas that are not currently served by traditional systems.	Cluster Development and Center Designation
Identification of Green Infrastructure	Identify permanently preserved lands as a vital component of green infrastructure.	Low Impact Development / Project Review
Center Designation	Amend the RMP to incorporate a Center Designation Program and guidelines.	Cluster Development and Center Designation
Center Guidelines	Establish guidelines for the designation of core, node, village, freight, and hamlet center typologies.	Cluster Development and Center Designation
Cluster Development	Incorporate procedures for cluster and non-contiguous cluster development within the Center Designation Program and guidelines, and revisit the current cluster development program to encourage use.	Cluster Development and Center Designation
Land Use Capability Map Series Updates	Develop a plan and schedule to update the Land Use Capability Map Series region-wide.	Land Use Capability Analysis

Summary of Recommendations

Title	Description	RMP Program
Sustainable Growth Map	Based on the resource assessment conducted under the Land Use Capability Map Series, establish a region-wide Smart Growth Capability map depicting areas within the region that are appropriate for future development and redevelopment activity and areas that are more appropriate for conservation and protection.	Land Use Capability Analysis
Center Identification	Assess the Highlands Region for State Development and Redevelopment Plan de-facto centers that may not voluntarily conform to the RMP and established procedures to recognize the importance of these centers.	Cluster Development and Center Designation
Affordable Housing Technical Report	Review the authority provided to the Highlands Council by the Fair Housing Act to determine Council's responsibility towards the adoption and implementation of standards to regionally provide affordable housing. Update and adopt as part of the RMP the draft Affordable Housing Technical Report of the RMP to provide technical assistance to municipalities.	Housing and Community Facilities
RMP Amendment: Affordable Housing	Amend the RMP to incorporate the results of the updated Affordable Housing Technical Report, and changes to affordable housing laws and regulations since RMP adoption.	Housing and Community Facilities
Landowner Equity		
Guidelines for Monitoring Highlands Council Preserved Lands	Develop a comprehensive program to address the long-term stewardship of conservation easements held by the Highlands Council.	Land Preservation and Stewardship
Expand Incentives for TDR Receiving Zones	Incentivize TDR Receiving Zones through establishment of alternative avenues for credit use and increased financial incentives to municipalities.	Highlands Transfer of Development Rights
Expand Landowner Equity Topic Area to Include Land Preservation	Expand the Landowner Equity section of the RMP to incorporate both lands preservation and farmland preservation goals as currently reflected in the natural resources and agricultural sections of the RMP and retitle the section Landowner Equity and Land Preservation.	Land Preservation and Stewardship
HDC Purchase Program	Amend the RMP to reflect the adoption of the HDC Purchase Program (N.J.A.C. 7:70)	Highlands Development Credit Bank
Support Dual Appraisal Methodology Indefinitely	Update RMP Policy 1H6 to indefinitely support the dual appraisal methodology.	Land Preservation and Stewardship
Update Preservation Priority RMP Datasets	Update Conservation Priority Areas, Agriculture Priority Areas, and Special Environmental Zone following the methodology in the Highlands Land Preservation and Stewardship Technical Report, and recalculate 5- and 10-year estimated preservation costs.	Land Preservation and Stewardship
Reevaluate Monetary Value of the Highlands Development Credit	Update the 2008 TDR Technical Report to determine whether a change to the initial credit value is warranted; explore the feasibility of creating a variable-value for credits.	Highlands Development Credit Bank
Interagency Coordination- TDR	Continue with an expansion of interagency coordination to increase funding priorities and permit coordination for receiving zone municipalities.	Highlands Transfer of Development Rights
LEED Certification	Consider requesting that the benefits of the Highlands TDR programs be recognized under the LEED certification program of the USGBC.	Highlands Transfer of Development Rights
Review and Update Non-residential HDC Allocation Methodology.	Review and update as appropriate the non-residential HDC allocation methodology and the 2008 TDR technical report.	Highlands Development Credit Bank
Funding Sources	Identify and update available and potential funding sources for the implementation of Landowner Equity and Land Preservation Programs	Land Preservation and Stewardship
Sustainable Economic Development		
Highlands-focused Tourism Program	Coordinate with the NJ Division of Travel and Tourism to establish a Highlands-focused tourism program.	Sustainable Regional Economy
Economic Coordination	Expand upon Highlands Council efforts to partner with other entities in support of sustainable economic development in the Highlands Region.	Sustainable Regional Economy
RMP Amendment: Recreation (New Section)	Add a section to the Regional Master Plan to address recreation as a major category of interest.	Sustainable Regional Economy
Smart Growth Map- Future Economic Development	Based on the resource assessment conducted under the Land Use Capability Map Series and updated information regarding built resources, establish a region-wide Smart Growth Capability map depicting areas within the Region that are appropriate for future economic development and redevelopment activity.	Sustainable Regional Economy
Regional Economic Plan Development	Coordinate with Highlands counties and destination marketing organizations (DMOs) to develop regional economic development plans.	Sustainable Regional Economy

Summary of Recommendations

Title	Description	RMP Program
Comprehensive Economic Development Plan	Develop a comprehensive economic development plan for the Highlands Region. The plan should include a broad characterization of the Highlands Region in the form of an economic profile (including the Fiscal Impact Assessment) and an identification of economic development potential.	Sustainable Regional Economy
Tourism Data Collection	Gather and organize data related to tourism visitation and spending, as well as investments in the tourism industry.	Sustainable Regional Economy
Regional Economic Monitoring	Establish a protocol to monitor data contained in the FIA, including specifically: total employment, building permits, housing sale values, commercial sales, vacant land sales, household income, equalized property values, assessed property values and property tax revenues.	Sustainable Regional Economy
Cost-Benefit Analysis	Develop a Cost-Benefit Analysis of the RMP to measure the full costs associated with the implementation of the RMP as well as the full range of benefits from its implementation.	Sustainable Regional Economy

Implementation		
Highlands Preservation Area Applications	Encourage continued coordination with NJDEP in review of any HPAAs application within the Highlands Region.	Preservation Area Plan Conformance
Revise Municipal Plan Conformance Guidelines	Adopt revised Plan Conformance guidelines that reflect the Council's experience to date.	Municipal Plan Conformance
Amend County Plan Conformance Guidelines	Adopt revised County Plan Conformance Guidelines that remove all references to county adoption of land use regulations not specifically within county authority as provided under the NJ County Planning Act and recommend the expansion of the county Plan Conformance grant program to include county-wide economic development, stormwater management, resource management, and agricultural development issues.	County Plan Conformance
Preservation Area Plan Conformance-Mandatory	Determine an appropriate course of action to address instances of municipal failure to conform, as required under the Highlands Act.	Preservation Area Plan Conformance
Development Application Notification-Municipal Education	Develop a program to periodically remind all municipal and land use board clerks of the local development application notification requirement found in the Highlands Act, as well as the Highlands Referral Ordinance.	Preservation Area Plan Conformance
Document RMP Monitoring Program Recommendations Report Process	Amend RMP Chapter 6, Subpart B to clearly document the process for the development and approval of the RMP Monitoring Program Recommendations Report.	RMP Monitoring Program
RMP Amendment Procedures	Adopt RMP Amendment Procedures, currently adopted as guidelines, as a component of the RMP.	RMP Monitoring Program
RMP Dataset Update Policy	Establish a policy and schedule for updating all RMP datasets.	RMP GIS Data Updates

Science and Research Agenda

Title	Description	RMP Program
Natural Resources		
Forest Sustainability	Develop incentives to encourage invasive species control and deer management; develop Highlands Forest Best Management Practices; evaluates carbon sequestration.	Forest Management and Sustainability
Forest Restoration	Investigate mapping methodologies to identify lands where it would be most appropriate to attempt forest restoration.	Forest Management and Sustainability
Forest Mitigation	Field test the Functional Ecosystem Evaluation Methodology to assess accuracy of the valuation determination.	Forest Management and Sustainability
Riparian Integrity	Complete a full re-calculation of the five indicators of riparian integrity that were used for the 2008 Ecosystem Technical Report.	Restoration of Streams and Riparian Areas
Expand Ambient Biological Monitoring Network in Highlands Region	Coordinate with NJDEP to expand the Ambient Biological Monitoring Network in the Highlands Region and input resulting data into the continued development of a Regional Stream Integrity Model.	Restoration of Streams and Riparian Areas
Highlands Open Waters and Riparian Areas Inventory	Develop methods for continued development and refinement of Highlands Open Waters and Riparian Areas inventory with an emphasis on identification of headwater streams and headwater seeps and springs.	Restoration of Streams and Riparian Areas

Summary of Recommendations

Title	Description	RMP Program
Municipal Critical Wildlife Habitat	Enhance GIS analysis of critical wildlife habitat on a municipal basis to determine appropriate mitigation and restoration standards.	Critical Habitat Conservation and Management
Functional Ecosystem Valuation	Modify and field test the Functional Ecosystem Valuation Methodology for use in critical habitat mitigation scenarios.	Critical Habitat Conservation and Management
Low Impact Development in Karst Terrain	Develop a unified approach for stormwater design in karst terrain and development of Stormwater BMPs design principles in karst areas.	Carbonate Rock Areas
Lake Management Study- Lake Hopatcong and Greenwood Lake	Develop a lake management study to focus on Lake Hopatcong and Greenwood Lake to preserve ecological integrity of the lakes, their water quality, and water source potential.	Lake Management Areas
Green Infrastructure in Steep Slope Protection Areas	Develop a plan for addressing green infrastructure initiatives in Steep Slope Protection Areas.	Steep Slope Protection Areas
Water Resources		
Low Flow Characteristics of Streams in the Highlands Region Report Update	Determine the feasibility of updating the Low Flow Characteristics of Streams in the Highlands Region Report to determine if any measurable changes has been observed in the base flows of the Highlands Region.	Highlands Restoration: Water Deficits
Gauging Stations	Evaluate and suggest locations for new gauging stations that would allow for a more effective and accurate analysis of streamflow conditions in the Region and identify potential funding sources to support installation, operation, and long-term maintenance.	Highlands Restoration: Water Deficits
Monitoring Networks	Improve existing monitoring networks and use additional data sources, in coordination with NJDEP, NJGS, and USGS, for monitoring and evaluating both natural conditions and anthropogenic factors in water quality.	Water Quality Restoration
Septic Densities	Coordinate with USGS to review existing USGS logistical regression models for estimating septic densities based on median nitrate concentrations which may be further tested and refined with additional data collected.	Water Quality Restoration
Ambient Ground Water Quality Modeling	Coordinate with NJGS and USGS to design an improved ambient groundwater quality modeling network in support of refining models for estimating septic system densities.	Water Quality Restoration
Watershed-based Management Plans	Determine, based on sufficient available data, where water quality improvements would be beneficial and develop watershed-based management plans based on the results.	Water Quality Restoration
Water and Wastewater Utilities		
Identification of Over Pumping for Water Supply	Link deficit utilities with critical resources to identify areas where water quality is degraded due to over pumping for public water supply or related to discharge of treated wastewater into surface water.	Water and Wastewater Utilities
Water Efficiency	Analyze water efficiency to gauge and predict the amount of water lost in transmission, metering, and operations.	Water and Wastewater Utilities
Septic System Failures	Develop a GIS mapping protocol for inventorying the locations of septic system failures to identify and prioritize areas that may need infrastructure investments.	Wastewater System Maintenance
Agriculture		
Agricultural Property Values	Measure the change in median per acre value of property sales and assessed value for preserved and non-preserved farmland.	Agricultural Sustainability, Viability, and Stewardship
Future Land Use		
Region-wide Municipal Zoning Map	Compile all municipal zoning maps to develop a region-wide map that accurately depicts municipal zoning districts and densities.	Land Use Capability Analysis
Landowner Equity		
Update the 2008 TDR Technical Report	Update the 2008 TDR Technical report to determine if a change to the initial credit value is warranted.	Highlands Development Credit Bank
TDR Receiving Zones Demand Analysis	Update the 2008 TDR Technical Report to include a market demand analysis to direct Council support and resources more appropriately.	Highlands Transfer of Development Rights
Update the 2008 TDR Technical Report- Non-Residential allocation values	Update the 2008 TDR Technical Report to review and compare non-residential allocation values.	Highlands Development Credit Bank

Supporting Documents

Highlands Water Protection and Planning Act, 2004
www.njleg.state.nj.us/2004/Bills/PL04/120_.PDF

Highlands Regional Master Plan, 2008
www.nj.gov/njhighlands/master/rmp/final/highlands_rmp_112008.pdf

**Highlands Regional Master Plan
Technical Reports, 2008**

Air Quality Assessment Technical Report
www.nj.gov/njhighlands/master/tr_air_quality_assessment.pdf

Ecosystem Management Technical Report
www.nj.gov/njhighlands/master/tr_ecosystem_management.pdf

Financial Analysis Technical Report
www.nj.gov/njhighlands/master/tr_financial_analysis.pdf

Highlands Regional Build Out Technical Report
www.nj.gov/njhighlands/master/tr_build_out.pdf

**Historic, Cultural, Scenic, Recreation
and Tourism Technical Report**
www.nj.gov/njhighlands/master/tr_historic_cultural_scenic.pdf

Land Preservation and Stewardship Technical Report
www.nj.gov/njhighlands/master/tr_land_pres_and_stewardship.pdf

Land Use Capability Zone Map Technical Report
www.nj.gov/njhighlands/master/tr_land_use_capability_zone_map.pdf

Local Participation Technical Report
www.nj.gov/njhighlands/master/tr_local_participation.pdf

**Regional Land Use Conditions and Smart
Design Guidelines Technical Report**
www.nj.gov/njhighlands/master/tr_land_use_conditions.pdf

Sustainable Agriculture Technical Report
www.nj.gov/njhighlands/master/tr_sustainable_ag.pdf

Transfer of Development Rights Technical Report
www.nj.gov/njhighlands/master/tr_tdr.pdf

**Transportation System Preservation and
Enhancement Technical Report**
www.nj.gov/njhighlands/master/tr_transportation.pdf

Utility Capacity Technical Report
www.nj.gov/njhighlands/master/tr_utility_capacity.pdf

Water Resource Assessment Technical Report - Vol. 1
www.nj.gov/njhighlands/master/tr_water_res_vol_1.pdf

Water Resource Assessment Technical Report - Vol. 2
www.nj.gov/njhighlands/master/tr_water_res_vol_2.pdf

Fiscal Impact Assessment & Peer Review, 2017
www.nj.gov/njhighlands/master/monitoring/fia/fia_final_jan2017.pdf
www.nj.gov/njhighlands/master/monitoring/fia/peer_review_final_jan2017.pdf

Highlands Municipal Fact Book, 2017
www.nj.gov/njhighlands/master/monitoring/fia/fact-book_final_jan2017.pdf

Appendix A: List of Indicators Considered

The following pages contain a list of all indicators considered for analysis as part of this report. Not all indicators received full analysis due to data limitations and/or applicability to the Highlands Regional Master Plan.



Natural Resources

Threatened and Endangered Species Habitat: Threatened and endangered species segregated by habitat specialization.

Acres of Forest Mortality: Measures acres of Forest Mortality as compared to existing healthy forest.

Acres of Parks and Protected Open Space per Capita: Measures acres of parks and protected open space per capita for each municipality in the Highlands Region.

Carbonate Rock Areas: Change in land use (development) or preservation of carbonate rock areas, including analysis of building permit data:

- Distinguish between residential and non-residential uses in LULC analysis
- Add Tier 2 indicator analyzing ordinances regarding development in carbonate rock areas
- Add Tier 2 indicator tracking issuance of NJDEP Bureau of Surface Water Permits
- Refine Carbonate Rock Area to identify areas that have a high rate of dissolution

Change in Population of Wildlife Not Using Core Habitat: Measures change in wildlife population not using Core Habitat.

Conservation Priority Areas: Measures change in land use or preservation of Highlands Council ranked high priority areas for conservation.

Constrained Slopes: Measures change in land use or preservation of moderate and severely constrained slopes.

Critical Wildlife Habitat: Measures change in extent, preservation, or development of habitat types in Critical Wildlife Habitat areas, vernal pools, and Natural Heritage Priority Sites.

Deer Patterns (Index): Deer population in Deer Management Zones, deer browsing, deer harvest.

Forest Area: Measures change in land use or preservation of the total forested area, including conversion to agricultural lands.

Forest Impacts: Measures the change in total forest area, and development and preservation in core forest areas.

Forest Integrity Index: Measures quantifiable landscape level changes that impact forest quality/integrity. Individual indicators include: total forest acreage, core (interior) forest acreage/percent of core forest by HUC 14, area statistics for distance to forest edge, patch size distribution, proportion of total forest (3km search area) and forest integrity value class (all 183 HUC 14s).

Forest Integrity Score : Measures the change in total forest area, and development and preservation in core forest areas.

Forest Resiliency: Measures the change in total forest area, and development and preservation in core forest areas.

Forest Resource Area: Measure change in land use or preservation of the Forest Resource Area.

Habitat Restoration: Identifies the number and location of areas with habitat restoration plans or projects.

Hydric Soils: Measures change in land use or preservation of hydric soil areas.

Invasive alien earthworm: Destruction by invasive alien earthworms of the organic humus layer that nurtures native plant reestablishment.

Invasive Species: Identifies number and location of invasive species occurrences and eradications, including “invasive alien earthworms”.

Land Acquisition Costs: Cost of land acquisition for preservation.

Native species regeneration: Measures the regeneration of native flora and fauna throughout the Highlands Region.

Number and species of birds: Changes in the numbers and species of birds counted in Christmas counts 2008-2014 in both Preservation Area and Planning Area, changes in the numbers of birds dependent upon early successional forests, edge forests counted in Christmas counts 2008-2014.

Oak regeneration: Estimated percentage of the above acreage with oak regeneration greater than 3' in height or ~10,000 feet/acre of aggregate oak regeneration height, thus serving as a proxy for deer damage to forest.

Open Space Taxes: Measures change in the rate and net value of open space taxes collected.

Open Water Protection Areas: Measures change in land use or preservation of Highlands Open Waters Protection Areas.

Preserved Lands: Measures change in total acreage of preserved open space lands.

Priority Conservation: Measures the change in development or preservation of the Special Environmental Zone, Conservation Priority Area, and Significant Natural Areas (Natural Heritage Priority).

Recreation Land Use Patterns: Qualitative information about the use patterns of state and federal recreation and conservation lands.

Resilient Landscape Preservation: Comparative analysis of OSI resilient landscapes to Highlands protection zone, and change in land use and preservation.

Riparian Integrity Score: Measures change in total forest area in riparian areas.

Significant Natural Areas: Measures change in land use or preservation of Significant Natural Areas.

Soil impairment from pollution: Measures acres of soil impairment due to pollution.

Soil quality: Measures soil quality throughout the Highlands Region.

Special Environmental Zone: Measures the change in development or preservation of the Special Environmental Zone, Conservation Priority Area, and Significant Natural Areas (Natural Heritage Priority).

Urban and community forest cover within municipalities

Vernal Pools: Measures change in land use or preservation of vernal pools and their buffers.

Watershed Resource Value: Measures change in watershed resource value score by HUC14 subwatershed.

White-Tailed Deer: Measures change in the number of deer.



Water Resources

Wellhead Protection Areas: Measures change in number of wellhead protection areas, as well as land use or preservation in designated wellhead protection areas.

Aquatic Invasive: Measures change in the proliferation of aquatic invasive species.

Change in Impervious Cover: By watershed, may need to use LULC data as proxy.

Conservation of Highlands water outside of Highlands: Measures efforts to conserve Highlands water outside of the Highlands Region.

Contaminated site remediation: Identifies the number of contaminated sites that have been remediated since the Highlands Act was passed.

Critical Water Resource Areas (Index): Measures the change in land use and preservation within Wellhead Protection Areas and Open Water Protection areas regionally, as well as Prime Groundwater Recharge Areas by HUC14 subwatershed.

Fish Consumption Advisories: Measures change in the number and location of fish consumption advisories.

Fish IBI Assessment: Measures change in the Fish Index of Biotic Integrity assessment.

Ground and Surface Water in Carbonate Rock Areas: Ground and surface water monitoring in relation to carbonate rock areas of the Conservation Zone to establish agricultural pollutant baselines (especially nitrate), and should be repeated over time to establish trends to determine the impact of the educational and administrative efforts mentioned above.

Groundwater Quality: Measures change in ground water nitrate concentration by Land Use Capability Zone (LUCZ) and HUC14 subwatershed.

Impervious Surface Cover: Measures change in impervious surface coverage by HUC14 subwatershed.

Net Water Availability: Measures change in net water availability.

Nitrate concentration: Nitrate concentration, including identification of and changes in nitrogen source loads.

Nitrogen mass balance: Measures the amount of nitrogen currently held in biomass.

Prime Groundwater Recharge Areas: Measures change in land use or preservation in prime groundwater recharge areas.

Private well contamination: Measures change in the share of tested wells exceeding maximum contaminant levels (as proxy for groundwater quality).

Appendix A: List of Indicators Considered

Soil and/or groundwater depth: Measures soil and / or groundwater depth throughout the Highlands Region.

Streamflow: Measures change in streamflow at flow gauging stations (where feasible).

Surface Water Quality: Measures change in designated use support status and impairment by HUC14 subwatershed.

Water Deficits: Change in land use or preservation in water deficit areas. Trends in water demand from water deficit areas.

Water Resource Management: Measures the number of Water Resource Management plans implemented in ARA.

Water Supply added to Highlands Region: Measures the volume of water imported into the Highlands region through interbasin transfers.

Water Use: Measures change in water withdrawal by HUC14 subwatershed for major use types, including agricultural, commercial, industrial, irrigation, mining, portable supply, and power generation.

Waterbody Impairment: Measures change in the level of water body impairment.

Wetlands: Measures change in land use or preservation of wetland areas and buffers.



Water and Wastewater Utilities

BOD5 Loading: Measures points of BOD5 loading to each surface waterway from NJPDES permitted discharges.

Domestic Sewerage Facilities Capacity and Demand: Measures change in domestic wastewater sewerage facilities current available capacity and demand by facility.

Ground Water Level: Measures change in groundwater average annual depth to water level.

Non-revenue water: Measures amount of water lost in transmission, metering and operations. TAC added:

- Moved to Tier 2 indicator
- Perform analysis where demand in water deficits area are trending negative

Number of Residences on Septic: Number of residences using septic assumed without the Highlands Act.

Public Community Water Systems Capacity and Demand: Measures change in public community water systems firm capacity and demand by Public Water System Identification number (PWSID).

Reservoirs: Measures change in annual average reservoir levels.

Septic System Failures: Measures number and locations of septic system failures to identify hot spots that may need infrastructure up-grades.

Stormwater Discharge: Number of stormwater discharge pipes along each stream.

Wastewater Existing Areas Served: Measures change in extent of wastewater existing areas served (EAS).

Water Supply Existing Areas Served: Measures change in extent of water supply existing areas served (EAS).

Water Use Efficiency: Measures change in per capita and consumptive use of water.



Agricultural Resources

Agricultural Labor: Measures agriculture employment including labor intensive organic farms.

