



State of New Jersey

Highlands Water Protection and Planning Council
100 North Road (Route 513)
Chester, New Jersey 07930-2322
(908) 879-6737
(908) 879-4205 (fax)
www.nj.gov/njhighlands



CHRIS CHRISTIE
Governor

JIM RILEE
Chairman

KIM GUADAGNO
Lt. Governor

MARGARET NORDSTROM
Executive Director

HIGHLANDS REGIONAL MASTER PLAN MONITORING PROGRAM NATURAL RESOURCES TECHNICAL ADVISORY COMMITTEE MEETING

DATE: December 8, 2015
TIME: 10:00AM – 5:00PM
LOCATION: Highlands Council Office
100 North Road
Chester, NJ

ATTENDEES:

First Name	Last Name	Organization
Bruce	Barbour	Rutgers Cooperative Extension
Dan	Bello	NJ Department of Environmental Protection (NJDEP)
Robert	Canace	The Peter and Carmen Lucia Buck Foundation
Tracy	Carluccio	Delaware Riverkeeper Network
Lou	Cattuna	NJ Department of Environmental Protection (NJDEP)
Emile	DeVito	NJ Conservation Foundation
Don	Donnelly	NJ Audubon Society
Joe	Dunn	Morris County Soil Conservation District
Ron	Farr	North Jersey District Water Supply Commission
Gretchen	Fowles	NJ Department of Environmental Protection (NJDEP)
Mark	Gallagher	Princeton Hydro
Steve	Kallessen	Gracie & Harrigan Consulting Foresters
Jeffery	Keller	Habitat By Design
Chris	Obropta	Rutgers Cooperative Extension
Richard	Pardi	William Paterson University
John	Parke	NJ Audubon Society
Chris	Squazzo	NJ Department of Environmental Protection

		(NJDEP)
Michael	Francis	NJ Highlands Council – Member
Mike	Sebetich	NJ Highlands Council – Member
James	Visioli	NJ Highlands Council – Member
Margaret	Nordstrom	NJ Highlands Council – Executive Director
Kelley	Curran	NJ Highlands Council – Staff
Chris	Danis	NJ Highlands Council – Staff
Carole	Dicton	NJ Highlands Council – Staff
Keri	Green	NJ Highlands Council – Staff
John	Maher	NJ Highlands Council – Staff
Nathan	McLean	NJ Highlands Council – Staff
Corey	Piasecki	NJ Highlands Council – Staff
Chris	Ross	NJ Highlands Council – Staff
Ian	Shiland	NJ Highlands Council – Staff
Jocelyn	van den Akker	NJ Highlands Council – Staff
Alex	Belensz	Regional Plan Association
Courtenay	Mercer	Regional Plan Association

MEETING PURPOSE:

Technical Advisory Committees (TACs) serve to engage those with specific technical content knowledge across the ten topic areas included in the Highlands Regional Master Plan (RMP). TAC membership represents academic institutions, business and industry, regulatory agencies, and non-government organizations each providing a unique perspective on their area of expertise. Each TAC will meet two times over the course of the RMP Monitoring Program project.

The purpose of TAC Meeting 1 was to review of the draft proposed indicators under consideration for analysis, as well as sample indicator reports demonstrating the type of output that is anticipated to be included in the Monitoring Program Recommendation Report (MPRR). As time allowed, the TAC could discuss potential milestones.

MEETING SUMMARY:

The meeting opened with welcome remarks by the MPRR project consultant, Courtenay Mercer, New Jersey Director at Regional Plan Association (RPA). After attendees introduced themselves, Ms. Mercer provided an overview of the meeting purpose and an explanation of the meeting materials, which included the Agenda, RMP Goals information sheet, Briefing Memo, and Draft Indicator Spreadsheets.

Participants were presented with several general questions regarding implementation indicators in the MPRR, including:

- Do the indicators adequately analyze the Natural Resources goals and policies of the RMP? Are there any missing indicators, or are any indicators listed in an inappropriate tier?
- For the sample indicators, does the proposed MPRR format present the indicator clearly (in its narrative, tables, charts, and maps)?

- For each indicator, what may serve as the appropriate corresponding milestone?

