MEMORANDUM

TO: Town Council

FROM: Stan Rogers, Chair, May River Watershed Action Plan Advisory Committee

CC: Stephen Steese, Town Manager
Heather Colin, Assistant Town Manager
Kim Washok-Jones, Director of Projects & Watershed Resiliency
Bill Baugher, Watershed Management Division Manager

SUBJECT: WAPAC Recommendation to Establish a Town of Bluffton Policy that Reduces and Minimizes the Extent of Impervious Area.

DATE: June 22, 2023

RECOMMENDATION: Please see recommendations provided on page 7 and 8.

INTRODUCTION: The May River Watershed Action Plan Advisory Committee (WAPAC) Strategic Plan Fiscal Year 2023 – 2024 Priority #3 is to evaluate the regulatory framework to codify additional requirements to restrict and/or moderate expansion of impervious cover. The purpose of this Memo is to

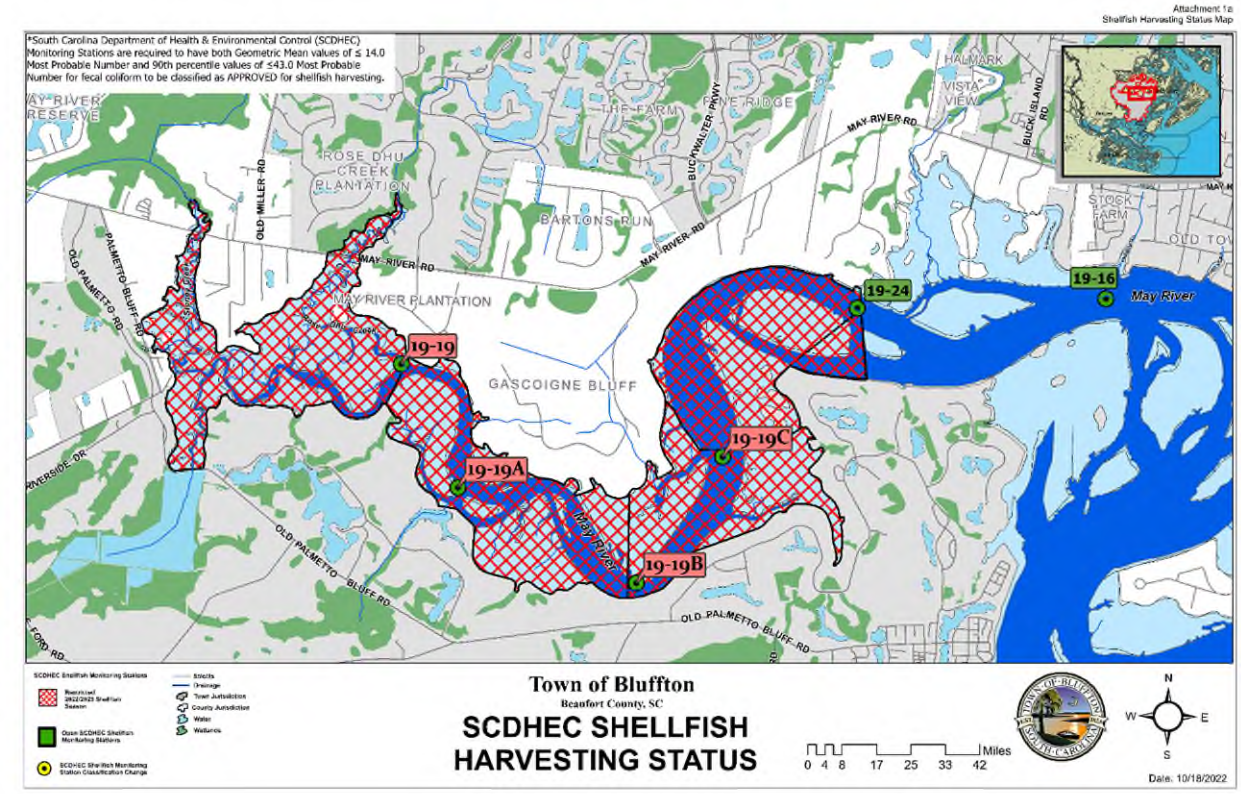
- Present information on the status of what has been accomplished;
- Present information on what additional measures are needed; and
- Present WAPAC's recommendation of how to achieve these additional measures.

