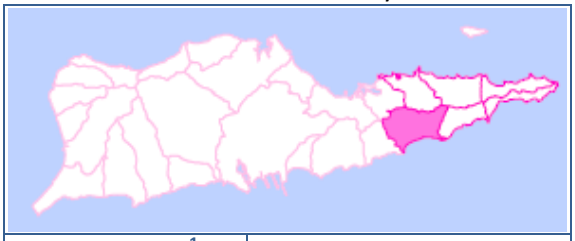
8.0 Great Pond Bay Watershed

This section summarizes baseline information specifically for the Great Pond Bay watershed and includes a description of the unique watershed features, a summary of existing water quality conditions, descriptions of potential restoration sites investigated during field assessments, and neighborhood descriptions. Table 8.1 summarizes basic watershed features.

Appendix A contains a basemap of the Great Pond Bay watershed depicting locations of water quality impairments, roads, hydrology, topography, and potential restoration sites.

Table 8.1. Watershed Summary



Drainage area[1]	2000 acres; 3.1sq miles
Length of guts[2]	5.5 miles mapped
Road length[2]	11.8 paved miles; 4.5 unpaved miles
# Road culverts[2]	12 mapped culverts
Impervious Cover[3]	69 acres; 3%
Dominant land use %[4]	Undeveloped: 55%
	Ag: 29% %
	LDR: 9%
Area within 100-yr floodplain[5]	891 acres; 45% of watershed
# Small ponds[4]	7 (not including Great Pond)
# Mapped wells[6]	12
Watershed erosion potential[7]	Vulnerability: High
	Road-based: Med
	Mean Relative: Med-High
2010 WQ Impairments[8]	None

[1] IRF/UVI/USGS 2001 watershed boundaries
[2] HW revised/or created, 2011
[3] NOAA CSC, CCAP data, 2005
[4] UVI-CDC data 2003 (land use) and 2001 (ponds)
[5] DPNR, dated 2005
[6] Received from DPNR Feb, 2011
[7] WRI/NOAA, 2005
[8] DPNR, 2010 Integrated Waters Report

6.1 General Description

The Great Pond Bay watershed is in the southwestern portion of the East End watersheds and is the largest of the six watersheds. It contains Great Pond, the largest salt pond in the USVI, which was identified as an Area of Particular Concern in 1979 and fully designated in 1991. The pond is essentially closed by a baymouth bar, supporting a substantial mangrove community, and providing habitat for resident and migratory birds as well as juvenile fish. It is also serves as a sediment trap from watershed sources. The water in the pond is brackish during the rainy season and hyper saline during the dry season. Like Southgate, this area was also designated as an Area of Preservation and Restoration, as well as a Significant Resource Area. Great Pond was recommended for conservation and education by the National Park Service (1960), the VI Territorial Park Service (1981), and by the Island Resources Foundation (1991).

Also like Southgate, the Great Pond area was included in the Coastal Barrier Resources System (1990), which prohibits federal funding and insurance for development projects within designated areas in order to: halt development in low-lying areas subject to flooding, protect natural resources, and reduce wasteful government spending. The central portion of the watershed is a shallow-sloping, alluvial plain surrounding the pond. Great Pond has the largest

number of wetland acres in the East End watersheds and is mostly undeveloped (55%). Over 45% of the watershed area lies within the 100-year floodplain. There are six major guts that drain the hillside on the northern watershed boundary. The Great Pond watershed receives an average of 40 inches of rain annually (DPNR, 1993).

Land Use

Three main roads effectively separate the Pond and surrounding lowlands from the steeper terrain: South Shore Road in the east, Southside Road (Rt. 62) in the west, and Route 624 connecting the two. Land use in the watershed consists of a large Boy Scouts of America Camp in the west, a public camping ground (Arawak) and the East End Marine Park (EEMP) Offices in the east, and a small grocery store (Milgie's). Several low-density, single family neighborhoods are located in the watershed: Union & Mt. Washington, Marienhoj, and Sally's Fancy. The watershed is mostly zoned for agriculture and low density residential; however, a portion of the watershed was up-zoned high density, associated with the proposed Robin Bay Resort development and, presumably, the Wyndham Golf Resort/Casino (Figure 8.1). North of Rt. 624 is a proposed commercial retail center, the Muddy Mongoose.

Like the rest of the East End, there are no central sewer lines located in the watershed; therefore, residential and small commercial areas rely on individual on-site septic systems. The soils in the central portion of the watershed are limited for septic disposal systems, which will become a bigger issue as the area continues to develop.

