

3.3 Town Policy and Ordinance Assessment

The following section provides an assessment of the policies and ordinances that are needed to promote the recommended programmatic elements in this action plan. This will identify the areas where new or improved policies are required to move forward with the Action Plan, as well as noting those that are already in place and can be taken advantage of in the short-term. Additional details are provided in Section 5.0 – Financial Mechanisms and Administration with regards to specific responsibilities that must be assigned to the Town and other partners for specific project types.

3.3.1 Current Standards Review and Recommendations to Zoning and Development Standards

Current Standards Review for Town of Bluffton and Beaufort County

The following existing ordinances for land development were reviewed, and the summary of the value, relevant to the goals of this Action Plan, is presented for each. A complete summary of the stormwater items reviewed is presented in Appendix E:

Town of Bluffton Stormwater Design Manual

- ✓ Provides general stormwater design criteria for hydrologic modeling including:
 - ❖ Rainfall distribution, rainfall intensity curves, basin sizes, design storm and duration.
- ✓ Provides detailed design information and instruction for design of culverts and bridges
- ✓ Provides detailed design information and instruction for the design of open channel flow, including natural channels
 - ❖ This guidance includes maximum velocities within the channels, conveyance volumes and freeboard depths.
- ✓ Provides detailed design information and instruction for the design of stormwater storage facilities – the following elements will support the goals of reduced runoff volumes (not just peak discharges) and filtering runoff from development:
 - ❖ Parking lot, cul-de-sac, and traffic islands shall be designed to be depressed and open to receive stormwater runoff storage and treatment.
 - ❖ For all parking lots, strategically placed vegetated swales or depressed uncurbed bioretention areas between parking stalls shall be constructed for a minimum of 50% (fifty percent) of islands between parking stalls to retain and treat any runoff generated onsite.
 - ❖ Below-ground proprietary structural storage products that are commercially available can be employed to meet both water quantity and water quality goals if approved as part of the stormwater system design by the Administrator(s).
 - ❖ For stormwater detention on parking lots: using the paved areas of the lot to channel runoff to grassed areas or gravel-filled seepage pits. Water from pavement should flow across a grassed vegetative buffer before entering a collection swale, infiltration swale, trench, or basin where the flow will then infiltrate into the ground.
- ✓ Provides detailed design information and instruction for the design of Structural BMPs, including detention, filtration and infiltration

- ❖ All projects shall have in series BMPs and all stormwater management system designs shall contain at a minimum one wet detention BMP, one vegetative BMP and one filter or infiltration based BMP.
- ❖ Projects shall be designed to include a minimum of three BMPs in series to meet the requirements set forth in the Stormwater Management Ordinance. The BMPs shall be selected based on site conditions to maximize their effectiveness.
- ❖ Provides pollutant removal efficiencies for various structural BMPs for TSS, Total P, Total N, and Trace Metals.
- ❖ Referenced stormwater design documents:
 - Georgia Storm Water Management Manual Sediment, Atlanta Regional Commission and Georgia Department of Natural Resources-Environmental Protection Division, 2001 <http://www.georgiastormwater.com/>
 - Manual of Stormwater Best Management Practices, North Carolina Department of Environment and Natural Resources-Division of Water Quality, 2005 http://h2o.enr.state.nc.us/su/bmp_updates.htm
 - Bioretention Manual, Prince George's Town Programs and Planning Division-Department of Environmental Resources, 2001 [http://www.co.pg.md.us/Government/AgencyIndex/DER/ESD/Bioretention/bioretention.asp?nivel=foldmenu\(7\)](http://www.co.pg.md.us/Government/AgencyIndex/DER/ESD/Bioretention/bioretention.asp?nivel=foldmenu(7))
 - Pervious Concrete Pavements, Paul D. Tennis, Michael L. Leming, and David J. Akers, 2004 <http://www.concrete.org/pubs/newpubs/pcp.htm>
- ✓ Provides design components, design guidelines, maintenance and monitoring, and general plan and profile information, all of which include water quality treatment volume requirements and BMP sizing.
- ✓ Provides engineering worksheets to assist in determining pollutant removal and BMP efficiencies for site specific designs.
- ✓ Provides design information for innovative BMP solutions in Appendix A.
- ✓ Discusses innovative stormwater solutions in Appendix A, such as rooftop practices, pervious pavement, runoff for irrigation, disconnection of impervious area, rain gardens, and swales.
- ✓ Lists the Town's in-series BMPs, including:
 - Redirecting roof drainage onto adjacent pervious surfaces;
 - Installing grassed swales on lots with suitable soils;
 - Installing sunken island in parking lots instead of raised islands with curbs;
 - Installing pervious pavement (at least 50 percent) in commercial parking lots; and
 - Installing disconnected drainage where possible.

