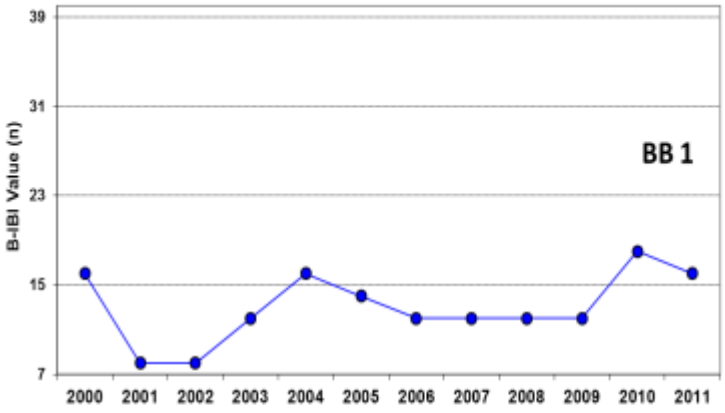
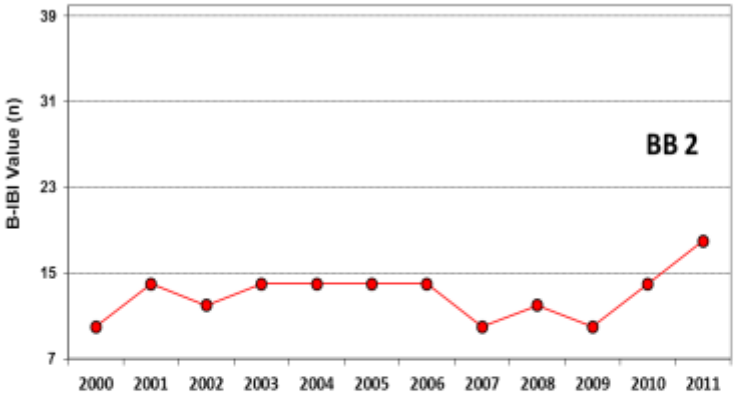
Appendix 11-2. Stream Summary



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. Sediment choked; oil films. 2006 CAP report: elevated Hg, Pb, PAH, Zn. Also golf course pesticides.

Rating: Generally "very poor". Tied for lowest B-IBI score 2011.

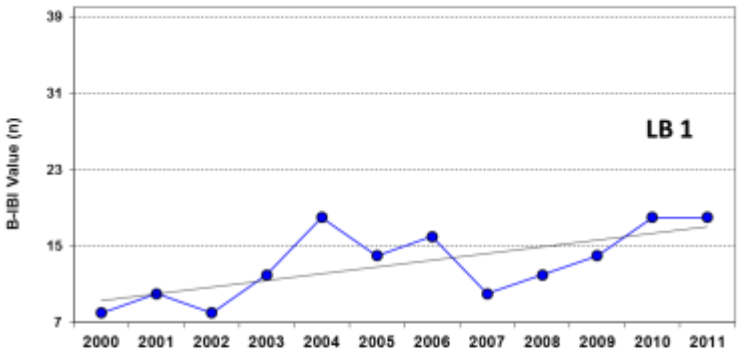
Action: Bank stabilization would help but low flow, highway runoff and upstream pond productivity will severely limit improvement. Riparian cover removed in 2008 should be allowed to regrow.



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. High & increasing TDS.

Rating: Usually along the "very poor"/"poor" borderline. Some improvement since 2009.

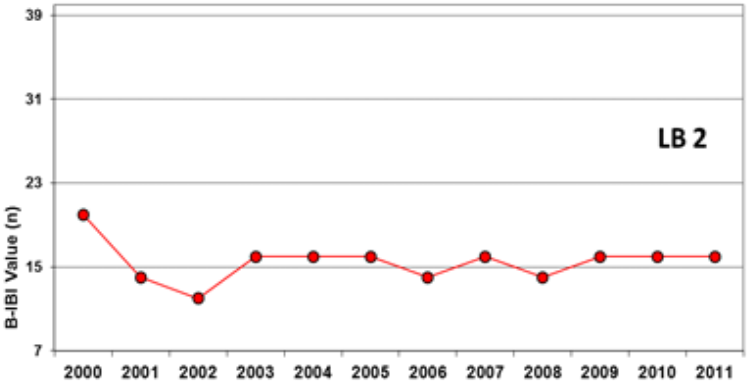
Action: Hard to imagine how to substantially improve this site for MIVs.



