

Comprehensive Watershed Improvement Program (CWIP)
Ad Hoc Technical Advisory Committee
Golden Gate Estates Flow-way
Recommendations from Committee Members
 Prepared by Collier County Stormwater Planning
 August 12, 2016

The questions below, along with the responses, were posed to CWIP Committee members to identify recommendations for watershed management in the Golden Gate Estates area of Collier County, Florida.

Committee Member	What are the priority issues, challenges, or problems?	What are the unique drivers, considerations, or other factors that should be understood?	What existing or upcoming efforts or solutions are being undertaken to address these identified problems, and what is your perspective on these proposed solutions?	Do you have a request, idea, or recommendation for addressing the identified problems that the Commissioners should consider? If so, what are they?	Is there anything else you would like to share?
Brent Bachelder, Biological Scientists III, Florida Fish & Wildlife Conservation Commission	<ul style="list-style-type: none"> The priority issue is balancing dispersed development/human population growth with natural resource management across a large area. On one hand, this balancing act involves providing flood control and ensuring a quality of life for residences in GGE. On the other hand, Golden Gate Canal discharges directly into Naples Bay – since Naples Bay is adversely impacted by excess freshwater, retaining as much water as possible in GGE would benefit the Bay. Protecting water supply well fields is also a critically important issue in GGE. The challenge in GGE will be directing future growth in a way that concentrates development to protect the area's natural ability to provide ecosystem services. This challenge is intensified by geography. Significant semi-functional wetlands – worthy of protection – have been identified (Winchester Head and Horsepen Strand) in the northern portion of GGE. At the same time – to reduce flows to Naples Bay – wetland restoration/flow attenuation/storage should be pursued at the southwest end of GGE. 	Although the area contains a significant coverage of undeveloped land that provides opportunities for management, the landscape is highly fragmented. As parcels continue to be filled for development in GGE, flood pressure and runoff will increase.	The Northern Golden Gate Estates Flowway Project (managed by Collier County Stormwater) has provided insight into where to focus attention and provide connectivity of wetland areas. The County's TDR program provides potential for addressing some development pressure. These projects provide a strong starting point from which to build future solutions.	<ul style="list-style-type: none"> There are ways to address stormwater issues in GGE – such as diverting water into and connecting naturally occurring low lying areas. There will likely be future Collier County infrastructure projects (road widening, construction/expansion of County facilities) within GGE. When these projects are being planned wetland creation/water retention/diversions should be pursued to provide storage/flow attenuation to the maximum degree feasible. That said, current and future watershed management challenges in GGE might not be resolvable purely with engineered solutions. Policy-related solutions should be considered to address wetland impacts/watershed management at a parcel level – above and beyond the current policy framework. Enacting a system to incentivize development on higher elevation parcels or further restrict development in low lying areas might be necessary. 	
Jeff Carter, Stewardship Coordinator, Rookery Bay	<ul style="list-style-type: none"> Continue to assess present flooding issues and determine 	<ul style="list-style-type: none"> Present ownership and how to engage and encourage 	Seriously support and further look into proposed idea by Jerry Kurtz	<ul style="list-style-type: none"> All future work must address and mitigate for future Sea Level Rise issues. 	

