

9.0 General Findings

General watershed findings to advance development of watershed goals and priority recommendations are presented below in no particular order. These findings are based on: (1) existing management plans or planned capital improvements; (2) input from residents and other stakeholders; and (3) direct observations made by field assessment teams.

- 1. Addressing Water Quality Impairments:** There are three TMDLs being developed for the northern shore of the East End in 2011. Pollutant load modeling under our planning effort should track closely with land use coefficients, rainfall distributions, drainage area delineations, and the load allocations established through the TMDL process. Prioritization of implementation activities should integrate with TMDL reduction goals where practical, understanding that current efforts to update/revise the water quality standards may result in eventual delisting of some impaired waters (e.g., Isaac Bay).
- 2. Managing Unpaved Roads:** Unpaved roads have the potential to be the most significant source of sediment loading in the East End and were identified as potential restoration sites in all of the watersheds. There are a number of privately-owned roads and residential streets that should be high priorities for repair, paving, or other drainage improvements (e.g., Cotton Valley area and Seven Flags Rd.). The DPW does not extend maintenance authority to most of the private roads; therefore, watershed managers and homeowner associations will likely have to play a large role in securing funding for any road improvement project. The watershed plan should highlight the most cost-effective alternatives for road improvement in priority areas and target educational efforts and grant opportunities, respectively.
- 3. Drainage Infrastructure Improvements:** Evidence of erosion, sediment transport, and wetland habitat loss from new culvert installations and unstable outfall discharges was observed in a number of the East End watersheds (e.g., Southgate, Turner Hole). Many existing culverts were completely blocked, crushed, or undersized. New or replacement culverts should be sized for the appropriate storm return frequency, watershed build out, gut grade control issues, downstream water quality, and potential fish/invertebrate migration. Rainfall statics should be updated and applied. Incorporation of water quality structures and stabilization techniques into culvert design and construction may help reduce sediment loading and long-term maintenance needs. Recommendations for culvert installation, sizing, and maintenance will be important, particularly for areas in the East End where DPW is planning improvements (i.e., Rt. 624 in Great Pond and the East gut in Southgate).
- 4. Supporting a Unified Gut Management Strategy:** There appears to be a nominal amount of scientific information regarding the ecological functions of guts in the East End, and as the East End continues to develop, additional degradation of guts is likely (e.g., buffer encroachment, increased stormwater discharge, and continued erosion). Watershed plan recommendations should support the establishment of a unified gut management policy for

the Territory, encourage the inventory and ecological assessment of East End guts, and provide design examples for gut stabilization and restoration projects. An overall strategy should address gut piping, new discharges, buffer protection, and invasive species/vegetative management; as well as enforcement of minimum 30-ft buffer zones.