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 debris present. 2006 Princeton Hydro: storm-related suspended solids getting worse.

Rating: Generally in the "very poor" range. Fares better in rainier falls.

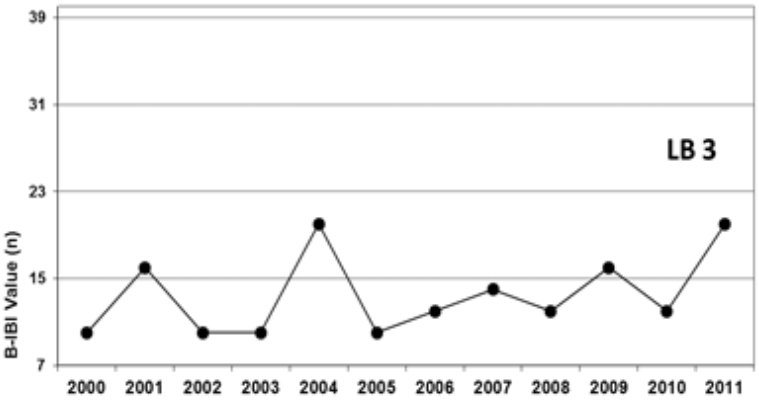
Action: Upstream stream-bank stabilization needed to curb sedimentation. Trash cleanup would help.



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

Rating: On the "poor" to "very poor" borderline. No change in recent years.

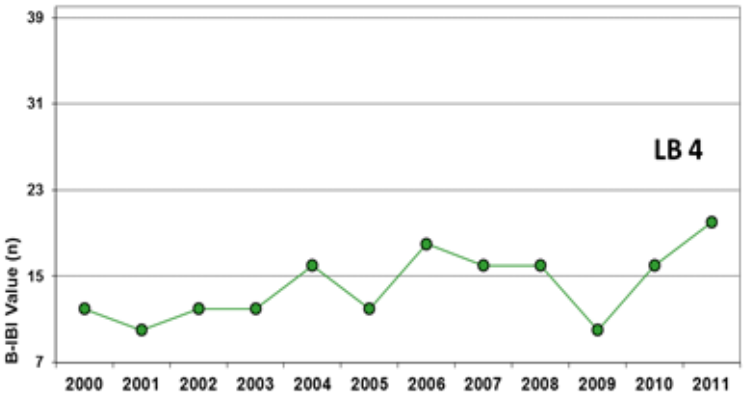
Action: Kitchell Pond eutrophy yields algal/organic fallout & low DO. Bank stabilization needed all along this stream.



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. Species diversity up by 1/3 in 2011.

Rating: "Very poor", but gradual improvement in recent years.

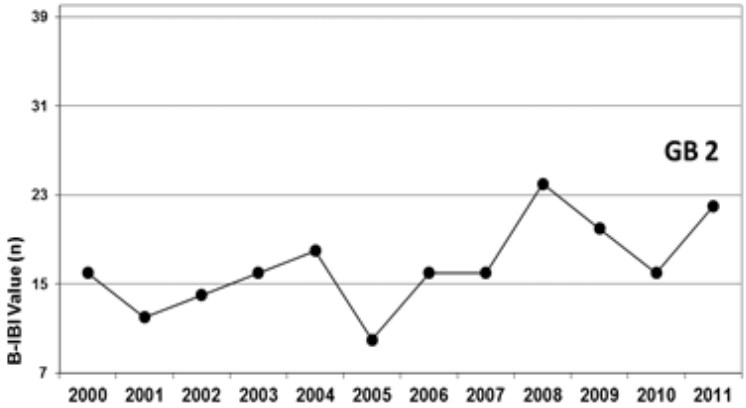
Action: Providing cobble substrate would improve MIV habitat. Richer MIV biota may be available here. Stream bank stabilization is needed. Upstream source of high TDS needs remediation



LOANTAKA BROOK 4 – LB4. Just downstream from Morris Township Municipal Pool at Fanok Road. Channelized ditch. Very high TDS from upstream source. Comparatively little MIV substrate; fine silt. MIVs vary w/ ppt.