Agricultural Activities: Measures changes in the acreage of land used for various major agricultural activities (e.g., cropland, fruit, cattle, equine).

Agricultural Economics Index: Measures change in farm gross income, expenses, and net income, the market value of major agricultural products (e.g., cropland, fruit, cattle, and equine) and direct sales to consumers, the number of farms and income from agritourism or recreational services, the number and percentage of agriculture producers engaging in value-added activities, and farm loan defaults.

Agricultural Employment Index: Measures change in:

- Number of farmers
- Agricultural retail employment
- Number of farm labor worker

Agricultural Land Use and Preservation Index:

Measures change in acreage of preserved farmland, share of total farmland that is preserved, acreage of preserved farmland by Land Use Capability Zone, and the change in land use or preservation of Moderate and High Priority Agriculture Resource Areas.

Agricultural Product Value: Measures change in the value of major agricultural products (e.g., cropland, fruit, cattle, equine).

Appendix A: List of Indicators Considered

Agricultural Property Value: Measures change in median per acre value of property sales for preserved and non-preserved farmland to compare agricultural property values for Preservation Area and Planning Area farms

Agricultural Value Added Production: Measures change in net income from agricultural value added production.

Agriculture Development Applications: Measures annual number and location of applications for agriculture development projects.

Agriculture Development Projects: Measures annual number and location of approved agriculture development projects.

Agriculture Priority Areas: Measures change in land use or preservation in “high” value agriculture priority areas.

Agriculture Resource Area: Measures change in land use or preservation in the Highlands Agricultural Resource Area.

Agriculture Retail-Based Employment: Measures change in agricultural retail employment.

Agritourism: Agritourism: sales tax collected, money spent by visitors to farm markets, agriculture tourism venues.

Agritourism income: Measures change in gross income from agritourism activities.

Direct Sales: Number of farms making direct sales to public 2007 vs 2012.

Economic Impact of Act: Economic effects of Highlands agriculture sales (besides sales).

Farm Characteristics Index: Measures change in the number of farms, total and average acreage of farms, acreage of land used for various major agricultural activities, number, average age and primary occupation of farmers, farm tenure, number of farm labor workers, and agricultural retail and wholesale operation employment.

Farm Housing Units: Number of new farm housing units built.

Farm Laborers: Measures change in the number of farm labor workers.

Farm Loans: Number of Farm Credit loans since 2008 for business development, expansion etc.

Farm Operator Age: Measures change in the average age of principal farm operator.

Farm Ownership and Tenancy: Identifies trends in farm ownership tenancy, e.g. change in share of farms that are farmed by owner vs. farmed by tenant.

Farmers’ Markets: Number and location of farmers’ markets

Farmland Assessed Acreage: Measures change in total acreage of assessed farmland.

Farmland Assessed Values: Measures change in the assessed property value of farmland.

Farm-to-School Programs: Measures number and location of farm-to-school programs.

Field crop production: Measures change in acres of land in field crop production.

Important Farmland Soils: Measures the acres and location of important farmland soils in the Highlands Region, and the proportion that are currently used for agriculture purposes.

Important Farmland Soils, Undeveloped: Measures change in land use or preservation of important farmland soils.

Managed Woodland: Measures change in acres of farmland assessed non-appurtenant woodland.

Number of Agritourism Initiatives: Measures change in the number of agritourism initiatives undertaken by agriculture operators.

Number of Farms: Measures change in the number of farms.

Number of Independent Agriculture Producers entering Value-Added Activities: Measures change in the number or share of agriculture producers engaging in value-added activities.

Preserved Farmland: Measures change in acreage of preserved farmland by LUCZ.

Preserved Farmland: Measures change in acreage of preserved farmland.

Right to Farm: Measures change in the number and location of Right to Farm complaints.

Share of Farmland that is Preserved: Measures change in share of total farmland that is preserved.

Small Farms: Measures change in the number of farms smaller than SADC priority size by County.



Historic, Cultural, Archaeological, and Scenic Resources

Cultural Resource Inventory: Measures change in development or preservation of scenic resources and critical vistas, open space, trails, and historic resources.

Appendix A: List of Indicators Considered

Archaeological Grids: Identifies the number and location of archaeological grids.

Built Scenic Resource Inventory: An inventory to catalog the scenic qualities of the built environment, similar to the existing scenic resources inventory.

Distribution of Recreational Capacity: Measures recreational facilities per unit of population.

Educational Institutions: Identifies the number and location of educational institutions.

Highlands Historic and Cultural Resource Inventory:

- Update per SHPO inventory
- Change in resources listed in the Highlands Historic and Cultural Resources Inventory
- Change in protection status of historic and/or cultural resources within the Highlands Region
- Permanent protection of resources listed on the Highlands Historic and Cultural Resources Inventory
- Affirmative local development decisions relative to historic/cultural resources
- Highlands Consistency Review reports issued with a historic/cultural resource component
- Adoption of local regulations to protect historic/cultural resources

Historic Districts: Identifies the number and location of Historic Districts.

Historic Properties: Identifies properties listed or eligible for National or State Register of Historic Places.

Historic Resource Inventory: Identifies the number, location, and change in status of historic resources, as well as stewardship of public and non-profit owned historic resources (Index).

Historic Resource Public Investment: Tracks public investment in the preservation and rehabilitation of historic resources.

Passive and Active Recreation: Measures the proportion of recreational amenities that are passive vs. active.

Performing and Visual Arts Facilities: Identifies the number and location of Performing and Visual Arts Facilities.

Recreational amenities: Inventory of number and location of recreational amenities by type.

Scenic Resources Inventory: Identify scenic resources to add to the Scenic Resources Inventory.



Transportation and Air Quality

Accidents: Measures change in the number and location of vehicular accidents.

Adult Asthma Rates: Measures change in the estimated share of adults with current asthma.

Air Quality Conditions (Index): Measures state of air quality conditions in region, including vehicle miles traveled vs. pollutant volume emitted from transportation sources

Air Quality Index (AQI): Measures change in the number of days annually that the Air Quality Index (AQI) exceeds the United States Environmental Protection Agency (EPA) National Ambient Air Quality Standards (NAAQS) for sensitive groups, and change in adult and childhood asthma rates.

Alternative transit programs participation: Measures change in the number of Highlands region employers participating in or offering programs such as carpools, vanpools and employer shuttles.

Asthma Induced Emergency Department Visits: Measures change in age-adjusted asthma induced emergency department visit rates per 100,000 residents.

Bicycle Parking: Identifies number and location of bicycle racks and amenities in the Highlands region.

Bike and Pedestrian Infrastructure (Index): Inventory of bicycle and pedestrian infrastructure in Highlands, including sidewalks, trails, shared lanes, bike lanes, and bike parking.

Bikeable routes: Identifies miles of bike lanes, shared lanes and bikeable routes.

Carpooling: Measures change in the share of Highlands resident workers who commute by carpooling.

Childhood asthma rates: Measures estimated change in share of children with current asthma.

Commutation Patterns Index: Measures change in commuting behavior, including travel mode, commute time, vehicle miles traveled (VMT), annual average daily traffic (AADT), origin and destination of commuting trips, total transit ridership, and park and ride usage.

Commuting Patterns: Measures change in the average commuting time and distance of resident workers who live in the Highlands Region.

Commuting Patterns: Measures change in the average time and distance for workers who work in the Highlands Region.

Appendix A: List of Indicators Considered

Complete Streets: Identifies number and location of municipalities and counties that have adopted Complete Streets policies.

Freight Index: Measures change in active freight rail miles, commercial and industrial land uses near freight rail lines and freight rail hubs, and jobs within freight rail hubs (and freight activity, if data available).

Freight Miles: Change in active vs. inactive freight miles. Proxy for freight demand in Highlands Region.

Freight Rail: Measures change in tons of freight rail goods movement.

Fuel consumption by land use and vehicles: Measures fuel consumption by land use and vehicles.

General Commuting Patterns: An index of Census commuting patterns (including origin-destination) and public transportation ridership.

Greenhouse Gas Emitters: Measures change in the number of large facility greenhouse gas emitters.

Large Greenhouse Gas Emitters (Index): Measures number and location of greenhouse gas emitters in the Highlands Region, along with amount emitted.

NJ TRANSIT bus ridership: Measures change in median ridership of NJ TRANSIT bus lines that operate in the Highlands Region.

NJ TRANSIT bus stops: Measures change in the number of NJ TRANSIT bus stops.

NJ TRANSIT rail ridership: Measures change in average weekday rail boarding's at NJ TRANSIT rail stations in the Highlands Region.

NJDOT Program Inventory (Index): Measures change in NJDOT elements within the region: measurement of restrictions on road cover treatments and planting treatments in the road ROW which are non-toxic/non-contaminating especially where run-off is concerned. Work with NJDOT on salt-spreading restrictions due to groundwater contamination potential. Compare historic miles of available freight lines and identify where they intersect with business centers. Compare NJDOT Pedestrian Safety Study data with average pedestrian incident data in the region. Delta of circulation plan elements in the region that include pedestrian amenities between historic and current.

Park and ride usage: Usage of park and rides.

Park and rides: Identifies number and location of park and rides.

Private bus routes: Identifies number of private bus routes operating in the Highlands region. Alternatively, could be miles of bus routes.

Private carrier bus ridership: Measures change in the annual ridership of private bus lines that operate in the Highlands Region.

Public Transportation Ridership and Usage (Index): Measures change in ridership on and usage of bus, rail, shuttles, park and ride, etc. including: NJ TRANSIT rail, NJ TRANSIT bus, NJ TRANSIT and private carrier park and rides, County and TMA shuttles and private bus carriers.

Share of commute by public transportation: Measures change in the share of Highlands resident workers who commute by public transportation.

Share of commute by walking or biking: Measures change in the share of Highlands resident workers who commute by walking or biking.

Share of people within walking distance of key destinations: Share of people within walking distance of key destinations (employment centers, schools, parks and recreation areas, and transit service).

Share of population living within 1/4 mile of bike lane or trail: Measures the share of Highlands population living within 1/4 mile of a bike lane or trail.

Share of population served by transit: Measures the share of the Highlands population served by transit.

Shuttle/community transit ridership: Measures change in ridership of county- and TMA-operated and other community transit shuttles within the Highlands Region.

Total GhG Emissions from Large Facilities: Measures change in total greenhouse gas emissions of large facilities.

Transit Land Area Activity: Measures change in land use, population density, jobs, and construction activity in transit lands areas.

Transportation System Baseline/Index: Update of the 2008 Transportation System Preservation and Enhancement report with the following indicators/datasets: Census origin and destination info, roadway miles by county, trip length, LOS/congestion analysis, air quality emissions estimates, etc. Reassess air quality conformity analysis utilizing NJTPA and EPA estimates. Final report should point out changes, if any, and provide brief analysis as to the potential impacts (positive or negative) of those changes.

Vehicle miles traveled per person: Measures change in the annual vehicle miles traveled per person.

Vehicle Miles Traveled vs. Pollutant Volumes: Review the Roadway Capacity Assessment to determine VMT (vehicle miles traveled) and then to apply it to transportation-related emission estimates for the following pollutants: Ozone (Volatile Organic Compounds (VOC) and Nitrogen Oxides (NOX)), Carbon Monoxide (CO) and Particulate Matter (PM) 2.5.

Appendix A: List of Indicators Considered

Volume/Annual Average Daily Traffic: Measures changes in annual average daily traffic estimates.

Walkability: Identifies the number of block groups ranked as very walkable or walker's paradise per the Walkscore.



Future Land Use

Affordable Housing: Measures change in the number of affordable housing units by LUCZ.

Broadband Accessibility: Measures access to high speed broadband internet.

Broadband and Fiber Optic Infrastructure: Measures broadband internet and fiber optic service area.

Brownfield Redevelopment Sites: Identifies known brownfield redevelopment areas.

Building Permits: Identifies the number of building permits issued by LUCZ.

Density of New Residential Development: Measures the density of new residential development.

Development Trends: Measures change in share of new development in water and sewer existing service areas compared to non-service areas, LUCZ, centers, redevelopment areas.

Existing Community Zone: Development by land use in ECZ:

- Building Permit Data
- Jobs created
- Change in assessed values

Fiber Optic Infrastructure: Identifies extent of fiber optic infrastructure.

Home improvements permitted: Number of existing Home Improvements permitted.

Housing Occupancy: Measures change in the proportion of renter- to owner-occupied housing units.

Impervious Cover: Measures change in impervious cover, by LUCZ, centers, redevelopment areas.

Known Contaminated Sites: Measures change in the number, location and status of known contaminated sites.

Land Consumption: Measures change in the ratio of developed to undeveloped land according to Highlands Land Use Capability Zone and Highlands Designated Centers.

Land Use: Measure change in total acres and percent by land use type (developed, agriculture, water/wetlands, forest, barren), as well as a transition matrix of the change from one category to another, by LUCZ, centers, redevelopment areas.

Land Use Capability Zone Development: Measures change in developed land, new residential development density, certificates of occupancy, employment, and population growth, distribution and density according to Land Use Capability Zone, Highlands Designated Centers, and Highlands Redevelopment Areas.

Non-residential Vacancies: Measures change in the amount (square feet) of vacant commercial, office and industrial space.

Planned Growth: Measures change in population and employment in the existing community zone and centers.

Population Density: Measures change in population density, by LUCZ, centers, redevelopment areas.

Population Growth and Distribution: Measures change in population growth and distribution, by LUCZ, centers, and redevelopment areas.

Public Service Index: Number and per capita ratio of key public service systems including capital investments, education, police, hospitals, and fire and ambulance.

Redevelopment Areas: Identifies areas in need of redevelopment and rehabilitation, and the number of building permits issued by redevelopment area by LUCZ.

School enrollment: Measure change in school enrollment.

Septic Yield: Measures changes in land use or preservation in low septic system yield areas, by LUCZ, centers, redevelopment areas.

Sewer Service Areas: Measures development patterns within approved Sewer Service Areas (SSAs) by analyzing change in developed land, population density, and certificates of occupancy.

Subdivision Trends: Measure change in subdivisions trends of large parcels.

Urban Land Cover: Measures change in the amount of urban land cover.

Zoning Change: Identifies zoning changes in conforming municipalities.



Landowner Equity

Agricultural Easement Values: Measures change in appraisal values of agricultural easements.

Appraisals based on pre-Act zoning: Number of landowners who have had appraisals based on pre-Act conditions versus current conditions.

Cost of Land Preservation: Measures the cost of land being preserved for in the Preservation and Planning Areas and how it compares to pre-Act acquisitions.

Exemptions: Identifies the number and location of Highlands exemptions.

HDC Allocation: Tracks HDC allocations, as well as number and minimum value of eligible HDCs.

HDC Funding Availability: Tracks sources and value of funding for HDC acquisition.

HDC Incentive Mechanisms: Number of incentive mechanisms

HDC Receiving Areas: Tracks eligible and designated HDC receiving areas, as well as the location, expenditures and status of Highlands TDR Feasibility Grants.

HDC Transfers Due to Density Increase: Number of HDCs transferred due to density increases.

HDC Value: Value of HDCs.

Highland Development Credit Values: Measures median values of HDCs.

Highlands Development Credits Transactions (formerly Bank Operation and Credits Purchased): Measures the number and status of applications for purchase of Highlands Development Credits (HDCs) to the Highlands Development Credit Bank, as well as HDC Bank and private HDC transactions.

Land Sales in Preservation Area: Measures change in the number and value of land sales in the Preservation Area.

Landowner Payment for Ecological Services: Number of landowners paid for the ecological services their preserved property will produce for the public (dollars calculated like similar formula in the Pinelands found on the SADC website).

Loss of equity caused by nitrate dilution model used in setting septic densities: Analyze the loss of equity caused by using the unscientifically derived nitrate dilution model to set septic densities in Preservation and Planning Area communities. Compare to numbers derived from more scientifically supportable numbers in the formula.

Opportunities to Recapture Land Value Equity: Measures the number of opportunities to recapture land value equity.

Subdivision Permits to qualify for Exemptions 1 or 2: Number of landowners permitted to subdivide their land in order to qualify for Exemptions 1 or 2.

TDR Sending Zones: Areas from which TDR can be transferred.

Waivers: Identifies the number and location of Highlands waivers.



Sustainable Economic Development:

Appraised value of Green Acres acquisitions: Measures change in appraisal values of Green Acres acquisitions

Assessed Property Value: Measures change in assessed property values, by planning/preservation area.

Business Establishments: Measures change in the number of business establishments.

Business Profile Index: An index that measures change in employment by industry, median wage by industry, non-residential vacancy rates, net absorption, rental rates, and construction completions and value, per-capita retail sales, as well as the number of business establishments and sole proprietorships.

Community Character Index: Rating system for overall community character, including open space, vacant buildings, evidence of community development, non-code compliant buildings, etc.

Entrepreneurship: Measures change in the number of sole proprietor businesses.

Equalized Property Value: Measures change in equalized property value, by planning/preservation area.

Estimated Construction Expenditures: Measures change in estimated cost of construction authorized by building permits.

Home Sales: Measures change in median home sale prices.

Housing Health Index: Determines the health of the residential housing market by analyzing construction data, equalized value, number of home sales, months of housing supply, foreclosures, and vacancy rates.

Housing Profile Index: An index that measures change in:

- Vacancy rates
- Foreclosures

Appendix A: List of Indicators Considered

- Median home sales

Labor Force Characteristics: Measures change in labor force characteristics, including age, race, gender, and educational attainment.

Lodging and prices: Provides an overview of lodging options and price ranges.

Non-residential Lease Rates: Measures change in non-residential lease rates.

Population Characteristics: Measures change in population profiles and characteristics, including age, income, households, race and ethnicity, etc.

Resident Profile Index: An index that measures change in median household income, median disposable income, wages earned as a percent of population, resident unemployment rate, acres of open space per capita, as well as general demographic information including population, age distribution, household formation, and county-to-county migration.

Residential Real Estate Transactions: Measure change in the annual number of residential real estate transactions.

Seasonal Employment: Measures change in propensity for seasonal employment by industry.

Seasonal Housing Conversion: Measures change in the gross number of housing units converted to year-round from seasonal, or to seasonal from year-round.

Tourism Profile Index: An index that measures change in the number of tourism related establishments, number of employees of tourism related establishments, median tourism-related wage, and seasonal employment by industry.

Tourist Visits: Measures change in the number of tourist visits.

Wages: Measures change in the breakdown of wages earned as percent of population.



Implementation

Acquisition: How many Highlands landowners have approached the Green Acres, SADC or TDR programs to discuss acquisition? Of those landowners, how many finalized an agreement, how many are working to finalize an agreement, and how many have been turned away by the state? How long does the process take on average from the time a Highlands landowner expresses interest in selling or putting an easement on his land until the deal is finalized?

Agriculture Impervious Cover: Participation in incentive program for 5% maximum impervious cover on agricultural land.

Best Management Practices Implementation: Number and location of BMP implementation projects.

BMP Retrofits and Repair Projects: Number and location of BMP retrofits and repair projects.

- Cash Flow Timetable:
- Dollars spent/encumbered in the Highlands planning grants
- Dollars awarded as part of the Highlands Property Tax Stabilization Aid
- Dollars awarded as part of the Watershed Moratorium Offset Aid
- Dollars associated with other State Aid funding in Highland Region municipalities and counties
- Dollars spent on preservation (fee simple and easements) in the Highlands Region

Circulation Plans: Adoption of circulation plans.

Cluster Development: Number of cluster provisions adopted and number of applications that have implemented cluster provisions.

Community Design Plans: Number of Municipal and county community design plans adopted.

Community Facilities Plans: Number of community facility plans adopted.

Community Forestry Management Plans: Identifies the number and location of Community Forestry Management Plans.

County Plan Conformance: A matrix of county Plan Conformance components and the current status of municipal completion, including for example, adoption of Highlands master plan element and zoning amendments

Critical Wildlife Habitat Stewardship: Measures quantity, location and quality of critical wildlife habitat stewardship activities.

Economic Development Initiatives: Economic development initiatives available for Highlands communities (number of initiatives/frequency of pursuit).

- Recognition of Highlands Council as an economic development advocate (survey local communities).
- Number of designated Highlands Redevelopment Areas.

Economic Development Support: Total dollars spent w/in Region by State and Federal programs targeted toward economic development:

- Economic Redevelopment and Growth (ERG) Program
- Grow NJ
- Federal EDA Economic Development Assistance Programs

Appendix A: List of Indicators Considered

Education about Wellhead Protection Areas: # people educated about WHPAs and protecting GW quality.

Education around Protecting Water Resources: Number of people educated about the importance of water quality and methods for protecting water resources.

Enforcement: Measures the quantity of enforcement actions and penalties related to anti-dumping efforts.

Enforcement - Wetlands and Highlands Act: Measures the quantity of enforcement actions and penalties related to wetland permit conditions and Highlands Act violations.

Environmental Literacy: Identifies number and participation levels in programs to educate the public about the importance of natural systems in the Highlands Region, including those by organizations other than the Highlands Council.

Fair Share Plans (Affordable Housing): Measures the number and status of Fair Share Plans and court petitions, as well as the number of planned and existing affordable housing units.

Farm Conservation Plans: Measures number of adopted Farm Conservation and Resource System Management Plans, including the number of acres affected.

Farmland Preservation Planning: Identifies municipalities and counties that have Comprehensive Farmland Preservation Plans, year of last up-date, and PIG status.

Farmland Preservation Planning: Identifies counties that have Comprehensive Farmland Preservation Plans.

Farmland Preservation Planning: Identifies county and municipally adopted Comprehensive Farmland Preservation Plans, and the number of Agriculture Development Area (ADA), eligible farm, and preserved acres.

Forest Stewardship Planning: Monitors quantity, quality and location of forest stewardship plans in the Highlands Region.

Highlands Council Grants: The grant programs developed and in operation, and the amounts awarded, expended, and remaining for the various Highlands Council grant programs.

Highlands Educational Programs: Identifies educational programs developed or implemented by NJHC.

Highlands Project Review: Record of projects reviewed by the Highlands Council and decisions.

Historic & Scenic Resources - Plan Conformance:

- Municipal and county scenic resource assessments in the Highlands Region
- Municipal ordinances which regulate scenic resource impacts

- Highlands project reviews (consistency reports) which address scenic resources
- Adoption of scenic resource management plans
- Adoption of municipal scenic resource protection ordinance
- Adoption of county scenic resource protection standards/guidelines
- Municipal Historic, Cultural, and Scenic Resource Protection Element adopted as part of the municipal master plan
- County Historic, Cultural, and Scenic Resource Protection plan
- Adoption of municipal historic preservation ordinance
- Adoption of county historic preservation standards/guideline

Historic Investment:

- Public dollars dedicated to scenic resource protection
- Public dollars dedicated to resource protection of all Highlands resources

Housing: Creation of comprehensive approach to housing needs.

Inter-Agency Coordination: Summary of inter-agency coordination activities between the Highlands Council and other agencies.

Lake Management: The number of lakes in the Highlands Region for which lake management plans have been developed, funded and implemented. Land Preservation and Protection in Lake Management Area. Regulations and Documents adopted.

