The pages in this document were taken from the "Corsica River Watershed Characterization" published in October 2003. The entire document can be found at http://dnrweb.dnr.state.md.us/download/bays/cr_char.pdf.

Corsica River Watershed Characterization

Excerpt Showing an Example of Existing Management Strategies Documentation

October 2003

Agricultural Conservation Programs

Many farmers in Queen Anne's County willingly implement management systems that address nutrient runoff and infiltration, erosion and sediment control, and animal waste utilization. Some of the best management practices identified in Soil Conservation and Water Quality Plans for implementation on individual farms include grassed waterways, riparian herbaceous and riparian forested buffers, conservation cover, cover crops, shallow water wildlife areas and grade stabilization structures. The Maryland Agricultural Cost-Share program (MACS), the Conservation Reserve Program (CRP and CREP) and the Environmental Quality Incentive Program (EQIP) are some of the state and federal programs promoted and administered by the Queen Anne's SCD and Natural Resource Conservation Service (NRCS). [28]

Marina Programs

In the Corsica River watershed, the only marina listed in DNR's Marina database is Centreville Public Landing. According the information available from the database, this marina does not offer pumpout facilities and it is not participating in Maryland's Clean Marina Program.

Discharges of sewage from boats are a concern for water quality because they release nutrients, biochemical oxygen demand and pathogens. This type of discharge to the Corsica River probably contributes to the problems identified in the River associated with nutrients and bacteria. At this time, the relative contribution of boat discharges to these problems has not been quantified.

The Clean Marinas Program is a way for marina owners to gain certification and public recognition for voluntarily undertaking a number of actions related to marina design, operation, and maintenance intended to properly manage all kinds of marine waste, by-products and activities. DNR also funds installation and maintenance of marine pumpout facilities, including those at certified Clean Marinas. Information is available at DNR's website, www.dnr.maryland.gov/boating.

Stream Buffer Restoration

1. Benefits and General Recommendations

Natural vegetation in stream riparian zones, particularly forest, provides numerous valuable environmental benefits:

- Reducing surface runoff
- Preventing erosion and sediment movement
- Using nutrients for vegetative growth and moderating nutrient entry into the stream
- Moderating temperature, particularly reducing warm season water temperature
- Providing organic material (decomposing leaves) that are the foundation of natural food webs in stream systems
- Providing overhead and in-stream cover and habitat
- Promoting high quality aquatic habitat and diverse populations of aquatic species.

To realize these environmental benefits, DNR generally recommends that forested stream buffers be at least 100 feet wide , i.e. natural vegetation 50 feet wide on either side of the stream. Therefore, DNR is promoting this type of stream buffer for local jurisdictions and land owners who are willing to go beyond the minimum buffer standards. The DNR Watershed Services and other programs like Conservation Reserve Enhancement Program (CREP), managed by the DNR Forest Service, are available to assist land owners who volunteer to explore these opportunities.

2. Headwater Stream Buffers

For many watersheds, headwater streams (first order streams) drain the majority of the land within the entire watershed. Therefore, stream buffers restored along headwater streams (First Order) tend to have greater potential to intercept nutrients and sediments than stream buffers placed elsewhere. In targeting stream buffer restoration projects, giving higher priority to headwater streams is one approach to optimizing nutrient and sediment retention.

Restoring headwater stream buffers can also provide habitat benefits that can extend downstream of the project area. Forested headwater streams provide important organic material, like decomposing leaves, that “feed” the stream’s food web. They also introduce woody debris which enhances in-stream physical habitat. The potential for riparian forest buffers to significantly influence stream temperature is greatest in headwater regions. These factors, in addition to positive water quality effects, are key to improving aquatic habitat.

Since the Corsica River Watershed has a substantial percentage of its headwater streams in interior forests, protection of these forests against impacts from development may be an important part of WRAS strategies, along with reforestation where necessary.

3. Land Use and Stream Buffers

One factor that affects the ability of stream buffers to intercept nonpoint source pollutants is adjacent land use. Nutrient and sediment loads from different land uses can vary significantly as shown in the adjacent table. By restoring naturally vegetated stream buffers adjacent to lands producing the highest pollutant loads, nutrient and sediment loads can be reduced most efficiently. Map 20 Stream Buffer Scenario focuses on the crop and pasture lands within 50 feet of a stream and identifies stream segments that lack naturally vegetated stream buffers. DNR encourages creating stream buffers at least 50 feet wide on each side of the stream, which is significantly greater than minimum buffer requirement, to enhance nutrient and habitat benefits beyond minimum buffer requirements.

