3.0 SUMMARY OF CHANGES IN THE 2004 INTEGRATED LIST

The brief timeframe between data solicitations for the 2002 and current report resulted in less new data for the 2004 List. However, there are still a substantial number of new additions to this year's Integrated List. The following sections summarize these new additions, as well as changes and revisions to older listings, according to listing category.

3.1 Biological Listings

3.1.1 Introduction

All biological listings in 2004 are based upon Round Two MBSS data collected by the MDNR. "To meet the State's growing need for information at finer spatial scales, Round Two's core survey was redesigned to focus on Maryland's 8-digit watersheds (averaging 75 mi^2 in area) rather than drainage basins (averaging 500 mi^2). The study design allows estimates at the level of 84 individual or combined Maryland 8-digit watersheds that serve as primary sampling units (PSUs). Each PSU has 10 or more sample sites. To achieve this sample density while sampling approximately 210 sites each year, Round Two will take five years to complete, running from 2000 through 2004 (rather than the three years in Round One, 1995-1997)."[2] Only the first three years of these data were available for listing decisions.

"The MBSS uses a probability-based survey design called lattice sampling to schedule sampling statewide over a multi-year period. The lattice design of Round Two stratifies by year and PSU and restricts the sampling each year to about one-fifth of the state's 138 watersheds. Approximately 300 stream segments (210 in the core survey) of fixed length (75 m) are sampled each year, with biological, chemical, and physical parameters measured at each segment using standardized methods. Biological measurements include the abundance, size, and individual health of fish; taxa composition of benthic macroinvertebrates; and presence of amphibians and reptiles, mussels, and aquatic vegetation. Chemical analytes include pH, acid-neutralizing capacity (ANC), nitrogen, phosphorus, sulfate, chloride, conductivity, dissolved oxygen (DO), and dissolved organic carbon (DOC). Physical habitat parameters include commonly used observational measurements such as in stream habitat structure, embeddedness, pool and riffle quality, shading, and riparian vegetation, and quantitative measurements such as stream gradient, maximum depth, wetted width, and discharge. Channelization, bank erosion, bar formation, and land use immediately visible from the segment are assessed. Additional land use data for the entire catchment upstream of each sample site are incorporated from statewide geographic information system (GIS) coverages.

For the most part, methods used in Round Two are identical to those of Round One. However, some changes were made to improve the quality and/or usefulness of the data generated. These changes in sampling methods include (1) modifications to habitat assessment and characterization, (2) the addition of new chemical analytes (total dissolved nitrogen, total particulate nitrogen, nitrite nitrogen, ammonia, ortho-phosphate, total dissolved phosphorus, total particulate phosphorus, chloride, and turbidity), (3) collection of continuous temperature readings in the summer, (4) characterization of invasive plant abundance, and (5) the addition of altitude as a physical variable. In addition, the reach file used to select sites is the U.S. Geological Survey's USGS 1: 100,000-scale map; this is a change from the 1 :250,000- scale

[2] Maryland Department of Natural Resources, "Maryland Biological Stream Survey, Volume II: Ecological Assessment of Watersheds Sampled in 2001" CBWP-MANTA-EA-03-3, pp. 7-8.

map used in Round One, meaning that more small streams will be sampled in Round Two. Another change to the sample frame is the inclusion of fourth-order streams."[3]

Compared to data used for the 2002 List (MBSS years 1995-1997), more rigorous statistical analysis was performed on the Round Two MBSS data. Confidence intervals were calculated for all sites sampled in 2000-2002 and watershed assessments were performed for those 8-digit basins having ten or more sampling sites. This facilitated biological assessments of Maryland's freshwater streams that are fully consistent with the State's biocriteria listing methodology (see Appendix C, Section 8.1) and that support listing segments at the larger 8-digit watershed scale. Because these new data and analyses fully implement the State's biocriteria listing methodology, MDE considers this current information of higher quality and therefore more appropriate for making regulatory decisions. Accordingly, where new data are available, the 2000-2002 MBSS data and analyses will supercede analyses conducted for the 2002 303(d) listings based on 1995-1997 MBSS data. Those sites listed in 2002 using the Year 2000 MBSS data will be reassessed using the newly calculated confidence intervals that were not available at the time the 2002 List was developed. The 1995-1997 data assessment results that support previous listing decisions will be retained when no new data are available.

3.1.2 MBSS Data Analysis and Results

Reanalysis of the 2000-2002 MBSS resulted in changes to watersheds previously listed in 2002. In many cases, there were no new data in previously listed 12-digit watersheds and therefore the 2002 listings remained unchanged. In other cases, there were new 12-digit data available for 2004 and, in cases where they corroborated earlier listings, these were simply appended to the original 2002 biological listings. For situations where the newer, more accurate data did not corroborate earlier 2002 listings (i.e., a 12-digit watershed was listed as impaired in 2002 but new data support listing this watershed as indeterminate or unimpaired), the original 2002 listing was placed in Category 6 or de-listed and a new 2004 listing was added to reflect the current assessment status.

A similar approach was followed when re-analyzing 8-digit waters. New data that corroborated 2002 8-digit listings were simply added to these 2002 listings as supporting data. For new listings in 8-digit watersheds, several approaches were followed depending upon the specific situation. For some new 8-digit listings there were corresponding listings at the 12-digit level that were made in 2002. Where these 12-digit data supported the new 8-digit listing, they were de-listed at the 12-digit level and re-listed within the 8-digit scale to support the 8-digit assessment. 2002 12-digit impairments that did not corroborate the new 8-digit listings and which had no newer data were retained on the List as impaired. In cases where an 8-digit basin was listed as impaired in 2002 and current data supported an indeterminate or unimpaired assessment, these waters were de-listed from category five and relisted in the appropriate category. Notes are provided in the listings to inform readers where these kinds of changes have been made.

The following paragraphs summarize the results of the 2000-2002 MBSS sampling in 8-digit watersheds. The individual biological assessment results for 12-digit basins are too numerous to summarize here. For information on 12-digit basins, please refer to the 2004 Integrated List.

[3] Maryland Department of Natural Resources, pp. 7-8.

3.1.3 Biologically Impaired Waters

New 8-digit biological listings, based on 2000-2002 MBSS data, placed in Category 5 of the 303(d) List and which may need a TMDL are shown in Table 1. Data results are also provided in this table to give readers information that was used to make an impairment determination.

Table 1: 8-Digit watersheds determined to be impaired using Maryland Biological Stream Survey Data.

NEW 8-DIGIT WATERSHED LISTINGS (Category 5)			
Basin Name	**Basin Code**	**Data Result**	**Comments**
Conococheague Creek	02140504	Mean BIBI = 1.96, Lower 90% CI = 1.69, Upper 90% CI = 2.22	Never listed before for any biological impairment
Lower Pocomoke River	02130202	Mean BIBI = 1.86, Lower 90% CI = 1.72, Upper 90% CI = 1.99	Listed on the 2002 List only at the 12-digit level (021302020632)
Middle Chester River	02130509	Mean BIBI = 2.43, Lower 90% CI = 2.17, Upper 90% CI = 2.68	Listed on the 2002 List only at the 12-digit level (021305090415)
Nanticoke River	02130305	Mean BIBI = 2.44, Lower 90% CI = 2.19, Upper 90% CI = 2.69: Site status = Fail and Mean FIBI = 2.57, Lower 90% CI = 2.3, Upper 90% CI = 2.84	Never listed before for any biological impairment
Patuxent River Middle	02131102	Mean BIBI = 2.76, Lower 90% CI = 2.49, Upper 90% CI = 3.03: Site status = Indeterminate and Mean FIBI = 2.58, Lower 90% CI = 2.19, Upper 90% CI = 2.98	Listed on the 2002 List only at the 12-digit level (basins 021311020908, 021311020911, 021311020912, and 021311020914).
Piscataway Creek	02140203	Mean BIBI = 2.29, Lower 90% CI = 2.11, Upper 90% CI = 2.46	Listed on the 2002 List only at the 12-digit level (basins 021402030799, 021402030802, 021402030803

BIBI = Benthic Index of Biotic Integrity
FIBI = Fish Index of Biotic Integrity
CI = Confidence Interval

3.1.4 Waters with Insufficient Biological Data to Determine Impairment

Category 3 of the Integrated List is reserved for waters that have insufficient data or information to make an assessment. Insufficient information can be the result of having either an insufficient quantity of data (e.g., a single data point) or having data of insufficient quality (e.g., undocumented sample collection procedures, high analytical equipment error). Maryland's biocriteria listing methodology recognizes that, due to natural variability and/or anthropogenic

impact, waters can score in an indeterminate zone between impaired and unimpaired. Assessments for such waters are considered indeterminate. All waters ranked indeterminate for biological condition using MBSS data, and which are not already listed in Category 5, will be placed in category 3a of the 2004 Integrated List as having an insufficient quantity of data to perform an accurate assessment. Eight-digit water bodies that score in this indeterminate range as a result of 2000-2002 MBSS data are presented in Table 2.

Table 2: 8-Digit watersheds assessed as indeterminate using Maryland Biological Stream Survey Data.

