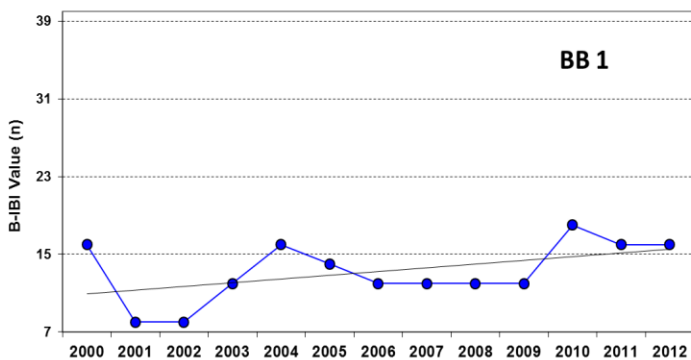


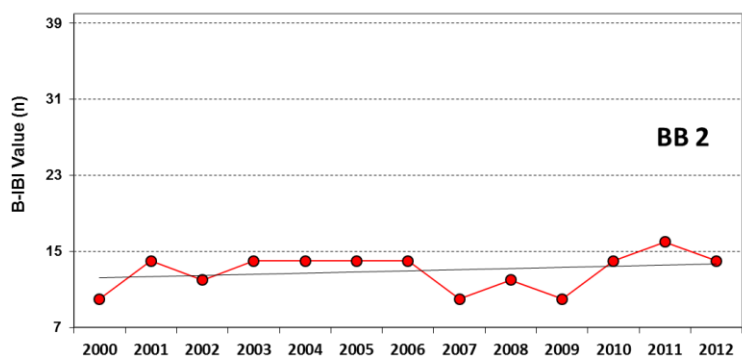
Appendix 12-2. Stream Summary



BLACK BROOK 1 – BB1. Just W of Southern Boulevard, S of Noe Pond, Chatham Township. Small, slow flow vulnerable to changes in rainfall. Downstream from eutrophic golf course pond and heavily traveled road. Poor DO. High temperature. Sediment choked; oil films. Road-related and golf course-related chemicals.

Rating: Generally "very poor". Slightly better recently.

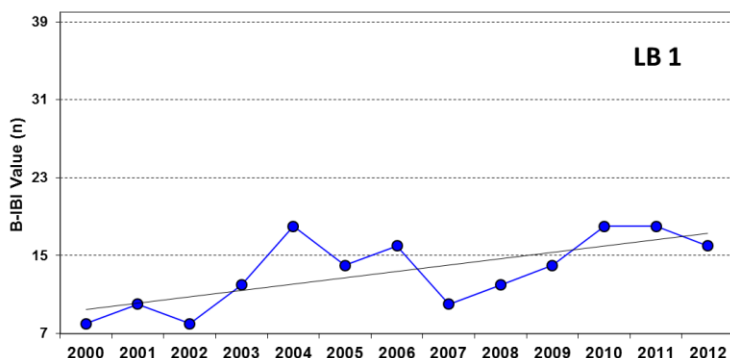
Action: Bank stabilization would help but low flow, highway runoff and upstream pond productivity will severely limit improvement. Riparian buffer mowed in 2008 should be allowed to regrow.



BLACK BROOK 2 – BB2. A drainage channel from the Chatham Township Sewage Treatment Plant. Sandy, man-made "stream" with minimal suitable substrate. Downstream from culverts under Tanglewood Lane. TDS >NJ standard 2010, 2011, 2012.

Rating: Usually along the "very poor"/"poor" borderline. Basically unchanged through study.

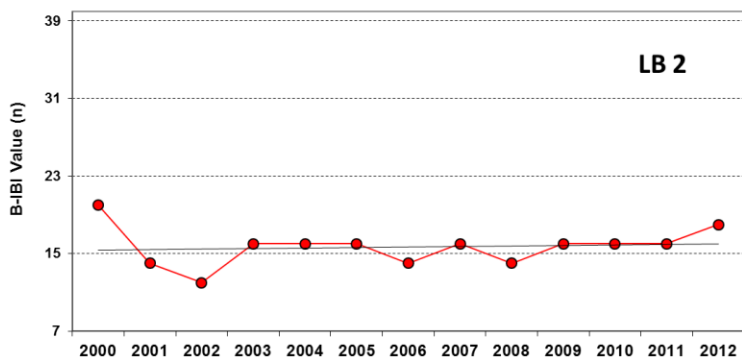
Action: Hard to imagine how to substantially improve this site for MIVs.



