DRAFT- FOR FINAL ADOPTION

Indicator Analysis Reports

Great Blue Heron / Splitrock Reservoir

DRAFT- FOR FINAL ADOPTION

Natural Resources / 73

- Critical Habitat / 74
- Forest Impacts / 77
- Preservation Priority / 83
- Watershed Resource Value / 86

Water Resources / 90

- Critical Water Resource Areas / 91
- Impervious Surface Cover by Subwatershed / 95
- Surface Water Quality / 99
- Water Use / 105

Water and Wastewater Utilities / 109

- Domestic Sewerage Facilities Capacity and Demand / 110
- Public Community Water Systems Capacity and Demand / 113
- Wastewater Utility Existing Areas Served / 120
- Water Supply Existing Areas Served / 117

Agricultural Resources / 125

- Agricultural Land Use and Preservation Index / 126

Historic, Cultural, Archaeological, and Scenic Resources / 129

- Preserved Lands and Trails / 130

Transportation and Air Quality / 133

- Air Quality Index / 134
- Commutation Patterns Index / 136
- Freight Index / 139
- Transit Lands Area / 140

Future Land Use / 144

- Conservation Zone / 145
- Existing Community Zone / 150
- Highlands Designated Centers and Highlands Redevelopment Areas / 155
- Protection Zone / 161

Landowner Equity / 166

- Exemptions / 167
- Open Space Program / 170
- Transfer of Development Rights Program / 172

Sustainable Economic Development / 175

- Regional Fact Book / 176

Implementation / 180

- County Plan Conformance / 181
- Highlands Project Review / 183
- Highlands RMP Implementation Funding / 185
- Local Participation, Outreach & Education, Inter-Agency Coordination / 187
- Municipal Plan Conformance / 190

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

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 Conditions 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).

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.

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 Wildife Habitat within the Region.

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 Conern 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	Preserved 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	Developed 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	Preserved 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	Developed 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

