Manokin River Watershed Restoration Action Strategy

Somerset County, Maryland

MANOKIN RIVER WATERSHED RESTORATION ACTION STRATEGY
SOMERSET COUNTY, MARYLAND

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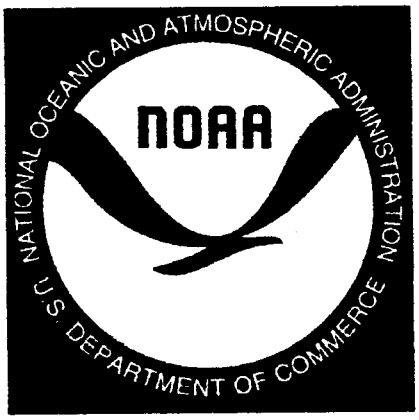

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1. INTRODUCTION

Background of the Strategy

Somerset County has worked to develop an "action strategy" for the conservation and restoration of the Manokin River. The Manokin is central to the history and economy of the County. With headwaters in the east, it transverses the landscape through the University of Maryland Eastern Shore, Town of Princess Anne, farm fields and residential development, the Eastern Shore Correctional Institution and final empties into Tangier Sound and the Chesapeake Bay near historic Clifton (c. 1805) and County-owned Raccoon Point Park. The Manokin was chosen because it had been placed on Maryland's 303 (d) list as an impaired waterway and identified in the 1998 Maryland Clean Water Action Plan as a priority watershed "in need of restoration." The Manokin was also the first watershed in Somerset County, and one of the first in Maryland to be evaluated under a TMDL (Total Maximum Daily Load) study. The results of the TMDL appeared to have serious implications for any future development in the County.

The Manokin River watershed includes over 14,900 acres of open tidal waters extending out to the Tangier Sound, as well as at least 90 miles of streams within six subwatersheds, for a total of 59,400 acres. Drainage within the watershed includes a system of private agricultural ditches, and Public Drainage Associations (PDA's) that are necessary to maintain agriculture and other human activities in the County. According to the County Comprehensive Plan, only about 10% of the County has soils that drain well enough to be farmed without artificial ditching.

This Action Strategy, or WRAS, project was to be accomplished through a Coastal Zone Management Grant (NOAA) and in partnership with the Maryland Department of Natural Resources Division of Coastal and Waterways etc, which administers the CZM program in Maryland. The grant was awarded in February 2001, and extended in December of the same year to allow for the completion of the work by March 31,2002. The intent of the County in undertaking the strategy was to assess and improve water quality, set community goals and projects for restoration and to develop the Manokin as a resource for the citizens of the County.

Organization and Development

The grant administration was through the County Department of Technical and Community Services, the planning agency for Somerset County. The County would take the lead on the project, trying to draw in other local agencies and citizens as partners as the grant progressed. The strategy process was broken down into five areas:

1. Developing a watershed characterization and assessment that would include the natural and physical environment, infrastructure and social structure of the watershed.
2. Enlisting public involvement through outreach efforts
3. Creating a technical advisory committee, watershed steering committee and appropriate subcommittees to direct the process.
4. Completing a watershed management plan that could be used in future planning efforts.
5. Initiating implementation of strategy efforts.

It was apparent that the most immediate need was to develop a watershed characterization, based on the available data and science and offer it a local technical review. Next, the technical group/steering committee would look for gaps in information and fine tune a preliminary direction before turning to general public for their comment and possible input as subcommittee members.

Informational Elements

The **Watershed Characterization** was compiled through the efforts of DNR staff, combining available data gathered by State agencies, GIS mappings, information on programs designed to address environmental protection, TMDL derived data and local agency comment on conditions.

Initial efforts centered on what should be included in the Characterization and review of various drafts as it progressed. The Characterization is viewed as a working document that will change over time. At some point in the future, it will be necessary to revisit the Characterization - and the hypotheses on which the strategy rests. In the interim, it will serve as a valuable compilation of data for decision makers.

The Characterization notes that the Manokin was placed on the impaired list because water - quality was not supportive of its designated use (water contact recreation) due to problems associated with nutrients, fecal coliform and suspended sediment. Water quality problems are linked to algae blooms and sporadic low dissolved oxygen in the river. Although algae is a food source for a number of species, overabundance is usually viewed as indicative of a problem. Non point sources seem to be driving these problems, with the supposition that land uses such as agriculture (less than 6% of the watershed is characterized as '"urban") are delivering nitrogen, phosphorus and BOD loads.

