AgroEcology Gateway Experience | *Extending UMD's Agricultural Legacy to the North Gateway*

Our design takes advantage of the visibility offered by north gateway of the University of Maryland to showcase its rich *agricultural legacy* and commitment to *environmental stewardship*. Currently, the north gateway does not showcase the north side of campus's green infrastructure approach to stormwater management, diverse ecosystems and naturalistic character. The AgroEcology Gateway Experience proposes to highlight the area's *ecological diversity* and *naturalistic aesthetic* by implementing *artful green infrastructure* that tells the story of *Maryland's diverse habitats* while connecting to *existing green infrastructure systems* in the rest of campus.
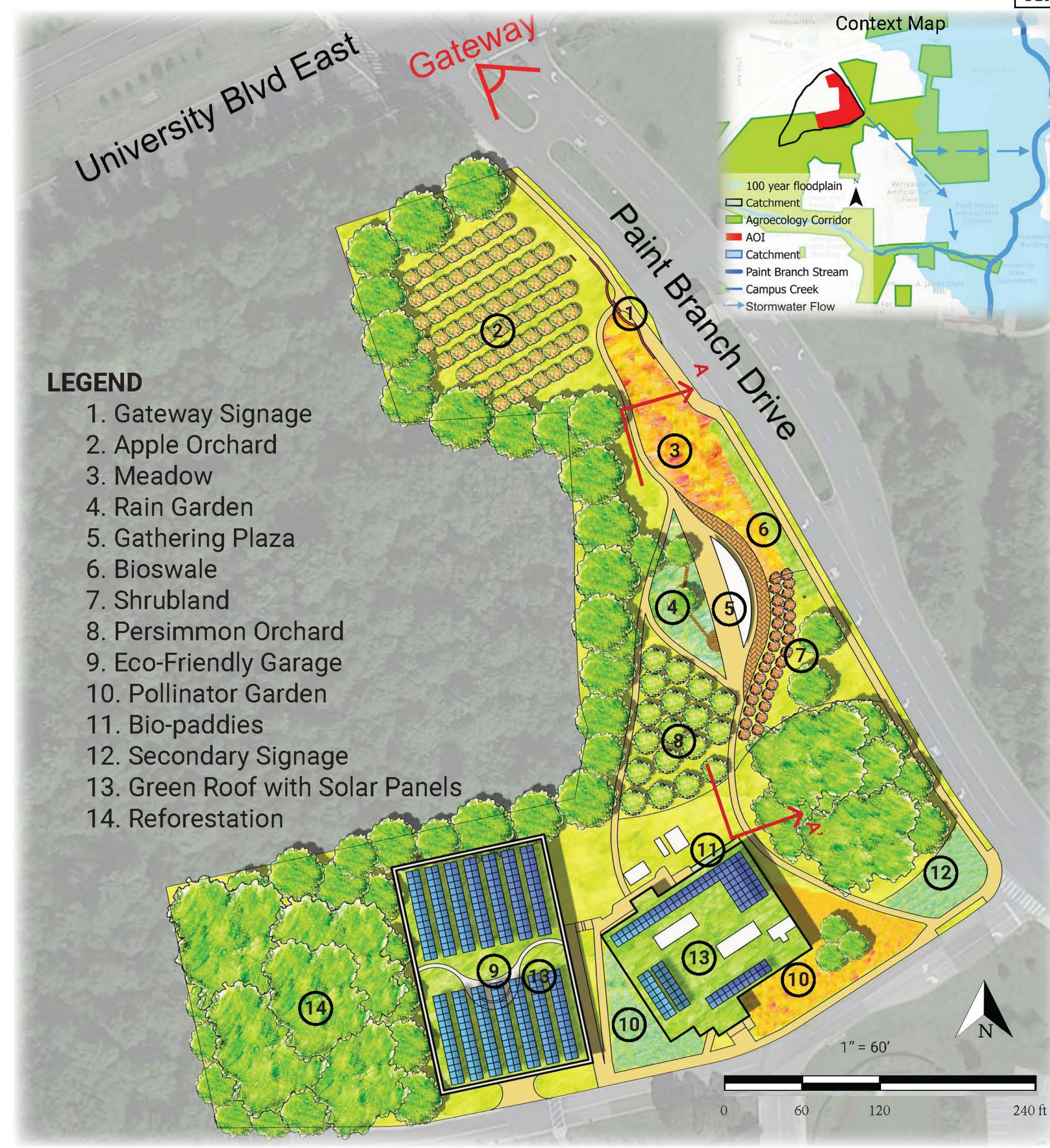
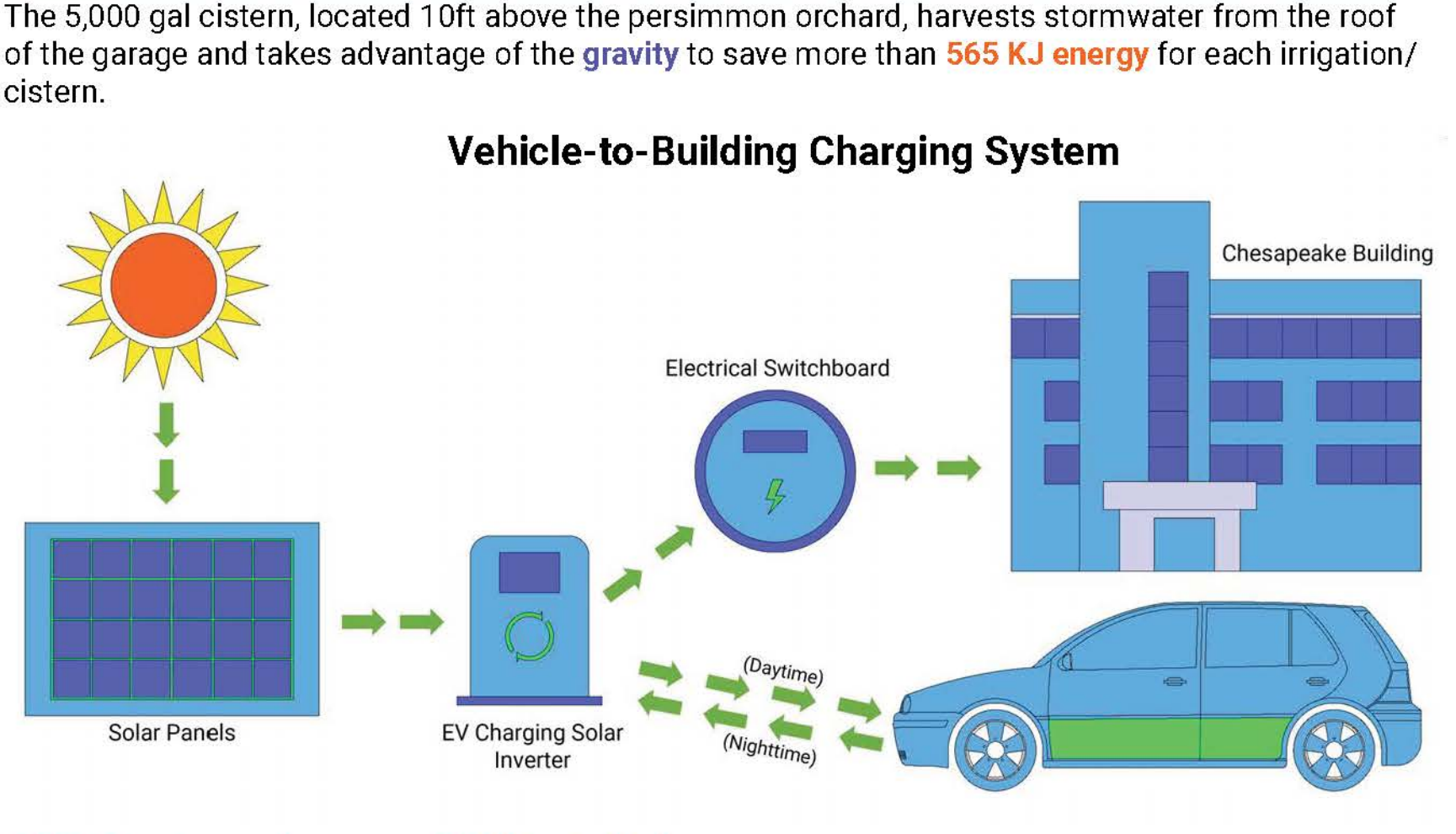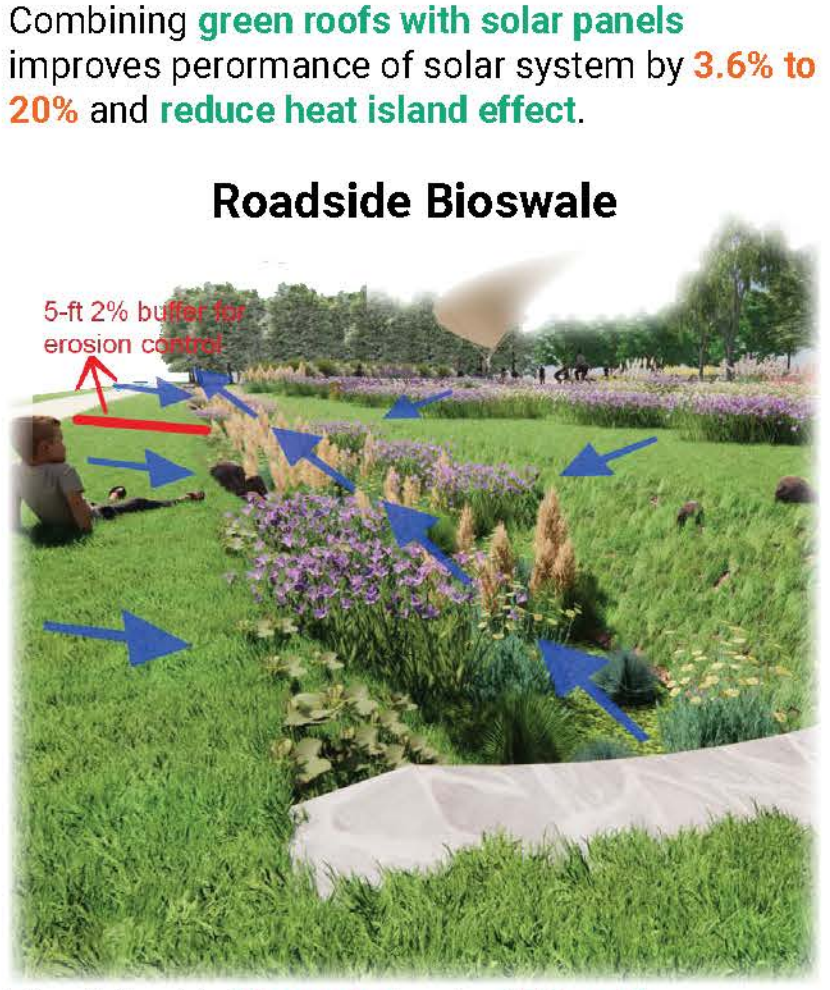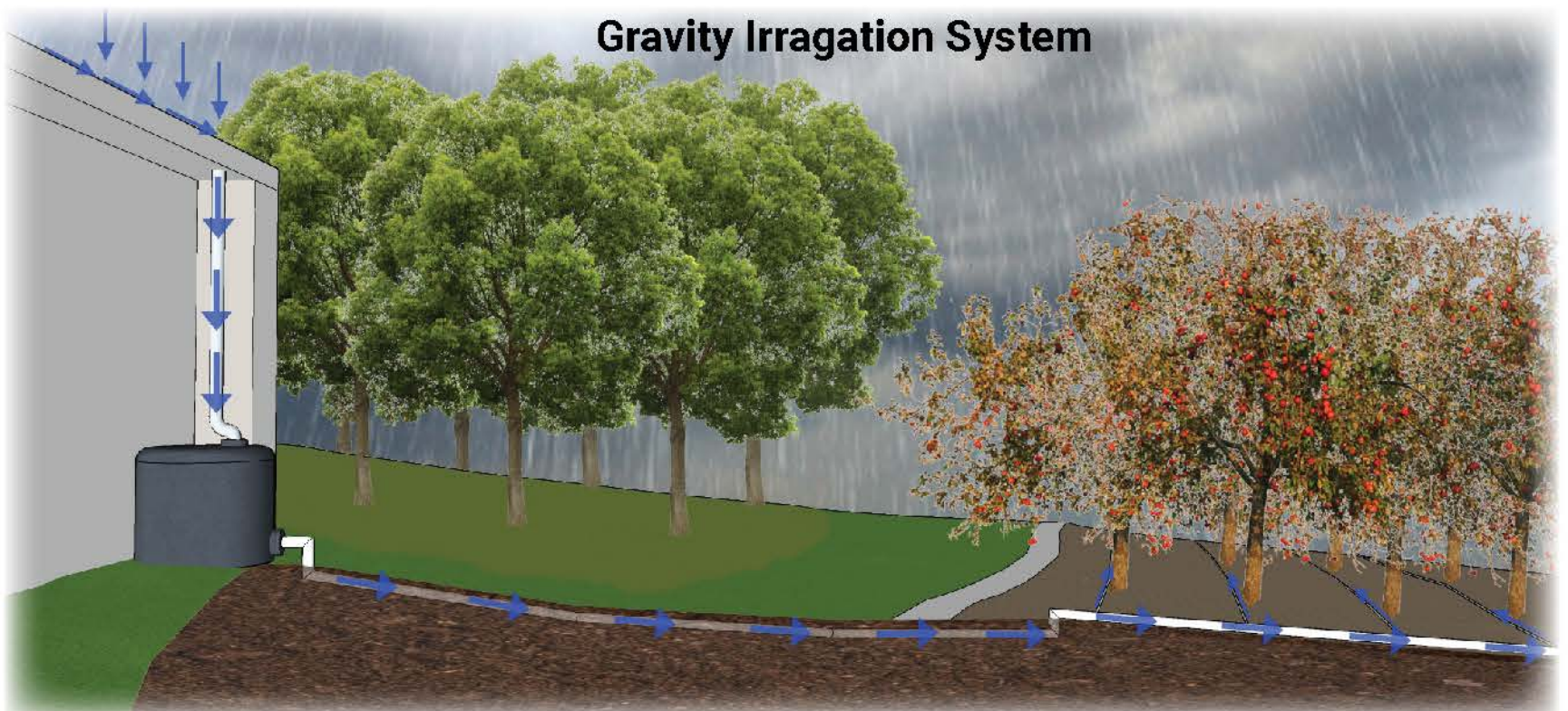Unwelcoming | Underutilized | Outdated | Degraded