Beaufort County Stormwater Manual for Stormwater Best Management Practices

The County Manual offers similar information as the Town Stormwater Design Manual. However, the County Manual offers information that may be useful to the goals of the Action Plan, which are as follows:

- ✓ Defines stormwater loading factors for urban development that establishes specific EMC loadings: These EMC loadings were established based on a review of multiple other documents, including nine within the state of Georgia and six within the state of Florida, and include fecal coliform bacteria for various land uses, including:
 - ❖ Open Space
 - ❖ Low Density Residential
 - ❖ Medium Density Residential
 - ❖ High Density Residential
 - ❖ Industrial

- ❖ Commercial
- ✓ Provides BMP efficiencies for extended dry detention, wet detention, infiltration and swales for numerous constituents, including fecal coliform bacteria.
- ✓ Provides a detailed BMP technology criteria matrix that details which type of BMPs should be used for which developments.
- ✓ Provides detailed worksheets for stormwater design for various BMP types

Current Ordinances & Comprehensive Planning Review

Town of Bluffton Unified Development Ordinance (UDO)

This document includes reference to stormwater design and supports the goals of this Action Plan in that it:

- ✓ Officially adopts the Stormwater Design Manual:
- ✓ Mandates that the review process for stormwater plans include a pre-application meeting, stormwater plan review, and submittal of record drawings upon completion:
 - ❖ This allows for earlier interaction and opportunities to add stringent water quality features.
- ✓ Includes the following general requirements which reduce runoff and pollutants:
 - ❖ All development shall disconnect impervious surfaces with vegetative surfaces to the maximum extent practicable.
 - ❖ Stormwater runoff shall be controlled in a manner that:
 - Promotes positive drainage from structures resulting from development.
 - Includes the use of vegetated conveyances, such as swales and existing natural channels to promote infiltration.
 - Promotes runoff velocities and maintains sheet flow condition to prevent erosion and promote infiltration.
 - Limits its interaction with potential pollutant sources that may become water-borne and create non-point source pollution.
 - ❖ Natural vegetative buffers play an integral part in minimizing the volume of stormwater runoff by promoting infiltration and acting as a first line of treatment of water quality pollution. Development shall observe the buffer requirements of Section 5.5 of the Ordinance; or if applicable the relevant development agreement, concept plan, and/or approved master plan.
- ✓ Implements the following key design standards, which are both stringent yet reasonable for the varying soils conditions and information that are available:
 - ❖ All development and redevelopment, including highways, shall use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the pre-development hydrology of the property with regard to the temperature, rate, volume, and duration of flow.
 - ❖ In areas of Hydrologic Soil Groups A and B, the development shall control and infiltrate the first one inch of stormwater runoff from the entire development or maintain the pre-development hydrology of the property for the Water Quality Design Storm Event, whichever is greater.
 - ❖ In areas of Hydrologic Soil Groups C and D only, the development shall maintain the pre-development hydrology of the property for the Water Quality Design Storm Event.

