**Watershed Plan Writing Template**

This template was designed to assist the watershed restoration plan writing process. This template is not a stand-alone document. It is intended to be used in tandem with the [**Watershed Restoration Planning Guidebook**](https://nccoast.org/guidebook), developed by the North Carolina Coastal Federation. This writing template is a suggested format based on past experiences in developing watershed plans. This template is intended to merely be a tool and aid to the writing process, not all components within this writing template may be necessary for your watershed. The suggestions given are also not exhaustive.

This writing template was developed by the **North Carolina Coastal Federation**, a non-profit dedicated to restoring and protecting the coast of North Carolina. For more information, find us at:

[**nccoast.org**](file:///C:\Users\Mariko\Desktop\Guidebook\Guidebook%20and%20Supplimental%20Docs\nccoast.org)**/guidebook**

**To use this template**

Utilize this writing template with the Guidebook and working with your water quality, water resource, and/or watershed state agencies to maximize your plan.

The examples, suggestions, and ideas given are intended to aid in the brainstorming, development, and writing process based on previous experiences. ***This template is not a substitution for mandatory statues, regulations, or requirements by federal, state or local agencies.***

The formatting and order of each chapter was based on previous experiences, you may need to rearrange sections to best suit the needs of your watershed plan.

All **[bracketed text]** should be deleted and replaced with the content that is suggested in the instructions within the brackets.

It is suggested that non-bracketed text be left within the document as is and/or be customized to meet the need of your watershed.

Refer to the Comments side bar for sections with further instruction. Please remove Comments from the side bar upon completion of your plan: *Review Tab > Comments: Delete button*

All numbers and scenarios used are strictly for the purposes of providing the user with examples and do not represent actual figures.

Utilize the pre-set styles settings: Home Tab > Styles tool bar. The styles have been preset for everything from chapter titles, section titles, lists and captions.

This template is a living document and is regularly updated as we learn from other plans. Please visit nccoast.org for examples of plans that utilize the methods discussed in this template and in the guidebook.



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*Template Version 2017.1*

**TURN ON COMMENTS TO SEE ALL INSTSRUCTIONS**

**Review Tab > Tracking > Drop-down menu: All Markup**

[Watershed Name]

Coastal Watershed Restoration Plan

[YEAR]

**[Insert Cover Image, delete this text box]**

Version [Month, Year]

Contributing Partners

[Partner Organization]

[Partner Organization]

[Partner Organization]

Acknowledgements

[Optional: First Last Name, Organization]

[Optional: First Last Name, Organization]

[Optional: First Last Name, Organization]

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# Guide to Nine Minimum Elements

This table serves as a quick reference guide to where the Environmental Protection Agency (EPA) Nine Minimum Elements within this watershed management plan.

|  |  |  |
| --- | --- | --- |
| **EPA Nine Minimum Elements** | | **Location in Plan** |
| **1** | Identification of causes of impairment and pollutant sources or groups of similar sources that need to be controlled to achieve needed load reductions, and any other goals identified in the watershed plan. | [Section #. # Title or short description]  [Section #. # Title or short description]  [Section #. # Title or short description] |
| **2** | An estimate of the load reductions expected from management measures. | [Section #.# Title or short description]  [Section #.# Title or short description]  [Section #.# Title or short description] |
| **3** | A description of the nonpoint source management measures that will need to be implemented to achieve load reductions, and a description of the critical areas in which those measures will be needed to implement this plan. | [Section #.# Title or short description]  [Section #.# Title or short description]  [Section #. # Title or short description] |
| **4** | Estimate of the amounts of technical and financial assistance needed, associated costs, and/or the sources and authorities that will be relied upon to implement this plan. | [Section #. # Title or short description]  [Section #. # Title or short description]  [Section #. # Title or short description] |
| **5** | An information and education component used to enhance public understanding of the project and encourage their early and continued participation in selecting, designing, and implementing the nonpoint source management measures that will be implemented. | [Section #. # Title or short description]  [Section #. # Title or short description]  [Section #. # Title or short description] |
| **6** | Schedule for implementing the nonpoint source management measures identified in this plan that is reasonably expeditious. | [Section #. # Title or short description]  [Section #. # Title or short description]  [Section #. # Title or short description] |
| **7** | A description of interim measurable milestones for determining whether nonpoint source management measures or other control actions are being implemented. |
| **8** | A set of criteria that can be used to determine whether load reductions are being achieved over time and substantial progress is being made toward attaining water quality standards. | [Section #. # Title or short description]  [Section #. # Title or short description]  [Section #. # Title or short description] |
| **9** | A monitoring component to evaluate the effectiveness of the implementation efforts over time, measured against the established criteria. | [Section #. # Title or short description]  [Section #. # Title or short description]  [Section #. # Title or short description] |

# Executive Summary

[Provide a clear and concise highlight of the watershed characterization, numeric target goals, and the proposed management recommendations. Aim to maintain a summary that is four pages or less. The executive summary it intended to provide a quick overview of the plan as a whole without excessive detail. The executive summary should be written after the entire plan has been written.]

[Suggested information to include:

* The purpose for creating this plan
  + (e.g., to reopen shellfishing waters or decrease the number of beach closures)
* Geopolitical location of the watershed
  + State, County, City/Town
  + Political boundaries for regulatory ordinances
* Name and description of the major waterbody
  + Major stream
* The partnerships involved
  + Organization names
  + Responsibilities
* Impairment issue(s) and indicator
  + Impairment issues/threats
  + Identified sources of pollution
  + Water quality categorization (state and federal categorization)
* Water quality assessment
  + What is the primary indicator being used to determine impairment
  + Numeric stormwater runoff volume reduction load
  + Ideal indicator count (what is the indicator’s current measured count vs ideal/safe/unimpaired count)
* Summary of implementation recommendations
  + Summary of reduction techniques that are proposed ]

# Introduction

[The introduction should provide the reader a comprehensive overview of the management plan. The following information should be included:

* Introduce the location of the watershed surrounding communities
  + State, County, City/Town
  + Political boundaries for regulatory ordinances (what county(s)/municipalities does the watershed fall under)
* Discuss the vision for the watershed and how this project will improve on that vision (see Chapter 4 of the guidebook for Goals )
* Discuss the importance and reasoning for developing a watershed restoration plan for this specific region
* Discuss stormwater runoff issue (see Chapter 1 of the guidebook) ]

# Watershed Description

[Include a short paragraph description of the watershed as whole. Include how many acres the watershed covers and surrounding waterbodies.]

[INSERT MAP OF WATERSHED LOCATION]

Figure 1-1. Map of [NAME OF WATERSHED].

## Physical and Natural Features

[Consider describing and including the following information if it is relevant to the watershed, only include information that is applicable to the goals and objectives of the watershed:

* Hydrology (see Chapter 5 of the guidebook)
  + Include map of all hydrologic features (see Chapter 5 of the guidebook)
  + State watershed or river basins that the project watershed is contained within (see Chapter 4.3 of the guidebook)
  + Name and description of the major waterbody (see Chapter 4 and 5 of the guidebook)
    - Major stream (define the primary stream of the watershed)
    - Outflow location (define where the water from the watershed is flowing to i.e. Cape Fear River, Atlantic Ocean, Intracoastal Waterway etc.)
    - 12-Digit HUC (see Chapter 4.3 in the guidebook)
* Aerial Photography (see Chapter 5 of the guidebook)
  + Include map of Baseline year aerial photography with watershed boundary
  + Include map of most current year aerial photography with watershed boundary
* Soils (see Chapter 5 of the guidebook)
  + Include map of Hydrologic Soil Groups
* Any of the following information should be included in this section **if it is applicable** to the watershed. It is recommended that any information that can be represented by maps or tables is presented in these formats and should always have a descriptive paragraph regarding the topic. (see Chapter 5.5 and Appendix F of the guidebook)
  + Biological richness
  + Cultural resources
  + Floodplain
  + Geomorphology
  + Habitat
  + Invasive species
  + Natural Heritage Program
  + Submerged Aquatic Vegetation
  + Topography, elevation
  + Vegetation
  + Wetlands
  + Wildlife
  + Any additional natural characteristics of interest]

Table 1-1.

Watershed 12-HUC codes.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Watershed Name | 12-HUC | 12-HUC Subwatershed Name |
| 1 | [Main Creek] | [000512340001] | *[Beach Inlet]* |
| 2 | Salty Creek | 000512340002  000512340005 | *Sandy Creek*  *Sunset-Sunrise Inlet* |
| 3 | Sunset Creek | 000512340005  000512340003 | *Sunset-Sunrise Inlet*  *Great Salty River* |

[INSERT MAP OF hydrologic features with watershed boundary]

Figure 1-2. Hydrology map of [NAME OF WATERSHED].

[INSERT MAP OF Baseline year aerial photography with watershed boundary, see Section 5.3.1 and 5.3.2 of the guidebook]

Figure 1-3. Baseline year [YEAR ####] aerial photography map of [NAME OF WATERSHED].

[INSERT MAP OF current year aerial photography with watershed boundary, see Section 5.3.1 and 5.3.2 of the guidebook]

Figure 1-4. Current year [YEAR ####] map of [NAME OF WATERSHED].

### Soils

The U.S. Department of Agriculture Natural Resource Conservation Service’s (NRCS) Web Soil Survey has designated four hydrologic groups (HSG; Groups: A, B, C, D) exist with progressively decreased infiltration potential characteristics; soils classified under Group A have the highest infiltration potential and are often the quickest draining soils, while soils classified under Group D have the lowest runoff potential. It is possible to have a soil type that has characteristics from two hydrologic groups; for example, a soil can be designated as Group A/D, which means it has characteristics of both Group A and Group D. This is because of the changing nature of the soils when they are fully saturated by water. Once a hydraulic threshold is reached, the soil type converts to another hydrologic group because of the change of the available water capacity of the soil.