Local Participation: The number of meetings the Highlands Council has held for public outreach by municipality.

Low Impact Development Projects: Number of low impact projects implemented for new construction, redevelopment, or retrofit.

LUCZ Map: Number of Map Adjustments

Number of updates to parcel based Development Lands Inventory (through plan conformance)

Mitigation Projects: Number and type of mitigation projects approved in deficit areas.

Municipal Adoption of Stormwater Ordinance with added Highlands Protections: Measures the number of adopted stormwater ordinances with added Highlands protections

Appendix A: List of Indicators Considered

Municipal Plan Conformance: A matrix of municipal Plan Conformance components and the current status of municipal completion, including for example, adoption of Highlands master plan element and zoning amendments

Municipalities with Interim Checklist Ordinance: Identifies the location and number of municipalities with an interim checklist ordinance.

NRCS Program Participation: Measures Highlands agricultural landowner participation in resource management programs, e.g. CREP, EQIP.

Outreach to municipalities: Matrix of type and number of outreach efforts to municipalities.

Pedestrian Safety Studies: Number, location and quality of pedestrian safety studies to help determine walkability of community.

Plan conformance ordinance training: Identifies number and location of plan conformance ordinance training efforts.

Plan Conformance: Business:

- Municipal ordinances that allow home office and live-work units as a permitted use in a residential zone.
- Incubator initiative.

Plan Conformance: Economic Development:

- Number of Sustainable Economic Development Plans prepared and adopted by municipal/county government
- Implementation strategies accomplished

Preservation Area Highlands Development: Number of NJDEP Highlands permit project reviews/approvals

Projects with Conditional Water Availability Allocated: Number of projects with conditional water availability allocated.

Public Infrastructure Investment: Measures the amount of public infrastructure investment by the New Jersey Environmental Infrastructure Trust in the Highlands Region.

Regional Stormwater Plans: Number and location of regional stormwater plans (ex: Troy Brook)

Remediation Projects: Number and status of remediation projects in the Highlands Region (NFAs granted)

Research Initiatives: Development and implementation of research initiatives needed to further resource planning and management.

Right to Farm Ordinances: Measures change in the number of agricultural municipalities that have adopted Right to Farm ordinances.

RMP Update Applications: Measures number of RMP Update applications and number processed.

RMP Updates and Map Adjustments: Record of updates and map adjustments implemented since the 2008 Regional Master Plan.

Safe Routes to School: Identifies number and location of Safe Routes to Schools (SRTS) program initiatives.

Significant Natural Areas Stewardship: Identifies number and location of stewardship activities in Significant Natural Areas.

Stormwater Plans & Controls Implemented: Measures the number of stormwater plans implemented.

Tourism Programs: Local, county, state or national initiatives that support tourism, including local ordinances, agritourism programs, and support from the National Park Service.

Tourism Programs: Active programs which advocate, facilitate and support tourism in the Highlands Region.

Transit Oriented Development: Identifies transit-friendly and transit-oriented plans and projects, and Transit Village participation.

Transit-friendly planning: Identifies number and location of municipalities participating in NJ Transit's transit-friendly planning initiatives, including the Transit Village program and other assistance programs.

Violations and Discharges: Number of violations and discharges associated with Highlands lands.

Wastewater Management Planning: The status of wastewater management plans for municipalities petitioning for plan conformance for the whole municipality.

Water Protection Ordinances: Identifies number and location of water protection ordinances.

Water Use and Conservation Management Plans: Number of WUCMPs in place.

Water Use Waivers: Number and types of water use waivers granted.

Watershed-Based Management Plans: Watershed-based management plans and project ID/implementation.

Wellhead Protection Area Ordinances: Adoption of ordinances related to WHPAs.

Appendix B: Public Comments and Highlands Council Responses

On July 11, 2017 the Highlands Council released for public comment a *Draft Monitoring Program Recommendation Report (MPRR)*. The public comment period was open through September 10, 2017 and announced by public notice.

Written public comments have been summarized below and are followed by Highlands Council staff responses. Comments received can be viewed in their entirety on the [Highlands Council Website](#)

List of Commenters

1. Ada Erik, Councilwoman, West Milford Township
2. Allegheny Society of American Foresters, NJ Division
3. Anonymous
4. Anonymous
5. Anthony Soriano, Morris County Planning Board
6. Bernard V. Navatto, Jr., Chairman, Somerset County Planning Board
7. Bettina Bieri, Mayor, West Milford Township
8. Bill Koppenaal, Department of Engineering & Planning, Sussex County
9. Cathy Brynildsen, Tewksbury Township
10. Christine G. Marion, Morris County Planning Board
11. Corey J. Tierney, Preservation Director, Warren County Land Preservation
12. David K. Dech, Planning Director, Warren County
13. Deborah Post
14. Donald Donnelly
15. Helen Heinrich
16. Judy Kehr, Clerk, West Milford Township
17. Leslie Sauer, Sergeantsville
18. Liberty Township
19. Lou Signorino, Council President, West Milford Township
20. Maria Sheridan, Morristown Airport
21. Marilyn Lichtenberg, Councilwoman, West Milford Township
22. Marion Harris, Chairman, Morris County Trust for Historic Preservation
23. Michael Hensley, Councilman, West Milford Township
24. Monique Purcell, Director, Division of Agriculture and Natural Resources
25. New Jersey Builder's Association
26. New Jersey Department of Environmental Protection
27. New Jersey Department of Environmental Protection, Natural & Historic Resources
28. New Jersey Farm Bureau
29. Paul Abraham, Mayor, Alexandria Township
30. Pete McGuinness, Councilman, West Milford Township
31. Scarlett Doyle, Township Planner, Washington Township (Warren)
32. Sharon Petzinger, Lebanon Township
33. Sue Dziamara, Planning Director, Hunterdon County
34. Tim Wagner, Councilman, West Milford Township
35. William R. Edleston, Borough Attorney, Borough of Bloomsbury
36. New Jersey Highlands Coalition
 - a. Alan R. Hunt, Ph.D., Musconetcong Watershed Association
 - b. Amy Hansen, New Jersey Conservation Foundation
 - c. Dave Peifer, Association of New Jersey Environmental Commissions
 - d. Doug O'Malley, Environment New Jersey
 - e. Elliott Ruga, New Jersey Highlands Coalition
 - f. Emile DeVito, Ph.D. New Jersey Conservation Foundation
 - g. George Cassa, Shannon's Fly & Tackle
 - h. Judy Sullivan, Esq., Ramapough Conservancy
 - i. Julia Somers, New Jersey Highlands Coalition
 - j. Marion Harris, Morris County Trust for Historic Preservation
 - k. Mark Lohbauer, Pinelands Commission
 - l. William S. Kibler, Esq., Raritan Headwaters Association
 - m. Wilma Frey, New Jersey Conservation Foundation



Natural Resources

Comment: Commenter suggests forest resource management requires more flexibility, rather than just being regulated based on extent and connectivity. Suggests forest resource management BMPs should include measures for reducing deer damage and invasive plant takeover as well as active management. Public forests need management plans as well as private landowners. Supports an update of Forest Resource mapping, and suggests including an assessment of the physical condition of the forest, not just geographic extent.

Commenter suggests simplification of the many different plans required of forest landowners including the Woodland Management Plans required for appurtenant Farmland Assessment and forestry plans required by the RMP. Commenter summarizes request to “revisit, simplify, and especially, find resources to pay for” required plans.

Highlands Council Response: Woodland Management Plans and any activities conducted under such approved plans are exempt from the Highlands Act and the RMP, and so are outside the scope of the MPRR. The Highlands Council is developing forest management guidance as discussed in the MPRR at page 14. Forest landowners who are not enrolled in the Farmland Assessment program and who do not already have exempt woodland management plans may benefit from additional guidance provided by municipalities conforming to the RMP. The recommendation regarding Forest Resource Area mapping (page 14) would consider efforts to assess physical condition of forests mapped in the Region in order to more accurately depict quality and extent of forested areas.

Comment: Commenter supports the recommendations regarding the Restoration of Streams and Riparian Areas program (page 15) and suggests that non-profit organizations and other local stakeholders be included in the plans.

Highlands Council Response: The Stream Corridor Protection/Restoration planning effort is a non-mandatory item for conforming Highlands municipalities, where water quality and stream integrity concerns have been noted. The Highlands Council welcomes assistance and technical guidance from non-profit organizations and hopes to continue to coordinate with them, as these planning efforts continue and yield actionable targets for restoration. The Highlands Council also recognizes and values the diverse skills and informa-

tion NJDEP and local watershed organizations have and would seek to partner with them, to efficiently expand and enhance existing surface water quality monitoring efforts throughout the Region.

Comment: Commenter submitted a number of comments regarding Forest Resource Management and Sustainability (page 13-14), the Science and Research Agenda (page 202-203), and Critical Habitat Conservation and Management (page 14-17). Many comments were in support of the recommendations and Science and Research Agenda items. Specifically, the commenter supports the development of a Highlands-specific Best Management Practices (BMP) manual for forestry activities, with the caveat that the document should distinguish between public and private forests in the Highlands Region. Commenter suggests the incorporation of Vermeule Maps depicting historic land use into Highlands forest mapping. Commenter suggests an added Science and Research Agenda item to incentivize reduction of forest fragmentation. Commenter supports the development of carbon sequestration models that would evaluate and determine such value, with an added distinction between public and private forests. Commenter supports the use of all Natural Heritage Priority Sites data in the definition of Significant Natural Areas. Commenter suggests that special emphasis be placed upon critical habitat guidelines within any Highlands Council specific BMP manual. Commenter suggests an additional recommendation that forestry activities proposed in Critical Habitat on private lands adhere to special BMPs developed specifically for these critical areas as proposed in a Highlands Specific BMP manual

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. The MPRR suggests recommendations for updates and amendments to the RMP based on a variety of inputs. The Council recognizes the significance of development of a Highlands Region-specific forestry BMP manual and as such has removed the recommendation in support of a broader Council discussion on the topic at a later date.

Regarding the commenter’s suggestions about mapping, the MPRR contains specific Science and Research Agenda items in the Forest Resource Management and Sustainability section (pages 13-14) to “investigate a mapping methodology to identify those lands where it would be most appropriate to attempt forest restoration” and to “develop guidance for reforestation based on specific site characteristics.” Both of these recommendations, upon further development, will include the addition of the historic forest mapping, known as Vermeule Maps. Pursuit of a valuation model for carbon sequestration in forests of the Highlands Region would necessarily consider

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both private and public forests. During production of the RMP, the Natural Heritage Priority Sites boundaries were imported into Highlands Council GIS mapping, and modified to remove active land use as well as utility rights of way from the data, which resulted in the Significant Natural Areas data layer. This methodology remains the RMP standard for this component of Critical Habitat mapping in the RMP.

Comment: Some commenters expressed support for the recommendations and science agenda items related to Lake Management Areas (pages 18-19). The commenters also suggested that Lake Management Plans developed for municipalities should be required to include an inventory of cultural resources and protection planning for such. Commenters suggest that the recommendation for a BMP manual for dam and lake maintenance prioritize ecological concerns, as well as safety and water quality. For the proposed lake management study of Lake Hopatcong and Greenwood Lake, the commenters suggest that the focus should be on preserving ecological integrity of lakes, water quality and water source potential.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. Lake Management planning would include inventories of all sensitive resources that make lake communities unique, which include cultural, historic, archaeological and ecological aspects. The RMP states that addressing land uses within lake communities allows for potential opportunities to improve community value including the protection of the cultural and historic resources often associated with lake communities.

Comment: Commenter supports the recommendations related to Steep Slope Protection Areas (page 19) and specifically comments that steep slope protection ordinances available from Highlands municipalities should not be the only ones referenced. Commenter further states that any model ordinance language provided by the Highlands Council to municipalities wishing to protect ridgelines should be made widely available.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. The recommendation to maintain a database of ordinance language protective of steep slopes would require the Highlands Council to search well beyond the Region to develop a meaningful set of comprehensive standards, so that municipalities have alternatives appropriate to each locale. Highlands Council model ordinances and guidance documents are available on the Council's website.

Comment: Commenters expressed support for a number of the recommendations and science agenda items related to Restoration of Streams and Riparian Areas (pages 14-16). Commenters suggest redefining the definition of "development" as a spectrum, in order to differentiate among impacts to waterways depending on proposed use. Commenters support the development and continual refinement of the Highlands Open Water and Riparian Inventories, and suggest additional data sources for this. Commenters support incentives to stimulate the Stream Corridor Protection/Restoration Plan adoption on a municipal level, but request that it be extended to non-profit and other local stakeholders. Commenters suggest that Stream Corridor Protection/Restoration planning include projected impacts of climate change. Regarding comments about expanding a surface water-monitoring network within the Region by adding more stations, commenters indicate that coordination with NJDEP and local organizations to expand the existing network may be more effective.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. The Highlands Council has recommended that the language in certain policies and objectives be clarified and refined in multiple instances. However, due to the unique nature of each disturbance this recommendation has been removed and such disturbances will be dealt with on a case-by-case basis with the full Council.

Comment: Commenters expressed support for the MPRR recommendations related to Carbonate Rock Areas (page 18), but suggest that more information is needed to understand how groundwater and surface water interact in carbonate rock rich watersheds. Commenters suggest the Highlands Council provide matching grant funding to pay for updates to NJGS and USGS carbonate rock mapping. Commenters suggest that Highlands Project Reviews should include substantive review of carbonate rock issues where a municipal ordinance is not in effect.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. The Highlands Council agrees that the interaction between ground water and surface water is integral to understanding some water quality concerns in carbonate rock watersheds. The Highlands Council is committed to using the best available data for inventorying all Highlands RMP resources, and this includes carbonate rock mapping. As new mapping becomes available from NJGS and/or USGS, the Highlands Council will update its data layers accordingly. Municipalities conforming to the RMP and participating in the Plan Conformance grant program may be eligible to use funding from the Highlands Council to inventory

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carbonate rock areas, or karst features, as appropriate, with an approved scope of work. The Highlands project review process includes substantive geophysical investigations in areas of carbonate rock, even where municipal ordinances exist.

Comment: Commenter recommends that the discussion of “Natural Resources” should emphasize that the environmental standards and municipal ordinances for the Planning Area should not be as stringent as those for the Preservation Area where the DEP’s regulations are applicable. A specific concern is that the 300-foot buffer from Freshwater Wetlands and for any Highlands open waters, which are virtually all waters except for swimming pools, may be imposed only in the Preservation Area pursuant to the Freshwater Wetlands Protection Act and the Highlands Act. In addition, riparian areas extending beyond these constraints are mapped and disturbance is not permitted. This restriction should apply only in the Preservation Area. In the Planning Area, the buffer should be reduced to coincide with the buffer required by DEP pursuant to the Freshwater Wetlands Protection Act regulations and no additional riparian areas should be required.

Highlands Council Response: The Highlands Water Protection and Planning Act defines “Highlands Open Waters” as “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...” Due to the recognition of the entire Region (Preservation Area and Planning Area) in the Act, the Highlands Council supports municipalities that are conforming to the RMP in the Planning Area that have committed to implementing the 300-foot buffer on Planning Area Highlands open waters. Adoption of the Highlands Area land use ordinance will allow municipalities to enforce the standards protective of this buffer as applicable. In addition, revised guidance on Highlands Open Water buffers disturbances can be found in the MPRR at page 15.

Comment: Several commenters discussed the Science and Research Agenda item proposed to develop a Highlands Forest Best Management Practices manual to supplement the current NJDEP BMP Forestry Manual, both for and against, and with many specific suggestions for changes to this proposal.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. The Council recognizes the significance of development of a Highlands Region-specific forestry BMP manual and

as such has removed the recommendation in support of a broader Council discussion on the topic at a later date.

Comment: Commenter requests a clarification in the definition of forest fragmentation be considered. Commenter requests recommendations pertaining to sustainable forestry practices including implementation or planning for active management of forests. This would include discussion of forest disturbance as a component of management.

Highlands Council Response: The Highlands Council is in the process of drafting forest management guidance for municipalities and will be sure to include a discussion of these related and important topics in this guidance. Active forest management would be a component of any guidance developed by the Highlands Council and we welcome the expertise and assistance of the NHRG in the review of this material during production and when completed.

Comment: Commenter suggests incorporating the use of the Floristic Quality Assessment (FQA) into the recommendations report and subsequently the RMP.

Highlands Council Response: The Highlands Council is in the process of developing a methodology to value ecosystem services provided by Highlands Resources, and the FQA is being incorporated as the Plant Stewardship Index into this effort. A specific discussion regarding this effort is found on page 13. A recommendation to incorporate the results of this project into future amendments of the RMP is found on page 14.

Comment: Commenter suggests collaboration with New Jersey Geological and Water Survey (NJGWS) regarding the mapping of carbonate rock and associated karst areas. States NJGWS has significant data to share in this area, which may be of value. Notes that there are some land use considerations when any parcel of land is mapped with a geologic hazard. Identifying a property as likely to contain karst features may have implications for land owners and developers. Finally the commenter notes that development of model ordinances is beyond the responsibility of NJGWS.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments regarding mapping carbonate rock and associated karst areas in the Highlands Region. We look forward to working collaboratively with USGS and NJGWS to accurately map these features using the most up-to-date data.

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Comment: Commenter states that changes in lake operating plans must consider downstream implications. For Lake Hopatcong, impacts on Lake Musconetcong and the required dilution at the Musconetcong Sewerage Authority treatment plant should be considered. For Greenwood Lake, any modification must take into account the passing flows required to meet the water rights of the North Jersey District Water Commission.

Highlands Council Response: Should the Highlands Council undertake the development of a Lake Management study for Lake Hopatcong, Lake Musconetcong will be included in discussion and planning. For Greenwood Lake, the impacts/concerns indicated in the comment will be considered.

Comment: Commenter suggests that West Milford residents and elected officials have concerns about recommendations in the MPRR to undertake a lake management study focusing on Lake Hopatcong and Greenwood Lake. Suggests that such a study will result in West Milford being subject to restrictions, rules and regulations that cannot be sustained because half of that lake is not within the municipality's jurisdiction nor is it in the jurisdiction of New Jersey State agencies.

Highlands Council Response: The Highlands Council intends to include stakeholders, including affected municipalities, in the development of lake management plans.

Comment: Commenter suggests examining how public lands in the Highlands are managed and tracking acres of lands managed under stewardship plans.

Highlands Council Response: The Highlands Council will consider this comment during the preparation of the Forest Restoration project identified in the science and research agenda.



Water Resources

Comment: Commenter found it confusing to have both agriculture and irrigation numbers combined. Suggests agricultural water certifications should be broken out to establish the use and change in use to track trends in efficient use of water. Suggests this data could come from implementing the recommendations that call for better collaboration with NJDEP, NJDA and Rutgers Cooperative Extension Service.

Highlands Council Response: The Highlands Council will consider this recommendation and bring it to the attention of the proposed Agricultural Advisory Committee.

Comment: Commenter found the reduction in consumptive uses of water (down 27%) in the Highlands Region interesting.

Highlands Council Response: The Highlands Council acknowledges these comments.

Comment: Commenter questions why additional research regarding septic density calculations is needed.

Highlands Council Response: The RMP calls for the continued refinement of water quality data and modeling. The MPRR continues these recommendations, which will provide for better, more accurate information (page 25).

Comment: Commenter suggests new build-out analysis is required for Highlands's municipalities in light of changes to NJDEP septic density standards.

Highlands Council Response: The Highlands Council provided funding to municipalities to update the Build-out Analysis in 2015. This update was primarily intended to inform changes in affordable housing regulation. The Highlands Council does not intend to update the region-wide build-out analysis due to any changes in the NJDEP Highlands Rules.

Comment: Commenter supports recommendation identifying and addressing septic system failures in the Highlands municipalities.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments.

Comment: Commenters support recommendations that encourage the use of alternate wastewater technology.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments.

Comment: Commenter requests that the Highlands Council amend the RMP to reflect any new nitrate dilution calculations for the Region.

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Highlands Council Response: The septic density calculations for each land use capability zone within the Highlands Region, based on nitrate dilution models, have not changed since the adoption of the RMP in 2008. Septic density in the Preservation Area is regulated by the NJDEP in the Highlands Rules (N.J.A.C. 7:38). In the Preservation Area, the RMP refers directly to the Highlands Rules and therefore no change would be necessary. In addition, the MPRR (page 25) includes recommendations for the refinement of the data and models used to calculate septic density.

Comment: NJDEP Division of Water Supply and Geoscience (DWSG) staff will make updated data available to the Highlands Council. DWSG staff can provide to the Highlands Council the most recent coverage of purveyor service areas.

Highlands Council Response: The Highlands Council acknowledges this comment and will follow-up with DWSG staff to obtain this information.

Comment: Commenter notes that the Highlands Council uses a different standard for evaluating new water availability than does DWSG. The Highlands Council also evaluates water deficits on a HUC14 basis whereas DWSG uses a HUC11 basis. These differences lead to different analyses. This is especially significant in comparing results of DEP's water supply plan to the Highlands Council's results. Commenter suggests that it may not be possible to reconcile the two approaches given the different implementation needs, and notes that additional policy considerations will be required.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments.

Comment: Commenter notes that enacting a water user fee, determining water use rates and assessing water use efficiency (pages 24 - 25) call for examining water use by users outside of the Highlands, partially or wholly depending on Highlands water. Notes these are statewide issues that should be examined closely for policy concerns and efficacy. Suggests that comparing water use rates for all users of Highlands water, from older cities in northeastern New Jersey, to suburban areas, to small towns in the Highlands, will probably reveal a wide range of costs. Commenter questions purpose of such an exercise and notes that comparing water rates will probably not provide information on relative efficiencies.

Highlands Council Response: The Highlands Council acknowledges these comments and will take them into consideration in evaluating water use efficiency and the

feasibility of a water user fee. It should be noted that implementing a water user fee would require legislative action.

Comment: Commenter suggests that items included in Science and Research agenda on page 25 (improving existing monitoring networks, reviewing logistical regression models and refining models for estimating septic densities) appear to arise from recent issues associated with determining an appropriate Highlands septic density and the appropriateness of using a logistical regression model of groundwater nitrate concentrations as compared to additional monitoring. Commenter suggests close collaboration with NJGWS regarding these issues.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. We look forward to further discussions with NJGWS staff regarding the potential expansion of the AG-WQMN.

Comment: DWSG see the draft water supply plan, and forthcoming final version, as a summary of current withdrawals and uses as wells as a guideline for development of future water supplies. The Highlands Council was consulted and their comments on the draft plan will be taken into consideration in developing the final plan.

Highlands Council Response: The Highlands Council acknowledges and appreciates this comment. The MPRR recommends the continued consultation with the NJDEP on future statewide water supply plans regarding the plans impact on the region.

Comment: Commenter disagrees with the Council's identification and definition of water deficit areas. Contends "water deficit" should be dependent on NJDEP's water allocation for municipalities and water purveyor. Supports recommendation regarding development of Water Use and Conservation Management Plans.