- ❖ Undisturbed natural areas will not be required to demonstrate that such areas can retain the first one inch of runoff.
- ✓ Implements monitoring policies to ensure performance of designed/constructed BMPs, which require that a developer be responsible for the performance, not just the installation of the required BMPs:
 - ❖ Structural BMPs shall be monitored individually up to 36 months from final as-built inspection for water quality performance.
 - ❖ At least half of the samples gathered will need to be taken within 24 hours of a rain event one-half inch or greater.
 - ❖ If 20 percent or more of the samples fail to meet the water quality, then within 60 days of reporting of such a sample failure, the operator of the stormwater system shall submit to the Town Engineer a corrective action plan stipulating how compliance with the DHEC water quality standards will be met. Violations of any single test parameter shall constitute a failure for that sampling period.
- ✓ Development shall construct permeable paving where soil conditions allow. Requirements for permeable paving are outlined in Section 7.8.2 of the Stormwater Design Manual.
- ✓ Irrigation systems must first make use of all available surface stormwater runoff or other retained or detained stormwater as the water supply. No groundwater wells or use of potable water for irrigation of any kind will be permitted in developments or redevelopments unless it can be demonstrated that alternative sources of irrigation water will not exceed pre-development conditions.

Town of Bluffton Comprehensive Plan 2007

This document contains goals that are consistent with the goals of this Action Plan. Specific examples include:

- ✓ Recommends that Bluffton organize a watershed education campaign with signs announcing entry into a community watershed. Also, recommends fostering community accountability, such as marking storm drains with statements or symbols such as “This flows into the May River.”
- ✓ States that Bluffton’s Stormwater Ordinance should be used to guide stormwater management based on the community’s desire to protect, maintain, and enhance its environment and to protect the health, safety, and general welfare of its citizens.
- ✓ Recommends in the short term to develop watershed and drainage basin plans. Begin with drainage basins that are identified as releasing high levels of pollutants.
- ✓ Recommends to complete recommendations of Environmental and Ecological Assessment of the May River Report in the long term.
- ✓ Recommends supporting Stormwater Utility efforts to complete Beaufort County Special Area Management Plan recommendations in the Medium term.
- ✓ Recommends to Assist Stormwater Utility with establishing water quality protocol in the short to medium term.
- ✓ Recommends continuing monitoring efforts which target and identify point sources in the short to medium term.
- ✓ Recommends pursuing grants and other funds for infrastructure and sewer.
- ✓ Recommend to identify infrastructure projects for a future project lists through a needs study in the short to medium term.

- ✓ Recommends developing and implementing a Town plan for upgrade and repair of Bluffton's drainage system.
- ✓ Encourages the use of innovative stormwater management, such as permeable pavement and LID designs.
- ✓ States that parking lots should have an increased amount of pervious surface in order to minimize stormwater runoff and non-point source pollution. Landscaped islands within off-street parking lots should be required.

Needs Assessment

After reviewing these Town ordinances, the following items are additional topics that should be considered for inclusion in the Town's ordinances to further address water quality improvements:

- ✓ Require a maximum time of land disturbance for new development without specific milestones being met, such as percent stabilization (i.e., provide a temporal limitation so areas are not clear cut and then sit inactive for an undisclosed amount of time).
- ✓ Continue to promote increased perviousness and reduced runoff (i.e. permeable pavement, landscape islands, buffers, etc.)
- ✓ Ensure correlation of septic design standards, which are regulated by DHEC, to water quality and stormwater requirements with regulated Town inspections
- ✓ Implement on-lot LID practices for new residential development, such as not installing downspouts to tie directly into stormwater infrastructure, or utilizing pervious pavement driveways, etc.
- ✓ Implementing a tracking system to track effectiveness of implementation and maintenance of on-site LID practices as part of the annual BMP inspections.
- ✓ Expand the types of innovative LID BMPs in the Stormwater Manual Appendix A to include additional stormwater BMPs, including various structural BMPs, as well as expanding discussion on the current listed innovative LID BMPs, such as rainwater harvesting which would increase the residence time, depressional medians for additional detention, treatment trains, bioretention areas, designing to minimum pavement widths, and vegetated filter strips, which reduce the overall runoff volumes for the watershed.
- ✓ Promote the transfer of development rights programs, incentives, and conversation easements.

Recommended Actions

Based on the review of the current zoning and design standard, ordinances and goals of the comprehensive plan, the following actions are recommended for the Town of Bluffton. Sections 3.3.2 – Incentives, 3.3.3 – Sustainable, and 3.3.4 – Land Acquisition provide details on important tools that need to be employed to support the recommendations below.