An obvious gap in information existed in the assessment of conditions on site. The County had previously funded an Anadromous Fish Survey under the Chesapeake Bay Critical Area grant that monitored several Manokin sites for fish species. Since this had been done in the 1989-1990 timeframe, it would be advantageous to update this information with a new survey. In addition, the County had funded five years of water quality data from different tributaries in the Critical Area; once again, several sites were suitable for the Manokin WRAS.

The County signed a contract with the University of Maryland-Eastem Shore to provide these services under the auspices of the WRAS grant. The survey was to provide a study of the anadromous fish population of the Manokin River Watershed, centering on sites on the main branch, Taylor Branch, Kings Creek and Back Creek, as well as a control stream outside the watershed. Survey work would be carried out from March to May, the months in which anadromous fish would be most likely to be spawning within local tributaries, as well as through the summer and into the Fall. Once the survey was complete, a comparison could be made with the species and numbers found in the previous survey to help determine if the river was still able to support a range of anadromous fish.

The streams in the Manokin Watershed were surveyed for blueback herring and alewife, as well as semi-anadromous fish such as white and yellow perch. The greatest difference between the 1990 and current survey was the presence of anadromous species in the Manokin Creek. Since stream flow and water quality seemed similar between the two periods, it was difficult to say if this could be due merely to differences in sampling. However, the stream currently appears to be able to support these anadromous species, as, in fact, all streams within the Manokin can, however there may be periodic lapses in spawning runs if conditions are degraded. Given the development of the University and its agricultural activities, this area can be easily monitored and should be given consideration in any monitoring plan.

A second effort to obtain local information was a **Stream Corridor Assessment Survey**, described locally as a "stream walk", in which members of the Maryland Conservation Corps literally walked the banks of the stream, using survey protocols developed by the Watershed Restoration Division of DNR. Those areas judged "non-walkable" due to the prevalence of tidal marsh were surveyed by DNR staff from the water.

It was important locally that citizens be made aware of the intent of the stream walk, and " that, insofar as possible, permission be given for any incursion on private property: Using GIS maps, the County developed a list of property owners whose property bordered tributaries and the main stem of the Manokin. Some two hundred letters were sent out apprising property owners of the project and explaining that the County would not include their property if they had any objections. By far the majority of property owners did not offer any objections and those few that did were noted on the maps provided to the Conservation Corps prior to the survey being conducted. This effort also allowed the County an early opportunity to inform property owners along the waterway as to the effort underway and the intent of the strategy.

The report from the stream assessment was encouraging in that there appeared to be very little in the way of erosion, and few obstructions in the stream. Of most note was lack of buffering, most specifically treed buffers, along one or both sides of tributary streams. This appears to offer an opportunity for encouraging planting by property owners.

Another important element in the development of the WRAS was the **Manokin River** TMDL, approved by EPA in January of2001. The information within the study had been used in the Watershed Characterization as compiled by DNR staff, however, there were major concerns locally as to the process by which the TMDL had been approved, as well as the science

on which it was based. The County wished to avoid a situation where the TMDL's questionable aspects compromised the WRAS itself.

As development of the WRAS continued, updates on the status of a court case filed by the Somerset County Sanitary District were followed closely. As the situation continued over the length of the grant, a decision was made to retain the information, but to mention local reservations. Since one of the goals of the WRAS was to address the TMDL in relation to non-point source, it would remain in place as an element in the plan. Any local projects and implementation affecting water quality would be likely benefit the goal of reducing non-point source pollution, regardless of the outcome regarding the specifics of the Manokin TMDL. The most serious concern regarding the TMDL, that the upgrading of goals at the Waste Water Treatment Plant to requirements, would virtually close down development on community sewerage, including the University of Maryland Eastern Shore and the County's primary Priority Funding and Growth Area, was largely outside of the scope of what the WRAS could hope to accomplish.

A final element of importance in the information gathered for the plan was **Local Knowledge and Concerns**. This was supplied by the technical background of steering committee members, as well as input from local citizens at the workshops and presentations.

Several areas of concern centered on water quality issues. For example, little is really known of algae configurations type of algae and for what biotic species serves as a food source), and while some citizens noted an increase in algae in the river, It was also noted that not enough is known of how nutrients are used by aquatic species. In other words, a correlation should be established between nutrient loads and ecosystem needs. The value and necessity of this kind of information has been recognized by the Chesapeake Bay Program and a new effort is underway to determine the specific needs of aquatic organisms. However, in the short term, most of these questions remain unanswered for the purposes of the WRAS. Information from the Fish Survey can provide only a snapshot of those species able to maintain themselves at the top of the food chain.