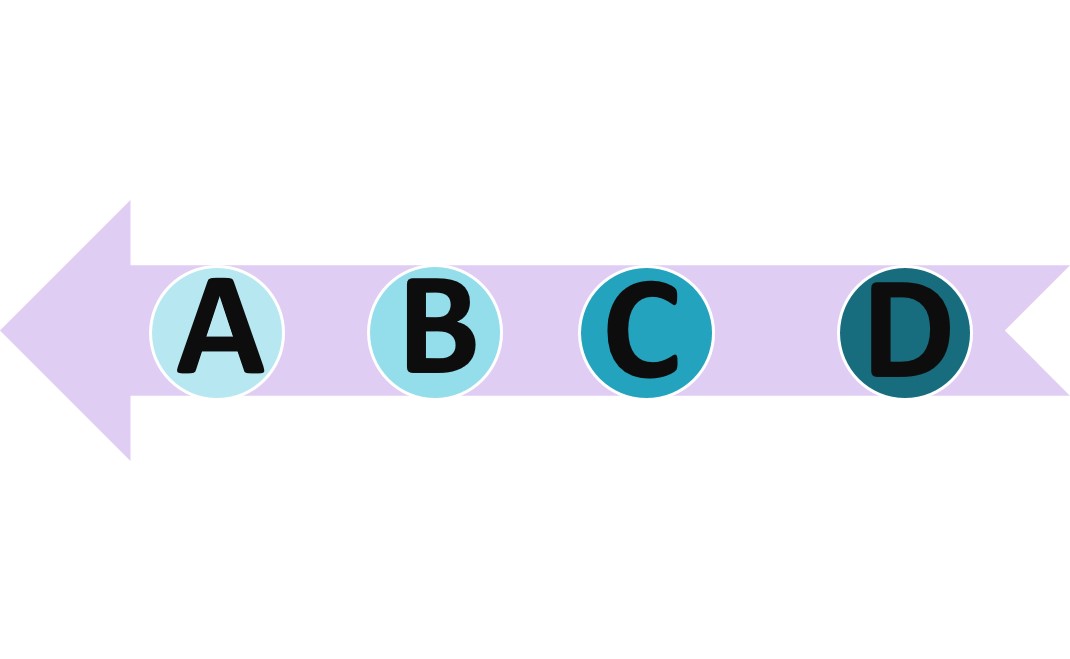
The following is the NRCS summary description for each soil group[[1]](#footnote-2):

**Group A** soils are sands, loamy sands, or sandy loams. These soils have high infiltration rates even when thoroughly saturated. These soils consist of deep, well to excessively drained sands or gravels and have a high rate of water transmission.

**Group B** soils are silt loams or loams. These soils have moderate infiltration rates when thoroughly saturated and consist of moderately deep to deep, moderately well to well drained soils with moderately fine to moderately coarse textures.

**Group C** soils are sandy clay loams. These soils have low infiltration rates when thoroughly saturated and consist of soils with a horizon that impedes downward movement of water and possess moderately fine to fine texture.

**Group D** soils are clay loams, silty clay loams, sandy clays, silty clays, or clay. These soils have the highest runoff potential. These soils have very low infiltration rates when thoroughly saturated and consist of clay soils with a high swelling potential, soils with a permanent high water table, soils with a claypan or clay layer at or near the surface, and shallow soils over nearly impervious material.



**HIGH**

**LOW**

**INFILTRATION RATE**

Some soil types possess two hydrologic group categories. In these instances, if a soil needs to be characterized by one soil group, the lowest infiltration rating should be used as this represents the likely infiltration performance in these areas during significant rain events. It’s important to note that NRCS soil surveys are ideal for watershed scale analysis and determining runoff volume rates. These data are used to calculate the runoff volume rates in this plan. Soil survey data can be used when trying to determine which areas have the most ideal combined characteristics for retrofit projects. HSG, as with any characteristic, should always be tested through field surveys to determine the extent of characteristics at a project site.

[INSERT MAP OF hydrologic soil group with watershed boundary, see Section 5.3.5 of the guidebook]

Figure 1-5. Hydrologic soil group map of [NAME OF WATERSHED].

## Land Use

[Consider describing and including the following information if it is relevant to the watershed, only include information that is applicable to the goals and objectives of the watershed:

* Geopolitical location of the watershed (see Chapter 4 and 5 of the guidebook)
  + State, County, City/Town
  + Political boundaries for regulatory ordinances (i.e. counties and municipalities within the watershed; ideally supplemented with a map)
  + Relevant jurisdictional authorities
  + Zoning (provide map, give information of what percent of the watershed is developed vs undeveloped, what are the percent coverages for each land use type (i.e. residential, commercial, industry, rural, forested, wetlands, etc.) (see Section 5.3.3 and Section 5.3.4 of the guidebook)
* Past and present uses of the watershed area; such as agriculture, lumber harvest/silviculture, military uses, etc. that may have altered or impacted the natural hydrology of the area (see Section 5.4.1, 5.5 and Appendix F of the guidebook)
* Utilizing GIS parcel or building footprint data (if available within your county), determine how many buildings are within the watershed. How many buildings are residential vs commercial. This information can be used to develop education and outreach that is applicable to the community. This information can also aid in the land use analysis of the watershed (see Section 5.3.3 and Section 5.3.4 of the guidebook)
* Any of the following information should be included in this section **if it is applicable** to the watershed. It is recommended that any information that can be represented by maps or tables is presented in these formats and should always have a descriptive paragraph regarding the topic. (see Section 5.5 and Appendix F of the guidebook)
  + Agriculture
  + Easements
  + Future expected land use
  + Manmade dams
  + Marinas
  + Managed areas
  + Navigation channels
  + Ports and harbors
  + Protected Areas
  + Urban development]

[INSERT MAP OF political boundaries with watershed boundary]

Figure 1-6. Political boundaries map of [NAME OF WATERSHED].

[INSERT MAP OF zoning with watershed boundary (see Section 5.3.3 and Section 5.3.4 of the guidebook)]

Figure 1-7. Zoning map of [NAME OF WATERSHED].

## Regulatory

[[*See Chapter 2 of the guidebook.* Discuss all appropriate regulation that *applies directly to the watershed*. There are a number of federal and state regulatory rules and laws that relate to water, coastal zone management, and environmental conservation that may serve as a factor for developing a watershed management plan. The primary regulation that affects all waters is the Clean Water Act. Additional national regulations or programs that may be applicable to a watershed include the Safe Drinking Water Act, the National Estuary Program, Coastal Zone Management Act, North American Wetlands Conservation Act, and the Endangered Species Act. These additional regulations and programs do not necessarily apply to all water bodies or watersheds. Discuss all *directly* *applicable* federal, state and local regulation as it can affect the timeline of projects.]]

[[Discuss directly applicable stormwater rules and land use rules that affect the watershed]]

When implementing projects, consideration should be given to the North Carolina Coastal Area Management Act (CAMA). Some projects may require CAMA permits, consideration of this should be given when developing a timeline for project completion.

Congress enacted the federal Clean Water Act (CWA) (33 U.S.C. §1251 et seq. (1972)) to establish regulations on water quality standards for waters with a purpose of protecting surface waters for drinking, fishing, and recreation. The EPA set water quality standards for many contaminants in surface waters and established pollution control programs. The CWA establishes use designations that mandate that waters maintain their designated usage. In North Carolina, the state Department of Environmental Quality’s Division of Water Resources is responsible for delegating water quality designations. When they do not meet their designation, waters are listed on the 303(d) list.

### Combined EPA and N.C. DEQ Guidelines

Below is a list of criteria that is required by the EPA and N.C. DEQ. All the criteria listed are addressed within this watershed management plan.

Identification of impairment, pollutant, causes, and sources of pollution that need to be controlled. Pollution sources that need control measures should include estimates of their presence in the watershed

Include a map of the watershed

Identifies the major stressors and sources of impairment, spatial visualize the information in map form

Identify point vs. nonpoint sources

Identify the indicators to be measured

Review existing water quality or biological data

Perform a field assessment, this can be initially conducted at areas of greatest concern.

Identify and detail reduction load and the measures necessary to meet water quality standards

Indicate the quantitative reduction load

Prioritize proposed activities/projects and identify critical areas that need management

Describe future and current management measures within the watershed

Document relevant authorities that may have a role in management plan

Management activities should address the indicators

Detailed management activities and the expected outcome

Describe what the indicators will be for each management measure

Establish what the expected potential pollutant load reductions by each project will be

Identification of technical and financial assistance needed to implement and long-term operation and maintenance measures

Estimate amount of technical assistance needed

Estimate amount of financial assistance needed, ideally using a detailed cost list

Identify federal, state, local, and private funds or resources that could potentially assist

Education and information plan for the watershed

Clearly identify stakeholders

Programs should have multifaceted involvement from local, state and federal programs and agencies; there should be a range of information and education options available

Plan implementation schedule

Identify timeline of implementation of actions with specifics on what entity will accomplish the actions including monitoring

Schedule should address short-, mid- and long-term actions

Implementation and tracking of measurable milestones to ensure benchmarks of success are being addressed

Milestones should be measurable and have a clear timeframe on when the milestone should be measured

Indicator to measure progress toward meeting watershed goals

Direct measurements (such as bacterial counts) and indirect measurements (such as number of beach closings, photographs, etc.) that can indicate whether substantial progress is being made

Should address how to proceed/modify strategies if interim goals are not being met

Monitoring component to evaluate effectiveness of plan

Monitoring should be of the load reduction goals to measure progress towards water quality improvement

# Watershed Conditions

[This plan seeks to address water quality through the management of stormwater runoff. Summarize how this relates to the watershed]

## Water Quality

[Consider describing and including the following information if it is relevant to the watershed, only include information that is applicable to the goals and objectives of the watershed:

* Locations of water monitoring stations, include who manages the stations and how regularly data is collected (see Chapter 5.1 of the guidebook)
* Designated and desired uses (see Chapter 2 of the guidebook)
* 1-year, 24-hour storm model depth frequency in inches (see Chapter 5.3.6 in the guidebook)
* Federal and state water quality designations; if available represent this with a map of the watershed and the water quality designations (see Chapter 2 and Section 5.1)
  + 303(d) listing
  + 305(b) Report summary
  + Federal water quality classification (Category 1-5)
  + State water quality classification
  + Impairment statuses
* Any additional water designations or categorizations: (see Chapter 2 and Section 5.1 and Table 5-3 of the guidebook)
  + Aquatic life habitat
  + Recreational (number of closures or advisories per year, etc.)
  + Shellfishing use
  + Water supply
* TMDL summary (if available) (see Chapter 2 and Section 5.1)
* Shellfish Sanitation reports (if available) (see Chapter 2, 5.3.1 and Table 5-3 of the guidebook)
* Water monitoring findings (see Section 5.1 and Table 5-3 of the guidebook)
  + Chemical, biological and/or nutrient findings (historic and present)
  + What organization has/is conducting the monitoring
  + Frequency of monitoring
* Additional water quality issues: (see Section 5.1 and Table 5-3 of the guidebook)
  + Erosion
  + Flooding
  + Sedimentation]

## Source Assessment

[*See Chapter 5.4 in the guidebook.* The primary source being addressed through this management plan will be stormwater runoff, which transports pollutants to waterways. That being said, it is important to recognize sources of pollution and to consider the effects of point and nonpoint source pollution on the watershed and how stormwater runoff could transport these pollutants. Summarize how these relate to the watershed.]

