

Habitat GIT meeting (10/22/14)

- Define what is meant by stream health and function
- Use of existing data to generate & inform stream health outcome.
- Interstate Commission on the Potomac River Basin (ICPRB) received funding to develop 2008 baseline (Chessie BIBI)
- MDE forthcoming requirement to generate information on stream functions from stream restoration projects
- Management Strategy should address the watershed, not just stream. Comment that the outcome should reflect actions taken throughout Bay watershed to restore stream health and function and not just stream restoration projects
- Document the rationale to adopt a stream functions-based approach, SFPF or other

Input from SHWG and Interested Parties (as of 12/5/14)

Management Strategy General Comments

- The management strategy needs to be developed **that prioritizes management actions to improve stream health and function** and measure the progress towards achieving the Stream Health (SH) outcome
- Address meeting stream health outcome to discuss the reality of the jurisdiction WIP commitments and the overlay with the outcome goal (what is happening now/reality and where we hope to be one day); address the role of practitioners who are actually doing the work and which methods within the area of practices they are relying
- Stream Health Work Group consider being an important integrator of information that could assist several goal teams (fisheries, habitat and water quality)
 - Are stream conditions adequate to support migratory fish populations as blockages are removed? (Close connection to both fish passage outcome and fish habitat outcome)
 - Are stream restoration efforts improving water quality?
 - Are restoration efforts improving habitat for benthic and fish communities?
- Stream function approach provides a nice framework to address these types of questions

Stream Health & Function

- As a starting point, approach to define stream health based on a short list of critical stream functions that can be related to state water quality standards or to stream designated uses (*water quality, biological, human use*)
 - Reflects what the States consider as important stream functions from the human perspective; ability to go beyond focus on Bay TMDL
- Two-fold approach: Provide a definition of stream health related to the 1) Bay TMDL to reduce nutrients and sediment and 2) ecological health representing different measures of ecological

condition (Fish, insects, other biota, habitat, connectivity etc.). Benthic macroinvertebrates are often used as an indicator b/c they integrate many different physical and chemical influences

- Concern emphasis in theory, focusing too much on water quality standards attainment COULD negatively affect stream health (i.e. focus on one pollutant to the detriment of other stream functions)
- *Stream Health*
 - Use of the term "health" implies that condition of ecosystem living components requires foremost consideration. However, depending on whether you're focusing on streams or the Bay can lead to somewhat different determinations of what matters most. What's most important to the Bay may not be what's most important to restore health of an individual stream.
 - The Clean Water Act requires consideration of the physical, chemical and biological integrity of the nation's waters. These parameters can be measured by a variety of different procedures, including the stream pyramids function framework of interest to the workgroup. However, other procedures should also be considered (detailed discussion on one additional important procedure in text below).
 - Biological integrity of instream life is probably adequately represented by various indices of biotic integrity (IBIs) which are standards that have evolved over decades with substantial peer review. IBIs were explicitly mentioned in the strategy for protecting and restoring the Chesapeake Bay prepared to support the Chesapeake Bay Executive Order because of concern by ecologists that restoration work could otherwise be promoted that provides no actual biological response or water quality benefit¹. Focusing on IBIs as the metric for stream health restoration requires figuring out what matters ecologically, and ideally prioritizing environmental management efforts on that².
 - IBIs do not provide a ready means to determine what problems are causing health impairment, nor whether some problems are hierarchically more important as causes of impairment than others. The stressor identification procedures of USEPA (2007, 2014) do provide a means to identify these stressors, and some means to prioritize among them. MDE "Biological Stressor Identification Analysis Results and Interpretation" reports provide this for some streams in Maryland. These procedures should be explicitly acknowledged in documents developed by the Stream Health Workgroup. Stressors often act hierarchically such that some are substantially more important than others. To improve stream and bay health, environmental management work needs to

¹ One example germane to this workgroup: physical condition (integrity) can be restored in streams where chemical factors (water and sediment pollutants) are vastly more important to controlling stream ecosystem health. In such settings, physical restoration work would likely not improve biological integrity nor water quality, and could potentially unintentionally serve to distract attention/efforts from hierarchically more important stressors.

² Health of the riparian zone should at a minimum consider landuse/cover. However, presumably that's not the responsibility of this workgroup, so that's not dealt with further in this response).

focus on priority stressors when these act hierarchically. Priority stressors can include physical, chemical, or even biological conditions³.

- *Bay Health*
 - With regard to Bay health distinct from stream health, TMDL requirements are now driving many stream restoration efforts because streams convey nutrients (N, P) and sediment to the Bay. Managing these inputs to the Bay requires a stream function focus, particularly on streams as sources/transformers/storage places for nutrients and sediment. Stream restoration has generally focused on reducing excess erosion, but there is growing awareness that we need to better consider instream and floodplain nutrient/sediment, transformation/storage functions. We should be designing stream restoration projects to promote nutrient and sediment transformation/storage.
 - Of potentially high future importance, consensus is emerging that excess sediment independent of nutrients is a lower level stressor to the Bay than was previously thought (such as CBP STAC, 2007, and recent findings of USACE/MDE study of sediment behind Conowingo Dam [attached email, and CBP STAC, 2014])). Additionally, there is growing recognition that total nutrient content of sediments is likely an inadequate means to evaluate the importance of various sediment parcels as nutrient sources to the Bay. Instead, bioavailability needs to be considered by nutrient form. To best help the Bay, we should probably focus on stream functions that would reduce delivery of biologically available nutrients by rivers to the Bay.