The TAC first discussed the draft proposed Tier 1 indicators (those with the strongest nexus to the goal and policies of the RMP), which would be analyzed as part of the MPRR. For many of the indicators, participants expressed a desire for science-based metrics that utilize on-the-ground data collection and monitoring. Highlands Council members replied that there was not a sufficient budget or staff capacity to perform on-the-ground data collection and analysis throughout the region, though there may be opportunities to extrapolate this data from Highlands Project Reviews and other existing management practices. Other participants noted that since the natural resources analysis was performed in the auspices of land use policy and water quality management, macro-level analyses using Land Use/Land Cover data (LULC) could be sufficient.

For the Carbonate Rock Areas indicator, participants suggested that the land use analysis should differentiate between residential and non-residential development, as these land uses have different implications for impacts to aquifers underlying karst features. TAC members further relayed that the impact of development in carbonate rock areas is greater in areas with a high dissolution rate, and suggested that the Carbonate Rock Areas be refined accordingly with respect to likelihood for dissolution as part of the Science and Research Agenda. Ultimately, a refined Carbonate Rock layer could be used to analyze the rate of development and preservation in high-risk areas based on dissolution potential. Participants recommended that the adoption of carbonate rock protection be considered a Tier 2 supportive indicator, as the impacts of development in carbonate rock areas can be mitigated to a large degree by proper site planning and design. The TAC further suggested tracking issuance of NJDEP Bureau of Surface Water permits as a Tier 2 indicator.

For the Critical Wildlife Habitat indicator, participants expressed concerns that more specific data metrics, such as the number of species of concern displaced by development or the preservation of edge habitat versus core habitat, were not included in the analysis. They felt that based on the trend of the initial analysis, this consideration of species loss could be a Tier 2 indicator. Participants recommended that this analysis be performed outside the Highlands Region for comparative purposes, and that vernal pools and Significant Natural Areas (Natural Heritage Priority Sites) be included as a subset of the analysis.

Some participants felt that Highlands Council should be engaging in on-the-ground monitoring of natural resources as part of the MPRR process. Mr. Piasecki (NJ Highlands Council) replied that this was not within the budgetary or staff capability of the Council. NJ Department of Environmental Protection's (NJDEP) Land Use/Land Cover (LULC) data is ground-truthed to some extent. In addition, while there have not been many to date, Highlands Project Reviews use on-the-ground data collected at the site. Accordingly, as an action item, the Council could establish a process to track habitat loss related to Highlands Council approved projects. The NJDEP Division of Fish and Wildlife Connecting Habitat across New Jersey (CHANJ) project will result in a Statewide Habitat Connectivity Plan (SHCP). The SHCP will serve as a blueprint for strategic habitat conservation, and will also highlight additional actions necessary to restore and maintain critical habitat linkages. The information from this project as well as NJDEP's work with Rowan University to perform a habitat change analysis could be incorporated into future indicator analyses as part of the Science and Research Agenda.

With regard to the Forest Integrity Score indicator, participants expressed that the method of assigning value classes based on percentage of total forest area by subwatershed was confusing and

less informative than simply looking at gross and net change in forest cover. The TAC recommended combining the Forest Integrity and Forest Resiliency indicators into a new indicator that analyzes overall (removing the subwatershed lens) net and gross loss of forest cover, and change in development and preservation in core forest areas. This analysis should be completed for the Highlands Planning Area and Preservation Area, and distinguishing between conforming and non-conforming municipalities. A threshold of negative change should be established at which point the Highlands Council could reevaluate integrity scores as a Tier 2 indicator, which is an intensive and expensive process.

The TAC expressed similar concerns with regard to the Riparian Integrity Score indicator, and using subwatershed value classes to report change in agricultural land use in riparian areas. Participants also questioned the relationship of agricultural land use to water quality, noting that there has been a lot of investment in preserving and restoring vegetated riparian buffers on agricultural lands to preserve water quality. The TAC recommended analyzing overall (removing the subwatershed lens) change in net and gross forest area in riparian buffers for the Highlands Planning Area and Preservation Area, and distinguishing between conforming and non-conforming municipalities. A threshold of negative change should be established at which point the Highlands Council could reevaluate integrity scores as a Tier 2 indicator. Tracking participation in Natural Resources Conservation Service (NRCS) Conservation Reserve Programs to establish or restore riparian forest buffers was suggested as another Tier 2 indicator.

