

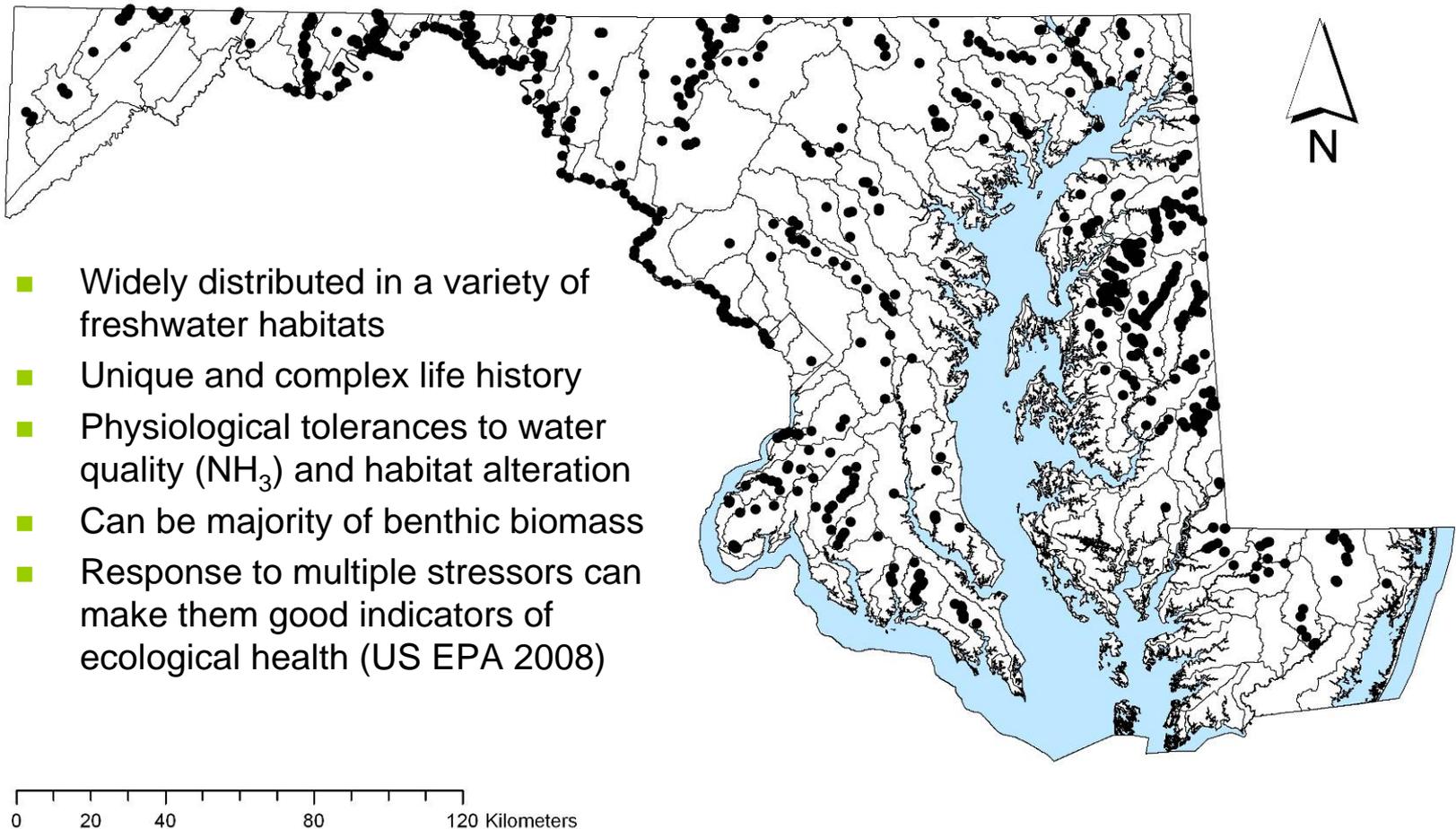


MBSS Freshwater Mussel Sampling Protocols

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Freshwater mussels as indicators



[MBSS-mussel background]