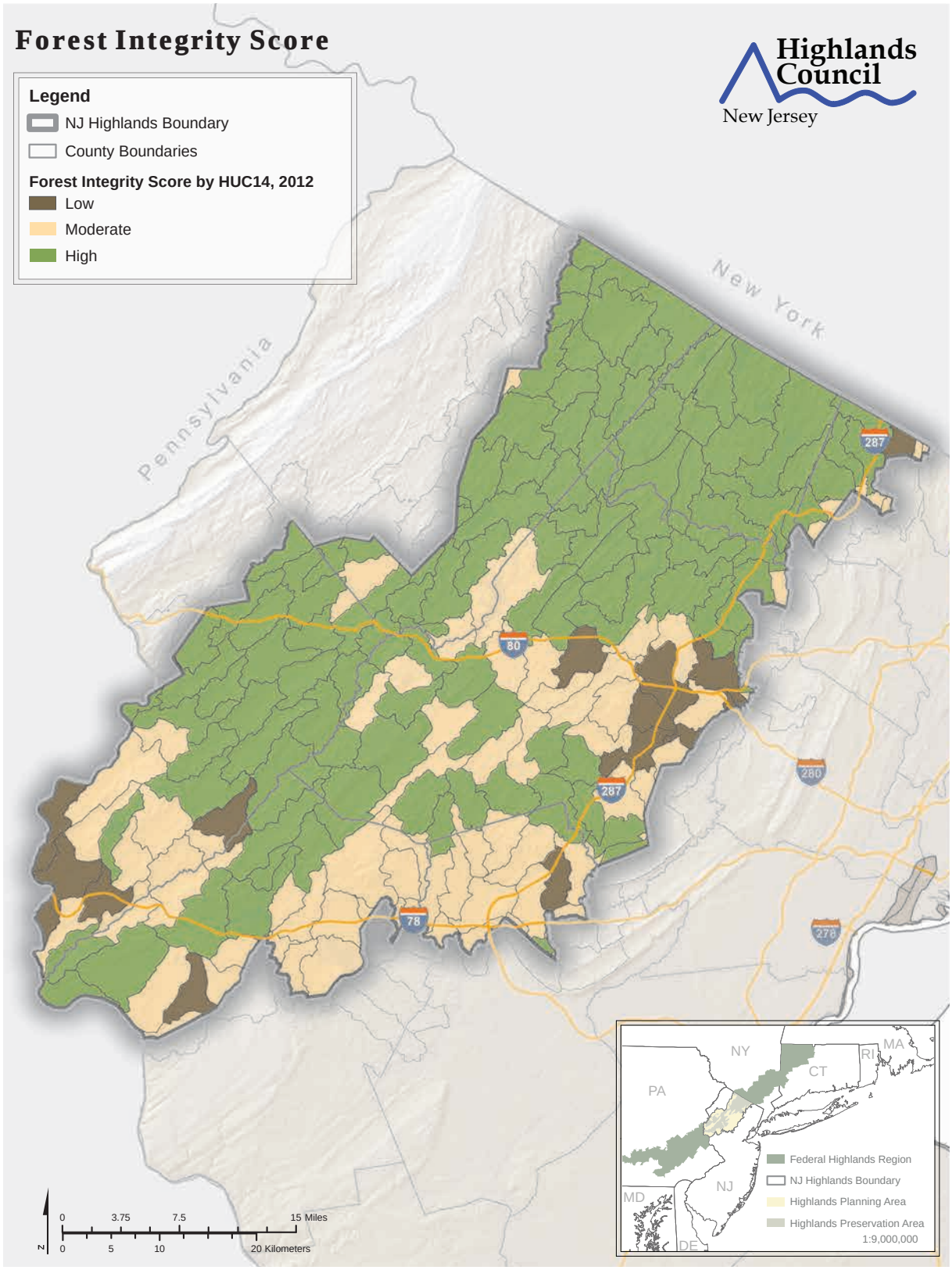


Figure 2: Forest Integrity Score Change, 2002-2012

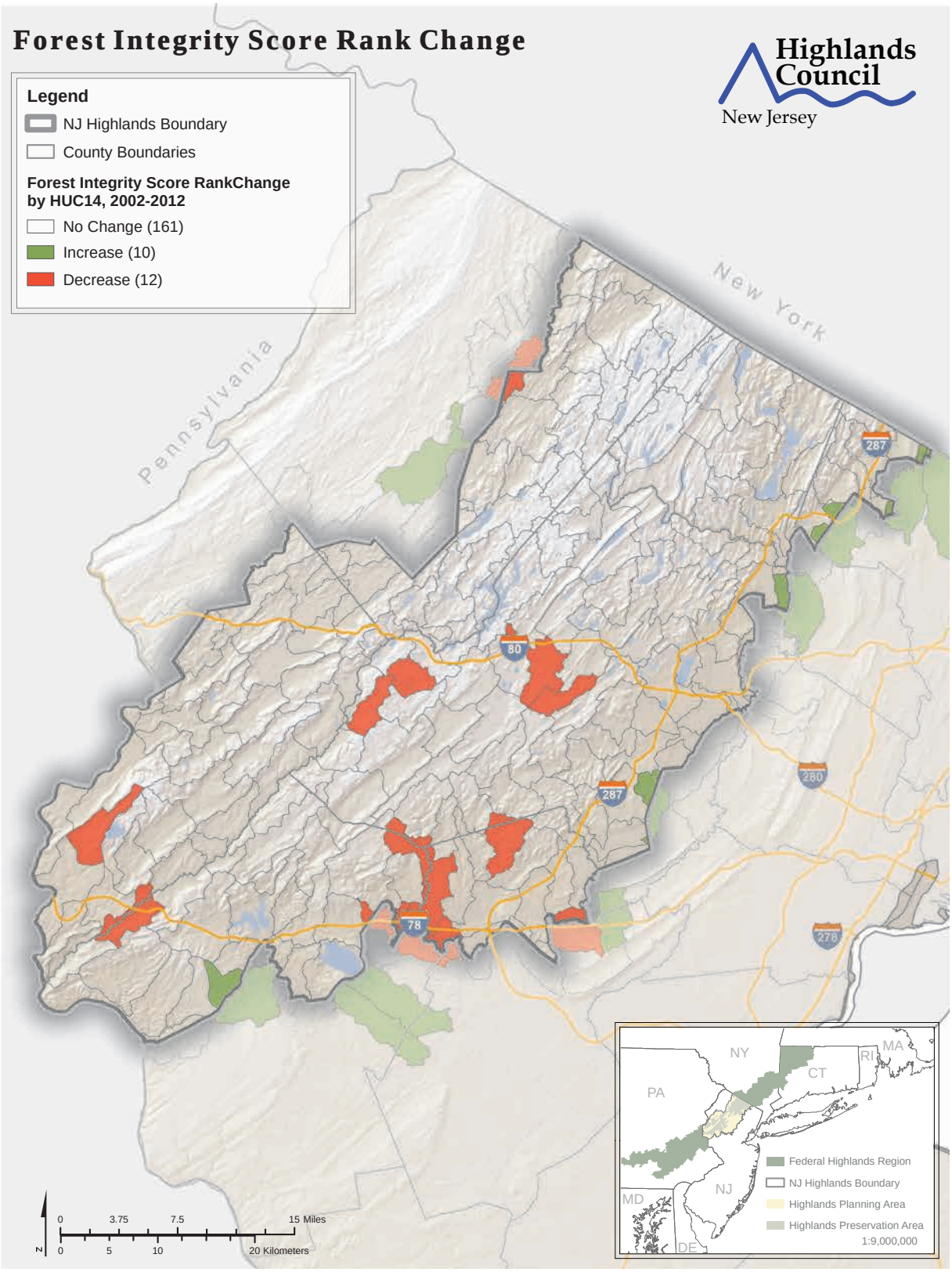


Figure 3: Change in Development in Total Forest Area, 2002-2012

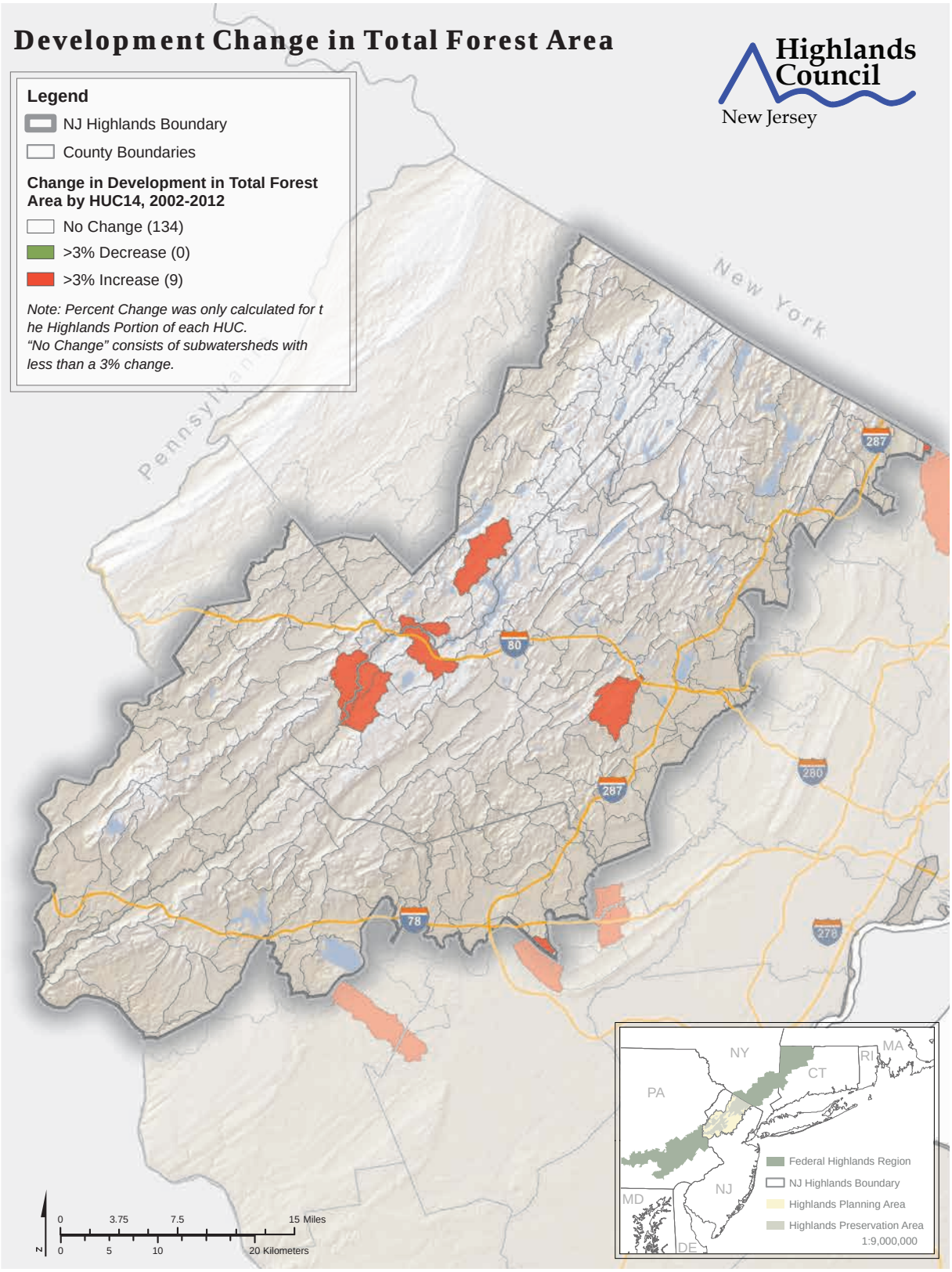
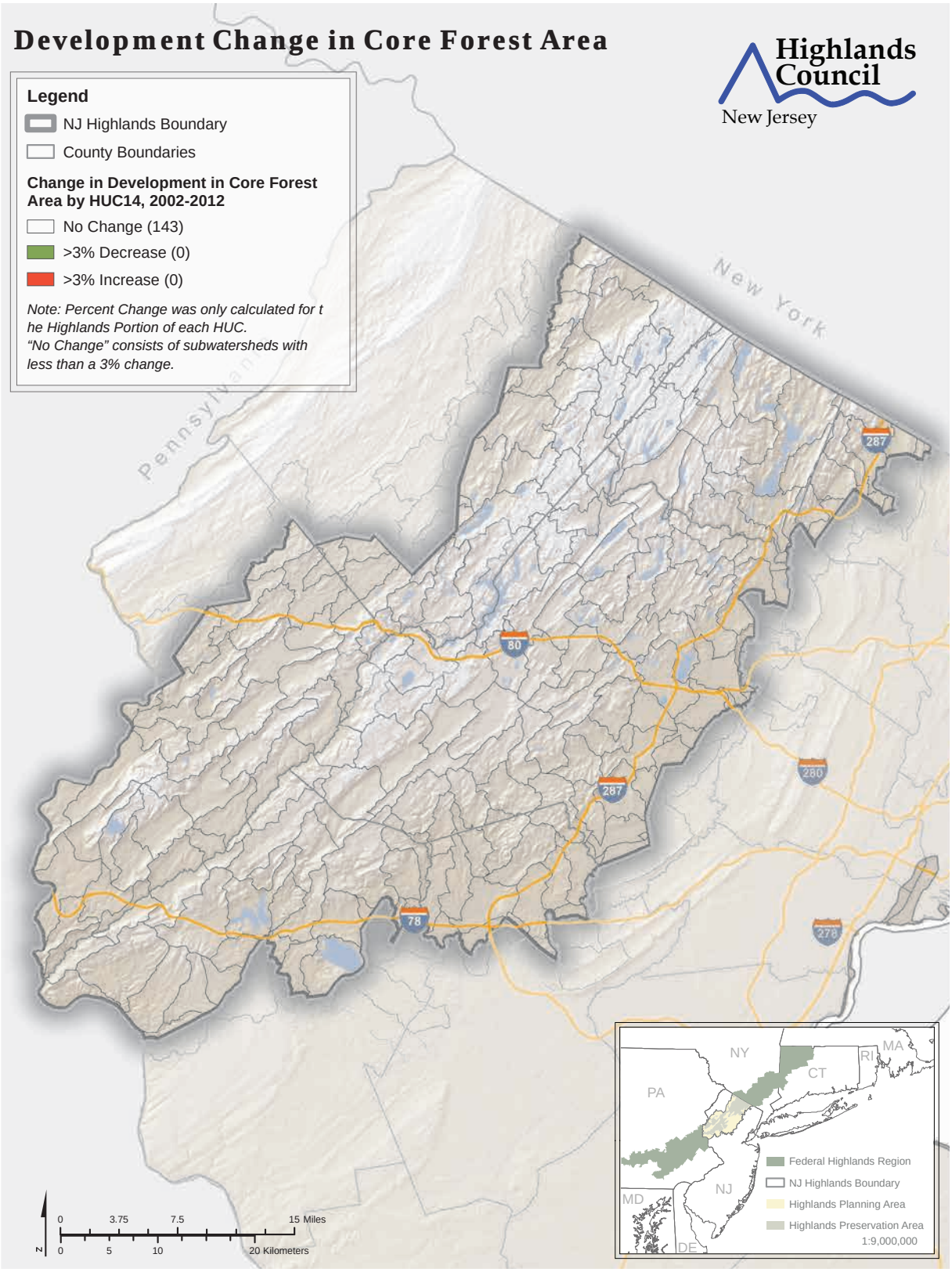


Figure 4: Change in Development in Core Forest Area, 2002- 2012



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

	Total SEZ Acres	Total Preserved Acres		Change		
Region	2008	2008	2016	Trend	Acres	Percent*
Planning Area	-	-	-	N/A	N/A	N/A
Preservation Area	19,138	81	4,488	Increase	4,406	23.0%
Highlands Region	19,138	81	4,488	Increase	4,406	23.0%

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

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

	Total SEZ Acres	Total Developed Acres		Change		
Region	2008	2008	2012	Trend	Acres	Percent*
Planning Area	-	-	-	N/A	N/A	N/A
Preservation Area	19,138	505	642	Increase	137	0.7%
Highlands Region	19,138	505	642	Increase	137	0.7%

*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

	Total CPA Acres	Total Preserved Acres		Change		
Region	2008	2008	2016	Trend	Acres	Percent*
Planning Area	96,094	241	2,525	Increase	8,101	8.4%
Preservation Area	159,026	8,342	18,759	Increase	16,234	10.2%
Highlands Region	255,120	8,582	21,284	Increase	24,334	9.5%

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

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

	Total CPA Acres	Total Developed Acres		Change		
Region	2008	2008	2012	Trend	Acres	Percent*
Planning Area	96,094	17,174	19,615	2,441	2.5%	8.4%
Preservation Area	159,026	33,928	37,948	4,019	2.5%	10.2%
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.

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

Change in Preserved Lands 2008-2016

	Total APA Acres	Total Preserved Acres		Change		
Region	2008	2008	2016	Trend	Acres*	Percent
Planning Area	131,183	-	14,636	Increase	14,636	11.2%
Preservation Area	63,694	-	8,379	Increase	8,379	13.2%
Highlands Region	194,877	-	23,015		23,015	11.8%

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

Change in Developed Lands 2008-2012 (2002 & 2012 LULC)*

	Total CPA Acres	Total Developed Acres		Change		
Region	2008	2008	2012	Trend	Acres**	Percent
Planning Area	131,183	24,279	28,303	Increase	4,023	3.1%
Preservation Area	63,694	13,041	14,902	Increase	1,861	2.9%
Highlands Region	194,877	37,321	43,205		5,884	3.0%

*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 Rseource Value Status, 2012