- ✓ Continue to address the goals of the Town Comprehensive Plan, and enforce the technical requirements and standards in the UDO and Stormwater Design Manual
- ✓ Continue coordination with the County to implement cohesive design requirements.
- ✓ Continue placing a strong emphasis on volume control:

- ❖ Increase pride in the May River: With the community actively participating in the improvement of the May River water quality, the community will take further pride in their natural resources, and strive to keep them clean on a continual basis.
- ❖ More sustainable and 'green' infrastructure: The development of innovative LID solutions to provide increased water quality for the May River will lead to longer, more sustainable development for the future.
 - For example: The Georgia Coastal Stormwater Supplement (CSS) uses the Runoff Reduction method to prevent the need to mitigate impacts from runoff. This standard over-detains the more frequent, shorter duration storm events, such as the 1-yr 24-hr event, to increase treatment provided to the watershed. Likewise, the CSS offers a calculation tool that quantifies reduction in peak runoff rates from typical events (25-yr) due to reductions in impervious areas and installation of BMPs to address water quality requirements. The CSS also shows how to provide credits/incentives to developers who adopt runoff reduction methods (i.e. how this practice can reduce stormwater treatment facility size, thereby reducing the overall construction and implementation cost requirements).

3.3.3 Sustainable Development and Transfer or Purchase of Development Rights Policies

As the Town of Bluffton has grown, so too has the increase in impervious surfaces, which include, but are not limited to, roads, rooftops, parking lots and sidewalks. Previous studies have shown a link between impervious surface coverage and water quality. Specifically, an increase in impervious surface and its associated uses will result in a reduction in water quality. This can be mitigated through treatment of stormwater runoff, as discussed in Section 3.3.2, with retrofit opportunities provided in Section 4.3. However, using Smart Growth practices as outlined in the EPA's guidance document, Protecting Water Resources with Smart Growth, will result in accommodating the future growth of Bluffton while minimizing impervious coverage. The main objective of smart growth is to provide higher population densities in strategically located areas, as opposed to the traditional practice of uncontrolled development resulting in urban sprawl. Concentrating density in specific, planned areas results in creating less infrastructure and compacted lawn, as well as their associated pollution. Conversely, undeveloped open space will be increased when compared to traditional development practices. There are many different planning tools that can be used to encourage development in strategic areas that have been specifically selected to allow for smart and sustainable growth that protects water resources. Some of the planning tools that have been used by the Town of Bluffton to protect the May River include watershed planning, developing a regional comprehensive plan, implementing watershed-based zoning and special development districts, coordinating development and conservation plans, allowing higher densities and density averaging, preserving open space, and allowing for transfer or purchase of development rights.

The Town of Bluffton strives to provide a sustainable, environmentally conscious community. Article 6 of the Town of Bluffton Unified Development Ordinance, *Sustainable Development Incentives*, provides applicants with options and incentives to integrate sustainable growth principles for development.

Article 6 utilizes the Town of Bluffton's Growth Framework Map, included in Appendix D as Map 4. This map was created to set forth a land use vision that assumes that growth should be sustainable as stated in the Town of Bluffton Comprehensive Plan. The Growth Framework Map is structured to suggest patterns of growth into "place types" that are intended to result in a growth pattern that respects the Town's natural resources, historic fabric, diverse housing, access to nature, mixed-use activity centers, street network and neighborhood structure. Place types are made up of centers and edges with varying degrees of residential and non-residential intensity. Centers consist of locations where a range of uses and density establishes context and character. Edges are either natural (such as a wetland, lake, or coastal marsh) or man-made such as a highway, parkway, or utility easements.

The Town of Bluffton recognizes that a growth framework is necessary to prepare for a more compact and sustainable future. The Town further recognizes that certain areas are best suited for a more intense land development scenario while other areas are more suited for a lower intensity of land use. To effectively and efficiently provide public services, attract desired investment, protect property values, and protect key natural resources, this growth framework is vital as the Town of Bluffton increases in population.