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

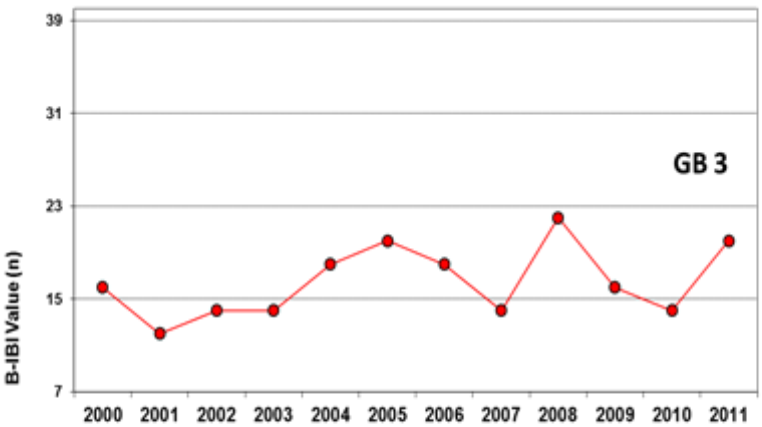
Action: Slow upstream stream-bank erosion & could add MIV cobble. Upstream source of TDS needs remediation.



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. Blackflies down in 2011 – dominance factor improved.

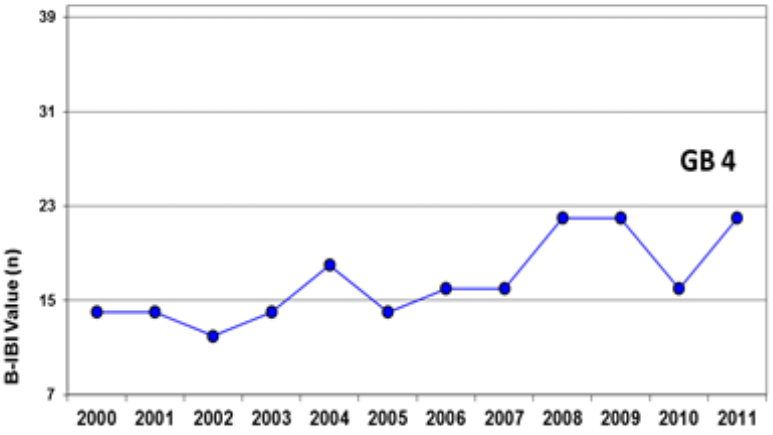
***Action*:** Upstream erosion source(s) need stabilization. CAP (2006) unidentified chemical impairment observed in Great Brook generally.



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 2011 led to high turbidity.

Rating: Ups and downs through "poor" – partly driven by blackfly flux and corresponding chironomid predator cycle.

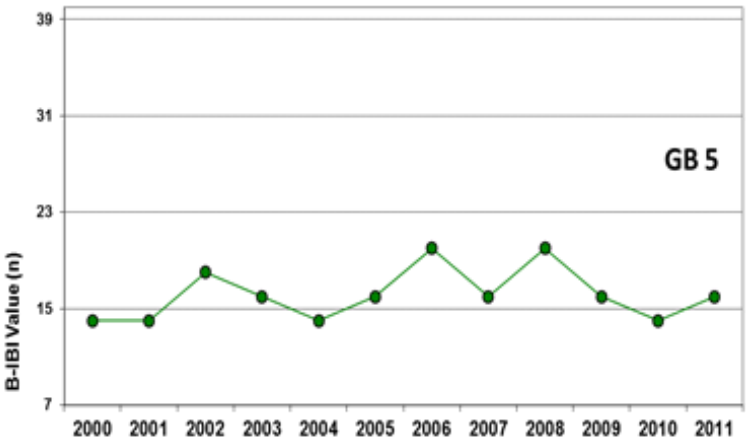
Action: Rain-storm flooding stirs up and distributes silt & turbidity. Control high-volume flow?