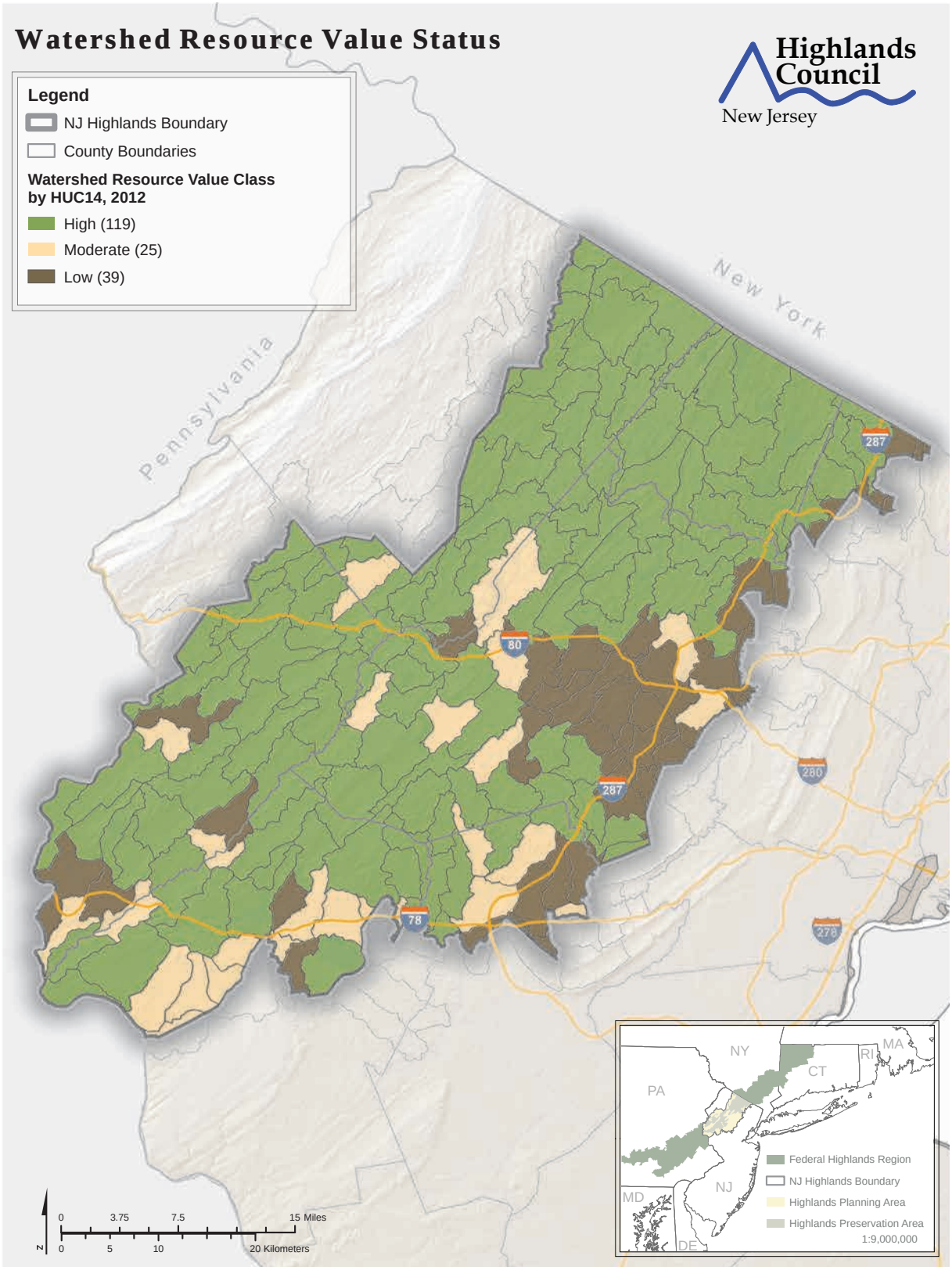
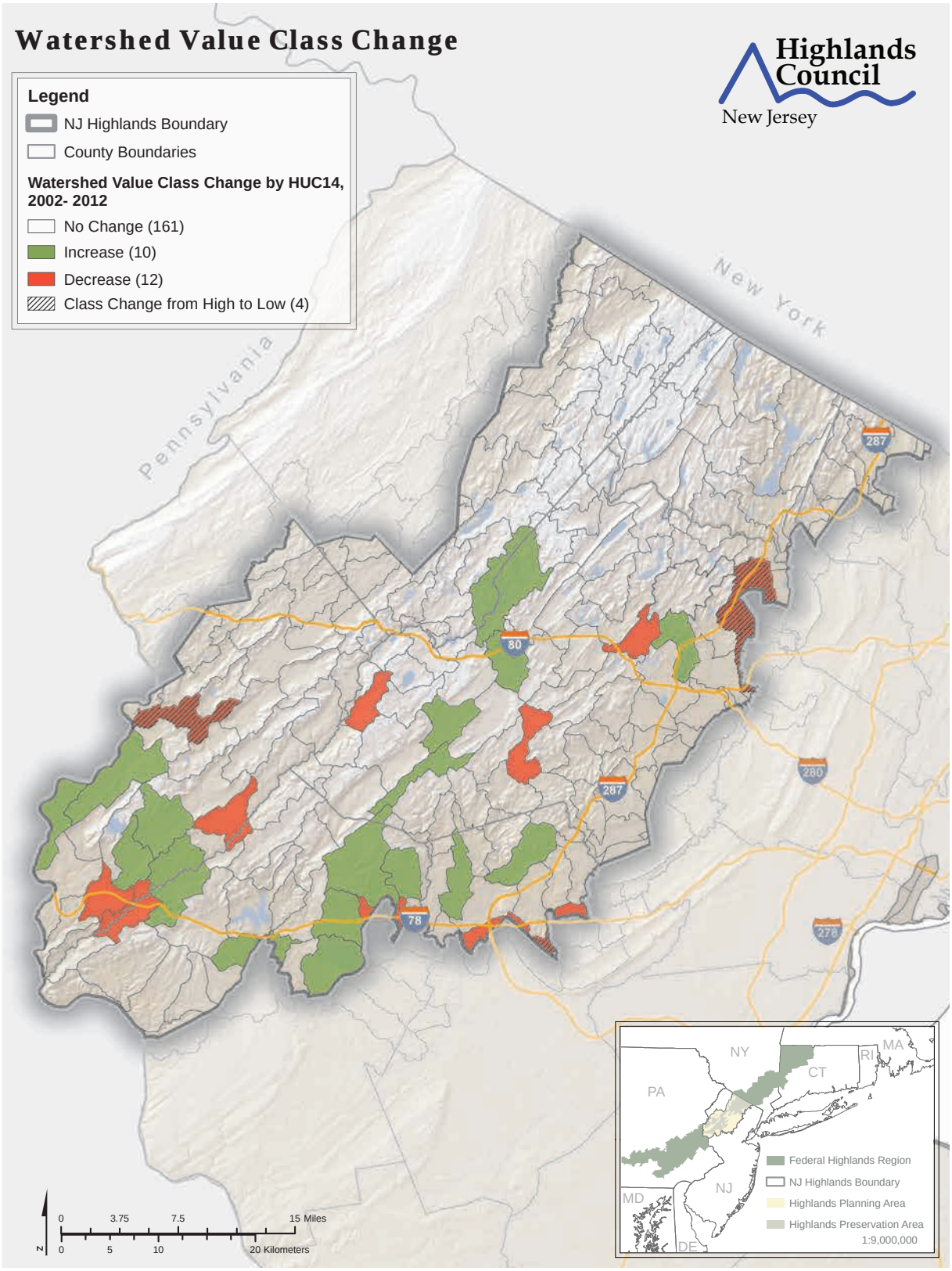


Figure 2: Watershed Resource Value Trend, 2002-2012



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).

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 indicator 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).

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 datasets 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