NEW INDETERMINATE 8-DIGIT WATERSHEDS			
Basin Name	**Basin Code**	**Data Result**	**Comments**
Casselman River	05020204	Mean BIBI = 3.38, Lower 90% CI = 2.87, Upper 90% CI = 3.89: Site status = Indeterminate and Mean FIBI = 2.63, Lower 90% CI = 2.09, Upper 90% CI = 3.17: Site status = Indeterminate	Already listed in Category 5 for other impairments, so cannot be listed in Category 3a.
Jones Falls	02130904	Mean BIBI = 2.89, Lower 90% CI = 2.45, Upper 90% CI = 3.33: Site status = Indeterminate	Listed in Category 5 on 2002 Integrated List. De-listed for biology as a result of an indeterminate assessment.
Little Patuxent River	02131105	Mean BIBI = 2.79, Lower 90% CI = 2.42, Upper 90% CI = 3.15: Site status = Indeterminate and Mean FIBI = 3.49, Lower 90% CI = 3.21, Upper 90% CI = 3.77: Site status = Pass	Listed in Category 5 on 2002 Integrated List. De-listed for biology as a result of an indeterminate assessment.
Lower Monocacy River	02140302	Mean BIBI = 3.32, Lower 90% CI = 3.05, Upper 90% CI = 3.59: Site status = Pass and Mean FIBI = 2.96, Lower 90% CI = 2.7, Upper 90% CI = 3.23: Site status = Indeterminate	Listed in Category 5 on 2002 Integrated List. De-listed for biology as a result of an indeterminate assessment.
Mattawoman Creek	02140111	Mean BIBI = 3.34, Lower 90% CI = 2.96, Upper 90% CI = 3.72: Site status = Indeterminate	Already listed in Category 5 for other impairments, so cannot be listed in Category 3a.
Patapsco River Lower North Branch	02130906	Mean BIBI = 2.87, Lower 90% CI = 2.66, Upper 90% CI = 3.08: Site status = Indeterminate and Mean FIBI = 2.64, Lower 90% CI = 2.13,	Listed in Category 5 on 2002 Integrated List. De-listed for biology as a result of an indeterminate

NEW INDETERMINATE 8-DIGIT WATERSHEDS			
Basin Name	**Basin Code**	**Data Result**	**Comments**
		Upper 90% CI = 3.16: Site status = Indeterminate.	assessment.
Potomac River Montgomery County	02140202	Mean BIBI = 3.38, Lower 90% CI = 3.08, Upper 90% CI = 3.68: Site status = Pass and Mean FIBI = 2.86, Lower 90% CI = 2.48, Upper 90% CI = 3.23: Site status = Indeterminate	Listed in Category 5 on 2002 Integrated List. De-listed for biology as a result of an indeterminate assessment.
Seneca Creek	02140208	Mean BIBI = 2.82, Lower 90% CI = 2.54, Upper 90% CI = 3.1: Site status = Indeterminate	Listed in Category 5 on 2002 Integrated List. De-listed for biology as a result of an indeterminate assessment.
Town Creek	02140512	Mean BIBI = 3.57, Lower 90% CI = 3.31, Upper 90% CI = 3.83: Site status = Pass and Mean FIBI = 2.8, Lower 90% CI = 2.17, Upper 90% CI = 3.43: Site status = Indeterminate	Already listed in Category 5 for other impairments, so cannot be listed in Category 3a.
Upper Monocacy River	02140303	Mean BIBI = 3.2, Lower 90% CI = 2.96, Upper 90% CI = 3.43: Site status = Indeterminate and Mean FIBI = 2.93, Lower 90% CI = 2.47, Upper 90% CI = 3.4: Site status = Indeterminate	Listed in Category 5 on 2002 Integrated List. De-listed for biology as a result of an indeterminate assessment.
Upper North Branch Potomac River	02141005	Mean BIBI = 3.27, Lower 90% CI = 2.91, Upper 90% CI = 3.62: Site status = Indeterminate	Already listed in Category 5 for other impairments, so cannot be listed in Category 3a.
Upper Pocomoke River	02140303	Mean FIBI = 3.02, Lower 90% CI = 2.69, Upper 90% CI = 3.36: Site status = Indeterminate	Already listed in Category 5 for other impairments, so cannot be listed in Category 3a.
Youghiogheny River	05020201	Mean BIBI = 3.73, Lower 90% CI = 3.42, Upper 90% CI = 4.03: Site status = Pass and Mean FIBI = 3.1, Lower 90% CI = 2.65, Upper 90% CI = 3.54: Site status = Indeterminate	Listed in Category 5 on 2002 Integrated List. De-listed for biology as a result of an indeterminate assessment.

BIBI = Benthic Index of Biotic Integrity
FIBI = Fish Index of Biotic Integrity
CI = Confidence Interval

3.1.5 Biologically Unimpaired Waters

Some waters sampled by MBSS had a high enough mean FIBI or BIBI score and associated confidence intervals to meet narrative water quality standards for aquatic life use. Those waters meeting biological standards are listed in Table 3 below.

Table 3: 8-Digit watersheds determined to be unimpaired using Maryland Biological Stream Survey data.

8-DIGIT WATERBODIES MEETING AQUATIC LIFE USE STANDARD			
Basin Name	**Basin Code**	**Data Result**	**Comments**
Deer Creek	02120202	Mean BIBI = 4.17, Lower 90% CI = 3.99, Upper 90% CI = 4.36: Site status = Pass and Mean FIBI = 3.75, Lower 90% CI = 3.44, Upper 90% CI = 4.05: Site status = Pass	Placed in Category 2 of the List
Liberty Reservoir	02130907	Mean BIBI = 3.6, Lower 90% CI = 3.41, Upper 90% CI = 3.78: Site status = Pass and Mean FIBI = 3.98, Lower 90% CI = 3.87, Upper 90% CI = 4.1: Site status = Pass	Already listed in Category 5 for other impairments, so cannot be listed in Category 2.
Little Gunpowder Falls	02130804	Mean BIBI = 3.76, Lower 90% CI = 3.36, Upper 90% CI = 4.15: Site status = Pass	Already listed in Category 5 for other impairments, so cannot be listed in Category 2.
Loch Raven Reservoir	02130805	Mean BIBI = 3.46, Lower 90% CI = 3.19, Upper 90% CI = 3.73: Site status = Pass	Already listed in Category 5 for other impairments, so cannot be listed in Category 2.
Middle Patuxent River	02131106	Mean BIBI = 3.56, Lower 90% CI = 3.37, Upper 90% CI = 3.74: Site status = Pass	Already listed in Category 5 for other impairments, so cannot be listed in Category 2.
Prettyboy Reservoir	02130806	Mean BIBI = 3.96, Lower 90% CI = 3.72, Upper 90% CI = 4.19: Site status = Pass	Already listed in Category 5 for other impairments, so cannot be listed in Category 2.

Rocky Gorge Dam	02131107	Mean BIBI = 3.84, Lower 90% CI = 3.58, Upper 90% CI = 4.11: Site status = Pass	Already listed in Category 5 for other impairments, so cannot be listed in Category 2.
Savage River	02141006	Mean BIBI = 4.06, Lower 90% CI = 3.85, Upper 90% CI = 4.27: Site status = Pass	Flowing portion placed in Category 2 of the List. Savage Reservoir still remains in Category 5 for mercury impairment in fish tissue.
Zekiah Swamp	02140108	Mean BIBI = 3.42, Lower 90% CI = 3.13, Upper 90% CI = 3.71: Site status = Pass and Mean FIBI = 3.73, Lower 90% CI = 3.48, Upper 90% CI = 3.97: Site status = Pass	Already listed in Category 5 for other impairments, so cannot be listed in Category 2.

BIBI = Benthic Index of Biotic Integrity
FIBI = Fish Index of Biotic Integrity
CI = Confidence Interval

3.1.6 Proposed Revisions for Waters Determined to be Unimpaired Based Upon New MBSS Data

Nine watersheds have been identified in section 3.1.5 as meeting biological standards based upon current MBSS data. Living aquatic resources, particularly benthic macroinvertebrates, integrate the effects of multiple ecological stressors over time and MDE considers aquatic biota the best overall indicator of watershed health. MDE feels that current biological data can be used in the Savage River watershed as "good cause" to revise an earlier 8-digit listing.

3.1.6.1 Savage River, 02141006

Savage River was listed for nutrients, pH, and metals in 1996; Savage Reservoir was listed for methylmercury in 2002. A Nutrients Water Quality Analysis (WQA) was approved by EPA on 4/16/2001. A TMDL to address the methylmercury impairment in Savage River Reservoir was submitted to EPA on 12/24/2002. The pH impairment was reassessed during the current list and in concert with data collected for the MBSS program. Table 4 below lists the pH values for the 12-digit subbasins sampled in the Savage River drainage during round two of the MBSS sampling.

Table 4: pH Values for Savage River subbasins measured during Maryland Biological Stream Survey sampling.

8-Digit Basin Name	8-Digit Basin Code	12-Digit Basin Code	Monitoring Station Name	BIBI Score	FIBI Score	Spring pH	ANC
Savage River	02141006	021410060075	SAVA-401-R-2002	3.89		7.39	206.9
Savage River	02141006	021410060075	SAVA-410-R-2002	3.89		7.35	202.7
Savage River	02141006	021410060075	SAVA-414-R-2002	3.44		7.38	210.5

8-Digit Basin Name	8-Digit Basin Code	12-Digit Basin Code	Monitoring Station Name	BIBI Score	FIBI Score	Spring pH	ANC
Savage River	02141006	021410060076	SAVA-120-R-2002	4.33	3.00	7.02	787
Savage River	02141006	021410060076	SAVA-312-R-2002	4.56	3.57	7.02	88.1
Savage River	02141006	021410060077	SAVA-104-R-2002	4.56			
Savage River	02141006	021410060077	SAVA-117-R-2002	4.33		6.55	78.4
Savage River	02141006	021410060077	SAVA-119-R-2002	4.11		7.18	138.5
Savage River	02141006	021410060077	SAVA-308-R-2002	4.56	3.86	7.26	164.6
Savage River	02141006	021410060078	SAVA-105-R-2002	4.56		6.87	57
Savage River	02141006	021410060080	SAVA-116-R-2002	3.67		6.86	58.9
Savage River	02141006	021410060083	SAVA-103-R-2002	4.33	3.00	6.75	151.4
Savage River	02141006	021410060083	SAVA-115-R-2002	2.33		6.32	131.4
Savage River	02141006	021410060083	SAVA-206-R-2002	4.33	3.00	7.14	132.9

COMAR Section 26.08.02.03-3, establishes that the pH for all Maryland waters must fall between the range of 6.5 to 8.5. In analyzing the above values recorded during the MBSS sampling in these basins, only one data point falls below the State's water quality criterion for pH. Furthermore, the other two pH measurements in this same basin are well within the criterion. These MBSS data, in conjunction with research performed by the University of Maryland Appalachian Lab and MDE Mining Program partners, suggest that the larger Savage River is not impacted by acid mine drainage and can be delisted at the 8-digit level[4]. The study also indicated that two small 12-digit tributaries (Jennings Run in the Wills Creek watershed and Aarons Runs in the Savage River watershed, basin codes 021410030100 and 021410060075, respectively) should be added to the list because of pH readings that consistently fall below State standards.

A land use map for the Savage River watershed is provided below (Figure 3). The watershed falls almost exclusively within State Park boundaries and is 98% forested. No anthropogenic impacts other than those associated with abandoned mines in the Aarons and Jennings Run are documented in the larger watershed. The 8-digit Savage River watershed has been moved to Category 2 of the List as meeting some standards.

