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# Green Infrastructure Planning and Implementation Action Items

Christopher C. Obropta, Ph.D., P.E.

obropta@envsci.rutgers.edu

*February 7, 2017*

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# Rutgers Cooperative Extension

Rutgers Cooperative Extension (RCE) helps the diverse population of New Jersey adapt to a rapidly changing society and improves their lives through an educational process that uses science-based knowledge.

# Water Resources Program



Our Mission is to identify and address community water resources issues using sustainable and practical science-based solutions.

# Three New Sustainable Jersey Green Infrastructure Planning Action Items

1.  Tier 1: Impervious Cover Assessment (10 points)

2.  Tier 2: Green Infrastructure Action Plan (20 points)

3.  Tier 3: Green Infrastructure Strategic Plan (30 points)

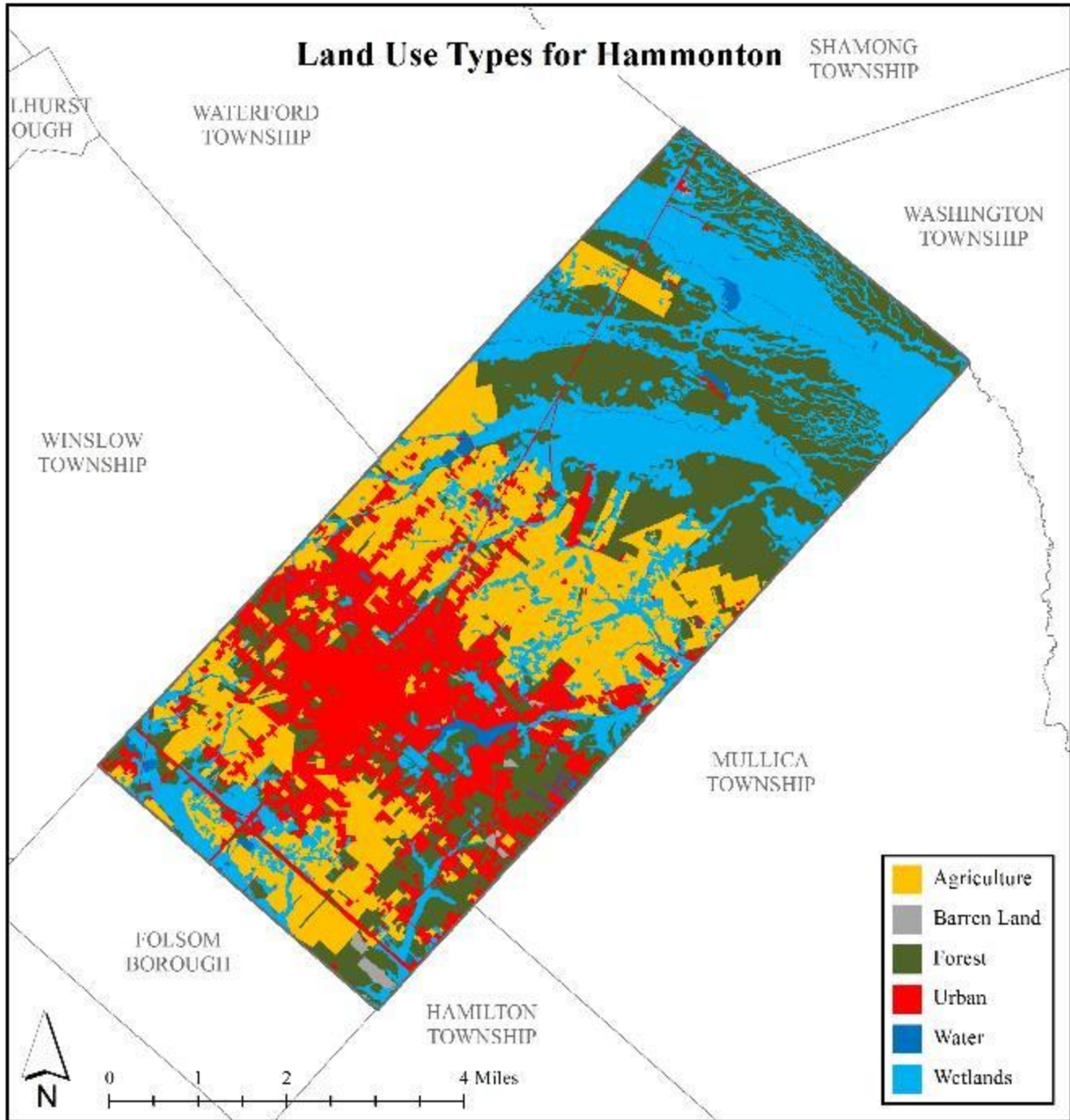# Tier 1:  Impervious Cover Assessment

# Impervious Cover Assessment

- Analysis completed by watershed and by municipality

- Use 2007 Land Use data to determine impervious cover

- Calculate runoff volumes for water quality, 2, 10 and 100 year design storm and annual rainfall