Figure 8.1. Overlooking Great Pond and the Union neighborhood from Mt. Washington (left), and signage indicating new proposed development (right).

Water Quality

There are three water quality assessment units associated with this watershed; none are listed in the 2010 Integrated Waters Report (DPNR, 2010) as impaired.

Table 8.2. Water Quality Impairments (from DPNR, 2010)

Assessment Unit ID/Name	Monitoring Station Name	Impairment	Source of Impairment	TMDL (Priority)
VI-STC-51 / Great Pond	None	(N/A)	(N/A)	(N/A)
VI-STC-52 / Great Pond Bay	STC-13A Great Pond Bay	(N/A)	(N/A)	(N/A)
VI-STC-53 / Great Pond Bay subwatershed, offshore	STC-OFF13 SE-4	(N/A)	(N/A)	(N/A)

8.3 Potential Watershed Restoration/Project Sites

A number of specific sites were identified by project partners, local residents, and field assessment teams as potential sources of pollution or as drainage improvement opportunities. Table 8.3 summarizes candidate projects to be considered during the watershed planning process. A more detailed description of existing conditions and potential opportunities at these sites is provided below.

Table 8.3. Summary of Candidate Restoration/Project Sites

Project ID/Site Name[1]	Description	Initial Ranking
Gut/Pond Restoration		
West Gut at Southside Rd. (GP-G-1)	Lack of drainage infrastructure has caused significant erosion at the West Gut in the northwest corner of the Sally's Fancy neighborhood. A portion of the roadway (Southside Road) and several large trees have been undermined as a result. Headcutting, bank erosion, and property loss have occurred. Curbing, a paved flume, and riprap is proposed to collect road runoff and stabilize gut.	High
Sally's Fancy East Gut (GP-G-2)	Remove the dirt being stockpiled in the gut.	High
Road Improvements		
Milgie's Grocery (GP-RC-2)	Construct a concrete v-ditch channel to collect gut flows and convey it across Route 624, near Milgie's Grocery. Water currently ponds at Milgie's Grocery, causing erosion and property damage.	Medium
Unnamed Rd. (GP-RC-33)	Eroding, steep, unpaved road in Mt. Washington/Union area discharging sediment across South Shore Rd. Flows contributing to raveling and potholes on South Shore Rd. Proposed installation of waterbars, swale, deep sump inlet, and stabilized outfall.	Low
Stormwater Retrofits/ Pollution Prevention		
Great Pond Parking Lot (GP-R-1)	Significant dumping of trash and debris at pond along beach access road. Substantial erosion and stormwater sheet flows over debris to pond and ocean. Restrict vehicle access and discontinue dumping.	High
EEMP Office (GP-R-2)	Potential area for growing native plants for restoration projects.	Low
Parking Lot/Trail Repair (GP-R-3)	Retrofit dirt parking area and stabilize eroding trail to beach near EEMP offices.	Medium

Project ID/Site Name[1]	Description	Initial Ranking
Culvert Maintenance and Repair		
Eastern culvert on Rt. 624 near proposed Muddy Mongoose (GP-RC-1)	Large scour hole below culvert splash pad. The curb-cut at the culvert headwall is bypassed by much of the road runoff, causing significant erosion. Curbing should be extended west to convey the road runoff to the existing curb-cut at the culvert headwall. Riprap should be placed at the end of the concrete splash pad to stabilize the scour hole formation. The culverts are in need of maintenance. Culvert replacement may be necessary if the proposed retail construction directs additional runoff here.	Medium
West culvert on Rt. 624 (GP-RC-3)	Twin 36" CMP culverts with downstream scour hole. Stabilize downstream with riprap to prevent further erosion.	Low
Marienhoj north culvert/ East Maria Ln. (GP-RC-4)	24" CMP is partially clogged with eroding outfall and downstream scour observed. Culvert is 'hanging' by ~3 feet. Concrete dumped at outfall for stabilization has failed. An improved paved drainage flume shall be installed to adequately collect the road runoff. Culvert maintenance and outfall stabilization is required. Possible culvert resizing may be necessary with future development. Culvert may be contributing to road erosion downgradient. Road/driveway stabilization measures may be necessary.	Medium
Marienhoj west culvert (GP-RC-5)	Culvert completely blocked and not functioning. Size and type are unknown. Culvert to be flushed and possibly replaced.	Medium
South Shore Rd. culvert (GP-RC-34)	12" culvert on South Shore Rd. completely blocked with sediment. Space available to install concrete drain box with sump behind existing pipe and stabilized outlet. Pipe to be flushed or replaced.	Low
[1]ID matches basemap locations and field sheets in the Appendix.		

