

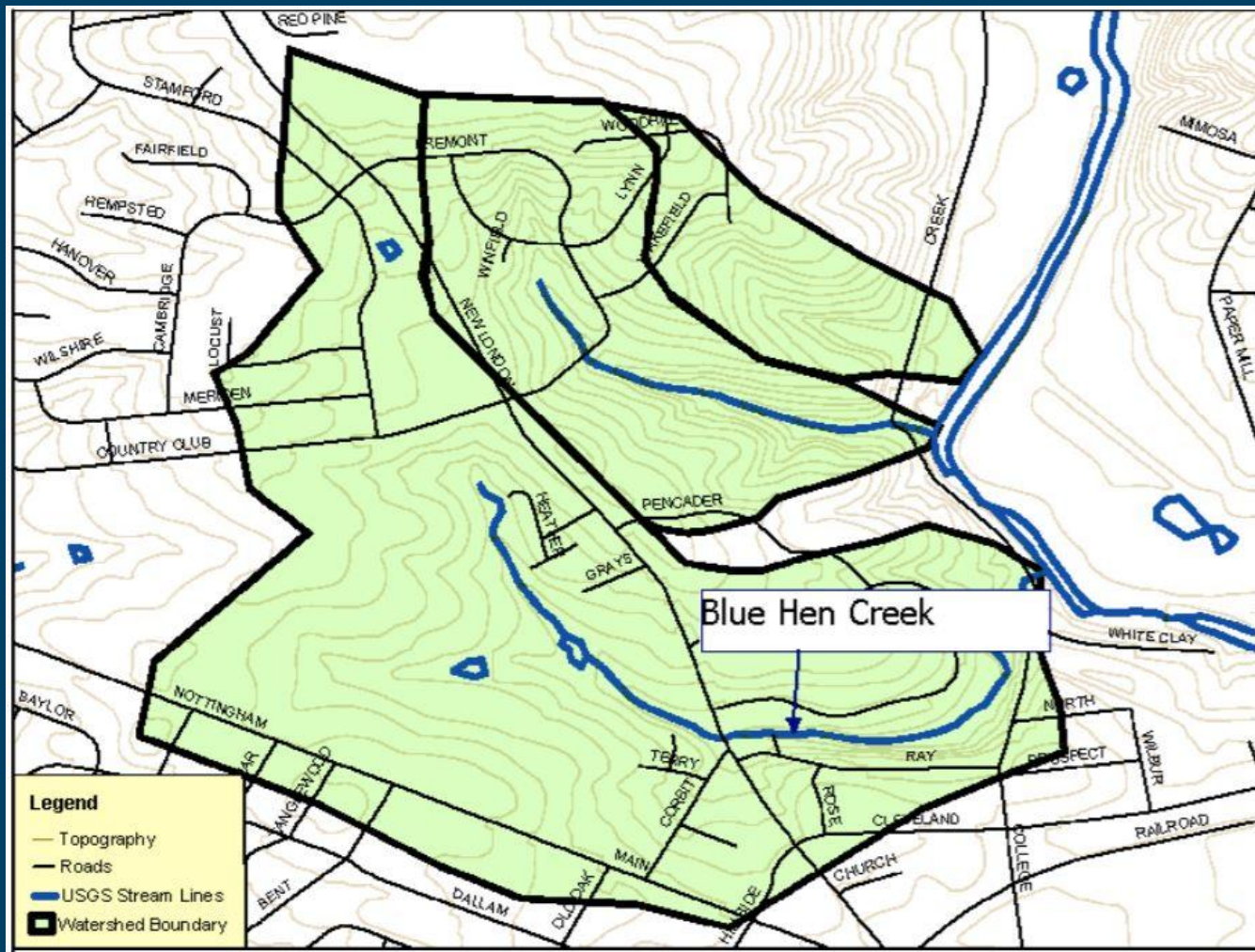


# Healing the Ecosystem in Newark's Stream



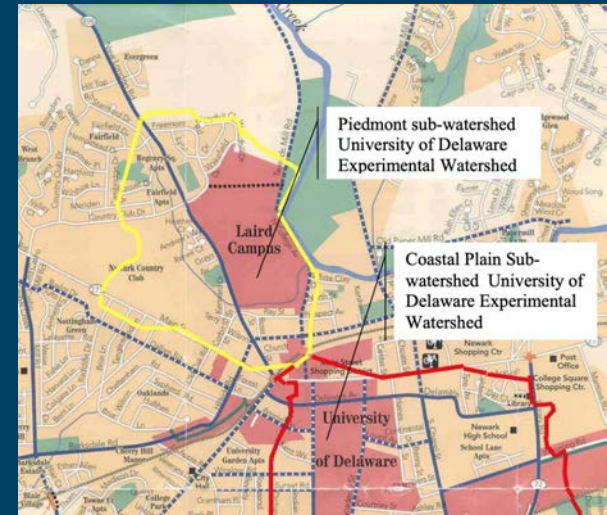
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# Blue Hen Creek