- Contain three concept designs

**Land Use Types for Hammonton**

SHAMONG TOWNSHIP

WATERFORD TOWNSHIP

WASHINGTON TOWNSHIP
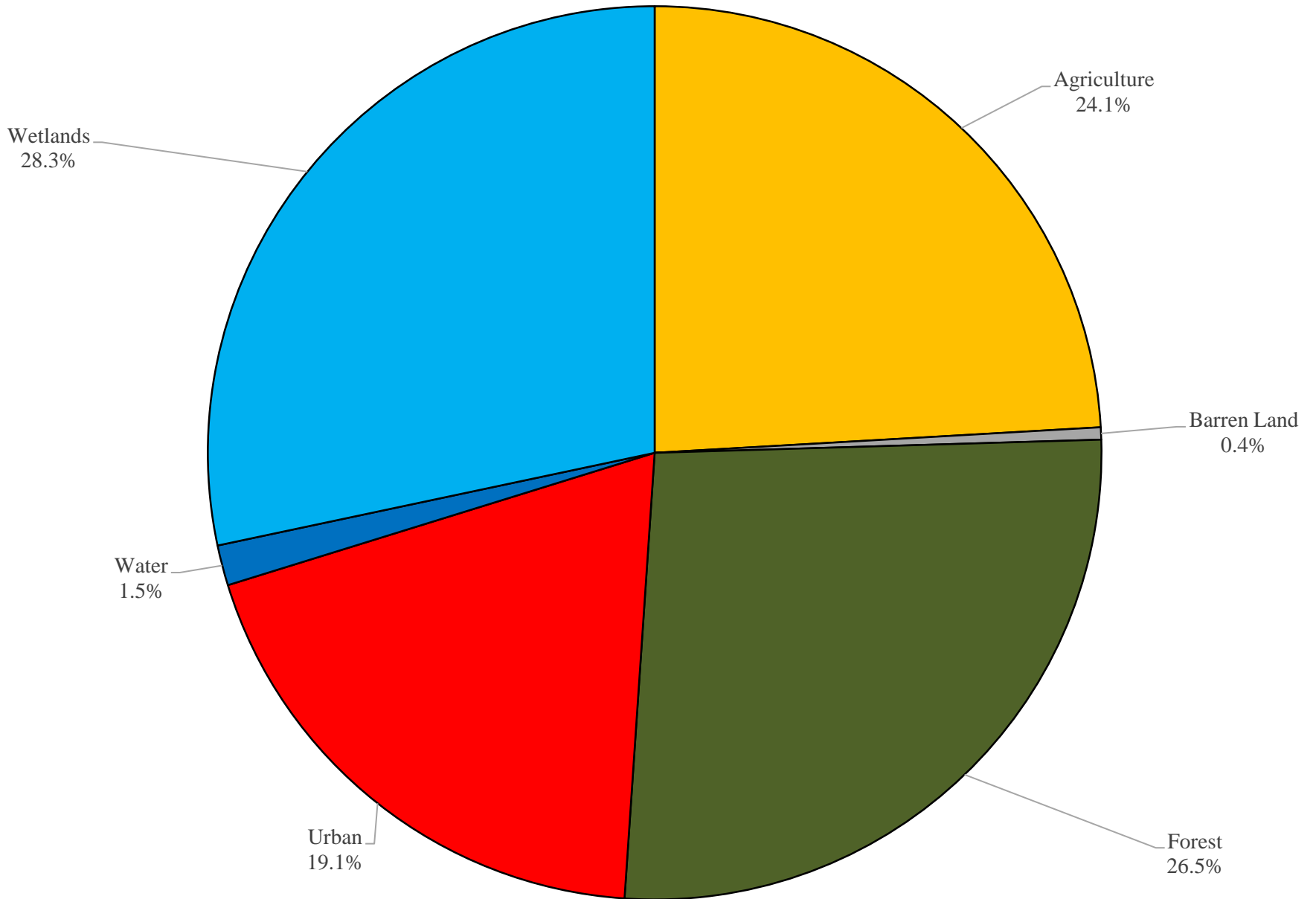
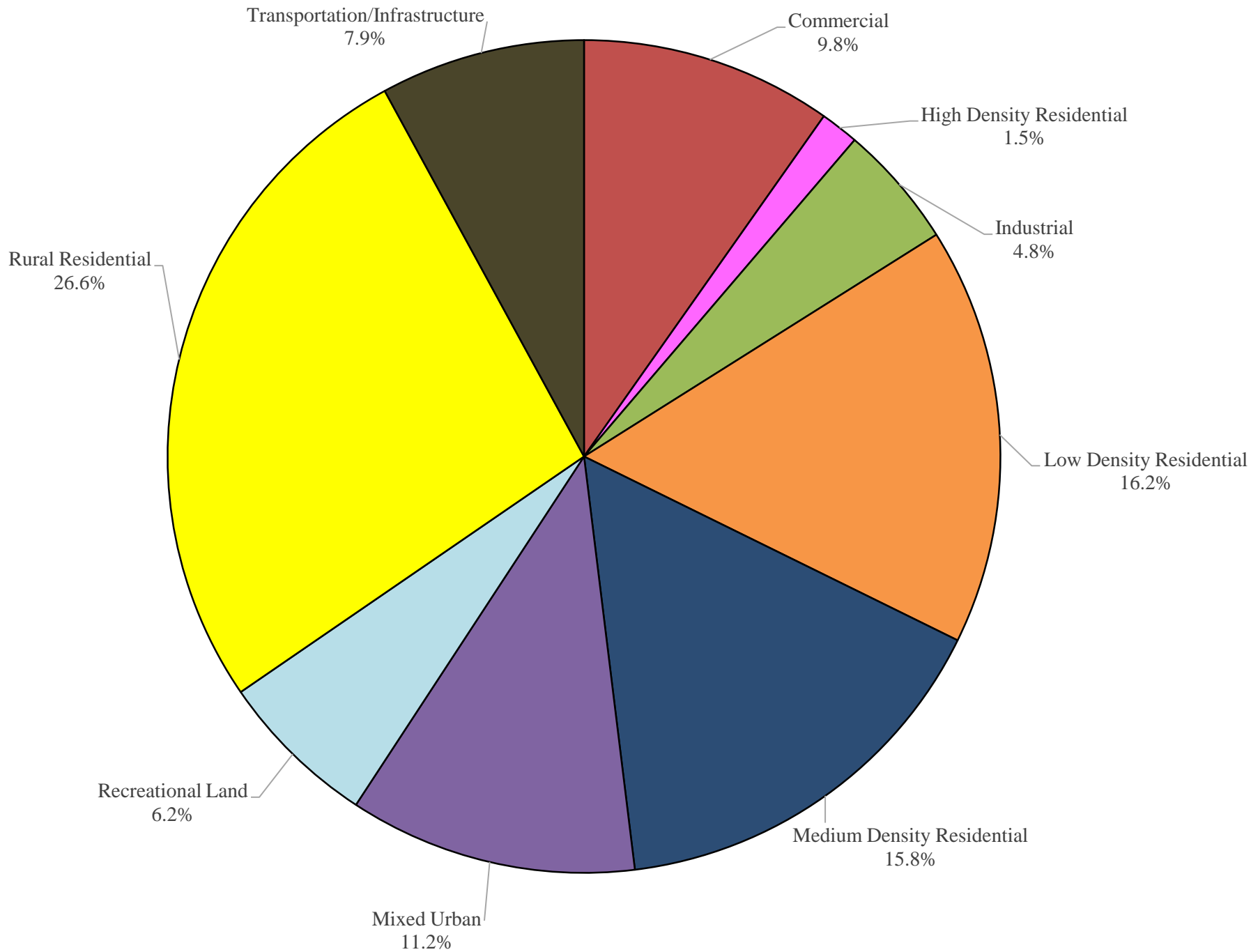I.HURST OUGH