Importance

- Add statement on jurisdictional WIP commitments in addition to “Current Efforts” section

Indicators

- Should the Stream Health outcome explore if metrics derived from routinely collected, non-biological monitoring data can be used to measure changes in stream health and function that occur between 2008 (or baseline period) and 2017, and whether these metrics can contribute to a broader understanding of goal attainment for the Stream Health Outcome?
- Biological indicators is the best measure for restoration success b/c it integrates the influences of all biotic and biotic factors
- Biological Condition Gradients (BCGs) being developed by state and local agencies as a starting point for discussion. At least the state narrative descriptions of what is good stream health might become more aligned

Factors Influencing

- Refer to spreadsheet
- Inability for jurisdictions to meet their stream restoration WIP commitments for 2017/2015 as per the input received from the EPA TMDL team and mid-point assessments
- The factors on the spreadsheet are focused on CB Watershed rather than specific streams. Stream health should also be monitored and measured using MBSS and other monitoring data.

³ Such as invasive exotic species.

Does this monitoring fall into the water quality standards attainment and monitoring factor?
(Regulatory looks at individual stream reaches for functional lift.)

Current Efforts

- Availability (and use) of existing tools to target stream restoration (and other) projects, (Note: this was identified as a gap but comment recognizes the availability of current targeting tools)
- National Park Service has 5 Inventory and Monitoring Networks operating within the Chesapeake Bay watersheds which include stream monitoring (*M. Norris*).
 - Request Forest Service to provide a table with the type of information generated by each monitoring program and the number of sites within the Bay. This would help to understand the breadth of activity currently undertaken by NPS and information available to evaluate this outcome.

Sampling Program	Purpose	Parameters/Data generated	Frequency	# sampling sites within Chesapeake Bay Watershed

- One factor that affects effective implementation of WIP stream restoration projects and may consider adding under effective policy in place for achieving goals would be: “In FY 15, USACE develop and implement permit streamlining measures under Clean Water Act Section 404 stream restoration projects.” This management action is already covered in the TMDL/WIP management strategy progress report, so not sure how or if to fit it into this stream health document as well.
- Clarify as to whether the current effort listed below would focus efforts on priority stressors for either streams or the Bay. The hierarchical relationship among the suite of stressors impacting stream health in any given waterway should guide formulation of restoration efforts. Improvement of stream functions associated with low level stressors would only be expected to improve stream health if other higher priority stressors are also remediated. With regard to the Bay, the emerging consensus that nutrients are of substantially greater importance as a stressor to the Bay than sediment alone should also help guide stream restoration for the Bay towards measures whose principal functional improvement would be reduced delivery of biologically available nutrients to the Bay.
 - “FWS/MDE developing guidance and checklist to evaluate stream restoration projects using a function-based assessment process (i.e., Stream Functions Pyramid Framework developed by FWS and EPA)”

Management Approach /Action Strategies

- Consideration of recommendations from STAC workshop report when final
- Focus on specific management actions as well as measurement of these actions. For example BMPs discussed in the Stream Restoration BMP Expert Panel final report
- Tracking progress on nutrient and sediment reductions based on BMP implementation and efficiencies (load reduction credited for practices). (Note: State and DC provide annual progress reports to CBP)

- Implementation of Phase II (and upcoming Phase III) WIP Commitments (J. Winters)
- *Forthcoming tools as a result of efforts by the Maryland Department of the Environment (MDE) and U.S. Fish and Wildlife Service (USFWS) may provide additional guidance for verification methods that may assist in these efforts.* Comment: the checklists to date are for design, and do not note whether or not the project was built as designed, and that associated structures and configuration are still in-place and self-sustaining.
- Utilizing other routinely collected non-biological monitoring data. Note that these would logically be used within a stressor identification and prioritization process such as USEPA (2014) Note: included in response to “current efforts”
- Note that local governments will be funding and implementing lion’s share of the restoration work over next couple decades that will hopefully allow us to meet our natural resource and pollution reduction goals

Gaps

- Benthic macroinvertebrate data are not available from enough streams with enough frequency to track progress over the time we have to show progress.
 - **Action:** Could an expert panel be convened that could come up with expected results from BMPs for benthic macroinvertebrate communities? If that could happen, progress could be tracked based on BMPs being completed the same way nutrients and sediment reductions are tracked.
- Current state/understanding of science and capability to measure and monitor stream restoration efforts
- Monitoring needs

Other – Jurisdictions/Agencies participating

- Request input from Larry Willis (VADEQ) re work on standardizing and expanding the stream physical metrics used in VA.

Opportunities for Cross-Goal Team Collaboration:

- Add Wetlands Work Group