### Nonpoint Source Pollution

[Consider describing and including the following information if it is relevant to the watershed, only include sources that are present in the watershed: (see Section 5.4.2 and Table 5-3 of the guidebook)

* [Agriculture
* Construction
* Septic systems
* Silviculture
* Stormwater Runoff
  + Fecal coliform
  + Nutrient from fertilizer
  + Pesticides
  + Sedimentation
* Wildlife]

### Point Sources

[Point sources of pollution, unlike the diffuse non-point sources, are any single identifiable source of pollution from which pollutants are discharged, such as a pipe or ditch. They can pollute the water, but their effects can often be lessened or eliminated through management strategies.

Consider describing and including the following information if it is relevant to the watershed, only include sources that are present in the watershed: (see Section 5.4.2 and Table 5-3 of the guidebook)

* [NPDES permitted facilities (provide map with watershed boundary, if possible)
* CAFO permits (Concentrated animal feeding operation. The NPDES program regulates the discharge of pollutants from point sources to waters of the U.S. CAFOs are point sources, as defined by the [CWA [Section 502(14)] (PDF)](http://www.gpo.gov/fdsys/pkg/USCODE-2013-title33/pdf/USCODE-2013-title33-chap26-subchapV-sec1362.pdf)) (provide map with watershed boundary, if possible)
* Phase I and II Stormwater Permits (provide map with watershed boundary, if possible)
* Wastewater Treatment Plants (provide map with watershed boundary, if possible)]

### Additional Sources

[Consider describing and including the following information if it is relevant to the watershed, only include sources that are present in the watershed: (see Section 5.4.2, utilize EPA [Envirofacts](http://www3.epa.gov/enviro/) and state waste management agency databases [Section 5.4.2.1] of the guidebook)

* [Brown Fields
* CERCLA Sites
* Mining
* RCRA sites
* Underground Storage Tanks
* Other hazardous pollutant sources]

# Runoff Volume Reduction

## Volume Reduction Methodology

Coastal areas have undergone significant change as land use practices have intensified through the increase in agriculture, forestry, and development. Before human alteration, more rainwater was absorbed into the ground, evaporated, or used by vegetation through natural hydrologic processes. Specifically, when rainwater is absorbed through the ground, bacteria and other pollutants are substantially filtered or eliminated through percolation. Conventional land use practices circumvent natural hydrologic processes. Stormwater runoff has increased along coastal shorelines as natural, vegetated environments are been developed, increasing the amount of impervious surface. Rainwater is transported rapidly over impervious surfaces through connected conveyance systems, including ditches, pipes, parking lots, and open grassy areas like yards that are circumventing natural hydrologic processes. This excess surface water from a rain event is known as stormwater. The result is that during and after storms, rainwater passes quickly over the landscape collecting bacteria, nutrients, chemical and physical pollution before flowing directly into coastal waters. Polluted water bodies negatively affect the environment, human health and coastal fishing and tourism industries. Restoration and management techniques that rely on stormwater reduction volume and that mimic or restore natural hydrology can reduce stormwater and pollutant loads.

Intensive land uses overwhelm the effectiveness of conventional stormwater treatment systems. Conventional methods rely on peak flow storage but do not mitigate pollution and cannot keep up with increased pressure from usage. As impervious surfaces and stormwater runoff increase, hydrology is altered and can lead to an increase in sedimentation and erosion, ecosystem degradation and loss of aquatic biodiversity, degradation of water quality, and increased flooding.

Rather than focusing on reducing sources of contamination or attempting to treat and remove bacteria and other pollutants from stormwater runoff, ***the management techniques used focus on reducing the overall volume of stormwater runoff to limit the conveyance from the land into coastal waters****.* Low impact development (LID) stormwater reduction practices can achieve this goal by replicating the natural hydrology and increasing infiltration of water into soils. LID practices are a form of land planning and engineering that primarily focus on mimicking natural hydrology of the area to limit stormwater runoff. For already developed locations stormwater reduction techniques can reduce the amount of stormwater entering waterways. The result of implementing stormwater reduction practices is that less bacteria and pollutants are transported off the land and into water systems.

Restoration of pre-development, natural hydrology leads to less bacteria and other pollutants in coastal waterways from discharges from the landscape after rainfall. Bacteria is affected by the following factors: the natural mortality of fecal coliform and enterococcus bacteria, the prevention of bacteria and pollutants from entering waterbodies and the reduction in the velocity of waters traveling off the landscape resulting from lower flows. Infiltration of rainfall into the ground serves as an extremely effective filtration system of bacteria and pollutants. Additionally, once bacteria enter the landscape they are subject to higher rates of mortality due to bombardment by ultraviolet radiation from sunlight. By reducing the flow velocity of stormwater, the dissemination of bacteria and other pollutants downstream into shellfishing and swimming waters will be reduced.

## Calculation Methodology

The process of calculating the amount of runoff that could be achieved has been standardized using instructions developed by the North Carolina Coastal Federation, a non-profit organization dedicated to preserving and protecting North Carolina’s coast, and WithersRavenel, a civil and environmental engineering firm. Using aerial photography to document land-use types, the partners characterized land uses during the baseline year, (or the earliest available aerial imagery of the watershed) and during subsequent years, land characterization was conducted by delineating parcel information, development (pervious, impervious), and soil characteristics (HSG) for each land use scenario (each aerial imagery year). The delineated land use parcels were then analyzed to estimate the average percent impervious coverage. Summations were calculated of overall percent coverage based on land use and soil. From this information, the runoff curve number is calculated then runoff depth is calculated for the 1-year, 24-hour depth of precipitation using formulas developed by the United States Department of Agriculture Natural Resource Conservation Service (USDA NRCS) in the *TR-55 Manual*. A runoff curve number (commonly referred to as CN) is a numeric parameter derived from combining the effects of soil, watershed characteristics, and land use. The following curve numbers were used in the hydrographs:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Land Use Classification | HSG | | | |
| **A** | **B** | **C** | **D** |
| Impervious | 98 CN | 98 CN | 98 CN | 98 CN |
| Open Space | 39 CN | 61 CN | 74 CN | 80 CN |
| Woods | 30 CN | 55 CN | 70 CN | 77 CN |

The following designations were utilized to categorize land use:

|  |  |
| --- | --- |
| Land Use | Designation |
| Impervious | Areas with distinctive impervious coverage from paved parking lots, roofs, driveways, curbs, storm sewers etc. |
| Open Space | Grassy areas where there is 75% or more grassy space such as from lawns, parks, golf courses, cemeteries, fields, pastures, etc. |
| Woods | Forested areas with thorough coverage, these areas are often protected from grazing, and forest litter and brush adequately cover the soil. |

The 2-year, 24-hour depth of precipitation is used to develop a hydrograph. The resulting value is then multiplied by the area of the watershed, which will give the total estimated stormwater runoff volume anticipated in response to the prescribed depth of rainfall over a 24-hour period. The volume difference between the baseline year and the analyzed year is calculated to determine the estimated volume of stormwater runoff that needs to be reduced to replicate pre-impairment conditions.

## Runoff Reduction Load Calculations

[*See Section 4.2, Chapter 6 in the guidebook.* This section should address the following: provide the numerical value of the stormwater runoff volume for the baseline year, most recent year estimated and the reduction goal. Discuss the water quality indicator parameters (fecal coliform count), comparing numerical before and after measurements of the water quality indicator parameter or pollutant loads (if TMDL has been conducted) that is appropriate for the watershed, until baseline year levels or non-impaired levels are reached.

Identify the amount of stormwater runoff volume that was calculated.]

Table 3-1. Identifying and linking concerns, causes and indicators.

|  |  |  |
| --- | --- | --- |
| **Issue** | **Source of Issue** | **Quantify Issue**  **(Indicators)** |
| **[Example: Not suitable for shellfishing or swimming]** | [Bacteria from stormwater runoff] | [Fecal coliform and enterococci levels, shellfish and beach closure data, waterbody classifications] |
| **[Example: Eroding banks]** | [High Peak Flow due to stormwater from impervious surfaces] | [Hydrographs, water velocity] |
| **[Example: Sediment in water]** | [Sediments from stormwater runoff] | [Turbidity, TSS] |

Table 3-2. Summary of the total area of each soil type based on land use for the baseline year of [YEAR ####], based on geospatial analysis.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **[Name] Watersheds** | | | | | | | | |
| **[Baseline Year]** | | | | **[Modern Year]** | | | | **Change** |
| **Soil Type** | **Land Use** | **Total Area**  **(acres)** | **% of total watershed** | **Soil Type** | **Land Use** | **Total Area**  **(acres)** | **% of total watershed** | **Difference between years (acres)** |
| **A** | Impervious |  |  | **A** | Impervious |  |  |  |
| **A** | Open |  |  | **A** | Open |  |  |  |
| **A** | Woods |  |  | **A** | Woods |  |  |  |
| **B** | Impervious |  |  | **B** | Impervious |  |  |  |
| **B** | Open |  |  | **B** | Open |  |  |  |
| **B** | Woods |  |  | **B** | Woods |  |  |  |
| **C** | Impervious |  |  | **C** | Impervious |  |  |  |
| **C** | Open |  |  | **C** | Open |  |  |  |
| **C** | Woods |  |  | **C** | Woods |  |  |  |
| **D** | Impervious |  |  | **D** | Impervious |  |  |  |
| **D** | Open |  |  | **D** | Open |  |  |  |
| **D** | Woods |  |  | **D** | Woods |  |  |  |

[Figure 3-1. Pre-treatment runoff hydrograph of EXAMPLE WATERSHED from baseline to modern conditions.]

Table 3-4. Summary of the total runoff volume reduction goals.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **EXAMPLE Watersheds** | | | | |
| **Year** | **Condition Peak Flow (CFS)** | **Reduction Goals** | | |
| **Runoff Volume (AC-FT)** | **Volume Change from Baseline Conditions (ac-ft)** | **Target Volume Reduction (gal/ft2)** |
| **1993** | [151.37] | [40.77] | -- | -- |
| **2014** | [531.03] | [78.41] | [37.65] | [0.12] |
| **Total Acres** | | [2,324] | | |
| **Reduction Goal for the entire watershed (Gallons)** | | **[13,368,590]** | | |

# Goals and Objectives

[*See Chapter 4 in the guidebook.* The goal is to reduce stormwater runoff volume there by reducing the pollutant in order to restore water quality. If additionally, goals are identified that are unique to the watershed they should be discussed in this section]

## Goal and Objectives

[*See Section 4.1 in the guidebook.* The primary goal is to reduce stormwater runoff volume there by reducing the indicator in order to restore water quality. Describe in detail the goal and how the objective support this goal in this section. Be sure to mention the length of time the plan is (e.g. “…this is a 20 year plan”).]