WINSLOW TOWNSHIP

MULLICA TOWNSHIP

FOLSOM BOROUGH

HAMILTON TOWNSHIP

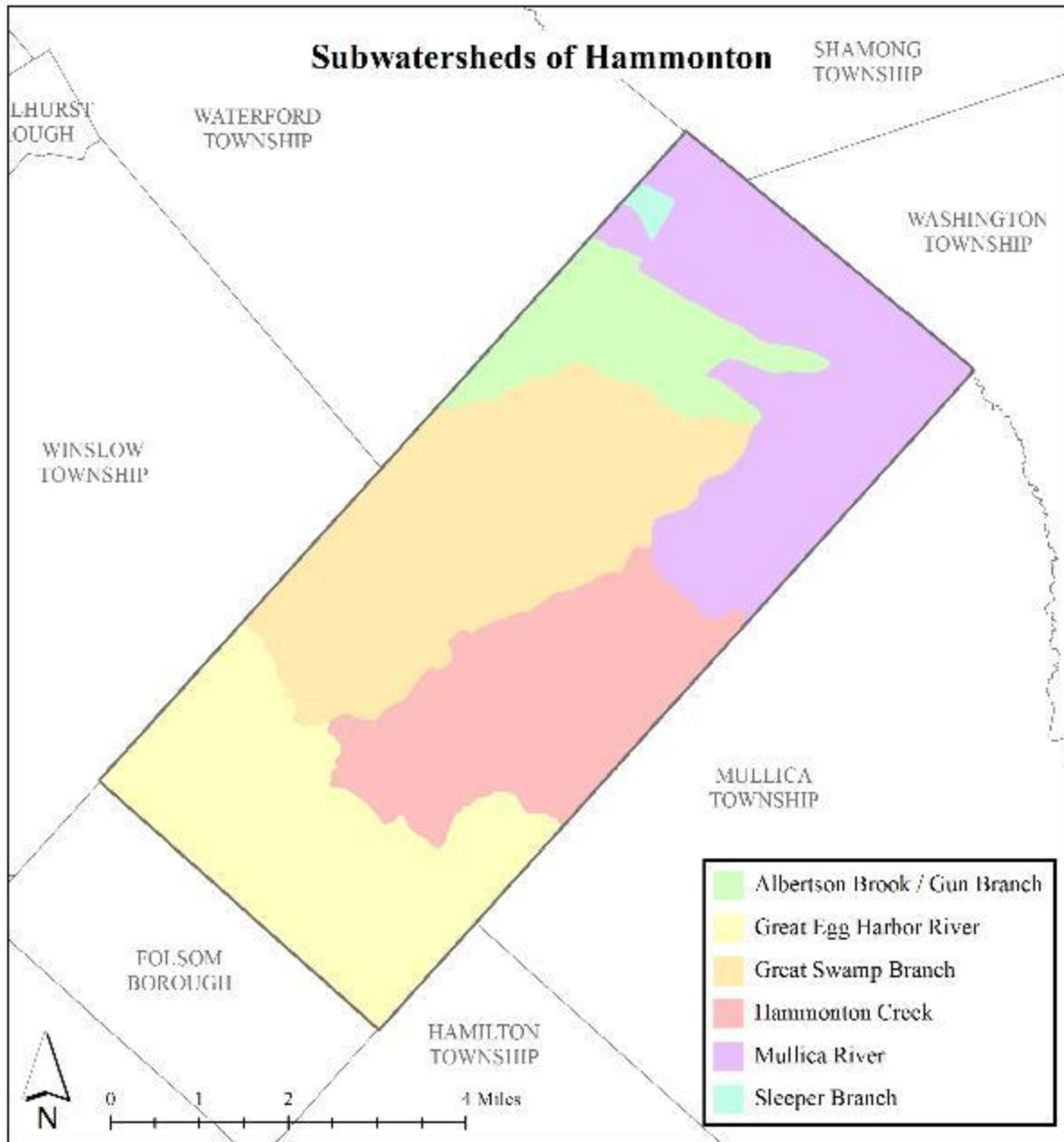| Agriculture |
| Barren Land |
| Forest |
| Urban |
| Water |
| Wetlands |