Unnamed Road (GP-RC-33)

Just off of South Shore Rd., north of the Union neighborhood area, is a private unpaved road that is contributing sediment across South Shore Rd. and contributing to pavement degradation (Figure 8.2). The road is approximately 600 ft. long, currently serving four to five houses. A number of strategically placed water bars could help prevent erosion of the road surface by breaking up the flow and conveying it to a stabilized concrete swale. There is room to collect flow at the base of the slope in a drop inlet structure and pipe it under South Shore Rd. to a stabilized outfall. The inlet sump could help trap sediment, but would require maintenance.

Figure 8.2. Unnamed, unpaved road (top photos) draining to South Shore Rd. deposits sediment across South Shore Rd. into vegetated area and is contributing to road surface degradation (bottom photos).

Culvert on South Shore Rd. (GP-RC-34)

At the bend on South Shore Rd., on the northern watershed boundary, there is an existing 12" RCP that was recently excavated, presumably because lack of maintenance or undersizing of the culvert has led to the culvert being completely buried (Figure 8.3). Sediment was removed from behind the culvert headwall, however no formal box structure or roadside drainage ditch exists. This area will likely continue to be a maintenance issue. The installation of a concrete box structure with stabilized ditch inlets and outlet structure (riprap) may provide a sump for sediment that can be removed with a back hoe. Increased pipe capacity may also be recommended, depending on an analysis of the drainage area to this point.

Figure 8.3. Unnamed road draining to South Shore Rd. deposits sediment across street into vegetated area and is contributing to road surface degradation.

Great Pond Bay Parking Lot (GP-R-1)

The parking area at Great Pond Bay is currently used as a dump site for trash and other refuse and debris (Figure 8.4). Evidence of soil staining from unknown discarded materials and/or liquids was also observed. Stormwater flows down the existing dirt road and paths, through the dump debris to the pond and beach area. The roadway and paths are highly eroded with deep ruts and gullies. The soil is also highly compacted from vehicular traffic and dumping activities. This area likely conveys large amounts of sediment and other pollutants to Great Pond Bay.

Figure 8.4. Dumping and debris at the Great Pond parking area

A series of minor site improvements at this property could alleviate dumping and reduce the threat of pollutant loading to the coastal waters. Installation of a guardrail or other suitable barrier at the entrance would restrict vehicle access and limit traffic to pedestrian use only. Sections of fencing or placement of large boulders at either end of the barrier may also be useful, to prevent visitors from bypassing the barrier in their vehicles. Limited vehicle access would, presumably, reduce the amount of dumping and introduction of potentially hazardous waste materials, and allow the area along the pond to naturally re-stabilize and re-vegetate. Large ruts and gullies may be backfilled with an appropriate soil or gravel to reduce further erosion. Restricted access should be accompanied with education and outreach including "no dumping" signage and trash cleanup events linked to the cleanup of Great Pond Bay.

Road Drainage Issues on Rt. 624 (GP-RC-2, GP-RC-1, GP-RC-3)

Several potential retrofit/drainage improvement sites were identified along Rt. 624 in the Great Pond Watershed. The most significant problem was identified near Milgie's Grocery (GP-RC-2) where drainage from the adjacent gut is not properly managed. Currently, water from the gut flows south until it reaches Rt. 624, where it then flows east along the road shoulder toward Milgie's before passing over the pavement and flowing to the south. Minor road flooding was witnessed during the site visit, but chronic flooding at the Milgie's Grocery property was reported (Figure 8.5). Erosion and undermining of the asphalt pavement at this location was also observed. Suggested drainage improvements include construction of a concrete drainage channel along the north side of Rt. 624 to direct runoff to the lowpoint in front of Miligie's. The existing drainage channel across Rt. 624, as well as the shoulder along the southern side, should be excavated and lowered to improve flow away from the roadway. Relocating the existing chainlink fence for the Wyndham property and selective vegetation management may also be necessary to address the drainage problem.

Figure 8.5. Road drainage issue in front of Milgie's Grocery.

Two drainage improvement projects were identified at road culvert crossings along Rt. 624: GP-RC-1 and GP-RC-3. The GP-RC-1 culvert (located south of the proposed Muddy Mongoose commercial development) is an eroding culvert network in need of maintenance and stabilization (Figure 8.6). Currently road runoff bypasses an existing curb-cut in the downstream headwall and is causing erosion at the west end of the headwall. Additional curbing should be installed to convey runoff to the existing curb-cut. Riprap stabilization at the existing culvert splash pad is also recommended to impede further scour hole formation. General debris removal and vegetation management is suggested.