BACKGROUND/CHRONOLOGY: The Town of Bluffton (Town) has grown through annexation from approximately 1 square mile in the 1980s to approximately 54 square miles today. Similarly, the population has grown from under 5,000 in 2004 to nearly 30,000 by 2021.[1] Without controls, uncontrolled growth and development time and again yields unintended consequences. Fortunately, the Town took responsible steps to plan development and conduct a baseline environmental assessment of the May River in 2004.[2] The assessment of water and sediment quality and biotic conditions concluded that generally **conditions were good, but conditions in the tidal**

[1] MKSK, Kimley Horn, Sottile & Sottile, Thomas & Hutton. *Comprehensive Plan Blueprint Bluffton*. November 2022.
[2] SCDNR, NOAA, USGS. *A Baseline Assessment of Environmental and Biological Conditions in the May River, Beaufort County South Carolina*. 2004.

headwater creeks (Stoney Creek, Rose Dhu, and Palmetto Bluff) were stressed and coliform bacteria was identified as a pollutant of concern.

South Carolina Department of Health & Environmental Control (SCDHEC) is responsible for monitoring shellfish including oysters, clams, and mussels and the harvest areas to assure federal and state health and environmental standards are met. In 2009, some locations within the headwaters of the May River were closed for oyster harvesting because of exceedances to coliform bacteria standards. **Shellfish monitoring locations 19-19, 19-19A, and 19-19B remain closed, and 19-19C is intermittently closed/open but currently is closed.**



As a result of the closure, the May River Watershed Action Plan (Action Plan) was prepared and adopted by the Town in 2011 to develop a strategy for assessing issues and implementing solutions to prevent further degradation. The Action Plan provided several actions items including:

- Targeted project retrofits
- Changes to town policies/zoning standards and ordinances including adoption of the volume-based stormwater ordinance in 2010
- Additional studies to identify septic tank users, survey flow and wildlife, and prepare a water quality model
- Ongoing sampling including improved quality assurance/quality control measures

- Communication and marketing of lessons learned and distribution of information
- Identification of partners and responsible parties[3]

An update to the Action Plan was prepared and adopted by the Town in 2021[4] and included two tasks: development of water quality models and evaluation of current Action Plan Best Management Practices (BMPs) recommendations. **Land use changes continued to occur with ongoing development and impervious surface area increased significantly in the headwaters of the May River from 5.78% in 2002 to 15.31% in 2018. Table 1 of the report is copied below and identifies the most impacted sub watersheds based on 2018 data. Note that 2018 to 2023 development has likely driven this much higher, specifically for Stoney Creek.**

Table 1: Change in Impervious Area in May River Headwaters

Subwatershed	Total Area (Acres)	2002 Impervious*		2018 Impervious*	
		Acres	%	Acres	%
Duck Pond	683.10	18.90	2.77%	18.90	2.77%
Palmetto Bluff	1,925.53	117.24	6.09%	186.24	9.67%
Rose Dhu Creek	4,168.06	342.00	8.21%	822.60	19.74%
Stoney Creek	5,480.16	229.79	4.19%	848.71	15.49%
TOTAL	12,256.85	707.93	5.78%	1,876.44	15.31%

*calculated from Town of Bluffton GIS files and referencing historic aerial imagery

The report developed a model and recommended several retrofit projects to reduce flow from existing developments and a strategy that included the current state of knowledge regarding stormwater treatment.

> "Overall, the goal will be to follow Better Site Design principles to conserve natural areas including tree canopy, **reduce impervious cover**, and manage designated stormwater reduction volumes by infiltration and/or filtration techniques as first priority, or other approved volume reduction techniques as second priority."

To address the recommendation in both the Action Plan and Update, the Town with partners adopted the Southern Lowcountry Stormwater Management Ordinance (SoLoCo) and prepared the Southern Lowcountry Stormwater Design Manual in September 2021.[5] The manual establishes a permit process and essentially specifies design criteria for new development or redevelopment that involves creation of 5,000 square feet of impervious surface or land disturbance of 1 acre or more.

[3] AMEC Center of Watershed Protection, Ward Edwards, Thomas & Hutton. May River Watershed Action Plan. November 2011.

[4] McCormick Taylor and Moffatt & Nichol. *May River Watershed Action Plan Update and Modeling Report.* Nov 2020.

[5] Center for Watershed Protection and McCormick Taylor. *Southern Lowcountry Stormwater Ordinance and Design Manual.* September 2021

Since the Action Plan and Update, the Town has approved and undertaken several initiates including:

- Formation of the WAPAC
- Septic to sewer conversion projects within the May River Watershed including the most recent approval for the Stoney Creek/Palmetto Bluff Sewer Partnership
- Evaluation and design of retrofit projects

OPPORTUNITIES FOR IMPROVEMENT AND ADDITIONAL INPUT

While many actions and attempts to plan for growth have been accomplished, reaction time sometimes has lagged in response to the growth. For example, the baseline assessment was conducted in 2004 and there has been no update despite the rapid development since then. Just recently, the WAPAC recommended that Town Council approve a budget to conduct a current assessment, but even with that approval, results of the sampling will not be available until late 2024 at best.