0    1    2         4 Miles

N

# Subwatersheds of Hammonton

SHAMONG TOWNSHIP

LHURST OUGH

WATERFORD TOWNSHIP

WASHINGTON TOWNSHIP

WINSLOW TOWNSHIP

MULLICA TOWNSHIP

FOLSOM BOROUGH

HAMILTON TOWNSHIP

N

0   1   2   4 Miles

| | |
|---|---|
| 🟩 | Albertson Brook / Gun Branch |
| 🟨 | Great Egg Harbor River |
| 🟧 | Great Swamp Branch |
| 🟥 | Hammonton Creek |
| 🟪 | Mullica River |
| 🟦 | Sleeper Branch |

| Watershed | Total Area (ac) | Impervious Cover (ac) | % |
|---|---|---|---|
| Albertson Brook / Gun Branch | 2,358.4 | 10.1 | 0.4% |
| Great Egg Harbor River | 5,947.5 | 341.0 | 5.8% |
| Great Swamp Branch | 7,144.4 | 544.1 | 7.7% |
| Hammonton Creek | 4,872.7 | 450.2 | 9.5% |
| Mullica River | 5,998.5 | 8.2 | 0.1% |
| Sleeper Branch | 117.4 | 2.8 | 2.4% |
| Total | 26,438.8 | 1,356.4 | 5.2% |