The GP-RC-3 culvert is located west of Milgie's Grocery and east of Southside Road. This site includes two 36-inch CMP culverts that direct gut drainage to the south of Rt. 624. The culverts are currently in good condition but a scour hole has formed at a concrete splash pad at the culvert outfall. Riprap stabilization is recommended to impede further scour hole formation. General debris removal and vegetation management is suggested at the culvert inlet location.

Figure 8.6. Culvert near Muddy Mongoose proposed development.

West Gut at Southside Rd. (GP-G-1)

The West gut begins at Southside Road and passes through the Sally's Fancy neighborhood. A gut restoration/road improvement site was identified where the West gut begins at site GP-G-1. At this location, the gut receives runoff from Southside Rd. and the Marienhoj neighborhood. The runoff is not properly collected in drainage infrastructure; instead it flows off of the shoulder and into the gut. Significant gut erosion has occurred and the roadway has been undermined as a result of improper stabilization. Boulders had previously been placed at this location to impede the erosion but the attempt failed. Several nearby, large trees have been uprooted. The bank erosion in the gut is so great that considerable property loss has occurred at the neighboring properties. Curbing should be added along the roadway at this location and a paved flume installed to collect the runoff. A riprap splash pad should be placed in the gut to minimize the erosive forces of the runoff. Bank stabilization measures in the gut are also recommended to prevent further property loss (Figure 8.7).

Figure 8.7. West gut erosion and trash.

Marienhoj East Maria Lane Culvert (GP-RC-4)

A 24-inch CMP culvert was identified on East Maria Lane at the GP-RC-4 site. The culvert inlet is partially clogged which has contributed to runoff bypassing the culvert and flowing off the roadway to the south. Significant erosion has resulted due to the steep terrain and improper stabilization. Concrete had been placed in an attempt to manage the road runoff but it is bypassed on both sides (Figure 8.8). The culvert is currently 'hanging' about three feet above ground. An improved paved drainage flume and curbing should be installed to adequately collect the road runoff and convey it to the outfall. Riprap should be placed at the outfall to arrest the existing bank erosion and scour hole formation. The culvert should be shortened to conform to the existing topography. Debris removal at the culvert inlet is recommended.

Figure 8.8. Attempt at concrete flume to manage runoff on East Maria Lane above culvert (GP-RC-4).

Boy Scout Property/Great Pond West

The Boy Scout camp contains a drainage outfall-grassed swale system, a gut that runs through the property, a mangrove forest, and recent excavation of drainage channels and detention ponds (Figure 8.9). All developed areas throughout the Boy Scout property were found to be in good condition. The outfall-swale system that drains to the property from Southside Rd had no signs of erosion and ample grass coverage. The gut downstream of the swale was also very stable. Bank stabilization was adequate due to the thick mangrove-manchineel forest downstream and the tall guinea grass upstream.

West of Great Pond there was recent excavation of earthen drainage channels and detention ponds for controlling water and runoff from the proposed Wyndham Resort development (see Figure 8.8). The drainage channels are simply trenches that were dug to redirect water to the constructed ponds. Excess soil from the excavation remained on-site, adjacent to the basins. Since that time, guinea grass was able to establish on the bare soil which appears to have kept erosion and sedimentation down. If the resort project does not take shape in the near future, consideration should be given to filling in the trenches and basins to restore more natural drainage patterns.

Figure 8.9. Clockwise from top left: Culvert leading from Southside Rd. to grass swale at Boy Scouts site; Grass swale leading from culvert outfall to Great Pond on Boy Scouts property; Detention pond adjacent to Great Pond near Boy Scouts property; Soil mounds from Wyndham excavation.

East End Marine Park (EEMP) Office (GP-R-2)

The EEMP office is a small, two-story building just east of Great Pond, adjacent to the historic Great House. Since rooftop runoff is collected in cisterns, the area is generally flat, and there is limited erosion evident in the parking lot or immediate vicinity, no stormwater drainage demonstration projects were identified. However, the park office is surrounded by a lot of open area, which could potentially be converted into a demonstration/study area for growing native plants for use in demonstration projects elsewhere on island (Figure 8.10). Part of the educational program of the EEMP could include how to convert residential lawns to native landscaping.

Figure 8.10. Eastern side of EEMP office building is a potential location for demonstration garden.