National Estuarine Research	<p>solutions that will not only fix present problems but integrate with and mitigate for potential impacts from future Development.</p> <ul style="list-style-type: none"> Hydrologic connectivity is a challenge. Connecting present Stormwater storage components to nearby undeveloped natural, or even previously impacted areas, would allow for increased mitigation of potential flooding. Hydrologic connections also need to be improved and or created within the Horsepen Strand areas, as well as, connecting these areas to other areas that could handle additional waters. Establish applicable TDR program that can help facilitate needed improvements. All of this needs to focus on preserving, restoring, and enhancing the natural historic function as much as possible creating these areas ability to solve present flooding problems. 	<p>transfers of ownership to the county regarding lands needed to improve overall hydrology for the GGE as a whole.</p> <ul style="list-style-type: none"> Establishment of a mitigation area. Could Belle Meade area and other RESTORE proposed watershed areas serve as one huge mitigation bank for restoration and Stormwater related projects that need to occur within the GGE area? Need to better understand sub-surface flows in these areas and how these affect surface flows. 	<p>for the establishment of mini-spreaders off of Swales throughout the GGE areas, where appropriate, so as to better deal with Stormwater issues through enhanced conveyance and surface storage, as well as, sub-surface storage through increased percolation. This is a truly innovative idea and warrants serious consideration and assessment.</p>	<ul style="list-style-type: none"> All future efforts must also be done within the context of improving the overall adaptive resiliency for all connected municipalities. 	
Chadd Chustz, Environmental Specialist, City of Marco Island	No input received.				
Joss Nageon De Lestang, Principal Engineer, Big Cypress Basin South Florida Water Management District	<ol style="list-style-type: none"> Restoration of the natural hydrology which has been compromised by stormwater channelization, and the overlay grid of platted lots and roadways. The resulting development pattern has redefined much of the original drainage pathways and associated forest and wetland mosaic which defined the pre-drainage landscape. Reduction of impacts due to freshwater pulses out flowing into Naples Bay. Reduction of nutrient loading from stormwater discharging into Naples Bay. Cumulative loss of floodplain storage, potentially resulting in diminished flood level of protection for residents. 	<ul style="list-style-type: none"> The existing network of drainage canals, providing flood protection to residents, lie along well-established platted alignments which are difficult to alter, thus precluding the possibility of easily rerouting drainage flow. The spread of existing development in GGE, albeit of low-density, has however been significant enough to temper more ambitious restoration efforts. Proposed projects wishing to increase surface storage, or improve aquifer recharge by modifying operating water levels, or redefine drainage pathways, must contend with existing development infrastructure frequently unaccommodating to these objectives. In particular, 	<ul style="list-style-type: none"> The TDR program is a particularly resourceful concept, which recognizes private land ownership and incentivizes individual land owners to participate in more purposeful, ordered development, one which ultimately benefits the larger goals of the GMP. Perhaps the drawback here is that the legal ramifications required for this swap seem cumbersome, and therefore unnecessarily daunting to those who may be tempted to use it. Nevertheless it is a concept of great merit, which would probably benefit from some streamlining, and could possibly be expanded by increasing incentives. The NGGEF is a project with modest, albeit realistic 		

		<p>residential septic systems, which are in widespread use and which are designed to operate within an existing range of water table fluctuations, would be at increasing risk of failure with any tampering of water levels. Similarly, changes to existing access roads and building pad elevations, constructed under previously compatible design objectives, would require complex and costly re-work, effectively limiting the scope of any such plans. Finally, the extent of private land ownership, developed under a previous model generally indiscriminating of more environmentally sensitive concerns, resulted in numerous constructed home sites in environmentally inappropriate locations</p>	<p>objectives. For reasons previously outlined, projects involved in re-connecting wetland pathways should proceed carefully, since there is always the possibility of unintended consequences. In particular for GGE where the main elements of the secondary drainage consists of roadside swales, which are often of inadequate capacity, and subject to intermittent flow blockages as they traverse numerous bisecting residential driveways.</p> <ul style="list-style-type: none"> • The diversion of water south to Belle Meade is being proposed by the RESTORE PROJECT. In scope, this Project is consistent with efforts designed to address issues in the major watersheds occupying the mid-section of Collier County. This is a significant, multi-pronged effort, involving the Golden Gate Main, South Belle Meade and Rookery Bay watersheds. • Project objectives in the Golden Gate Main [GGM] watershed include the reduction of freshwater entering upper Naples Bay; in South Belle Meade [SBM], the restoration of historic hydrology and seasonal groundwater levels, and for Rookery Bay, restoration of historic flows to supplement those currently provided by Henderson Creek. Although this latest concept does not include specific features to reconnect the historic links between North and South Belle Meade, such as existed prior to channelization and the construction of the I-75 roadway, the project objectives are generally consistent. In addition, the proposed rehydration improvements to SBM have the additional potential of sending water south across US41 and into the headwaters of Rookery Bay, a goal identified in the latest 		
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Study commissioned by FDEP 2014. While the final design details are still to be worked out, the project's basic elements involve multiple pumped systems, with directed flow paths through man-made channels, as well as natural sheet flow through existing sloughs. Flow through the project initiates upstream at the GGM. Once pump-on criteria are met, water is drawn from the GGM, and diverted south towards the I-75 roadway swale—perhaps the most straightforward component of this design. The next stage involves flow into SBM, to be accomplished by a pump and spreader system which draws from the I-75 roadway swale, and generates the ponded surfaces which eventually lead to water movement by overland flow. Sheet flow through natural sloughs in SBM eventually collects in the southern quadrant of the watershed, where it's re-channelized to cross under the US 41 roadway. Once past US 41, these flows, presumably much diminished, would access existing man-made and natural channels to merge with distributed flows at the headwaters of Rookery Bay. Ultimately, in terms of actual water transfers from Golden Gate, the project effectiveness may not be so predictable, since actual pumping volumes are likely to vary according to downstream demand. The project does however, offer the possibility of advancing the restoration goals for SBM, and contribute to the headwater flows into Rookery Bay. In the final analysis, the overall goals are therefore commendable, and the principal aspects of the design should be noted as a comprehensive attempt to address known problems in some of the more significant

