



Green Infrastructure & Stormwater Management CASE STUDY

The River of Grass

Location: Naples Botanical Garden, Naples, FL

Client: Naples Botanical Garden

Design Firm(s): GOETZ+STROPES LANDSCAPE ARCHITECTS, INC.

Landscape architect/Project contact: Ellin Goetz, FASLA

Email: egoetz@gsnaples.com

ASLA Chapter: Florida



Image: GOETZ+STROPES LANDSCAPE ARCHITECTS, INC

Project Specifications

Project Description: This disturbed agricultural site previously invaded with exotics was cleared, filled and regraded with a gradually sloped swale leading down to a new lake dug to generate fill for the project. Elevations follow naturally existing water tables on the site. Water

flow mimics the natural pattern of regional flow ways such as the Everglades River of Grass and initiates at the "head" of the swale, where an outfall structure gathering piped site stormwater acts as the source. Boardwalk brings visitors up close and personal with this iconic Florida landscape, and whenever it rains, water flows beneath them through the plantings, creating a habitat complete with fish, tadpoles, wading birds and hundreds of dragonflies.

Project Type:

Open space - garden/arboretum

Part of a new development

Design features: Bioretention facility, rain garden, and bioswale.



Photo: GOETZ+STROPES LANDSCAPE ARCHITECTS, INC.

This project was designed to meet the following specific requirements or mandates:

State statute, local ordinance, developer/client preference

Impervious area managed: greater than 5 acres

Amount of existing green space/open space conserved or preserved for managing stormwater on site: 1 acre to 5 acres. Site was a disturbed former agricultural property that was redeveloped as a Botanical Garden; this River of Grass stormwater management design was introduced as part of the site design to use natural patterns and systems.

The regulatory environment and regulator was supportive of the project.

Did the client request that other factors be considered, such as energy savings, usable green space, or property value enhancements? Florida's Everglades, within 30 miles of this new Botanic Garden in South Florida, is expressed in our design for the River of Grass, the designed centerpiece of the Garden. We shaped the landforms and plantings and designed a drainage system to echo the slow natural movement of water so that stormwater piped to the head of this River filters through a thick swath of grasses and other plantings down to a lake where it is captured before seeping out into acres of larger restored wetlands. A new habitat is born, complete with attendant wildlife. Not only do plants, wildlife and water tables benefit, but the visitor experience is shaped by an immediacy to this stunning ecosystem, as boardwalks designed by the landscape architect connect parts of the garden above this River of Grass. The visitor (over 100K since Nov. 09) is constantly informed of the confluence of land, water and sky that defines South Florida as they travel within the garden.

Cost & Jobs Analysis

Estimated Cost of Stormwater Project: \$100,000-\$500,000 (Public funding: Not available)

Related Information:

- Drainage Pipe and structures \$25,000
- Boardwalks \$35,000
- Grading and Sitework \$50,000
- Plantings \$60,000

Was a green vs. grey cost analysis performed? No

Cost impact of conserving green/open space to the overall costs of the site

design/development project: Initial costs of the River of Grass were higher than traditional stormwater system, but the long term benefits of using open space to slow and filter stormwater through a created wetland are many. The landscape maintenance of the area is limited to removal of exotic species should they take seed. Irrigation was temporary only to establish plant communities.

Cost impact of conserving green/open space for stormwater management over traditional site design/site development approaches (grey infrastructure)?

Did not influence costs. Stormwater from site drains is piped to an outfall structure sited at the "head" of the River of Grass, and is directed through a designed wetland to flow a distance of 450 feet towards site lakes. Native plantings are established in the River of Grass to handle periodic inundation.

Number of jobs created: 10

Job hours devoted to project:

Planning and Design: 2 months

Construction: 6 months

Annual Maintenance: 24 hours

Performance Measures

Community & economic benefits that have resulted from the project: The River of Grass is the core area of a new Botanic Garden, within a 160 acre site disturbed by agriculture and suffered from encroachment of environmentally invasive plants that had destroyed natural drainage patterns and native ecosystems that depend on water flows. The area was not part of any specific mitigation, yet we intentionally designed it to display the beauty of our regional landscape, while incorporating natural processes of water flow. We selected plant materials able to absorb periodic inundation at specific elevations, with native Royal Palms, Sabal Palms and thickets of silver saw palmetto placed at the highest points, just as seen in the natural forms of the Everglades landscape. In addition to this designed feature, over 60 acres of protected wetlands have been restored on site by others by removal of exotics, resulting in a significant return to seasonal water levels.

Project Recognition

FNGLA 2010 Award of Excellence; Urban Land Institute, Southwest Florida Chapter, 2010 Impact Award

Additional Information

Links to images: www.gsnaples.com

Over 180,000 annual visitors traverse the River of Grass via the Boardwalks to link up with various areas of the Botanical Garden and cannot help but be immersed in this true Florida landscape, as the walks subtly dip lower and lower, following the contours of the land. Signage interprets the drainage system of plants and landform cooperating to filter stormwater looping from site to lakes.