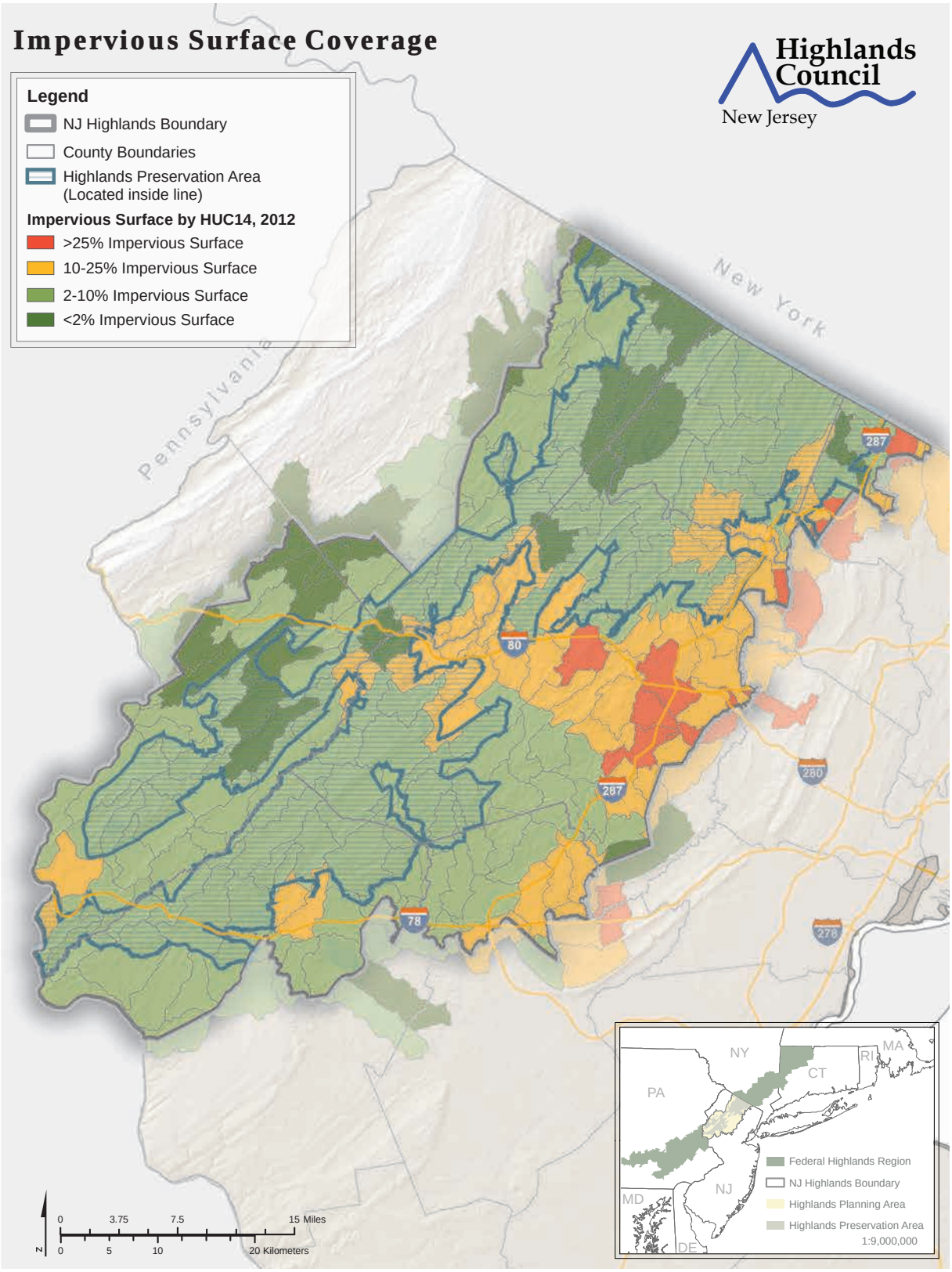
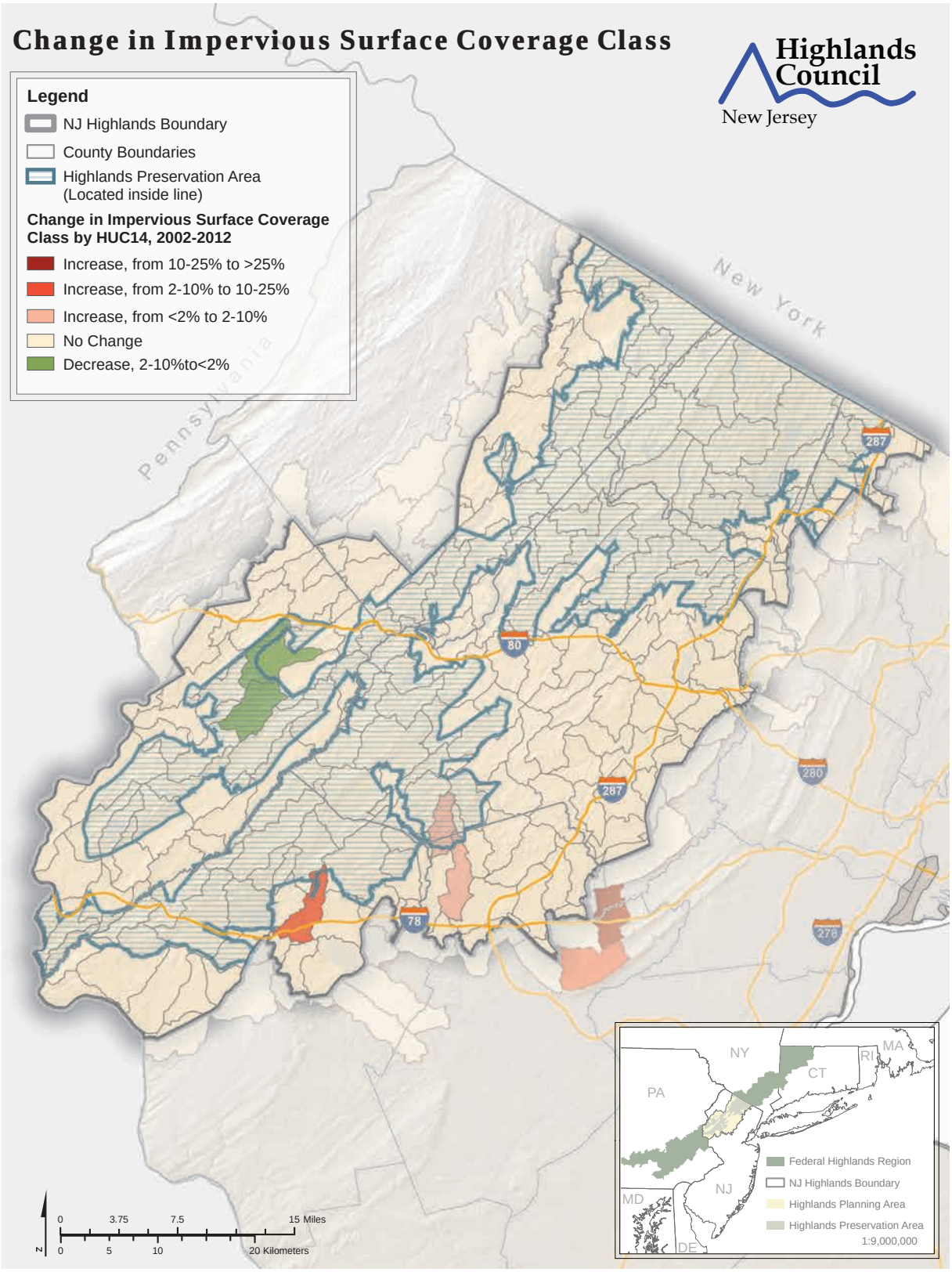


Figure 2: Change in Impervious Surface Cover Classification, 2002-2012



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 groundwater 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 potential 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

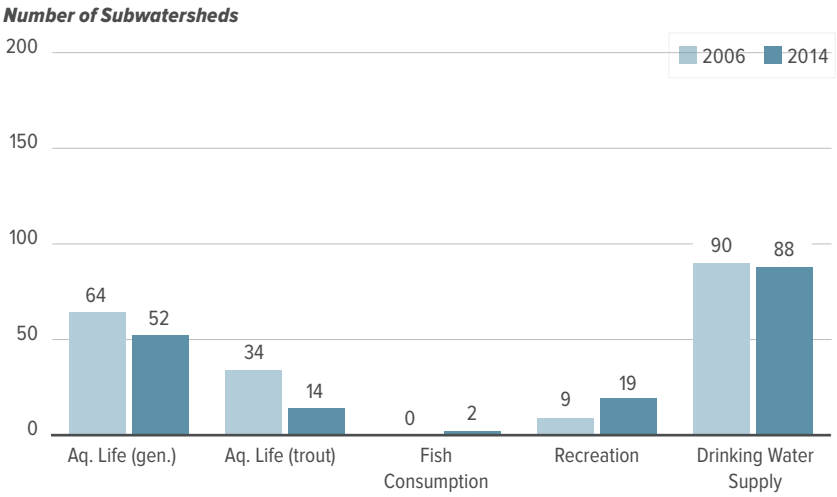
Acknowledging that the delineation of HUC14 subwatersheds dataset has recently changed in the Highlands Region, the 2005 subwatershed (HUC14) dataset used in the 2008 RMP was also used for the display of this analysis in order to maintain consistency for comparison purposes, even though the data is reported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