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.

Rating: Ups and downs through "poor" – partly driven by blackfly flux and corresponding chironomid predator cycle.

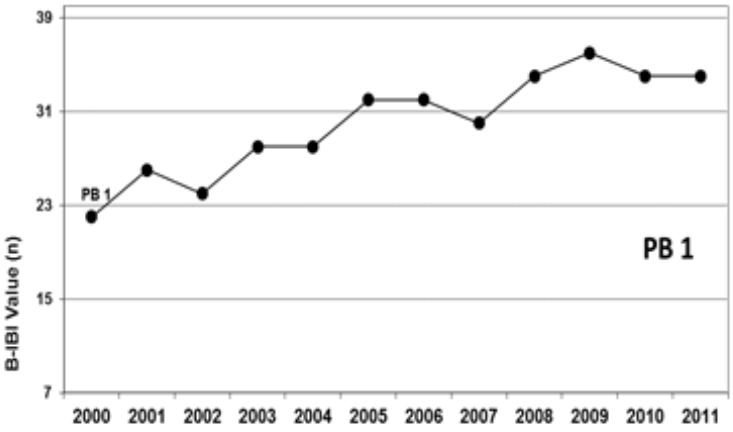
Action: Removed riparian vegetation is returning and should be encouraged. Sedimentation from upstream sources (including I-287?) is bad. Would benefit from reduction in local source (parking lot salting?) of high TDS.



GREAT BROOK 5 – GB5. Just downstream from the dam at Foote's Pond on James Street in Morristown. The pond and dam were reworked in 2006. GB5 has high temperatures, high organic detritus, high pH, and low oxygen from its decay. TDS near 500 mg/L in 2011. These are pond-related.

***Rating*:** Generally in lower portion of the "poor" range. Ups and downs through "poor" – partly driven by blackfly flux and corresponding chironomid predator cycle – Same as at other GB sites. 7 more species in 2011.

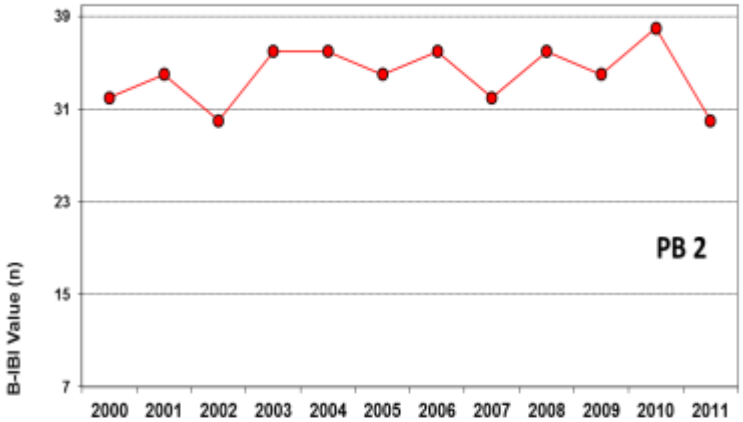
***Action*:** Source of high and rising TDS needs to be addressed.



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

Rating: 2000-2011 trend: clear improvement since early 2000s bridge replacement.