There appears to be general reliance that Planned Unit Development (PUD) agreements approved 20 years ago are ironclad and cannot be changed yet the developers seem to have opportunities to frequently update their side of the agreement via subsequent amendments.

The Action Plan and Update addressed only the May River Watershed, not the other watersheds within the Town including, the Okatie/Colleton and New River Watershed areas. WAPAC has recommended expansion of the purview to include the other watersheds and extend the focus beyond shellfish harvesting. This has been discussed for more than a year and still awaits review and acceptance of the process by Town Council.

The passage of the SoLoCo Stormwater Ordinance addressed some issues, but those requirements came to fruition after much of the development had already occurred and the ordinance has little enforcement capability. Further, **there is misconception regarding the 10% rule in that ordinance (Section 3.8). The ordinance rule and the cited percentage pertains to the sizing of downstream conveyance structures for flood control, NOT impervious cover.** The ordinance references the Atlanta Regional Commission and the State of Georgia Stormwater Management Manual.

> "The 10% rule evaluation must address existing conveyance system capacity and "pinch points" where a pipe/culvert would be overtopped and where the pipe/culvert will need to be upgraded or the peak discharge rate will need to be limited to the capacity of the downstream system…….if the drainage control drains 10 acres, the zone of influence ends at a point where the total drainage area is 100 acres or greater." [6]

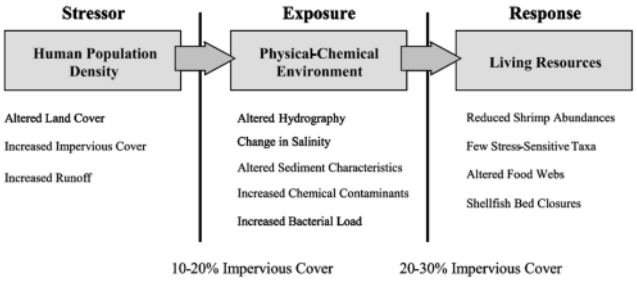
[6] Center for Watershed Protection and McCormick Taylor. Southern Lowcountry Stormwater Design Manual. September 2021.

Moreover, the ordinance applies to 5,000 square feet of impervious cover however additional requirements of 5,000 square feet of DISTURBED soil is not clearly specified. While the bulk of the manual describes in detail best management practices, it is lacking practices during construction when significant damage occurs and maintenance and inspection of those controls are necessary for them to be effective. Specifically, more reference to other agencies and the Town of Bluffton's National Pollutant Discharge Elimination Systems (NPDES) Stormwater Management Plan is needed including discussion (figures or inspection sheets) regarding proper installation and inspection (especially before/after storm events) of silt fencing and sediment barriers, specific time requirement to stabilize exposed soil, access roadway minimum requirements, etc. Enforcement has been improving in accordance with the Town of Bluffton's Enforcement Response Plan (ERP), but the language of the Stormwater Design Manual needs additional considerations and resources.

WHY CONTROLS FOR IMPERVIOUS COVER ARE CRITICAL

While a specific Federal or State regulatory standard for impervious cover has not been promulgated, there is ample reference both nationally and locally when impervious cover exceeds 10%, there are detrimental impacts to the receiving watershed and water quality. The diagram below is from **the baseline assessment and notes changes in salinity and increased pollutant loading are noted when the impervious cover exceeds 10-20%.** As noted from the Action Plan Update, some sub watersheds already exceeded these thresholds in 2018 and additional development has occurred.

Figure V-4. Conceptual model of the linkages between land use and headwater tidal creek environmental quality (Holland and others, 2004).



Reference [7]

Further, there are many lessons learned from other communities. The United States Environmental Protection Agency (USEPA) Watershed Academy as noted below concurs as shown below:

> "Since impervious cover has such a strong influence on watershed quality, a watershed manager must critically analyze the degree and location of future

[7] SCDNR, NOAA, USGS. *A Baseline Assessment of Environmental and Biological Conditions in the May River, Beaufort County South Carolina*. 2004

development (and impervious cover) that is expected in a watershed (Figure 2). Consequently, **land use planning ranks as perhaps the single most important watershed protection tool**. Land use planning is best conducted at the sub watershed scale, where it is recognized that stream quality is related to land use and consequently impervious cover (Figure 3)…….. **A sub watershed with 10 - 25% impervious cover is classified as a degraded or impacted system. Any stream's watershed having greater than 25% impervious is classified as a non-supporting stream with characteristics such as eroding banks, poor biological diversity, and high bacterial levels."**