[4] Morgan R. P. et al. December 2000, Analysis of Aaron's Run and Jennings Run Benthic Macroinvertebrates, Fishes and Physical Habitat, Appalachian Laboratory, Frostburg, Maryland

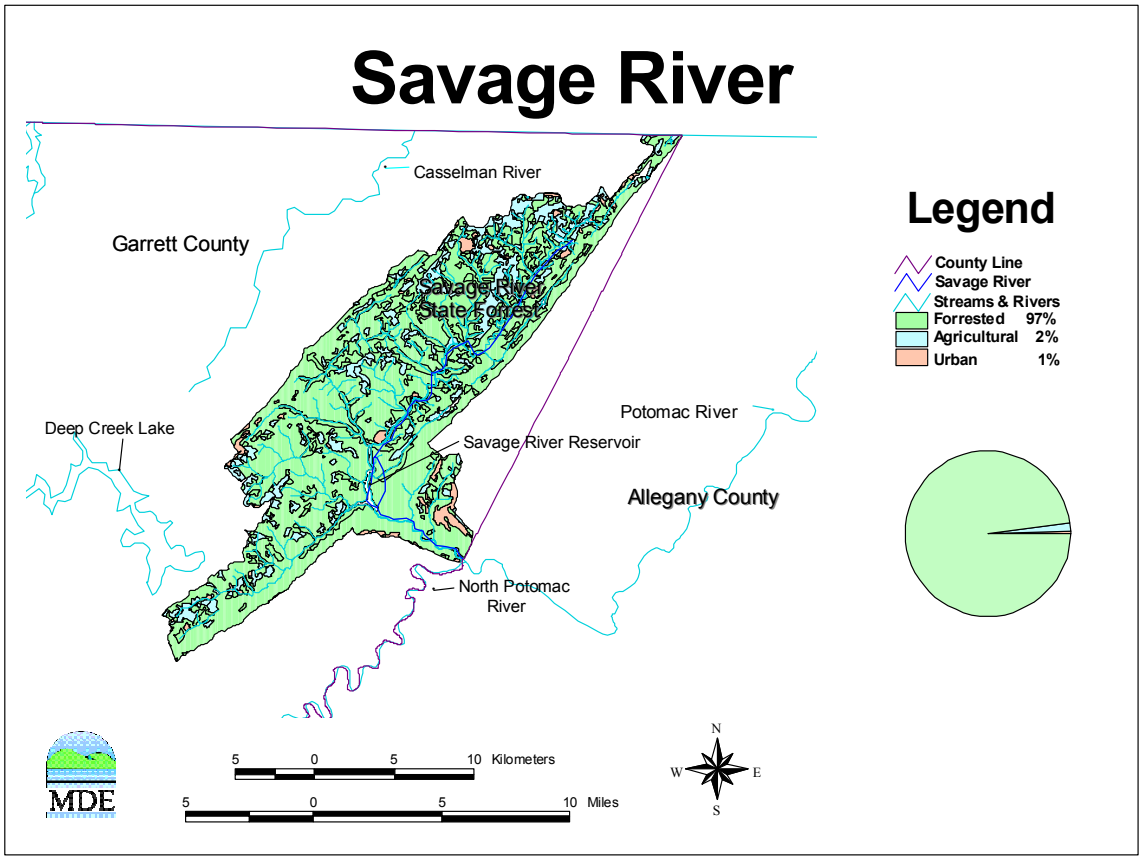

Figure 3: Land use map for the Savage River watershed.

3.2 Chesapeake Bay Benthic Index of Biological Integrity (IBI)

Five-years (1998-2002) of Chesapeake Bay benthic data were evaluated with the newly established 303(d) listing methodology (see following section 3.2.1). As a result, thirteen tidal segments failed the aquatic use standard for Index of Biological Integrity (IBI) (Table 6). These segments were added to part 5 of the 2004 303(d) list and listed separately for biological impairments. They include six listed strictly for biological impairment (no cause known), six listed for nutrients "low D.O.", and one listed for nutrients "low D.O." and toxics.

The remainder of the bay benthic data analysis resulted in thirty-four categorized as inconclusive due to <10 stations in the assessment zone (Table 7). Also, twenty-nine segments were classified in the unknown category as a result of no data. All sixty-three of these water bodies are currently listed for nutrient impairments on part 5 of the 303(d) list. The state anticipates that TMDL's designed to reduce nutrient influx will generally benefit the bay IBI. In addition, four segments fully support aquatic life use standards but will not be placed on part 2 because they are currently impaired by nutrients.

3.2.1 Listing Methodology for Identification of Estuarine Biological Impairments

3.2.1.1 Scope

Measuring the "health" of benthic macroinvertebrate communities is often considered as a measure of support for a balanced population of aquatic animals. This measure of "health" often is derived as an index based on species abundance, biomass, feeding guilds, life history strategies, and spatial community measures (Ranasinghe, et al., 1993).

Maryland and Virginia have sponsored an estuarine macrobenthic community sampling program in Chesapeake Bay and its tidal tributaries since the mid-1980's. Results of Baywide analyses of these data resulted in identification of seven habitat strata based principally on salinity and sediment types (tidal freshwater, oligohaline, low mesohaline, high mesohaline mud, high mesohaline sand, polyhaline mud and polyhaline sand) and helped to establish restoration goals to better manage this living resource. These findings also allowed for the development of a monitoring program employing both a fixed and probabilistic monitoring program to assess trends and overall conditions with a known level of confidence.

For this 2004 water quality assessment and listing of impaired waters, the States are interpreting aquatic life use support in their estuarine waters of the Chesapeake Bay and tributaries using benthic community data assessed with respect to key stressors (dissolved oxygen and toxic contaminants). This decision process is not applicable to benthic macroinvertebrate data States may have collected in free-flowing streams, lakes or along Atlantic coastal waters/embayments, all of which have a different analytical framework.

3.2.1.2 Criteria

Currently, Maryland and Virginia water quality standards include narrative criteria to address support for aquatic life uses using benthic macroinvertebrate community data. The US Environmental Protection Agency's Chesapeake Bay Program established that a benthic macroinvertebrate Index of Biotic Integrity (IBI) score of 3.0 or higher meets that program's restoration goal for benthic communities (Ranasinghe, et al., 1993). Results are regularly reported to the public and are available on the Internet (http://www.chesapeakebay.net/).

This Bay goal, however, was not designed to be a criterion for defining "impaired" waters in the regulatory sense – that is, to define waters that do not support a balanced population of aquatic life. Areas that meet or do not meet this Bay Program goal may or may not be "impaired" for aquatic life use by specific pollutants or causes.

The US Environmental Protection Agency (EPA) recognized that while neither Bay state had defined numeric criteria for assessing support of aquatic life uses using benthic macroinvertebrate data, there was a wealth of estuarine benthic data available for managers to try to make such a decision. Since August 2002, a workgroup comprised of Maryland Department of Natural Resources and Department of the Environment staff, Virginia Department of Environmental Quality staff and EPA staff with support from benthic monitoring and analytical staff at Old Dominion University and Versar, Inc. have worked together to try to define a process that could be used to reasonably define impaired waters of the Bay and its tributaries with recently collected estuarine benthic data.

3.2.1.3 Process

The evaluation of benthic community impairments in Chesapeake Bay segments was based on a Wilcoxon rank sum test (Lehmann, E. L. 1998. Nonparametrics. Statistical Methods Based on Ranks. Revised First Edition. Prentice Hall, Upper Saddle River, New Jersey), as implemented in Proc-StatXact 5 (Cytel Software Corporation 2002. Proc-StatXact 5 for SAS users. Statistical software for exact non-parametric inference). The Chesapeake Bay Benthic Index of Biotic Integrity (B-IBI) was calculated for each sample. The B-IBI scores for all samples were grouped into four categories (1 to 4) and the distribution of scores within a segment was compared to the reference distribution, treating the scores in each population of samples as ordered categorical responses. The four categories of B-IBI scores are 1.0-2.0; 2.1-2.9; 3.0-3.9; and 4.0-5.. Under the null hypothesis (H_0) of no impairment, the two populations (segment and reference) can be considered to have the same underlying multinomial distributions of samples among the ordered categories. The assessment of impairment was based on a one-sided exact test of H_0 against the alternative hypothesis that the segment had a distribution shifted towards lower B-IBI scores than for the reference condition. A segment was labeled impaired if the downward shift in B-IBI scores was significant at the $\alpha = 0.01$ level, and with the additional condition that the test had a power of 0.9 or greater. This latter requirement controls for type II errors. Additional requirements for impairment were a minimum sample size of 10 and low B-IBI scores (<3.0) had to have been observed during more than one year. When a segment had more than one habitat class, the stratified Wilcoxon rank sum test in Proc-StatXact was applied. In this case, we assumed that the samples in both populations were random within each habitat class (stratum). In the stratified Wilcoxon rank sum test, the ranking is done separately by habitat, and then combined across habitats. The strata weights are based on the frequency of samples in the habitats. Because samples in the benthic monitoring program are allocated randomly within each segment, the number of samples in each habitat is, on average, proportional to the area of each habitat. The methods for calculating the B-IBI can be found at the web site: http://www.baybenthos.versar.com/referenc.htm

Benthic community structure can be affected by anthropogenic stresses associated with toxic contaminants in the sediment, low oxygen and high sedimentation rates. Development of benthic restoration goals identified low oxygen levels and toxic contaminants as key parameters that differentiate expected reference from degraded sites (Ranasinghe et al. 1993). In this work, low oxygen levels identifying degraded sites were defined as having bottom oxygen levels during the summer index period (July 15-September 30). Also, toxic contaminant levels were defined as exceeding published ER-M (threshold contaminant) concentrations (Ranasinghe et. al, 1993). For this effort then, in addition to benthic results, Maryland and Virginia will evaluate the bottom layer dissolved oxygen levels of field data collected during each benthic sampling event as well as other, quality-assured bottom oxygen data collected during the summer index period (July 15-September 30) in these segments. The States also will evaluate toxic contaminants in sediments using currently accepted State protocols.

Segments having less than ten samples were not considered for the analysis. If a segment has insufficient or no benthic IBI results, aquatic life use support in the segment will be evaluated using other currently accepted State processes for evaluating dissolved oxygen and toxic contaminant results.