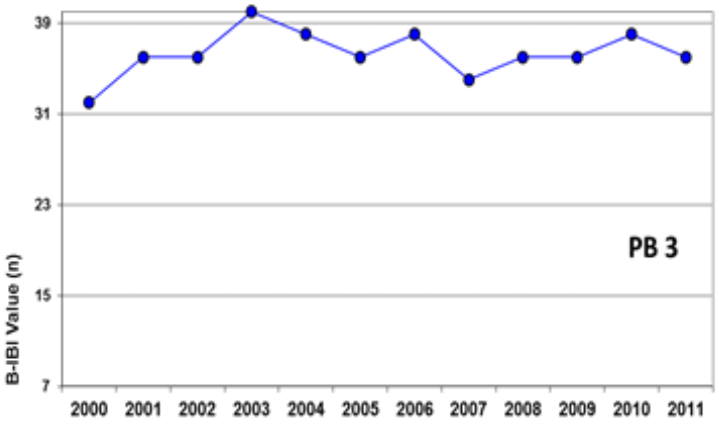
Action: Nicely protected site. No improvements suggested.



PRIMROSE BROOK 2 – PB2. A lovely site, down an 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 issues.

Rating: Consistently in the "good" category. Steep drop in 2011 and up-and-down variability the likely result from community composition near B-IBI scoring thresholds. Four of these on “wrong” side in 2011.

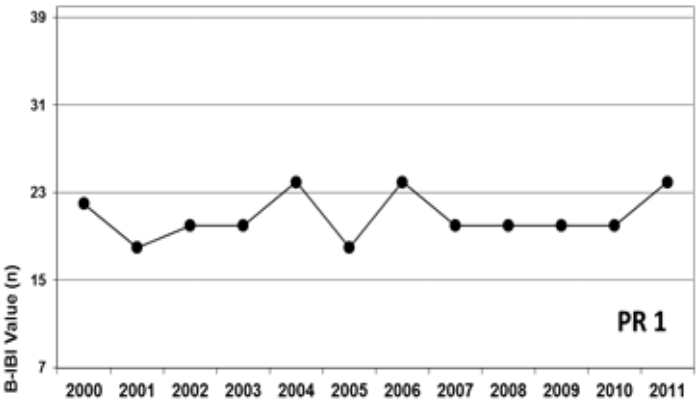
Action: Should be left in its current, natural condition. Sedimentation sources bear watching.



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

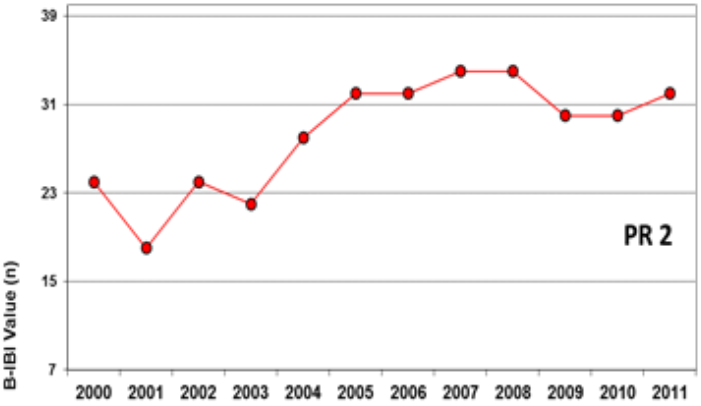
***Action*:** Despite heavily traveled commuter road and upstream impoundment, conditions are good here.



PASSAIC RIVER 1 – PR1. 200 yds downstream from Osborn Pond at Lee's Mill 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. Drop in hydropsychid caddisflies improves dominance; small increase in predatory chironomids helps too.

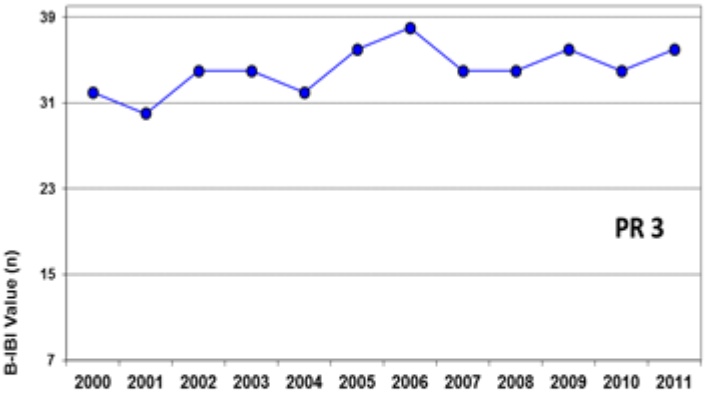
Action: Pond-driven high temperatures are unavoidable. Preventing nutrient-loading and eutrophication of Osborn Pond is important.