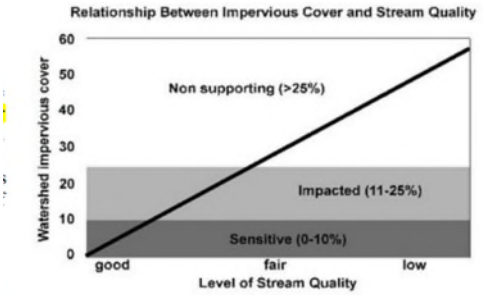


Figure 3

Reference[8]

Similarly, the State of Ohio as a result of dealing with the impacts from increased runoff from rapid development notes:

> "impervious surface percentages……fundamentally impact the stream flow regime and therefore impact both overland pollutant transport and stream integrity. Specifically, the Center for Watershed Protection (CWP) has documented that adverse impacts to stream integrity can occur with as little as 10% impervious surface in a watershed. **Once 25% impervious surface occurs, full restoration of stream integrity may not be possible technically and/or economically."** [9]

To estimate runoff from an area, there are sophisticated models and detailed calculations to adjust for different conditions from simple to complex. These alternative methods, some of which are included in the current SoLoCo Stormwater Ordinance consider not only rainfall intensity, but also variable rainfall intensities for defined critical areas, antecedent moisture conditions, connected versus unconnected impervious areas, weighted coefficients to account for different media, hydrologic soil groups, etc. In the most basic terms, the rationale equation is used to calculate runoff from an agreed minimum required storm.

[8] H.Y. Kwon, R. Winer, and T. Schueler, Center for Watershed Protection USEPA. *Eight Tools of Watershed Protection in Developing Areas* USEPA Watershed Academy.

[9] Ohio Water Resource Council, Ohio EPA. Getting the Point about NonPoint, Non Point Source Pollution Management Plan 2005-2010.

Mathematically it can be shown that runoff from a natural flat 0-5% woodland or pasture area (coefficient 0.1) is approximately 45 gallons/minute whereas, the runoff from driveways, roofs and walks is (coefficient 0.95) approximately 465 gallons/minute or 10 times as more!

RECOMMENDATIONS

The May River is designated as Outstanding Natural Resource Water (ORW), a distinction reserved for freshwaters and saltwaters which provide outstanding recreational or ecological resources. That designation must be respected to retain its status and benefits to the community.

Although the Town has taken steps to address the impacts of rapid development, the development has occurred faster than the reactions. The rapid increase in impervious cover above 10% was already established based on the Action Plan Update data from 2018 but there is no specific policy, mandate, or ordinance to limit further increases of impervious cover in those sub watersheds or overall, for the Town.

At a minimum, WAPAC recommends the following actions:

1. Update the calculation and related mapping for impervious cover in the watersheds based on current conditions and anticipated future growth already approved. This may require budgeting for outside assistance.

2. Conduct an evaluation of the SoLoCo Stormwater Ordinance (September 2021) and make improvements to assure they are understood, prevent repeat occurrences and violations, and to keep with the overall goal of restricting and/or moderating expansion of impervious cover. For example:

    - Require a permit for 5,000 square feet of disturbed soil which is typical;
    - Include specific discussion regarding controls for construction activities with details regarding placement, operation, and maintenance so that these are effectively managed;
    - Enhance enforcement of rules;
    - Require documented inspections made available to inspectors on site;
    - Conduct ongoing education and training of all contractors; and
    - Revise the current ordinance to require runoff calculations for more intense storms and other critical areas. [10]

3. The Town focus has primarily centered around shellfish harvesting and extensive monthly sampling for coliform bacteria because of the closures of shellfish harvesting areas in 2009. This attention has prevented the needed efforts protecting other water quality parameters from the impacts from extensive changes of the natural landscape in a short time. The results of the new assessment will not be available for another year, but it is a reasonable guess that conditions have not improved in the last 20-years when much of the development occurred. At a minimum, the Town's approval and oversight committees (Development Review and Planning Commission) need greater

insight on this important issue and the need to have each review address the impact on the watershed's total impervious cover. If already exceeding thresholds, additional controls are warranted and should be required prior to approval.

4. The State of Maryland and Chesapeake Bay have enacted many rules to address and protect their water resources. One example is the critical land document which limits the phosphorus loadings from new development and defines critical areas.[11] Some consideration for this type of approach is needed by the Town especially for any new development.