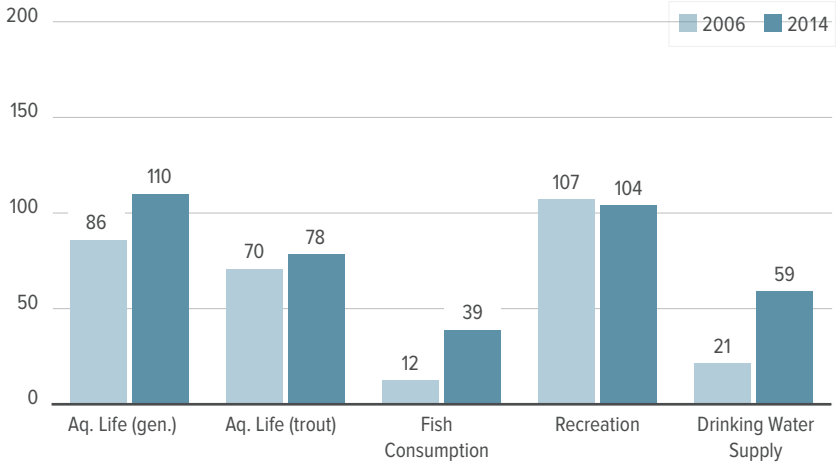
Fully Supporting

	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



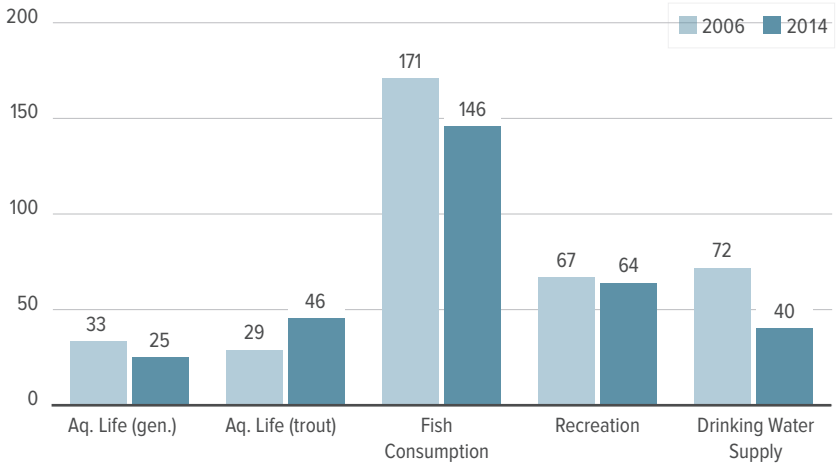
Not Supporting

	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



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



DRAFT- FOR FINAL ADOPTION

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

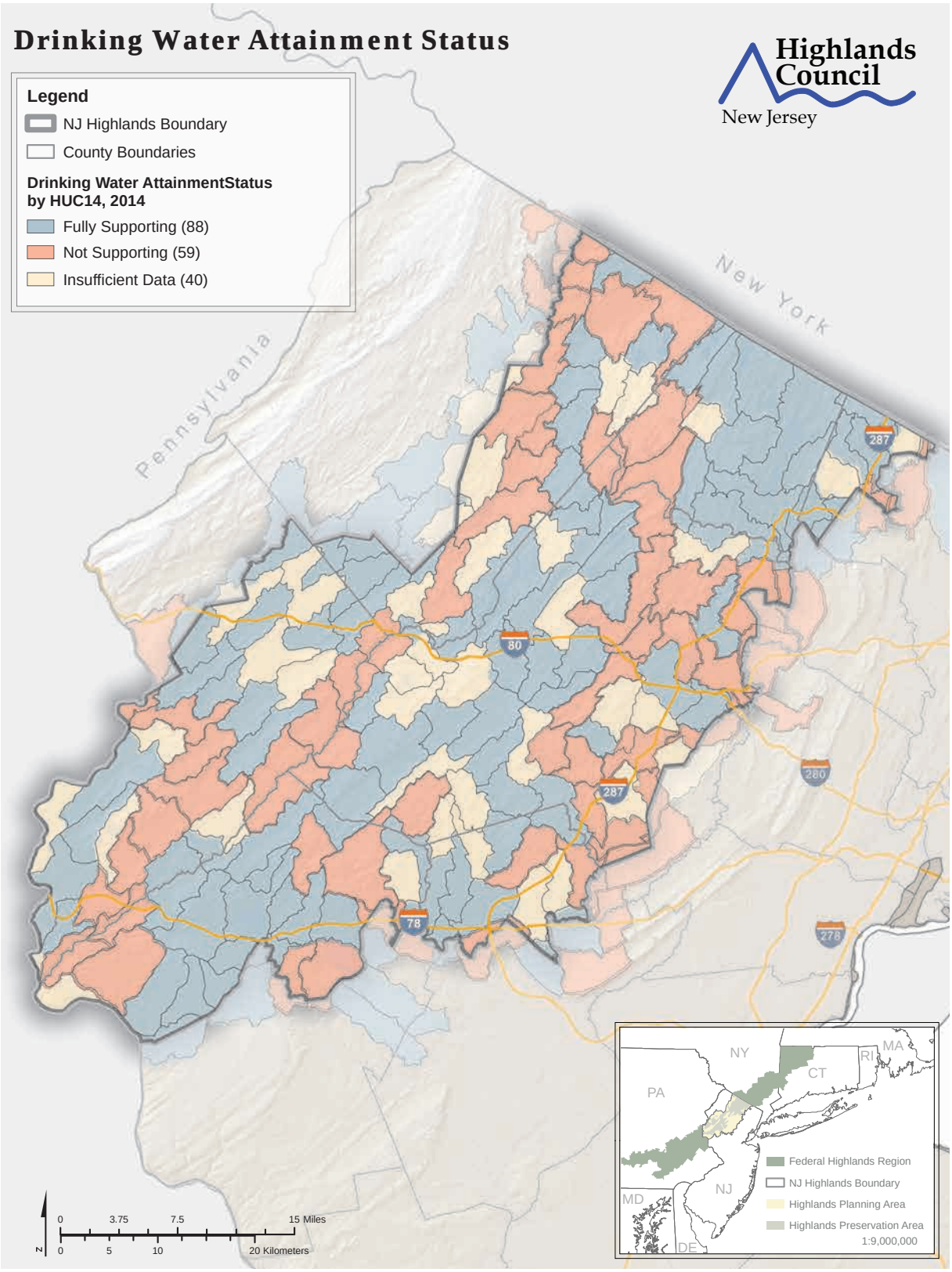
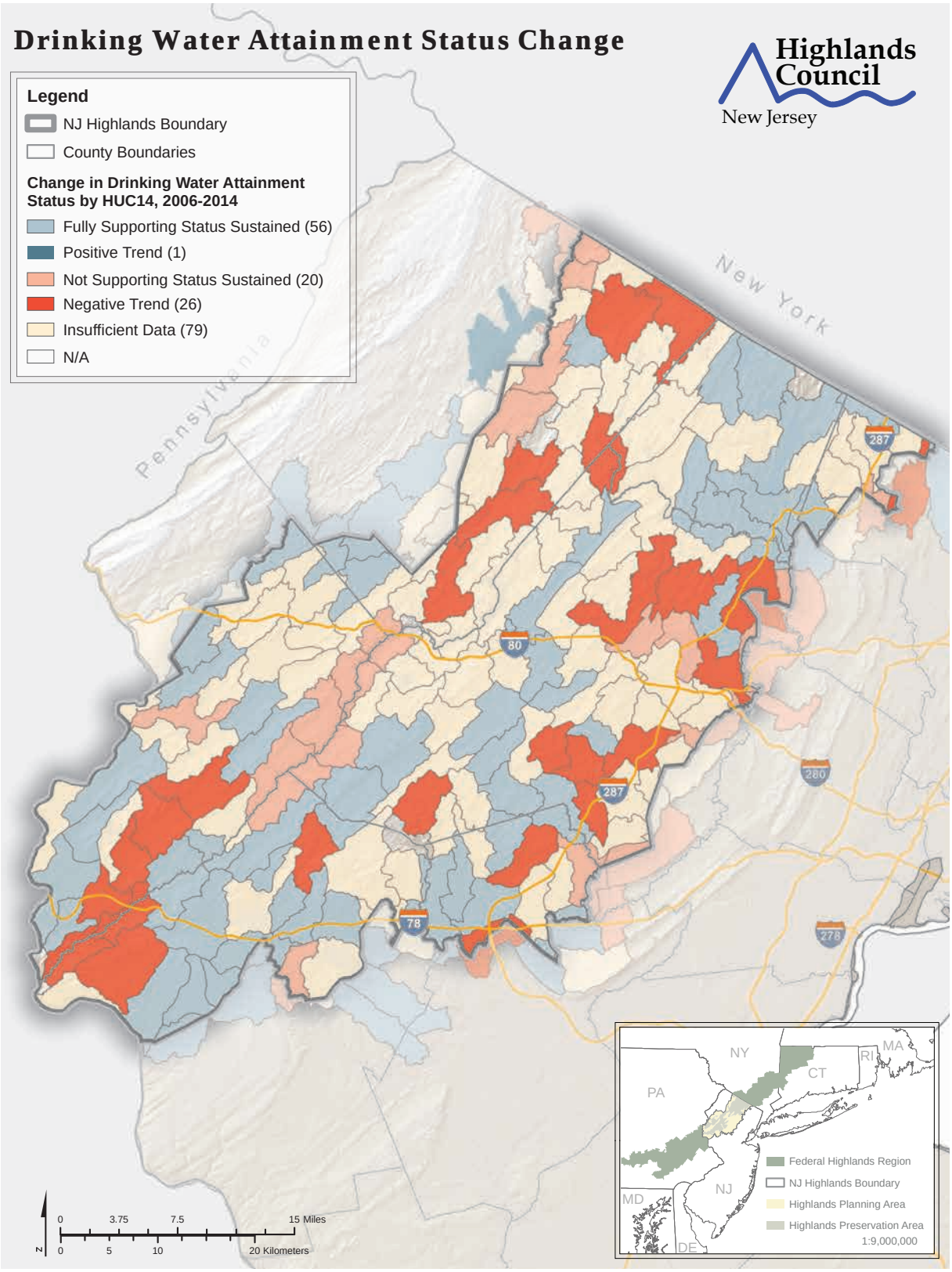