LOANTAKA BROOK 1 – LB1. Downstream of Green Village Road bridge in Green Village. Upstream bank erosion produces sandy sediment and high turbidity. Diluted but still high TDS. Poor MIV habitat substrate. Some trash present..

Rating: Generally in the "very poor" range. Improving trend since 2007.

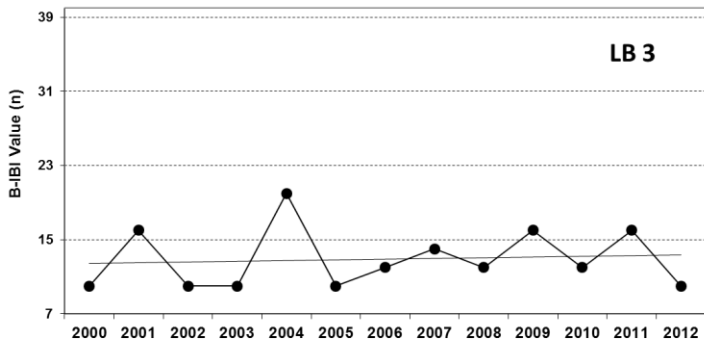
Action: Upstream stream-bank stabilization needed to curb sedimentation. Trash cleanup would help.



LOANTAKA BROOK 2 – LB2. Downstream from Kitchell Pond. Decent MIV substrate. High temperature and other pond byproducts, i.e., turbidity, organic detritus, low oxygen. High TDS. Lingering "chemical smell" from upstream Morris Township Sewage Treatment Plant. Bad bank erosion above and below site. Amphipod crustacean dominate in 2012.

Rating: On the "poor" to "very poor" borderline. No change during the study period.

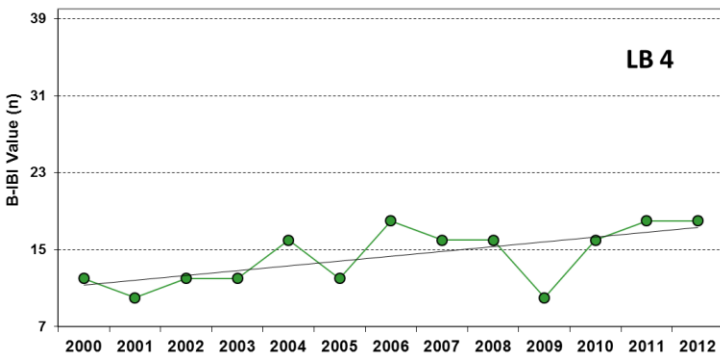
Action: Kitchell Pond eutrophy yields algal/organic fallout & low DO. Bank stabilization needed all along this stream.



LOANTAKA BROOK 3 – LB3. Just downstream from Morris Township Sewage Treatment Plant. Strong "chemical" smell. Very poor MIV substrate – shifting sand. Very high TDS –from upstream and/or STP sources. >>NJ standard. Overrun with enchytraid worms in 2011.

Rating: "Very poor", with little change over the study.

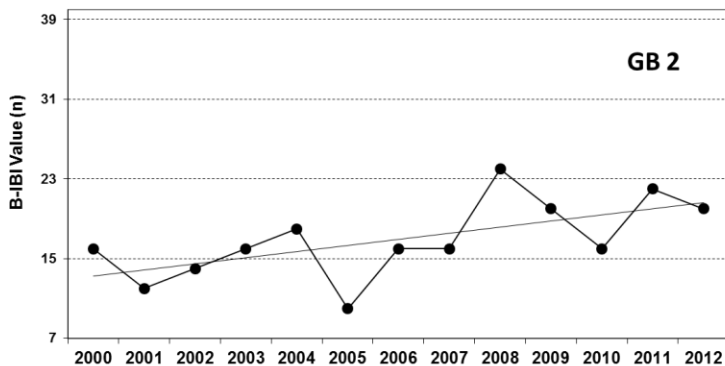
Action: Providing cobble substrate would improve MIV habitat. Stream bank stabilization is needed. Upstream source of high TDS needs remediation.



