# JAMES MADISON UNIVERSITY®

JMU®

## MS4 Program Plan Annual Report

FY22/23

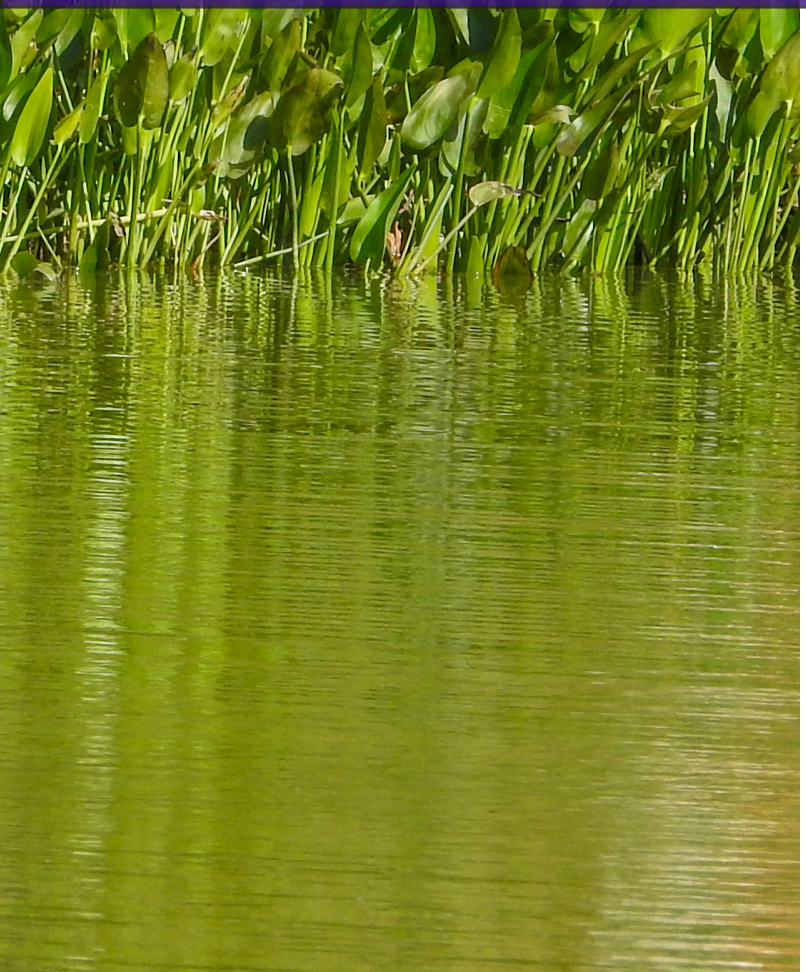
Great blue heron in the aquatic bench at Newman Lake.

JAMES MADISON UNIVERSITY®

CONTENTS



# BEING THE CHANGE



James Madison University - Harrisonburg, VA

Permit Number: VAR040112

Reporting Period: July 1, 2022 thru June 30, 2023

CERTIFICATION STATEMENT

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

I further certify that after an evaluation of the program plan, and associated MCM's, the plan has been determined to be effective and no plan changes are necessary.

Signature: _____

Printed Name: Dale Chestnut

Title: Stormwater Coordinator

Date: August 3, 2023

# PUBLIC EDUCATION & OUTREACH

Fall tree planting event near UREC.

In order to best identify the most efficient use of resources to distribute information related to stormwater impacts to the public, three main issues have been identified as; public awareness of pollution prevention and reporting of water quality issues, litter prevention at outdoor athletic events, and pollution prevention related to facilities management operations. These three issues have been selected as they target audiences that are most likely to have significant impacts on stormwater quality within the University.

Possible strategies of increasing public knowledge include; printed materials (newspaper advertisements, brochures, flyers, etc.), signage, websites, social media, training (seminars, presentations, guidance booklets), and other activities deemed appropriate. As with most targeted audiences, there will be some overlap in promotion.

Several strategies listed above are ongoing and always available such as JMU's website, signage and storm drain marking. Typically, advertisements and posters are promoted during the first semester of each school year, and speaking arrangements and curriculum materials are provided as requested or scheduled throughout the year.

### *PUBLIC AWARENESS OF POLLUTION PREVENTION AND REPORTING OF WATER QUALITY ISSUES*

Illicit discharges to the MS4 can be acutely harmful to aquatic life, and pose a risk to health and safety on campus. These factors make it a critical issue of which the entire university community should be aware. The focus of this high priority issue is recognizing and reporting illicit discharges (water quality issues). While minimum control measure 3 requires JMU to "promote, publicize, and facilitate public reporting of illicit discharges into or from" the MS4, the general public doesn't necessarily know how to identify or prevent such, or why. To maximize outreach effectiveness, this issue will combine education on general awareness with outreach on reporting water quality issues on campus.

Stormwater literacy and illicit discharges are general awareness issues, and thus affect everyone on campus. An illicit discharge could be noticed by anyone, at any time, necessitating broad outreach to the campus community. The target audiences for these issues include the faculty (1,400), staff (2,600), and students (21,800). Faculty and staff are considered long-term members of the university community, and as such, will receive outreach on this topic cumulatively over the years. Students are short-term members of the campus community, but will carry these lessons with them when they move on. Together these groups are the eyes and ears of the stormwater management staff, and play a critical role in addressing illicit discharges on campus. In general, bulletins or ads will be placed in the Breeze along with posting on bulletin boards such as at campus libraries during the first semester of each school year. Also speaking engagements will be provided as requested to classes. (See Activity/Strategies for Outreach & Speaking Engagements table on page 5.)

### *POLLUTION PREVENTION RELATED TO FACILITIES MANAGEMENT OPERATIONS*

JMU manages a wide variety of land and infrastructure that allows each student to be well prepared in the educational process. These facilities require operation and maintenance using materials and methods that can pose a risk to water quality. Examples include housekeeping, fueling stations, solid waste facilities, energy generation, landscaping, and snow removal. These operations are likely the biggest threat to water quality on campus, qualifying them as a high priority issue on which to focus outreach activities. Risks to water quality will be minimized by performing outreach on basic watershed and stormwater literacy, laws and regulations, and appropriate management techniques to minimize stormwater pollution.

As a nontraditional MS4, one segment of JMU's public is its staff (2,600 total people). Facilities management (FM) staff (500 people) is the segment of the staff that is most likely to have an effect on water quality, as it is responsible for the operations described above. FM staff is the target audience for this high priority issue. Policies are kept up to date and employee refresher training will be provided bi-annually, typically in the fall, through disseminating training material through email and management. Also, an overview of programs and policies will be provided to new FM employees during orientation which takes place monthly, as needed. (See Training Plan on page 17.)

### *LITTER PREVENTION AT OUTDOOR ATHLETIC EVENTS*

JMU welcomes a large number of visitors, in addition to faculty, staff, and students to events that take place on campus. While JMU hosts other outdoor events, there are none that are as numerous and regularly scheduled as athletic events. Athletic events are more prone to create litter than normal campus activities and events, as attendees often participate in tailgating and other activities, involving eating, drinking, and vending in outdoor areas for extended periods of time, and the use of disposable items is the norm. Various promotional debris related to these events can also be left behind at the facilities, in the parking lots, and on the roads. Thus, targeting outdoor athletic events maximizes the opportunity to reduce litter on campus.

