CHATHAM COUNTY, GA

Best Management Practices for Canal Greenway Maintenance

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ABOUT THIS GUIDE

A **Best Management Practice** (BMP) is an established technique, either an engineered control or operational practice, that effectively reduces polluted stormwater.

To ensure that drainage canals in Chatham County are maintained as required by State and Federal regulations, and that proposed trails and adjacent habitats are properly maintained as green infrastructure, BMPs specific to canal greenway corridors have been developed

This guide is intended primarily for maintenance professionals seeking information on the design, construction, and maintenance of canal features, and contains information that relates to the primary drainage function of the canals as well as potential issues related to the increasingly popular use of canal corridors as greenway trails.

In addition to a description of each BMP, this guide indicates additional, site-specific issues that warrant further discussion by maintenance staff. Finally, this guide provides several relevant case studies that demonstrate BMPs elsewhere in Georgia and around the country.

DEFINITIONS

INFRASTRUCTURE - Infrastructure provides commodities and services such as water, power and transportation, which are essential for communities and economic activities. Conventionally engineered drainage infrastructure is made of pipes, tanks, pumps, and treatment facilities, but it can also include canals.

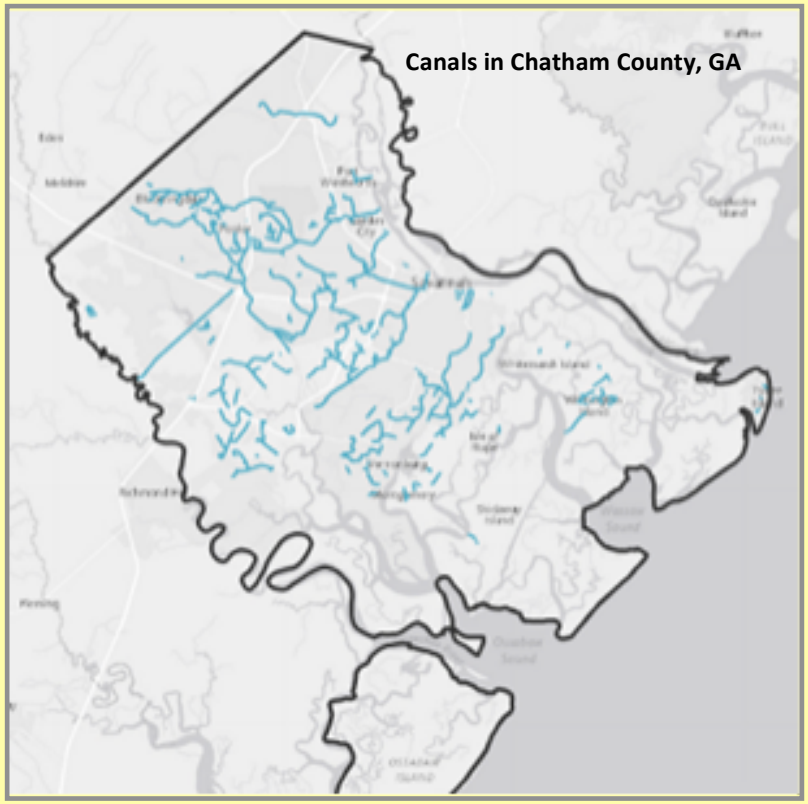
GREEN INFRASTRUCTURE – Green infrastructure is a network of natural areas that provide habitat, flood protection, clean air and water. It can be made up of conservation areas, developed areas with retrofits such as rain gardens and green roofs, or often some combination of both.

GREENWAY – Greenways are trails found in both urban and rural settings that are frequently created from underutilized railway, canal towpath, utility, or similar right-of-way. A greenway may provide pedestrian or bicycle connections between parks, cultural features, historic sites and populated areas. Greenways are often designed with green infrastructure principles to maximize the ecosystems services they may provide.

CHATHAM COUNTY CANALS ARE GREEN INFRASTRUCTURE

In Chatham County, historic canals and railways present a widespread opportunity to incorporate green infrastructure. In addition to their primary function as flood control, the canals have great potential to provide multiple ecosystem services - such as improved water quality, air quality, habitat and biodiversity.