Gregg Strakaluse, Director- Streets & Stormwater Department, City of Naples	An important consideration must be how the County, Big Cypress Basin, and private property owners within the watershed can better retain stormwater and ground water.	<ul style="list-style-type: none"> • New PUD's and other development are on the horizon and approvals of these development projects should require the highest level of commitment to stormwater initiatives. Collier County could lead the way as public development projects are planned, designed and constructed. Significant public involvement should be considered for changes in development regulations and a potential stormwater utility fee. • Based on the information provided, the easy opportunities for addressing problems are gone. What's left are difficult and expensive solutions that affect many. 	<p>watersheds in Collier County.</p> <ul style="list-style-type: none"> • At this time the deep and expansive canal systems work to drain stormwater and groundwater. These canals are important for flood protection, however weirs must be operated and controlled in such a way as to better introduce technology and automation. The BCB should strive to make canal control structures (weirs) more responsive and predictive to environmental conditions. • Collier County has several large capital improvement projects programmed to keep up with the growth of private development. Such projects include road expansions and government building centers. Collier County might consider (on a case-by-case basis) exceeding the State minimum standards for stormwater management for these government projects. As projects are required to treat 50% more stormwater when discharging into impaired water bodies, Collier County may determine it is in the best interest of the watershed (and neighboring watersheds) to achieve a higher level of stormwater treatment. • Collier County may desire to consider an update to development regulation that requires private property development that is currently exempt from stormwater management systems to incorporate a stormwater management system into the development. This is mainly geared to single family lots. Other considerations include the development of a stormwater utility fee that could be used to fund stormwater projects. 	Please see #3.	
Dennis P. Vasey, Supervisor, Seat 3, Collier Soil and Water Conservation District	<ul style="list-style-type: none"> • General - The flood conveyance capacity of the <i>Golden Gate Estates drainage system</i> is limited as the <i>canals</i> were 	<ul style="list-style-type: none"> • Golden Gate Estates occupies approximately 100 square miles, has 880 miles of roads, and 183 miles of <i>canals</i> which 	Neither the Big Cypress Basin or County web site list major infrastructure initiatives that address my areas of concern.	Begin to evaluate development using LiDAR and science as opposed to the unscientific Land Development Code.	<ul style="list-style-type: none"> ○ Every wildlife species requires a general environment in

	<p>primarily constructed to rapidly “wick” water away from structures.</p> <ul style="list-style-type: none"> • Priority Issues <ul style="list-style-type: none"> ○ Street flooding ○ Riverine flooding ○ Inadequate maintenance of stormwater system facilities ○ Buildings and facilities that are impacted by the erosion and scour of sandy soils at flow velocities above 2 feet/second ○ Critical Facilities not protected to the 500-year flood • Challenges or Problems <ul style="list-style-type: none"> ○ Development built to older standards that did not adequately address flood risks ○ Pre-FIRM structures with their lowest floor below the base flood elevation ○ Large areas of environmentally sensitive lands that need to be protected from the effects of flooding ○ Stormwater systems with older design standards. Properties subject to shallow flooding during smaller rainfall events ○ Modifications of drainage flow by streets, land development, and the construction of canals along section lines and roads ○ The value of residential structures and taxable sales could be significantly impacted by flooding. The potential impact grows each year as Collier County continues to experience significant growth 	<p>drain in part into the Gordon River, Naples Bay, and the <i>Faka Union Canal</i>, and support <i>commercial, multi-family, and single family use</i>.</p> <ul style="list-style-type: none"> • Because much of the County is so flat whatever rainfall doesn’t sheet flow from an area tends to pond and percolate into the ground, causing water tables to rise during the wet season to within a foot or less of the ground in most of Collier County, so there is little soil storage. • Continued land development has caused a cumulative loss of storage capacity within the Basin, resulting in the need to increase the flow capacity of the main receiving canals, when needed. 	<p>There are several maintenance activities underway but none that address takings or land acquisition to address sea level rise, water quality and quantity issues.</p>		<p>which to live. To properly manage land for the benefit of wildlife, landowners must be aware of those things in the environment that wildlife needs to survive and reproduce. The environment or natural home where a wild animal lives is called its habitat. Just like humans, wild animals have specific requirements that they get at home. Habitat for any wild animal must provide:</p> <ul style="list-style-type: none"> ○ cover (shelter) from weather and predators; ○ food and water for nourishment, and ○ Space to obtain food, water, and to attract a mate. ○ The selection of habitat is a specialized process that has taken hundreds of years to develop. When an animal selects a certain place to call home, it often restricts itself to a certain type of area, and often will adapt for the particular combination of features found in that habitat. While shelter, food, and water are basic requirements, how wildlife obtain these requirements varies.
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