By rain and wind, litter can end up in drainage ways, storm sewers, stormwater controls, and ultimately Sibert Creek and Blacks Run. While JMU's Landscaping Department is tasked with cleaning up the debris created by athletic events, there is the opportunity to reduce litter before it is created. Preventing litter from entering stormwater infrastructure is a priority.

JMU focuses on football game attendees. Football games account for approximately 94% of outdoor athletic event activity, accounting for the audience that is most likely to create the largest amount of litter, and providing the best potential for litter prevention outreach. The population size of the target audience is approximately 22,000 people per game. All other outdoor athletic events combined attract only approximately 300 people per event. This includes several other sports team schedules such as track, soccer, lacrosse, baseball, softball, field hockey and tennis. The Athletics Department makes at least two public service announcements at each outdoor sporting event to promote pollution prevention requesting spectators to be responsible and discard all wastes in the trash and recycling receptacles located throughout the sports facility. With approximately 130,000 spectators at about 90 events, these targeted announcements were estimated to have reached more than 90% of the target audience.

### *ENVIRONMENTAL COURSES*

Three sections of ISAT 112 (Issues in Environmental Science and Technology) was taught through the year for 72 students. As an outdoor lab, students perform water quality sampling of on-campus waterbodies including the Arboretum Pond, ISAT Retention Ponds, Siebert Creek, and Newman Lake. Parameters measured include phosphorus, nitrate, pH, dissolved oxygen, hardness, conductivity, and turbidity.

One section of ISAT 321 (Fundamentals of Environmental Science and Technology II) was taught through the year for 21 students (21 students Spring 23). This class specifically covers stormwater impacts and best management practices designed to reduce those impacts. Stormwater quantity and quality was discussed with particular attention given to stormwater best management practices installed on JMU's campus.

Twenty students enrolled in Industrial Environmental Management (ISAT 422). In this class, students learn about stormwater and waste water, and created fictitious companies to produce compliance plans addressing stormwater management.

Eighteen students enrolled in the GEOG 427 Water Resources in Fall 2022 taught by Professor Mary Kimsey. Stormwater management was a major topic in the course, one that was introduced to students by Mr. Dale Chestnut, JMU Stormwater Manager, early in the semester. He discussed skills that are helpful for a career in stormwater management, went over some important water/stormwater terminology, gave a history of related laws and regulations and, finally, went into detail about stormwater management at JMU.

In the week following Mr. Chestnut's lecture, GEOG 427 students mapped an area of Harrisonburg that drains into a storm pipe on South Dogwood Drive. As part of this field activity, they discussed the impacts the runoff from the various surfaces in the area have on Blacks Run and, eventually, the Chesapeake Bay. For their semester project and working in pairs, students selected a site on a body of water in the local area. Using water quality test kits they had purchased, they monitored the water quality of the site over the course of the semester. Students measured temperature and determined the turbidity level. They used the test kits to determine the level of dissolved O2, biochemical O2 demand, nitrates, pH, phosphates and coliform bacteria. Finally, the results were written up in a term paper that was submitted at the end of the semester.

| Environment Related Courses/Programs |
|---|
| Biology |
| Chemistry |
| Earth Science |
| Engineering |
| Geographic Science |
| Geology |
| Integrated Science & Technology |

A variety of other classes are offered at the University that cover issues related to the impact of urban stormwater runoff on the environment which will increase the overall awareness among students at the University.

### *EDUCATIONAL SIGNAGE*

Educational signage along with storm drain marking is conducted to assist in educating the public on the purpose of stormwater best management practices and to inform that what goes in a storm drain eventually makes its way to our local waterways.

As part of new construction on campus, a total of eight new storm drain markers were installed. One at the ECPP Landscape Storage Building, three at Veterans Memorial Park Softball Expansion, and four at the Sentara Park Facility Addition.

| *Educational Signage* | *Location(s)* |
|---|---|
| Bio-retention | Sibert Creek |
| Conservation Landscaping | Hillside |
| Green Roof | Madison Union |
| Natural Channel Design Stream Restoration | Arboretum |
| Riparian Buffer | Various locations along Sibert Creek and East Campus Creek. |
| Watersheds & Stormwater Management | Arboretum |
| Wetlands & Floodplain Connections | Arboretum |


Enviroscape demonstration for elementary school students

| Activity/Strategies for Outreach & Speaking Engagements | Partner(s) | Date |
|---|---|---|
| Watershed Day at the EJC Arboretum in partnership with the Massanutten Regional Library – 34 adults and kids rotated between an Enviroscape Non-point Source Pollution Demo and a riparian buffer scavenger hunt at the arboretum. | FM, Library | 7/29/22 |
| Explorer Day Camp at EJC Arboretum – 25, 1st-3rd graders learned about non-point source pollution with a Fred the Fish activity. | FM | 8/4/22 |
| Water Appreciation Day – Family education program about conserving water, pollution and riparian buffers (22 adults and kids in attendance) | FM | 8/11/22 |
| Stormwater education campaign on Facebook started for fiscal year. | FM | 8/29/22 |
| "Stormwater Pollution Prevention @ JMU" poster posted at Carrier and Rose Library's. | FM | 8/29/22 |
| "Stormwater Pollution Prevention @ JMU" ad in *the Breeze*, JMU's newspaper. | FM | 9/1/22 |
| "Stormwater Pollution Prevention @ JMU" ad in *the Breeze*, JMU's newspaper. | FM | 9/8/22 |
| "Stormwater Management @ JMU" presentation for senior water resources class (18 students & 1 faculty) | FM | 9/12/22 |
| "Stormwater Pollution Prevention @ JMU" ad in *the Breeze*, JMU's newspaper. | FM | 9/15/22 |
| Tree planting on south side of East Campus Stream. 10 volunteers, 6 JMU staff and 3 City staff with 165 trees planted. | FM, City | 10/18/22 |
| Trees Virginia Board Retreat. Highlighted Meadow, Food Forest, and Tree Plantings | FM, City | 3/7/23 |
| Tree planting on north side of East Campus Stream. 190 volunteers, 2 JMU staff and 3 City staff with 165 trees planted. | DOF, City, CBLP | 3/23/23 |
| Enviroscape Model Demonstration to Pleasant View Elementary 4th graders, teachers and parents (38 students, 10 adults) on drinking water, stormwater and sanitary sewer treatment processes. | FM | 3/28/23 |
| Booth at Blacks Run Clean Up Day. 525 volunteers for Stream Clean-up. 2.91 tons of trash removed from Blacks Run. | City | 4/15/23 |
| Explorer Kids Camp – Pollinator Education Program for 1st thru 3rd graders. 12 students, and 4 adults. | FM, Arboretum | 6/13/23 |
| Explorer Kids Camp – Pollinator Education Program for 4th thru 6th graders. 18 students, and 5 adults. | FM, Arboretum | 6/20/23 |

Explorers Kids Camp Pollinator Education Program

# PUBLIC INVOLVEMENT & PARTICIPATION

## STORMWATER MANAGEMENT WEBSITE

Through the FM Engineering and Constructions stormwater website, which can be found at www.jmu.edu/stormwater, documents are available for access such as this MS4 Plan, TMDL Action Plans, stormwater related policies and procedures, and other relevant information. An email and phone number is listed in order for the public to report potential illicit discharges, improper disposal or spills to the MS4, complaints regarding land disturbing activities, or other potential stormwater pollution concerns. The same contact information can also be used to provide input on the University's MS4 program plan. No public input was received in regards to the MS4 program.