Highlands Council Response: In essence, Net Water Availability is estimated by subtracting from the Groundwater Availability for that subwatershed an estimate of the consumptive and depletive groundwater use, and the consumptive and depletive surface water uses that are not supported by reservoir storage or safe yield. Additional information regarding the complex calculations used to determine Net Water Availability can be found in the Water Resources Volume II – Water Use and Availability Technical Report (2008).

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The ten (10) Water Use and Conservation Management Plans developed under the Pilot Program are used as models to assist in the development of municipal-wide plans. Development of the plans is funded through plan conformance grants and is currently under way.

Comment: Commenter supports recommendation on page 22 regarding prioritization of municipal-wide WUCMP development, but feels the recommendation should include working with non-profit organizations and other local stakeholders. Additionally, DEP must consult with the Council on all new water allocation permits and on all permit renewals, not just those with major modifications.

Highlands Council Response: Development of municipal-wide WUCMPs includes identification of all potential stakeholders within the subwatersheds of the municipality. The Highlands Council is copied on all new allocation permits and renewals in the Highlands Region and responds where consistent with the requirements of the Highlands Act and the RMP.

Comment: Commenter supports recommendation regarding water use rates (page 198), but encourages the Highlands Council to estimate water use rates from historical usage, unlike the methods in the draft NJ Water Supply Plan, which used an estimated future rate that was 20% lower (about 100 gpd per person) than the historical rate of individual water consumption (about 125 gpd per person). Commenter also suggests that water use rates for private potable wells must also be included in this assessment as some watersheds in the Highlands Region have water deficits due primarily to the abundance of potable private wells, as in the Lower Musconetcong watershed.

Highlands Council Response: The Highlands Council acknowledges the comments regarding development of water use rates and will take these recommendations into consideration when coordinating with the NJDEP.

Comment: Commenter notes that the recommendation to continue monitoring water withdrawals throughout the region using data catalogued by the NJGS is a first step, but relying on NJGS data is inadequate to address the intent of the Highlands Act. Commenter encourages the Highlands Council to develop a more robust monitoring program, which monitors both groundwater and surface water volume, especially in carbonate rock areas, and seek partnerships for establishing groundwater monitoring sites (e.g. NJ Wildlife Management Areas, municipal public lands) and non-profit organizations. Suggests other useful information may be avail-

able through the NJDEP well drilling permit program on well depth, depth to water, and need for replacement wells (e.g. due to an original well going dry).

Highlands Council Response: The Highlands Council plans to work with the NJDEP-Division of Water Supply and Geoscience staff regarding the rationality and feasibility of expanding both the groundwater and surface water monitoring networks throughout the Highlands Region. This is mentioned under the Science and Research Agenda sections of the MPRR (pages 23-25).

Comment: Commenter supports recommendation related to consultation with NJDEP on the New Jersey State Water Supply Plan (page 23), but notes this consultation should occur while the Statewide Water Supply Plan is being drafted, not after it has been released for public comment. The Plan as currently proposed addresses neither water quality nor the water needs of aquatic ecosystems. The Council must ensure that the RMP continues to address those two needs.

Highlands Council Response: In accordance with the requirements of the Highlands Act, the Highlands Council was in consultation with the NJDEP during the development of the Statewide Water Supply Plan. Comments were also submitted by the Highlands Council following the release of the Draft Plan.

Comment: Commenter supports several recommendations related to: net water availability based on data from completed WUCMPs; development of RMP subprogram to directly address PGWRAs [Prime Ground Water Recharge Areas]; development of avoidance/minimization/mitigation strategies and policies associated with development in PGWRAs; development of site design guidelines for development in PGWRAs, including permissible uses; and development of municipally based guidance for the local identification of municipally important groundwater recharge areas.”

Highlands Council Response: The Highlands Council appreciates the commenter’s support for these recommendations.

Comment: Commenter supports science and research agenda item on page 23 related to working with USGS to determine the feasibility of updating the Low Flow Characteristics of Streams in the Highlands Region report. Suggests inclusion of (1) a long-term trends analysis of base flows; and (2) a projection of base flows 40 or more years out to account for the likely impacts of climate change. To the extent possible this

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analysis should include river tributaries and streams, in addition to a watershed or basin level flow assessments, because of the localized impacts of water withdrawals.

Highlands Council Response: The Highlands Council will consider these comments if it is determined that updating the report is feasible.

Comment: Commenter supports the recommendation related to streamflow condition analysis simplification, but suggests that the focus should be on a more accurate analysis of stream flow, rather than a more simplified analysis.

Highlands Council Response: The Highlands Council agrees with this comment and has incorporated this change into the final MPRR. Please see MPRR page 23 for changes.

Comment: Commenter supports recommendation to “Identify potential funding sources to support the installation, operation and long-term maintenance needs associated with new gauges situated in the region.” Suggests the Highlands Council could partner with non-profit organizations to deploy and monitoring continuous flow stations.

Highlands Council Response: The Highlands Council acknowledges and appreciates this comment.

Comment: RMP Program: The Efficient Use of Water (pgs. 23-25)

Commenter supports recommendations related to development of municipal-wide WUCMPs. Suggests the Highlands Council should include a recommendation to help coordinate development of WUCMPs among neighboring municipalities, as most HUC14s overlap municipalities and most municipalities include more than one HUC14.

Highlands Council Response: Development of municipal-wide WUCMPs takes into account the fact that most HUC14s overlap municipal boundaries. The reevaluation of net water availability is performed on the entirety of the HUC14 subwatershed situated either wholly or partially within the municipality. Proposed deficit mitigation strategies will include coordination efforts with bordering municipalities where appropriate and feasible. Please see results of Highlands Council WUCMP Pilot Program: www.nj.gov/njhighlands/plan-conformance/guidelines/resource.html#3

Comment: Commenter supports the integration of water conservation strategies into the WUCMPs, but suggests such strategies should be mandatory in any municipality that includes all or a portion of any HUC14 in deficit.

Highlands Council Response: During the development of municipal-wide WUCMPs, net water availability numbers are revised using the most current data available. In addition, the methodology used to calculate the numbers has been improved from that which was used during the development of the RMP. As such, a HUC14 subwatershed listed as being in a deficit condition in the RMP may actually be in a surplus condition. Updated data regarding net water availability will be published in accordance with the policy developed for GIS Data Updates (see MPRR Page 60). Regardless of the condition, water conservation strategies are proposed for implementation in the WUCMP.

Comment: Commenter suggests that since the volume water used on golf courses is extremely large, and the use is almost entirely consumptive, best management/water conservation practices should be mandatory in any new or renewed water allocation permit.

Highlands Council Response: The Highlands Council agrees with this comment and currently includes this condition in our reviews.

Comment: Commenter supports recommendation to continue coordination with NJDEP on water allocation permit actions if the coordination between the Council and NJDEP includes all permit actions, whether the permit is new or is being renewed.

Highlands Council Response: The Highlands Council continuously coordinates with the NJDEP on all permit actions concerning the Highlands Region.

Comment: Commenter supports recommendation to continue monitoring water withdrawals throughout the region using data catalogued by NJGS, but suggests the Highlands Council should take action in those HUC14s that remain in deficit. Also, relying on NJGS data is inadequate to address the intent of the Highlands Act and a more robust groundwater monitoring network needs to be implemented.

Highlands Council Response: The Highlands Council agrees with this comment and plans to work with the NJDEP-Division of Water Supply and Geoscience staff regarding the rationality and feasibility of expanding the groundwater monitoring network throughout the

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Highlands Region. This is mentioned under the Science and Research Agenda sections of the MPRR (pages 23-25).

Comment: Commenter suggests that all projects reviewed for consistency by the Highlands Council should be required to reduce water consumption, reuse stormwater on site, and recycle water for beneficial reuse “to the maximum extent possible.” Suggests the phrase “to the maximum extent practicable” should be clearly defined for the purposes of the RMP and the Highlands Council should ensure that water conservation measures are used on all sites.

Highlands Council Response: All new and/or redevelopment projects in the Highlands Region are required to incorporate low-impact/green infrastructure features in order to achieve consistency with the RMP from the Highlands Council. Please see the Low Impact Development section of MPRR on page 51.

Comment: Commenter supports recommendation to develop educational materials for Highlands municipalities regarding water use efficiency and conservation practices. Suggests coordinating outreach with NJDEP and appropriate regional non-profits.

Highlands Council Response: The Highlands Council appreciates the support for this recommendation.

Comment: Commenter does not support recommendation to explore feasibility of enacting a water user fee and using funds raised to assist in compensating landowners whose future land use expectations have been impacted by the Highlands Act. Commenter notes that courts have clearly and repeatedly held that “future land use expectations” are not a taking and therefore not compensable. Commenter would support a proposal to enact a water user fee to compensate Highlands landowners willing to sell their property for preservation purposes, or willing to place an agricultural or conservation easement on their property.

Highlands Council Response: The Highlands Council’s recommendation is to determine the feasibility of a water user fee. Any resulting compensation would occur within the parameters of the Highlands Open Space Partnership Funding Program and Highlands Development Credit Purchase Program (N.J.A.C. 7:70), which compensates willing sellers for preserving their land either through conservation easements or fee simple acquisition.

Comment: Commenter suggest that recommendation to collaborate with the NJDEP (all uses) and the NJDA (agricultural uses) to select the most appropriate metrics for water use efficiency should be broader and might be a good use of a Technical Advisory Committee (TAC). Suggests TAC should include water authorities, such as the New Jersey Water Supply Authority and the North Jersey District Water Supply Commission, water utilities, academics, and non-profit organizations such as watershed associations.

Highlands Council Response: The Highlands Council acknowledges and appreciates this comment and will consider a broader collaboration when developing metrics for water use efficiency. A change has been incorporated in to the final MPRR. Please see MPRR page 25 for changes.

Comment: Commenter supports recommendation to collaborate with the NJDEP to determine existing water use rates for all public community water supply systems using Highlands’ water, categorize the systems for comparison purposes, and assess the relative efficiency of water uses among common classes of public community water systems. Suggests water use rates for private potable wells should also be included in this assessment as some watersheds in the Highlands region have water deficits due primarily to the abundance of potable private wells, as in the Lower Musconetcong watershed.

Highlands Council Response: The Highlands Council agrees with this comment and has incorporated this change into the final MPRR. Please see MPRR page 25.

Comment: Commenter supports recommendation to collaborate with the NJDEP, NJDA, and Rutgers Cooperative Extension Service to determine existing water use rates for all agricultural and other self-supplied irrigation uses using Highlands water, categorize the uses for comparison purposes, and assess the relative efficiency of water uses among common classes of purposes.

Highlands Council Response: The Highlands Council appreciates the support for this recommendation.

Comment: Commenter supports all recommendations on page 25 related to Water Quality Restoration (page 25). Suggests the Highlands Stormwater Management Program must ensure that municipalities address current and predicted future effects of climate change.

Highlands Council Response: The Highlands Council appreciates the support for these recommendations.

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Comment: Comments suggest that the recommendation to identify if any watershed-based management plans associated with the Highlands Region have been developed and/or implemented should be changed to reflect the fact that such plans do exist. Suggests recommendation should be to collect and catalog all existing watershed-based management plans in the Highlands, update their implementation status, coordinate support for their implementation, and prioritize for development of a plan for those watersheds within the Highlands that presently lack a management plan.

Highlands Council Response: The Highlands Council partially agrees with this comment. Changes have been incorporated into the final MPRR. Please see MPRR page 25. The MPRR includes an item on the Science and Research Agenda regarding the development and implementation of additional watershed-based management plans in the region (page 25).

Comment: Commenter agrees that existing governmental monitoring networks are insufficient to provide the level of information to management water availability and quality in compliance with the Highlands Act (page 25). Commenter encourages the Council to work with non-governmental and non-profit partners.

Highlands Council Response: The Highlands Council agrees with this comment and has incorporated changes into the final MPRR. Please see MPRR page 25.

Comment: Commenter states that USGS's current regression model has proven to be inadequate and suggests the Council should not rely on it. Suggests a new regression model should be developed, tested, and peer-reviewed before revisiting the septic density issue.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments.

Comment: Commenter notes that while septic density can be an important lens to interpret groundwater quality protection needs, estimating septic densities is only one of many reasons to improve the groundwater monitoring network in the Highlands. Suggests design of an improved groundwater monitoring network to collect data for a variety of potential pollutants and use of that data to prepare an analysis of temporal and spatial trends in groundwater quality and quantity in the Highlands.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. Changes have been incorporated into the final MPRR. Please see MPRR page 25.

Comment: Commenter supports the development and implementation of watershed-based management plans where they are needed. However, notes that the Highlands Act directive to “protect, restore, and enhance the quality and quantity of surface and ground waters” (emphasis added) is not geographically limited to those places in the Highlands with “sufficient available data.” Where existing data isn’t sufficient, it is incumbent on the Council to collect sufficient data and then use that data to improve water quality.

Highlands Council Response: The Highlands Council has included proposals in the Science and Research Agenda sections of the MPRR (see pages 23 and 25) to determine the feasibility of improving the groundwater and surface water quality monitoring networks throughout the region in an effort to collect sufficient data where it is not currently available.

Comment: Commenter suggest a water fee be charged of users of Highlands water. Suggests funds raised could be used to compensate landowners, preserve land, and for forest management critical to water supply and quality.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. The Highlands Council has long supported the concept of a water user fee.



Water & Wastewater Utilities

Comment: DWSG staff meet regularly with Highlands Council staff to coordinate reviews. A draft DWSG-SOP (Standard Operating Procedure) was never officially finalized but is used as guidance. DWSG intends to maintain the open lines of communication and coordination. DEP staff meet monthly with Highlands Council staff to discuss coordination of all issues of mutual concern.

Highlands Council Response: The Highlands Council acknowledges and appreciates this comment. The Highlands Council would like to formalize the Standard Operating Procedure.

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Comment: Commenter notes that on page 27 under the Highland RMP Program the 5th and 7th bullet points both refer to a build-out analysis. Should these be combined?

Highlands Council Response: The bullet points referenced in this comment are associated with two separate programs identified in the RMP (refer to pages 272 and 273 of the RMP). One program is associated with ‘Existing Areas Served’ while the other program is associated with ‘Proposed Service Areas.’

Comment: Commenter suggests adding an additional recommendation to the lists of Recommendations for water and wastewater utilities on page 30: Prioritize Municipal Wastewater Management Plan (WMP) development and identify those priorities to NJDEP.

Highlands Council Response: The Highlands Council continuously coordinates with the NJDEP on Water Quality Management Plan (WQMP) amendments and municipal/ county WMPs within the Highlands Region. Prioritization is conducted at a staff level and inclusion in the MPRR is not required.

Comment: Commenter questions need for different approach than rest of NJ to capacity and demand status discussed on page 112.

Highlands Council Response: The Highlands Act designated the Highlands Region as an area subject to more stringent environmental standards. In keeping with the intent of the Act, the method for calculating capacity and demand is more conservative than in the rest of the state.

Comment: Commenter suggests that Septic Maintenance programs in the Highlands Region should be voluntary. Suggests mandatory programs would create unfunded mandated costs to both the municipality and its residents.

Highlands Council Response: To date, no Highlands Municipal Septic System Maintenance Plan Ordinance has been developed or adopted. The MPRR (page 31) contains recommendations intended to review the Septic Maintenance program including a review of the effectiveness of existing septic maintenance requirements. Septic System Maintenance program initiatives developed in the future would likely be funded by the Highlands Council’s Plan Conformance amended grant agreement program for conforming municipalities.

Comment: Commenter notes that the Build-out Analysis for Non-Highlands Approved Service Areas in Hunterdon County will be completed by the Hunterdon County planning department, not the Highlands Council staff.

Highlands Council Response: The Highlands Council is only conducting the build-out analysis for conforming municipalities within the Highlands Region.

Comment: The commenter strongly supports the recommendation for alternative waste water treatment plants. This will have broad impacts in other sections of the report (Future Land Use, Landowner Equity, Sustainable Economic Development). The commenter agrees with the need to better monitor existing septic systems and septic failures, as the burden of clean ground water should not be solely focused on new septic systems. However, there needs to be a process to address business, including farm business expansion of waste water systems. Better coordination of DEP rules and the Highlands RMP, when encouraging businesses to grow or stay in the region.

Highlands Council Response: The Highlands Council appreciates these comments and support for its recommendations. Wastewater treatment for commercial development is an issue of concern in the Region since public sewer service is not widely available. This is a major reason for Highlands Redevelopment Area and Highlands Center designations. The Council seeks to locate development in the most suitable locations, where it will have supporting infrastructure to sustain it.

Comment: Commenter suggests the Council coordinate with NJDEP to ensure the adoption of more reasonable Wastewater Management Plans that identify new sewer service areas for development, particularly in the Existing Community Zones and Centers. Commenter questions the decrease in sewer service areas in the Existing Community Zones and Centers. (pages 154 and 159)

Highlands Council Response: There are currently 6 adopted Wastewater Management Plans within the Highlands Region. The Highlands Council is continuously coordinating with the NJDEP on the development and adoption of Wastewater Management Plans. The Wastewater Management Plan amendment process is a NJDEP protocol and documents are not public information until NJDEP publishes the Water Quality Management Plan amendment in the NJ Register.

Sewer Service Areas could decrease in Centers due to more accurate mapping. The mapping for sewer service areas is developed and refined through the

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2009 and 2015 Build-out Analysis and through the adoption of Wastewater Management Plans. The 2002 mapping originated by NJDEP may not have reflected the most accurate information. The mapping for the MPRR identifies the areas that have pipes in the ground and wastewater flowing to a treatment plant. Therefore, sewer service areas may have decreased in ECZ and Centers based on the in ground piping and wastewater flowing, not the Future sewer service areas that the Highlands Council finds to be consistent with the RMP, which includes ECZ and Centers.

Comment: Commenter noted an omission in a Highlands Act Goal related to Water and Wastewater Utilities on page 27.

Highlands Council Response: The Highlands Council has incorporated this change into the final MPRR. Please see page 27.

Comment: Commenter notes several omissions in RMP goals, objectives, and programs related to water and wastewater utilities.

Highlands Council Response: The Goals of the RMP for "Sustainable Development and Water Resources" are listed in the MPRR. The commenter lists the policies and objectives under those goals. It should be noted that the MPRR discusses recommendations for modifications and refinement of the RMP. Any item contained in the RMP that is unaddressed in the MPRR would remain in the RMP unchanged.

Comment: Commenter supports the RMP Wastewater System Maintenance program and its elements, yet notes issues with adoption and enforcement of such ordinances and the resulting impact on communities.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments.

Comment: Commenter states that indicator reports do not provide sufficient insight into whether or not the Highlands Act's goals and objectives are being met. Cites as an example the finding that most of the water supply EAS lies within the ECZ of the Planning Area, and that most of the wastewater EAS lies within the ECZ of the Planning Area. Includes other specific examples.

Highlands Council Response: The indicators contained in the MPRR provide baseline documentation that will be tracked through iterative monitoring reports and may reveal evidence of additional impacts of the RMP

over time. Regarding the data used, the mapping has been updated and refined through both the 2009 and 2015 Build-Out Reports, Wastewater Management Plans and amendments, and the Water Use and Conservation Management Plans.

Comment: Commenter supports several recommendations::

- Develop procedures that improve coordination with WMP partners to accelerate development and adoption of WMPs.
- Update EAS data for both wastewater and water utilities on a regular schedule.
- Continue to coordinate with NJDEP on water allocation decisions and project reviews that demand public water and/or wastewater utilities, particularly regarding sensitive resources.
- Identify and prioritize areas that are in need of upgraded infrastructure.
- Investigate opportunities for creating grant programs to assist with infrastructure upgrades.

Highlands Council Response: The Highlands Council staff acknowledges and appreciates this comment.

Comment: Commenter feels the content of the Water and Wastewater Utility topic chapter in the MPRR was insufficient. Suggests that if the indicators were more reflective of showing how well the Water and Wastewater Utility programs succeeded in meeting the fundamental goals and objectives of the Act and the RMP for this topic, there would be more meaningful recommendations to make at this time.

Highlands Council Response: The Highlands Council staff acknowledges and appreciates this comment. The indicators contained in the MPRR provide baseline documentation that will be tracked through iterative monitoring reports and may reveal evidence of additional impacts of the RMP over time. The Highlands Council anticipates that there will be more useful data on the EAS of water and wastewater in the future.

Comment: Commenter has a number of concerns in the Water and Wastewater Utilities section of the Report. States that Water and Wastewater Utilities are lumped together in a way that terms and statements are applied in a manner that makes it difficult to ascertain whether the report is referring to wastewater or water supply systems. Suggests making terminology consistent with standard language used in applicable rules and regulations.

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Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. The laws, regulations and rules that apply to water and wastewater utilities are cited in the Highlands Utility Capacity Technical Report, (which provided the foundation for the water and wastewater components of the RMP) but were not repeated in the MPRR. While the Highlands Council has endeavored to use consistent terminology to date, we will continue to coordinate with state agencies to maintain consistent terminology.

Comment: Commenter questions the findings on page 30 related to water supply EAS, i.e. the extent of the mapped water supply service area has increased. However the reason for this is not provided and can be complex, potentially attributed to the following: ground water contamination requiring conversion from private well to public water systems or other ground water supply constraints; change in the methodology for delineating or defining water service areas. The decrease in wastewater EAS is attributed to more accurate mapping; however, it should be clear that a change in the method for delineating Wastewater service areas has also taken place, affecting the size of the service area. Finally the indicator does not recognize the critical impact rainfall patterns have on wastewater flow. Dry weather patterns are the primary factor, coupled with more efficient plumbing fixtures and population decline in much of the Highlands Region.

Highlands Council Response: The indicators contained in the MPRR provide baseline documentation that will be tracked through iterative monitoring reports and may reveal evidence of additional impacts of the RMP over time. The increase in public water supply EAS may be attributed to many factors, including conversion of private well to public water systems required because of groundwater contamination or other groundwater supply constraints, or increases in mapping accuracy. However, the methodology for delineating or defining water service areas has not changed. The water and wastewater service areas identified in the report are defined in the RMP on page 432 as "... areas connected to either an existing public wastewater collection system or public water distribution system where such infrastructure is already constructed. It does not include areas of designated sewer service areas or water service franchise areas where collection, transmission, or distribution systems do not currently exist."

Comment: Commenter states that the map on page 111 is unclear for a number of reasons and specifically questions whether the mapped Wastewater Service Areas on page 111 are consistent with the Sewer Service Areas adopted for Somerset County's Highlands municipalities. Suggests that if sewer service

areas are defined as individual tax parcels or facilities/building footprints currently served, then this definition should be provided.

Highlands Council Response: The map referenced is an update of Figure 3.30 on page 120 and 121 of the RMP and the legend correlates with capacity data. It identifies the EAS and the capacity for wastewater treatment plants. For the definition of EAS, please refer to the previous response. The sewer service area mapping that Somerset County prepared for NJDEP is a different map than what is shown here. That map is of the sewer service areas, depicting areas assigned and unassigned to wastewater facilities. No Somerset County municipality is conforming for the Planning Area of the Highlands Region; therefore, no update to a Wastewater Management Plan or build-out analysis would inform updates to this map. The EAS mapping is accurate to the best of our knowledge and Somerset County may request the GIS shapefiles or download them from our website (data-njhighlands.opendata.arcgis.com).