Goals and Objectives

Ecology

Address Climate Change
Reforestation
Heat island reduction
Reduction of greenhouse gas emissions

Stormwater Management
Collection and treatment of water

Increase Plantings
Increase habitats for wildlife & pollinators
Native Species that can withstand planting zones 7a-8
Food forest edge

Education

Research Opportunities
Green technology development
Food safety
UMD's first-ever patented apple variety

Environmental Eduction
Green infrastructure

Economy

Green Energy Production
Lower heating/cooling cost with green infrastructure
Ep to Ek for irrigation with the gravity drip system
Energy supply with solar panels

Cost Savings
Stormwater fee reduction
Carbon sequestration

Society

Gateway Enhancement
Improve signages
Highlight UMD's development history
Showcase Maryland's ecological variety

Community Engagement
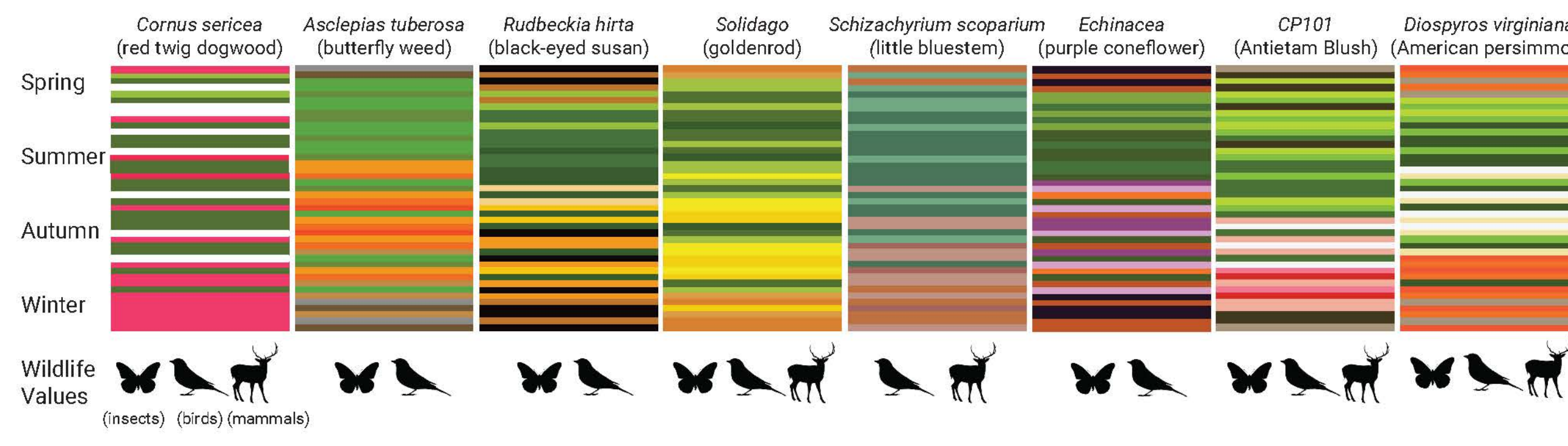Space for community gathering and harvest celebration