Figure 3: Change in Drinking Water Attainment Status, 2006-2014



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

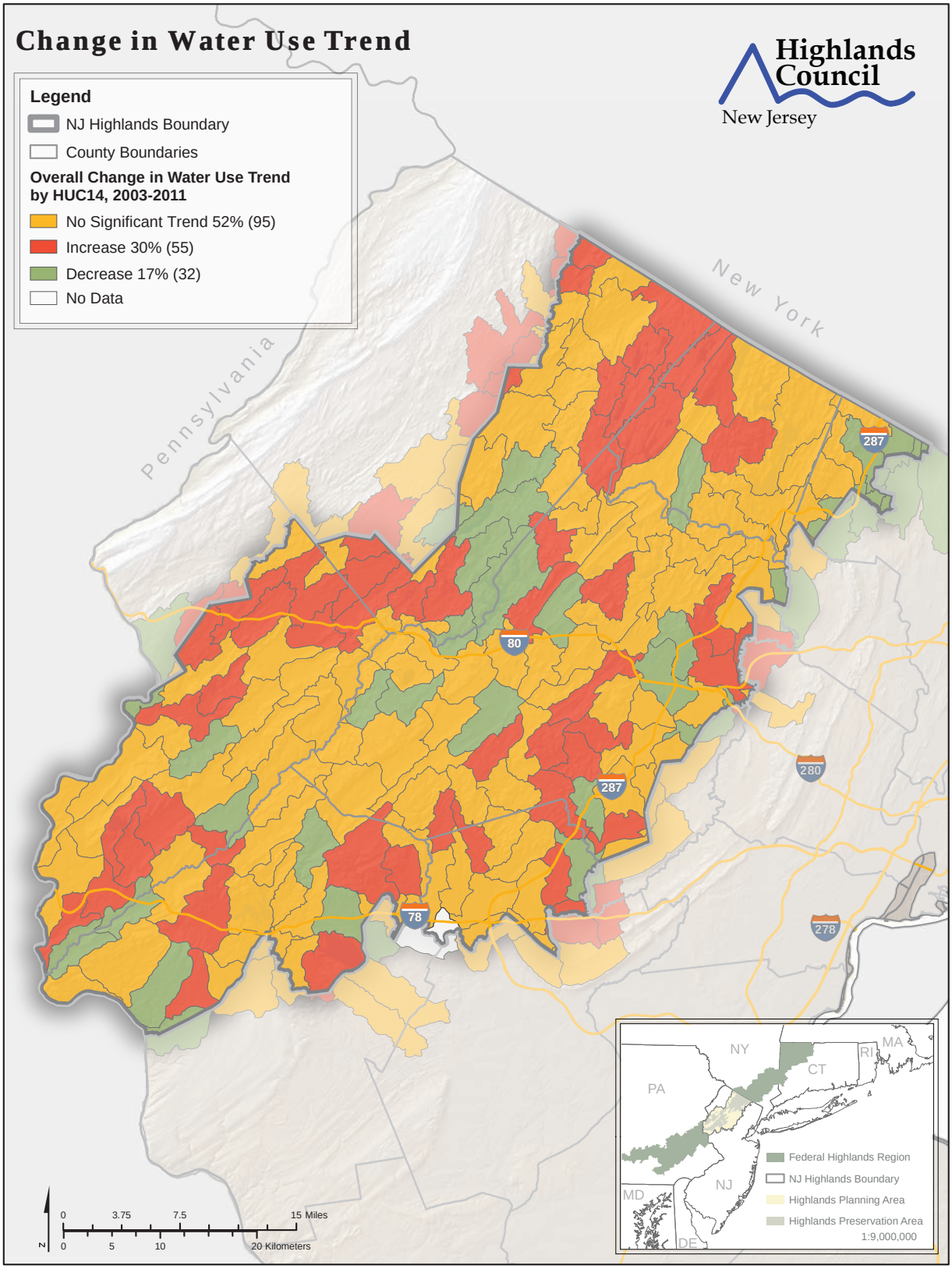
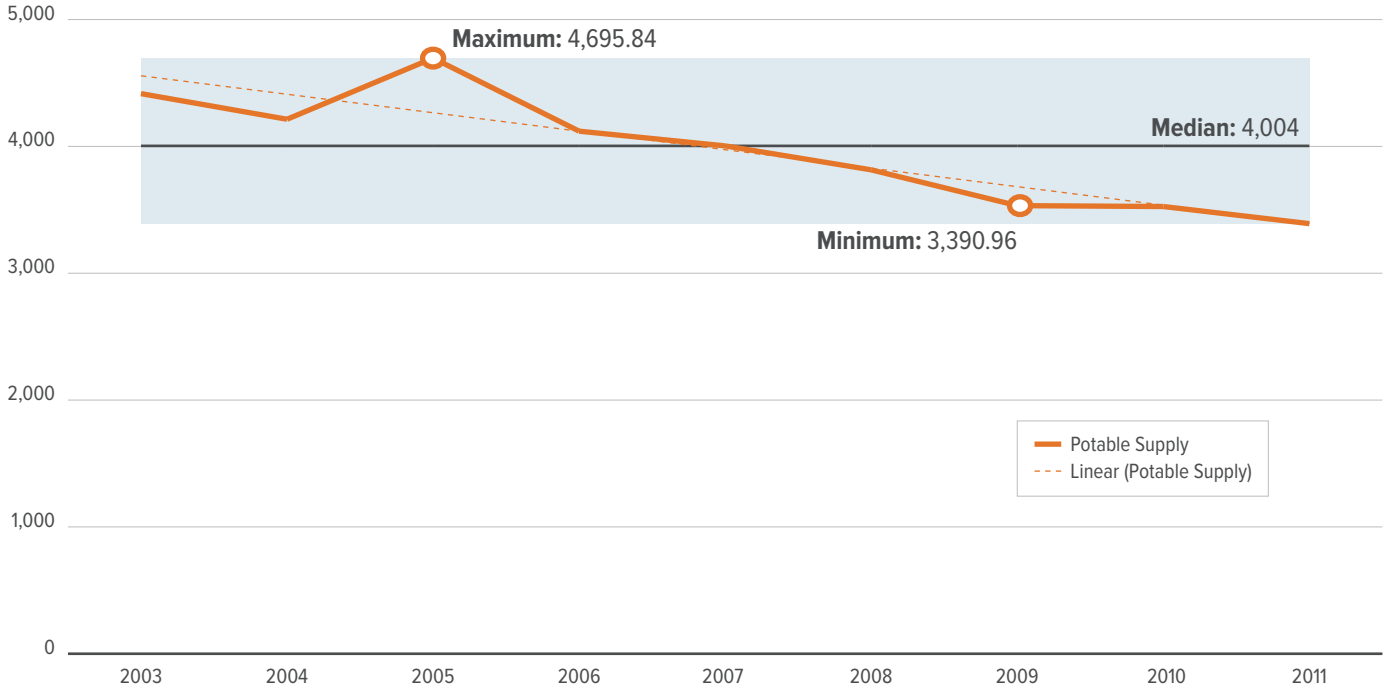
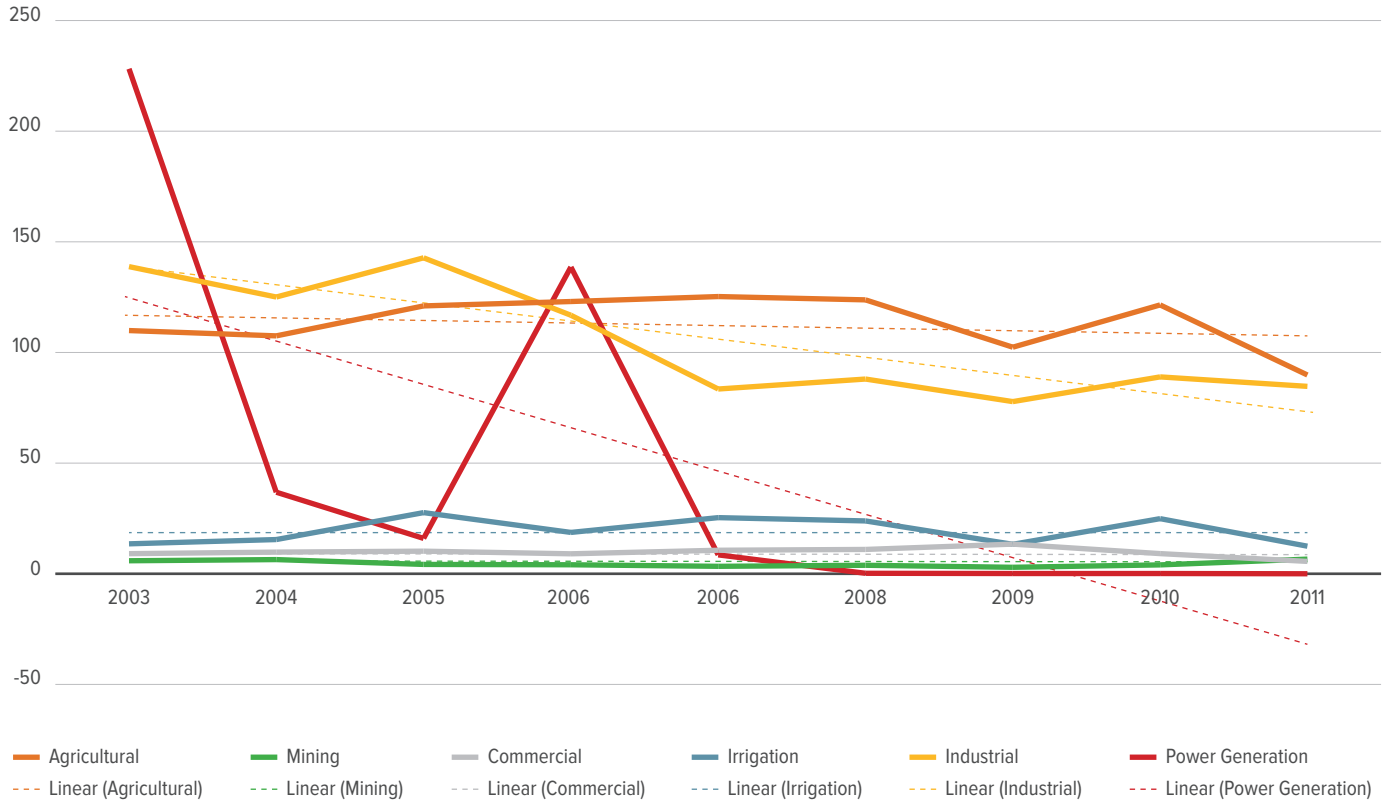


Figure 2: Potable supply water use across the Highlands Region, 2003-2011

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

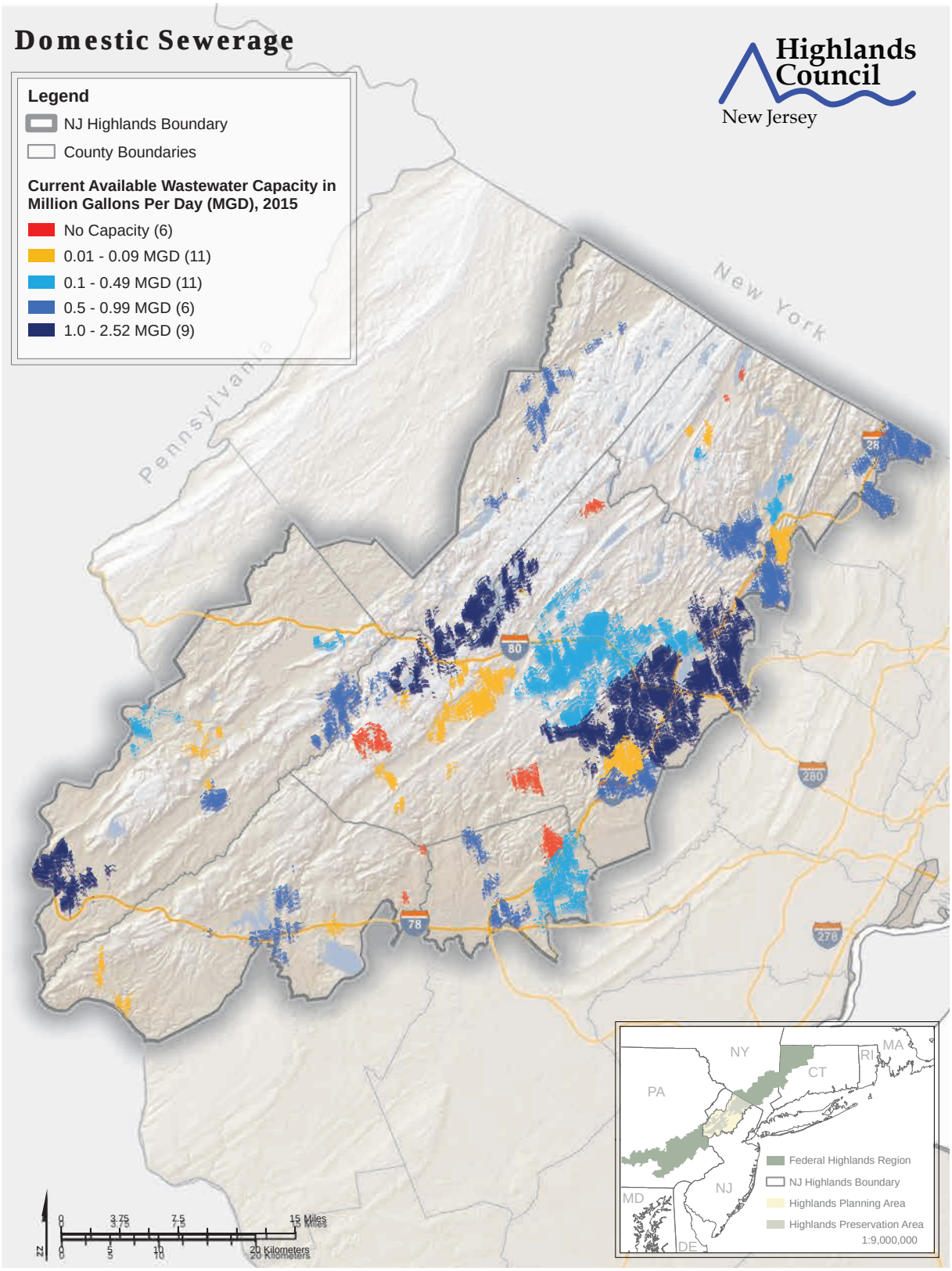
Data sets and how they were used for the analysis are described below. Each data set is intersected with the Highlands Region.