If there are sufficient data to evaluate benthic IBI condition, the segment will also be evaluated for dissolved oxygen and toxic contaminant stressors. If more than 80 percent of the bottom

oxygen observations during the summer index period are less than 2 mg/L or if two or more observations during this period are below 0.3 mg/L, the area will be defined as "*not supporting aquatic life uses (benthos) due to impairments by low oxygen from eutrophication from excess nutrients*". Areas where less than 80 percent of bottom dissolved oxygen levels are below 2.0 mg/L during the summer index period, but overall oxygen levels remain below State criteria (in MD, 5.0 mg/L; in VA, 4.0 mg/L) aquatic life uses other than benthos are impaired and the area will be defined as "*not supporting aquatic life uses (nekton, plankton) due to impairments by low oxygen from eutrophication from excess nutrients*". In segments where the State's toxic contaminant evaluation identifies impacts on benthic communities, the segment area will be defined as "*not supporting aquatic life uses due to impairments by toxic contaminants from unknown sources*". A decision matrix showing the relationship between IBI, bottom layer dissolved oxygen and toxic contaminant summaries is provided below.

Table 5: DECISION MATRIX – Interpretation of other data affecting observed benthic IBI (Dissolved oxygen, Toxic contaminants)

BIBI results	Oxygen Results	No toxic contaminant data	Toxic contaminant data define no aquatic life use impact	Toxic contaminant data define aquatic life use impact	ROW
Column		**A**	**B**	**C**	
Insufficient Data	**Insufficient data**	Aquatic life – unknown Cause - N/A Source - N/A List 3	Aquatic life - supported Cause - N/A Source - N/A List 1 or 2	Aquatic life - fails Cause - toxics Source – unknown List 5	**1**
	DO fails State criteria	Aquatic life – fails Cause – DO Source – eutrophication List 5	Aquatic life - fails Cause - DO Source – eutrophication List 5	Aquatic life - fails Cause – DO, toxics Source – eutrophication, unknown List 5	**2**
	DO meets State criteria	Aquatic life supported Cause - N/A Source - N/A List 1, 2 or 3	Aquatic life supported Cause - N/A Source - N/A List 1 or 2	Aquatic life - fails Cause - toxics Source – unknown List 5	**3**
Fails	**Insufficient data**	Aquatic life (benthos) – fails Cause - biology (BIBI) Source – unknown List 5	Aquatic life (benthos) - fails Cause - biology (BIBI) Source – unknown List 5	Aquatic life (benthos) – fails Cause – toxics Source – unknown List 5	**4**
	Benthos Hypoxia Impacted *	Aquatic life – fails Cause – DO Source – eutrophication List 5	Aquatic life - fails Cause – DO Source – eutrophication List 5	Aquatic life - fails Cause –DO, toxics Source – eutrophication, unknown List 5	**5**
	Benthos Not Hypoxia Impacted *	Aquatic life (benthos) – fails Cause – biology (BIBI) Source – unknown List 5	Aquatic life (benthos) - fails Cause – biology (BIBI) Source – unknown List 5	Aquatic life (benthos) fails Cause – toxics Source – unknown List 5	**6**
Passes	**Insufficient data**	Aquatic life – supported Cause – N/A Source - N/A List 3	Aquatic life - supported Cause – N/A Source - N/A List 1 or 2	Aquatic life - fails Cause – toxics Source – unknown List 5	**7**
	DO meets State criteria	Aquatic life supported Cause - N/A Source - N/A List 1 or 2	Aquatic life supported Cause - N/A Source - N/A List 1 or 2	Aquatic life - fails Cause – toxics Source – unknown List 5	**8**

"Hypoxia Impacted Benthos" are defined as conditions where bottom oxygen levels during the summer index period are less than 2.0 mg/L more than 80 percent of the time or where two or more individual observations are less than 0.3 mg/L during the 5-year period of assessment

3.2.1.3.1 Natural conditions/assessment issues

Naturally-occurring conditions (no direct, indirect or accelerated anthropogenic impact) that exceed criteria are not considered violations of water quality standards. The deep trough of the old Susquehanna River bed in the mid-Bay region is seasonally stratified and likely suffered from some level of hypoxia even in pre-colonial times. Proposed new designated uses and oxygen criteria for Chesapeake Bay recognize the seasonal environment of the Deep Trough as a designated use and define low oxygen criteria below current State criteria, but at levels considered protective of benthos. To date, the Chesapeake Bay benthic monitoring program generally excludes samples from being collected in these deeper areas, assuming that benthos are impacted by hypoxia. When new Bay standards are adopted, it is likely that sampling will occur in these deeper zones. Until then, aquatic life use support can still be evaluated using other available data sources.

3.2.1.4 Limitations and use of professional judgment

As with all statistical tests, assessment personnel must consider inherent properties of the data and the statistical test used to analyze the data :

1. Reference conditions represent the "best of the best conditions" for several particular habitats (e.g. Polyhaline Sand and others) and thus may be an overly strict yardstick for determination of impaired conditions. Segments with a high percentage of samples in these particular habitat types may have a healthy benthic community and yet still be significantly different from the reference distribution (e.g. segment CB7PHa). This problem can be examined by comparing the area-weighted percentage of low IBI scores against the same percentage of the reference distribution.
2. The stratified Wilcoxon rank sum test can be very sensitive to small changes between distributions, especially as sample sizes increase. This can lead to statistically significant differences that may not be ecologically or managerially significant.

For these reasons, other documented conditions and best professional judgement can be used to make final impairment decisions. Other best professional judgement considerations may include cases where naturally high tidal mixing forces may cause a segment to be different than reference conditions. It should be noted that due to these issues further refinement of benthic IBI assessment procedures are planned that may change future results.

3.2.1.5 Reporting

Waterbody segments identified as "*Not Meeting Criteria*" for benthic IBI, dissolved oxygen and/or toxic contaminants are reported as "**Not Supporting Aquatic Life Uses**". These areas are not identified as a public health threat unless fish consumption advisories are identified due to bioaccumulation of toxic contaminants.

3.2.1.5.1 Use of other data

This process is not applicable for other benthic macroinvertebrate data collected in waterbodies other than the Chesapeake Bay and its tidal tributaries. This process addresses the monitoring data from the program's probabilistic approach. Benthic macroinvertebrate data from fixed stations used for trend analysis in this Bay Program monitoring effort may be used if use of the data does not adversely affect error or confidence in the results.

Table 6: Bay IBI impairments (Category 5)

Bay segment	State 8-digit segment	State 8-digit segment name	Limits/Portion	Cause	Source
POCMH	02130201	Pocomoke Sound	mouth to Pig Point (VA)	biology	unknown
TANMH	02130206	Tangier Sound	all	biology	unknown
NAMH	02130305	Nanticoke River	mouth to Penknife Point	biology	unknown
CHOMH	02130403	Lower Choptank River	mouth to Clarks Wharf	biology	unknown
CHSMH	02130505	Lower Chester River	mouth to Melton Point	nutrients "low D.O."	eutrophication
GUNOH	02130801	Gunpowder River	all	biology	unknown
PATMH	02130903	Baltimore Harbor	all	nutrients "low D.O.",toxics	eutrophication
MAGMH	02131001	Magothy River	all	nutrients "low D.O."	eutrophication
PAXMH	02131101	Patuxent River (Mouth to Ferry Landing)	mouth to Chalk Point	nutrients "low D.O."	eutrophication
CB3MH	02139997	Middle Chesapeake Bay	Lower Bay to Black Marsh-Tolchester Beach	nutrients "low D.O."	eutrophication
CB5MH, CB4MH	02139998	Lower Chesapeake Bay	all	nutrients "low D.O."	eutrophication
POTMH, POTOH	02140101	Lower Potomac River (mouth to Smith Point)	all	nutrients "low D.O."	eutrophication
POTOH	02140102	Potomac River (Smith Point to Marshall Hall)	mouth to Moss Point-Shipping Point	biology	unknown

Table 7: Assessment Status for all waters evaluated as inconclusive using the Chesapeake Bay IBI.

8-DIGIT WATERBODIES ASSESSED WITH BAY IBI LISTING METHODOLOGY AQUATIC LIFE USE STANDARD			
Basin Name	**Basin Code**	**Assessment Status**	**Comments**
Lower Pocomoke River (tidal)	02130202	inconclusive (n<10)	Already listed in Category 5 for Nutrients
Big Annemessex River (tidal)	02130207	inconclusive (n<10)	Already listed in Category 5 for Nutrients
Manokin River (tidal)	02130208	inconclusive (n<10)	Already listed in Category 5 for Nutrients
Monie Bay	02130302	inconclusive (n<10)	Already listed in Category 5 for Nutrients
Marshyhope Creek (tidal)	02130306	inconclusive (n<10)	Already listed in Category 5 for Nutrients
Fishing Bay	02130307	inconclusive (n<10)	Already listed in Category 5 for Nutrients
Honga River (tidal)	02130401	inconclusive (n<10)	Already listed in Category 5 for Nutrients
Little Choptank River (tidal)	02130402	inconclusive (n<10)	Already listed in Category 5 for Nutrients
Upper Choptank River (tidal)	02130404	inconclusive (n<10)	Already listed in Category 5 for Nutrients
Eastern Bay	02130501	inconclusive (n<10)	Already listed in Category 5 for Nutrients
Wye River (tidal)	02130503	inconclusive (n<10)	Already listed in Category 5 for Nutrients
Langford Creek (tidal)	02130506	inconclusive (n<10)	Already listed in Category 5 for Nutrients

8-DIGIT WATERBODIES ASSESSED WITH BAY IBI LISTING METHODOLOGY AQUATIC LIFE USE STANDARD			
Basin Name	**Basin Code**	**Assessment Status**	**Comments**
Corsica River (tidal)	02130507	inconclusive (n<10)	Already listed in Category 5 for Nutrients
Southeast Creek (tidal)	02130508	inconclusive (n<10)	Already listed in Category 5 for Nutrients
Middle Chester River (tidal)	02130509	inconclusive (n<10)	Already listed in Category 5 for Nutrients
Upper Chester River (tidal)	02130510	inconclusive (n<10)	Already listed in Category 5 for Nutrients
Lower Elk River (tidal)	02130601	inconclusive (n<10)	Already listed in Category 5 for Nutrients
Bohemia River (tidal)	02130602	inconclusive (n<10)	Already listed in Category 5 for Nutrients
Upper Elk River (tidal)	02130603	inconclusive (n<10)	Already listed in Category 5 for Nutrients
Northeast River (tidal)	02130608	inconclusive (n<10)	Already listed in Category 5 for Nutrients
Sassafras River (tidal)	02130610	inconclusive (n<10)	Already listed in Category 5 for Nutrients
Lower Susquehanna River (tidal)	02120201	inconclusive (n<10)	Already listed in Category 5 for Nutrients
Bush River (tidal)	02130701	inconclusive (n<10)	Already listed in Category 5 for Nutrients
Middle River-Browns Creek (tidal)	02130807	inconclusive (n<10)	Already listed in Category 5 for Nutrients