As stated above, one of the opportunities available to applicants within the Town of Bluffton that encourages smart growth is the Town's Transfer of Development Rights (TDR) Program. TDR is a way of controlling land use to complement zoning and strategic planning for more effective urban growth management and land conservation. A TDR program is a creative and innovative form of development control. TDR permits a community to encourage the transfer of development potential from areas that the community wants to preserve, called sending zones, to areas that are more appropriate to accommodate increased growth, called receiving zones. The Growth Framework Map shows areas that would be recommended as receiving zones. TDR can aid in accommodating growth within the Town without increasing the overall amount of permitted development. It offers landowners financial incentives for the conservation and maintenance of the environmental, heritage or agricultural values of their land. TDR is based on the concept that with land ownership comes the right of use of land, or development. Therefore, these land-based development rights can in some jurisdictions be used, unused, transferred or sold by the owner of a parcel.

All properties within the Town of Bluffton and under the purview of a development agreement are eligible for and allow TDRs by right within area limits of that development agreement. Article 6.6 of the UDO provides incentives for those properties within the Town of Bluffton and under the purview of a development agreement to develop or redevelop in a manner that is in accordance with the UDO, the Growth Management Framework Map, and the Town of Bluffton Comprehensive Plan. In order to qualify for the incentives as outlined in Article 6.6.4,

development or redevelopment of property that is under the purview of a development agreement in the Town of Bluffton shall utilize the Town of Bluffton's TDR Program and/or transfer of Assignment of Rights and Assumptions within the purview of the respective development agreement to facilitate growth within the respective place type as illustrated on the Growth Framework Map.

The Town has established the Town of Bluffton Development Rights Bank, which can be used to store development rights that have been purchased (PDR) if there is not yet a receiving area development identified. This mechanism is used when the time of the sale in the sending area is not concurrent with a development in the receiving area. It can also be useful in communities that have the opportunity to purchase the rights from an area of high conservation interest but do not have a development that can receive higher density at the time.

- ✓ The Town does not require that developers look for or pursue opportunities for TDR transactions. However, the Town does offer incentives in the form of reduced application fees to those parties who do utilize the TDR Program.
- ✓ The TDR Program also operates similar to a mitigation bank in that a party looking to perform a TDR transaction does not need to own development rights to both the sending and receiving properties. The party could purchase Development Right Units from the Town of Bluffton Development Rights Bank.
- ✓ Property owners can donate Development Right Units to the Town.
- ✓ When the development right is transferred from a developer it can be put into a conservation easement to preserve the natural land cover. However, the Town may find stormwater BMPs that could be implemented on the property that would have a direct improvement on water quality of the May River.
- ✓ TDR is a practice that would help prevent future degradations of the May River. In most cases it is not expected to be able to restore areas that have become degraded due to existing developments.

TDR opportunities will vary from site to site. There can be no broad or general set of guidelines around which the Town could focus incentives or a standard operating procedure. Each TDR project will offer up its own set of unique circumstances that will result in site specific opportunities and incentives that will be reviewed and recognized on a case by case basis.

There may be circumstances in which there is a desire to keep certain properties undeveloped without wanting to transfer their development rights elsewhere, effectively retiring those development rights. In this case there would be a need to negotiate the development rights to those properties. That action would most likely be taken by the Town or a partnership as identified in Section 5.4.

In summary, smart, sustainable, and environmentally conscious growth is critical to maintaining the May River as a natural resource for future generations. Encouragement of continued development within the targeted locations of the Growth Framework Map should be promoted, which in turn will minimize sprawling development. Providing more TDR opportunities could help protect the May River by reducing the amount of impervious area introduced into the watershed, and ensuring that natural ground cover is maintained. It is

suggested that detailed discussions and negotiations would be required to occur with the current stakeholders in order for this to be a successful practice. This action requires complex negotiations and detailed agreements, and the process of this type of action should be started in the near term to ensure success and that coordination is utilized to the fullest.