The TAC indicated that they would also like to see change in development analyzed as part of the Special Environmental Zone (SEZ) indicator. Participants noted that it was important for the Highlands Council to be able to display trends in preservation in order to send a positive message to conservation partners. To that end, they recommended elevating the Conservation Priority Area and Significant Natural Areas (Natural Heritage Priority Sites) Tier 2/3 indicators, and combining them with the Special Environmental Zone indicator to establish a new Conservation Priorities indicator. The narrative of this indicator should also include information about overall preservation trends or rates in the Highlands Region. This analysis should be completed for the Highlands Planning Area and Preservation Area, and distinguish between conforming and non-conforming municipalities. Participants also stressed the importance of assessing the impact of preservation in maintaining habitat connectivity, which could be done using NJDEP's Connecting Habitat Across New Jersey project data once released.

With regard to Water Resource Management indicator, participants recommended tracking funding from the NRCS Conservation Innovation Grants program in order to determine where agricultural operations had upgraded the efficiency of their irrigation systems. However, this was not seen as a clear primary indicator and the TAC recommended the indicator be moved to the Water Resources topic area as a Tier 2.

Participants echoed earlier concerns about the use of value classes to analyze change in development and total forest area for the Watershed Resource Value indicator. Another area of concern was the clipping of contiguous habitat areas by subwatershed boundaries as part of the analysis. Ms. Danis (NJ Highlands Council) replied that habitat areas were analyzed as a whole before being clipped, and that this was necessary to target resources and learn where water resources were being threatened. She further relayed that, unlike the previously discussed integrity scores, she believed Highlands Council staff could reevaluate the Watershed Resource value internally. The TAC agreed that, if feasible, this re-evaluation would be an appropriate Tier 1 indicator.

Participants questioned why the Vernal Pools and Significant Natural Areas indicators are listed as Tier 2/3. Vernal pools provide habitat for amphibian reproduction, and amphibian health is a critical indicator of overall ecosystem health. Natural Heritage Priority Sites identify areas containing rare plant species and associated ecological communities. As noted above, these analysis of vernal pools and Significant Natural Areas have been integrated into related Tier 1 indicators.

Ms. Mercer then led the participants in a discussion of the remaining Tier 2 and 3 indicators, including Steep Slopes, Forest Area, Number/Location Restoration Plans/Projects, Hydric Soil Areas, Invasive Species, Open Space Taxes, Recreational Land Use Patterns and Resilient Landscape Preservation. The TAC agreed that these indicators should remain Tier 2 and 3.

Participants then examined Tier 1 indicators from other topic areas that were determined to have a significant nexus to natural resources. With regard to the analysis of building permits and certificates of occupancy (CO's) for several indicators, participants noted that permits and CO's for exemptions should be analyzed. Mr. Piasecki (NJ Highlands Council) replied that the Council would internally discuss the possibility of performing this analysis.

Ms. Mercer then reviewed the final proposed changes to Natural Resources indicators:

Carbonate Rock Areas:

- Distinguish between residential and non-residential uses in LULC analysis
- Add a Tier 2 indicator analyzing ordinances regarding development in carbonate rock areas
- Add Tier 2 indicator tracking issuance of NJDEP Bureau of Surface Water permits
- Refine the Carbonate Rock Area to identify areas that have a high rate of dissolution (Science and Research Agenda)

Critical Wildlife Habitat:

- Add Vernal Pools and Significant Natural Areas (Natural Heritage Priority Sites) geographic to analysis
- Incorporate a connectivity analysis using NJDEP's Connecting Habitat Across New Jersey project (Science and Research Agenda)
- Add a Tier 2 indicator determining the number of species of Special Concern that relied on lost habitat identified in Tier 1

Forest Integrity Score & Forest Resiliency

- Combine Forest Integrity Score & Forest Resiliency indicators, and title "Forest Impacts"
- Remove breakdown by HUC14 subwatershed
- Determine the gross and net change in total forest area and land use change (development) and preservation in core forest areas.
- Analyze for Planning and Preservation Area, distinguishing conforming and non-conforming municipalities
- Add a Tier 2 indicator to reevaluate the Forest Integrity Score should the combined analysis indicate a significant negative trend