Comment: Commenter notes that there is no estimate of future additional wastewater flows or water demand from vacant potentially developable land, future infill and redevelopment in the MPRR and questions why.

Highlands Council Response: The commenter is correct that the MPRR does not address future wastewater flows or water demand; it did not intend to. The MPRR provides a baseline evaluation of RMP implementation and does not reflect a revised build-out analysis.

Comment: Commenter questions references throughout the document to a build-out analysis that appears to have been performed for "conforming" municipalities. Notes that neither change in population growth between 2002 and 2012 based on census trends, nor estimates/projections of future municipal population growth based on the aforesaid build-out analysis are provided in the MPRR (see tables beginning on page 148). Commenter suggests that existing and projected population (and household growth) are a key determinant of future wastewater and water supply demand. Change in acres of sewer service area and water service area from 2008 – 2016 provided in these tables is not a determinant of future wastewater and water demand in and of itself. Future Service Area must be distinguished from Existing Areas Served, then Future Service Area must be coupled with vacant potentially developable land and associated allowable development densities and land use types and estimates of growth in designated redevelopment areas in

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order to predict future sewer and water needs within the Highlands area, which this report does not appear to address.

Highlands Council Response: The analysis discussed shall be resolved through Recommendations contained under the future land use section of the MPRR, including the revision of the Land Use Capability Zone Map series and the development of a Smart Growth Map in accordance with the requirements of the Act (C.13:20-11.a (6)(d)), which shall “identify transportation, water, wastewater, and power infrastructure that would support or limit development and redevelopment in the Planning Area.”



Agricultural Resources

Comment: In the land in Agriculture Preserved Land Indexes, commenter questions 95% of Agricultural Resource (ARA) being preserved.

Highlands Council Response: The Highlands Council agrees that the ARA preserved farmland figure is in error and has provided corrections. Thank you for bringing this to our attention. Please see pages 34 and 127.

Comment: Commenter would like to see the restoration of the farming assistance program and expected to see more detailed reporting of the benefits of the program, including number of farms helped, acres of land impacted, etc. in the MPRR. Commenter indicates that \$418,000 was spent in three counties and recommends the results of the grants should be shared.

Highlands Council Response: The Highlands Council provided the referenced funding through its county agricultural grants program. Information and deliverables related to this program are no longer directly available on the Highlands Council website; however, the Council will provide the information upon request. The Highlands Council continues to promote the use of its grant funds for county projects and, with the creation of an Agricultural Advisory Committee, the Council will likely seek to increase grant funding in this area.

Comment: Commenter recommends adding additional indicators to better understand the health of the agriculture economy in the region:

- Number and nature of Right to Farm complaints since 2008 (CADB and SADC data). NJDA can work on this.
- Market value of crops 2007 vs. 2012 (Ag 2012 Census).
- Economic value of agri-tourism and direct marketing to towns and counties. NASS
- Comparison of acres/numbers of major commodities 2008-2012. NASS
- Number of new farm conservation plans developed and implemented (NRCS and Soil Conservation District data).
- Number of scale of projects that have used the Agriculture Development process for new buildings and farm expansion.

Highlands Council Response: The Highlands Council acknowledges and appreciates these suggestions. However, in order to produce a useful MPRR document that retains a focus on priorities, the Highlands Council had to reduce the total number of suggested possible indicators to a manageable number. It was also helpful to consolidate items in a number of cases, to create representative indexes composed of various parts. The MPRR does include the full list of Indicators considered, beginning on page 205.

Comment: The commenter generally supports the MPRR recommendations listed on page 35 and adds additional suggestions, thoughts and ideas, including:

1. “We suggest that the RMP promote organic agriculture in the Highlands Region through education and technical assistance as a way to fulfill multiple Highlands Water Protection and Planning Act resource protection and sustainable economic goals, including especially protection of water quality, biodiversity, human and environmental health.”
2. “We strongly recommend first prioritizing a transition to organic agriculture as noted above, and then the reduction of synthetic pesticides, herbicides, etc. through IPM.”
3. “We support marketing assistance that promotes Highlands' products within already existing venues, including farmers' markets. Many farmers have experienced a decrease in farmers' market attendance due to the over-abundance of such markets.”
4. “Research into the benefit of cooperatives could be useful for Highlands farmers. In Pennsylvania, the Lancaster Farm Fresh Coop successfully supports local farmers while selling to customers, both retail and wholesale, in the tri-state area.”
5. “If an Agricultural Advisory Council is established, it is important that it include organic farmers in its membership, and include cross-sector representation in order to address the marketing and supply-

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chain issues faced by farmers, (e.g. marketing diversification specialists, consumers, retailers, and distributors).”

Highlands Council Response: The Highlands Council appreciates these comments and will bring these issues to the attention of the Agricultural Advisory Committee proposed in the MPRR (see MPRR page 35).

Comment: The commenter suggests offering competitively awarded grants to non-governmental organizations to provide marketing assistance and training and suggests such resources be offered on a regional basis (e.g. a scenic region like the Highlands versus the political boundary of a County).

Highlands Council Response: Funding for NGOs may indeed be helpful, but Section 18 of the Highlands Act limits Highlands Council Plan Conformance grant funding to municipalities and counties only. It may be feasible for municipalities or counties to contract the services of other entities to complete Highlands grant tasks.

Comment: The commenter supports forest sustainability recommendations regarding proactive management of deer populations and incentives to encourage control of both invasive species and deer, as these are vital to agricultural production as well.

Highlands Council Response: The Highlands Council appreciates the comment and agrees that these are issues of concern to the agricultural community that will be brought to the attention of the Agricultural Advisory Committee proposed in the MPRR (see MPRR page 35).

Comment: The commenter provides information on additional programs of interest that the Highlands Council may wish to consider:

- The national Sustainable Agriculture Research and Education (SARE) program.
- The Marin Land Trust (MALT) in California, for agricultural practices that sequester carbon.
- The Marin Carbon Project – a consortium of ranchers, scientists, nonprofits, agencies and policymakers, for information on adding compost to soil for soil health and for carbon sequestration.
- Carbon Farming practices to reduce or reverse a farm’s greenhouse gas emissions.

“In 2014, the American Carbon Registry, a group that certifies carbon offsets, used results from the Marin Carbon Project to approve a protocol for adding compost to rangeland. Through the new protocol,

ranchers who spread compost on their pastures can now sell carbon offset credits through voluntary carbon markets.”

Highlands Council Response: The Highlands Council appreciates this information and will bring these issues to the attention of the Agricultural Advisory Committee proposed in the MPRR (see MPRR page 35). Please note that the RMP does address the concept of carbon sequestration, and the MPRR includes it among recommendations for the Science and Research Agenda (see Forest Sustainability). Incorporating effective carbon sequestration strategies into agricultural practices is a logical extension of the idea. A recommendation regarding a potential climate change technical study has been added to the MPRR at page 45. Such a technical report would likely review carbon sequestration issues.

Comment: Commenter suggested increased emphasis on development of Agriculture Retention and Farmland Preservation plans in municipalities with agriculture. This includes encouraging town to adopt and upkeep Right to Farm ordinances in accordance with the SADC model Right to Farm ordinance.

Highlands Council Response: The Highlands Council agrees that municipal participation in developing Agricultural Retention/Farmland Preservation Plans has been limited thus far. The MPRR states that the main program issue facing the Highlands Council in this regard is “limited implementation of existing RMP programs.” The Plan Conformance program does require such plans of its agricultural municipalities, but does not dictate the timing for completion. In some number of cases, municipalities appear to rely on existing farmland preservation plans while addressing other items they see as taking priority. The recommendation for an Agricultural Advisory Committee (MPRR page 35) is in recognition of these issues and through the committee the Council will continue to encourage their completion along with Right to Farm Ordinances.

Comment: Commenter notes that only 12 towns have developed a Right to Farm ordinance acceptable to the Council.

Highlands Council Response: The Highlands Council continues to promote adoption of Right to Farm ordinances, particularly for communities of the Highlands Region located within the Agricultural Resource Area.

Comment: Commenter supports the establishment of an Agricultural Advisory Committee and suggests development of a formal process for consultation

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with agricultural support agencies in the Highlands including: NJ Department of Agriculture, USDA Natural Resources Conservation Service, Rutgers Cooperative Extension, USDA Farm Service Agency, USDA Rural Development, the National Agricultural Statistical Service, and county agriculture development boards.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. The Highlands Council will forward these issues to the attention of the Agricultural Advisory Committee proposed in the MPRR (see MPRR page 35).

Comment: The commenter suggests revisiting cluster development requirements to examine why cluster development has been lacking in the Region. Commenter supports noncontiguous cluster and the encouragement of alternate wastewater technology.

Highlands Council Response: The Highlands Council believes that the lack of cluster development in the Region results from both the slow growth period as a result of the recent recession and the fact that few properties exist in the Region that are large enough in acreage to support cluster development. The model Highlands Land Use Ordinance requires cluster development in the Agricultural Resource Area, wherever a project proposes construction of four or more single-family homes. Based on septic density requirements in the Preservation Area, such development would require a minimum of 100 acres. For forested lands, the minimum acreage requirement climbs to 352 acres. The Highlands Council appreciates the support for noncontiguous cluster options and remains interested in alternative wastewater treatment technologies, particularly for application in densely developed areas with failing septic systems.

Comment: Commenter suggests there should be a relationship between the Woodland Management Plans required for appurtenant Farmland Assessment and the many types of forestry plans required by the RMP. Requests the Council revisit, simplify, and find resources to pay for the required plans.

Highlands Council Response: Approved Woodland Management Plans and associated forest management activities are exempt from the restrictions of the Highlands Act and RMP. The Highlands Council is in the process of developing forest management guidance that may be adopted by conforming municipalities and this guidance may be of use to non-farmland assessed forest owners. Please see page 14 of the MPRR for amended language concerning the recommended Highlands Specific BMP manual.

Comment: Commenter suggests that the term “Farm Conservation Plan” should be used instead of “Agriculture Conservation Plan.”

Highlands Council Response: The Highlands Council has modified the label to “Farm Conservation Plans.” Please see page 213.

Comment: Commenter feels indicators for Agricultural Resources are insufficient and others were identified during TAC meetings, which were not included

Highlands Council Response: In order to produce a useful review of the RMP that retains a focus on priorities, the Highlands Council had to reduce the total number of suggested possible indicators to a manageable number. It was also helpful to consolidate items in a number of cases, to create representative indexes composed of various parts. The full list of Indicators considered is included in the MPRR, beginning on page 205.

Comment: Commenter supports cluster development recommendations.

Highlands Council Response: The Highlands Council acknowledges and appreciates this comment.

Comment: Commenter supports additional farmland preservation in the Highlands Region, especially using the federal Agricultural Land Easement program, which requires an impervious cover limit.

Highlands Council Response: The Highlands Council recognizes the impacts that impervious coverage can have on water quality and appreciates the commenter’s support for farmland preservation in the Region.

Comment: Multiple commenters expressed concerned with the low number of completed Agricultural Retention/Farmland Preservation Plans and inquired about the total number of municipalities in the Highlands Region required to complete such plans.

Highlands Council Response: The Highlands Council agrees that municipal participation in developing Agricultural Retention/Farmland Preservation Plans has been limited thus far. The MPRR states that the main program issue facing the Highlands Council in this regard is “limited implementation of existing RMP programs.” The Plan Conformance program requires such Plans of its agricultural municipalities, but does not dictate the timing for completion. In some number of cases, municipalities appear to rely on existing farm-

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land preservation plans while addressing other items they see as taking priority. Coordination with SADC, CADBs, Municipalities and the Farm Bureau should take place to determine where the Highlands Council grant funding for these planning activities can best be leveraged. The Council will bring these issues to the attention of the Agricultural Advisory Committee that is recommended to be established (see MPRR page 35). In addition the total number of municipalities in the Highlands Region required to complete such plans has been added to Table 1 on page 192.

Comment: Commenter questioned the inclusion of the Open Space Program as an indicator for Agricultural Resources.

Highlands Council Response: Please note that the MPRR identifies the Open Space Program in the referenced section as an Indicator “related to Agricultural Resources” (emphasis added). The commenter is correct that the Open Space Program includes farmland, an edit has been made to the indicator, and page numbers and links to the indicators are proposed to be added to the final MPRR to aid in referencing various indicator sections of the MPRR.

Comment: Commenter suggests coordination with county agriculture development boards and the SADC in the Highlands Council’s role as Regional Clearinghouse for Farmland Preservation, Stewardship and Technical Assistance referenced in the Agricultural Resources Topic Area chapter.

Highlands Council Response: The concept of serving as a Regional Clearinghouse appears in a summary list of programs already included within the RMP, under the subtitle “Coordination Efforts.” (Page 33) Please note that the preceding text explains that such coordination refers to coordinating with other county, state, and federal agencies. While this summary text does not specifically mention county agriculture development boards or the SADC, the RMP itself does so repeatedly.

Comment: Commenter questioned the Agricultural Resource Area (ARA) preserved farmland data in the Agricultural Resources Topic Area chapter and the Agricultural Land Use and Preservation Index indicator report.

Highlands Council Response: The Highlands Council agrees that the ARA preserved farmland figure is in error and has provided corrections. Please see pages 34 and 127.

Comment: Commenter suggests additional metrics for measuring the continued viability of agriculture throughout the region.

Highlands Council Response: The Highlands Council acknowledges these comments and will bring these issues to the attention of the Agricultural Advisory Committee that is recommended to be established (see MPRR page 35).

Comment: Multiple commenters suggested increasing outreach to the farm community with regard to existing loan opportunities from state and federal sources.

Highlands Council Response: The Highlands Council agrees with the commenters’ suggestion to begin with better education about existing opportunities, as these may address much of the need. Working with existing credit agencies to expand options may also be worthwhile. As for all MPRR recommendations, the Highlands Council will research and carefully evaluate the concept of establishing an Agricultural Loan Bank before any actual implementation gets underway. The Council will bring these issues to the attention of the Agricultural Advisory Committee that is recommended to be established (see MPRR page 35)

Comment: As to measuring the change in median per-acre value of property sales and assessed value for preserved and non-preserved farmland, the commenter suggests checking with the SADC first, to see if these numbers already exist.

Highlands Council Response: The Highlands Council searched for these figures and found that they are not available through the SADC or other known sources.

Comment: Commenter suggests the research agenda should include compiling data from County Agriculture Development Boards.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. The Highlands Council will take these into account as we implement the RMP goals concerning agricultural retention. We acknowledge that retention of agriculture in the Region requires an active, engaged agricultural community.

Comment: Multiple commenters expressed support for recommendations related to agri- and eco-tourism, while offering suggestions for enhancements to the recommendations, and additional specific suggestions for how these recommendations might be implemented. Commenters noted concerns over potential

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traffic issues related to agritourism. Commenters also noted the important connection between tourism and economic development in the more rural parts of the Highlands Region.

Highlands Council Response: The Highlands Council appreciates these comments and will consider each as the Highlands Council moves forward with the recommendations for Highlands tourism programming. The Council will bring these issues to the attention of the Agricultural Advisory Committee that is recommended to be established (see MPRR page 35)

Comment: Multiple commenters expressed concern over recommended changes to the definition of “disturbance” as it relates to agricultural use. One commenter expressed support for the change.

Highlands Council Response: The Highlands Council appreciates these comments and has modified this recommendation. The recommendation to “Amend RMP Definition of Disturbance” on page 15 has been removed and replaced with language focused on coordinating with the NDJEP to allow for certain exceptions to buffer area rules, conditioned upon implementation of significant restoration/enhancement mitigation initiatives. Please see page 15 for complete text.

While encountered during Highlands Project Reviews in the context of agricultural disturbances, this issue is actually of a broader nature. The Highlands Council intent is to encourage and incentivize stream corridor and Highlands Open Water buffer restoration in accordance with the goals and policies of the RMP. In review of various development proposals, the Council has identified opportunities to achieve restoration or significant enhancement of degraded or non-functional stream buffers. To take advantage of these opportunities, the Highlands Council recommends permitting limited development in degraded buffer areas, in exchange for meaningful restoration projects that result in significant net improvements to stream corridor protection that would not likely occur otherwise. The MPRR recommendations on page 15 already speak to this issue.

As to agriculture, the New Jersey Department of Agriculture regulates Highlands agricultural uses, pursuant to N.J.A.C. 2:92, “Agricultural Development in the Highlands.” The main requirement therein is for development of Farm Conservation Plans in the event of significant increases in agricultural impervious coverage. As required by the Highlands Act, other Highlands resource regulations do not apply to agriculture. In fact, NJDEP Highlands Rules explicitly exempt agricultural disturbance from Highlands Open Waters requirements unless one seeks to develop “previously-disturbed”

agricultural areas for non-agricultural uses. Accordingly, both the RMP and the Highlands Council seek to educate and incentivize farmers to restore/enhance stream buffers where they intersect with agricultural lands.



Historic, Cultural, Archaeological and Scenic Resources

Comment: Commenter states that the goals outlined for historic, cultural, archaeological and scenic resources are clear and concise. Further suggests that many of the issues addressed in the section are currently handled by the State Historic Preservation Office (SHPO) and questions who will be responsible for undertaking the work described.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. Historic resource protections are the purview of SHPO and the Highlands Council incorporates that information into the Regional Master Plan; however, there is opportunity to expand the inventory of historic resources to include those that may have particular local significance. Additionally, the Highlands Council would like to more fully implement the resource protection goals for historic and scenic preservation as contained within the Highlands Act. The responsibility for these efforts will likely be shared between the Highlands Council and our constituent county and municipal partners.

Comment: Multiple commenters expressed support for the recommendation to amend the Plan Conformance Program to make review of impacts on historic, cultural, and archaeological resources a required component, in compliance with the stated goals, policies, and objectives of the RMP.

Highlands Council Response: The Highlands Council acknowledges and appreciates this comment.

Comment: Commenter supports the recommendation to consider amending the language of the RMP to more strongly reflect the intention of the Highlands Act goal to “preserve . . . historic sites and other historic resources.” Suggests that the Highlands Council has

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the authority to identify historic and cultural resources, as part of a Highland resource area, in the Planning and Preservation areas ((N.J.A.C. 7:38-1.1(d)) and should utilize this authority fully in furtherance of the RMP goals.

Highlands Council Response: The Highlands Council acknowledges this comment. The Highlands Rules section referred to gives the NJDEP authority to confirm the location of Highlands resources, not the Highlands Council. Although the Highlands Council coordinates with the NJDEP on its implementation of the Rules, Highlands Council activities are directed by the Regional Master Plan.

Comment: Commenter supports the recommendation to gather information related to historic preservation efforts in each Highlands municipality and county and prepare, and keep up-to-date, an inventory of Certified Local Governments, historic preservation plans, survey, and ordinances. Suggests adding “for Highlands municipalities and counties” at the end of the sentence.

Highlands Council Response: The Highlands Council appreciates this comment and has incorporated this change into the final MPRR. Please see MPRR page 38 for changes.

Comment: Commenter supports the recommendation to coordinate with the NJ Historic Trust to establish a mechanism for tracking public spending on historic, cultural, and archaeological resources and to work in cooperation with SHPO to initiate an education and outreach program.

Highlands Council Response: The Highlands Council acknowledges and appreciates this comment.

Comment: Commenter stated that cultural resources cannot be separated from natural resources, but the RMP provides detailed plans for natural resource protection and only generalities related to cultural resources. Suggests that amendments to the RMP should include specific programs for cultural resource protections. Further suggests cross-referencing cultural resource language with other sections of the RMP, such as water resources, agricultural resources, transportation, and others.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. The MPRR includes a recommendation to consider amending the language of the RMP to “more strongly reflect the intention of the Highlands Act goal.” (page 38)

Comment: Commenter supports the use of Highlands Council grant funding to inventory cultural resources, but believes the conformance process should require municipalities to adopt a cultural resources element as part of the municipal master plan. Further suggests requiring establishment of a historic preservation commission and an environmental commission.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. The MPRR recommends amending the plan conformance process “to make the review of impacts on historic, cultural, and archaeological resources a required component.” The actions undertaken by each municipality will be specific to individual municipal conditions and resource needs.

Comment: Commenter states that Native American and Indigenous Peoples sites are not well-represented on the New Jersey portion of the National Register of Historic Places. Suggests the RMP increase the importance of processes and funding for recognizing, mapping, protecting and preserving Native American and Indigenous Peoples sites, landscapes, rock shelters, cemeteries, etc. that are located in the New Jersey Highlands Region.

Highlands Council Response: The Highlands Council acknowledges and appreciates this comment. The MPRR includes a recommendation to consider amending the language of the RMP to “more strongly reflect the intention of the Highlands Act goal.” (page 38)

Comment: Commenter notes that although scenic resources are recognized in the Highlands Act, these resources have not yet received the protections they deserve. Suggest a mandatory scenic resource component in the Highlands land use ordinance.

Highlands Council Response: The Highlands Council acknowledges this comment and will take it into consideration in future iterations of the model ordinance.

Comment: Commenter suggests that identification of scenic resources and review of impacts on those resources be a required component of plan conformance.

Highlands Council Response: Scenic resource protection is currently a required component of plan conformance. The RMP identified 131 scenic resources in the baseline inventory. The inventory currently includes national historic landmarks, publicly owned parks, forests, and recreation area. A Procedure for Nomina-

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tion, Evaluation, and Inventory of Highlands Regionally Significant Scenic Resources was passed by Highlands Council resolution in 2008, but no additional nominations have been made.

Comment: Commenter supports the recommendation for scenic resources education, specifically the development of a “municipally oriented outreach effort to assist in the identification and nomination of potential Highlands scenic resources.” (page 39)

Highlands Council Response: The Highlands Council acknowledges and appreciates this comment.

Comment: Commenter supports the recommendation that the Highlands Scenic Resource Inventory be updated and further notes that scenic resources comprise a wide spectrum of values beyond preserved lands. Offered several suggested additions to the inventory.

Highlands Council Response: The Highlands Council acknowledges and appreciates this comment. The Procedure for Nomination, Evaluation, and Inventory of Highlands Regionally Significant Scenic Resources establishes a process for adding resources to the inventory.

Comment: Commenter disagrees with the recommendation to review the Procedure for Nomination, Evaluation, and Inventory of Highlands Regionally Significant Scenic Resources to determine if modifications are appropriate. States that there has never been a serious or sustained effort to implement these procedures, so there is no way of knowing how well they might work. Instead, the Highlands Scenic Design Advisory Board needs to be appointed and implementation efforts initiated.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments.

Comment: Commenter supports the recommendation to include a section on recreation in the RMP. Suggests that recreation, when managed properly, can contribute to economic development in the region with minimal environmental impact.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments.

Comment: Commenter suggests that protection of cultural resources should be addressed in multiple other sections of the RMP and cultural resource protection procedures should be implemented throughout the region.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments.

Comment: Commenter suggests that the Highlands Council should not develop a new Highlands inventory of cultural resources because the State Historic Preservation Office (SHPO) already maintains a statewide inventory.

