

CONCLUSIONS

Nineteen (43 percent) of the 44 interstate streams sites at which macroinvertebrate samples were collected contained nonimpaired biological communities. Biological conditions at another 16 sites (36 percent) were slightly impaired, while nine sites (21 percent) were moderately impaired. No sites were designated severely impaired. Nine sites (SUSQ 10.0, SUSQ 44.5, CASC 1.6, TROW 1.8, LSNK 7.6, WAPP 2.6, HLDN 3.5, NFCR 7.6, SCTT 3.0) were not sampled using RBP III techniques due to either dry conditions or deep waters and, thus, were not averaged into the final scores. Twenty one (48 percent) sites had excellent habitats. Twenty two (50 percent) had supporting habitats, and one site (2 percent) was designated as having a partially supporting habitat.

Overall, 86 observations (14 percent) of water chemistry parameters exceeded state standards, which is a slightly higher proportion of exceedance values than last year. Total aluminum exceeded standards most frequently with 54 violations (63 percent). Twenty-two out of the 28 sites had parameters exceeding water quality standards, with 17 of those having more than one violation. Total iron and total aluminum appear to be naturally high in some of these watersheds. Aluminum exceeded water quality standards (100 µg/l) in every sample for the New York-Pennsylvania border streams. Tioga River is the only stream that has documented abandoned mine discharge indicated by high metals and high acidity. Elevated aluminum and depressed alkalinity may be due to acid precipitation, especially in the New York-Pennsylvania border streams. Total dissolved solids, nitrate plus nitrite, and dissolved oxygen are all indicators of organic pollution.

During the summer sampling event when macroinvertebrates are collected and habitat conditions are assessed, six of the New York-Pennsylvania streams were dry so no macroinvertebrate or habitat assessment could be completed. Of the remaining eight sites, the biological community of four (50 percent) of these streams was nonimpaired. Overall, biological conditions improved at two sites, declined at four sites, and stayed the same at the other two stations. High metal concentrations, particularly total iron and total aluminum, appeared to be the most common sources of water quality degradation in this region. The parameters that exceeded New York and Pennsylvania state standards were total iron, total aluminum, total chlorine, pH, dissolved oxygen, and alkalinity. Iron standards were exceeded at Apalachian Creek, Cascade Creek, Choconut Creek, Little Snake Creek, and Troups Creek. Aluminum standards were exceeded at all of the New York-Pennsylvania streams. Total chlorine was exceeded at Cayuta Creek, while Cascade Creek and Little Snake Creek exceeded alkalinity standards. Dissolved oxygen standards were exceeded at Choconut Creek and Apalachian Creek, and pH standards were exceeded at Choconut Creek and Cayuta Creek. In fiscal year 2006, low flows may have impacted the water quality and biological conditions at the New York-Pennsylvania border streams.

Among the New York-Pennsylvania sites, three streams were slightly impaired (37.5 percent) and one site (12.5 percent) was designated as moderately impaired. Four of the New York-Pennsylvania sites had excellent habitats (50 percent), while the other four sites (50 percent) had supporting habitats. No sites had partially supporting or nonsupporting habitat. In overall habitat ratings, three sites improved, one site declined, and four sites remained the same as the previous year. The most common habitat concern among the New York-Pennsylvania streams is lack of riparian buffer zone along the stream banks.

During FY-06, eight Pennsylvania-Maryland sites were sampled. Scott Creek was dry during the sampling event so no macroinvertebrate or habitat data were collected. Four streams (50 percent) were designated nonimpaired using RBP III protocol designations. Three sites (37.5 percent) were slightly impaired, and one site (12.5 percent) was moderately impaired. No sites were ranked as severely impaired. Biological conditions at Pennsylvania-Maryland sites appeared to improve or remain the same for the second consecutive year, with the exception of Long Arm Creek, which showed some degradation.