- 5. Managing New Development:** Major development projects proposed in Madam Carty, Great Pond, and Southgate watersheds may merit a more thorough review of site design/layout, construction site ESC, and post-construction stormwater management plans before Earth Change/TPDES/CZM permits are issued. These projects, if caught early enough in the planning stage could incorporate low impact development (LID) techniques, enhance water management and hydrologic balance, and serve as demonstration projects. The watershed plan should support efforts to update development regulations and stormwater standards to protect water resources (e.g., require installation of drainage infrastructure in addition to paving of roads for subdivision projects). Even for minor permits and small site construction, proper ESC should be enforced. Consider administering a local contractor and equipment operator ESC certification or required licensing program. Most of the existing neighborhoods have remaining undeveloped lots, and much of the land designated for residential development remains undeveloped. It will be important to ensure that existing and proposed roads and drainage infrastructure are replaced/designed to accommodate future conditions.
- 6. Minimizing Flood Hazards:** The USVI Territorial Emergency Management Agency is currently updating hazard mitigation plans and should weigh-in on new development and drainage infrastructure priorities. A significant portion of the Southgate and Great Pond watersheds, and some of the proposed new developments, are within the 100-yr floodplain. Therefore, future development proposed around existing guts and wetlands will likely need to meet existing (or more stringent) setback requirements. The setback distance (or buffer zone) should be determined through consideration of slope, aspect, vegetative cover, and other relevant factors. Despite the 1993 Great Pond APC Management Report discouraging development in the pond floodplain, a resort/casino development is proposed, and land reclamation activities are reportedly underway. Development here will not only have a significant risk of flooding, but will potentially have an adverse effect on hydrology in upstream residential areas and on the pond itself. Channelization, filling, and piping of guts for flood control should be avoided wherever possible.
- 7. Improving Wastewater Treatment:** There is no central sewer system in the East End; and other than a few small package plants at resorts and condos, everyone is on individual onsite disposal systems. The soils in many areas in the East End are not ideal for septic systems, particularly the single tank and seepage pits typically used. Also, there are no inspection and maintenance requirements to identify areas where system failure is high. Soils, high groundwater elevations, and percentage of undeveloped lots could be factors used to identify which neighborhoods may be higher priorities for promoting free septic inspections, subsidizing maintenance, or requiring new septic designs. Continued monitoring of small package systems, particularly in Chenay Bay, should be encouraged. Requiring more advanced treatment systems for new developments may be recommended, as well as capacity upgrades for systems that manage infrequent, but large events.

Consideration should be given for single lot construction standards regarding advanced systems, setbacks from guts, and minimized limits of clearing. A standard engineering design (e.g., three-chambered, prefabricated system with appropriate distribution and disposal) could be developed as part of the watershed planning process.

- 8. Supporting Residential Stewardship:** Neighborhoods were evaluated to determine which type of restoration activities should be specifically targeted to individual communities (e.g., road improvement, septic inspections, and pollution prevention). The watershed management plan could support the coordination of efforts with Condo Associations and HOAs on education and outreach, grant solicitation, and other implementation activities, where there is interest. Use of existing island media outlets such as the public TV station, radio, and local newspaper could provide for broader messaging. A guide for homeowners could be developed that would illustrate watershed best management practices on small lots (e.g., construction, septic, pet waste, vegetation management, driveway management, and rain gardens).
- 9. Maintaining Impoundments:** Farm ponds in the East End detain runoff, retain sediment, and provide drinking water for livestock; however, the influence of these small impoundments on the overall water budget has not been documented. Existing farm ponds require routine and non-routine maintenance including vegetation management, sediment removal and impoundment management (e.g., liners, spillway systems, etc.). The USDA typically provides grant monies for restoration activities, which could be viable when coupled with gut restoration, buffer reforestation, and other agricultural best management practices.
- 10. Supporting Wellhead Protection Efforts:** The watershed plan could support DPNR with their ongoing effort to identify threats to wells and groundwater supplies from land-based contaminants. There are over 60 permitted wells in the East End watershed (according to DPNR mapping). At a minimum, a mapping analysis could be conducted to determine potential land use threats within a 1000-foot radius of permitted wells.
- 11. Pollution Prevention:** A few locations where trash and other pollutants have a high potential to be conveyed into guts, wetlands, or coastal areas were identified. Illicit dumping, improper waste management, exposed storage of materials, pet waste, and landscape maintenance all can contribute to polluted stormwater. Solid waste management is a challenge in the USVI; however, any structural projects that could reduce pollution should be considered high priorities (e.g., signage, blocking vehicular access to areas of frequent dumping, household hazardous waste pickup days, covering and/or relocating dumpsters, and providing secondary containment for outdoor storage).
- 12. Land Conservation and Restoration:** The East End is such a remarkable resource for residents and visitors. The watersheds' inextricable tie to the quality of the marine resources within the STXEEMP, as well as other unique island habitats, is unquestionable. Avoiding impacts to these areas is of the utmost importance, and the watershed plan should prioritize land acquisition opportunities, if available, and support those who actively manage conservation lands and open space (e.g., TNC, SEA, USVI Department of Housing, Parks and Recreation, and others).

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