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

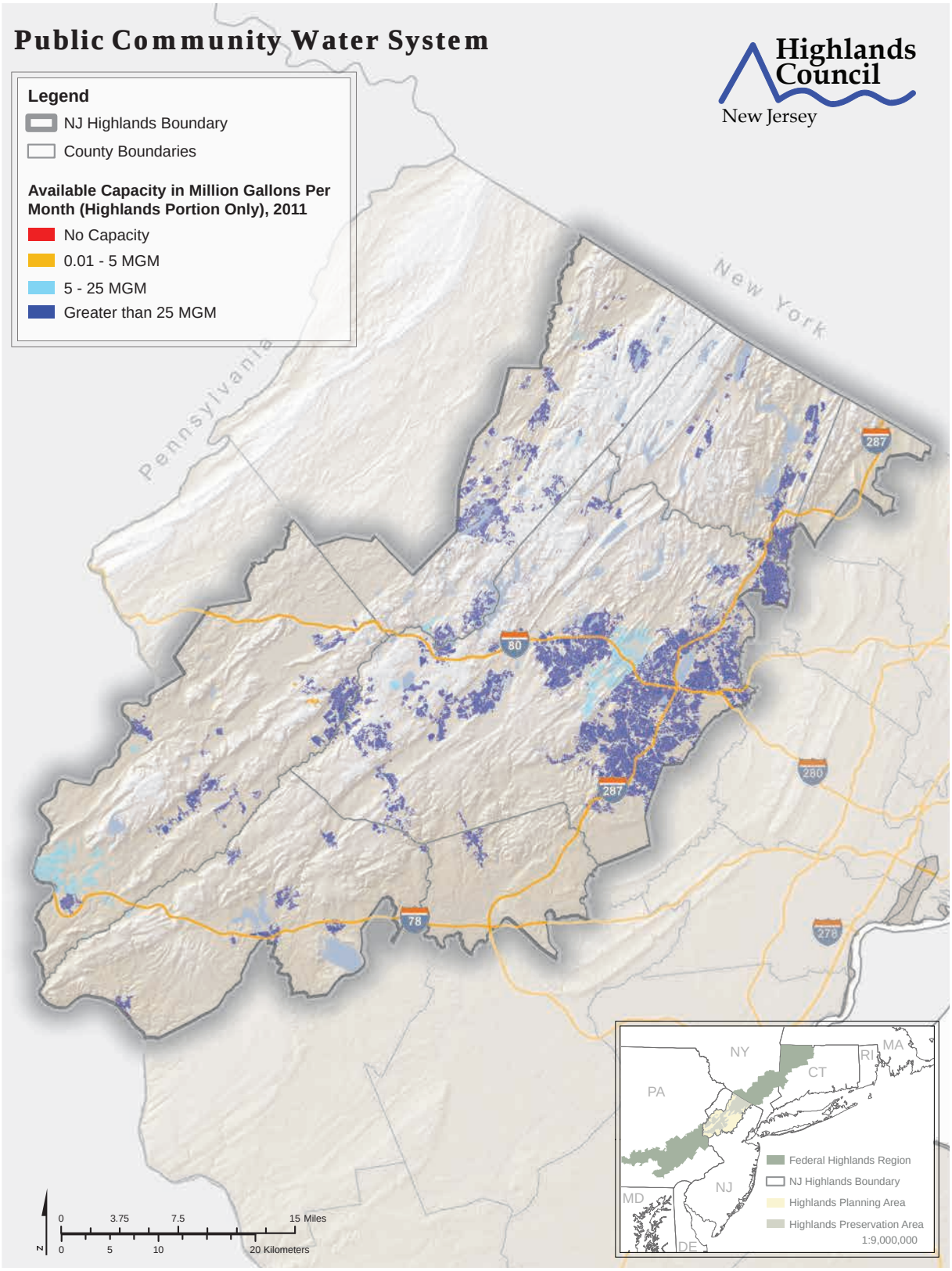


Figure 2: Average Monthly Demand for Large Systems

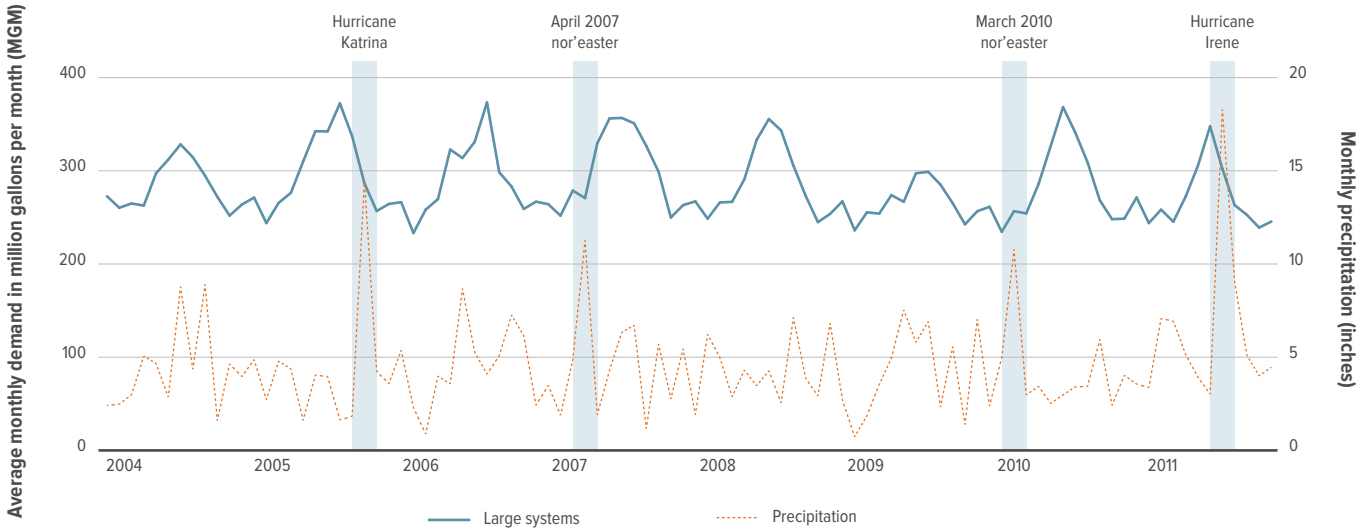


Figure 3: Average Monthly Demand for Small Systems

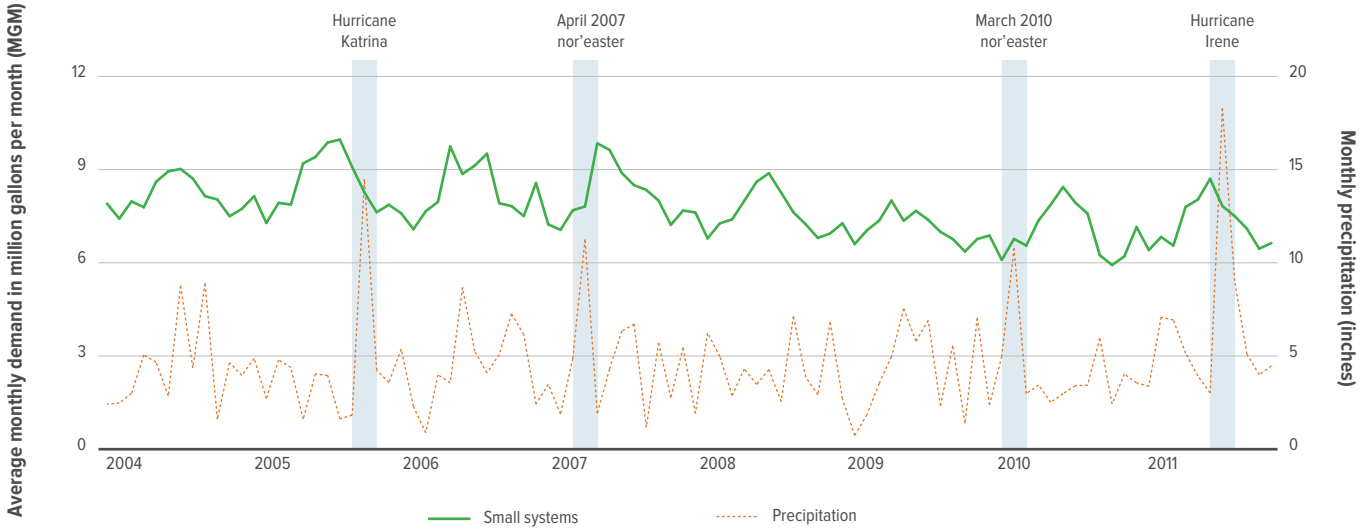
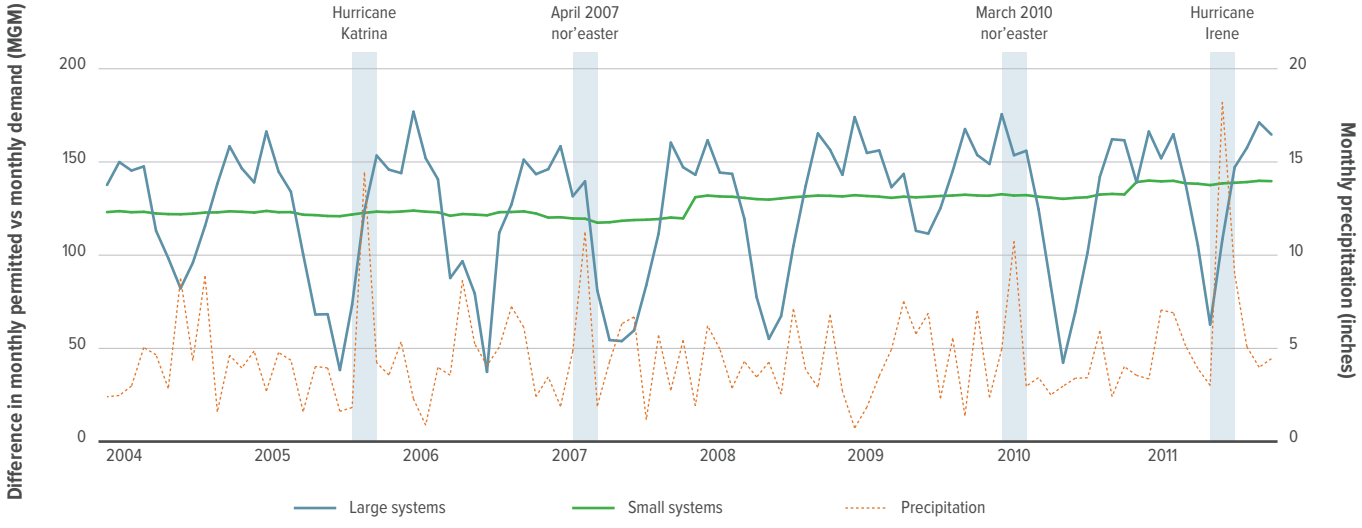