**www.jmu.edu/stormwater**

| Page Description | Pageviews |
|---|---|
| Stormwater Main Page | 222 |
| IDDE Information | 50 |
| MS4 Information | 94 |
| Site Plan Review | 226 |
| FAQ | 22 |
| Total | 614 |

## STUDENT WATER QUALITY TESTING

Three sections of ISAT 320 (Fundamentals of Environmental Science and Technology I) was taught through the year for 59 students. This course provides students with the basic understanding of environmental processes, pollution and control technologies. The class integrates classroom learning, field-based studies and laboratory analysis of field samples to explore local aquatic and terrestrial environments and contextualize them in broader scientific knowledge.

This water testing is not for monitoring of stormwater discharges or control measures, but for educational purposes of basic water quality and is to be considered as a "citizen monitoring group".

## STREAM CLEAN-UP EVENTS

Newman Lake has a watershed of approximately 4 square miles and is fed by Siberts Creek, a tributary of Blacks Run. As part of JMU's efforts to keep the campus clean, JMU staff from the FM Environmental Services Department regularly pick up trash and debris within the heart of campus and also along the streams and lake.

There was approximately 4,500 total hours dedicated to ground litter cleanup during this reporting period. From just Newman Lake and tributaries, approximately 2935 pounds of floatable debris was removed from waterways.

In addition to the constant efforts on campus, JMU staff and students typically participate in Earth Day and provide a large group of volunteers to assist the City of Harrisonburg with efforts for the annual Blacks Run Clean-Up Day. This event increases awareness among students and staff of the opportunity to improve local water quality, and how to identity and report illicit discharges to the City or JMU for further investigation. The 25th annual Blacks Run Clean-Up Day was on April 15th, and had 525 volunteers that gathered over 2.91 tons of trash from the stream.

## ENVIRONMENTAL GROUPS AND COMMITTEES

Faculty and staff participate with local organizations and environmental advisory committees such as Soil & Water Conservation Districts, stormwater advisory committees, environmental performance standards advisory committees, Friends of the Shenandoah River, and the Shenandoah Valley Pure Water Forum. JMU also maintains membership in environmental organizations such as the Virginia Municipal Stormwater Association (VAMSA) and the Central Shenandoah Stormwater Network in order to network with other municipalities, engineers and regulatory agencies.

| Organization or Committee name | Web Link |
|---|---|
| Central Shenandoah Stormwater Network | cleanstream.org |
| City of Harrisonburg Environmental Performance Standards Advisory Committee | harrisonburgva.gov/epsac |
| City of Harrisonburg Stormwater Advisory Committee | harrisonburgva.gov/swac |
| Friends of the Shenandoah River | fosr.org |
| Shenandoah Valley Pure Water Forum | purewaterforum.org |
| Shenandoah Valley Soil & Water Conservation District<br>Chesapeake Bay Committee<br>Education & Awards Committee<br>Urban Committee | svswcd.org |
| Virginia Municipal Stormwater Association (VAMSA) | vamsa.org |

***The combination of all activities implemented to provide educational outreach through a website, educational signage, speaking engagements, clean-up events, and involvement on committees allows for many beneficial activities for improving water quality.***


Spring tree planting event at ISAT Campus

# ILLICIT DISCHARGE DETECTION & ELIMINATION (IDDE)

## *MS4 MAP*

JMU maintains a GIS map with a corresponding database that contains the locations and attributes of the storm sewer system, structural best management practices, and MS4 outfalls that the university is responsible for within their municipal jurisdiction. The MS4 map and corresponding database have been updated to reflect any changes to the MS4 occurring on or before June 30 of the reporting year.

From construction activity at the ECPP Landscape Storage Building, one new outfall was installed (ID# EC-3447). This outfall has a drainage area of approximately 0.97 acres. One new discharge point was identified (ID# SC-5164) near JMU's football stadium which is for a foundation drain and has no associated drainage area.

## *NOTIFICATION OF INTERCONNECTIONS WITH ADJACENT MS4'S*

James Madison University's MS4 system interconnects with the City of Harrisonburg, Rockingham County, and the Virginia Department of Transportation (VDOT). Both Harrisonburg and VDOT are MS4's and have previously been notified and are aware that our systems interconnection. JMU will continue to notify adjacent MS4's of any new interconnections established or discovered.

No new interconnections were made with adjacent MS4s, and no notifications were received from adjacent MS4s.

## *IDDE POLICY & PROCEDURES*

The University has implemented a campus wide IDDE policy in order to establish methods for controlling the introduction of pollutants into the MS4. The policy includes procedures for field screening, notification of spills and illicit discharges, tracking, enforcement and training with the goal of eliminating unauthorized discharges.

A total of 116 inspections were conducted on the 116 outfalls within JMU's jurisdiction. No illicit discharges were observed during the annual outfall inspections. Approximately $2,737 was spent for inspections, maintenance and repairs related to stormwater outfalls.

From the pollution hotline, 2 notifications were received. On Tuesday, September 13th, 2022 at 11:00am, a call was received from the City of Harrisonburg transferring a concern about grease seen entering a storm drain around the parking deck by the football stadium. All inlets around the parking deck and football stadium were inspected, along with MS4 outfalls to Newman Lake and just upstream of the Lake. No illicit discharges were observed. A sheen was noticed near the pedestrian bridge of the lake and was determined to be from iron oxidizing bacteria. The investigation was closed the same day. We did meet with the individual making the notification to explain findings. On Tuesday, September 27th, 2022 at 9:20am, a call was received through the hotline that reflective dust from crosswalk painting has been left in the curb at the intersection of Bluestone and Duke Drive. A site inspection was conducted at 9:30am and confirmed dust had been left from crosswalk painting activities. No dust was observed in nearby storm drains. The JMU project manager was notified of this issue, and the contractor was requested to have the dust cleaned-up within 24 hours. By 9:00am on the 28th, dust residue had been removed and the investigation was closed.

JMU operates a HAZWOPER team with 6 Certified Team Members and 4 Active responders. JMU's Spill Prevention, Control and Countermeasure Plan (SPCC) was last updated in April of 2019. The HAZWOPER team was called out for 3 clean-ups over the year, with none reported to enter the storm system.

| Date | Description | Approximate Amount |
|---|---|---|
| 1/16/23 | Hydraulic line busted on trash truck. | ~ 5 gallons |
| 2/16/23 | Fuel leak from parked vehicle. | ~ 1 gallon |
| 4/18/23 | Diesel fuel leak from bus. | ~ 2 gallons |

Green heron tests the water at the arboretum pond.

# CONSTRUCTION & POST-CONSTRUCTION STORMWATER MANAGEMENT

### *STANDARDS & SPECIFICATIONS.*

JMU initially received approval from the Department of Conservation and Recreation (DCR) to operate its own erosion and sediment control (ESC) program under a set of annual standards and specifications on July 6, 2009. While the responsibility of the stormwater program has been transferred from the DCR to the Department of Environmental Quality (DEQ), JMU continues to maintain approved standards and specifications as requested by the Department. Responding to amendments to regulations, stormwater management (SWM) was introduced into the standards and JMU received combined approval from DEQ for Standards and Specifications for ESC and SWM on May 28, 2014. This document continues to be updated as needed. On January 5th, 2022 updated standards and specifications were submitted to DEQ for approval. Those standards have been administratively approved by DEQ and the University is awaiting a formal letter of approval.