- Collecting observational data since 1995
 - Round 1: General search
 - Round 2: Incidental observations
 - No species identifications
- Since 2006 (MBSS Round 3)
 - Visual search w/in site ~ 15 minutes
 - Identified to species and note condition (L, D)
 - Incidental observations
- $N_{\text{present}} = XX$, ~ XX% of all MBSS sites

[Sampleability]

- General search can be conducted at any accessible MBSS site
 - Even if electrofishing cannot be conducted
 - Dry stream does **not** preclude mussel presence
- Incidental observations always noted
- Fill in sampleability code if unable to sample

MBSS SUMMER INDEX PERIOD DATA SHEET		Page	Of
SAMPLEABILITY <input type="checkbox"/> s = Sampleable <input type="checkbox"/> 1 = Dry Streambed <input type="checkbox"/> 2 = Too Deep <input type="checkbox"/> 3 = Marsh, no defined channel <input type="checkbox"/> 4 = Excessive Riparian Vegetation <input type="checkbox"/> 5 = Impoundment <input type="checkbox"/> 6 = Tidally Influenced <input type="checkbox"/> 7 = Permission Denied <input type="checkbox"/> 8 = Unsafe (describe in comments) <input type="checkbox"/> 9 = Beaver <input type="checkbox"/> 10 = Other _____		<input type="checkbox"/> None Observed Species	EXOTIC PLANTS Relative Abundance (P or E)
<input type="checkbox"/>	Electrofishing	_____	_____
<input type="checkbox"/>	Habitat	_____	_____
<input type="checkbox"/>	Water Quality	_____	_____
<input type="checkbox"/>	Herpetofauna	_____	_____
<input type="checkbox"/>	Salamanders	_____	_____
<input type="checkbox"/>	Crayfishes	_____	_____
<input type="checkbox"/>	Mussels	_____	_____
<input type="checkbox"/>	Aquatic Plants	_____	_____
<input type="checkbox"/>	Exotic Plants	_____	_____

[Incidental collection]

- Any observation while sampling or accessing MBSS sites
 - Spring and summer index period
- Record scientific name and condition
- Note in comments approximate location of observation, geographic coordinates if a T or E species

[What is suitable mussel habitat?]



[What to look for....]





[Animal middens and shoreline]



Maryland's freshwater mussel names

Anodontinae	Status	Lampsilinae	Status
<i>Alasmidonta heterodon</i>	FE, SE	<i>Lampsilis cardium</i>	
<i>A. undulata</i>	SE	<i>L. cariosa</i>	SU
<i>A. varicosa</i>	SE	<i>Lampsilis radiata</i>	
<i>Anodonta implicata</i>		<i>Leptodea ochracea</i>	
<i>Lasmigona subviridis</i>	SE	<i>Ligumia nasuta</i>	
<i>Pyganodon cataracta</i>		Ambleminae	
<i>Strophitus undulatus</i>	I	<i>Elliptio complanata</i>	
<i>Utterbackia imbecillus</i>		<i>E. fisheriana</i>	
		<i>E. lanceolata</i>	
		<i>E. producta</i>	I

- Based on Turgeon et al. (1998), but taxonomy in flux.

[Photographic vouchers]



[Why photograph...]

- You should never voucher live mussels
- Are you permitted to possess mussel shells?
 - Including rare, threatened, or endangered species
- Unsure or unable to identify in the field
 - Shell deformities, weathered shell, etc.
- Photographic voucher collection
 - Provides QA/QC of field identification
 - Verification or resolution of field identification

[Be aware!]

- Zebra mussels (*Dreissena polymorpha*) have been found in Maryland and are dispersing
 - Conowingo Pool (2008)
 - Susquehanna River below Conowingo Dam (2010)
 - Sassafras River at Turners Creek (2011)
 - Susquehanna River at Turkey Point/Spesutie Is. (2012, 2013)
 - Number of veligers reported at Peach Bottom increasing



- Triangular in shape
- Sits flat on ventral side
- Usually < 40 mm in length, attaches to hard surfaces with byssal thread
- Looks similar to native, Dark false mussel (*Mytilopsis leucopaeta*)
- Zebra mussel lack apophysis (small tooth) in the beak cavity

[Questions?]