Table 4-1. The primary goal of the watershed management plan and the objectives.

|  |  |
| --- | --- |
| Primary Goal  [Reduce stormwater runoff volume to restore water quality….] | |
| **OBJECTIVES** | |
| **1** | New development and redevelopment does not create additional water quality impairments. |
| **2** | The targeted volume of stormwater runoff is reduced from existing private land uses. |
| **3** | The targeted volume of stormwater runoff is reduced from existing public land uses and paired with capital improvement projects. |
| **4** | Water quality is appropriately classified by existing uses. |
| **5** | Periodic monitoring and review is conducted. |
| **6** | Community is educated about stormwater pollution and engaged in accomplishing objectives. |

### Objective 1

[[*See Section 4.1 in the guidebook.* This objective serves to address future changes within the watershed. Strategies aimed at preventing further degradation of water quality by emphasizing a proactive approach to new development and redevelopment through sustainable stormwater management. ]]

|  |  |  |  |
| --- | --- | --- | --- |
| Objective 1. Continue existing programs that address water quality impairments in the watershed | | | |
| **Action #** | **Specific Action** | **Timeline** | **Partners** |
| **1-1** | [Implement and enforce existing stormwater requirements for new development and redevelopment] | [Ongoing] | [] |
| **1-2** | [Continue to promote stormwater reduction designs] | [Ongoing] | [] |
| **1-3** | [Continue to cooperate with CCAP] | [Ongoing] | [] |
| **1-4** | [Maintain existing educational programs] | [Ongoing] | [] |
| **1-5** | [Reflect plan in other Town plans, regulation and management strategies] | [As plans are updated] | [] |
| **1-6** | [Continue education and code enforcement programs that reduce and eliminate sources of bacteria and pathogens related to human and pet wastes] | [Ongoing] | [] |
| **1-7** | [Continue to support the community’s local plan, which includes a water quality protection component. The County is dedicated to assisting local communities in developing and implementing water quality enhancement projects. ] | [Ongoing] | [] |

### Objective 2

[[*See Section 4.1 in the guidebook.* Monitoring of water quality that has been closed to shellfish harvest is limited, and not adequate to determine trends in water quality. Monitoring needs to be undertaken upstream and analyzed to better determine water quality condition improvement, and to evaluate appropriateness of existing water quality classifications and designated uses. ]]

***Actions***

|  |  |  |  |
| --- | --- | --- | --- |
| Objective 2. Determine Appropriate Water Quality Classifications and Designated Uses Where Water Quality Impairment Exists | | | |
| **Action #** | **Specific Action** | **Timeline** | **Partners** |
| **2-1** | [Continue to utilize and rely on Shellfish Sanitation monthly monitoring data from station] | [Ongoing] | [] |
| **2-2** | [As water quality improvement projects are applied monitor changes in station readings in order to determine when to reclassify from Conditional Approved-Closed to Open] | [Ongoing based on monitoring results] | [] |
| **2-3** | [Partner with Shellfish Sanitation to devise a recommended timeframe of if and when a new monitoring station can be installed upstream ] | [Year 2 based upon preliminary monitoring] | [] |
| **2-4** | [Partner with local academia to perform additional monitoring program ] | [Ongoing] | [] |

### Objective 3

[[*See Section 4.1 in the guidebook.* The volume of stormwater runoff being transported over land to waterways needs to be reduced to restore water quality. The objective of the plan is to reduce the volume of stormwater generated and conveyed from the land uses to levels that occurred prior to the baseline year.]]

***Actions***

|  |  |  |  |
| --- | --- | --- | --- |
| Objective 3 Reduce the transport of bacteria from land to water by reducing the volume of stormwater runoff | | | |
| **Action #** | **Specific Action** | **Timeline** | **Partners** |
| **3-1** | [Secure and budget funds for retrofits in the watershed and determine volume that can be reduced with funds ] | [Year 1] | [] |
| **3-2** | [Install stormwater reduction projects] | [Within first 5 years] | [] |
| **3-3** | [Incorporate additional measure to reduce pollutant indicator] | [Within first 5 years] | [] |
| **3-4** | [Incorporate stormwater reduction regulations into town planning] | [Within first 5 years] | [] |
| **3-5** | [Track actual reductions by each project using calculation and project measurement tools] | [Annually once projects are installed] | [] |

### Objective 4

It will only be possible to obtain significant reduction in the volume of stormwater runoff if strategic decisions are made about how to achieve the most benefit for the staff and resources used.

***Actions***

|  |  |  |  |
| --- | --- | --- | --- |
| Objective 4. Promote/focus stormwater reduction efforts in locations where they yield the greatest and most cost effective stormwater volume reductions | | | |
| **Action #** | **Specific Action** | **Timeline** | **Partners** |
| **4-1** | [Promote use of GIS web based retrofit Atlas] | [Annually] | [] |
| **4-2** | [Investigate cost effective methods of working with landowners to disconnect impervious surfaces] | [Year 1 and 2 ] | [] |
| **4-3** | [Promote stormwater retrofits within private development] | [Annually] | [] |
| **4-4** | [Promote tree planting and retention] | [Annually] | [] |
| **4-5** | [Promote stormwater reduction measures on Town streets in future capital improvement projects] | [Dependent on Capital Improvement schedule] | [] |
| **4-6** | [Pursue strategy with Department of Transportation to incorporate retrofits into highway upgrades] | [Based upon project schedules] | [] |
| **4-7** | [Promote stormwater retrofits in future publicly funded maintenance or redevelopment of Town owned buildings, parks, parking lots and drainage systems] | [Based upon project schedules] | [] |
| **4-8** | [Promote and assist with stormwater retrofits at Elementary School] | [Year 1] | [] |
| **4-9** | [Promote and assist with stormwater retrofits at Public library] | [Year 1] | [] |
| **4-11** | [Evaluate existing stormwater ponds on public and private properties for potential volume] reductions enhancements, and if feasible, retrofit them to achieve volume reductions] | [Years 3 - 5 ] | [] |

### Objective 5

Accomplishing the actions called for in this plan require partnerships with state and local government agencies, non-profit organizations, universities, houses of worship, landowners and residents.

***Actions***

|  |  |  |  |
| --- | --- | --- | --- |
| Objective 5. Form and maintain partnerships to carry out the plan | | | |
| **Action #** | **Specific Action** | **Timeline** | **Partners** |
| **5-1** | [Work with partners to educate stakeholders] | [Years 1 – 5] | [] |
| **5-2** | [Work with government agencies and NGOs to secure grants for retrofits and other programs] | [Years 1 – 5] | [] |
| **5-3** | [Provide strategies and policies for the Town and County departments to carry out plan by incorporating runoff reduction strategies] | [Years 1 – 5] | [] |
| **5-4** | [Promote use of atlas among key Town and County departments in their routine business] | [Years 1 – 5] | [] |
| **5-5** | [Work with partners to establish long-term monitoring program] | [Years 1] | [] |

### Objective 6

Progress made in achieving water quality improvements will be measured. This plan will be adapted as necessary based upon the results of this monitoring.

***Actions***

|  |  |  |  |
| --- | --- | --- | --- |
| Objective 6. Evaluate success and modify plan based upon results | | | |
| Action # | Specific Action | Timeline | Partners |
| **6-1** | [Use atlas accounting system to document and track progress toward watershed goals.] | [Years 1 – 5] | [] |
| **6-2** | [Work with Shellfish Sanitation and local academia to monitor and track changes] | [Years 1 – 5] | [] |
| **6-3** | [Conduct annual and five-year assessment of plan’s success and modify plan as needed] | [Annually] | [] |
| **6-4** | [Identify which management measures are successful in reducing the among of stormwater transported to surface waters based upon physical factors, institutional contains, cost effectiveness, and other factors that influence their feasibility and efficacy. ] | [Years 1-5] | [] |
| **6-5** | [Calculate intermediate stormwater runoff reduction goals with additional aerial imagery and data] | [Year 1] | [] |

# Management Strategies

[*See Chapter 7 and 8 in the guidebook.* Utilizing stormwater reduction techniques will reduce stormwater runoff. The *Runoff Reduction Scenario Tool* calculates what strategies would be appropriate and how many would need to be applied to achieve appropriate runoff reduction. Summarize here.]

[Conventional management methods rely on peak flow storage and the mitigation of on-site flooding by removing stormwater from the site as quickly as possible. In this approach, stormwater is quickly moved through curb and gutter systems, often over impervious surfaces, where the untreated runoff is conveyed to the nearest receiving water. This approach is effective at deterring on-site flooding but the downstream effects result in an increase in the magnitude and frequency of flooding. Conventional efforts to manage runoff throughout the coast have failed to prevent stormwater runoff pollution; particularly from increased bacterial pollution, which causes contamination of shellfish and swimming waters.]

## Volume Reduction Measures

[*See Chapter 7 and Section 8.1 in the guidebook.* Discuss all proposed volume reduction measures]

Table 5-1. List of Proposed Volume Reduction Measures for Public Spaces

|  |  |  |
| --- | --- | --- |
| **Volume Reduction Measure** | **Number of Retrofits** | **Lifespan (years)** |
| [Install downspout retrofit at Library, Police Station, Elementary and Town Hall with signs] | [20] | [50] |
| [Install raingarden at Library, Town Hall and Elementary with signs] | [#] | [#] |
| [Replace parking lot with Permeable pavement at Library and Town Hall and Police station] | [#] | [#] |
| [Remove curb in Police Station parking lot and replant with native garden or rain garden] | [#] | [#] |
| [Shade tree planting along HWY ] | [#] | [#] |
| [Shade tree planting along Main Street] | [#] | [#] |
| [Install rock sills along HWY ] | [#] | [#] |
| [Install native plants at Town welcoming signs] | [#] | [#] |
| [Installation of living shorelines projects at or near stormwater runoff outflows] | [#] | [#] |

## Other Reduction Measures

[*See Section 7.3 in the guidebook.* Discuss any additional measures that may aid in preventing or reducing stormwater runoff or reduce pollutants from entering the watershed. For example, any proposed regulatory changes, installation of pet waste stations, street sweeping, and so on.]