These Standards layout the framework for the administration and implementation of projects within the university concerning erosion and sediment control, and stormwater management. Certification requirements are listed for appropriate personnel along with the structure for plan review and approvals, construction inspections, variances and exceptions and long-term maintenance.

### *LAND DISTURBING ACTIVITIES POLICY.*

JMU is responsible for ensuring all regulated land disturbing activities have adequate documentation before construction activity begins and that construction activities follow approved plans, JMU's Standards and Specifications for ESC and SWM, and regulatory requirements. The purpose of this policy is to layout the procedures for regulatory compliance concerning all regulated land-disturbing activities at the University.

The policy includes definitions of relevant terms, the individuals responsible for implementation of the policy, and procedures for both non-regulated and regulated activities. The land disturbing activities policy was originally approved in July 2009, and is re-evaluated on an annual basis.

### *REPORTING PERIOD SUMMARY.*

The project table below shows the active construction projects throughout the reporting period along with the VSMP permit number, if applicable, and the disturbed acreage associated with the project. These projects were conducted in accordance with the current department approved standards and specifications for erosion and sediment control.

A total of 169 construction site inspections were conducted over the reporting period on 8 projects. Alleged deficiencies observed on-site were noted in inspection reports and were addressed in an acceptable manor and time frame, thus requiring no further methods of enforcement. There were no corrective actions or violations issued for this reporting period. Thank you contractors for your efforts! Copies of inspection reports are kept on file and are available upon request.

| Active Projects | VSMP Permit | Disturbed Acreage |
|---|---|---|
| Carrier Library Expansion & Renovation | VAR10S314 | 2.55 |
| ECPP Landscape Storage Building | N/A | 0.50 |
| ISAT Solar Upgrade | VAR10P600 | 1.23 |
| Retail Dining Demolition | N/A | 0.44 |
| Sentara Park Facility Addition | N/A | 0.36 |
| South Main Spoils Site | VAR108454 | 6.20 |
| Veterans Memorial Park Softball Expansion | N/A | 0.37 |
| Village Housing Phase 1 | VAR10S560 | 3.00 |
| *Total Acreage* | | ***14.65*** |

| Plans Approved | Date Approved | Disturbed Acreage |
|---|---|---|
| Carrier Library Expansion & Renovation | 12/28/22 | 2.55 |
| Village Housing Phase 1 | 5/24/23 | 3.00 |

## CONSTRUCTION BY THE NUMBERS

**8** Active Projects

**14.65** Acres Disturbed

**169** Inspections

| DEQ ESC/SWM Certification | Person | Certificate Number | Expiration Date |
|---|---|---|---|
| Dual Combined Administrator | Dale Chestnut | DCA0106 | 10/2026 |
| Dual Combined Administrator | Ali Sloop | DCA0582 | 8/2025 |
| Dual Combined Administrator | Abe Kaufman | DCA0330 | 7/2026 |
| Responsible Land Disturber | Robert S. Jones | 41745 | 4/2026 |
| Responsible Land Disturber | Patrick Puffenbarger | RLD23542 | 12/2025 |
| Responsible Land Disturber | Kevin Dinges | RLD05601 | 12/2025 |
| Responsible Land Disturber | Ricky Lucas | RLD05597 | 12/2025 |

ISAT Campus Solar Panel upgrade project.

# CONSTRUCTION & POST-CONSTRUCTION STORMWATER MANAGEMENT

## *STORMWATER MANAGEMENT FACILITIES POLICY*

JMU is required to operate a Virginia Stormwater Management Program (VSMP) as part of permit and legislative requirements. Structural stormwater best management practices (BMP's) are sometimes required to be installed for the mitigation of construction projects or for pollution reduction credits related to watershed clean-up efforts such as the Chesapeake Bay Total Maximum Daily Load (TMDL). These BMP's must remain in place as designed and be maintained in perpetuity to function as intended.

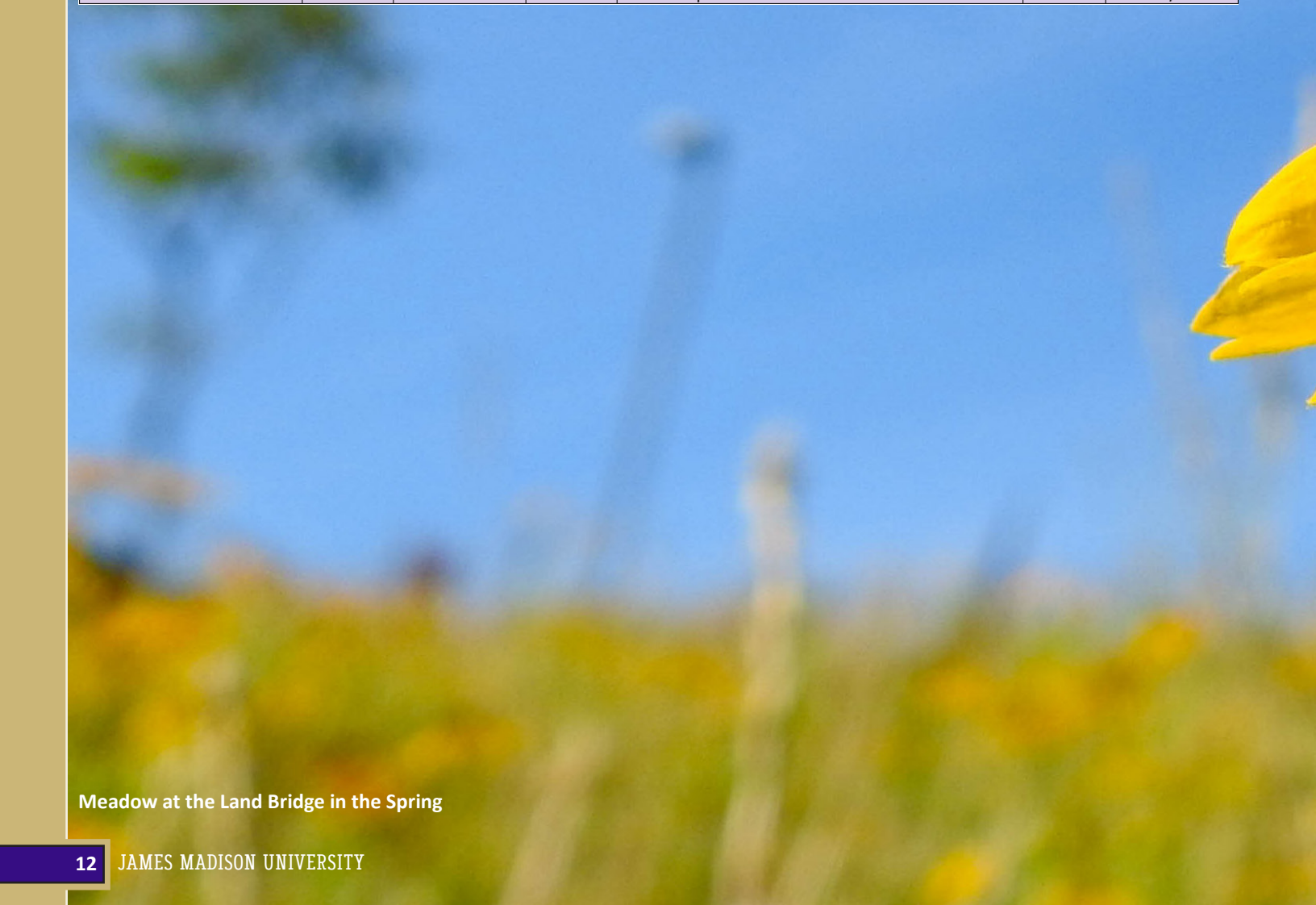
The purpose of the policy is to establish procedures for the design, installation, acceptance, inspections, and maintenance of stormwater facilities installed on campus. The stormwater management facilities policy was originally approved in 2009 and is re-evaluated on an annual basis.