3.3.4 Land Acquisition Strategy/Condemnation Policy

The Town doesn't currently have a specific land acquisition strategy or condemnation policy. Beaufort County has developed the Rural and Critical Lands Program, which provides insight to this issue. However, this is a secondary element. Therefore, it is recommended the Town develop their own land acquisition strategy for future potential stormwater projects. Items to consider while developing this policy include:

- ✓ There are future projects that will require it. These projects could range from pond modifications, new pond construction, or right-of-way expansion for further stormwater treatment. Therefore, it would serve the Town well to have this policy in place so it could be utilized should it be required.
- ✓ Each project will vary regarding the amount/extent of acquisition required. Various projects will require different access, easements, and ownership, thus dictating specific needs for the project. It is recommended to have maintenance and access agreements in place for various projects, as opposed to implementing actual land acquisition for the project where possible or desirable. This will reduce the overall costs and complexities associated with the projects. For projects that will be a partnership with the public with grant funding, this is needed early in the process to be able to apply for a grant.
- ✓ There is upfront effort required to implement this type of policy, and therefore it is recommended to begin in the short-term. This process begins with coordination with the Town's legal department and assessing similar policies used for eminent domain cases and other projects requiring land acquisition or condemnation. Where projects locations have been identified that clearly show exceptional benefit to the water quality of the May River, all means should be used to gain access to the site, including condemnation. It will also be beneficial to review past public support feedback, and identify which situations seem most and least favorable to the public at this time, then coordinate with the Communications Plan (See Section 4.4 – Timeline of Implementation Schedule). The Town can use the 319 projects as well other defined Town projects as short term opportunities to test the receptiveness of likely stakeholders.

3.3.5 Sewer Policy

Based on AMEC's and the CWP's review of available data, septic systems may be a source of bacteria loading because areas of older developments that have long relied on septic systems appear to have elevated levels of fecal coliform. In addition, Beaufort Jasper Water Sewer Authority data suggests high concentrations of septic systems near the May River. While functioning septic systems remove most bacteria, according to the CWP, septic system failure

undeveloped areas, and as areas utilizing detention and non-detention techniques. This detailed monitoring data can then be implemented into a watershed water quality model, which will show more accurate loading information throughout the watershed based on site specific runoff information. This data can be used to calibrate/validate the stormwater model that the Town plans to develop in the short-term. This accurate loading information can be used to pinpoint the hot spots and problem areas throughout the watershed with more accuracy, thus providing the Town more specific areas where water quality improvement efforts should be focused.

Recommended Actions

In order to improve the water quality throughout the May River watershed, the following recommended steps can be taken with regards to design storm recommendations:

- ✓ Discuss desire/feasibility for implementing a Aquatic Protection standard, as discussed in the CSS.
- ✓ Perform more detailed monitoring throughout the watershed to determine outflow and rainfall volumes at various locations, to assist in determining actual runoff volumes versus predicted runoff volumes.

3.3.7 Wildlife Management Policy

The review and recommendations for wildlife management policy are variable as there are many unknowns with the wildlife population within the May River Watershed. Therefore, the first recommended action is to obtain a wildlife survey, which will aid in determining what populations exist in the watershed, and where the concentration of the populations is. This will allow for a more specific determination of pollutant loadings from wildlife sources. The survey should be designed for a 12-month period to address various life cycles of wildlife. The survey methods may include trapping and observations as well as interviews with residents. It is recommended that the survey have the goal of determining 4 habitat types on which to focus survey efforts (developed open space-inland, developed-coast, natural open space-woodlands, coastal buffers, or other representative land use types.). This survey will help to establish a (baseline) wildlife contribution of bacteria. Doing so will enable the Town to determine if the current distribution and types of wildlife are in excess of typical populations (and loading rates) for undeveloped areas. Questions that could be answered by this survey include:

- Is there a clustering or concentration of wildlife in a particular area (i.e. riparian buffers), or is it evenly distributed throughout all habitats in the Town?
- Do the numbers of wildlife compare to typical undisturbed areas/natural habitats?

The distribution of wildlife may impact other local policy decisions in terms of habitat and food sources for wildlife, and should be considered before investing with this effort. The SC DNR contact for furbearing wildlife surveys and local wildlife biologist are provided below to help the Town make this decision. The Town of Kiawah Island has a staff biologist (see contact

information below) who conducts regular surveys of a wide range of wildlife and can also be of assistance to the Town of Bluffton in this matter.