- Piedmont sub-watershed
  - Tributary to White Clay Creek
  - 1.16 miles in length
  - Drains 281.6 acres of the experimental watershed
- Headwaters at the Newark Country Club Golf Course and flows through Laird Campus at the University of Delaware
- Primary land uses include residential, forested, and commercial, which contribute to the 33% impervious cover within the watershed



# Land Uses



Land Use	Rating
Multi-family Residential	2
Agricultural	2
Commercial	2
Single Family Residential	3
Institutional	3
Wooded	4
Public/Private Open Space	4

Rating	Watershed Imperviousness	Impact to Stream
4	0%	No Impact
3	0-10%	Sensitive
2	10-25%	Impacted
1	> 25%	Non-Supporting of Aquatic life

# History

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- Laird Campus made up of four residential dorms, hotel, conference center, the Christiana Towers, and the Pencader dining hall
- \$72 million project to update the Pencader Complex that made up of 12 residential buildings and 3 common buildings
- New dorms consists of Independence Hall, George Read Hall, Thomas McKean Hall, and James Smith Hall



# University Policy 7-49 Storm Water Management

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- Introduced in 2004, revised in 2006 and 2014
- Partnership with the City of Newark

## Purpose:

- protect the storm water system by prohibiting University employees, students, and contractors from disposing chemicals into drains leading to it
- Require prior approval from Environmental Health and Safety
- National Pollutant Discharge Elimination System(NPDES) compliance

# Mission Statement

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HENS's mission is to target current issues in a stream that runs through the University of Delaware's Laird Campus, Blue Hen Creek, and to raise its current assessment grade of a C to a B- by the year 2035.

# Problem 1: Erosion

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Issue:

The 33% of impervious cover within the watershed combined with the presence of a highly invasive species covering the streambanks has contributed to erosion.

Solution:

- Control multiflora rose on the University of Delaware Laird Campus
- Plant native trees, shrubs, and grasses to stabilize banks
- Create a forested buffer between developed land and Blue Hen Creek





# Problem 2: In Stream Habitat Quality

## Issue:

- Blue Hen Creek received a moderate habitat rating (B-)
- Chemical, biological, and physical composition of water
- Invasive species hinder the growth of beneficial species (native fauna)

## Solution :

- Limiting invasive species by cutting or herbicides
- Litter cleaning efforts and preventive measures
- Woody Debris (by hand)
- Log, brush, and rock structures (by tools)

NZ-SHMAK Part C: Habitat Quality Results		
Site	Reference	Blue Hen
Parameter (max. score)	Score	
Flow Velocity (10)	8	1
pH (10)	5	10
Temperature (10)	5	5
Conductivity (20)	16	6
Clarity (10)	10	10
Stream Bed Composition (20)	4.5	3
Deposits (10)	5	-5
Bank Vegetation (20)	19.5	8
Total (100)	73	38
Habitat Score	Very good	Moderate

# Problem 3: Nutrient Runoff

## Issue:

- Abnormally high level of algae
- Excess phosphorus and nitrogen from fertilization practices at the nearby golf course
- Excess Algae = harm to water quality, food resources and habitat, and decreases oxygen availability for fish and other aquatic life

## Solution:

- Buffer Strips (Native grasses, turf, plants trap nutrients)
- Controlled releases (small amounts and avoid applying before rain storm)
- Construct wetlands or filters to contain nutrients
- Use turfgrass that needs less fertilizer



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# HENS Goals

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- Control multiflora rose on the University of Delaware Laird Campus
- Plant native trees, shrubs, and grasses to stabilize banks
- Create a forested buffer between developed land and Blue Hen Creek
- Clean and prevent litter from reaching the stream
- Place a woody debris in pools and under boulders
- Place log, brush and rock structures at the end of banks
- Utilize controlled releases when working with fertilizers
- Construct wetlands or filters to contain nutrients
- Use turfgrass that needs less fertilizer



# Outcomes

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- Allow for native species to grow back creating a more healthy ecosystem
- Create a more stable bank and prevent invasive species from growing as easily
- Reduce the amount of runoff entering the stream
- Reduces the release of toxic chemicals from litter into the habitat and aquatic life
- Filter leaf collection, improving conditions for fish life
- Supports food cycle and shading
- Natural ways of avoiding the nutrient runoff into getting into the creek
- Less fertilizer means a lot less nutrient runoff into the streams
- Reducing runoff means reducing harmful algae



Questions?