For this reporting period, as part of a permitted project, the only BMP added to JMU's database was an open space meadow installed as part of the ISAT Solar Panel project. As part of an upcoming local TMDL for Blacks Run, a forested tree buffer was installed along JMU's East Campus Creek and a turf to meadow land conversion was accounted for a project completed on the East Campus Hillside. All new BMP's that were installed as part of a project under a Construction General Permit have been, or will be, provided to the DEQ as part of the projects permit Notice of Termination.

A total of 131 inspections were performed on JMU's 113 structural BMP's. All maintenance work completed on the structural BMP's was considered to be typical maintenance items. Approximately $66,410 was expended for inspections, maintenance and repairs of stormwater management facilities.

**BMP INSTALLATIONS**

| BMP Type | HUC | Impaired Water | Acres Treated | Description | JMU BMP ID | VSMP Permit |
|---|---|---|---|---|---|---|
| Other: VRRM Open Space | PS22 | Blacks Run | 1.23 | ISAT Solar Panel Meadow | EC043 | VAR10P600 |
| Urban Forest Buffer | PS22 | Blacks Run | 4.51 | East Campus Creek Tree Buffer | EC044 | N/A |
| Land Conversion | PS22 | Blacks Run | 1.06 | East Campus Hillside Meadow | EC045 | N/A |



**Meadow at the Land Bridge in the Spring**

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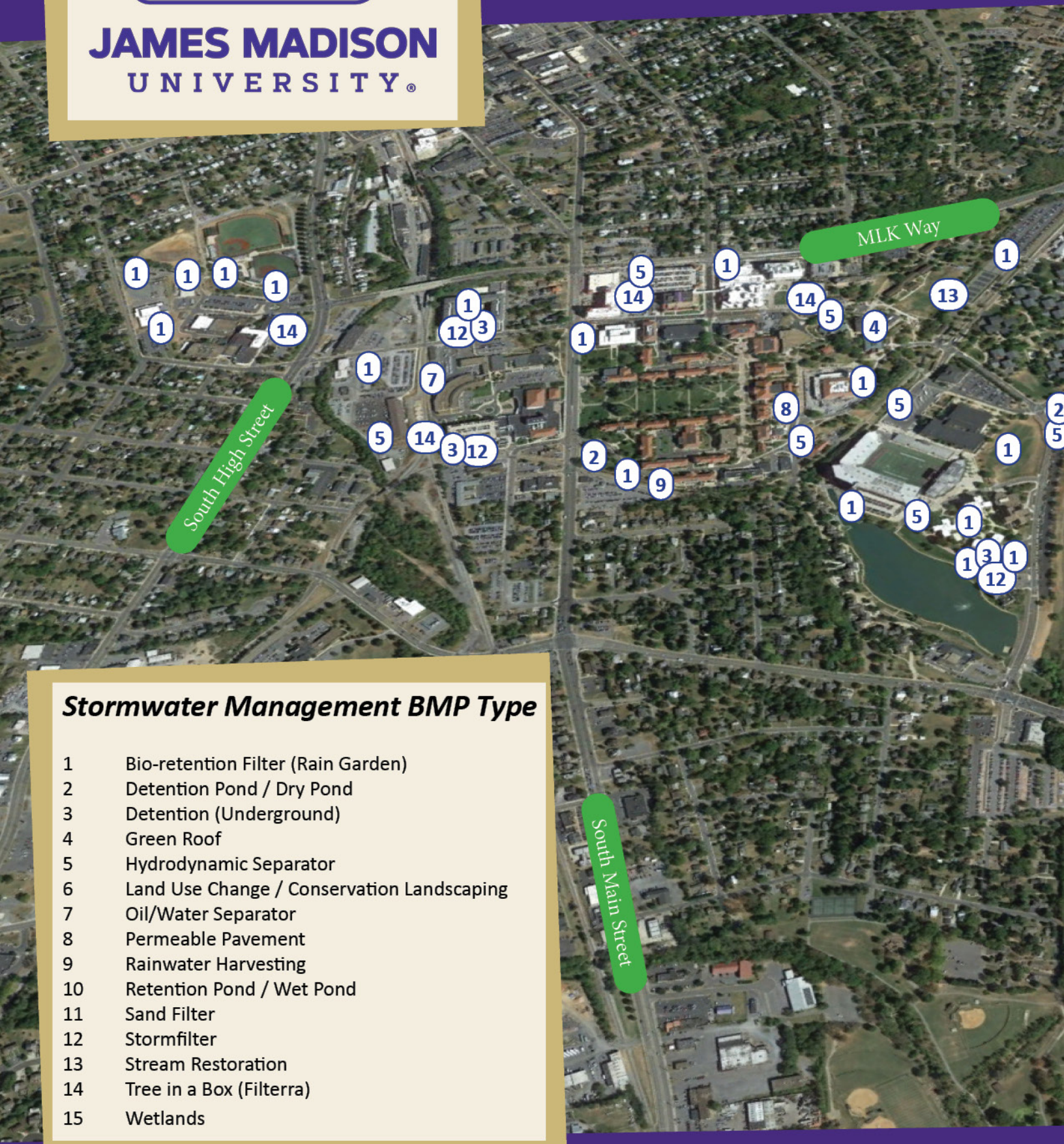
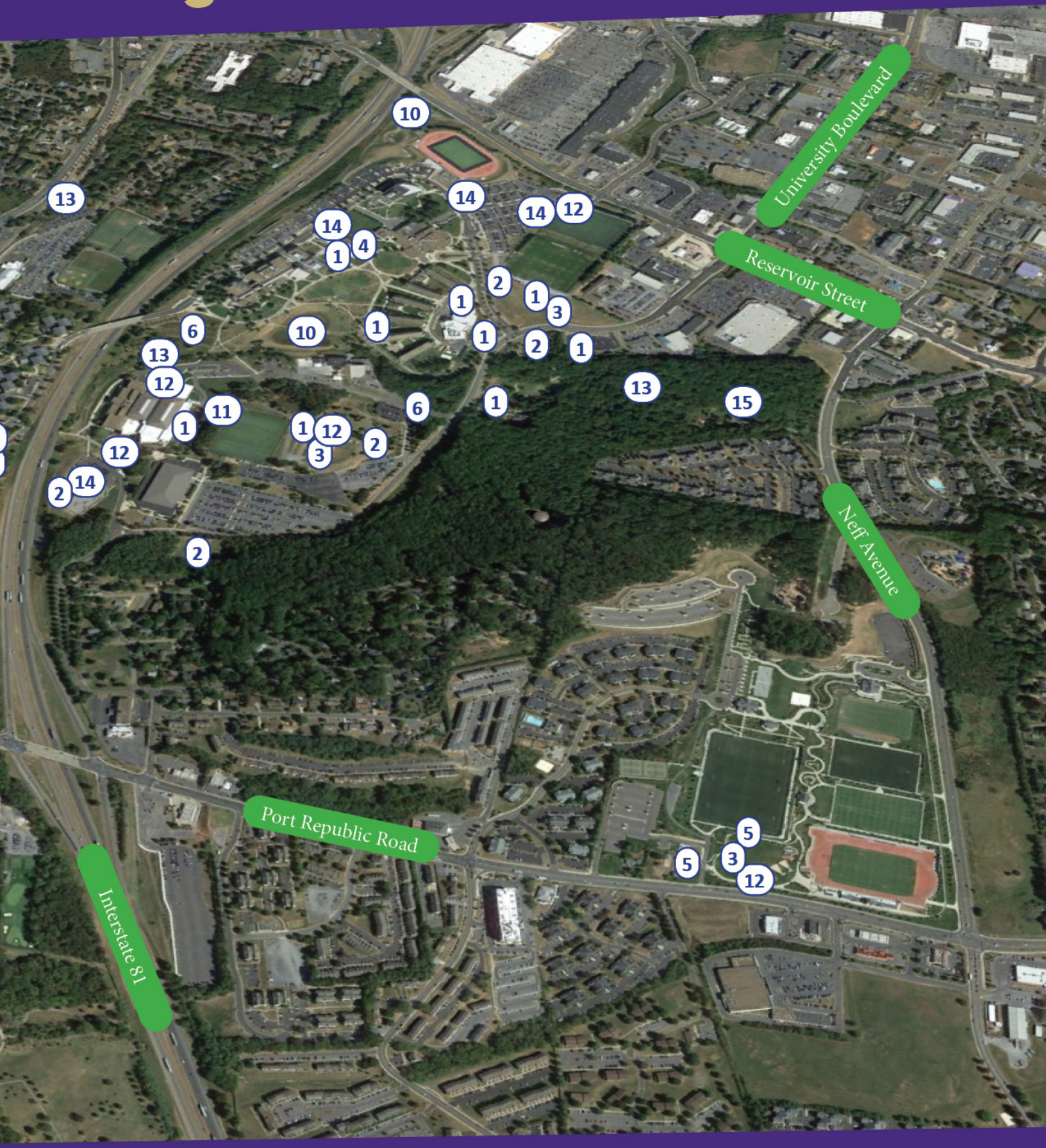
# Stormwater