One element that is often overlooked in the analysis of water quality issues is the contribution of tidal marsh to sediment and nutrients. This was identified as a concern at several meetings, since citizens are acutely aware that former uplands have become marsh as sea level rises and that marsh edges often break off into the water. It was also noted that although erosion of soils in upland regions of the watershed may not be a problem, there is a separate issue of erosion due to tides and sea level rise.

While many citizens noted conditions they had observed, there was some frustration that they could not be linked to inputs. From the information gathered, nutrification appeared to be out of proportion to inputs. Did "we" really know what was being put in the river? Also, how to decide on what were .the principle non point source contributors and how well Best Management Practices work once m place were often mentioned.

The local knowledge of what appeared to be the condition of the river, conjecture and concerns would form a basis for discussion of what steps should be taken in protecting and

restoring the watershed. Questions as to what historic level of water quality a watershed can be - "restored", given economics and existing land use, and what practices could be best recommended and funding sources obtained for cost shares would help to ground the watershed plan in local realities.

2. PUBLIC INPUT PROCESS

From inception, the WRAS was to include as much public input as possible. Based on experience the Department of Technical and Community Services decided that the best use way to include the public was after an initial effort had been made by a steering committee made up of interested parties and technical agencies. The overall grant period as set out in the grant agreement was short, and although the County began the process prior to the actual grant (Spring of 2000), a large amount of information would have to be gathered, reviewed and discussed in order to offer the public a platform on which to develop the strategy.

The format chosen was to hold steering committee meetings, inviting as many interested agency and private interests as possible and once the Watershed Characterization was developed to a point satisfactory to that group, going out to the public in both informational meetings and workshops, developing subcommittees on an ad hoc basis. Goals and implementation choices would be decided based on public comment. The final strategy would include these measures and the River and its watershed viewed from both a need to protect and improve water quality, but also to include the idea the Manokin is a resource for the citizens of the County. The open-ended nature of this process allowed for maximum public participation and the opportunity to generate projects that were proposed and supported by the public.

Steering Committee

The Steering Committee was not viewed as a static group, nor was it officially appointed. Instead, it included a nucleus of individuals with technical experience and interest in the WRAS, as well as a fluctuating group of attendees. All comment was welcomed. For the most part, the Committee included members of the planning portion of the Department of Technical and Community Services, members of the Maryland Coastal Zone Management Program, the Soil Conservation District and local USDA-NRCS staff, the University of Maryland Eastern Shore, the Farm Bureau, Sanitary District (TMDL Liaison), and a local aquaculture expert. As time went on, other interested citizen members were invited to join.

The Steering Committee's role was as follows:

* Conduct overview of the project
* Review available information
* Make recommendations on assessments and analysis needed.
* Determine 12 digit watersheds that will be highlighted
* Help organize workshops, meetings
* Provide expertise in related disciplines
* Participate in the preparation of a final report and strategy recommendations.

Public Information Presentations

During Fall 2001 and Winter 2002, the Somerset County Department of Technical and Community Services held four public meetings on the topic of the Watershed Restoration Action Strategy for the Manokin River. This section outlines the purpose, public participation and general content of the issues expressed during public meetings held on November 15,2001, December 11,2001, January 30,2002 and February 21, 2002.

As regards public participation in general, the issue of the Manokin River Watershed and the nature of the grant proposed provided a mild level of public participation. Although the first "Town Style" meeting attracted approximately twenty- five participants,'an average of approximately fifteen people attended the meetings.

The County attempted to draw as many people as possible into the process. In order to facilitate the meetings and to keep them moving in an interesting and orderly fashion, the County contracted with a professional from Salisbury State's Conflict Resolution affiliate. He opined that the reasons behind the less than optimal public participation were that the issues themselves were not extremely controversial in nature. Since the County had deliberately undertaken the project as a positive response to environmental concerns, as opposed to regulation, no one was being forced to change the way they conducted business or how they used their land. With no challenge to human habits, the type of confrontational public meetings often associated with land use/environmental plans did not materialize.

Since, as noted by the facilitator, the purpose of the process was to develop programs that involved public participation in the watershed such as the creation of blue ways, oyster bed restoration, shore erosion restoration and the like, it does not appear that it was viewed as a challenge to the day-to-day life of most citizens. For example the local experience is that in the workaday world of watermen and farmers, only meetings that raise very serious concerns are likely to attract a crowd. The public participation that was achieved, however, was based on citizens who had a decided interest, as well as the time and disposition to attend meetings. In the end, in spite of limited numbers, public input and ownership of the process made for meaningful and stimulating participation.