## Present Controls

[Discuss all stormwater runoff controls currently in place within the watershed (if applicable). Elaborate on any pre-existing plans or management programs. This is an integral component to developing a comprehensive watershed management plan and should not be overlooked.]

## Education and Outreach

[[*See Chapter 3.1, 3.2, 3.3 of the guidebook.* Identify stakeholders and partners involved. Acknowledge their critical roles in the planning and implementation process. Discuss any committees and sub-committees that have been created and their roles.]]

[[Include stakeholder demographic information for purposes of education and outreach discussed in later chapters: population information, economics, job (fishing/shellfishing community, business, tourism community, etc.), languages, age, etc. This information can readily be found utilizing U.S. Census Bureau data or county demographic information. Knowing this information will help your environmental educators design programs that appropriately address those who live in your watershed.]]

### Partnerships and Community Building

[*See Section 3.4.1 in the guidebook.* Discuss the education and outreach goals of the watershed management plan in detail here.]

The primary purpose of conducting education and outreach within the watershed is to expand and improve environmental literacy to ensure that the community maintains a vested interested in the protection and improvement of the watershed as stakeholders. Education and outreach should enhance public understanding and the outreach messages, which relate coastal watersheds to stormwater runoff. Tailor messages in ways that clearly represent how reducing runoff volumes will benefit target audiences while tying in overarching goals and to communicate volume reduction. ]

[*See Section 3.4.1 in the guidebook.* Discuss a basic proposed education and outreach program]

[ Remember, an education and outreach strategy should include the following components:

* Enhance public understanding of the project.
* Encourage early and continued involvement in selecting, designing, and implementing nonpoint source management measures to be put into practice
* To enhance public understanding, create outreach messages, which relate coastal watersheds to stormwater runoff. Tailor messages in ways that clearly represent how reducing runoff volumes will benefit target audiences while tying in overarching goals and to communicate volume reduction.
* To encourage involvement, provide messages that highlight simple ways others can join project efforts.]

[When developing an education and outreach strategy, follow these six steps:

1. Define outreach goals;
2. Identify and analyze the target audiences;
3. Create the messages for each audience;
4. Package the messages for various audiences;
5. Distribute the messages;
6. Evaluate the Information/Education program.]

[The details of each step should be discussed within the plan. Specifically, clarify the proposed target audience, summarize the message and the method of distributing (i.e. classes, pamphlets, etc.) the material]

# Implementation Schedules

[*See Chapter 8 in the guidebook.* Summarize the proposed implementation program schedule, monitoring and milestones that will support the application of the stormwater reduction techniques.]

[The following discusses the proposed implementation schedule of projects, milestones and monitoring work to occur. Table 6-1 is an overview of the general implementation schedule describing the actions that should be taken over the course of the next ## years. ]

Table 6-1. Overview of general Implementation Schedule.

|  |  |  |  |
| --- | --- | --- | --- |
| **Action** | **Partner** | **Time** | |
| [Meet with education and outreach partners to support programs that are already in place and to determine best methods to incorporate stormwater education within preexisting programs ] | [] | | [Year 1] |
| [Review Town’s current planning, zoning, new development and land management strategies and regulations to maximize stormwater reduction methodology] | [] | | [Year #] |
| [Seek advice from Shellfish Sanitation on when to submit request to Shellfish Sanitation to reactivate Station ##] | [] | | [Year #] |
| [Develop comprehensive education lesson curriculum collaborating with Elementary School teachers] | [] | | [Year #] |
| [Develop comprehensive education lesson curriculum to be presented to residents at meetings ] | [] | | [Year #] |
| [Develop comprehensive education lesson curriculum to be presented to businesses at meetings] | [] | | [Year #] |
| [Seek monitoring program development with local academia. Develop program then incorporate as addendum to this Plan] | [] | | [Years #-#] |
| [Seek and budget funds for retrofits in Watershed. ] | [] | | [Years #-#] |
| [Investigate additional cost effect methods of working with landowners to disconnect impervious surfaces, beyond what is currently outlined within this plan. ] | [] | | [Years #-#] |
| [Incorporate stormwater reduction Projects within public areas] | [] | | [Year #] |
| [Evaluate stakeholder attitude towards watershed (see Table 6-4)] | [] | | [Year #, #, #, #] |
| [Mid-course Evaluation. Update the Watershed Management Plan with Addendums (see Table 6-4) ] | [] | | [Year #] |
| [Education and Outreach program evaluation (see Table 6-4)] | [] | | [Year #] |
| [Publish quick report updating stakeholders on watershed (see Table 6-4). ] | [] | | [Year #] |
| [Promote stormwater reduction retrofits within private developments] | [] | | [Year #] |
| [Education and Outreach annual meetings with Residents] | [] | | [Year #] |
| [Education and Outreach annual meetings with Businesses ] | [] | | [Year #] |
| [Annual review of Milestones and Evaluation to determine whether plan remains on track. Implement further evaluation to get back on track if necessary (see Table 6.4)] | [] | | [Year #] |
| [Install stormwater reduction structural projects in public areas (See Section 6.1)] | [] | | [Year #] |
| [Renew plan. Update and write updated Watershed Management Plan. Additional funding should be sought during this time to support additional 10 years.] | [] | | [Year #] |
| [Final Assessment. Review entire plan and implementation successes and failures, lessons learned and how future plans can improve] | [] | | [Year #] |

## Project Implementation Schedule

[[*See Section 8.6 in the guidebook.* The following is the suggested stormwater reduction techniques projects and education implementation projects with the implementation schedule and projected costs of each (Table 6-2). The estimated cost does not incorporate staff time of partners involved or volunteer time and strictly considers cost of materials and professional labor to install projects. Estimate Cost reflect total cost to install or execute all components of the Action and Indicator (it does not reflect each individual installation but the Action as a whole). The Maintenance Schedule column of Table 6-2 should be taken into consideration as part of the technical considerations of the plan.]]

Table 6-2. Project Implementation schedule matrix table format.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Action** | **Partner** | **Time** |  | **Maintenance Schedule** | **Estimate Cost** | **Indicator** |
| [Install stormwater reduction signs at all public docks and parks ] |  | [Year 1] |  | [Annually assess of signage, incorporate with regular landscape maintenance schedule] | [$5,000] | [# of 10 signs installed] |
| [Printing and mailing of *Smart Yard* to residents] |  | [Year #] |  | [Annually provide additional prints to Public buildings] | [$####] | [# of ### residents mailed] |
| [Install downspout retrofit at Library, Police Station, Elementary and Town Hall with signs] |  | [Year #] |  | [Annually, incorporate with regular building maintenance schedule] | [$####] | [# of # retrofits; # of # signs] |
| [Install raingarden at Library, Town Hall and Elementary with signs] |  | [Year #] |  | [Annually, incorporate with regular landscape maintenance schedule] | [$####] | [# of # rain garden and signs] |
| [Replace parking lot with Permeable pavement at Library and Town Hall and Police station] |  | [Year #] |  | [Annually, incorporate with regular building maintenance schedule] | [$####] | [# of # parking lots installed and signs] |
| [Remove curb in Police Station parking lot and replant with native garden or rain garden] |  | [Year #] |  | [Annually, incorporate with regular landscape maintenance] | [$####] | [# of # gardens] |
| [Shade tree planting along HWY ] |  | [Year #] |  | [Monthly, incorporate with regular landscape maintenance] | [$####] | [# of ## trees planted] |
| [Shade tree planting along Main Street] |  | [Year #] |  | [Monthly, incorporate with regular landscape maintenance] | [$####] | [# of ## trees planted] |
| [Install rock sills along HWY ] |  | [Year #] |  | [Annually, incorporate with regular landscape maintenance] | [$####] | [# of ## sills installed] |
| [Elementary lesson plan curriculum materials for demonstration, handouts and visual aids] |  | [Year #] |  | [Annually, review how to improve lessons] | [$####] | [# of ##lessons] |
| [Install animal waste station receptacles at all parks and docks with signs] |  | [Year #] |  | [Monthly, incorporate bag replacement with regular landscape maintenance] | [$####] | [# of ## pet waste stations] |
| [Install native plants at Town welcoming signs] |  | [Year #] |  | [Monthly, incorporate with regular landscape maintenance] | [$####] | [# of # native plant gardens] |
| [Residential Town Hall meetings curriculum materials for demonstration, handouts and visual aids] |  | [Year #] |  | [Annually, review how to improve lessons] | [$####] | [# of ##lessons] |

## Milestones

[*See Section 8.4 in the guidebook.* Discuss all milestones that have been chosen. Clarify time line and implementation priorities.]

[Primary milestones for restoring water quality through volume reduction of surface runoff can be:]

* [A certain number of gallons reduced;
* The number of shellfish harvesting areas reopened;
* The number of acres no longer impaired;
* The number of community members educated on stormwater runoff, stormwater reduction techniques.
* Number and duration of swimming advisories]

### Short-Term (< 5 years)

* [Reducing stormwater runoff by 5% (169,212.4 gallons) of 3,384,248.05 gallons through the implementation of stormwater reduction techniques
* Reduce the number of times Station ## exceeds FC 14/100ml from one to two times a year to one or less
* Reactivate the use of Station ##, which is more upstream that Station ## for monitoring, begin monitoring baseline data
* Educate 491 of 1,962 residents on stormwater runoff, stormwater reduction techniques
* Install 5 stormwater reduction projects
* Install ## of ## proposed stormwater reduction retrofits]

### Mid-Term (< 15 years)

* [Reducing stormwater runoff by ##% (###### gallons) of 3,384,248.05 gallons through the implementation of stormwater reduction techniques
* Reduce the number of times Station ## exceeds FC 14/100ml from one to two times a year to zero for consecutive years
* Recategorize the mouth of Creek monitored by Station ## from Conditionally Approved-Closed to Conditionally Approved-Open
* Recategorize upper creek from Closed to Conditionally Approved-Closed
* Educate ### of 1,962 residents on stormwater runoff, stormwater reduction techniques
* Install ## of ## proposed stormwater reduction retrofits]

### Long-Term (< 25 years)

* [Reducing stormwater runoff by #### gallons through the implementation of stormwater reduction techniques
* Reduce the number of times Station # exceeds FC 14/100ml to zero for consecutive years
* Recategorize the mouth of Creek monitored by Station # to Open
* Recategorize Creek from Closed to Conditionally Approved-Open
* Educate ### residents on stormwater runoff, stormwater reduction techniques
* Install ## proposed stormwater reduction retrofits]

## Monitoring

[*See Section 8.2.1 in the guidebook.* Discuss all proposed monitoring strategies.]