## Stormwater Management BMP Type

| | |
|---|---|
| 1 | Bio-retention Filter (Rain Garden) |
| 2 | Detention Pond / Dry Pond |
| 3 | Detention (Underground) |
| 4 | Green Roof |
| 5 | Hydrodynamic Separator |
| 6 | Land Use Change / Conservation Landscaping |
| 7 | Oil/Water Separator |
| 8 | Permeable Pavement |
| 9 | Rainwater Harvesting |
| 10 | Retention Pond / Wet Pond |
| 11 | Sand Filter |
| 12 | Stormfilter |
| 13 | Stream Restoration |
| 14 | Tree in a Box (Filterra) |
| 15 | Wetlands |

# Management BMP Map



# POLLUTION PREVENTION & GOOD HOUSEKEEPING

FM Landscaping providing temporary irrigation for a meadow project.

## *NMP & IPM*

The University currently implements several Nutrient Management Plans that cover the lawn and landscaped areas of the University that receives nutrient applications. The plans outline the rates and frequencies that nutrients may be applied, and covers best management practices to follow regarding the application of these nutrients. By following this Plan, it can be ensured that nutrients are applied in a manner that will minimize their impact on stormwater quality. JMU has 14 Certified Fertilizer Applicators, 6 Commercial Pesticide Applicators, 30 Registered Technicians, 2 persons Licensed in Trapping and Nuisance, and 1 Licensed Nutrient Management Planner. The Main Campus NMP was updated and approved. Following is a list of NMP's active at the University:

| Plan Name | Acreage | Start Date | Expiration Date |
|---|---|---|---|
| **Main Campus** | 224.48 | May 20, 2021 | May 20, 2024 |
| **Forest Hills Off Campus Properties** | 6.95 | December 5, 2021 | December 5, 2024 |
| **Total** | 231.43 | | |

The University also has an Integrated Pest Management (IPM) program which seeks to control pests with a minimal use of pesticide while maximizing effectiveness and cost efficiency. The application of all fertilizers and pesticides will be conducted in accordance with the Virginia Department of Agriculture and Consumer Services (VDACS) rules and regulations for agricultural chemical operations and only properly trained and/or certified employees or contractors will apply fertilizer or pesticides on campus.

## *DAILY OPERATIONAL PROCEDURES*

As a MS4 permittee, JMU is responsible for preventing, or minimizing to the maximum extent practicable, any discharges to the storm sewer system, or waterways, that is not entirely composed of stormwater run-off. A "Daily Operational Procedures for Stormwater Control Best Management Practices" policy was created in 2015 to implement written procedures for activities such as road, street, and parking lot maintenance; equipment maintenance; and the application, storage, transport, and disposal of pesticides, herbicides, and fertilizers. The policy and procedures are re-evaluated on an annual basis, and no modifications were made for this reporting period.

These procedures are utilized as part of FM employee training and is an effective way to ensure that employees are aware of proper procedures associated with typical operations and the possible impacts on local waterways.


## *TRAINING PLAN*

A "Stormwater Pollution Prevention/IDDE" presentation and guidebook has been developed for use with Facilities Management employee training. During new employee orientation for FM personnel, a presentation is given introducing them to basic stormwater information, pollution prevention, good housekeeping measures, related policies and procedures, and how to recognize and report illicit discharges. Refresher training will be provided no less than once per 24 months through the use of a presentation, guidebook, or other similar format. New FM employee training is provided with FM orientation which typically occurs on a monthly basis.

| Date | Event | Participants |
|---|---|---|
| March/April 2022 | FM Refresher Training | 408 |
| September 19, 2022 | FM New Employee Orientation | 4 |
| October 17, 2022 | FM New Employee Orientation | 9 |
| November 14, 2022 | FM New Employee Orientation | 7 |
| January 30, 2023 | FM New Employee Orientation | 13 |
| April 3, 2023 | FM New Employee Orientation | 19 |
| May 1, 2023 | FM New Employee Orientation | 5 |
| June 5, 2023 | FM New Employee Orientation | 12 |

Through new employee orientations, 69 employees received initial training about stormwater management at JMU. Bi-annual training is also provided to FM employees and was last provided in March/April 2022 to 408 employees (approx. 77% of staff).