Performances

6,790 cu ft Stormwater can be treated on the site for the 1-year 24 h rain event
····· **5.7-year** 1.6 gallons' toilet flush

67,243 cu ft Stormwater can be harvested annually for irrigation
····· **130** young fruit trees' water need

156,437 Btu Energy for heating/cooling saved by the green roofs
····· **3.2%** Chesapeake Building energy use

816,149 kWh Electricity generated by solar panels
····· **2,356** EV's 100-mile travel

35,000 SF Reforestation to replace the existing parking lot
····· **7.5** basketball courts

1,641,734 lbs CO2 reduced in the next 30 years
····· **1.82 acre** 50-year-old oak forest

8,032 lbs Fruits can be produced annually by the orchards
····· **$12,033** annual profit

Existing / Proposed

47.34% Impervious Area → **11.38%** Impervious Area

18 °F Difference Between Paved and Vegetated Areas (Nov. 1st)
- Measuring Point
- 52.39 °F - Average Temperature of Plant Cover
- 70.29 °F - Average Temperature of Asphalt Area
- 71.24 °F - Average Temperature of Concrete

5.78 °F Potential Ground-level Average Temperature Decrease
- Ground-level Vegetated Area
- Ground-level Paved

11,815 cu ft Stormwater Needs to be Treated for "Woods in Good" Condition → **4,604 cu ft** Stormwater Needs to be Treated After Design

Context Map Legend
- 100 year floodplain
- Catchment
- Agroecology Corridor
- AOI
- Catchment
- Paint Branch Stream
- Campus Creek
- Stormwater Flow

University Blvd East
Gateway
Paint Branch Drive

LEGEND
1. Gateway Signage
2. Apple Orchard
3. Meadow
4. Rain Garden
5. Gathering Plaza
6. Bioswale
7. Shrubland
8. Persimmon Orchard
9. Eco-Friendly Garage
10. Pollinator Garden
11. Bio-paddies
12. Secondary Signage
13. Green Roof with Solar Panels
14. Reforestation

1" = 60'
0   60   120   240 ft
N

Methods and Programs

Gateway and Apple Orchard
The proposed gateway and the 16,500 sq ft **Antietam Blush** orchard, producing **5,280 lbs apples** annually, catch visitor's eyes and highlight UMD's **culture, history, and research**.

Green Roof With Solar Panels
Combining **green roofs** with solar panels improves performance of solar system by **3.6% to 20%** and reduce heat island effect.

Gravity Irrigation System
The 5,000 gal cistern, located 10ft above the persimmon orchard, harvests stormwater from the roof of the garage and takes advantage of the **gravity** to save more than **565 KJ energy** for each irrigation/cistern.

Rain Garden Resting Space
The **rain garden area** is composed of 4 sub-gardens to treat **1,672 cu ft** 1-year, 24 h designed storm, equiped with decks, paths, and signages for users to **visit, relax,** and **learn**.

Roadside Bioswale
5-ft 2% buffer for erosion control
The 8-ft wide **bioswale** treats **679 cu ft** stormwater from sidewalk, and provides **learning opportunities** and **visual interests** for visitors.

Vehicle-to-Building Charging System
Chesapeake Building
Electrical Switchboard
Electrical Switchboard
Solar Panels
EV Charging Solar Inverter
(Daytime)
(Nighttime)
8,000 SF solar panels produce **124 Kw electricity** for Chesapeake Building and Electrical vehicles (EV). Vehicle-to-Building technology adopted to achieve the maximum energy storage.

Plant Palette Sample: Year-Round Color Interests and Ecological Values

	Cornus sericea (red twig dogwood)	*Asclepias tuberosa* (butterfly weed)	*Rudbeckia hirta* (black-eyed susan)	*Solidago* (goldenrod)	*Schizachyrium scoparium* (little bluestem)	*Echinacea* (purple coneflower)	*CP101* (Antietam Blush)	*Diospyros virginiana* (American persimmon)
Spring								
Summer								
Autumn								
Winter								
Wildlife Values								

(insects) (birds) (mammals)

Ecological Diversity - Section A-A'

Meadow Habitat | Rain Garden | Shrubland | Persimmon Orchard | Wooded Area

1" = 20'
0   10   20   40ft