Original ICM developed based on 200+ reports and papers

Impervious Cover Model

Stream Quality: Good, Fair, Poor

Sensitive, Impacted, Non-Supporting, Urban Drainage

Watershed Impervious Cover: 10%, 25%, 40%, 60%, 100%

**Reference: Tom Schueler and Lisa Fraley-McNeal, Symposium on Urbanization and Stream Ecology, May 23 and 24, 2008**
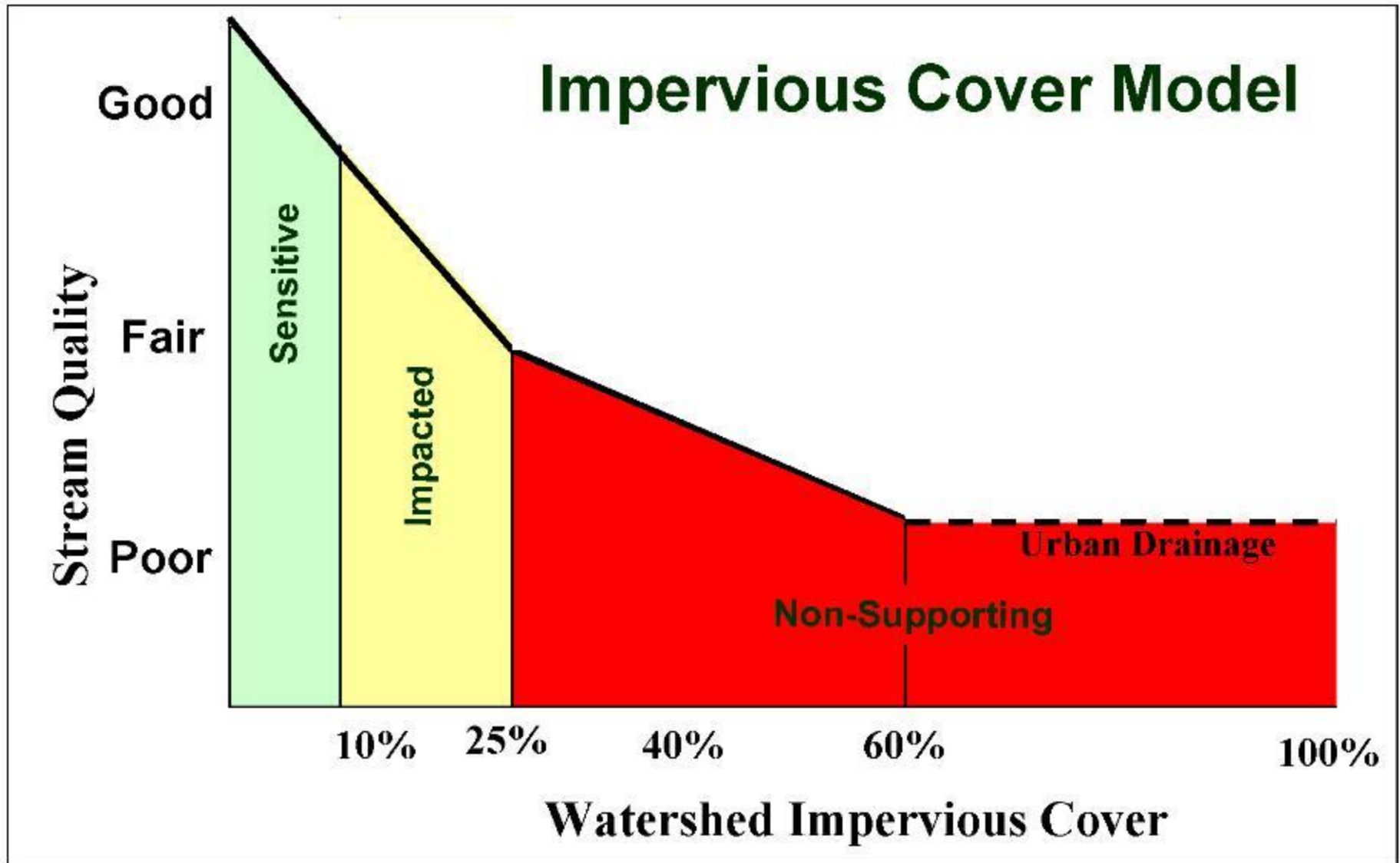
| Subwatershed | NJ Water Quality Storm (MGal) | Annual Rainfall of 44" (MGal) | 2-Year Design Storm (3.3") (MGal) | 10-Year Design Storm (5.0") (MGal) | 100-Year Design Storm (8.2") (MGal) |
|---|---|---|---|---|---|
| **Albertson Brook / Gun Branch** | 0.3 | 12.1 | 1.0 | 1.4 | 2.3 |
| **Great Egg Harbor River** | 11.6 | 407.4 | 32.4 | 48.1 | 76.8 |
| **Great Swamp Branch** | 18.5 | 650.0 | 51.7 | 76.8 | 122.6 |
| **Hammonton Creek** | 15.3 | 537.9 | 42.8 | 63.6 | 101.5 |
| **Mullica River** | 0.3 | 9.8 | 0.8 | 1.2 | 1.8 |
| **Sleeper Branch** | 0.1 | 3.4 | 0.3 | 0.4 | 0.6 |
| **Total** | 46.0 | 1,620.5 | 128.9 | 191.5 | 305.7 |

# Tier 2: Green Infrastructure Action Plan

# Action Plan …

- Sets immediate and short-term goals (< 5 years)
- Documents community engagement
- Identifies opportunities
- Contains concept plans for opportunities
- Provide linkage to stormwater mitigation plan