Jay Cantrell
Wildlife Biologist
SCDNR Webb Wildlife Center
1282 Webb Ave
Garnett, SC 29922
(803) 625-3569
CantrellJ@dnr.sc.gov

Jim Jordan
Wildlife Biologist
Town of Kiawah Island
21 Beachwalker Drive
Kiawah Island, SC 29455
(843) 768-9166 ext. 405
jjordan@kiawahisland.org

After the wildlife survey is established, the need for further wildlife policy (if any) will be clearer. Loading rates can be determined for the wildlife area using information obtained in the survey, as well as implementing Beaufort County's EMC for fecal loading from Table 3-8 of the Manual for Stormwater Best Management Practices. Likewise, the CWP Watershed Treatment Model uses a loading rate of 1.2×10^{10} cfu/year for a forested landuse. These generic loading rates can be applied to determine a conceptual loading rate generated from the forested land uses, but a wildlife survey is recommended to determine the actual loading rates and to determine the actual sources of the loading rates (coyotes, deer, etc.) so an action plan can be implemented. Using these loading rates and specific wildlife counts from a survey, it can be determined if wildlife is a significant source of fecal loading to the May River. If it is determined that specific wildlife management policy is required, below are recommendations that can be taken for review of current/proposed policy and action items. These items are prioritized in Section 4.4 – Timeline for Implementation Schedule, for short, medium and long-term recommendations:

- ✓ *Wildlife Corridors.* Establishing connected corridors through open space, wetlands and conservation easement areas can provide the opportunity for population distribution.
- ✓ *Expand forested buffers.* While forested buffers may provide food and shelter for wildlife, buffers are the first line of defense to protect water quality. Currently, the Town has adopted a River Protection Overlay District to require 100 to 150 ft minimum riparian or forest buffer ordinance. Selective clearing is allowed along with 7 defined uses within the buffer. Likewise, if buffer widths appear to be adequate, there is still concern with the extent of clearing on individual lots and the impact this has on effectiveness of buffers and wildlife corridors.
- ✓ *Public education campaign to reduce wildlife food sources in developed areas.* Signs posted in public areas 'do not feed wildlife'; flyers in water bills or other local mailers will remind homeowners of proper and secure waste disposal practices.

- ✓ *Physical barriers to wildlife.* Should physical barriers, such as fences, be implemented in certain areas of the watershed and along streams/conveyance sources, to limit the fecal loading being conveyed to the May River.
- ✓ *Individual homeowner BMPs.* Individual residents can be made aware of specific non-invasive actions they can take to reduce wildlife species in their neighborhood, and improve the water quality of the adjacent May River. Likewise, consider providing information on town website about creating backyard wildlife habitat for a positive spin on wildlife as a companion program with other measures to control wildlife considered a nuisance.
- ✓ *Horse manure management & BMPs.* Direct management of horse manure can directly and significantly increase the water quality of a watershed.
- ✓ *Hunting/culling.* It is cautioned that there are dangers associated with hunting in populated areas (i.e. injuries to citizens from missed shots, or other methods), should this method be considered.
- ✓ *Re-introduction of predators of problem species.* Caution is advised on the type of predator species, given planned growth in the area/human population and risks to human safety that may incur as a result. Also, it is difficult to create a balanced predator-prey ratio, which introduces the risk of causing more ecological problems in the future based on the predator species introduced.

Recommended Actions

There are many unknowns when it comes to the wildlife population and loading throughout the May River watershed. However, in order to accurately assess the situation and determine the loadings from the wildlife population, the following items are recommended:

- ✓ Perform a wildlife survey to determine the count/species of deer, hogs, raccoons and coyotes within the watershed.
- ✓ Use the determined EMCs and loading information to obtain specific loading rates/concentrations throughout various portions of the watershed. Use this for determination of problem areas/sources. If wildlife indeed is a significant loading source, below are additional steps that can be taken:
 - *Establish Wildlife Corridors.*
 - *Expand forested buffers.*
 - *Public education campaign to reduce wildlife food sources in developed areas.*
 - *Physical barriers to wildlife.*
 - *Individual homeowner BMPs.*
 - *Horse manure management & BMPs.*
 - *Hunting/culling.*
 - *Re-introduction of predators of problem species.*
 - *Promote purchase and transfer of development rights in sensitive areas.*