8-DIGIT WATERBODIES ASSESSED WITH BAY IBI LISTING METHODOLOGY AQUATIC LIFE USE STANDARD			
Basin Name	**Basin Code**	**Assessment Status**	**Comments**
Back River (tidal)	02130901	inconclusive (n<10)	Already listed in Category 5 for Nutrients
South River (tidal)	02131003	inconclusive (n<10)	Already listed in Category 5 for Nutrients
West River (tidal)	02131004	inconclusive (n<10)	Already listed in Category 5 for Nutrients
Patuxent Mainstem-Ferry Lndg to Rt 214 (tidal)	02131102	inconclusive (n<10)	Already listed in Category 5 for Nutrients
St. Mary's River (tidal)	02140103	inconclusive (n<10)	Already listed in Category 5 for Nutrients
Breton Bay	02140104	inconclusive (n<10)	Already listed in Category 5 for Nutrients
St. Clements Bay	02140105	inconclusive (n<10)	Already listed in Category 5 for Nutrients
Wicomico River (tidal)	02140106	inconclusive (n<10)	Already listed in Category 5 for Nutrients
Nanjemoy Creek (tidal)	02140110	inconclusive (n<10)	Already listed in Category 5 for Nutrients
Mattawoman Creek (tidal)	02140111	inconclusive (n<10)	Already listed in Category 5 for Nutrients

3.3 2004 303(d) bacterial listing changes

Use I waters were reassessed for fecal coliform bacteria standards using the long-term geometric mean. The analysis included the most recent data (up to five years), with a minimum of one-year datasets.

EPA's draft guidance document titled "Implementation Guidance for Ambient Water Quality Criteria for Bacteria"[5] states that in terms of criteria setting, the targeted level of protection is the illness rate, and the most direct measurement of the relationship between bacteria levels and illness rates is the geometric mean of bacteria levels during the recreational season (USEPA 2002). EPA also specifies that the best way to interpret a series of measurements taken over a period of time is the comparison to the geometric mean, whereas the best way to interpret any single measurement is in comparison to the confidence level associated with the distribution around the mean. Because the Use I waters may experience contact recreation throughout the year, the long-term geometric mean is substituted for the recreational season.

Based on EPA's risk assessment and interpretation of bacteriological data, the State fecal coliform standard of 200 MPN/100 ml meets the accepted illness risk for water contact and recreation (USEPA, 1986). EPA's evaluation of bacteriological data indicated that the fecal coliform group at a geometric mean of 200 most probable number (MPN)/100 ml would cause an estimated 8 illnesses/ 1,000 swimmers at freshwater beaches and 19 illnesses/ 1,000 swimmers at marine beaches (USEPA, 1986).

The rationale for using the previous five point moving average listing methodology was based on the State fecal coliform standard and an interpretation of COMAR 26.08.02.03-3.A(1)(a), wherein the data requirement is specified as "not less than five samples taken over any 30-day period" [2002 303(d) List]. Available resources limit the sampling frequency for many of Maryland's Use I waters. Therefore, the five point moving average was substituted for the five samples in 30 days. However, based on interpretation of current guidance from EPA, the long-term geometric mean is now applied for assessment and attainment purposes (USEPA, 2002). The Bacteria Listing Methodology was adjusted to accommodate this modification under section 8.4.4 INTERPRETATION OF FECAL COLIFORM DATA FOR USE I, III OR IV WATERS (see Appendix C) by deleting "five-point moving average " from the text and adding long-term geometric mean.

Based on long-term geometric mean analysis of fecal coliform, supported by E. coli analysis when available, the following Use I waters have been delisted on the 2004 303(d) List:

1. Loch Raven Reservoir (02130805) - Long-term geometric mean 104 and 140 MPN/100ml at stations GUN0258 and GUN0125, respectively.
2. Liberty Reservoir (02130907) - Long-term geometric mean 193 MPN/100ml at station NPA0165
3. Patapsco River L N Br. (02130906) – Long-term geometric mean 87 and 118 MPN/100ml at stations PAT0285 and PAT0176.
4. Potomac River MO County (02140202) - Long-term geometric mean 149, 67 and 43 MPN/100ml at stations POT1184, POT1471, and POT1472, respectively.
5. Potomac River FR County (02140301) Long-term geometric mean 68 MPN/100ml at station POT1596.
6. Patuxent River upper (02131104) – Long-term geometric mean 129 MPN/100ml at station PXT0603.
7. Conowingo Dam Susq R. (02120404) – Long-term geometric mean 27 MPN/100ml at station SUS0109.

[5] USEPA. 2002. Implementation Guidance for Ambient Water Quality Criteria for Bacteria: Draft. U.S. Environmental Protection Agency. Office of Water, Washington, D.C. EPA-823-B-02-003.

8. Youghiogheny River (05020201) - Long-term geometric mean 58 and 176 MPN/100ml at stations YOU0920 and YOU1139, respectively.

Although Cabin John Creek (02140207) now also meets the standards for fecal coliform, it will remain on the 303(d) List because of questionable results. Two water bodies with bacteria impairments will be added to the 2004 303(d) List based on long-term geometric mean analysis of fecal coliform.

1. Catoctin Creek (02140305) is added based on the results of two stations (CAC0148 and CAC0031). The long-term geometric mean was 516 MPN/100ml and 379 MPN/100 ml respectively, based on 16 samples at each station.
2. Cranberry Branch (021309071061) is added based on four stations (Park, Reservoir, WTP, and Farm). The long-term geometric mean was 261 MPN/100ml, 367 MPN/100ml, 199/100ml MPN, and 490/100ml MPN respectively.

The public review period for the 303(d) delistings and additions coincides with the 303(d) List review period beginning December 1st . The change in the listing methodology is also subjected to public review during this period.

References:

USEPA. 1986. Ambient Water Quality Criteria for Bacteria-1986. U.S. Environmental Protection Agency. EPA-440/5-84-002.

3.4 Bacteria Shellfish Water Adjustments

Some changes were made this year to bacterial shellfish listings due to analysis of MDE's 2003 shellfish monitoring data. MDE is compiling and summarizing all supporting data for submittal to EPA. These changes to the bacterial listings are proposed in the current 2004 List to give the public and interested stakeholders sufficient time for review and comment now, rather than initiating a separate public review process for this effort when all monitoring data are readily available. All supporting data will be made available prior to finalization of the 2004 List and in time to respond to any comments.

3.4.1 Water Body Type Designations

The State of Maryland has different water quality criteria for fecal coliform in shellfish (Use II waters) and beach areas (Use I waters). Accordingly, two new water body types for bacterial listings were added to the 2004 List. Waters that are shellfish harvesting waters have been given a "Tidal Shellfish Area" designation; swimming areas have been given a "Public Beaches" designation. All other water bodies that are Use I waters but are not designated swimming or shellfish harvesting areas have not been changed. These revised water body type designations will better provide the public and interested stakeholders specific information about which fecal coliform standard is being applied to bacteria impaired waters.

The two water bodies changed to a "Public Beaches" designation were moved to Category 3a of the list requiring more data to confirm impairment. The Nanticoke River, basin code 02130505, Cove Road Beach area, is a public swimming water and may be safe for swimming even if not

for shellfish consumption. The larger 8-digit Nanticoke is still in Category 5 of the List as a Tidal Shellfish Area. The second public beach, Choptank Marine Beach in the Upper Choptank River (basin 02130404, has also been moved to Category 3a. Both of these beaches will soon be reassessed with the implementation of MDE's Beaches Program.

3.4.2 Geographical Scale of Listing for Shellfish Harvesting Waters

MDE adopted the same 12-digit watershed scale approach for bacterial listings that has been used for listing biologically impaired waters. Where data supports this approach, both new listings and clarifications of older listings were made at 12-digit watershed scale. The 12-digit watershed scale is better aligned with the actual designated shellfish harvesting areas, will give the public a more accurate portrayal of the impaired region, and will assist in focusing future TMDL development and monitoring to the precise region of concern.

3.4.3 New and Revised Listings to Tidal Shellfish Areas

3.4.3.1 New Listings

Only two new 12-digit watersheds have been listed for shellfish harvesting restriction in 2004. Two of these listings are in the Potomac River lower tidal basin (02140101, Figure 4). The first watershed is Tall Timbers Cove, subbasin code 021401010697, and Whites Neck Creek, subbasin code 021401010702 (Figure 5), as shown in Figures 4 and 5

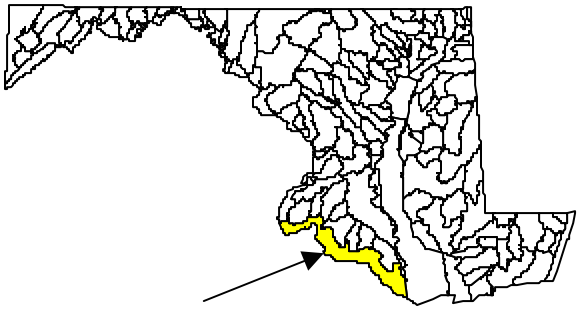

Figure 4: Maryland 8-digit basin map highlighting the Potomac River lower tidal basin (02140101).