## *SWPPP'S for HIGH-PRIORITY FACILITIES*

Several facilities at JMU meet the criteria listed in the general permit as high-priority facilities and are considered to have a high potential for discharging pollutants. These facilities are required to maintain and implement a stormwater pollution prevention plan (SWPPP) to provide a summary description of the facility and activities, description of potential pollutants and sources, procedures for reducing and preventing pollutant discharges and procedures for inspections and maintenance. There were no modifications needed for existing SWPPP locations, and no new facilities were brought on-line requiring SWPPP development. Following is a list of facilities that have been identified as high-priority facilities with a high potential for discharging pollutants:

| Facility | Type of Facility |
|---|---|
| Arboretum Storage Yard | Materials storage. |
| Memorial Hall Maintenance Shop | Maintenance shop. |
| R2 Lot Storage Yard | Materials and salt storage. |
| South Main Street Facilities: HVAC | Maintenance shop. |
| South Main Street Facilities: Recycling | Recycling. |
| South Main Street Facilities: Salt & Other Material Storage | Materials and salt storage. |
| South Main Street Facilities: Transportation | Vehicle storage and maintenance. |
| South Main Street Maintenance Facility by K Lot | Materials and mulch storage. |
| University Park Maintenance Shop | Maintenance shop. |
| University Services Building & Annex | Equipment, vehicle and materials storage, and maintenance facilities. |

# TMDL ACTION PLANS

## *CHESAPEAKE BAY TMDL*

The Chesapeake Bay Total Maximum Daily Load (TMDL) was established to create implementation plans to reduce pollutants entering the Bay. The pollutants of concern were listed as phosphorus, nitrogen, and sediment, of more specifically, total suspended solids (TSS). For JMU, those pollutant reductions per year were calculated to be 78.90 lbs/yr of phosphorus, 626.82 lbs/yr of nitrogen, and approximately 33.5 tons/yr of TSS.

Stream restoration had become a popular choice for meeting the Bay goals, and that practice was chosen to be implemented throughout campus streams to meet those goals and to be an educational tool for students and the public. Nearly 3700 linear feet of stream has been restored on campus along with allowing a vegetated buffer to grow on most stream banks. In addition to stream restoration work, nearly 53,000 square feet of land has been converted from pervious (turf areas) to grass (unmanaged grass).

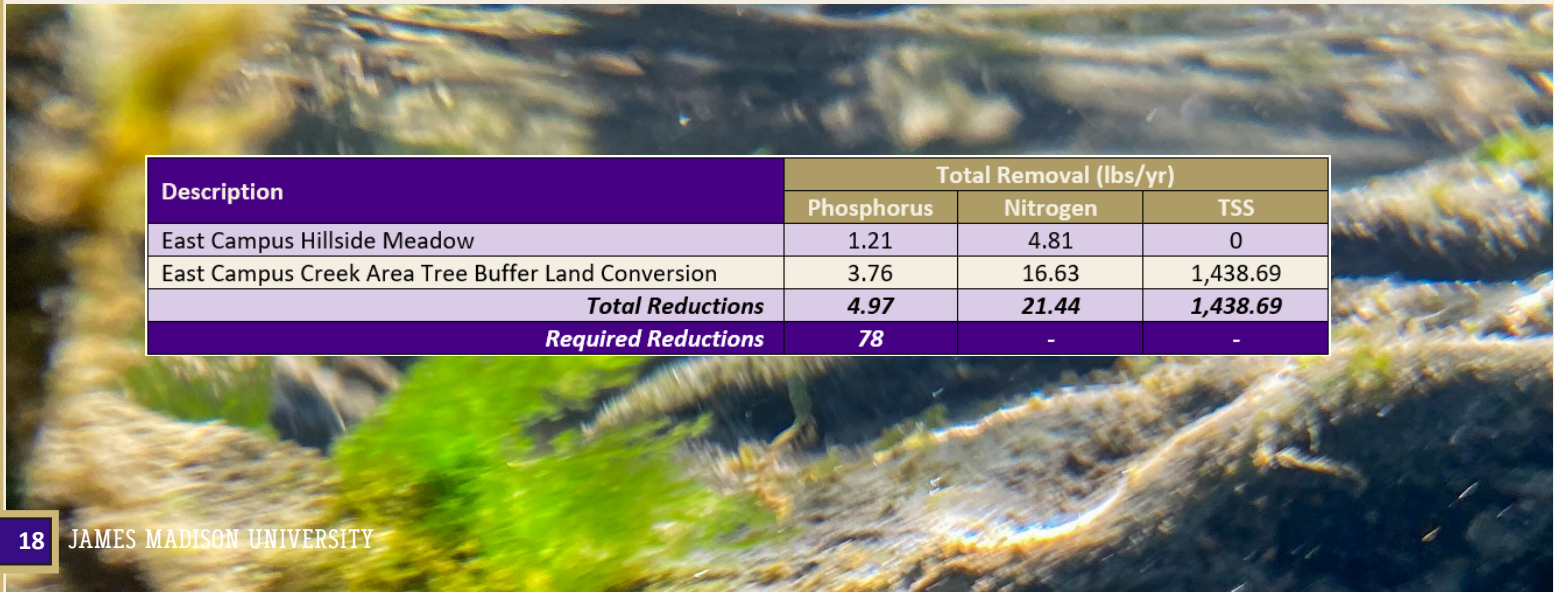
| Pollutant Reduction Requirements | | |
|---|---|---|
| **Phosphorus** (lbs/yr) | **Nitrogen** (lbs/yr) | **TSS** (tons/yr) |
| *78.90* | *626.82* | *35.5* |

With the completion of the stream restoration and constructed wetland cells in JMU's Arboretum in March of 2016, reduction goals for the Chesapeake Bay TMDL was surpassed by the University. No new BMP's were installed this reporting period, and none are currently planned to be implemented in the near future. For the most recent action plan for the Chesapeake Bay TMDL, public comment was providing by sending a mass email alert to the JMU community allowing a month long comment period. No comments were received for the action plan. JMU's complete Chesapeake Bay TMDL Action Plan can be viewed online at jmu.edu/stormwater.

| Description | Total Removal (lbs/yr) | | |
|---|---|---|---|
| | Phosphorus | Nitrogen | TSS |
| East Campus Stream Restoration | 69.74 | 71.03 | 45,895.20 |
| East Campus Land Use Change | | 2.75 | |
| Siberts Creek Stream Restoration – Segment A | 27.63 | 29.47 | 18,231.23 |
| Siberts Creek Stream Restoration – Segment B | 33.80 | 36.09 | 22,283.14 |
| Siberts Creek Stream Restoration – Segment C | 47.91 | 47.45 | 31,446.04 |
| Siberts Creek Area Land Use Change | | 4.31 | |
| Siberts Creek Bio-retention | 1.87 | 13.02 | 1,551.38 |
| Arboretum Stream Restoration w/ Constructed Wetlands | 161.84 | 630.91 | 54,160.00 |
| ***Total Reductions*** | ***342.79*** | ***835.03*** | ***173,566.99*** |
| ***Required Reductions*** | ***78.90*** | ***626.82*** | ***66,904.99*** |
| ***Goals exceeded by:*** | ***263.89*** | ***208.21*** | ***106,662.00*** |