[In North Carolina consider and include the following information: Shellfish Sanitation and Recreational Water Quality section of the Division of Marine Fisheries (DMF) is responsible for monitoring the bacteria levels in coastal waters and has the authority to close waters to shellfishing and issue swimming advisories when bacterial levels are unacceptable. This is accomplished through monitoring water quality conditions at over a thousand stations for shellfishing and 240 stations for swimming.]

[ In addition, every three years N.C. Shellfish Sanitation staff ground truth the entire shoreline of shellfish growing areas to document current and potential pollution sources. The data collected by Shellfish Sanitation is publicly available and is a source of historical and present day information regarding water quality of an area. By utilizing data that has already been collected, communities can research and develop plans without implementing extensive and costly data collection and monitoring programs. Shellfish closure area information can be used by communities to determine what waterways are impaired and to what extent the waterway is being affected. Additionally, communities that have multiple watersheds within their boundaries can determine the level of impairment or the number of years a waterway has had that status to develop a list of watersheds to focus on or develop a prioritization list.]

Table 6-1. The primary goal of the watershed management plan and the indicators and how to measure the indicators.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Primary Goal Indicators | | | | |
|  | **Indicator** | **Measured by** | **Collected by** | **Collection Cycle** |
| **1** | [EXAMPLE: Water quality parameter (fecal coliform count, etc.)] | [Comparing numerical before and after measurements of the water quality indicator parameter or pollutant loads (if TMDL has been conducted) that is appropriate for the watershed, until baseline year levels or non-impaired levels are reached.] | [Shellfish Sanitation] | [Monthly] |
| **2** | [EXAMPLE: Stormwater Runoff Volume] | [Applying stormwater reduction techniques and determining how much stormwater is reduced by the techniques; these measures should attempt to reduce current stormwater runoff volume to the levels of the baseline year. Utilizing data collected by GIS analysis.] | [Organization] | [Yearly] |

## Evaluation

[*See Section 8.3 in the guidebook.* To ensure that the Watershed Management Plan is meeting the needs of the watershed and the community, the management plan should be evaluated on a regular basis to determine effectiveness (Table 6-4). Records keeping will be imperative to the long-term success of this plan and organized and meticulous records shall be kept. ]

Table 6-4. Evaluation of the Deer Creek Watershed Management Plan.

|  |  |  |  |
| --- | --- | --- | --- |
| **Evaluation** | **Partner** | **Indicator** | **Timeframe** |
| [Load reduction calculation for installed stormwater reduction projects ] |  | [Utilize *Watershed EZ tool*] | [Pre/Post implementation of projects] |
| [Progress towards meeting FC 14/100ml standards] |  | [Readings in excess of 14 should go from # per year at Station # to zero] | [Annual review] |
| [Mid-course evaluation ] |  | [Conduct full assessment of plan with suggestions on ways to enhance or redirect the plan] | [Year #] |
| [Education and Outreach Evaluation] |  | [Full evaluation of Education and Outreach success; review of surveys and stakeholder] [feedback, if successful seek funding for additional # years.] | [Year #] |
| [Pre and Post implementation monitoring of Station 25 once it is reactivated] |  | [Establish baseline conditions once reactivated and determine changed based on pre and post project installation] | [Pre/Post implementation of projects; Annual review] |
| [Evaluate stakeholder attitude towards Watershed ] |  | [Survey stakeholders for opinions and knowledge on watershed, stormwater, responsibility and general opinions on projects] | [Years 2, 5, 7 and 10] |
| [Publicize and evaluate successes] |  | [During education and outreach events update stakeholders on watershed successes] | [Throughout the project] |
| [Publish quick report updating stakeholders on watershed] |  | [Publish report on watershed health. Recognize past, current and future projects for the year. ] | [Annually] |

## Cost and Technical Needs

[*See Section 8.5 in the guidebook.* Discuss all costs, budget and technical assistance necessary to achieve this plan. This includes necessary costs and technical assistance needed for the administration and management of projects, salaries, in-kind volunteer services, donations of facility time, education and outreach needs, installation and maintenance of management measures, monitoring and data management]

## Funding

[*See Section 8.5 in the guidebook.* Discuss all available funding and all proposed funding as well as discuss existing resources]

# References

[Include all references here.]

# Appendix

# Appendix B Water Quality Standards

Further information regarding 303(d) List and its reporting categories[[2]](#footnote-3):

*“The term "303(d) list" or “list” is short for a state’s list of impaired and threatened waters (e.g. stream/river segments, lakes). States are required to submit their list for EPA approval every two years. For each water on the list, the state identifies the pollutant causing the impairment, when known. In addition, the state assigns a priority for development of Total Maximum Daily Loads (TMDL) based on the severity of the pollution and the sensitivity of the uses to be made of the waters, among other factors (40 C.F.R. §130.7(b)(4)).*

*In general, once a water body has been added to a state’s list of impaired waters it stays there until the state develops a TMDL and EPA approves it. EPA reporting guidance provides a way to keep track of a state’s water bodies, from listing as impaired to meeting water quality standards. This tracking system contains a running account of all the state’s water bodies and categorizes each based on the attainment status. For example, once a TMDL is developed, a water body is no longer on the 303(d) list, but it is still tracked until the water is fully restored.”*

Table 1. EPA 303(d) List Integrated Report Categories

|  |  |
| --- | --- |
| Category/Subcategory | Description |
| Category 1 | **Meets tested standards for clean waters.** All designated uses are supported, no use is threatened. |
| Category 2 | **Waters of concern.** Available data and/or information indicate that some, but not all, designated uses are supported. |
| Category 3 | **Insufficient data.** There is insufficient available data and/or information to make a use support determination. |
| Category 4 | **Polluted waters that do not require a TMDL.** Available data and/or information indicate that at least one designated use is not being supported or is threatened, but a TMDL is not needed. |
| Category 4a | **Has a TMDL.** A State developed TMDL has been approved by EPA or a TMDL has been established by EPA for any segment-pollutant combination. |
| Category 4b | **Has a pollution control program.** Other required control measures are expected to result in the attainment of an applicable water quality standard in a reasonable period of time. |
| Category 4c | **Is impaired by a non-pollutant.** The non-attainment of any applicable water quality standard for the segment is the result of pollution and is not caused by a pollutant. |
| *Category 5* | **Polluted waters that require a**[**TMDL or other WQI project**](http://www.ecy.wa.gov/programs/wq/tmdl/)**.** Available data and/or information indicate that at least one designated use is not being supported or is threatened, and a TMDL is needed. |

**DWR PRIMARY SURFACE WATER CLASSIFICATIONS**

All surface waters in North Carolina are assigned a primary classification by the NC Division of Water Resources (DWR). All waters must at least meet the standards for Class C (fishable / swimmable) waters. The other primary classifications provide additional levels of protection for primary water contact recreation (Class B) and drinking water (Water Supply Classes I through V). To find the classification of a water body you can either use the BIMS database or contact Adriene Weaver of the Classifications & Standards/Rules Review Branch. To view the regulatory differences between the currently implemented classifications for freshwaters, click here for the freshwater classifications table.  To view the regulatory differences between the currently implemented classifications for tidal saltwaters, click here for the tidal saltwaters classifications table.

*Table 2. North Carolina surface water classifications. Full descriptions available on* [*DEQ Website*](http://portal.ncdenr.org/web/wq/ps/csu/classifications)*.*

|  |  |
| --- | --- |
| Primary Use Classifications | |
| SA | Commercial Shellfishing |
| SB | Class SC and Primary Recreation in tidal salt water |
| SC | Aquatic Life, Secondary Recreation, and Fishing in tidal salt water |
| SWL | Coastal wetlands |
| Supplemental Use Classifications | |
| HQW | High Quality Waters |
| ORW | Outstanding Resource Waters |
| NSW | Nutrient Sensitive Waters |
| CA | Critical Area |
| UWL | Unique Wetland |
| +, @, #, \* | Special Designations (variable based on river basin) |

**Class C**

Waters protected for uses such as secondary recreation, fishing, wildlife, fish consumption, aquatic life including propagation, survival and maintenance of biological integrity, and agriculture. Secondary recreation includes wading, boating, and other uses involving human body contact with water where such activities take place in an infrequent, unorganized, or incidental manner.

**Class B**

Waters protected for all Class C uses in addition to primary recreation. Primary recreational activities include swimming, skin diving, water skiing, and similar uses involving human body contact with water where such activities take place in an organized manner or on a frequent basis.

**Water Supply I (WS-I)**

Waters protected for all Class C uses plus waters used as sources of water supply for drinking, culinary, or food processing purposes for those users desiring maximum protection for their water supplies. WS-I waters are those within natural and undeveloped watersheds in public ownership. All WS-I waters are HQW by supplemental classification. More information: [Water Supply Watershed Protection Program Homepage](http://portal.ncdenr.org/web/lr/water-supply-watershed)

**Water Supply II (WS-II)**

Waters used as sources of water supply for drinking, culinary, or food processing purposes where a WS-I classification is not feasible. These waters are also protected for Class C uses. WS-II waters are generally in predominantly undeveloped watersheds.  All WS-II waters are HQW by supplemental classification. More information: [Water Supply Watershed Protection Program Homepage](http://portal.ncdenr.org/web/wq/swp/ws/wswp)

**Water Supply III (WS-III)**

Waters used as sources of water supply for drinking, culinary, or food processing purposes where a more protective WS-I or II classification is not feasible. These waters are also protected for Class C uses. WS-III waters are generally in low to moderately developed watersheds. More information: [Water Supply Watershed Protection Program Homepage](http://portal.ncdenr.org/web/lr/water-supply-watershed)

**Water Supply IV (WS-IV)**

Waters used as sources of water supply for drinking, culinary, or food processing purposes where a WS-I, II or III classification is not feasible. These waters are also protected for Class C uses. WS-IV waters are generally in moderately to highly developed watersheds or Protected Areas. More information: [Water Supply Watershed Protection Program Homepage](http://portal.ncdenr.org/web/lr/water-supply-watershed)

**Water Supply V (WS-V)**

Waters protected as water supplies which are generally upstream and draining to Class WS-IV waters or waters used by industry to supply their employees with drinking water or as waters formerly used as water supply. These waters are also protected for Class C uses. More information: [Water Supply Watershed Protection Program Homepage](http://portal.ncdenr.org/web/lr/water-supply-watershed)

**Class WL**

Freshwater Wetlands are a subset of all wetlands, which in turn are waters that support vegetation that is adapted to life in saturated soil conditions.  Wetlands generally include swamps, marshes, bogs, and similar areas.  These waters are protected for storm and flood water storage, aquatic life, wildlife, hydrologic functions, filtration and shoreline protection.