Attendees appeared to be citizens who had a direct interest in the watershed, many waterfront property owners, others whose professional duties were impacted by water quality issues. In general, they raised thoughtful questions and exhibited an intellectual curiosity on the subject. Comments and questions often centered around the history of the river and how the Manokin had reached the current status as to water quality and sedimentation. There were a consistent number of public officials, scientists and a small group of citizens at all meetings.

Summaries of the Public Meetings

Meeting One - November 15, 2001

A public meeting was held at the public library on November 15, 2001. This meeting had the largest number of citizen in attendance. In this meeting, Joan Kean introduced the project to the public. The majority of the time was spent listening and recording the concerns and ideas of the public (see below). Three major concerns were expressed that focus on: the preservation of farm practices, the loss of aqua-cultural enterprises due to changes in water quality and the need for more basic research on the watershed. The need for basic research was the dominant issue as many citizens concur that there needs to be a starting point from which to compare the present state of the watershed as a control measure for any proposed projects. There was also considerable discussion on the history of the watershed in terms of depth of the various waterways, siltation, historic sites and the abundance or reduction of fish and other animal stock.

Public input also focused on the proposed projects by various citizens. These projects include:

- Citizens taking part in tree planting for the restoration and protection of embankments
- The clearing of drainage ditches
- Oyster bed restoration
- Access to the bay
- Development blue ways
- A census of the historic properties within the watershed
- Developing an eco-tourism company
- Conducting basic research water, fish, pollutants, run-off, siltation

Some related concerns include:

- The impact of output generated by the local water treatment plants
- The impact of output generated by the Eastern Shore Correction Institution

At the end of this meeting, two subcommittees were formed. One that focuses on basic research within the watershed and the other focuses on citizen initiated and supported environmental restoration or preservation projects within the watershed.

Meeting Two - December 11,2001

The second public meeting was held on the first floor of the County office building. The intent of this meeting was to have the two subcommittees begin work on exploring projects that interest them. There were about ten people in attendance. The two subcommittees briefly met separately and then gathered into a larger group to share ideas and get a better sense of what people wanted to consider as viable options for the grant application. The group spent approximately 40 minutes examining some of the basic research that has already been conducted

by faculty members and graduate students at UMES. The meeting adjourned with the intent of the subcommittee's information being sent to the steering committee.

Notes from the December meeting

- The Director convened the meeting and Brian produced a summary of the first meeting
- Ms. Kean and the Planner responded a number of questions about the process and time lines
- UMES faculty discussed a fish count field research project
- The group interested in citizen input talked about projects that would be low intensity, low impact and easy to undertake and complete. Restoring embankments and walking paths were mention.
- The group discussed the focus of the subcommittees and the steering committee.
- It appears that many of the questions will be raised and addressed at the next meeting when the researchers present their findings.

Meeting Three - January 30, 2002

The third public meeting unveiled the research that has already been conducted on the watershed. Joan Kean gave an introduction and the meeting proceeded with presentations. The first was by Ken Shanks ofDNR who presented the DNR website and showed the audience the overall data that have been collected on the watershed characterization. He also spent a good deal of time showing how various databases can be linked to answer a variety of questions. The second presenter was Ken Yeatman of DNR who focused on the results of the stream walk and assessment. In general, Mr. Yeatman was positive about the condition of the watershed and made a point to compare via slides its pristine quality to other places where his team has done stream walks on the Western Shore. The third presenter was Dr. Roman Jesien who gave a presentation on his fish survey and stream monitoring research. His research provided a means of comparing the various types offish (up to 22 species) by stream or river. Next was Earl Ludy of Princess Anne WWTP who essentially told the audience that the Eastern Shore Correctional Institute and the Waste Water Treatment Plant are well within state and federal compliance laws and that the handling capacity of both systems are capable of large influxes. These four presentations answer many of the questions raised in the first two public meetings.

The audience then had the opportunity ask questions for 30 minutes. The questions and concerns are as follows:

- Request to look at the summer months as well in order to investigate oxygen problems (i.e. bottom sampling)
- Was the data gathered from a sufficient number of locations and an ample number of times to ensure that readings are accurate?
- Request to investigate Pfisteria in regards to the relationship between increased nitrates and decreased oxygen. What are the causes, locations, etc?
- Determine the exact levels ofPfisteria in the Manokin River
- What grants are available for private lando\vners? Can this information be made for public use?

- What constitutes the involvement of the state government on private property erosion?
- What are the more specific levels and types of erosion? (There is a study now in progress.) Could this information be made available in the form of maps for the public?
- What causes and levels of the increase in silt? To what degree is naturally or human induced?