Highlands Council Response: The Highlands Council acknowledged, in both the RMP and the Historic, Cultural, Scenic, Recreation, and Tourism Technical Report, the inventory of cultural resources maintained by SHPO and incorporates these all by reference. As the SHPO list is updated, the Highlands inventory follows. The Technical Report states that the inventory includes only those resources expected to meet national and state register criteria and “many more resources are important locally and deserve consideration and support when planning projects are initiated. Much of this information can be drawn from local knowledge and local history” (page 2, Historic, Cultural, Scenic, Recreation, and Tourism Technical Report). The Highlands Council is not duplicating the SHPO efforts in identifying cultural resources.

Comment: Commenter suggests the Highlands Council may wish to include New Jersey Scenic Byways, such as the Warren Heritage Scenic Byway, and scenic railroads, such as the Delaware River Railroad, in the Highlands Scenic Resource Inventory. Further suggests adding a number of parks, natural areas, greenways, and trails which are not only natural resources, but also cultural and scenic resources. States that in addition to federal, state, county, and municipal lands, there are a number of multi-jurisdictional resources like the Morris Canal Greenway, the Highlands Trail, the Warren-Highlands Trail, the 911-Memorial Trail, and others that may be appropriate to include in the inventory.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. The Highlands Council adopted the Procedure for Nomination, Evaluation and Inventory of Highlands Regionally Significant Scenic Resources in 2008 to provide a mechanism for adding to the Scenic Resource Inventory. The MPRR includes recommendations to review the Procedure and to develop a municipally oriented outreach effort to assist in the identification and nomination of potential Highlands scenic resources (MPRR

page 39). The Highlands Council recognizes the important role that County and other officials may have in this process and has added a recommendation to encourage greater involvement by County officials and other interested organizations. Please see MPRR page 39 for changes.



Transportation and Air Quality

Comment: Commenter states the MPRR looks great and is well thought out.

Highlands Council Response: The Highlands Council acknowledges and appreciates this comment.

Comment: Commenter notes that transportation is not addressed as it relates to tourism in the region. Suggests a need for coordination across towns and counties, for expanded public transportation to rural areas, bike friendly roads and other beneficial programs that can facilitate improving tourism and agri-tourism in the region.

Highlands Council Response: The Highlands Council appreciates these comments and will consider each, both as agri-tourism in the Region grows itself, and particularly, as the Highlands Council moves forward with the recommendation for a Highlands tourism program.

Comment: Several commenters addressed concerns regarding climate change and its impact on the Highlands Region.

Highlands Council Response: The Commenters' overarching concerns refer to the effect of climate change and the incorporation of climate change objectives into the RMP Goals, Policies and Objectives. The RMP in Part 9, Air Quality states that "The Highlands Act recognizes that the Highlands Region includes "exceptional natural resources such as clean air" (Section 2) and the Highlands RMP seeks to establish mechanisms for the protection and enhancement of air quality resources for the Highlands Region that consider the interplay of air quality conditions at local, regional, interstate, and global levels. The RMP policies support the State Global Warming Response Act in reducing the level of greenhouse gas emissions in the state by the year 2020 through the reduction of mobile sources, resource protection and energy efficient practices. The RMP also recognizes the importance of the State

Energy Master Plan as a means to plan and evaluate for energy efficiency and greenhouse gas reductions at all levels of government."

While the RMP recognizes the importance of improving air quality and reducing greenhouse gases, there is no discussion of the longer term impacts on the water supply, environment, agriculture, the regional economy and physical impacts that may be caused by climate change. In response to the comments, the Highlands Council will supplement the MPRR to incorporate a recommendation on climate change (see page 45).

Comment: Commenter suggests that any site design guidelines developed as part of Green Streets Planning and Walkable/ Bicycle Friendly Site Design should be consistent with the Complete Streets concept. Any green streets should support all modes of travel.

Highlands Council Response: The Highlands Council acknowledges this comment. The current recommendation (see MPRR page 44) would establish guidelines for green streets. The establishment of guidelines would investigate those elements typically described under a Complete Streets concept and others.

Comment: Commenter suggests changes to Highlands Act exemptions related to Transportation (exemptions 9 and 10).

Highlands Council Response: This comment is outside the scope of the MPRR, as it addresses a concern with Highlands Act exemptions which are defined in the Highlands Act (C.13:20-28). The Highlands Council does not have the power, authority, or jurisdiction to change the Highlands Act.

The Act also charges the Highlands Council with reviewing any capital or other projects undertaken by any state, county or local government (C.13:20-16). The transportation component is consistent with the requirements of the Highlands Act and informs our capital project reviews.

Comment: Commenter felt there was an implied correlation in the report between improvements in Air Quality Index days in the Highlands Region since 2004 and policies contained in the Highlands Act and RMP. Commenter questions such a connection.

Highlands Council Response: The MPRR acknowledges (see page 134) that “given the ambiguous nature of contributing factors to air quality, it is difficult to ascertain the direct impact of the RMP in reducing air pollution.”

Comment: Commenter questions the need for a recommendation to create additional guidelines to help improve air quality in the Region.

Highlands Council Response: Air Quality is specifically defined under the resource assessment of the Regional Master Plan and under the Highlands Act (C.13:20-11a (1) (a)).



Future Land Use

Comment: Commenter supports the MPRR’s focus on low impact development, cluster, and center development. Suggests the plan and the report should focus on better ways to use the state regulations that include noncontiguous cluster and other planning tools to preserve open lands/farmland and still permit appropriate development in the region.

Highlands Council Response: The Highlands Council believes that the lack of cluster development in the Region results from both the slow growth period of the recent recession and the fact that few properties exist in the Region that are large enough in acreage to support it. The Highlands Council appreciates the comments regarding noncontiguous cluster options and agrees that it may have greater potential to assist in balancing land preservation with appropriate development.

Comment: Commenter suggests that stronger emphasis needs to be placed on TDR opportunities within the Highlands Region, center designation and infill development. Suggests the MPRR should include:

- Number of towns in the areas identified in the RMP as suitable for Receiving Zones that have considered TDR; number that received grants to do a Feasibility Study
- Number of TDR programs resulting.
- Number and nature of funding sources for the Highlands Bank’s new land conservation easement purchase program.

Highlands Council Response: The Highlands Council continues to build its Transfer of Development Rights (TDR) program and to encourage and support designation of both Highlands Redevelopment Areas and Highlands Centers in viable locations in the Region. Please see pages 55-58 of the MPRR for details on the Highlands TDR Program and the Highlands Open Space Partnership Funding Program. The section includes each of the suggested bullet items with the exception of funding sources. Funding source information will be provided in the Highlands Council Land Preservation Report. The Highlands Council will consider also including such information in future iterations of the MPRR.

Comment: Commenter supports creating a two-map set depicting past and present on-the-ground conditions but does not support the creation of a regional “Smart Growth Capability Map” map reflecting areas appropriate for future growth. Commenter had several additional comments related to mapping, development in the Highlands, and the Highlands Act requirements related to Smart Growth.

Highlands Council Response: The Highlands Act at N.J.A.C 13:20-11.a. (1) requires that the RMP include a resource assessment. The Act at N.J.S.A. 13:20-11(6) requires that the Regional Master Plan contain “a smart growth component” that includes a “resources assessment of opportunities for appropriate development, redevelopment, and economic growth...” The Act continues, stating that the Council shall prepare a “Land Use Capability Map, identify existing developed areas capable of sustaining redevelopment activities and investment; and 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.”

The Highlands Council affirms that one of the principal goals of the Preservation Area stated in the Act is to “prohibit or limit to the maximum extent possible construction or development which is incompatible with preservation of this unique area.” However the Highlands Council in the RMP recognizes the need to provide a “balance of environmental protection and sound land use, the Act requires that the Regional Master Plan provide for the preservation, to the maximum extent possible, of environmentally sensitive lands and other lands necessary for recreation and conservation, and for the protection and maintenance of lands essential to the character of the Region while supporting new growth opportunities in the Planning Area” (RMP page 39).

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The Highlands Council utilized the Land use Analysis Decision Support model for the Highlands Region to develop the initial Land Use Capability Zone Map (Land Use Capability Zone Map Technical Report, 2008). The Land Use Capability Zone map is currently utilized to comply with the requirements of the Highlands Act N.J.A.C 13:20-11.a. subsections 1 and 6. The Land use Analysis Decision Support model provided for a comprehensive evaluation of both resource constraints and development opportunities at a regional scale. However, the Land use Analysis Decision Support model utilizes data sets to develop a plan for the RMP, and it neglects to encourage smart growth strategies consistent with the Highlands Council's directive from the Act and its own stated smart growth goals.

The Highlands Council affirms the 2008 RMP Technical Report Regional Land Use Conditions and Smart Design (pp. 43-44) which states that Smart growth efforts are organized around ten guiding principles:

1. Mix Land Uses – Integrate land uses to provide alternatives to driving and offer complete communities.
2. Take Advantage of Compact Building Design – Incorporate move compact building design to use land more efficiently and make public transit networks more viable.
3. Create a Range of Housing Opportunities and Choices – Provide quality housing for people of all income levels at each stage of life.
4. Create Walkable Neighborhoods – Walkable neighborhoods are desirable places to live, work, worship and play and help foster a sense of community.
5. Foster Distinctive, Attractive Communities with a Strong Sense of Place – Developing a clear vision of places we want to create and maintain is an early step in achieving that vision.
6. Preserve Open Space, Farmland, Natural Beauty, and Critical Environmental Areas – Open spaces protect both the natural environment and its resources while providing a healthy setting for people.
7. Strengthen and Direct Development Towards Existing Communities – Redeveloping and supporting existing communities utilizes infrastructure more efficiently and guards against future sprawl.
8. Provide a Variety of Transportation Choices - Recognizing the integral relationship between land use and transportation, wise choices will help to alleviate our congested roadways and improve quality of life for residents and workers.
9. Make Development Decisions Predictable, Fair, and Cost Effective – The implementation of smart growth can be a collaborative effort between

government agencies and the private sector. Making clear and understandable decisions about the type of development a community wants is a critical component of achieving those goals.

10. Encourage Community and Stakeholder Collaboration in Development Decisions – Involving the community early and often is key to producing a plan and implementing strategies to achieve the community's vision. Communities should develop a strong sense of where and how they want to grow and where and how they want to preserve their natural resources. A well thought out vision with the support from the community are integral to smart growth success.

Taken together these principles encompass the full range of goals laid out for the Highlands Regional Master Plan. They aim to create healthy communities within a clean and diverse environment, balancing development with environmental protection, accommodating growth while preserving critical habitat and open spaces, reusing land wisely, and protecting our water supplies and air quality. Smart growth considers economic development and job creation, recognizing that communities need to be economically balanced. Smart growth successes result in strong neighborhoods with a range of housing options, transportation choices, social and cultural outlets and a positive sense of community.

The creation of a “Sustainable Growth Capability Zone Map” would further the requirements of the Highlands Act and the RMP by encouraging development in locations that do not contain critical Highlands resources and implement a regional sustainable growth planning approach to development. Any such Map would be adopted by the Highlands Council using the procedures for Considering Proposals to Amend the Highlands Regional Master Plan and would be subject to thorough public review.

Comment: Commenter supports two recommendations in the redevelopment program related to creating and drafting and adopting redevelopment procedures in the Preservation and Planning Areas.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments.

Comment: Commenter generally concurs with several recommendations related to low impact development (LID), while offering some specific proposals for enhancements, including a suggestion related to mitigation and a suggestion to use the phrase “Permanently preserved public and nonprofit lands” in place of “Parkland” in a recommendation related to LID.

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Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. Any procedures that the Council may develop pertaining to off-site mitigation would be subject to public review in accordance with the Procedures for Considering Proposals to Amend the Highlands Regional Master Plan prior to adoption. Furthermore, any specific off-site mitigation proposed for a given project would be subject to Council review at an open public meeting. Please see page 51 of the final MPRR for the substitution of “Permanently preserved public and nonprofit lands” for “Parkland.”

Comment: Commenter generally supports several recommendations related to the Cluster Development Program, while expressing concerns regarding recommendations that encourage the use of alternative wastewater treatment systems (AWTS) for cluster development. Commenter suggests that “de-facto centers” would be in the existing community zone of the land use capability map and the Goals, Policies, and objectives of the RMP would be appropriate for them. The commenter continues that providing planning assistance grants to these de-facto centers would divert limited funding and resources from conforming municipalities and would be unfair.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. Any guidelines would incorporate the Highlands Council’s 2008 RMP Technical Report “Regional Land Use Conditions and Smart Design” which sets forth ten guiding Smart growth principles (pp. 43-44). The guidelines that the Council may adopt would be subject to public review in accordance with the Procedure for Considering Proposals to Amend the Highlands Regional Master Plan.

The RMP at Objectives 6C1a and 6C3b states that centers in the Protection Zone and Conservation Zone, potentially including clustered development, shall be at densities appropriate to the Zone, the community character, the State Development and Redevelopment Plan, and the use of septic systems or community wastewater systems. The recommendation for alternative wastewater treatment systems seeks to further the existing stated objectives of the RMP that the use of AWTS of community wastewater systems may be appropriate for cluster development in accordance with the guidance provided in the RMP. The Highlands Act requires that the RMP identifies areas that are appropriate for growth including Section 13:20-6c “identification of 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.” The Highlands

Council addresses this component of the Highlands Act through the identification of Centers. These centers may not always be appropriate for the traditional mixed-use center approach.

Regarding the identification of de-facto centers in the Region, the recognition of non-conforming municipalities and the support for those de-facto centers through planning assistance grants recognizes the regional planning implications of these areas of existing development and their significant impacts on the water resources, environment, transportation and employment of the region. The Highlands Council believes that the proposed program will encourage a strong regional planning approach that further protects the resources of the Highlands Region in accordance with Goal 6F of the RMP in “support of compact development, mixed use development and redevelopment and maximization of water, wastewater and transit infrastructure investments for future use of land and development within the existing community zone.” .

Comment: Multiple commenters expressed concerns and suggested amendments related to recommendations regarding Affordable Housing, and specifically Executive Order 114 and the Highlands Council Memorandum of Understanding with the Council on Affordable Housing.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. The Highlands Council believes that the commenter’s proposed new amendment will be adequately addressed through the recommendations to update the Affordable Housing Technical Report and RMP to address changes in affordable housing laws and regulations that have occurred since RMP adoption and the recommendation to review the authority provided to the Highlands Council by the Fair Housing Act (MPRR page 53).

Comment: Commenter proposed an RMP Amendment to “Clarify Eligibility Criteria and Procedural Requirements for Legal Representation under the Highlands Act” and provided a discussion to support the proposal.

Highlands Council Response: The three requirements for legal representation, including the requirement for an actual application for development, are set forth in the Highlands Act itself, N.J.S.A. 13:20-20. The Council believes that the requirements for legal representation are adequately addressed through the Highlands Act and any changes to those requirements are legislative and beyond the scope of Highlands Council authority.

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Comment: Commenter supported multiple recommendations to secure updated data sets and sources.

Highlands Council Response: The Highland Council acknowledges and appreciates this comment.

Comment: Commenter suggests that any smart growth and economic development mapping updates should be developed in coordination with municipal land use goals and objectives, regardless of a municipality's current conformance status. Suggests that development of a regional economic development plan should similarly recognize local land use goals and objectives and done in collaboration with county economic development entities. Suggests that highway corridors zoned for commercial or industrial uses not be excluded from identification as economic development areas due to lack of sewer infrastructure.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. Any economic development or sustainable growth mapping that the Council may undertake would be as a revision to the Regional Master Plan and in consultation with all Highlands municipalities and counties. The development of a sustainable growth map would include a review of property that may be appropriate for preservation or development, including commercial corridors. Furthermore, N.J.S.A. 13:20-9a, the Highlands Act, requires that the Council consult with municipalities, counties, state agencies, and interested parties prior to adoption of any revision to the Regional Master Plan.

Comment: Commenter states the MPRR does not meet the statutory requirements of the Highlands Act at C.13:20-8.a., and suggests that a thorough update of the RMP should have been completed in 2014. Expresses concerns regarding prioritization and timeline for implementation of recommendations. Suggests a more formal approach to regulatory programs and a critical examination of the Plan Conformance implementation process in light of the limited adoption of the Highlands Land Use Ordinance and Zone Map Ordinance.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. The Regional Master Plan (RMP) undergoes a continuous update process based on factual information received through on-the-ground verification or updated GIS analysis. The RMP identifies the Monitoring Program as the means to identify policy issues that require updating to meet the goals of the Highlands Act. The Monitoring Program Recommendations Report (MPRR) identifies recommendations based on the topic areas in the RMP. Recommendations pursued by the Highlands

Council that require amendment or addendum (guidance documents) to the RMP will be adopted in accordance with the Procedures for Considering Proposals to Amend the Highlands Regional Master Plan. Updates to the Plan Conformance Guidelines (page 67) will include a review of the existing plan conformance implementation process.

Comment: Commenter believes that implementation of the RMP has failed to fulfill the statutory mandates of the Highlands Act. Recommends that revisions to the RMP should focus upon enabling the Region to fully realize its economic potential. States RMP has not addressed the "smart growth" component required pursuant to N.J.S.A. 13:20-11a(6), and recommends that "smart growth" be identified as a priority issue that is necessary to address or support development and economic growth in the Highlands Region.

Highlands Council Response: The Highlands Council believes that the existing Land Use Capability Zone map, including the designation of centers and redevelopment areas, complies with the smart growth requirements of Act. However, the Highlands Council recognizes that continuous refinement and improvement of the RMP should take place, and has included several recommendations in the Monitoring Program Recommendations Report to improve these components. Specifically, the Recommendations Report recommends a Sustainable Growth Capability Map along with Low Impact Development Guidelines, Center Guidelines, Redevelopment Guidelines, and a Regional Sustainable Economic Development Plan to guide development to appropriate areas while meeting the requirements of the Highlands Act to protect critical resources.

Comment: Commenter states that the Land Use Capability Zone (LUCZ) Maps do not satisfy N.J.S.A. 13:20-11a(6), in that a map does not exist that designates areas appropriate for future growth. Acknowledges that the MPRR recognizes this as a program issue on page 50. Supports and suggests prioritization of recommendations on page 50 related to LUCZ Maps. Suggests that the Council develop a process by which a property owner or town may petition or request a change in a Highlands RMP resource area designation of a specific piece of property based upon on-site data such as soil samples, groundwater data or habitat evaluation reports.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. Highlands RMP resource area designations may be changed based on factual conditions. An RMP Update or Map Adjustment must be submitted through High-

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lands municipalities using the form provided on the Highlands Council website. In addition the Highlands Council will document and adopt the methodologies, policies, and schedules used for the update of all Highlands Council GIS data sets.

Comment: Commenter expressed concerns regarding the lack of consideration of the Fair Housing Act (FHA) by the Highlands Council in general and in the MPRR. Suggests the Council should evaluate the extent of zoning for affordable housing as well as the actual construction of same within the Highlands region since the Highlands Act was passed. Also suggests the Council promulgate a policy, adopted after rule-making, which recognizes the court/COAH designation of these sites, unless it is demonstrated that development cannot be accomplished in conformance with statewide DEP regulations.

Highlands Council Response: The Highlands Council acknowledges these comments and believes that the comments submitted will be adequately addressed through the update of the Affordable Housing Technical Report and RMP that will address changes in the affordable housing laws and regulations that have occurred since RMP adoption. Such updates will be formally adopted by the Council in accordance with the Procedures for Considering Proposals to Amend the Highlands Regional Master Plan.

Comment: Commenter supports the recommendations for the Council to develop and adopt procedures for designating Highlands Redevelopment Areas.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments.

Comment: Commenter supports recommendations regarding Highlands Center Designation process, use of alternative wastewater treatment systems for cluster development in areas that are not currently served by traditional systems, and the Council's work with municipalities and NJDEP to "develop alternative and innovative Wastewater Treatment Plans to address wastewater issues."

Commenter adds that it is unclear why the draft Report states that there is a lack of groundwater nitrate data and modeling, given that the recently adopted NJDEP Septic Density Standards relies upon such updated data and contains information for the entire Highlands Region.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. The Highlands Council intends to review both current data and modeling as part of its ongoing science and research agenda.

Comment: Commenter suggests incorporating implementation of green infrastructure in Highlands Designated Redevelopment Areas.

Highlands Council Response: The Highlands Council acknowledges and appreciates this comment. Section 1.4.1 of the draft Procedures for Highlands Redevelopment Area Designations requires that low impact development for stormwater management be incorporated in the proposal.

Comment: Commenter identified areas of overlap between the Highlands RMP and The Plan 2015 developed by Together North Jersey and recommends coordination.

Highlands Council Response: The Highlands Council acknowledges and appreciates this comment and will work to coordinate with all interested stakeholders during the ongoing planning process.



Landowner Equity

Comment: Regarding the establishment of TDR receiving zones, commenter suggests the Council should focus its efforts on developing meaningful incentives for municipalities where market demand exists (or is projected) to encourage their engagement as designated receiving zones.

Highlands Council Response: The Highlands Council acknowledges this comment and agrees that additional incentives to local governments that designate TDR Receiving Areas should be identified. Please see MPRR page 57 for changes.

Comment: Commenter supports the recommendations to revisit the 2008 TDR technical report and review the existing credit valuation formula.

Highlands Council Response: The Highlands Council acknowledges and appreciates the comment.

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Comment: Commenter suggests looking at alternative uses for TDR credit transfers, such as waivers, water and septic permits. Recommends having an online tool for landowners to get an idea of TDR credits a property has. Suggests the MPRR should track the number of landowners paid for the ecological services their preserved property will produce for the public (dollars calculated like similar formula in the Pinelands found on the SADC website). SADC, CADBs can help with this.

Highlands Council Response: The Highlands Council will consider the idea of developing alternative uses for credit transfers as its TDR program continues to develop. The Council currently does not pay landowners for the ecological services provided by preserved lands, but the concept of developing such an assessment is one that may find application at some point in the future in a Highlands program. The Highlands Council provides a tool for calculating approximate Highlands Development Credits on its website: www.nj.gov/njhighlands/gis/hdc_estimator/

Comment: Commenter suggests tracking the numbers of exemptions 1 and 2 granted and locations: county, town, and on the number on active farms.

Highlands Council Response: The Highlands Council tracks all exemptions issued by Highlands municipalities, which includes exemptions 1 and 2. The tables on page 168 of the MPRR provide the information currently available regarding exemption determinations, including a breakdown by exemption type and location in the Highlands Preservation or Planning Area. Provided only as a summary, the Highlands Council does not include municipal/county information in the MPRR. It would be possible to track the issuance of exemptions on active farmland, but as exemptions as of right they may not be fully reported; therefore the use of any such tracking would be of limited value. The Highlands Council tracks municipally issued exemptions (those issued by municipalities certified to issue exemptions) in its “Project Review” tracking sheet, under the project type “Delegated Exemptions.” www.nj.gov/njhighlands/projectreview/project_review_tracking.pdf.

Comment: Commenter suggests development of a new land preservation program that would result in the purchase of forest easements, to be operated by the SADC because of its experience with easement acquisition. Suggests support for this concept can be found in RMP Policy 1A4 (p. 139).