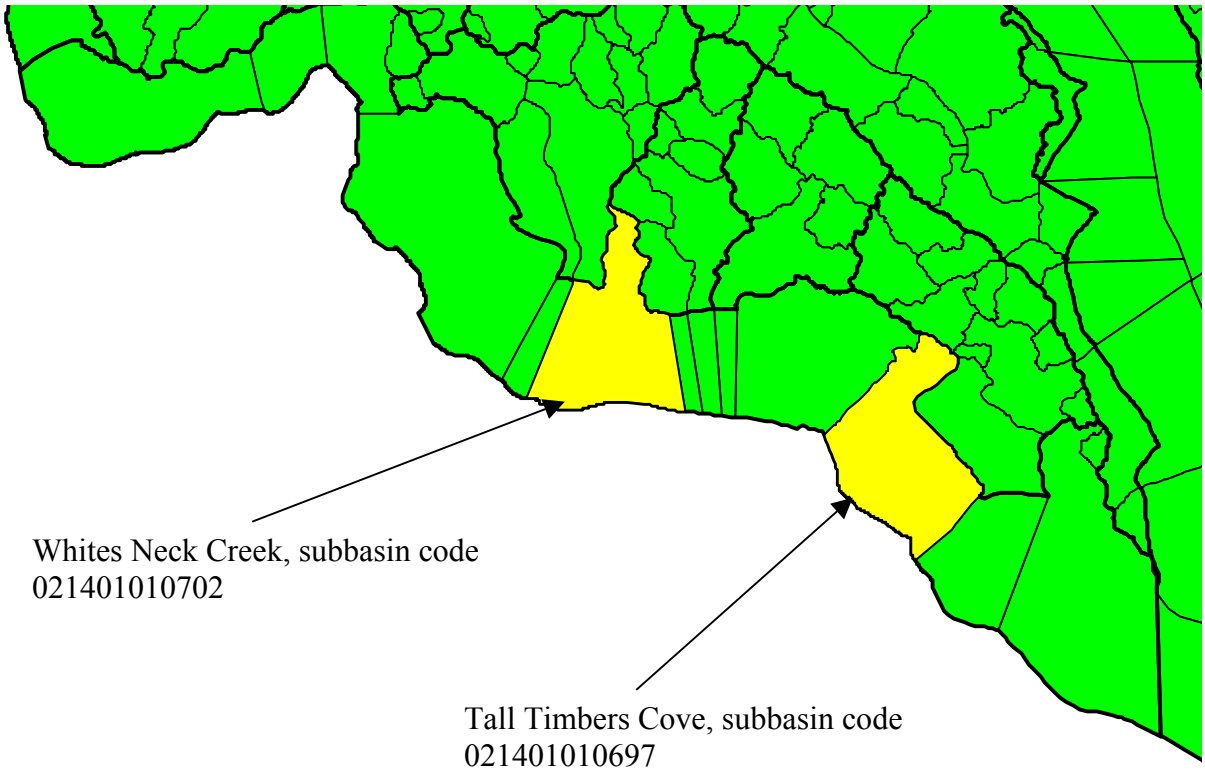

Figure 5: Potomac River lower tidal basin with the two bacterial impaired shellfish waters of Whites Neck Creek and Tall Timbers Cove.

3.4.3.2 Revised Listings

MDE's Shellfish Monitoring Program had sufficient data to reassess all shellfish harvesting waters. As a result, some waters were completely delisted, others were delisted at the 8-digit scale and relisted on the 12-digit scale, and others were retained at the 8-digit scale but had several 12-digit basins added to clarify the precise area of impairment. Eight-digit waters completely delisted in 2004 were based upon recent data indicating that these watersheds meet the bacterial standard for shellfish harvesting waters or that they were erroneously listed as restricted rather than conditionally approved. MDE does not list conditionally approved waters (see Appendix C, Section 8.4). Waters that were delisted at the 8-digit scale and had one or more 12-digit impairments listed in their place are also based upon recent data indicating that only specific subbasins within this larger 8-digit area fail to meet shellfish bacterial standards. In the last case where the original 8-digit listing was retained and further clarifying 12-digit waters have been listed, MDE currently lacks sufficient data to make an 8-digit delisting but has included further clarifying data pinpointing impaired subbasins. All refinements and clarifications of earlier listings still retain the original listing date (i.e., mostly 1996 listings). Table 8 serves as a guide for following these revisions.

Table 8: Bacteria Shellfish Water Adjustments

8-digit Basin Name	8-digit Basin Code	12-digit Basin Code	12-digit Basin Name	List Status	Comments
Monie Bay	02130302	021303020544		Delist - Category 6	adjusted from restricted to conditional, erroneously listed
Langford Creek	02130506	021305060405		Delist - Category 6	adjusted from restricted to conditional, erroneously listed
Assawoman Bay	02130102	N/A		Delist - Category 6	meets standards for shellfish waters
Sinepuxent Bay	02130104	N/A		Delist - Category 6	meets standards for shellfish waters
Newport Bay	02130105	N/A		Delist - Category 6	meets standards for shellfish waters
Chincoteaque Bay	02130106	N/A		Delist - Category 6	meets standards for shellfish waters
Kent Island Bay	02130511	N/A		Delist - Category 6	meets standards for shellfish waters
Baltimore Harbor	02130903	021309031006	Rock Creek	Delist - Category 6	erroneously listed as shellfish waters, meets Use I standards
St.Mary's River	02140103			Delist - Category 6	St. Mary's River delisted at the 8-digit scale. Individual 12-digit basins are listed in its place.
Breton Bay	02140104			Delist - Category 6	Breton Bay delisted at the 8-digit scale. Individual 12-digit basin listed in its place.
Wicomico River	02140106			Delist - Category 6	Wicomico River delisted at the 8-digit scale. Individual 12-digit basins listed in its place.
Honga River	02130401			Delist - Category 6	Honga River delisted at the 8-digit scale. Individual 12-digit basins listed in its place.
Little Choptank River	02130402			Delist - Category 6	Little Choptank River delisted at the 8-digit scale. Individual 12-digit basins listed in its place.
Eastern Bay	02130501			Delist - Category 6	Eastern Bay delisted at the 8-digit scale. Individual 12-digit basins listed in its place.
upper Choptank River	02130404	N/A		move to Category 3	erroneously listed as shellfish waters, may meet Use I standards

8-digit Basin Name	8-digit Basin Code	12-digit Basin Code	12-digit Basin Name	List Status	Comments
St.Mary's River	02140103	021401030710	St. Inigoes Creek	Add to Category 5	Added as separate 12-digit listing
St. Mary's River	02140103	021401030709	Carthagena Creek	Add to Category 5	Added as separate 12-digit listing
St. Mary's River	02140103	021401030709	Locust Grove Cove	Add to Category 5	Added as separate 12-digit listing
Magothy River	02131001	021310011004	Tar Cove	Add to Category 5	Added as a separate 12-digit listing to the 8-digit Magothy River listing.
Magothy River	02131001	021310011003	Forked Creek	Add to Category 5	Added as a separate 12-digit listing to the 8-digit Magothy River listing.*
Magothy River	02131001	021310011003	Deep Creeks	Add to Category 5	Added as a separate 12-digit listing to the 8-digit Magothy River listing.*
Severn River	02131002	021310020997	Mill, Whitehall and Meredith Creeks	Add to Category 5	Added as a separate 12-digit listing to the 8-digit Severn River listing.*
Severn River	02131002	021310020997	Mill Creek	Add to Category 5	Added as a separate 12-digit listing to the 8-digit Severn River listing.*
South River	02131003	021310030990	Duvall Creek	Add to Category 5	Added as a separate 12-digit listing to the 8-digit South River listing.
South River	02131003	021310030989	Ramsey Lake	Add to Category 5	Added as a separate 12-digit listing to the 8-digit South River listing.*
South River	02131003	021310030989	Selby Bay	Add to Category 5	Added as a separate 12-digit listing to the 8-digit South River listing.*
West River	02131004	021310040986	Bear Neck Creek	Add to Category 5	Added as a separate 12-digit listing to the 8-digit West River listing.*
West River	02131004	021310040986	Cadle Creeks	Add to Category 5	Added as a separate 12-digit listing to the 8-digit West River listing.*
West River	02131004	021310040984	Parish Creek	Add to Category 5	Added as a separate 12-digit listing to the 8-digit West River listing.
Breton Bay	02140104	021401040720	Cherry Cove Creek	Add to Category 5	Added as separate 12-digit listing

8-digit Basin Name	8-digit Basin Code	12-digit Basin Code	12-digit Basin Name	List Status	Comments
St. Clements Bay	02140105	021401050725	St. Patrick Creek	Add to Category 5	Added as separate 12-digit listing to the 8-digit St. Clements Bay listing.*
St. Clements Bay	02140105	021401050725	Canoe Neck Creek	Add to Category 5	Added as separate 12-digit listing to the 8-digit St. Clements Bay listing.*
Wicomico River	02140106	021401060733	Charleston Creek	Add to Category 5	Added as separate 12-digit listing
Wicomico River	02140106	021401060732	Chaptico Creek	Add to Category 5	Added as separate 12-digit listing
Manokin River	02130208	021302080657	St. Peter's Creek	Add to Category 5	Added as separate 12-digit listing
Honga River	02130401	021304010446	Back Creek	Add to Category 5	Added as separate 12-digit listing
Little Choptank River	02130402	021304020452	Church Creek	Add to Category 5	Added as separate 12-digit listing
Eastern Bay	02130501	021305010429	Little Creek	Add to Category 5	Added as separate 12-digit listing*
Eastern Bay	02130501	021305010429	Shipping Creek	Add to Category 5	Added as separate 12-digit listing*
Miles River	02130502	021305020439	Leeds Creek	Add to Category 5	Added as separate 12-digit listing*
Miles River	02130502	021305020439	Hunting Creek	Add to Category 5	Added as separate 12-digit listing*
Kent Narrows	02130504	021305040429	Little Creek	Add to Category 5	data supports modifying from 8 to 12-digit for TMDL development
Kent Narrows	02130504	021305040431	Wells Cove	Add to Category 5	data supports modifying from 8 to 12-digit for TMDL development
Lower Choptank River	02130403	021304030462	Tred Avon River	Add to Category 5	data supports modifying from 8 to 12-digit for TMDL development
Lower Choptank River	02130403	021304030461	Tar Creek	Add to Category 5	data supports modifying from 8 to 12-digit for TMDL development