Six (75 percent) of the Pennsylvania-Maryland border sites had excellent habitats, while two sites (25 percent) had supporting habitats. Water quality at four sites exceeded Pennsylvania and Maryland water quality standards: nitrite plus nitrate at CNWG 4.4, alkalinity at FBDC 4.1, pH at LNGA 2.5, and total chlorine at EBAU 1.5. The Pennsylvania-Maryland border streams are located in a heavily agricultural region, and many of the parameters that exceeded the 90th percentile at these sites were nutrients. Also, streambank erosion, lack of riparian buffers, and sedimentation created instream habitat problems in this region.

River sites consisted of nine stations located on the Susquehanna, Chemung, Cowanesque, and Tioga Rivers. This year two stations (SUSQ 10.0 and SUSQ 44.5) were not sampled for macroinvertebrates due to deep water and a lack of riffle habitat at the sites. Of the seven river sites that were sampled during fiscal year 2006, the biological community at four (57 percent) of these sites was nonimpaired. One site (14 percent) had slightly impaired biological conditions, and two sites (29 percent) were ranked as moderately impaired. At the three river sites that also were sampled the previous year, conditions remained generally the same, with the exception of a marked decline in biological condition at COWN 1.0. Water quality parameters that exceeded state standards were total iron, total aluminum, and dissolved oxygen. Total iron standards were exceeded at COWN 2.2, COWN 1.0, SUSQ 365.0, SUSQ 340.0, SUSQ 289.1, and TIOG 10.8. Total aluminum standards were exceeded at CHEM 12.0, COWN 2.2, COWN 1.0, SUSQ 365.0, SUSQ 340.0, SUSQ 289.1, and TIOG 10.8. Additionally, dissolved oxygen exceeded water quality standards at SUSQ 10.0. Water quality appeared to decline slightly with an increased number of state water quality standard violations. The habitat at five (71 percent) of the river sites was excellent and the other two sites (29 percent) rated as having supporting habitat.

Group 3 sampling stations consisted of 21 sites on small streams located along the New York-Pennsylvania border. Seven of the 21 sites sampled (33 percent) had nonimpaired biological conditions. Nine sites (43 percent) were slightly impaired, and five sites (24 percent) were moderately impaired. Overall, five of the Group 3 sites demonstrated an improvement in biological condition, six sites showed a decline, and nine remained the same. Six (29 percent) of the Group 3 sites had excellent habitat scores. Fourteen sites (67 percent) had supporting habitat conditions, while one site (4 percent) was designated partially supporting, and no sites were nonsupporting. In overall habitat rankings, nine of the Group 3 sites were improved, two showed some degradation, and nine remained the same as the previous year.

The current and historical data contained in this report provide a database that enables SRBC staff and others to better manage water quality, water quantity, and biological resources of interstate streams in the Susquehanna River Basin. The data can be used by SRBC's member states and local interest groups to gain a better understanding of water quality in upstream and downstream areas outside of their jurisdiction. Information in this report also can serve as a starting point for more detailed assessments and remediation efforts that may be planned on these streams.

Future Study

Future study and remediation efforts should focus on those streams that had moderately impaired macroinvertebrate communities or exceeded water quality standards. Moderately impaired biological conditions were found at Seeley Creek, Long Arm Creek, both sites on the Cowanesque River (1.0 and 2.2), Babcock Run, Bill Hess Creek, Denton Creek, Dry Brook, and White Branch Cowanesque River. Additional study of stream water chemistry, biology, and habitat at varying flows may help explain some impairment problems.

During this sampling period, a large number of streams had water quality parameters that exceeded standards. These streams included Apalachian Creek, Bentley Creek, Cascade Creek, Cayuta Creek, Choconut Creek, Little Snake Creek, Seeley Creek, Snake Creek, South Creek, Troups Creek, Conowingo Creek, Ebaughs Creek, Falling Branch Deer Creek, Long Arm Creek, Chemung River, Cowanesque River (1.0 and 2.2), Susquehanna River (10.0, 289.1, 340, and 365), Tioga River, Deep Hollow Brook, and Denton Creek. The water quality conditions of these streams should be monitored for future violations. Furthermore, the source of these pollutants should be identified. State water quality standards vary across state lines, and problems may arise when the source of these pollutants is located in an adjacent state.

All data from interstate streams sampling from the mid-1980s to the present is available from SRBC upon request.