Annual Nonpoint Source Pollution Load Rates By Land Use Chesapeake Bay Watershed Model (2000)

Land Use	Nitrogen (lbs/ac)	Phosphorus (lbs/ac)	Sediment (tons/ac)
Crop land	17.11	1.21	0.74
Urban	7.5	0.7	0.09
Pasture	8.40	1.15	0.30
Forest	1.42	0.00	0.03

4. Nutrient Uptake from Hydric Soils in Stream Buffers

In general, the nutrient nitrogen moves from the land into streams in surface water runoff and in groundwater with a significant percentage of nitrogen entering streams in groundwater. Stream buffers can be used to capture nitrogen moving in groundwater if buffer restoration projects have several key attributes:

– Plants with roots deep enough to intercept groundwater as it moves toward the stream
– Plants with high nitrogen uptake capability, and
– Targeting buffer restoration projects to maximize groundwater interception by buffer plants.

Hydric soils in stream riparian areas can be used as one factor to help select stream buffer restoration sites. Siting buffer restoration on hydric soils would offer several benefits:

– Plant roots are more likely to be in contact with groundwater for longer periods of time
– Hydric soils tend to be marginal for many agricultural and urban land uses
– Natural vegetation in wet areas often offers greater potential for habitat.

Map 20 Stream Buffer Scenario identifies lands that are adjacent to streams that meet three criteria: hydric soil is present, the riparian area is used for crops or pasture and naturally vegetated stream buffers are absent. In these areas, restoration of stream buffers would be most likely to intercept nitrogen, control sediment and phosphorus movement, and improve stream water quality and habitat in general. Additional assessment and field evaluation should be used to determine land owner interest, the practical implications of creating naturally vegetated stream buffers in areas identified and to evaluate any hydrologic modification of these soils, such as ditching or draining activities.

5. Optimizing Water Quality Benefits by Combining Priorities

Strategic targeting of stream buffer restoration projects may provide many different benefits. To maximize multiple benefits, site selection and project design need to incorporate numerous factors. For example, finding a site with a mix of attributes like those in the following list could result in the greatest control of nonpoint source pollution and enhancement to living resources:

– land owner willingness / incentives
– marginal land use in the riparian zone
– headwater stream
– hydric soils
– selecting appropriate woody/grass species
– adjacent to existing wetlands / habitat

Additionally, selecting restoration projects that are likely to produce measurable success is an important consideration in prioritizing projects for implementation. In general, targeting restoration projects in selected tributaries or small watersheds will tend to offer the greatest probability of producing measurable water quality improvement in the short term. By selecting small areas like a small first order stream for restoration, there is greater likelihood that local water quality will improve with relatively limited investment. In addition, local water quality improvements will likely contribute to downstream improvements.

Wetland Restoration

Wetlands serve important environmental functions such as providing habitat and nursery areas for many organisms, facilitating nutrient uptake and recycling, providing erosion control. However, most watersheds in Maryland have significantly fewer wetland acres today than in the past. This loss due to draining, filling, etc., has led to habitat loss and negative water quality impacts in streams and in the Chesapeake Bay. Reversing this historic trend is an important goal of wetland restoration. One approach to identifying candidate wetland restoration sites involves identifying “historic” wetland areas based on the presence of hydric soils. This process can be accelerated by using GIS to manipulate soils information with other data like land use. The GIS products can then assist in initiating the candidate site search process, targeting site investigations and helping to identify land owners.

Map 21 Wetland Restoration Scenario indicates that there is potential for wetland restoration based on identifying agricultural fields (crop or pasture) on hydric soil. This is one of many potential scenarios for finding opportunities for wetland restoration. The steps and priorities used to generate the map are listed below:

– Data used: Hydric soils (Maryland Dept. of Planning Data), existing wetlands (DNR Wetlands), land use (Maryland Dept. of Planning, 2000).
– Identify candidate hydric soil areas based on land use. Hydric soils used in agricultural fields are selected for consideration. Hydric soils used for development or underlying natural vegetation are not considered in this scenario.
– Explore hydric soils based on land use / land cover and proximity to existing wetlands or streams.

The potential wetland restoration sites suggested in the scenario can be filtered further by using more accurate wetlands and soil information and by considering land ownership or other factors like like habitat enhancement opportunities, sensitive species protection, targeting specific streams or subwatersheds for intensive restoration, and using Conservation Reserve Enhancement Program (CREP) information.