Riparian Integrity Score

- The indicator will report change in total forest area in riparian areas
- Remove breakdown by HUC14 subwatershed
- Determine the change in gross and net change in total forest area in riparian areas.
- Add a Tier 2 indicator to reevaluate the Riparian Integrity Score should the total forest areas analysis indicate a significant negative trend
- Tracking participation in Natural Resources Conservation Service (NRCS) Conservation Reserve Programs to establish or restore riparian forest buffers

Water Resource Management

- Move to a Tier 2 indicator in the Water Resources topic area
- NRCS Conservation Innovation Grants program expenditures suggested as a possible data source

Special Environmental Zone

- Add analysis of change in development (urban land uses)
- Include an analysis of preservation and development of Conservation Priority Areas and Significant Natural Areas (Natural Heritage Priority Sites) (previously Tier 2/3 indicators)

Watershed Resource Value

- Highlands Council to reevaluate value scores using the most up-to-date data

Conservation Priority Areas (Tier 2)

- Consolidated into Special Environmental Zone

Vernal Pools (Tier 2)

- Consolidated into Critical Wildlife Habitat

Significant Natural Areas (Tier 3)

- Consolidated into Critical Wildlife Habitat and Special Environmental Zone

ADDITIONAL COMMENTS RECEIVED:

Several Natural Resources TAC members were not able to attend the meeting and submitted written comments in lieu of their attendance. Those comments that address Natural Resources indicators are summarized below:

- For the Carbonate Rock Areas indicator, it was recommended that a risk assessment approach be used as part of the analysis. This would involve the use of geologic data to identify areas within carbonate rock areas that are more susceptible to sinkholes and other surface deformations, and the analysis of development patterns within these high-risk areas.
- Instead of using value classes to compare changes between subwatersheds, the overall relative change for each indicator could be displayed using 5 percent intervals.

- There could a more substantive analysis of urban land use change using alternative data sources.
- There should be an indicator related to steep slopes.
- Vermeule Maps, which date back to the 1800's, could be used to differentiate between old-growth forests and those that were tilled and plowed. Soils in old-growth forests will be of significantly higher quality and species of concern are more likely to be found there. Thus, these areas should be prioritized for preservation and stewardship. Vermeule Map data could be incorporated into many of the Tier 1 indicators, particularly Watershed Resource Value, Forest Resiliency, Riparian Integrity Score, Special Environmental Zones, and Conservation Priority Areas. A new Tier 1 indicator could be also be created to look at both soil and vegetation quality.

REVISED DRAFT NATURAL RESOURCES INDICATORS:

TIER 1 INDICATORS:

- **Critical Wildlife Habitat:** Measures change in extent, preservation, or development of habitat types in Critical Wildlife Habitat areas, vernal pools, and Natural Heritage Priority Sites.
- **Forest Impacts:** Measures the change in total forest area, and development and preservation in core forest areas.
- **Riparian Integrity:** Measures change in total forest area in riparian areas.
- **Priority Conservation:** Measures the change in development or preservation of the Special Environmental Zone, Conservation Priority Area, and Significant Natural Areas (Natural Heritage Priority).
- **Watershed Resource Value:** Measures change in watershed resource value score by HUC14 subwatershed.

TIER 2 and 3 INDICATORS

- **Carbonate Rock Index:** Measures change in residential and non-residential development and preservation of carbonate rock areas, measures development of RMP prohibited uses in Carbonate Rock Areas, and tracks adoption of ordinances related to development in carbonate rock areas.
- **Species of Special Concern Lost in Habitat Conversion:** Measures the number of species of concern potentially present in converted habitat lands.
- **Forest Integrity Score by HUC14:** Measures change in forest integrity score by HUC14 subwatershed.
- **Riparian Integrity Score by HUC14:** Measures change in riparian integrity score by HUC14 subwatershed.
- **NRCS Conservation Reserve Program Participation:** Measures participation in the NRCS Conservation Reserve Program for the purposes of restoring or maintaining forest riparian buffers.
- **Forest Resource Area:** Measures change in land use or preservation of Forest Resource Area lands.
- **Habitat Restoration:** Measures the number and location of areas with habitat restoration plans or projects.
- **Hydric Soils:** Measures change in land or preservation of hydric soil areas.
- **Invasive Species:** Measures number and location of invasive species occurrences and eradications, including "invasive alien earthworms."
- **ISI Permits:** Tracks issuance of ISI permits.
- **Open Space Taxes:** Measures change in the tax rate and net value of open space taxes collected.
- **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.