Naturally-vegetated drainage canals can be considered green infrastructure, if certain BMPs are used in their operation and maintenance. For example, canals use vegetation and soils to infiltrate some of the stormwater runoff that is conveyed in the canal. Doing so provides natural filtration of area-wide non-point source pollution, and better local air quality. Establishing a more diverse and stable ecosystem at and in the canals reduces the need for chemical control of nuisance vegetation and pests. The BMPs described in this guide are designed to support the function of the canals as green infrastructure.



BEST MANAGEMENT PRACTICES FOR CANAL MAINTENANCE

In this guide, BMPs for canal maintenance are presented in the following categories:

DRAINAGE: BMPs related to maintaining stormwater runoff and flood control function of canals.

RECREATION: BMPs related to supporting public access activities, such as walking, biking, and wildlife viewing.

OPERATIONS: BMPs related to providing staffing and procedures for efficient maintenance of all corridor features.

DESIGN: BMPs related towpath surface, landscaping, interpretation, site furnishings, etc., that may be incorporated into future canal design, greenway path development or retrofit.

DRAINAGE

1.1 Minimize disturbance of routine dredging.

Dredging is occasionally necessary to remove accumulated sediments, vegetation, or other debris that might be impeding flow in a canal. However, dredging can re-suspend sediments in the water, impairing water quality in the canal and its receiving water bodies. Therefore, it is recommended to:

- Limit dredging activities to one time per year or less.
- Perform dredging during the lowest water level possible.
- Schedule during the fall and winter when the seasons are less ecologically active.

Site-specific issues to consider:
When are water levels at their lowest? Are there locations where sediment repeatedly accumulates? Are known species spawning or nesting within the canal corridor?

1.2 Remove dredge spoils “up and out” for proper disposal or reuse.

Dredge spoils that are placed alongside canal embankments or disposed of nearby can re-enter the canal after rainfall events and drive the need for unnecessary maintenance in the future. Therefore it is recommended that:

- Dredge spoils are removed for application to upland areas well off canal banks.
- Clean dredge spoils are reserved off site for reuse in approved restoration work or as clean fill.
- Dredge spoils that are known or suspected to contain contaminants are properly disposed of off-site.

Site-specific issues to consider:
Where can spoils be utilized within the ROW landscape without re-entering the canal as sediment? Within the jurisdiction? How is contamination assessed?

DRAINAGE

1.3 Minimize disturbance to canal banks.

Retaining vegetation along canal embankments reduces erosion and detains/delays runoff during wet weather. In addition, canal side vegetation can provide habitat for pollinator species and contribute to establishing stream ecology in the canal. Therefore, it is recommended to:

- Reduce or eliminate mowing of banks where possible.
- Deposit dredge spoils well away from canal banks.
- Where mowing is required for nuisance vegetation, target mowing for late in the flowering season, but before going to seed.

Site-specific issues to consider:
What nuisance vegetation grows on canal banks? In the canal itself? Are there recommended control methods aside from mowing that are appropriate for this vegetation?

1.4 Stabilize and protect canal banks using green infrastructure practices.

Green infrastructure helps reduce erosion, loss of nutrients, and scouring, while providing ecosystem services like flood control during peak wet weather. Therefore, it is recommended to:

- Naturalize sections of canal banks where possible, by planting and/or maintaining native floodplain plant communities on canal banks.
- Prioritize and protect existing bank areas along canals.
- Consider simple check dams where appropriate to control flow rate and create habitat.

Site-specific issues to consider:
Where in the canal corridor do you find visible erosion or canal sections that repeatedly need significant dredging that would benefit from green infrastructure practices above?

RECREATION

2.1 Provide features for users to participate in canal corridor upkeep.

Introducing or formalizing public access to canal corridors for recreational use creates many new responsibilities and concerns for local jurisdictions. However, it also can create potential stewards. Therefore, it is recommended to:

- Provide physical features such as signage, mile markers, waste bins and doggie bags to reduce litter, increase safety and facilitate inspection work.
- Provide programs to increase use and stewardship, such as seasonal gardening and Adopt-A-Highway type programs.
- Provide and clearly post "point of contact" to report maintenance issues.

Site-specific issues to consider:
Are there local community groups that could become stewards and help reduce maintenance needs along the canal corridor?

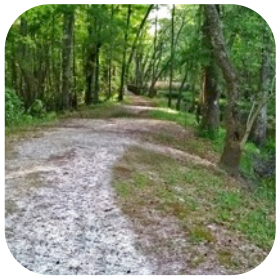
2.2 Provide frequent inspection of site furnishings and trail surface.