Highlands Council Response: The Highlands Council acknowledges the comment and agrees that such a program could be beneficial. While not focused on

forest easements specifically, the Highlands Council’s Transfer of Development Rights program includes purchase of Highlands Development Credits (HDCs) for forested lands. Purchase of HDCs requires that landowners agree to conservation easements, which protect the subject properties, including forest resources. In addition, the Highlands Council’s preservation priority data uses the presence of forest as an important indicator of land value. The Highlands Council’s prioritization is then used by other state agencies to assist in the identification of future acquisitions.

Comment: Commenter supports the recommendation regarding a water user fee to help fund the TDR bank and land preservation programs in the region.

Highlands Council Response: The Highlands Council acknowledges and appreciates this comment.

Comment: Commenter supports extension of the dual appraisal process beyond the 2019 current deadline and suggests tracking the appraisal values of preserved lands pre and post Highlands Act dual appraisal to provide a clearer picture of the impact on landowners.

Highlands Council Response: The appraisal values discussed are not readily available to the Highlands Council; however, it would be beneficial for the Highlands Council to track the final purchase price of open space and preserved farmland throughout the Region. The Highlands Council will coordinate with other state agencies to track this data where possible.

Comment: Multiple commenters expressed support for the recommendation to extend dual appraisal indefinitely.

Highlands Council Response: The Highlands Council appreciates support for the recommendation to extend the dual appraisal program beyond 2019.

Comment: Commenter supports recommendation to revisit HDC valuation. Opposes making HDCs bought by the HDC Bank available to towns developing Receiving Zones to sell and help pay for impacts of new development. Suggests that the effects on demand for HDCs should be examined before the market is impacted in this way.

Highlands Council Response: The Highlands Council agrees that implementation of the proposed Recommendation would need to be constructed as to not discourage the establishment of TDR receiving zones nor ultimately, negatively affect the private market

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of HDCs. Both the State TDR Act and the Highlands Development Credit Bank state that any sale or use of credits by the Bank may not substantially impair the private market. The Highlands Council has altered the Recommendation. Please see MPRR page 59 for changes.

Comment: Commenter had several questions regarding Watershed Moratorium Offset Aid payments referenced on page 179, including which municipalities receive the funding (inside and outside the Highlands Region); purpose of the funding; reporting of the funding; and determination of how funding is allocated.

Highlands Council Response: The Watershed Moratorium Offset Aid account was established with the passage of the Highlands Act as a component of the “Highlands Protection Fund.” The purpose of this account was to reimburse each municipality, in the State of New Jersey, that contain watershed lands and are subject to the moratorium on the conveyance of watershed lands imposed pursuant to section 1 of P.L.1988, c.163, as amended by section 1 of P.L.1990, c.19. The funds are regulated and appropriated by the New Jersey Department of the Treasury and, while they are part of the Highlands Act, the Highlands Council has no oversight of this funding and cannot influence the quantity or distribution of funds allocated to Highlands and non-Highlands municipalities alike.

Comment: Multiple commenters provided comments on lost property values and compensation to landowners; impacts on commercial development; the purchase of forestry easements; farmland and forestry assessments, and the delineation of the Preservation Area and Planning Area boundaries.

Highlands Council Response: These comments mainly concern areas outside the scope of the MPRR. The Highlands Council does not have the power, authority, or jurisdiction to change the Highlands Act. The Act established the Highlands Council and charged it with development of the Highlands Regional Master Plan and its implementation. The boundaries of the Region and specifically, the Preservation Area, are a part of the Act, delineated pursuant to Section 7 (N.J.S.A. 13:20-7).

As to landowner equity, the RMP outlined a Transfer of Development Rights (TDR) program as the primary means of compensation. The Highlands Council has also created a land preservation program (N.J.A.C. 7:70), which contributes to landowner equity through the acquisition of lands from private property owners. The MPRR provides an analysis of the implementation of these two programs to date, along with recom-

mendations for possible amendments to the RMP to address these issues in the Landowner Equity section of the MPRR, pages 54-59.

Comment: Commenter expressed concerns with implementation of the Highlands Transfer Development Rights program.

Highlands Council Response: The Highlands Council acknowledges the comment. The MPRR provides an analysis of the implementation of the Highlands TDR program (Highlands Development Credit Bank) to date, along with recommendations for possible amendments to the RMP to address these issues in the Landowner Equity section of the MPRR, pages 54-59.

Comment: Commenter supports recommendation to develop guidelines for monitoring Highlands Council preserved lands. Suggests identifying a funding source for such monitoring.

Highlands Council Response: Highlands Council staff currently conducts annual inspections of all its conservation easements. The Highlands Council expects that monitoring of these preserved lands will continue to be conducted internally by Highlands Council science and planning staff and that securing additional funding for this purpose would not be necessary.

Comment: Commenter supports recommendation to expand incentives for TDR receiving zones, but does not support the proposed alternate avenues of credit use. Suggests instead seeking ways for the State of New Jersey to offer incentives to eligible municipalities to establish TDR receiving zones. Suggests that if the community seeking the incentive is within the Highlands Region, it must be compliant with the RMP in order to qualify for incentives.

Highlands Council Response: The Highlands Council agrees that implementation of the proposed Recommendation would need to be constructed so as to not discourage the establishment of TDR receiving areas nor ultimately, negatively affect the private market value of HDCs. In addition, both the State TDR Act and the Highlands Development Credit Bank state that any sale or use of credits by the Bank may not substantially impair the private market. The Highlands Council has altered the Recommendation. Please see MPRR page 59 for changes. Any requirement for a TDR receiving area to comply fully with the RMP would likely reduce the demand for TDR receiving areas.

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Comment: The commenter concurred with a number of Recommendations made related to Landowner Equity, including: HDC purchase program (amend the RMP to reflect the adoption of the HDC Purchase Program), HDC Purchase Program (amend the RMP to reflect its adoption), Support dual appraisal methodology indefinitely, Update preservation priority RMP datasets, Reevaluate monetary value of the Highlands Development Credit, Interagency Coordination-TDR, LEED certification, Review and update non-residential HDC allocation methodology.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments.

Comment: Commenter questions the incorporation of Land Preservation into the Landowner Equity program area. Acknowledges practicality of the change, but believes the emphasis of this recommendation is misplaced. Suggests instead “Preservation and Equity.”

Highlands Council Response: The Highlands Council acknowledges this comment. The Highlands Council recognizes the importance of both the Landowner Equity and Land Preservation programs as important components of the RMP.

Comment: The commenter proposed two recommendations be added to the MPRR: (1) Identify dedicated sources of funding for land preservation and stewardship and (2) Secure significant federal funding. The commenter suggests existing and potential funding sources for implementation of Landowner Equity and Land Preservation programs.

Highlands Council Response: As previously stated Highlands Council staff will conduct ongoing monitoring of properties preserved by the Council. However, the Highlands Council agrees that additional funding is needed for land preservation and has incorporated this change into the final MPRR. Please see MPRR page 59 for changes.

Comment: Commenter recommends topics such as Agriculture, Future Land Use, and Sustainable Economic Development and others in the RMP and MPRR be considered holistically and in relation to one another in terms of equity and fairness.

Highlands Council Response: The Highlands Council agrees with this comment and recognizes that implementation of any specific RMP programs requires consideration of all topic areas of the RMP.

Comment: Commenter suggested that matters of equity extend beyond private property values. The commenter also suggests that the Council continue analyzing and monitoring how the Act may be affecting the economic prosperity and well-being of communities throughout the Highlands Region.

Highlands Council Response: The Highlands Council acknowledges this comment. As part of the RMP monitoring program, the Highlands Council conducted a peer-reviewed Fiscal Impact Assessment (FIA). The FIA evaluated the ways in which the Highlands Act and the RMP may have influenced the economy and the fiscal resources of Highlands Region municipalities. The FIA is publicly available on the Highlands Council’s website.

Comment: Commenter suggested that there does not appear to be a clear goal related to Exemptions, aside from administering those Exemptions. The commenter also encouraged that education and outreach efforts for private landowners and professionals should be a goal related to the Exemptions and Waivers.

Highlands Council Response: The Highlands Council acknowledges these comments. One of the Highlands Council’s initiatives is to provide detailed guidance on Highlands Exemptions and Waivers (MPRR page 69). The Highlands Council oversees a Municipal Exemption Determination Program that includes training for conforming municipalities and certification to authorize specific Highlands Act Exemptions. The Highlands Council agrees that more robust and continued education and outreach programs related to Exemptions, Waivers, and all components of RMP implementation should be incorporated into the MPRR. The Highlands Council has incorporated this change into the final MPRR. Please see MPRR page 69 for changes.

Comment: Commenter suggests that, related to Exemptions and Waivers, goals of the Highlands Council should be to “efficiently and fairly process these Exemptions (when issued rather than exercised as of right), and to evaluate whether affected landowners find these mechanisms to be fair and helpful in addressing the Act’s impacts.”

Highlands Council Response: While the Highlands Council does issue certain Highlands Exemptions in the Planning Area, the vast majority are issued by NJDEP or municipalities authorized to issue certain Highlands Act Exemptions. Please see page 167 for data related to exemptions. The Highlands Council oversees a Municipal Exemption Determination Program that includes training for conforming municipalities and certification to authorize specific Highlands Act Exemptions. The Highlands Council also agrees that

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more robust and continued education and outreach programs are important (please see MPRR page 69 for changes); however, Highlands Exemptions and waivers are defined in the Highlands Act. The Highlands Council does not have the power, authority, or jurisdiction to change the Highlands Act.

Comment: Commenter suggested four proxy measurements for Exemptions and waivers related to measuring development, disturbance, reconstruction, and improvements on lots that may qualify for Exemption #1, #2, #4, and #5.

Highlands Council Response: The Highlands Council agrees that these measures would be valuable; however, given the variability associated with Exemptions and land development, data limitations prevent these measurements from being conducted with reliable accuracy. Please see page 167 for additional information regarding the tracking of exemptions.

Comment: The commenter acknowledges the Land Preservation Program issues identified in the MPRR and goes on to state, "...this Department supports the MPRR recommendations, including, most notably, the recommendation to update the RMP to "specify indefinite support of the dual appraisal methodology." This Department has previously supported the two legislative extensions of the dual appraisal provision because it has been the most effective mechanism to provide affected landowners with compensation for the depreciation in property values attributable to the Act."

Highlands Council Response: The Highlands Council acknowledges and appreciates this comment.

Comment: Commenter suggested that the continuation of the Open Space Program will not be viable without additional funding.

Highlands Council Response: The Highlands Council acknowledges this comment and has incorporated a change into the final MPRR. Please see MPRR page 59 for changes.

Comment: Commenter suggests that ongoing monitoring of land preservation in the Highlands Region should incorporate data from other state agencies in addition to the Highlands Council's own programs and suggests that these programs also address landowner equity even though not funded directly from the Highlands Council.

Highlands Council Response: The Highlands Council tracks all preserved lands throughout the Highlands Region. As lands are preserved, the Highlands Council updates the need for land preservation within the confidential inventory discussed within the Financial Analysis Technical Report (see RMP pages 131-132). The Agriculture and Conservation Confidential Priority Lists inform acquisition priorities for state agencies and keeps track of land available for preservation and in turn compensation for the land owners.

Comment: Commenter acknowledges the Highlands TDR Program issues identified in the MPRR and goes on to state "...this Department generally supports the MPRR recommendations to: (i) determine whether a change to the initial credit value is warranted, (ii) explore the feasibility of creating a variable-value for credits, (iii) determine whether a location adjustment for non-residential HDCs is warranted, (iv) examine whether the HDC Bank should use credits it currently holds to provide financial incentives to local governments that designate TDR receiving areas, and (v) consider requesting that the benefits of the TDR program be recognized under the LEED certification program."

Highlands Council Response: The Highlands Council acknowledges and appreciates this comment.

Comment: Commenter generally supports the recommendation to explore the feasibility of creating a variable-value for HDCs, but has concerns regarding the potential to create inequities among sending zones.

Highlands Council Response: Under the proposed Recommendation, the Highlands Council would determine the feasibility for variable-value for credits and, as part of that feasibility study, investigate the projected impact on both the sending zones and receiving areas.

Comment: Commenter generally supports the recommendation that suggests using existing HDCs as financial incentive to local governments establishing TDR receiving areas, but expresses concerns that such a measure could limit the HDC Bank's ability to function as a purchaser of credits.

Highlands Council Response: The Highlands Council agrees that implementation of the proposed Recommendation would need to be constructed as to not discourage the establishment of TDR receiving zones, nor ultimately negatively affect the private market of HDCs. Both the State TDR Act and the Highlands Development Credit Bank's Operating Procedures state that any sale or use of credits by the Bank may not

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substantially impair the private market. The Highlands Council has altered the Recommendation. Please see MPRR page 59 for changes.

Comment: Commenter suggests comparing properties with HDC allocations against those properties eligible for HDC allocations. The commenter also states, “In other words, nearly 13 years after the Act passed and nearly 10 years after the HDC Bank was established, it appears that only 6% of affected property owners have received compensation (for about 8% of the total HDC valuation) through the Highlands' Landowner Equity programs. Were full HDC compensation to be the goal, at this rate it would likely take over 125 years for affected landowners to be made whole. Considering that the TDR program was envisioned to be the primary mechanism for addressing Landowner Equity, this is extremely discouraging to landowners hoping to find equitable relief through the TDR program.”

Highlands Council Response: The Highlands Council acknowledges this comment. The HDC program is voluntary and allocations are not provided unless an HDC Allocation Application is submitted to the Highlands Council. Receiving an HDC Allocation does not provide compensation to a landowner. Therefore, the datasets the commenter is referring to do not directly relate to compensation. The datasets address actual allocations determined (as submitted voluntarily by landowners) compared to the estimated number of credits that could be allocated in the Highlands Region.

Comment: Commenter suggests considering Landowner Equity across jurisdictional boundaries. For example, if a large majority of HDC purchases were to occur only in a particular municipality or county, this would not appear to be an equitable distribution of limited resources among those who have been adversely affected by the Act. Commenter acknowledges that priority is given to preserving those areas having the most significant resource values and suggests measuring HDC purchases in proportion to each jurisdiction's resource values. Conceivably, the equitable distribution of limited funding should be somewhat proportional to each jurisdiction's resource values.

Highlands Council Response: The Highlands Council acknowledges this comment. Under the Highlands Open Space Partnership Funding Program and Highlands Development Credit Purchase Program (N.J.A.C. 7:70), criteria adopted for property acquisition are not based on jurisdiction, but are based on the protection of Highlands Resources tied to each individual property.

Comment: Commenter notes that although the Highlands Act remains unpopular and controversial in Warren County, the Department of Land Preservation has received funding and support from Highlands Council staff that has contributed to protection of natural resources and landowner equity in the county as well as support of local agricultural and tourism industries. Expresses support for many of the findings and recommendations in the MPRR.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments.

Comment: Commenter feels that the “inability to implement a viable Transfer of Development Rights program should be a major concern” and notes that no receiving zones have been established.

Highlands Council Response: The Highlands Council acknowledges the comment. The MPRR provides for an analysis of the implementation of the Highlands TDR program (Highlands Development Credit Bank) to date, along with recommendations for possible amendments to the RMP to address these issues in the Landowner Equity section of the MPRR, pages 54-59.

Comment: Commenter cites requirements of the Highlands Act regarding the establishment of the TDR program, specifically the requirement that “The council shall not adopt the regional master plan unless it recommends receiving zones in the planning area and capacity therefor for each receiving zone pursuant to the transfer of development rights program authorized in section 13 of this act.” Commenter notes that the RMP provided some direction and detail regarding this requirement, but ultimately falls short of meeting this statutory requirement.

Highlands Council Response: The Highlands Council recommends the establishment of a region-wide Sustainable Growth Capability map (see MPRR page 50), following the update of the Land Use Capability Zone Map. This would include areas for redevelopment and TDR receiving areas, as consistent with C.13:20-11a (6) of the Highlands Act. The RMP (see page 353) fully acknowledges that the preliminary GIS-based analysis of the Planning Area lands that may have potential for TDR receiving areas, “will require refinement as the Highlands Council works with Highlands municipalities during the Plan Conformance process.” The MPRR (see page 69) recommends the continuation of updates to all mapping datasets, which may include potential TDR receiving areas and opportunities for redevelopment that may also be submitted by a municipality through an RMP Update or Map Adjustment submission to the Highlands Council. Furthermore, the Highlands Council

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TDR Receiving Zone Feasibility Grant Program focuses specifically on determining site-specific capacity and appropriateness for TDR Receiving Zones within municipalities that receive that grant funding.

Comment: Commenter expresses concerns with TDR programs in the state in general and the Highland Region specifically. Commenter feels a voluntary TDR receiving zone system cannot work and incentives have proved unsuccessful. Suggests that if TDR is to become an effective growth management tool, a strictly voluntary system for receiving zones should be revisited.

Highlands Council Response: The MPRR identifies program issues related to the TDR Program, including the failure to create a private market and the fact that no Highlands TDR receiving areas have yet been established (see MPRR page 57). The MPRR makes recommendations to further incentivize the establishment of TDR receiving areas. Any requirement to make TDR mandatory would require amendments to the Act.

Comment: Commenter supports the recommendation to coordinate with the NJ Division of Tourism and suggests collaboration with the federal National Park Service, the NJ Department of Environmental Protection Division of State Parks, and with private commercial entities in the Highlands that stimulate destination visits.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. Collaboration with federal, state and local agencies, as well as appropriate private and non-profit entities, is anticipated as part of the development of a comprehensive economic development plan for the Highlands Region.

Comment: Multiple commenters expressed support for recommendations related to Highlands tourism and provided specific suggestions for implementation of such a program including the incorporation of goals related to economic development in the region.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. These suggestions will be considered during the development of the tourism component of a comprehensive economic development plan for the Highlands Region.

Comment: Commenter supports recommendation to monitor data contained in the Fiscal Impact Analysis (FIA) related to eco- and agri-tourism. Suggests using the FIA to drive decisions about housing, expansion, transportation and infrastructure investment.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. The Highlands Council will use the FIA during the development of a comprehensive economic development plan.

Comment: Commenter expressed concern that the goals for sustainable economic development did not include a goal specific to the protection of the region's water supply.

Highlands Council Response: The Highlands Council acknowledges the comments and the importance of a reliable water supply as part of a healthy economy. Sustainable practices associated with ensuring the quality and quantity of water from the Highlands are addressed in the Water Resources section of the MPRR, page 24.

Comment: Commenter disagrees with the recommendation to pursue modifications to the NJEDA Grow NJ Assistance Program. Commenter supports appropriate development and redevelopment in the Highlands Planning Area, but does not believe the Grow NJ Assistance Program is appropriate for the Highlands. Further states that programs that incentivize downtown commercial district enhancement would be more appropriate for the Highlands.

Highlands Council Response: The Highlands Council acknowledges these comments and has removed the recommendation.

Comment: Comment agrees with the recommendation to add recreation as a major category of interest in the Regional Master Plan. Suggests that any economic development plan should give full consideration to outdoor recreational pursuits.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. The development of a comprehensive economic development plan for the Highlands Region will include recreation as a key component in accordance with the requirements of the Highlands Act (c.13:20-10.b (5)).



Sustainable Economic Development

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Comment: Commenter suggests that development of a Smart Growth Capability Map to depict areas that are appropriate for future economic development and redevelopment should be preceded by municipal and regional economic planning and a series of public hearings.

Highlands Council Response: The Highlands Council acknowledges and appreciates this comment. Additional information regarding the preparation of the Smart Growth Capability Map may be found in the response to comments under Future Land Use.

Comment: Commenter agrees with the recommendation to coordinate with Highlands counties and destination marketing organizations (DMOs) to develop regional economic plans, but suggests that municipalities are also a critical partner. Also suggests including non-profit organizations and others involved in activities and operations that encourage public use.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. Development of a comprehensive economic development plan for the Highlands Region will include a robust outreach effort.

Comment: Commenter concurs with the recommendation to develop a comprehensive economic development plan for the Highlands Region. Urges the plan to be sensitive to the resources of the Highlands and the need for appropriate scale development.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. Development of a comprehensive economic development plan for the Highlands Region, will carefully consider Highlands resources to be consistent with the goals of the Highlands Act and RMP.

Comment: Commenter notes that the Fiscal Impact Assessment (FIA) measures dollar value within the Highlands Region, but does not measure the social value of preservation. Suggests that the economic development plan should include these values. Additionally, suggests that the economic development plan should be subject to public hearings prior to adoption by the Highlands Council.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. A number of studies have been conducted to measure the value of conservation and open space preservation, including societal. The Highlands Council will

consider these during the development of a comprehensive economic development plan for the Highlands Region.

Comment: Commenter agrees with the recommendation related to tourism data collection and suggests the Highlands Council make use of existing data collected by other agencies.

Highlands Council Response: The Highlands Council acknowledges and appreciates this comment.

Comment: Commenter agrees with the recommendation related to regional economic monitoring. Suggests additional items for monitoring: Annual amount of Highlands water distributed by public and private water purveyors to NJ residents and businesses; Water treatment costs avoided due to Highlands protections; Number of Highland tourism visitors; Average spending per tourist visit annually; Estimate of total Highlands tourism spending annually.

Highlands Council Response: The Highlands Council acknowledges and appreciates this comment. The Highlands Council will consider monitoring the suggested parameters subject to availability of information.

Comment: Commenter agrees with the recommendation to measure the full range of benefits from the implementation of the Regional Master Plan. Suggests that a traditional cost-benefit analysis may not fully capture social benefits associated with land preservation.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. The Highlands Council will consider the use of non-traditional measures of societal benefits as part of the development of a comprehensive economic development plan for the Highlands Region.

Comment: Commenter supports the Highlands Council's efforts to ensure long-term and sustainable economic development within the region. Further supports the commitment to grow tourism and the development of a comprehensive economic development plan. Suggests that a representative group of economic development professionals, planners, and other experts should be able to assist in the development of the plan.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. The Highlands Council intends to assemble a team of

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qualified professionals within the region to assist in the development of a comprehensive economic development plan.

Comment: Commenter notes that the economic development focus may rely too heavily on tourism as an economic driver. Suggests an analysis be conducted to determine how the region can accommodate and promote tourism as a viable industry, while creating jobs with a livable wage.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments. The proposal to develop a comprehensive economic development plan for the Highlands Region will include all aspects of the regional economy, including but not limited to a tourism component, which analyzes the Region's potential as an industry and an economic engine.

Comment: Commenter concurs with the Sustainable Economic Development program issues identified in the MPRR and strongly supports the recommendations associated with this topic area.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments.

Comment: The commenter submitted three comments. The first comment requests a breakdown of land use changes on a municipal level in addition to the land use changes reported by Land Use Capability Zones (LUCZ) for the region as a whole. The second comment requests a clarification in the definition of Northern New Jersey as it relates to non-Highlands counties. The comment requests details on capita property taxes paid for northern New Jersey, median income for the region as compared to outside the region, as well as a comparison of median home values among the Region, northern New Jersey and New Jersey as a whole. The third comment states that improving economic conditions of Highlands residents cannot be planned for without giving a clear picture of economic vitality of the region.