LOANTAKA BROOK 4 – LB4. Just downstream from Morris Township Municipal Pool at Fanok Road. Channelized ditch. Highest TDS; >>NJ standard; from upstream source. Comparatively little MIV substrate; fine silt.

Rating: "Very poor" but slightly improving toward the "poor" range with site move slightly downstream in 2006. Recovering from 2009 low.

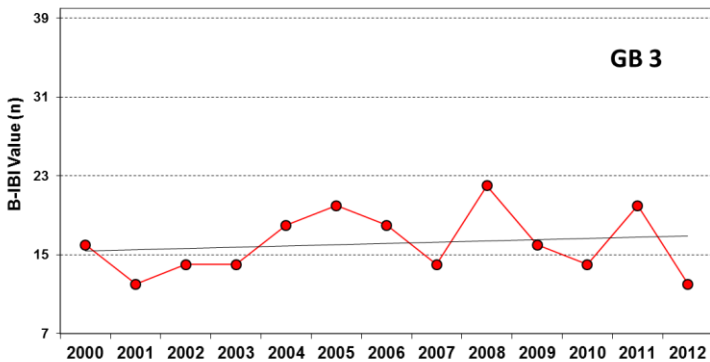
Action: Slow upstream stream-bank erosion & could add MIV cobble. Upstream source of TDS needs remediation.



GREAT BROOK 2 – GB2. Upstream from Woodland Road bridge, Harding Township = GSWA sampling site. MIV substrate limited to coarse gravel. Typically storm-related high turbidity and heavy sedimentation. Mussel population present.

Rating: Generally "poor" in recent years. Improving over the study period.

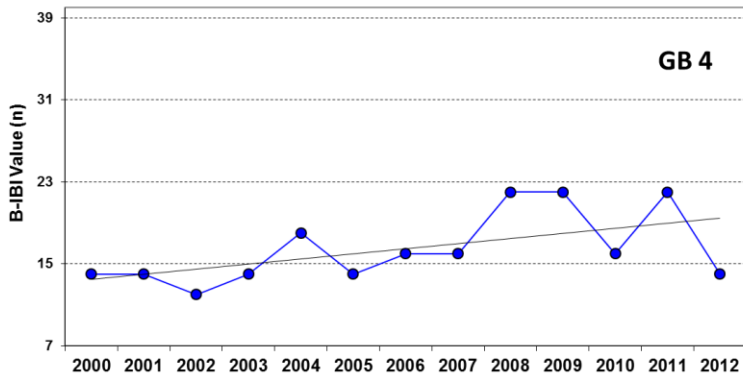
Action: Upstream erosion source(s) need stabilization.



GREAT BROOK 3 – GB3. Below Silver Lake Dam, Harding Township. Terrific MIV habitat but with high temperature and turbidity from silt and organic matter from lake above. High precipitation in fall 2011 (IRENE) led to very high turbidity in 2012.

Rating: Ups and downs through "poor" – partly driven by blackfly flux and corresponding chironomid predator cycle. 2012: blackflies up, chironomids down.

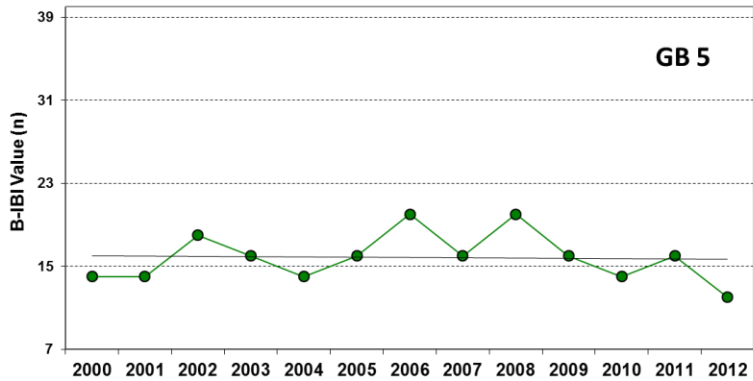
Action: Rain-storm flooding stirs up and distributes silt & turbidity. Control high-volume flow?



