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

Corsica River Watershed Characterization

Excerpt Showing an Example of Biological Monitoring Information

October 2003

Biological Monitoring In Streams

The Maryland Biological Stream Survey (MBSS) sampled stream conditions in the Corsica River watershed in 1995 and 2000. Additionally, citizen volunteers in the Stream Waders program, which is associated with MBSS, assessed the benthic macroinvertebrate community at several sites in the watershed in 2000.

Results from these sampling efforts address three broad categories of stream conditions as listed below. The findings in each of these categories, which are each summarized on a separate map, allow comparison of stream conditions across the watershed:

– Fish as summarized in Map 14 MBSS Fish Index
– Benthic macroinvertebrates (benthos or stream bugs) Map 15 MBSS Benthic Index
– Physical habitat Map 16 Physical Habitat Index
– Table MBSS Findings for 2000 and 1995

Additionally, overall conditions in a stream or subwatershed may be interpreted by considering fish, benthos and physical habitat together. Several interpretations are offered below.

– Conditions that underlie the indices are complex and apply primarily to a local stream segment. No streams ranked as good or very poor for all indices. Typically, a stream segment ranks as a mix of good, fair, poor and/or very poor for the three indices.
– There is a tendency for good/fair conditions to be associated with watersheds with the least disturbance (natural vegetation, forest) and for poor/very poor conditions to be assoiciated with greater disturbance (impervious area, agriculture, construction sites).

Prior to creation of the MBSS method of assessment and random site selection technique, DNR used a biological assessment approach in nontidal steams known as rapid bio-assessment. While results of this assessment is not directly comparable to the current day MBSS data, it does provide a way to compare stream conditions during the early 1990s. The table DNR Rapid Bio-Assessment Data Summary lists these results.

DNR Rapid Bio-Assessment Data Summary [12]					
Location	**Sample Yr**	**Benthic**	**Habitat**	**Water Quality**	**Comments**
Old Mill Stream at Taylors Mill Road	1990, 92, 94, 96	good	good	fair/good	Excellent riparian area; heavy sediment load
Three Bridges Br. at Rt 213	1990. 92, 94, 96	poor/fair	poor/fair	fair/good	Good riparian area, heavy sediment load

Why Look at Benthos in Streams?

Unimpaired natural streams may support a great diversity of species like bacteria, algae, invertebrates like crayfish and insects to fish,birds, reptiles and mammals. All these groups of organisms have been extensively assessed relative to water quality and habitat quality. One group, benthic invertebrates, was found to serve as a good indicator of stream condition including water quality and habitat quality.

Benthic invertegrates are sometimes called "stream bugs" though that name overly simplifies the diverse membership of this group. This group includes mayflies, caddisflies, crayfish, etc., that inhabit the stream bottom, its sediments, organic debris and live on plant life (macrophytes) within the stream. Benthic macro-invertebrates are an important component of a stream's ecosystem.

The food web in streams relies significantly on benthic organisms. Benthos are often the most abundant source of food for fish and other small animals. Many benthic macroinvertebrates live on decomposing leaves and other organic materials in the stream. By this activity, these organisms are significant processors of organic materials in the stream. Benthos often provide the primary means that nutrients from organic debris are transformed to other biologically usable forms. These nutrients become available again and are transported downstream where other organisms use them.

Assessment of benthic organisms is a valuable tool for stream evaluation. This group of species has been extensively used in water quality assessment, in evaluating biological conditions of streams and in gauging influences on streams by surrounding lands. These organisms serve as good indicators of water resource integrity because they are fairly sedentary in nature and their diversity offers numerous ways to interpret conditions. They have different sensitivities to changing conditions. They have a wide range of functions in the stream. They use different life cycle strategies for survival.