Highlands Council Response: The Highlands Council acknowledges and appreciates these comments.

Land Use Capability Zones are delineated at a regional level, regardless of municipal or county boundary. The Model draft Land Use Ordinance considered by each municipality at the time of Plan Conformance Petition included a mapping of LUCZ clipped to the municipal boundary, which is as precise a manner of presenting

this data as available. Calculating land use change by LUCZ on a municipal level was not considered for the MPRR.

The Highlands Council published a final Fiscal Impact Assessment in January 2017 that included the Regional Factbook, noted in the comment. Per capita property taxes for northern New Jersey were not calculated due to a lack of available or consistent data. Northern New Jersey is defined in the Fiscal Impact Assessment and Page 177 of the Monitoring Program Recommendation Report has been updated to reflect this definition. Median Household Income has been calculated for the Highlands Region, Northern New Jersey, and New Jersey in the Regional Factbook that appears on page 179 of the MPRR. With regard to the suggested economic indicator proposed, the Highlands Council will consider this comment during the next update of the FIA.

Comment: Commenter expressed concerns over the Highlands Council providing funding for tourism planning, specifically a proposed tourism planning grant for Hunterdon County.

Highlands Council Response: While the comment is referring specifically to the Hunterdon County tourism planning grant, the MPRR does contain a recommendation regarding economic development and coordination of tourism efforts (page 62). The MPRR recommendation is based on the Highlands Act statement (C.13:20-2), "it is important to ensure the economic viability of communities throughout the New Jersey Highlands; and that residential, commercial, and industrial development, redevelopment, and economic growth in certain appropriate areas of the New Jersey Highlands are also in the best interests of all the citizens of the State, providing innumerable social, cultural, and economic benefits and opportunities." In addition, the Act states that the goals of the RMP shall be to preserve outdoor recreation opportunities and to promote compatible agricultural, horticultural, recreational, and cultural uses and opportunities within the framework of protecting the Highlands environment. The recommendations contained in the MPRR are intended to further these stated goals of the Act.

Comment: Commenter expressed a number of general concerns about threats to the environment. With respect to specific provisions of the MPRR, the commenter is opposed to adding a section to the RMP to preserve hunting on public land, and to the idea of promoting farm labor housing; states that all golf courses should be mandated to use only recycled water on their grounds. The commenter also expresses concern over the contents of the FIA.

Highlands Council Response: The Highlands Act (c.13:20-10.a (5)), specifically calls for the goals of the RMP to include preservation of outdoor recreation opportunities, including hunting and fishing, on publicly owned land. Any changes to the Highlands Act are outside the scope of the MPRR. Regarding Farm Labor Housing, the Council states in the RMP that it “will ensure opportunities through local development review and Highlands Project Review for family and farm labor housing that is necessary to support the viability of the agricultural operation.” No changes are proposed to this statement and the Highlands Council does not have the authority to fund the development of any housing. Regarding golf courses, the MPRR (page 24) contains a specific recommendation to research and develop best management/conservation practices for inclusion in golf course management plans to reduce irrigation needs. The FIA is not the subject of this comment period. The FIA provides an analysis of a wide range of economic and fiscal data for the Highlands Region and for comparison regions in New Jersey, New York, and Pennsylvania. An independent peer review of the methods and research approaches used in the FIA was conducted to determine whether its central conclusions are supported by the data and analysis conducted for the study. These two documents, while supporting the development of the MPRR, are separate reports that are not part of the MPRR.”



Implementation

Comment: Commenter expresses concern with the pace and level of municipal participation in Plan Conformance to date, and finds that the MPRR and the Highlands Council itself, seems to have “given up” on municipalities that have not yet petitioned or have not included Planning Areas in Petitions.

Highlands Council Response: The Highlands Council continues to work with nonconforming municipalities in the Region, and invites and encourages all to participate. Of the 88 municipalities in the Region, 36 lie wholly within the Planning Area, where Plan Conformance is voluntary. For the remaining 52 municipalities, Plan Conformance is mandatory to address, at minimum, Preservation Area lands.

The current level of municipal participation in Preservation Area Plan Conformance is 98% (51 of 52 municipalities). Planning Area conformance includes 28 of a maximum of 83 municipalities, or 34%.

The Highlands Council anticipated that submission of Petitions for Plan Conformance would slow considerably after mandatory conformance municipalities met the December 2009 deadline. All but one of the nonconforming municipalities are located fully within the Planning Area, for which conformance is voluntary. In addition, the Council believes that uncertainty related to the requirements for affordable housing at a statewide level have delayed implementation, particularly of aspects of plan conformance that affect zoning and land development. The Council acknowledges that its work is far from finished, but at the same time, finds that the current level of participation represents a meaningful achievement.

Comment: Commenter believes that “a much more rigorous outreach program to municipalities is needed on the Council’s part to engage communities in the conformance process, including at least annual, targeted presentations to update municipal governing bodies on their conformance advancement and other Highlands activities.”

Highlands Council Response: As noted elsewhere in the Highlands Coalition comments, the MPRR states: “efforts are needed to significantly expand the outreach and education component of the Highlands Council mission.” We acknowledge the comments and are in agreement with the need for a more comprehensive outreach and education program for all constituent groups, including municipalities. Please see Recommendation added page 39.

Comment: Commenter feels that the Highlands Council should apply its “binding authority over local government approvals in the Preservation Area” where municipalities have not achieved full conformance.

Highlands Council Response: The Highlands Council is aware that the Highlands Act provides it with the authority as needed to regulate municipal land use in accordance with the Highlands RMP for nonconforming Preservation Area municipalities. Exercise of this authority does not require “forcing” any Preservation Area municipality to petition for Plan Conformance. The Council has not found it necessary to date to take control of any municipal land use board, planning department, or even to challenge a local land use decision. Rather, the Highlands Council ensures compliance through careful monitoring and review of local land development applications for potential conflicts with the RMP in accordance with the call up provisions of the Act (C.13:20-17). Should any significant RMP deviation arise, the Council will not hesitate to exercise its authority to intercede. In addition the Act permits any

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member of the public to request the Council consider conducting a review of any application for development in the Preservation Area. It is important to note that applicants achieve RMP compliance, in large part, due to requirements of NJDEP Highlands Rules in the Preservation Area. In addition the NJDEP Highlands Rules require that the NJDEP give great weight and consideration to the RMP. Highlands Act exemptions, moreover, remove the vast majority of local applications from the pool of those for which Highlands regulations are even applicable. The Highlands Council continues to view municipal Plan Conformance as an important goal, but even nonconforming Preservation Area municipalities are subject to the Highlands Council's purview.

Comment: Commenter disagrees with the Highlands Council's provision of a streamlined approach to Plan Conformance for municipalities with limited development potential and with the statement (p. 65) that: "for the few municipalities remaining outside of Plan Conformance, the full conformance process is less applicable and should be streamlined accordingly."

Highlands Council Response: The Highlands Council has, for a number of years, been utilizing a streamlined approach for municipalities with limited development potential. There is no evidence that this streamlined approach has weakened any of the protections of the Act or the RMP. Given the requirements of the Act, the RMP, the referral of all land development applications to the Council, and the NJDEP Highlands Rules, the Council believes that in certain cases there exists sufficient protections without the need for the adoption of all plan conformance items.

The Highlands Council has incorporated the following change to the referenced statement: "for a number of the municipalities remaining outside of Plan Conformance, the full conformance process is less applicable and should be streamlined accordingly" (see page 65). In addition, the Highlands Council has incorporated language to clarify the intent of the recommendation is to strengthen the Plan Conformance process and maintain protection of all Highlands resources. It is clear that not all remaining municipalities fit within the criteria set forth by the Highlands Council for the "streamlined" Plan Conformance approach, which relies mainly upon adoption of the Highlands Municipal Referral Ordinance. However, the Highlands Council finds that the approach continues to be an appropriate option for certain municipalities.

Comment: Commenter disagrees with the MPRR recommendation concerning changes to the 2008 Plan Conformance Guidelines, which the Report suggests due to a Highlands Council finding that certain aspects of the 2008 requirements are unnecessary.

Highlands Council Response: The main modification proposed to the Plan Conformance Guidelines would provide for pre-review by the Highlands Council to determine the extent of the changes necessary to align the municipal planning program with the RMP. The Highlands Council would then tailor Petition submittal requirements to reflect the specific circumstances of the municipality. This process would eliminate unnecessary components of the currently required Petition submittal package, before municipal professionals expend time and resources preparing them. The original Guidelines provided for waivers of submission items, which the Highlands Council would consider on a case-by-case basis. The tendency has been for professionals involved in developing Petitions to provide the most thorough packages possible, and to avoid waiver requests. The Highlands Council finds that the proposed methodology achieves all Plan Conformance goals and requirements in a more efficient manner while minimizing the expense and maximizing Highlands resource protection.

Comment: Commenter requests a publicly available archive of Highlands GIS data.

Highlands Council Response: Archived Highlands GIS data is available to the public upon request. This archive includes the GIS data from the time of the Regional Master Plan and will include all GIS data used in tracking indicators in the Monitoring Program. The Highlands Council Open Data Site and all web mapping applications will continue to use the most up-to-date GIS data available. Providing outdated data online presents an opportunity for confusion.

Comment: Commenter supports recommendations provided concerning the RMP Monitoring Program on page 69.

Highlands Council Response: The Highlands Council acknowledges and appreciates this comment.

Comment: Commenter requests dialog with municipality before any further recommendations, restrictions, rules and requirements are adopted.

Highlands Council Response: Highlands Council staff would be very pleased to discuss Plan Conformance issues with the Borough of Bloomsbury. As a small Preservation Area community with limited future development potential, the Borough has taken advantage of the streamlined approach to Plan Conformance as discussed in the comment above. The Highlands Council seeks to simplify the process for communities such as Bloomsbury and encourages the Borough to

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move forward with remaining implementation tasks. The Sustainable Economic Development Plan component may be of particular interest to the Borough. Please do not hesitate to contact your staff Liaison at the Highlands Council for further information.

Comment: Commenter addressed the timeline for completion of the MPRR stating “the Highlands Act clearly states that it was this Council’s job to review the RMP every six years. Six years was up back in 2014, that was three years ago. And let’s not forget the RMP itself was finalized years after the Act directed. Because this Council didn’t bother to obey the law, technically, the RMP is null and void. The commenter continues to state “monitoring was not meant to facilitate revisions to the RMP. Objective 10A5a states it was to ‘insure the RMP was meeting its goals.’ I recommend reading pages 416-7 of the Council’s Regional Master Plan.”

Highlands Council Response: The Highlands Council acknowledges these comments and appreciates the length of time it has taken for this first ever Monitoring Program Recommendations Report to be completed. Significant effort was made during the creation of this report to include advice from stakeholders, members of the public, and technical advisors to capture, as thoroughly as possible, whether the RMP was meeting its goals and those of the Highlands Act. The Council anticipates that future iterations of the report will result in ongoing monitoring and should take significantly less time to complete.

Comment: Commenter expressed concerns with the draft “Procedures for Considering Proposals to Amend the Highlands Regional Master Plan.”

Highlands Council Response: The Highlands Council acknowledges these comments. However this comment does not specifically address any component of the MPRR.

Comment: Commenter expressed concerns with the public participation component of the MPRR development. States that TAC reports did not reflect content of TAC sessions and that a planned second TAC session was never held. States “interest in public comment is a farce” and process is “corrupt.”

Highlands Council Response: The drafting of the Monitoring Program Recommendations Report (MPRR) included a robust public process including an initial public comment period from September 15, 2014 through April 30, 2015, fourteen targeted stakeholder meetings, three stakeholder outreach workshops,

ten Technical Advisory Committee (TAC) meetings, three public outreach sessions, and a sixty day public comment period on the draft MPRR. The verbatim written comments submitted during the Stakeholder meetings are included as an attachment to the Landowner Stakeholder meeting summary. TAC meetings were only summarized. The commenter does correctly note that a second TAC meeting was not held due to limited Council resources.

Comment: The commenter indicates that Plan Conformance should remain voluntary for the Planning Area and suggests that the Summary of Recommendations should clearly identify which actions are voluntary.

Highlands Council Response: The Highlands Act stipulates that conformance for Highlands Planning Area lands is strictly voluntary. Any change would require that the state legislature amend the Act. As to the Summary of Recommendations (pp 197-203), please note that it consists of recommended actions for execution by the Highlands Council and its staff. Plan Conformance program materials provide information as to mandatory vs. optional conformance activities.

Comment: Commenter feels implementation of the RMP should rely on existing subject matter experts from other government regulatory agencies for topics beyond the Highlands core mission. Feels development of new and standalone practices specific to the Highlands region appear to place further burdens onto already strained resources of Municipalities and Counties and should be avoided. Recommends limiting the MPRR to a few select topics particularly relevant to the Highlands mission, and suggests that development of goals should be focused and mindful of resources and staffing limitations experienced at all levels of government.

Highlands Council Response: The Highlands Council appreciates these comments and recognizes the need to rely on other agencies to address a number of RMP objectives. With better interagency coordination, it may be feasible to ensure that RMP goals and objectives are among the priorities of other agencies. To the extent possible, the Highlands Council does aim to rely on existing frameworks to achieve RMP goals. By doing so, the Highlands Council conserves its own resources and operates more efficiently. Where existing agencies do not address RMP issues, however, the Highlands Council has an obligation to develop whatever tools may be necessary. The Highlands Council covers the costs for Plan Conformance activities, as required under state law. As such, it is keenly aware of the needs of local jurisdictions in implementing

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Plan Conformance requirements. This is a part of the rationale for the “Referral Ordinance” approach to Plan Conformance, as discussed above.

Comment: Commenter asks that the Highlands Council include nonprofit organizations among those it provides with grant funding toward achievement of RMP goals.

Highlands Council Response: Section 18 of the Highlands Act limits Highlands Council Plan Conformance grant funding to municipalities and counties only.

Comment: Commenter expressed concern that if the Highlands Council expands grant offerings to counties as recommended in the MPRR, competition for Highlands Plan Conformance grant funding will suddenly surge, placing pressure on dollars believed to have thus far been “limited to municipal grants.”

Highlands Council Response: County Plan Conformance grant funding has been available since the Plan Conformance grant program was established in 2008. The Highlands Council would be pleased to see more counties take advantage of the funding that is available and does not foresee any conflicts with municipal Plan Conformance.

Comment: As to expanding the county grant program, the commenter recommends inclusion of funding to address county land preservation and transportation issues as well.

Highlands Council Response: The Highlands Council Plan Conformance grant program currently allows for county land preservation and transportation planning funding. Both these areas also support sustainable economic development planning, which the Highlands Council encourages. The Highlands Council would be pleased to speak with the commenter regarding specific projects of interest.

Comment: Commenter feels state should compensate municipalities in the Highlands for lost revenue or provide with a means to minimize development restrictions.

Highlands Council Response: This comment is outside the scope of the MPRR and the jurisdiction of the Highlands Council; however, as noted previously, the Borough may find it helpful to initiate work on a Sustainable Economic Development Plan, for which the Highlands Council has already allocated Plan Conformance funding.

Comment: Commenter notes historical and ongoing involvement with the Highlands Regional Master Plan and supports efforts to track the impact of the Plan and the Act on the economy of the region as well as the goals objectives outlined in the Plan. Feels the MPRR provides useful indicator and recommendations which will provide a good starting point for tracking the plan’s impacts.

Highlands Council Response: The Highlands Council appreciates these comments and thanks the New Jersey Farm Bureau for its continued support.

Comment: Commenter expressed concern with the lack of dedicated sources of funding for land preservation and stewardship. States that the continued failure to provide the funding coupled with the demand to abide by the rules and regulations and the imposition of costly fines make the loss of funding a triple threat to Preservation Area municipalities.

Highlands Council Response: The Highlands Council acknowledges these comments and will continue to seek funding sources for land preservation

Comment: Commenter expressed frustration that tax payers in the Preservation Area protect the water supply to over 7 million residents in New Jersey.

Highlands Council Response: The Highlands Council acknowledges the comment; however, it is outside the scope of the MPRR.

Comment: Commenter found organizational structure, format, and much of the content of the MPRR confusing and incomplete.

Highlands Council Response: The MPRR attempts to provide an analysis of RMP implementation to-date as measured by identified indicators. The structure of the report is explained on page 7. The report is intended to meet the requirements of the Highlands Act (c.13:20-8) to periodically revise and update the RMP and RMP Policy 10A5 which states: “to ensure the long term success of the RMP, evaluate regional conditions, identify new or emerging issues, and develop future RMP priorities through the tracking and monitoring of regional indicators.” To aid readers in navigating the report, cross reference page numbers (with live links in the PDF files) to will be added to the Final MPRR.

Comment: Commenter is concerned that municipalities located wholly in the Preservation Area should have input prior to any new rules and regulations are enacted. Requests that this be done in an informal,

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public venue and include legislative and enforcement officials involved in the Highlands Act, so they may hear from those municipalities directly.

Comment: Commenter states that the MPRR directs the Highlands Council to work with other state and federal officials on matters that will have a negative impact on municipalities located wholly in the Preservation Area, without a requirement to involve those municipalities.

Highlands Council Response: Any amendment to the RMP will take place only after 6 public hearings are held as required by the Highlands Act. In addition, the Highlands Act requires the Highlands Council to consult with municipalities in the Region prior to the proposal of any amendment to the RMP.

Comment: Commenter expresses frustration with land preservation that results in the loss of tax revenue for municipalities, especially those that are wholly located in the Preservation Area. Suggests the state should find a mechanism to compensate municipalities for this loss of taxes.

Comment: Commenter expresses frustration with the limited development potential of municipalities located entirely within the Preservation Area of the Highlands. Suggests the state should find a mechanism to compensate municipalities for this lost revenue or finds ways to reduce these restrictions in certain cases, as has already been done with schools.

Comment: Commenter expresses frustration with additional resources required to comply with more stringent regulations imposed on municipalities located entirely within the Preservation Area of the Highlands, and lack of funding to those municipalities to compensate for this required compliance. Also notes that DEP fines for noncompliance add to this burden.

Comment: Commenter expresses frustration with inequity in municipalities located entirely within the Preservation Area of the Highlands, in which much of the land is undevelopable but municipal services to the land are still required. Suggests the state should provide funding to offset this inequity.

Comment: Commenter feels that much of the financial burden of realizing the laudable goals of the Highlands Act is borne on the residents of municipalities located entirely within the Preservation Area of the Highlands, and should not be.

Highlands Council Response: The Highlands Council acknowledges these comments and agrees that the potential economic hardship and fiscal impact to municipalities caused by limited opportunities to expand their ratable base continues to be an issue for many municipalities. The Highlands Council has sought, and will continue, to work with the impacted municipalities wherever feasible.

Several programs were created at the inception of the Act in anticipation of this situation, including the Watershed Moratorium Offset Aid. West Milford is a beneficiary of this program, but some other Highlands towns are not. The Highlands Council does not have the authority to generate the kind of funding referenced in the above comments, and as such they are outside the scope of MPRR, but the Highlands Council has, as a body, been sympathetic and as proactive in this issue as is allowed by the scope of its mission. The Highlands Council offers sustainable economic development grants, Highlands Center designation, and Highlands Redevelopment Area designations as other means of addressing these concerns.

The Highlands Act does include 17 exemptions that address landowner equity concerns by allowing property owners to develop their properties without applying the enhanced environmental protections of the Act in a number of circumstances. Also, the Highland Rules adopted by the NJDEP, subsequent to the passing of the Highlands Act, include four waivers that provide additional opportunities for relief.

Comment: Commenter notes that Super Storm Sandy has resulted in deforestation in West Milford. Much of the impacted land is owned by either the state, non-profits groups or the Newark Watershed. No efforts have been made by the state to restore this damage.

Highlands Council Response: The Highlands Council acknowledges the comment; however, it is outside the scope of the MPRR.

Comment: Multiple commenters discussed County Plan Conformance requirements and requested that any changes to County Plan Conformance Guidelines be discussed and reviewed in collaboration with county representatives.

Highlands Council Response: The MPRR does not recommend complete elimination of regulatory modifications for County Plan Conformance. It does, however, recommend aligning the language from the RMP with the Highlands Act to address issues specifically within county authority (pursuant to the NJ County Planning

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Act). The Highlands Council intends to meet with county representatives to discuss future changes to the county Plan Conformance program. Any revised plan conformance procedures would be subject to public review and comment in accordance with the Procedures for Considering Proposals to Amend the Highlands Regional Master Plan prior to adoption. Furthermore, Highlands Act N.J.S.A. 13:20-9a requires that prior to adoption of any revision of the Regional Master Plan the Council consult with municipalities, counties, state agencies, and interested parties.

subject of comment here. However, the Highlands Council believes that the recommendations for additional monitoring made in the FIA and Peer Review are adequately addressed through recommendations made on page 62-63 of the Monitoring Program Recommendations Report.

Miscellaneous

Comment: Commenter believes that a number of programs discussed in the RMP are non-existent, have very little participation, or are repetitious of existing programs administered by other agencies. Specifically suggests that lake management plans, steep slope programs, scenic resource protection, and historic preservation are small components of the RMP and need to be developed. Further suggests that most municipalities have steep slope and historic preservation ordinances in place and no new program is appropriate.

Highlands Council Response: The Regional Master Plan addresses a wide range of topics related to Highlands resources and sets forth programs and implementation strategies to address them. By necessity, some programs have advanced faster than others. Nevertheless, if a municipality already has in place adequate ordinances and municipal protections, the Council is not seeking to replace them. The plan conformance process seeks to ensure that all Highlands resources are adequately protected at the local level.

Comment: Acknowledging that the “Fiscal Impact Assessment of the Highlands Water Protection and Planning Act and RMP” (FIA) and associated “Peer Review” are not the subject of the current public comment process, commenter notes that both are part of the overall RMP Monitoring Program and so felt it appropriate to provide comments. Commenter requests clarification as to how the Council will address and respond to the issues, findings, and areas of concern noted in the Peer Review. Commenter concurs with many of the Peer Review findings regarding shortcomings in the FIA.

Highlands Council Response: The Highlands Council acknowledges these comments. As the commenter correctly notes, the FIA and Peer Review are not the

Acknowledgments

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The Highlands Council would like to thank the following Technical Advisory Committees for their assistance in providing technical advice and information that aided in the preparation of the MPRR.

Agricultural Resources

Economic Development

Future Land Use

Historic, Cultural, Archaeological, and Scenic Resources

Implementation

Land Owner Equity

Natural Resources

Transportation and Air Quality

Water Resource Protection

Water and Wastewater Utilities

Dedication

This document, the first re-examination and evaluation of the Regional Master Plan, is dedicated to **Christine M. Ross**, Senior Resource Management Specialist, loyal defender and advocate of the Highlands Region since 2006. Chris was integral in the research, development and science behind the Ecosystem Management Technical Report as well as in production and implementation of the RMP. Her expertise, institutional knowledge and brilliant smile will be missed immeasurably.