## *BLACKS RUN TMDL*

Blacks Run is located in the City of Harrisonburg and receives run-off from the City, JMU, VDOT and Rockingham County, then eventually flows to Cooks Creek. A TMDL was developed in 2002 for Blacks Run and Cooks Creek but did not issue waste load allocations (WLA) to the jurisdictions in the watershed. A revision to the local TMDL has been completed and approved by the EPA on July 10, 2019. As such, an Action Plan will be developed and included in the requested time frame for the next MS4 General Permit period. In preparation for the Blacks Run TMDL, JMU has already implemented the following BMPs:



| Description | Total Removal (lbs/yr) | | |
|---|---|---|---|
| | Phosphorus | Nitrogen | TSS |
| East Campus Hillside Meadow | 1.21 | 4.81 | 0 |
| East Campus Creek Area Tree Buffer Land Conversion | 3.76 | 16.63 | 1,438.69 |
| ***Total Reductions*** | ***4.97*** | ***21.44*** | ***1,438.69*** |
| ***Required Reductions*** | ***78*** | ***-*** | ***-*** |

## AWARDS & OTHER RECOGNITION

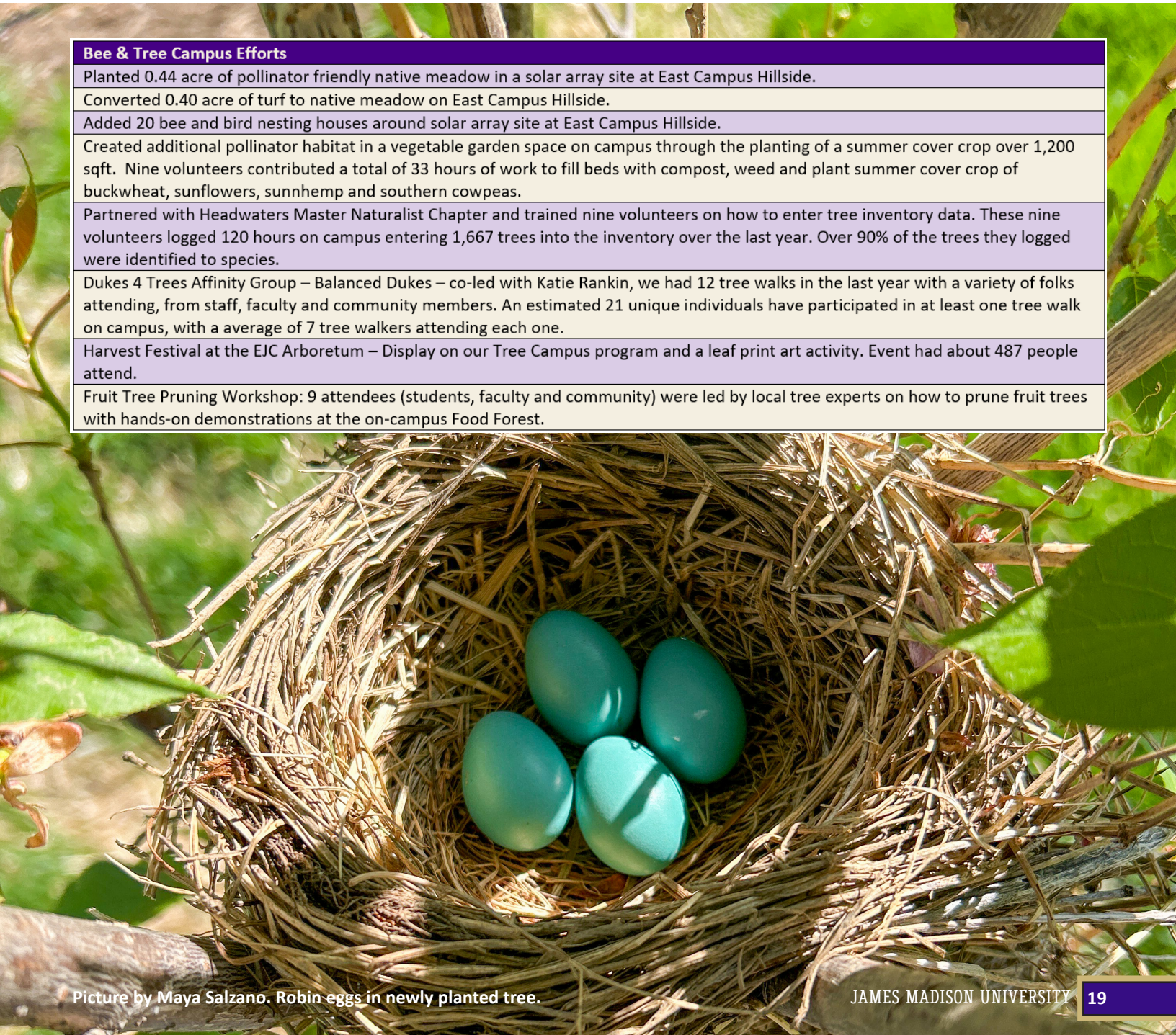
### *BEE & TREE CAMPUS STATUS MAINTAINED*

In June 2018, Bee City USA and Bee Campus USA became initiatives of the Xerces Society for Invertebrate Conservation. On February 14th, 2019 JMU became the 66th college/university in the nation to become a Bee Campus USA affiliate. JMU is the second campus affiliate in Virginia following Randolph College. Bee Campus USA fosters ongoing dialogue to raise awareness of the role pollinators play in our communities and what individuals can do to provide them with healthy habitat. The Bee Campus USA program endorses a set of commitments, defined in an application, for creating sustainable habitats for pollinators, which are vital to feeding the planet.

JMU received Tree Campus USA recognition in 2017. Tree Campus USA is a national program launched in 2008 by the Arbor Day Foundation honoring colleges and universities for promoting healthy trees and engaging students and staff in the spirit of conservation. The Tree Campus USA program recognizes college and university campuses that:

- Effectively manage their campus trees.
- Develop connectivity with the community beyond campus borders to foster healthy, urban forests.
- Strive to engage their student population utilizing service learning opportunities centered on campus, and community, forestry efforts.

| Bee & Tree Campus Efforts |
|---|
| Planted 0.44 acre of pollinator friendly native meadow in a solar array site at East Campus Hillside. |
| Converted 0.40 acre of turf to native meadow on East Campus Hillside. |
| Added 20 bee and bird nesting houses around solar array site at East Campus Hillside. |
| Created additional pollinator habitat in a vegetable garden space on campus through the planting of a summer cover crop over 1,200 sqft. Nine volunteers contributed a total of 33 hours of work to fill beds with compost, weed and plant summer cover crop of buckwheat, sunflowers, sunnhemp and southern cowpeas. |
| Partnered with Headwaters Master Naturalist Chapter and trained nine volunteers on how to enter tree inventory data. These nine volunteers logged 120 hours on campus entering 1,667 trees into the inventory over the last year. Over 90% of the trees they logged were identified to species. |
| Dukes 4 Trees Affinity Group – Balanced Dukes – co-led with Katie Rankin, we had 12 tree walks in the last year with a variety of folks attending, from staff, faculty and community members. An estimated 21 unique individuals have participated in at least one tree walk on campus, with a average of 7 tree walkers attending each one. |
| Harvest Festival at the EJC Arboretum – Display on our Tree Campus program and a leaf print art activity. Event had about 487 people attend. |
| Fruit Tree Pruning Workshop: 9 attendees (students, faculty and community) were led by local tree experts on how to prune fruit trees with hands-on demonstrations at the on-campus Food Forest. |



Picture by Maya Salzano. Robin eggs in newly planted tree.

JAMES MADISON UNIVERSITY

BEING THE CHANGE

Double-crested cormorant at Newman Lake spillway.