GREAT BROOK 4 – GB4. Downstream from bridge entrance to the office complex off Blackberry Lane (James Street intersection) in Morris Township. Slow flowing, silty water with high TDS from nearby parking lots and detention basins. Low DO.

Rating: Ups and downs through "poor" – partly driven by blackfly flux and corresponding chironomid predator cycle. 2012: blackflies up; chironomids down. 8 fewer MIV types in 2012.

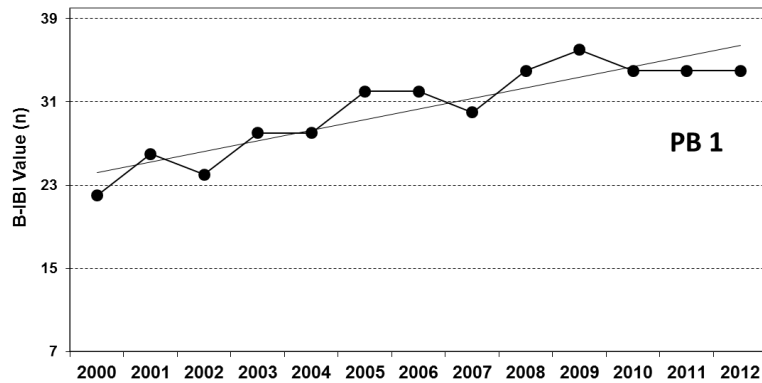
Action: Mowed riparian vegetation is returning and should be encouraged. Sedimentation from upstream sources (including I-287?) is bad. Would benefit from reduction in local source (parking lot salting?) of high TDS.



GREAT BROOK 5 – GB5. Downstream from Foote's Pond on James Street in Morristown. The pond and dam were reworked in 2006. GB5 has very high temps, high organic detritus, high pH, and low oxygen from its decay; all related to eutrophic pond. Clogged with filamentous algae. Golf course upstream.

Rating: Along the "poor"/"very poor" line. Ups and downs through "poor" – partly driven by blackfly flux and corresponding chironomid predator cycle – Same as at other GB sites. No change over study.

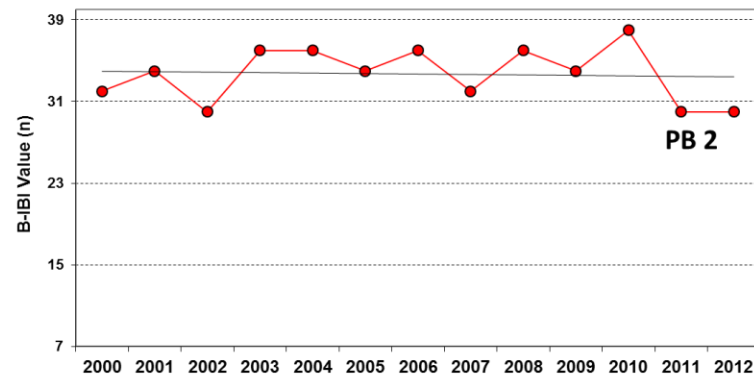
Action: Control upstream nutrients and lake productivity?



PRIMROSE BROOK 1 – PB1. Downstream from Lee's Hill Road bridge, Harding Township. Good quality MIV habitat. Modest sediment issues.

Rating: Clear improvement since early 2000s bridge replacement.

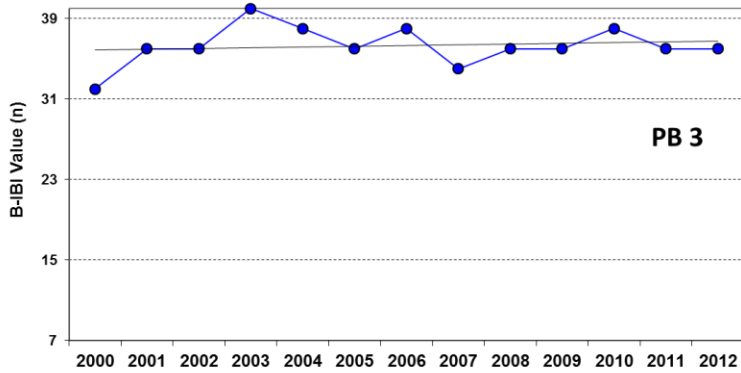
Action: Nicely protected site. No improvements suggested.