Proposed Arawak Campground/Eroded Trail near EEMP Office (GP-R-3)

The adjacent open area north of the EEMP is currently being considered for a large campground. In the northeastern corner is an active parking area that connects to an eroded trailhead leading down to the beach. EEMP staff indicated that observable erosion occurs during rain events and that trail stabilization and parking management at this location would help reduce sedimentation. The trail is approximately 150 feet long at a 2:1 to 3:1 slope. Deep gullying has occurred in the trail (Figure 8.11). Basic trail stabilization techniques including waterbars and steps, as well as management of flow from the parking area could help stabilize the trail. Ownership of the trail is uncertain.

Figure 8.11. Eroded trail to beach (left) and parking area (right)

8.3 Neighborhood Summaries

A summary of general neighborhood conditions is provided below in order to identify which neighborhoods are likely to generate pollutants of concern, what the common sources are, and which areas/sources should be targeted for watershed stewardship activities. Unless otherwise noted, it is assumed that neighborhoods consist of single-family, detached residences, with cisterns, on-site septic systems, and open section/drainage roads (without curb and gutter). Table 8.4 is a comparative summary of each neighborhood, and more detail is provided below. Pollution source is determined by number of observed pollutants (1-2=Medium; >2 = High).

Table 8.4. Summary of Neighborhood Restoration Opportunities

Name[1]	Road/ Driveway Condition	% Lots Un-developed	Pollution Source	Potential Stewardship Activities
Sally's Fancy	Unpaved, turf & dirt/ moderate to good	<50%	Medium	Education – Yard cleanup and pet waste; buffer protection
Marienhoj	Paved/good condition		Medium	ESC for Residential construction
Union (portion of Union & Mt. Washington)	Paved/mod erosion of pavement	<25%	Low	Septic survey (poor soils)

[1]See Southgate watershed (Section 3.0) for Mt. Washington description.

Sally's Fancy

The Sally's Fancy neighborhood is located northeast of the Southside Rd./Rt. 624 intersection. The neighborhood includes a mix of topography, landuse, and parcel size and has two guts flowing through it (Figure 8.12). The topography varies from moderate in the north and very flat topography in the south. The parcels, which are primarily developed, range from quarter-acre to three-acre lots. The larger parcels are primarily brush or tall grass that may include some agricultural activities. At least two lots were identified as possible automobile junk yards. Other than the two highways that border the neighborhood, the roads are mostly dirt or gravel. Severe rutting was observed in the low-lying areas. Some of the ruts were in the process of repair with crushed stone. A high density of dogs was observed in this neighborhood.

An area of future concern near Sally's Fancy is the proposed Wyndham Golf Resort & Casino, which is directly across from Milgie's Grocery. The local gut flows directly into this property and the topography is extremely flat. Any impoundment to the gut will likely contribute to more severe flooding problems in Sally's Fancy neighborhood. Any future downstream development should evaluate these potential impacts during the planning phase.

Figure 8.12. Sally's Fancy neighborhood (left); sediment dumping in gut (right).

Marienhoj

The Marienhoj neighborhood is located in the northwest corner of the watershed and is accessed by Southside Rd. It is primarily located in the hills and consists of large parcels on steep terrain. Few of the parcels are developed, with the majority remaining forested. There is some new construction currently taking place. At one recently cleared lot (Figure 8.13), no erosion/sediment control practices were installed and much soil was exposed, creating high potential for down-gradient sedimentation. Most of the roadways are paved but with minimal drainage infrastructure. A culvert was found with significant erosion at the outfall. An ineffective attempt was made to manage the runoff at the outfall by pouring a concrete

drainage flume/splash-pad. This measure failed due to water bypassing and scouring beneath the flume. Some dirt driveway erosion was identified that was contributing sediment onto the roadways.

Figure 8.13. Slope clearing at residential construction site in Marienhoj.

Union

The Union area is the flatter portion of the greater Union/Mt. Washington neighborhood. It is located northeast of Great Pond and off of South Shore Rd, and is relatively flat compared to many of the other residential areas in the East End (Figure 8.14). The primary roadways within this area are Sunset Road, Corry Road, Tamarind, David Oliver, Seaview, Blue Dolphin, Kenjo, and Acacia. The Union area is approximately 115 acres with 302 lots, less than 25% of which remain undeveloped. Average lot size for the single family homes in this neighborhood is around 0.25 acres, however, there are larger lots. Average lot cover is 70% turf, 25% rooftop, and 5% bare soil. Wastewater is managed via on-site septic systems and no problems with septic were observed. Road cover was mixed, but mostly paved. One section of Kenjo Road was unpaved and eroded with large ruts. All roads had open drainage and there was no evidence of water bars or culverts. A few roads had shallow grass swales on the road shoulder. This neighborhood does not appear to pose as a source of pollutants or sediment to down-gradient resources.

Figure 8.14. Street view of the Union area.

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