PASSAIC RIVER 2 – PR2. Downstream of I-287 bridges, Bernards Township. High sedimentation. Some flooding and highway debris present. High temperatures in 2011.

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.

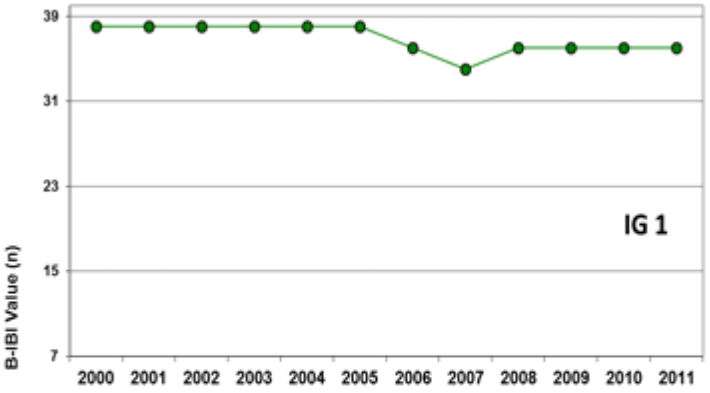
Action: Locate source of upstream sediments. Some stream bank erosion occurs. Surprisingly little TDS impact from road maintenance. Trash removal would improve aesthetics.



PASSAIC RIVER 3 – PR3. Off Hardscrabble Road (opposite Butternut Road) in Bernardsville. Prettiest site in the study! 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. Reduced blackflies helped in 2011.

***Action*:** Nothing to "fix" here. Maintaining current high-quality surroundings here and upstream will keep this portion of the upper Passaic River in 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 11-1. Great Swamp Watershed, May 27, 2011. Habitat Assessment

	B-IBI	temp	TDS	DO	pH	Turbidity	total	HabValue2	
BB1	16	21.2	381.7	5.43	7.04	9.99	61	27	**BB1**
BB2	16	16.8	592	8.8	6.87	4.42	71	22	**BB2**
LB1	18	19.2	517	7.73	7.22	4.87	66	19	**LB1**
LB2	16	20.0	680	7.67	7.31	3.21	78	24	**LB2**
LB3	20	17.5	756	7.4	7.30	1.19	49	7	**LB3**
LB4	20	18.0	906	8.13	7.44	5.01	40	15	**LB4**
GB2	22	18.4	246.1	8.43	7.32	5.79	74	34	**GB2**
GB3	20	19.0	254.8	8.6	7.40	8.13	119	58	**GB3**
GB4	22	19.7	304	6.94	7.57	4.24	55	20	**GB4**
GB5	16	21.0	498	7.96	7.58	4.64	91	38	**GB5**
PB1	34	18.0	148.7	9.31	7.35	1.76	129	68	**PB1**
PB2	30	18.0	145.5	9.35	7.42	1.92	137	63	**PB2**
PB3	36	17.0	90	9.88	7.84	2.09	159	75	**PB3**
PR1	24	21.0	170.6	9.6	7.58	3.79	105	46	**PR1**
PR2	32	20.5	157	8.98	7.38	8.14	108	40	**PR2**
PR3	36	18.9	144.4	9.15	7.50	1.85	150	77	**PR3**
IG1	36	18.3	157.9	9.23	7.51	1.68	154	79	**IG1**
Mean	24.35	18.97	361.75	8.39	7.39	4.28	97	41.88	
Max	36	21.2	906	9.88	7.84	9.99	159	79.00	
Min	16	16.8	90	5.43	6.87	1.19	40	7.00	