PRIMROSE BROOK 2 – PB2. A lovely site, down embankment opposite the intersection of Youngs Road and Bailey's Mill Road, Harding Township. Good canopy cover and lots of cobble substrate but building sedimentation/turbidity issues. Mt Kemble Pond influence?

Rating: Consistently in the "good" category. Steep drop in 2011; no recovery in 2012. Troubling.

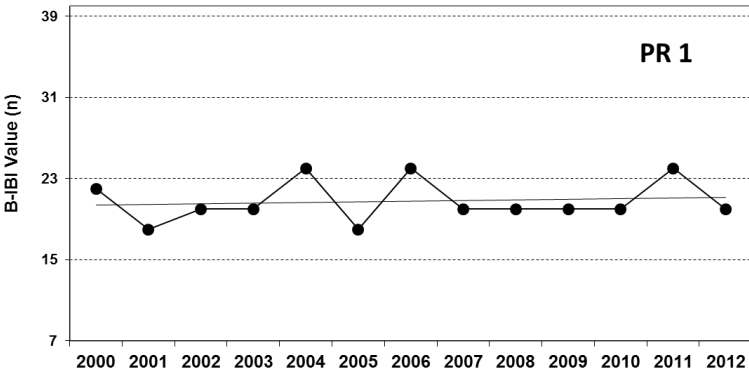
Action: Should be left in its current, natural condition. Sedimentation sources bear watching.



PRIMROSE BROOK 3 – PB3. Downstream side of Tempe Wick Road in Harding Township. Nearly ideal MIV substrate.

Rating: Consistently with scores in the upper "good" range. Often matches or exceeds our "reference" site – IG1

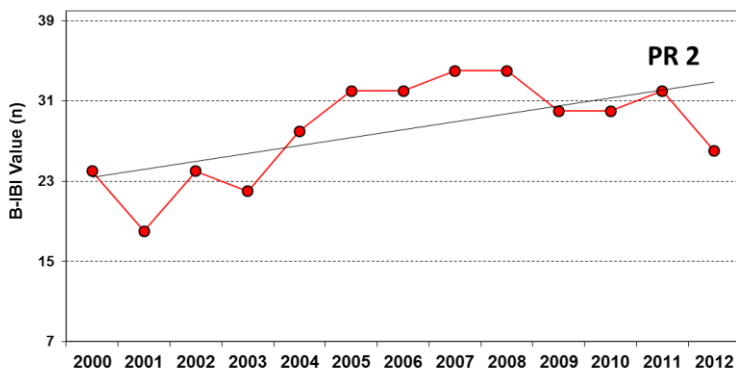
Action: Despite heavily traveled commuter road and upstream impoundment, conditions are good here.



PASSAIC RIVER 1 – PR1. 200 yds downstream from Osborn Pond at Lee's Hill Road, Bernards Township. The river surrounds a gravel-bar island. Influenced by high temperatures from the pond. Biota-spillover from the pond (especially amphipods) and detrital filtering caddisfly larvae often dominate. Waterfowl gather upstream.

Rating: Modestly variable in the upper portion of the "poor" range. Little change over study period.

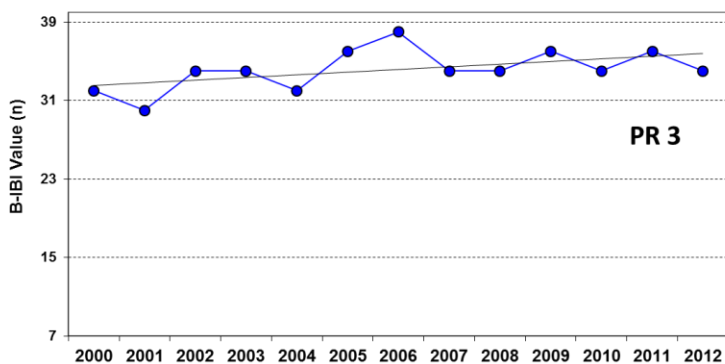
Action: Pond-driven high temperatures are unavoidable. Preventing nutrient-loading and eutrophication of Osborn Pond is important.