Recreational trails might incorporate a variety of new features that will require upkeep such as seating, signage, lighting, bike racks, exercise equipment, wetland crossings, docks, and waste bins. Therefore, it is recommended to:

- Inspect canal corridor regularly for debris, physical damage and general safety.
- Promptly schedule and perform maintenance and spot repairs via the appropriate jurisdiction and department.

Site-specific issues to consider:
What jurisdiction and department will be responsible for this inspection? Could it be performed in partnership with volunteers? Is it clear who is responsible for emergency repairs or maintenance?

DESIGN



3.1 Ensure reliable towpath conditions.

Towpath maintenance roads are often rutted by heavy machinery and unreliable after wet weather. Furthermore, increasing access as a trail creates additional safety and aesthetic expectations for a towpath. Therefore, it is recommended to:

- Carefully evaluate towpath substrate for potential multi-use as maintenance road and trail.
- Consider the creation of a separate trail for exclusive use by the public where space allows.
- Incorporate green infrastructure practices such as permeable surfaces (crushed stone or pavement) where appropriate

Site-specific issues to consider:
Where do towpaths need resurfacing to improve maintenance access? What surface materials could accommodate both maintenance and trail use? What surface materials are ideal for separate trails?



3.2 Ensure reliable towpath closure for maintenance vehicles, staff and equipment.

To ensure safety during periodic maintenance such as dredging or path maintenance, towpath maintenance roads must be secured in order to establish a safe work zone. Therefore, it is recommended to:

- Exclude motorized vehicles during recreational use of canal towpaths, and exclude recreational uses during operation of heavy maintenance machinery.
- Install removable bollards or swing gates at access points for controlled access.
- Utilize visual cues at access points and intersections.

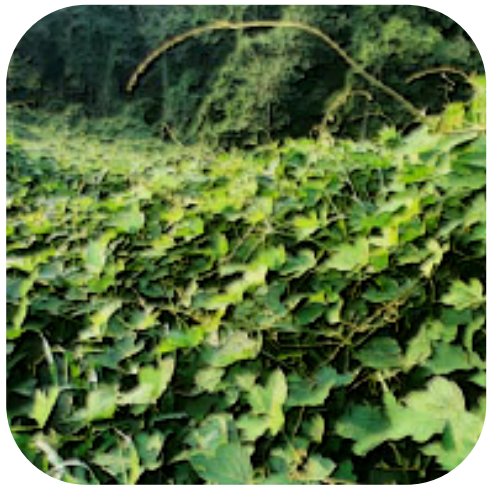
Site-specific issues to consider:
Would there be additional staffing needs related to ensuring safety at access points during maintenance activities?

OPERATIONS

4.1 Control invasive plant species

Invasive species have negative impacts on infested areas, as well as commercial, agricultural, and recreational activities dependent on these areas. Control of nuisance vegetation reduces the long-term need for herbicide application, improves floodplain function of canal, and increases the biodiversity and resilience of the ecosystem Therefore, it is recommended to:

- Identify and inventory invasive species (terrestrial and aquatic) within the canal corridors.
- When disposing of invasive plant material consider whether there are any seeds, fruits or cuttings that could re-sprout – remove them before they become viable, or dispose of them by burning or bagging.



Site-specific issues to consider:
What resources are needed to identify, monitor and control invasive species?

4.2 Integrated pest management approach to mosquito control

Integrated pest management is an ecosystem approach to pest control that includes biological, cultural and mechanical controls. Canals with more diverse aquatic life will have natural biological controls for pests. Therefore, it is recommended to:

- Increase habitat for species that predate mosquito and other pests.
- Incorporate mosquito fish programs where appropriate.

Site-specific issues to consider:
Are there locations that would be ideal for reduced pesticide use?