Meeting Four - February 21, 2002

The fourth public meeting combined the Steering Committee and interested citizens who had attended previous meetings and workshops. The intent of this meeting was to help finalize the projects that should be supported in the final plan. This workshop was held in the late afternoon in an attempt to gather more of the local agency people who found returning for night meetings burdensome and to offer an alternative to citizens who disliked driving at night.

Unfortunately, attendance was slight, probably due to the fact that the February weather was unseasonably warm and sunny. Only about ten people were in attendance. However, there was a lively discussion and input from several people who had not previously been in attendance.

The projects suggested at this meeting focused more on agricultural Best Management Practices than previous meetings. The fact that the county could include some of the goals and suggestions in other planning and zoning decisions and plans was discussed to some extent. Finally, participants were informed as to the schedule for finishing the grant and told that they would be mailed a copy of the draft for review.

Outcomes of the Public Participation Process

The public participation portion of the planning process of the WRAS had called for four public meetings/workshops. These meetings were designed to accomplish the following tasks: the first was to describe the purpose of the project to the public, the second was to gain citizen involvement in what kind of goals and projects should be considered, the third was to present the findings from research on the watershed, and finally, the fourth was to receive direction as to projects to be included in the plan for future use in County and citizen projects. These tasks were accomplished in a satisfactory manner.

Given the fact that efforts to attract public participation far outweighed the response achieved from citizens, the County was directly concerned with how any kind of continuing interest could be obtained once the initial strategy and plan was completed. The Facilitator was asked to analyze both the participation level achieved and how to best encourage future interest. He noted that there needs to be something "intrinsically rewarding" for citizens to continue to participate and related it to ownership of the process. This appears to be linked to public perception and educational opportunities for citizens.

Several of the suggestions as to how to best achieve this areas follows:

- Focus a survey on the current and future state of the Manokin Watershed as a follow-up to the Strategy.
- Provide a copy of the final Strategy to all who participated and follow up later with a copy of the Somerset County Land Preservation and Recreation Plan when that is prepared in 2003.
- Develop a lecture series that features educational topics by County citizens on a variety of topics relating to the watershed and link these to the Strategy goals.
- Work with the local press to carry stories on the WRAS and any future projects.

3. WRAS GOALS AND OBJECTIVES

Initial Goals of Grant:

The purpose of developing the Watershed Restoration Action Strategy (WRAS) for the Manokin River Watershed was to develop a plan/strategy to improve the water quality of the Manokin River. The Manokin River was selected to receive funding for such a watershed study from a CZM grant through the Department of Natural Resources. It had been labeled as a priority watershed within the State in need of restoration. The WRAS planning process was to assess water quality, and set local goals and suggest projects leading to restoration of the watershed.

Initial goals established under the grant were:

1. Review the practicality of establishing the Manokin River Greenway as shown in the Somerset County Land Preservation and Recreation Plan.

2. Review the watershed protection goals from the Land Preservation and Recreation Plan and any recommended changes.

3. Identify any mitigation sites and opportunities via existing programs.

4. Make recommendations for future implementation and pilot projects, including any areas recognized for restoration possibilities.

5. Develop a list of funding sources

Revised Goals and Objectives:

The assessment portion of the WRAS included the Manokin River Watershed Characterization, the Stream Corridor Assessment Survey, the Anadromous Fish Survey, the Water Quality Monitoring Study results, and the TMDL Study results. In addition the planning process included four public meetings during which public comment was obtained, assessments and study results presented, and goals ad objectives refined.

As a result of the assessments and studies and the public meetings held throughout the process the initial goals have been refined and additional goals developed.

A major point of discussion beginning with the first public meeting was the lack of basic research on the Manokin watershed and the river itself. Goals established at the meeting were:

- Conduct basic research within the Manokin River Watershed including water quality, aquatic life, and run-off
- Investigate whether oyster beds could be restored
- Investigate whether access to the Bay could be improved through deepening
- Promote eco-tourism on the Manokin River
- Promote planting of trees as buffers possibly with citizen involvement
- Research whether drainage ditches contribute to adverse water quality
- Develop a greenway/blueway using the Manokin River

This goal supports reaffirms one of the original goals also included in the Land Preservation and Recreation Plan. According to the Plan this Manokin River Greenway would run from the University of Maryland Eastern Shore campus to the Manokin Park in Princess Anne and then run down the main stem of the river to Raccoon Point. It would also become a major focus of eco-tourism on the River.

Recreation Plan Goals:

The Somerset County Land Preservation and Recreation Plan include several goals, which apply to the Manokin River Watershed. These are:

Waterway Protection Goal:

Preserve the quality of Somerset County's environmentally sensitive Chesapeake Bay waterfront and waterway corridors.