8-digit Basin Name	8-digit Basin Code	12-digit Basin Code	12-digit Basin Name	List Status	Comments
Lower Choptank River	02130403	021304030457	San Domingo Creek	Add to Category 5	data supports modifying from 8 to 12-digit for TMDL development
Lower Choptank River	02130403	021304030458	Jenkins Creek	Add to Category 5	Added as separate 12-digit listing*
Lower Choptank River	02130403	021304030458	Indian Creek	Add to Category 5	Added as separate 12-digit listing*
Lower Choptank River	02130403	021304030466	Warwick River	Add to Category 5	data supports modifying from 8 to 12-digit for TMDL development
Lower Choptank River	02130403	021304030455	Cummings Creek	Add to Category 5	data supports modifying from 8 to 12-digit for TMDL development
Lower Choptank River	02130403	021304030455	Northeast Branch	Add to Category 5	data supports modifying from 8 to 12-digit for TMDL development
Lower Choptank River	02130403	021304030458	Whitehall Creek	Add to Category 5	Added as separate 12-digit listing*
Lower Choptank River	02130403	021304030458	Goose Creek	Add to Category 5	Added as separate 12-digit listing*
Patuxent River lower	02131101	021311010874	Cuckold Creek	Add to Category 5	adjusted from conditional to restricted
Patuxent River lower	02131101	021311010873	Solomons Island Harbor	Add to Category 5	data supports modifying from 8 to 12-digit for TMDL development
Patuxent River lower	02131101	021311010871	Harper and Parson Creeks	Add to Category 5	data supports modifying from 8 to 12-digit for TMDL development
Patuxent River lower	02131101	021311010871	Goose Creek	Add to Category 5	data supports modifying from 8 to 12-digit for TMDL development
Patuxent River lower	02131101	021311010887	Indian Creek	Add to Category 5	data supports modifying from 8 to 12-digit for TMDL development
Patuxent River lower	02131101	021311010872	Town Creek	Add to Category 5	data supports modifying from 8 to 12-digit for TMDL development
Patuxent River lower	02131101	021311010877	St. Thomas Creek	Add to Category 5	data supports modifying from 8 to 12-digit for TMDL development

8-digit Basin Name	8-digit Basin Code	12-digit Basin Code	12-digit Basin Name	List Status	Comments
Patuxent River lower	02131101	021311010878	Island Creek	Add to Category 5	data supports modifying from 8 to 12-digit for TMDL development
Patuxent River lower	02131101	021311010884	Trent Hall Creek	Add to Category 5	data supports modifying from 8 to 12-digit for TMDL development
Patuxent River lower	02131101	021311010884	Washington and Persimmon Creeks	Add to Category 5	data supports modifying from 8 to 12-digit for TMDL development
Patuxent River lower	02131101	021311010879	Battle Creek	Add to Category 5	data supports modifying from 8 to 12-digit for TMDL development

* Indicates that a 12-digit water body was listed multiple times due to the unique hydrology of the basin and which necessitates multiple TMDLs/models in one 12-digit watershed.

3.5 Nutrient Listing Changes

EPA Region III approved the TMDL for Biochemical Oxygen Demand (BOD) and Phosphorus for an Unnamed Tributary of La Trappe Creek (UTLTC) and the in-stream pond (basin code 021304030463). A third TMDL for nutrients in Southeast Creek (basin code 02130508) was also approved by EPA. For specific details concerning these TMDLs go to the following links (http://www.mde.state.md.us/Programs/WaterPrograms/TMDL/Pub_Notice/tmdl_pubnotice_southeastcreek.asp and http://www.mde.state.md.us/Programs/WaterPrograms/TMDL/Pub_Notice/tmdl_pubnotice_la_trappe.asp). These waters will be placed in Category 4a of the List as having a completed TMDL.

3.6 Mercury Impairment Additions

The CWA and Maryland regulations require the State to maintain water quality that supports fish, other aquatic life, and fishing. The U.S. EPA interprets the "fishable" use under Section 101(a) of the CWA to include, at a minimum, the protection of aquatic communities and human health related to the consumption of fish and shellfish. In other words, "fishable" means that not only can fish and shellfish survive in a water body, but when harvested, can also be safely eaten by humans and terrestrial wildlife (OWOW Memorandum # WQSP-00-03, October 2000).

Based on mercury data in fish tissue from a subset of lakes across the State, MDE announced a statewide fish consumption advisory for lakes in 2001. This advisory has been established statewide as a precautionary measure because the primary source of mercury is atmospheric deposition, which is widely dispersed.

In fish tissue, mercury is not usually found in concentrations high enough to cause fish to exhibit signs of toxicity, but the mercury in sport fish (trophic level 4) can present a potential health risk to humans. The health risk to humans represented by the mercury content in consumed fish tissue is due to methylmercury. Typically, almost all of the mercury found in fish tissue (90 to

95%) is in the methylmercury form. Mercury chemistry in the environment is complex and not totally understood. Mercury exhibits the properties of a metal, specifically, persistence in the environment because it is not chemically broken down beyond the elemental mercury form (Hg^0) or its ionic forms (Hg^+ and Hg^{+2}). It also has properties similar to a hydrophobic organic chemical due to its ability to be methylated through a bacterial process. Methylation of mercury can occur in water, sediment, and soil solution under anaerobic conditions and, to a lesser extent, under aerobic conditions. In water, methylation occurs mainly at the water-sediment interface and at the oxic-anoxic boundary within the water column. Methylmercury is readily taken up by organisms and will bioaccumulate, as it has a strong affinity for muscle tissue. It is effectively transferred through the food web, with tissue concentrations magnifying at each trophic level. This process can result in high levels of mercury in organisms high on the food chain, despite trace mercury/methylmercury concentrations in the water column.

For public health purposes, MDE has the responsibility to monitor and evaluate the contaminant levels in Maryland fish, shellfish, and crabs, and to determine if contaminant levels are within the limits established as safe for human consumption. In fulfillment of this public health responsibility, MDE has issued a statewide fish consumption advisory for mercury in fish. This advisory provides guidelines (Table 9) on fish consumption (allowable meals per month, not including commercially harvested fish) for recreational anglers and their families, and includes fish species in publicly accessible lakes and impoundments.

Table 9: Maryland Department of the Environment Fish Consumption Guidelines

Total mercury in fish tissue residue Range (μg/kg)	**Recommended fish consumption meals per month (based on an 8 oz. meal size)**
117 – 235	7 - 4
236 - 322	3
322 – 409	2
410 – 939	1
> 939	< 1

These guidelines were developed, in part, to be protective for neurobehavioral effects during human fetal development and early childhood. An 8 ounce meal size is recommended for the general population. Recommended meal sizes for women of childbearing age and children (0-6 years) are 6 ounces and 3 ounces, respectively.

Levels of mercury (methyl or total) in fish tissue above an arithmetic mean of 300 μg/kg are an indication of impairment. MDE proposes to adopt this 300 μg/kg arithmetic mean threshold to replace the 235 μg/kg geometric mean threshold for listing waters impaired by mercury in 2002. This threshold is consistent with EPA standards. No existing TMDLs will be affected since they all have an arithmetic mean greater than 300μg/kg.

MDE's adoption of the EPA's 300 ug/kg threshold for mercury is consistent with recent information received from a statewide survey (collaborative – MDE/JHU/CBF) of licensed recreational fishermen. The results of the survey indicate that over 65 % of the respondents

(~400) eat 2 or less meals per month, and approximately 35% eat more than 2 meals per month. The decision to use 235 ug/kg for the MeHg TMDLs was not based on actual consumption data, rather it was based on anecdotal information that MD fisher-people and their families consume more than the nationwide average of 2 meals per month. The findings of the MDE survey are consistent with a survey performed in Delaware (contact Rick Greene for more info) that demonstrated that the consumption rate was 17.8 g/day. The Department feels that the survey findings justify the adoption of EPA's proposed threshold. The Department will still use the 235 ug/kg threshold as a TMDL goal, and the difference between the 300 and 235 will be a MOS. From this point forward, listing decisions will be made based on the basis of tissue concentrations greater than 300 ug/kg.

To determine if a water body is impaired, the contaminant concentration from a composite sample of fish fillets of any single common species of recreational fish is compared to the established threshold. Maryland collects composite samples of trophic level 4 fish (e.g., largemouth bass) of legally harvestable size. If the threshold is exceeded, the water body's designated use (i.e. fishable) is not met and the water body is considered impaired.

Based upon this methodology, Maryland has determined that the following two water bodies should be added to the 2004 303(d) List as impaired by methylmercury in fish tissue:

1. Cash Lake (basin number 02131104), located in Prince George's County. The mean of two composite samples (n = 4 per sample) collected from Cash Lake has been calculated as 337 μg/kg.
2. Millington Wildlife Management Area Ponds (basin number 02130510). The mean of two composite samples (n = 4 per sample) collected from the Millington Wildlife Management Area Ponds has been calculated as 341 μg/kg.

3.7 Toxic Water Quality Analysis

WQAs were performed on five previously listed water bodies in an effort to corroborate unconfirmed 1996 heavy metal impairment listings. On September 24th, 2003 these documents were submitted to EPA. The WQAs indicate that heavy metal impairments are not apparent in either the water column or the sediment. The WQAs support the conclusion that TMDLs are not necessary and all five water bodies will be de-listed on the 2004 303(d) List. WQAs are subject to a review and comment period similar to the TMDL process.

The first WQA shows that water quality standards are being achieved in the Liberty Reservoir impoundment (basin code 02130907) for chromium (Cr) and lead (Pb). Water column samples collected from May 2001 to July 2001 at four monitoring stations in the Liberty Reservoir demonstrate that numeric water quality criteria are being met. Bottom sediment samples collected at four monitoring stations, and used for bioassay toxicity tests, demonstrate no impacts on survival and growth of benthic organisms. Barring the receipt of any contradictory data, this information provides sufficient justification to revise Maryland's 303(d) List to remove Cr and Pb as impairing substances in the Liberty Reservoir impoundment.

The range of concentrations for Cr and Pb sampled in the Liberty Reservoir impoundment are included below. For comparison, Table 10 lists the water quality criteria for several metals.

Cr = ND to 0.21 µg/l
Pb = ND to 0.041 µg/l

Table 10: Numeric Water Quality Criteria (Metals)

Metal	Fresh Water Aquatic Life Acute Criteria (µg/l)	Fresh Water Aquatic Life Chronic Criteria (µg/l)	Human Health Criteria Fish Consumption (µg/l)
As	340	150	41
Cd	4.3	2.2	-
Cr (VI)	16	11	-
Cu	13	9	1,300
Hg	1.4	0.77	0.051
Ni	470	52	4,600
Pb	65	2.5	-
Se	20	5	11000
Zn	120	120	69,000

The second WQA shows that water quality standards are being achieved in the Loch Raven Reservoir impoundment (basin code 02130805) for heavy metals. Water column samples collected from May 2001 to July 2001 at five monitoring stations in the Loch Raven Reservoir demonstrate that numeric water quality criteria are being met. Bottom sediment samples collected at five monitoring stations, and used for bioassay toxicity tests, demonstrate no impacts on survival and growth of benthic organisms. Barring the receipt of any contradictory data, this information provides sufficient justification to revise Maryland's 303(d) List to remove metals as impairing substances in the Loch Raven Reservoir impoundment.