Figure 4: Average Available Capacity (Difference in Monthly Permitted Capacity and Demand)



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 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

		2008		2016		Change		
	Total Acres[1]	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%

[1]The 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.

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

		2008		2016		Change		
	Total Acres[1]	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%

[1]The 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

	Total Acres			Change	
Municipality Name*	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

	Total Acres			Change	
Municipality Name*	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
Bloomingdale 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.

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
- Strewardship

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	22.2%	44,694	40.9%	Increase	18,590	71.2%
						629 Parcels		1,479 Parcels				
Highlands Counties (outside the Highlands Region)	123,347	113,870	Decrease	(9,477)	-7.7%	34,505	28.0%	46,486	40.8%	Increase	11,981	34.7%
						689 Parcels		1,317 Parcels				
Total	**240,898**	**223,076**	**Decrease**	**(17,822)**	**-7.4%**	**60,609**	**25.2%**	**91,180**	**40.9%**	**Increase**	**30,571**	**50.4%**
						1,318 Parcels		**2,796 Parcels**				

[1]Note 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.

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 tihe 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 (µg/m^3) to 12.0 µg/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.

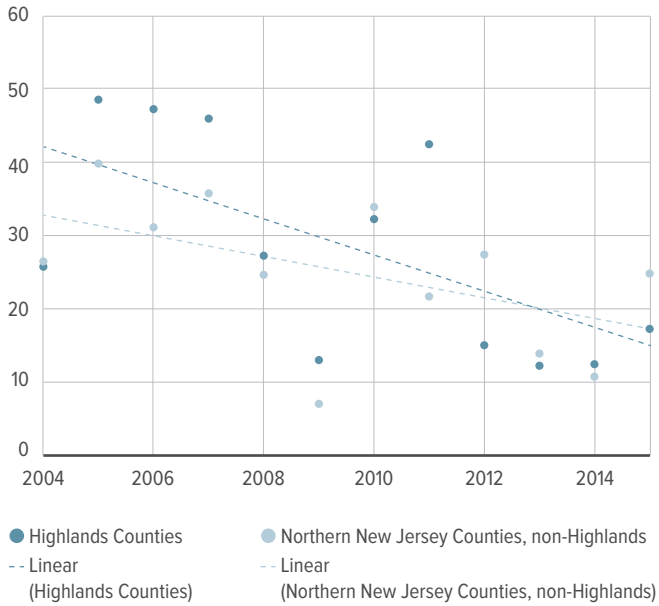
MILESTONE

- 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 employers 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, 2009[1] 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

[1]Active freight spur miles not available for 2009; [2]Total 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. Georeferenced 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%
Commerical & 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

Table 3: New development certificates of occupancy per square mile in Transit Lands Area, Highlands Region, 2013-2014

		Certificates of Occupancy Per Square Mile		
	Square Miles	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%

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 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)

DRAFT- FOR FINAL ADOPTION

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 available 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.

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

		2002		2012		Change		
	Total Acres	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

		2002		2012		Change		
	Total Acres	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

		2002		2012		Change		
	Total Acres	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

		2008		2016		Change		
	Total Acres	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

		2008		2016		Change		
	Total Acres	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

		2008		2016		Change		
	Total Acres	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

		2008		2016		Change		
	Total Acres	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.

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

		2002		2012		Change		
	Total Acres	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

		2002		2012		Change		
	Total Acres	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

		2002		2012		Change		
	Total Acres	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

		2002		2012		Change		
	Total Acres	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

		2002		2012		Change		
	Total Acres	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

		2002		2012		Change		
	Total Acres	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

		2002		2012		Change		
	Total Acres	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

		2002		2012		Change		
	Total Acres	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%

[1]Currently, 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

		2002		2012		Change		
	Total Acres	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%

[1]Currently, 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

		2002		2012		Change		
	Total Acres	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%

[1]Currently, 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

		2002		2012		Change		
	Total Acres	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%

[1]Currently, 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

		2002		2012		Change		
	Total Acres	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%

[1]Currently, 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

		2002		2012		Change		
	Total Acres	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%

[1]Currently, 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

		2002		2012		Change		
	Total Acres	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 % Pf 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%

[1]Currently, neither Highlands Centers nor Redevelopment Areas can be located within the Non-Conforming Planning Area. [2]Due 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.

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

		2002		2012		Change		
	Total Acres	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

		2002		2012		Change		
	Total Acres	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

		2002		2012		Change		
	Total Acres	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

		2008		2016		Change		
	Total Acres	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

		2008		2016		Change		
	Total Acres	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

		2008		2016		Change		
	Total Acres	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

		2008		2016		Change		
	Total Acres	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**

Table 2: Exemptions Issued by Municipalities, 2013-2016

Exemption in the Highlands Planning Area		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**
Exemption in the Highlands Preservation Area						
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**

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 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 generally 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

Funding Source for the HDC Purchase Program	**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.

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)

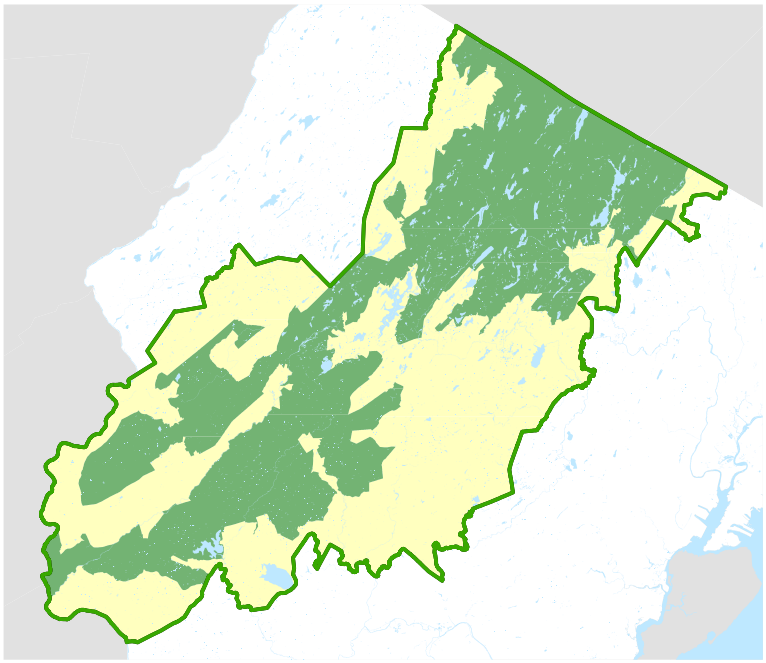
Figure 1: Highlands Region Page from Highlands Regional Factbook, Released January 2017

Highlands Region

	Acres*	%
Planning Area	444,269	52%
Preservation Area	415,003	48%
Highlands Region Boundary		

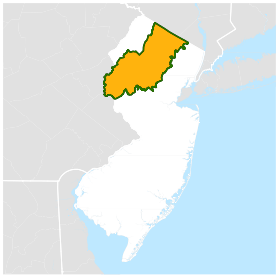
PRESERVED ACREAGE (NJ Highlands Council, 2016)	Acres*	%
Total	308,090	36%
Highlands Region acreage per capita	0.38	-

LAND USE CAPABILITY ZONES (NJ Highlands Council, 2016)	Acres*	%
Protection Zone	420,996	51%
Wildlife Management Area	45,653	6%
Conservation Zone	66717	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
Land sales (NJ MOD-IV, 2013)		*Plan.*	*Pres.*	*Total*	*Total*
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/**

1

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

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 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.

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

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, 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 Update 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.

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.

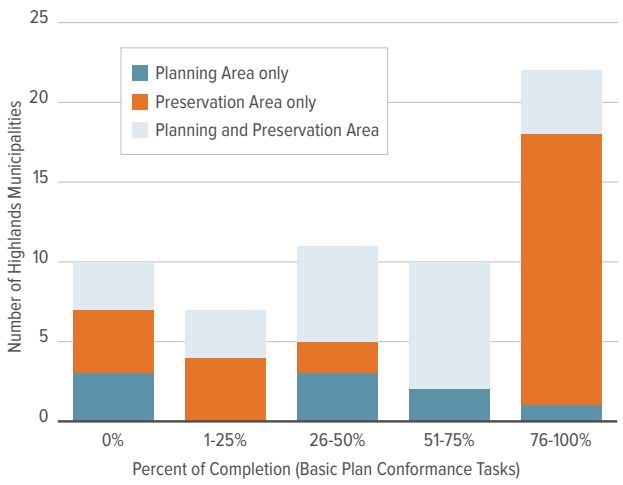
Implementation Phase: The Plan Conformance Implementation Phase begins after a municipality's Petition is approved by the Highlands Council. All Petitions thus far have been approved with conditions and have been accompanied by a draft Highlands Council grant agreement setting forth priority implementation 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 Comforming 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 Ordinancet 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.