The recommended policies to achieve this goal are:

1. Avoid disturbing soil along waterway corridors
2. Stress voluntary use of site design principles when developing near waterways.
3. Encourage appropriate farm and forest management practices near waterways.
4. Heighten public awareness about the need to protect waterways.
5. Preserve natural drainageways and public access for maintenance.
6. Ensure community storm drainage systems remain I working order.
7. Encourage landowners to plant riparian buffers that filter runoff and provide shade to moderate water temperatures.
8. Develop heritage tourism along area waterways.
9. Continue to make floodplain protection an important part of County planning.
10. Continue to support interstate, State and local efforts to restore the Chesapeake Bay

Other Land Preservation and Recreation Plan Goals also can be applied to the watershed, however, several of the specific polices do not apply or have already been implemented.

Wetlands Protection Goal:

Avoid disturbing wetlands and disrupting their critical environmental functions

Agricultural Land Preservation Goal:

Support local farming, save farmland and maintain the County's rural heritage by continuing to preserve agricultural land.

Forest Protection Goal:

Safeguard the economic value, recreational qualities and environmental attributes of Somerset Counf)1 's woodlands.

Historic Preservation Goal:

Enrich local quality of life by conserving, enhancing and promoting historic resources and the area's unique cultural heritage.

Other Goals:

- Identify mitigation sites and opportunities via existing programs
- Make recommendations for future implementation and pilot projects including any areas recognized for restoration possibilities.
- Develop a list of funding sources
- 2 subwatershed studies
- Undertake additional research on the causes and effects of Pfisteria on the river
- Provide for private landowners a list of programs available control erosion
- Encourage buffers along existing streams within the watershed
- Promote septic tank maintenance by homeowners
- Encourage mitigation banking along streams in the watershed
- Examine the effects of marsh loss on the water quality of the Manokin River
- Promote watershed restoration via billboards
- Encourage completion of BMP' s within the watershed

4. REVIEW OF WATERSHED CONDITIONS AND OPPORTUNITIES FOR PROTECTION

The first public meeting on the WRAS was advertised as a "Town Meeting", denoting the fact that the County was offering information, but soliciting input from local citizens in an informal setting. The effort was to differentiate between the process to garner citizen comment and future participation in developing the WRAS and a Public Hearing process that the general public commonly, if incorrectly, perceives as just a legal requirement with little possibility of change based on the comment received.

After explanation as to what the WRAS was and the steps taken to date, local citizens discussed at length their concerns regarding the Manokin and their preliminary recommendations as to the direction that WRAS projects and implementations should take. It was clear from the beginning that the group could be broken into two areas of interest: additional studies and continuing data gathering and on ground projects, such as tree planting and best management practices. All comments were recorded by staff and the facilitator and appear in the appendix of this plan. A more complete discussion of the public process can be found in Section 2, Workshops and Public Presentations.

After subsequent work sessions, a number of areas suitable for future development and implementation were discussed. Recommendations fell into the categories of additional study, best management practices and educational outreach.

Study Areas

- Study of two subwatersheds, with monitoring, for comparison purposes. One watershed would be relatively pristine, the other predominately agriculture. Data should be referenced as well from the Green Branch Study in Parsonsburg.
- Study and Cost share: One watershed appropriate agricultural watershed should be chosen and designated for cost share for additional of lime to raise the Ph level. Ph level is directly related to the ability of the soil to provide nutrient uptake.

The continued study of marsh loss and its contribution to Bay sediment and nutrients should be encouraged. The personal experience of many local property owners along the river and its tributaries involves the loss of uplands to marsh and also the loss of existing marsh to erosion.

Best Management Practices

- Although the Soil Conservation District does not recommend treed buffers on PDA's (Public Drainage Ditches), and easements are usually mowed every year, a cost share to encourage individual farmers to use grassed buffers of 10-25 feet along ditches in their farm fields. Given the flat landscape, 10 feet would often be sufficient to contain run off.
- Recommend the use of available funding for planting trees around poultry houses (Funding is currently available through EQUIP). In the Chesapeake Bay

Critical Area Program, the County requires the planting of trees for impervious surface created. Although planting in the buffer is the first priority, the second priority in the case of poultry buildings (also manure sheds, barns, etc.) could be around the building itself. Infonnation is available through the study conducted by the University of Delaware and deals most specifically with ammonia.

- Recommend continued support of nutrient management plans through cost share.
- A strong recommendation was made throughout the workshops for tree/forest planting. Riparian buffers should be encouraged by supporting CREP and using Forest Conservation to encourage mitigation banks in areas including riparian buffers.
- Recommend a strong commitment to cover crops as one of the best available best management practices available to agriculture.