**Class SC**

All tidal salt waters protected for secondary recreation such as fishing, boating, and other activities involving minimal skin contact; fish and noncommercial shellfish consumption; aquatic life propagation and survival; and wildlife.

**Class SB**

Tidal salt waters protected for all SC uses in addition to primary recreation. Primary recreational activities include swimming, skin diving, water skiing, and similar uses involving human body contact with water where such activities take place in an organized manner or on a frequent basis.

**Class SA**

Tidal salt waters that are used for commercial shellfishing or marketing purposes and are also protected for all Class SC and Class SB uses.  All SA waters are also HQW by supplemental classification.

**Class SWL**

These are saltwaters that meet the definition of coastal wetlands as defined by the Division of Coastal Management and which are located landward of the mean high water line or wetlands contiguous to estuarine waters as defined by the Division of Coastal Management.

**DWR SUPPLEMENTAL CLASSIFICATIONS**

Supplemental classifications are sometimes added by DWR to the primary classifications to provide additional protection to waters with special uses or values.

**Future Water Supply (FWS)**

Supplemental classification for waters intended as a future source of drinking, culinary, or food processing purposes. FWS would be applied to one of the primary water supply classifications (WS-I, WS-II, WS-III, or WS-IV). Currently no water bodies in the state carry this designation.

**High Quality Waters (HQW)**

Supplemental classification intended to protect waters which are rated excellent based on biological and physical/chemical characteristics through Division monitoring or special studies, primary nursery areas designated by the Marine Fisheries Commission, and other functional nursery areas designated by the Marine Fisheries Commission.

The following waters are HQW by definition:

WS-I,

WS-II,

SA (commercial shellfishing),

ORW,

Primary nursery areas (PNA) or other functional nursery areas designated by the Marine Fisheries Commission, or

Waters for which DWR has received a petition for reclassification to either WS-I or WS-II.

**Outstanding Resource Waters (ORW)**

All outstanding resource waters are a subset of High Quality Waters. This supplemental classification is intended to protect unique and special waters having excellent water quality and being of exceptional state or national ecological or recreational significance. To qualify, waters must be rated Excellent by DWR and have one of the following outstanding resource values:

Outstanding fish habitat and fisheries,

Unusually high level of water based recreation or potential for such kind of recreation,

Some special designation such as North Carolina Natural and Scenic River or National Wildlife Refuge,

Important component of state or national park or forest, or

Special ecological or scientific significance (rare or endangered species habitat, research or educational areas).

For more details, refer to the [Biological Assessment Branch homepage.](http://portal.ncdenr.org/web/wq/ess/bau)

**Nutrient Sensitive Waters (NSW)**

Supplemental classification intended for waters needing additional nutrient management due to being subject to excessive growth of microscopic or macroscopic vegetation.

**Swamp Waters (SW)**

Supplemental classification intended to recognize those waters which have low velocities and other natural characteristics which are different from adjacent streams.

**Trout Waters (Tr)**

Supplemental classification intended to protect freshwaters which have conditions which shall sustain and allow for trout propagation and survival of stocked trout on a year-round basis. This classification is not the same as the NC Wildlife Resources Commission's Designated Public Mountain Trout Waters designation.

**Unique Wetland (UWL)**

Supplemental classification for wetlands of exceptional state or national ecological significance.  These wetlands may include wetlands that have been documented to the satisfaction of the Environmental Management Commission as habitat essential for the conservation of state or federally listed threatened or endangered species.

Table 3. North Carolina water quality classification and standards.

|  |  |
| --- | --- |
| Classification | Description |
| Class SA | Tidal salt waters that are used for commercial shellfishing or marketing purposes and are also protected for all Class SC and Class SB uses.  All SA waters are also HQW by supplemental classification.  The following water quality standards apply to surface waters that are used for shellfishing for market purposes and are classified SA. Water quality standards applicable to Class SC waters as described in Rule .0220 of this Section also apply to Class SA waters.   * 1. Best Usage of Waters. Shellfishing for market purposes and any other usage specified by the "SB" or "SC" classification;   2. Conditions Related to Best Usage. Waters shall meet the current sanitary and bacteriological standards as adopted by the Commission for Health Services and shall be suitable for shellfish culture; any source of water pollution which precludes any of these uses, including their functioning as PNAs, on either a short-term or a long-term basis shall be considered to be violating a water quality standard;   3. Quality Standards applicable to Class SA Waters:      1. Floating solids; settleable solids; sludge deposits: none attributable to sewage, industrial wastes or other wastes;      2. Sewage: none;      3. Industrial wastes, or other wastes: none which are not effectively treated to the satisfaction of the Commission in accordance with the requirements of the Division of Health Services;      4. **Organisms of coliform group: fecal coliform group not to exceed a median MF of 14/100 ml and not more than 10 percent of the samples shall exceed an MF count of 43/100 ml in those areas most probably exposed to fecal contamination during the most unfavorable hydrographic and pollution conditions.** |
| Class SB | Tidal salt waters protected for all SC uses in addition to primary recreation. Primary recreational activities include swimming, skin diving, water skiing, and similar uses involving human body contact with water where such activities take place in an organized manner or on a frequent basis.  The following water quality standards apply to surface waters that are used for primary recreation, including frequent or organized swimming, and are classified SB. Water quality standards applicable to Class SC waters are described in Rule .0220 of this Section also apply to SB waters.   1. Best Usage of Waters. Primary recreation and any other usage specified by the "SC" classification; 2. Conditions Related to Best Usage. The waters shall meet accepted sanitary standards of water quality for outdoor bathing places as specified in Item of this Rule and will be of sufficient size and depth for primary recreation purposes; any source of water pollution which precludes any of these uses, including their functioning as PNAs, on either a short-term or a long-term basis shall be considered to be violating a water quality standard; 3. Quality Standards applicable to Class SB waters:    1. Floating solids; settleable solids; sludge deposits: none attributable to sewage, industrial wastes or other wastes;    2. Sewage; industrial wastes; or other wastes: none which are not effectively treated to the satisfaction of the Commission; in determining the degree of treatment required for such waters discharged into waters which are to be used for bathing, the Commission shall take into consideration quantity and quality of the sewage and other wastes involved and the proximity of such discharges to the waters in this class; discharges in the immediate vicinity of bathing areas may not be allowed if the Director determines that the waste cannot be treated to ensure the protection of primary recreation;    3. **Organisms of coliform group: fecal coliforms not to exceed a geometric mean of 200/100 ml (MF count) based on at least five consecutive samples examined during any 30-day period and not to exceed 400/100 ml in more than 20 percent of the samples examined during such period.** |
| Class SC | All tidal salt waters protected for secondary recreation such as fishing, boating, and other activities involving minimal skin contact; fish and noncommercial shellfish consumption; aquatic life propagation and survival; and wildlife.  The water quality standards for all tidal salt waters are the basic standards applicable to Class SC waters. Additional and more stringent standards applicable to other specific tidal salt water classifications are specified in Rules .0221 and .0222 of this Section.   1. Best Usage of Waters. Aquatic life propagation and maintenance of biological integrity (including fishing, fish and functioning PNAs), wildlife, secondary recreation, and any other usage except primary recreation or shellfishing for market purposes. 2. Conditions Related to Best Usage. The waters shall be suitable for aquatic life propagation and maintenance of biological integrity, wildlife, and secondary recreation; Any source of water pollution which precludes any of these uses, including their functioning as PNAs, on either a short-term or a long-term basis shall be considered to be violating a water quality standard. 3. Quality standards applicable to all tidal salt waters:    1. Chlorophyll a (corrected): not greater than 40 ug/l in sounds, estuaries, and other waters subject to growths of macroscopic or microscopic vegetation; the Commission or its designee may prohibit or limit any discharge of waste into surface waters if, in the opinion of the Director, the surface waters experience or the discharge would result in growths of microscopic or macroscopic vegetation such that the standards established pursuant to this Rule would be violated or the intended best usage of the waters would be impaired;    2. Dissolved oxygen: not less than 5.0 mg/l, except that swamp waters, poorly flushed tidally influenced streams or embayments, or estuarine bottom waters may have lower values if caused by natural conditions;    3. Floating solids; settleable solids; sludge deposits: only such amounts attributable to sewage, industrial wastes or other wastes, as shall not make the waters unsafe or unsuitable for aquatic life and wildlife, or impair the waters for any designated uses;    4. Gases, total dissolved: not greater than 110 percent of saturation;    5. **Organisms of coliform group: fecal coliforms not to exceed geometric mean of 200/100 ml (MF count) based upon at least five consecutive samples examined during any 30 day period; not to exceed** **400/100 ml in more than 20 percent of the samples examined during such period**; violations of the fecal coliform standard are expected during rainfall events and, in some cases, this violation is expected to be caused by uncontrollable nonpoint source pollution; all coliform concentrations are to be analyzed using the MF technique unless high turbidity or other adverse conditions necessitate the tube dilution method; in case of controversy over results the MPN 5-tube dilution method shall be used as the reference method;    6. Oils; deleterious substances; colored or other wastes: only such amounts as shall not render the waters injurious to public health, secondary recreation or to aquatic life and wildlife or adversely affect the palatability of fish, aesthetic quality or impair the waters for any designated uses; for the purpose of implementing this Rule, oils, deleterious substances, colored or other wastes shall include but not be limited to substances that cause a film or sheen upon or discoloration of the surface of the water or adjoining shorelines pursuant to 40 CFR 110.4(a)-(b);    7. pH: shall be normal for the waters in the area, which generally shall range between 6.8 and 8.5 except that swamp waters may have a pH as low as 4.3 if it is the result of natural conditions;    8. Phenolic compounds: only such levels as shall not result in fish-flesh tainting or impairment of other best usage;    9. Radioactive substances: (i) Combined radium-226 and radium-228: The maximum average annual activity level (based on at least four samples, collected quarterly) for combined radium-226, and radium-228 shall not exceed five picoCuries per liter; (ii) Alpha Emitters. The average annual gross alpha particle activity (including radium-226, but excluding radon and uranium) shall not exceed 15 picoCuries per liter; (iii) Beta Emitters. The maximum average annual activity level (based on at least four samples, collected quarterly) for strontium-90 shall not exceed eight picoCuries per liter; nor shall the average annual gross beta particle activity (excluding potassium-40 and other naturally occurring radio-nuclides) exceed 50 picoCuries per liter; nor shall the maximum average annual activity level for tritium exceed 20,000 picoCuries per liter;    10. Salinity: changes in salinity due to hydrological modifications shall not result in removal of the functions of a PNA; projects that are determined by the Director to result in modifications of salinity such that functions of a PNA are impaired will be required to employ water management practices to mitigate salinity impacts;    11. Temperature: shall not be increased above the natural water temperature by more than 0.8 degrees C (1.44 degrees F) during the months of June, July, and August nor more than 2.2 degrees C (3.96 degrees F) during other months and in no cases to exceed 32 degrees C (89.6 degrees F) due to the discharge of heated liquids;    12. Turbidity: the turbidity in the receiving water shall not exceed 25 NTU; if turbidity exceeds this level due to natural background conditions, the existing turbidity level shall not be increased. Compliance with this turbidity standard can be met when land management activities employ Best Management Practices (BMPs) [as defined by Rule .0202(6) of this Section] recommended by the Designated Nonpoint Source Agency (as defined by Rule .0202 of this Section). BMPs must be in full compliance with all specifications governing the proper design, installation, operation and maintenance of such BMPs;    13. Toxic substances: numerical water quality standards (maximum permissible levels) to protect aquatic life applicable to all tidal saltwaters: (i) Arsenic, total recoverable: 50 ug/l; (ii) Cadmium: 5.0 ug/l; attainment of these water quality standards in surface waters shall be based on measurement of total recoverable metals concentrations unless appropriate studies have been conducted to translate total recoverable metals to a toxic form. Studies used to determine the toxic form or translators must be designed according to the "Water Quality Standards Handbook Second Edition" published by the Environmental Protection Agency (EPA 823-B-94-005a) or "The Metals Translator: Guidance For Calculating a Total Recoverable Permit Limit From a Dissolved Criterion" published by the Environmental Protection Agency (EPA 823-B-96-007) which are hereby incorporated by reference including any subsequent amendments. The Director shall consider conformance to EPA guidance as well as the presence of environmental conditions that limit the applicability of translators in approving the use of metal translators. (iii) Chromium, total: 20 ug/l; (iv) Cyanide: 1.0 ug/l; (v) Mercury: 0.025 ug/l; (vi) Lead, total recoverable: 25 ug/l; collection of data on sources, transport and fate of lead shall be required as part of the toxicity reduction evaluation for dischargers that are out of compliance with whole effluent toxicity testing requirements and the concentration of lead in the effluent is concomitantly determined to exceed an instream level of 3.1 ug/l from the discharge; (vii) Nickel: 8.3 ug/l; attainment of these water quality standards in surface waters shall be based on measurement of total recoverable metals concentrations unless appropriate studies have been conducted to translate total recoverable metals to a toxic form. Studies used to determine the toxic form or translators must be designed according to the "Water Quality Standards Handbook Second Edition" published by the Environmental Protection Agency (EPA 823-B-94-005a) or "The Metals Translator: Guidance For Calculating a Total Recoverable Permit Limit From a Dissolved Criterion" published by the Environmental Protection Agency (EPA 823-B-96-007) which are hereby incorporated by reference including any subsequent amendments. The Director shall consider conformance to EPA guidance as well as the presence of environmental conditions that limit the applicability of translators in approving the use of metal translators. (viii) Pesticides: (A) Aldrin: 0.003 ug/l; (B) Chlordane: 0.004 ug/l; (C) DDT: 0.001 ug/l; (D) Demeton: 0.1 ug/l; (E) Dieldrin: 0.002 ug/l; (F) Endosulfan: 0.009 ug/l; (G) Endrin: 0.002 ug/l; (H) Guthion: 0.01 ug/l; (I) Heptachlor: 0.004 ug/l; (J) Lindane: 0.004 ug/l; (K) Methoxychlor: 0.03 ug/l; (L) Mirex: 0.001 ug/l; (M) Parathion: 0.178 ug/l; (N) Toxaphene: 0.0002 ug/l. (ix) Polycholorinated biphenyls: 0.001 ug/l; (x) Selenium: 71 ug/l; (xi) Trialkyltin compounds: 0.002 ug/l expressed as tributyltin. 4. Action Levels for Toxic Substances: if the Action Levels for any of the substances listed in this Subparagraph (which are generally not bioaccumulative and have variable toxicity to aquatic life because of chemical form, solubility, stream characteristics or associated waste characteristics) are determined by the waste load allocation to be exceeded in a receiving water by a discharge under the specified low flow criterion for toxic substances (Rule .0206 in this Section), the discharger shall be required to monitor the chemical or biological effects of the discharge; efforts shall be made by all dischargers to reduce or eliminate these substances from their effluents. Those substances for which Action Levels are listed in this Subparagraph may be limited as appropriate in the NPDES permit if sufficient information (to be determined for metals by measurements of that portion of the dissolved instream concentration of the Action Level parameter attributable to a specific NPDES permitted discharge) exists to indicate that any of those substances may be a causative factor resulting in toxicity of the effluent. NPDES permit limits may be based on translation of the toxic form to total recoverable metals. Studies used to determine the toxic form or translators must be designed according to: "Water Quality Standards Handbook Second Edition" published by the Environmental Protection Agency (EPA 823-B-94-005a) or "The Metals Translator: Guidance For Calculating a Total Recoverable Permit Limit From a Dissolved Criterion" published by the Environmental Protection Agency (EPA 823-B-96-007) which are hereby incorporated by reference including any subsequent amendments. The Director shall consider conformance to EPA guidance as well as the presence of environmental conditions that limit the applicability of translators in approving the use of metal translators. (a) Copper: 3 ug/l; (b) Silver: 0.1 ug/l; (c) Zinc: 86 ug/l. |