# Recommended  Short-Term Impervious Cover Management Goals

| Existing Municipal Impervious Cover | Recommended Short-Term (<5 years) Impervious Cover Management Goal (%) | Recommended Impervious Cover Management Goal Area (acres) |
|---|---|---|
| **0% to 10%** | 1% | 10 acres |
| **10.1% to 25%** | 2% | 15 acres |
| **> 25.1%** | 5% | 20 acres |

# Green Infrastructure

…an approach to stormwater management that is cost-effective, sustainable, and environmentally friendly
Green Infrastructure projects:

- capture
- filter
- absorb
- reuse

stormwater to maintain or mimic natural systems and treat runoff as a resource

# Green Infrastructure includes:

- green roofs
- rainwater harvesting
- tree filter/planter boxes
- rain gardens/bioretention systems
- permeable pavements
- vegetated swales or bioswales
- natural retention basins
- trees & urban forestry
- green streets



Parker Urban Greenscapes. 2009.

disconnected downspouts
pervious pavement
bioretention systems
drainage area
property line
2012 Aerial: NJOIT, OGIS

0'     100'     200'

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Downspouts around the building can be disconnected and redirected to rain gardens to capture, treat, and infiltrate roof runoff. Parking spaces in the two parking lots can be converted to porous asphalt to capture and infiltrate runoff from the parking lot. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

| Impervious Cover | | Existing Loads from Impervious Cover (lbs/yr) | | | Runoff Volume from Impervious Cover (Mgal) | |
|---|---|---|---|---|---|---|
| % | sq. ft. | TP | TN | TSS | From the 1.25" Water Quality Storm | For an Annual Rainfall of 44" |
| 12 | 606,360 | 29.2 | 306.2 | 2,784.0 | 0.472 | 16.63 |

| Recommended Infrastructure Practices | Recharge Potential (Mgal/yr) | TSS Removal Potential (lbs/yr) | Maximum Volume Reduction Potential (gal/storm) | Peak Discharge Reduction Potential (cu. ft./second) | Estimated Size (sq. ft.) | Estimated Cost |
|---|---|---|---|---|---|---|
| Disconnection | - | - | - | - | - | $3,250 |
| Bioretention systems | 0.627 | 105 | 45,912 | 4.02 | 7,365 | $30,090 |
| Pervious pavement | 1.075 | 180 | 148,269 | 1.25 | 6,018 | $184,125 |

HAMMONTON HIGH SCHOOL

566 Old Forks Road
Hammonton, NJ 08037

# CURRENT CONDITION

# CONCEPT DESIGN

# Tier 3: Green Infrastructure Strategic Plan

# Strategic Plan …

- Sets long-term goals (5-20 years)

- Identifies long-term projects

- Documents water quality benefits

- Identifies a funding strategy

- Contains agenda with policy recommendations and incentives

- Provide linkage to stormwater mitigation plan

# Recommended Long-Term Impervious Cover Management Goals and Green Infrastructure Goals

| Existing Municipal Impervious Cover | Recommended Long-Term (5-20 years) Impervious Cover Management Goal (%) | Recommended Impervious Cover Management Goal Area (acres) |
|---|---|---|
| 0% to 10% | 2% | 25 acres |
| 10.1% to 25% | 5% | 50 acres |
| > 25.1% | 10% | 80 acres |

# Three New Sustainable Jersey Green Infrastructure Implementation Action Items

Tier 1:  Implement Green Infrastructure Demonstration Projects  - Two Projects or One Policy (10 points)

# Three New Sustainable Jersey Green Infrastructure Implementation Action Items

Tier 2:  Implement Green Infrastructure Action Plan – achieve 50% of short-term goal (20 points)

# Three New Sustainable Jersey Green Infrastructure Implementation Action Items

Tier 3:  Implement Green Infrastructure Strategic Plan – achieve 50% of long-term goal (30 points)

# QUESTIONS?

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