Educational Outreach

- Property owners should be educated in the proper care of on site septic systems. Pumping is usually recommended on a three-year basis. Although there is considerable infonnation available, the difficulty is getting it into the right hands. Effort should be made to disseminate such infonnation. Also, the County should continue to seek funding to help low to moderate income homeowners to replace individual failing septic systems or in areas with failing septic systems, funding for community water and sewer projects.
- One area often noted but not addressed locally is lawn care. Recommend a campaign using infonnation from the Tributary Strategy television advertisements. This could be a project in conjunction with the local Tributary Strategy Team. Suggest at least two billboards in the County, to be combined with a mail out of a brochure to all property owners in the watershed.

Other Suggested Projects

- Recreational uses of the Manokin were discussed, particularly in the first workshop, since is the designated use for the Manokin and is an important part of viewing the river as a Resource for local citizens. In connection with recreational use, citizens recommended encouraging designations for greenways, blueways and "marinas" for canoeing, which are appropriate given the shallow depth of the most of the waterway.
- The County will shortly be updating its Comprehensive Plan and the Land Preservation and Recreation Plan. Each addresses environmental and sensitive areas issues and also greenways. The recommendations from the WRAS should be incorporated where appropriate in the Plan.

5. TECHNICAL AND FINANCIAL ASSISTANCE NEEDS

Role of the County and Partnerships

As stated earlier, the County Department of Technical and Community Services would most likely have to take the lead on any projects implementing the Strategy, unless citizen or watershed organizations emerge in the future to assist in this role. However, strong partners are a necessity since the County's staff is so small and there is no public works department for physical work on projects.

Efforts to involve the Lower Eastern Shore Tributary Team have been unsuccessful to date, perhaps because that Team covers four other, larger counties. However, one of the educational outreach projects suggested in a workshop might manage to interest the Team, particularly if it could be copied later in other counties. The Maryland Conservation Corps could offer another possible partner, particularly in planting projects and in view of their stream assessment findings as to the lack of riparian buffers in the northeastern portion of the watershed.

Technical assistance would be required as well, drawing particularly from the Maryland Department of Natural Resources, the Maryland Department of the Environment and the Maryland Department of Agriculture. Also, since the Strategy did' draw some academic interest, the University of Maryland system might be interested in participation.

Grants

During the course of the public participation portion of Strategy development, the County provided a list of possible grants taken from an Internet site. These combined with regular notifications of specific grants for rivers and watersheds offer considerable potential for furthering the Strategy, in spite of the scarcity of local funding. However, it is important not to minimize the time and effort required for grant administration and project organization. Even the most generous grants take a considerable commitment of already limited staff time.

The most successful course, given the current situation, is to consider small grants for which a partner can be identified. This would have the added benefit of providing the "doable" project that citizens wished to identify in the workshops and demonstrate that progress can be made with local effort.

6. IMPLEMENTATION PROGRESS AND MILESTONES

Continued Monitoring for Water Quality

The County has developed five years of data for points on the Manokin River. In addition. the State has monitored the area more closely. It will be important that some kind of monitoring program continue in the future so that progress can be measured. The County may be able to set aside some portion of its funding from the Chesapeake Bay Critical Area grant for this purpose, but other sources of funding and perhaps, participants, should be sought.

Best Management Practices

Time and again, it has been stated that no one knows when BMP's work and there are no measurements in place to assess their success. In fact, BMP's are rarely tracked on a continuing basis. Any BMP growing out of this or future grants in the Manokin River Watershed should be catalogued, coordinates listed, and tracked as to condition and any possible measurements. This is the only method by which many non-point source solutions can be captured.

Documenting a successful BMP can also serve the purpose of encouraging its use throughout the watershed. Given the fact that changing public attitudes and educating the public as to what non-point source pollution is can be such a challenge, an on-ground project would be valuable.

Follow Up Actions

The County can begin to follow up on the Strategy by including several of the suggestions made during the process in activities that are currently on-going. For example, a fact sheet as to planting around poultry and other operations can be provided and planting requirements can recommend it to meet Critical Area requirements. Also, the direction of the Strategy can be carried over into the next update of the Land Preservation and Recreation Plan and other local planning ordinances.

A brief Project Description of the Billboard and Brochure educational outreach can be prepared by the Department and provided to the local Tributary Team to gain their support. Participants in the Strategy can be asked to suggest possible sites for the two billboards.

A final steering committee meeting should be called to discuss any next steps that should be taken from the list of suggested projects. By taking these early first steps, a commitment to the Strategy may be able to stay in the forefront, with later steps involving larger grants, studies and partnerships.