**Shellfish Sanitation Classifications**

Table 4. Classifications used by Shellfish Sanitation for shellfish harvesting waters.

|  |  |
| --- | --- |
| **North Carolina Shellfish Sanitation Growing Area Classifications** | |
| **Approved** | These areas are always open to shellfish harvesting and close only after rare heavy rainfall events such as hurricanes. The median fecal coliform Most Probable Number (MPN) or geometric mean MPN of water shall not exceed 14 per 100 milliliters, and the estimated 90th percentile shall not exceed an MPN of 43 per 100 mL for a five-tube decimal dilution test. |
| **Conditionally  Approved-Open  Shellfish Areas** | Sanitary Survey indicates an area can meet approved area criteria for a reasonable period of time, and the pollutant event is known and predictable and can be managed with a plan. These areas are open to harvest much of the year, but are immediately closed after certain sized rainfall events. |
| **Conditionally  Approved-Closed  Shellfish Areas** | Sanitary Survey indicates an area can meet approved area criteria during dry periods of time, and the pollutant event is known and predictable and can be managed with a plan. This growing area classification allows harvest when fecal coliform bacteria levels are lower than the state standard in areas that otherwise might be closed to harvesting. These areas are regularly monitored to determine if temporary openings are possible. |
| **Prohibited  Shellfish Harvest  Areas** | Sanitary Survey is not routinely conducted because previous sampling data did not meet criteria for Approval or Conditional Approved. Area may also be closed as a matter of regulation due to the presence of point source discharges or high concentrations of boats with heads. |

**Recreational Water Quality Standards**

|  |  |
| --- | --- |
| Tier | Description |
| Tier I | "Tier I swimming area" means a swimming area used daily during the swimming season, including any public access swimming area and any other swimming area where people use the water for primary contact, including all oceanfront beaches.   1. The enterococcus level in a Tier I swimming area shall not exceed either:    1. A geometric mean of 35 enterococci per 100 milliliter of water, that includes a minimum of at least five samples collected within 30 days; or    2. A single sample of 104 enterococci per 100 milliliters of water.   Tier I Swimming areas:  (1) A swimming advisory shall be issued by the Division when samples of water from a swimming area exceeds a geometric mean of 35 enterococci per 100 milliliters during the swimming season.  (2) A swimming alert shall be issued by the Division when a single sample of water from a swimming area exceeds 104 enterococci per 100 milliliters and does not exceed 500 enterococci per 100 milliliters during the swimming season.  (3) A swimming advisory shall be issued by the Division when a sample of water from a swimming area exceeds a single sample of 500 enterococci per 100 milliliters during the swimming season.  (4) A swimming advisory shall be issued by the Division when at least two of three concurrent water samples collected at a swimming area exceeds 104 enterococci per 100 milliliters during the swimming season.  A Tier I swimming area advisory shall be rescinded when two consecutive weekly water samples and the geometric mean meet the bacteriological limits in Rule 18A .3402(a) of this Section. A swimming alert shall be rescinded within 24 hours of compliance with Rule 18A .3402(a)(2) of this Section. |
| Tier II | "Tier II swimming area" means a swimming area used an average of three days a week during the swimming season.  The enterococcus level in a Tier II swimming area shall not exceed a single sample of 276 enterococci per 100 milliliters of water.  Tier II swimming areas:  (1) A swimming alert shall be issued by the Division when a single sample of water from a swimming area exceeds 276 enterococci per 100 milliliters and does not exceed 500 enterococci per 100 milliliters during the swimming season.  (2) A swimming advisory shall be issued by the Division when a single sample of water from a swimming area exceeds 500 enterococci per 100 milliliters during the swimming season.  A Tier II or Tier III swimming area advisory or alert shall be rescinded after water samples meet the bacteriological standard in Rule 18A .3402(b) or (c) of this Section. |
| Tier III | "Tier III swimming area" means a swimming area used an average of four days a month during the swimming season.  Tier III swimming area with a water sample result of 500 enterococci per 100 milliliters or higher on the first sample shall be resampled the following day. If the laboratory results of the second sample exceed 500 enterococci per 100 milliliters a swimming advisory shall be issued by the Division.  A Tier II or Tier III swimming area advisory or alert shall be rescinded after water samples meet the bacteriological standard in Rule 18A .3402(b) or (c) of this Section. |
| Swimming Season | April 1 through October 31 of each year.  The enterococcus level in a Tier III swimming area shall not exceed two consecutive samples of 500 enterococci per 100 milliliters of water. |
| Winter Season | November 1 through March 31 of each year. |

1. Natural Resources Conservation Service. (n.d.). Updated Hydrologic Soil Group. *United States Department of Agriculture Natural Resource Conservation Service*. [↑](#footnote-ref-2)
2. Environmental Protection Agency. Retrieved from https://www.epa.gov/tmdl/program-overview-303d-listing [↑](#footnote-ref-3)