OPERATIONS

4.3 Inter-agency maintenance schedule

Creating a comprehensive list of maintenance-related tasks with an associated schedule and lead agency will reduce potential staff and budgetary conflicts, and provide clarity between jurisdictions:

Regular, frequent tasks:

- Trail surface and features inspection
- Ground debris removal
- Emptying trash containers
- Scheduling maintenance tasks discovered on trail
- Public engagement on trail usage

As-needed tasks:

- Tree and shrub pruning
- Mowing along trail
- Dredge canal bottom
- Control overgrowth on canal
- Repair/replacement of trail surface and features
- Invasive plant removal
- Erosion control

Ongoing tasks:

- Interagency coordination
- Law enforcement
- Education and interpretation
- Employee training
- Records-keeping
- Budget development
- Volunteer coordination
- Mapping

OPERATIONS

Utilizing the template below, specify the type, frequency and jurisdiction of each maintenance task related to a canal segment.

CANAL SEGMENT DESCRIPTION (provide cross streets at beginning and end):					
		JURISDICTION (fill in department name)			
ACTIVITY	FREQUENCY	COUNTY	CITY	OTHER	NOTES
Trail surface and features inspection	Daily				
Ground debris removal	Weekly				
Emptying trash containers	Weekly				
Scheduling special maintenance	Weekly				
Public programs	Seasonal				
Tree and shrub pruning	Seasonal				
Mowing along trail	Seasonal				
Dredge canal bottom	Annual				
Control overgrowth on canal	As needed				
Repair/replacement of trail surface and features	As needed				
Invasive plant removal	Seasonal				
Erosion control	Seasonal				
Interagency coordination	Ongoing				
Law enforcement	Ongoing				
Education and interpretation	Ongoing				
Employee training	Ongoing				
Records-keeping	Ongoing				
Budget development	Ongoing				
Volunteer coordination	Ongoing				
Mapping	Ongoing				

EXAMPLES OF CANAL GREENWAYS

Police Memorial Trail (City of Savannah)

This is the towpath section of the Truman Linear Park Trail that will ultimately link Daffin Park and Lake Mayer Community Park. This is an example of an established canal greenway that provides non-motorized transportation links to multiple community institutions.

www.trumangreenway.org

Savannah – Ogeechee Canal (Chatham Co.)

This volunteer-maintained section of towpath in Chatham County near the Ogeechee River terminus provides public access to historic exhibits, a restored lock, a floating dock, and a half-mile walking trail. Maintained in cooperation with Savannah – Ogeechee Canal Society.

http://www.parks.chathamcounty.org/parks

EXAMPLES OF CANAL GREENWAYS

J. F. Gregory Park (Richmond Hill)

This well-used 335-acre multi-use recreational area was built on Henry Ford's rice plantation. It features a 3-mile nature trail on the elevated impoundment berms, including a birding trail with tower and fitness stations along the trail.

www.richmondhill-ga.gov

Augusta Canal National Heritage Area

The Augusta Canal and nearby land became a National Heritage Area in 1996. A master plan guides redevelopment of the canal for recreation, preservation, education, conservation, and economic development. The seven-mile long towpath on the canal's first level forms a backbone for an area-wide recreational trail system.

www.augustacanal.com

EXAMPLES OF OTHER GREENWAYS

Atlanta Beltline

The Atlanta BeltLine is one of the largest urban redevelopment and mobility projects in the United States. This project incorporates stewardship and invasive species control into the rehabilitation of 22 miles of underutilized railroad corridors. The project pioneered innovative BMPs such as grazing animals (like the above goat!) for clearing nuisance vegetation. The BeltLine is a model for sustainable greenway development.

www.beltline.org

San Antonio River Walk

The River Walk is a world-renown linear park lined with restaurants, hotels, attractions and more. The San Antonio River Authority schedules dredging and inspections annually in the month of January. Maintenance activities are publicized well in advance and in coordination with River Walk establishments.

www.thesanantonioriverwalk.com

RESOURCES

Coastal Region Metropolitan Planning Organization Non-motorized Transportation Plan
http://www.thempc.org/Transportation/Non-motorTranspPlan.html

The Hydromodification BMP Manual for Coastal Georgia
http://marex.uga.edu/uploads/documents/Hydromod_Manual_Sept_2009.pdf

Green Infrastructure Planning Guidelines for Coastal Georgia
http://www.crc.ga.gov/departments/planning/Docs/GreenInfrastructurePlanningGuidelinesV1.pdf

The Georgia Invasive Species Task Force
http://www.gainvasives.org

Best Practices: Greenspace and Flood Protection Guidebook
https://epd.georgia.gov/sites/epd.georgia.gov/files/related_files/site_page/EPDGreenspace-Flood-Guidebook.pdf