APPENDICES

Comments from November meeting

- Possible ideas such as removing fish migration obstructions, stream restoration and a mitigation bank.
- Individuals mentioned oyster bed restoration and availability of grants for dredging shoaling areas. There are sediment problems and a need to dredge.
- It was reported that the West Post Office Tax Ditch is the contributor of the sediment and a dam should have been built.
- It is a complicated issue; there is not enough grass ~nd trees. More trees are the solution. Should work on restoring grasses and trees; this is where run off begins and trees can be used to improve absorption. Maybe a deeper river would attract more people.
- Focus on shoreline erosion and restoration. Perhaps grants are available for shoreline erosIon.
- The number of oysters is way below historic levels and something could be done there. Tonging boats were common the river and now there are no oysters. Can they be revived?
- Look at BMP's to improve the watershed. Problems are non-point source pollution. Find
- out where and to what degree the inputs are coming from. Need to minimize runoff, but
- also need to know what the contributors are and what percentage. Farms use BMP's but there is not way to gauge whether they are working. Need a comprehensive look at sources.
- Need water quality testing that will actually pick up the source.
- There is an expensive test to determine sources of nutrients but the State wouldn't test during the Pfisteria scare.
- What has changed over the last 50 years to create these problems? (over fishing, development, etc.) Need a historical study of the watershed. Give a context - assessments should be based on that.
- There are less people but they are more concentrated. There is more woodland now and agriculture land is being taken from production. U£\t1ES has grown and ECI was built 15 years ago.
- An aquaculture operation had clear water in 1992 but in 1996 it went south. There was a flood that year. The prison went online with its own plant that year and there was serious flooding causing an unusual amount of fresh water. Regarding aquaculture (rockfish),
- the water quality had been acceptable up to then and changed to kill the fish in the ponds. Turbidity and water quality problems.
- Recreation fishing is also down with oystering.
- A Kings Creek resident reported increased algae and that the prison contributes 4,000,000 gallons per day to the watershed. We don't have a handle on the prison and sources and inputs.
- Why the nutrification? Seems out of proportion to inputs.
- A Twining Road resident reports soapsuds in the river and is curious how much is from the prison. Does prison use phosphate free detergent?
- There are no bad guys, just a lot of contributors.
- There had been a proposal for filtration dams to stop sediment, but never done.

- Erosion is a contributing factor. Ditches used to be cleaned out and the water ran through, now with current economics, this no longer happens.
- There is too much erosion as ships sail up to Princess Anne. . Education is a solution.
- Current industrial zoning is too liberal with many harmful uses. The Zoning Ordinance needs to be examined and improved. Should focus on allowable uses, not appropriate near creeks, etc.
- Look at small canal "marinas"; Manokin outback; fly-fishing is dra\ving people around Crisfield.
- "If you dredge, they will come." Should dredge and improved access by boat? There are really only small areas that need dredging.
- Clean up the problems and other things will follow.
- Is it possible to create greenways, blue ways, and marinas for canoeing? . Stream buffers and natural sponges are needed.
- Canoe adventure experience is suggested.
- There are only a few shallow spots on the river."
- Do fast growing trees have different effect than those that are slow growing?
- Perhaps Rt. 13 acts as a dam blocking sheet flow. The river flattens out after 13. Sheet flow accentuates the problem. Likened to Alligator Alley in southern Florida.
- When they dug the tax ditches in the upper Manokin the lower river filled with siltation.
- Breakdown into subcommittees for future meetings. Suggestion is one "on ground" dealing with erosion, waterfront, ditches, etc as possible measures and one on the contextual aspects, such as a grant to look at all factors, what has been done such as BMP's, etc. Where does education fit?

WRAS STEERING COMMITTEE

Somerset County Department of Technical and Community Services
- Joan S. Kean, Director
- Thomas Lawton, Planner

Somerset County Sanitary District
- Earl Ludy, County TMDL Liaison and Princess Anne WWTP Manager

Somerset Soil ConServation District
- Larry Fykes, Manager
- Nelson Brice, Acting Manager

USDA-NRCS
- Greg Williams
- Melissa Rochford

Max Chambers, Flomax Marine Nursery
Charles Otto, Somerset County Farm Bureau
Roman Jesien, University of Maryland Eastern Shore
Robin Bunting, Director, Somerset Recreation & Parks Paul Stimson, Citizen
Maryland Coastal Zone Management Program
- Mary Conley
- Katharine Dowell

Ken Shanks, Maryland Department of Natural Resources, Watershed Management & Analysis