Mercury concentrations in the water column were not analyzed since a TMDL for mercury had already been submitted to EPA in 2002. The range of concentrations for metals sampled in Loch Raven Reservoir are as follows:

As = ND to 0.33 µg/l
Cd = ND to 0.01 µg/l
Cr = ND to 0.24 µg/l
Cu = 0.45 to 0.76 µg/l
Ni = 0.09 to 0.64 µg/l
Pb = ND to 0.02 µg/l
Se = ND to 0.51 µg/l
Zn = ND to 7.79 µg/l

The third WQA shows that water quality standards are being achieved in Lower Gunpowder Falls (basin code 02130802) for heavy metals. Water column samples collected at five monitoring stations in the Lower Gunpowder Falls, from May 2001 to April 2002, demonstrate that numeric water quality criteria are being met. Barring the receipt of any contradictory data, this information provides sufficient justification to revise Maryland's 303(d) List to remove metals as impairing substances in the Lower Gunpowder Falls.

The range of concentrations for metals sampled in the Lower Gunpowder Falls are as follows:

As = ND to 0.6 µg/l

Cd = ND to 0.019 µg/l
Cr = ND to 1.04 µg/l
Cu = 0.31 to 2.98 µg/l
Hg = 0.0004 to 0.0024 µg/l
Ni = ND to 1.45 µg/l

The fourth WQA shows that water quality standards are being achieved in Middle River (basin code 02130807) for cadmium (Cd) and lead (Pb). Water column samples collected at five monitoring stations in the Middle River, from May 2001 to April 2002, demonstrate that numeric water quality criteria are being met. Bottom sediment samples collected at seven monitoring stations, and used for bioassay toxicity tests, demonstrate no impacts on survival and growth rates, and reproduction impacts at one of the seven stations. In light of the other information, this one reproduction finding is not considered of significance in regard to a determination of toxicity. Barring the receipt of any contradictory data, this information provides sufficient justification to revise Maryland's 303(d) List to remove Cd and Pb as impairing substances in the Middle River.

The range of water concentrations for Cd and Pb sampled in the field survey are as follows:

Cd = ND to 3.38 µg/l
Pb = 0.004 to 1.02 µg/l

Similarly, measurable amphipod growth rates observed in the field sediment samples, which ranged from 0.035 to 0.049, were not significantly different than the growth rate of 0.046 observed in the control sample [$p < 0.05$]. Therefore, no sediment samples exhibited toxicity contributing to a reduction in growth.

Amphipod reproduction rates were not significantly different than the control samples, with the exception of one station, MR01. The control sample exhibited a reproduction rate of 3.3 neonates per survivor, in contrast to 0.7 neonates per survivor at MR01 [$p< 0.05$]. However, this low reproductive rate is puzzling due to the station's location at the mouth of the Middle River. This station has significant interaction with Chesapeake Bay waters; therefore it is unlikely that this observation is due to potential sources of sediment toxicity originating from the Middle River. The significance of this finding is minimal because the population dynamics of *L. plumulosus*, as well as most benthic invertebrates, are classified as "r strategists". Their population dynamics are characterized by rapid growth in population before falling off rapidly. Due to their opportunistic nature, amphipod species will relocate to regions of reduced population. In addition, sufficient compensatory reproductive capacity exists in the Middle River as demonstrated by amphipod reproduction rates at the remaining six stations.

Table 11: Sediment Toxicity Test Results

Sample	Amphipod Survival (#)	Amphipod Growth Rate (mg/day)	Neonates (#)	Average Amphipod Survival (%)	Average Amphipod Growth Rate (mg/day)	Average Neonates/survivor
Control A	18	0.052	61			
Control B	15	0.057	75			
Control C	16	0.05	46	84	0.046	3.3
Control D	20	0.036	80			
Control E	15	0.035	30			
MR-01	17	0.022	5			
MR-01	17	0.031	0			
MR-01	17	0.049	22	85	0.035	0.7*
MR-01	17	0.033	14			
MR-01	17	0.041	21			
MR-02	19	0.055	34			
MR-02	16	0.044	28			
MR-02	20	0.049	33	91	0.047	1.5
MR-02	16	0.053	25			
MR-02	20	0.036	18			
MR-03	18	0.05	66			
MR-03	19	0.055	113			
MR-03	13	0.055	40	90	0.049	3.3
MR-03	20	0.036	20			
MR-03	20	0.048	59			
MR-04	15	0.038	42			
MR-04	19	0.045	48			
MR-04	15	0.037	12	78	0.043	3
MR-04	19	0.04	51			
MR-04	10	0.057	63			
MR-05	17	0.051	32			
MR-05	18	0.044	77			
MR-05	19	0.044	63	75	0.047	3.1
MR-05	10	0.039	24			
MR-05	11	0.059	40			
MR-06	19	0.071	71			
MR-06	15	0.07	49			
MR-06	16	0.056	96	85	0.064	3.6
MR-06	16	0.062	37			
MR-06	18	0.059	46			
MR-07	13	0.056	21			
MR-07	15	0.05	16			
MR-07	19	0.049	107	85	0.052	2.7
MR-07	20	0.048	39			
MR-07	18	0.056	54			

The fifth WQA shows that water quality standards are being achieved in Prettyboy Reservoir Impoundment (basin code 02130806) for heavy metals. Water column samples collected from May 2001 to July 2001 at five monitoring stations in the Prettyboy Reservoir demonstrate that numeric water quality criteria are being met. Bottom sediment samples collected at two monitoring stations, and used for bioassay toxicity tests, demonstrate no impacts on survival and growth of benthic organisms. Barring the receipt of any contradictory data, this information provides sufficient justification to revise Maryland's 303(d) List to remove metals as impairing substances in the Prettyboy Reservoir impoundment.

Mercury concentrations in the water column were not analyzed since a TMDL for mercury had already been submitted to EPA in 2002. The range of concentrations for metals sampled in the Prettyboy Reservoir Impoundmentare as follows:

As = ND to 0.26 µg/l
Cd = ND to 0.08 µg/l
Cr = ND to 0.12 µg/l
Cu = 0.61 to 0.75 µg/l
Ni = 0.13 to 0.43 µg/l
Pb = ND to 0.1 µg/l
Se = ND to 0.37 µg/l
Zn = ND to 0.4 µg/l

3.8 Other De-listings and Revisions

3.8.1 Coastal Bays

In the 2002 List and with the approval of EPA (December 20th, 2002 MDE memo), the Department delisted DO impairments, and then used them as supporting data for previous nutrient 303(d) listings. This was only done for those waters that had a nutrient impairment that was likely causing depleted DO in bottom waters. This same approach is used in the current List to de-list Sinepuxent, Assawoman, Newport , Chincoteague and Isle of Wight Bays for dissolved oxygen (DO) since they are already listed for Nutrients. For these and the earlier revisions, low DO is cited in the notes for the nutrient impairment.

3.8.2 Baltimore Harbor

Baltimore Harbor was originally listed for toxics in 1996. In 1998, MDE conducted targeted sampling in the Harbor to refine this general toxics listing and identify the specific pollutants impairing the Harbor. This resulted in three new 1998 metals listings for lead, chromium and zinc (Zn). As a result, the original 1996 toxics listing should have been de-listed. This original 1996 listing, however, inadvertently remained on the List. MDE proposes to de-list the 1996 Baltimore toxics listing and leave the 1998 Pb, Cr and Zn listings in its place.

3.8.3 Sediment Listings

In 2002, the Department made a distinction in the sediment listings between "suspended sediment" and "sedimentation". "Suspended sediment' was considered a water column or turbidity impairment while sedimentation was supposed to identify the sediment deposition process that can impair benthic communities and habitat. Since the 2002 List, there has been confusion about the basis for this distinction and what methodology was used for making this determination. Because consistent data requirements and methodologies were not used to make a distinction among sediment impacts, MDE has opted to not make any distinction in sediment impairments but rather leave them listed as sediments. All sediment listings have thus been revised. Please refer to Section 8.6 of Appendix C for further information.

3.8.4 Tidal and Non-Tidal Listings

MDE proposes to change the water body status for two bacterial listings. Dividing Creek (basin 02130204) and the Wicomico River headwaters (basin 02130304) were erroneously listed as tidal waters when they should have been listed as non-tidal. Similar changes or revisions to the

water body type in future lists will likely occur as the Department analysis newer data and investigates the data sources used for prior listings.

3.8.5 Other Miscellaneous and Non-substantial Revisions

Some other slight changes in the 2004 Integrated List worth mentioning here include:

1. The Cherry Creek subbasin was added to the 1996 Deep Creek Lake listing for pH (basin code 05020203) in order to more accurately identify the region of impairment. The TMDL for Cherry Creek was submitted to EPA on December 17th, 2002.
2. The Lake Roland subbasin was added to the 1996 Jones Falls listing for chlordane (basin code 02130904) in order to more accurately identify the region of impairment. The TMDL for Lake Roland was submitted to EPA on November 9th, 2000 and approved on March 28th, 2001.
3. Cove Road Beach was added to the 1998 Nanticoke River listing for fecal coliform (basin code 02130305) in order to more accurately identify the region of impairment.
4. The Northwest Branch Inner Harbor was added to the 1998 BaltimoreHarbor listings for Cr, Zn and Pb in Harbor sediments (basin code 02130903) in order to more accurately identify the region for these impairments.
5. Scott Creek, a headwater stream in Maryland with 99% of its flow in Pennsylvania, was identified separately as a subbasin impaired by fecal coliform in the Conowingo Dam Susquehanna River (basin code 02120204). However, since the cause of the impairment is a faulty sewage pipe the water body was placed in Category 4b of the List as a technical fix.
6. The Youghiogheny River basin (basin code 05020201), Youghiogheny River Lake impoundment subbasin was listed separately from the Little Youghiogheny River basin (05020202), Broadford Lake impoundment listing for methyl mercury. These are actually the same water bodies but were listed independently due to confusion over the impoundment name and location. Accordingly, the Youghiogheny River listing was delisted and the more accurate Little Youghiogheny River/Broadford Lake listing was retained.