PASSAIC RIVER 2 – PR2. Downstream of I-287 bridges, Bernards Township. High sedimentation. Some flooding and highway debris present. Riffle habitat washed away by hurricane Irene, fall 2011. Site moved downstream.

Rating: Site has shown steady MIV community improvement from "poor" in the drier early 2000s to "good" in higher rainfall of the mid and later 2000s.

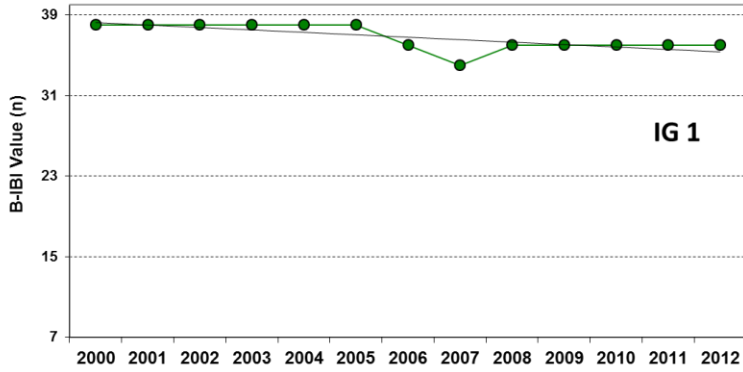
Action: Some stream bank erosion occurs. Lots of fine sediments but surprisingly little TDS from road maintenance. Trash removal would improve aesthetics.



PASSAIC RIVER 3 – PR3. Off Hardscrabble Road (opposite Butternut Road) in Bernardsville. Cold, fast-flowing water over ideal substrate. Only drawback is close proximity of roadway. MIV community is species rich but very low in density.

Rating: Consistently in the "good" range.

Action: Nothing to "fix" here. Maintaining current high-quality surroundings here and upstream will keep this portion of the upper Passaic River in strong contrast to sections found downstream of the Great Swamp.



INDIAN GRAVE BROOK 1 – IG1. Downstream of Chestnut Avenue bridge, Bernardsville. This tributary of the Passaic River hosts our "reference" site, i.e., a glimpse at the "ideal" regional MIV community living under minimally stressful conditions. Despite lying downstream from a bridge, Chestnut Avenue is lightly traveled.

Rating: Right at the top of the "good" category virtually every time.

Action: Maintaining a riparian buffer of natural vegetation is valuable here.

Table 12-1. Great Swamp Watershed, May 25, 2012. Habitat Assessment

	B-IBI	temp	TDS	DO	pH	Turbidity	total	HabValue2
BB1	16	19.0	300.7	5.24	7.35	6.93	19.52	33
BB2	14	17.2	555	8.16	7.57	0.81	16.54	22
LB1	16	17.5	438.5	6.99	7.57	4.44	19	16
LB2	18	18.5	578	6.37	7.50	3.72	17.59	36
LB3	10	18.1	701	6.68	7.21	1.54	15.43	17
LB4	18	16.7	737	6.5	7.42	4.54	18.46	22
GB2	20	17.4	239.2	7.4	7.19	8.98	23.57	39
GB3	12	17.7	245.3	7.85	7.43	13.00	28.28	68
GB4	14	17.5	419.1	6.56	7.50	4.14	18.2	31
GB5	12	18.9	381	5.48	7.55	5.10	18.13	42
PB1	34	17.3	157.4	8.69	7.62	2.95	19.26	52
PB2	30	17.2	157.1	8.79	7.54	5.56	21.89	56
PB3	36	16.0	92.2	9.21	7.63	2.23	19.07	73
PR1	20	18.5	146	8.39	7.42	5.93	21.74	57
PR2	26	17.1	153.5	8.62	7.34	3.17	19.13	24
PR3	34	17.0	118.7	8.97	7.53	2.27	18.77	81
IG1	36	15.5	148.9	9.16	7.50	1.12	17.78	85