

BIOLOGICAL ASSESSMENT

GBM^c & Associates provides a broad range of services relative to the assessment of aquatic biological communities in both streams and lakes. Fish, macroinvertebrate, periphyton, zooplankton, phytoplankton and habitat collection and analysis techniques have been used over a wide range of habitat types and sampling conditions. GBM^c maintains a variety of field equipment to facilitate multiple site surveys in various size waterbodies. GBM^c & Associates have maintained appropriate state collectors permits, allowing sampling and preservation of aquatic macroinvertebrates, and fish since the mid-1980's and for multiple states including Arkansas, Oklahoma, Missouri, and Kansas.

Experience and Capabilities

- Conducted hundreds of **rapid bioassessments** above and below point source (industrial and municipal) and non-point pollution sources to evaluate the development of benthic macroinvertebrate and fish communities, the maintenance of designated uses, and the biological integrity of the receiving stream.
- Conducted simple qualitative and detailed quantitative **habitat assessments** (both aquatic and terrestrial) as a prerequisite to maintenance of biological integrity.
- Performed **periphyton community analysis** using various techniques including the rapid periphyton survey, quantitative biomass sampling and visual qualitative coverage assessment.
- Designed and implemented **quantitative sampling** and assessment programs for benthic and fish communities to measure pre and post project biological integrity on systems ranging from intermittent streams to the Arkansas River.
- Completed numerous **bioassessments of lakes and reservoir** systems using various techniques for the collection of fish, macroinvertebrates, zooplankton, phytoplankton and habitat data.
- **Bioassessment to Document the Existing Condition of Aquatic Life.** A multi-site intensive field study of the macroinvertebrate and fish community was used determine the downstream limit of adverse effects below a point source discharger and to identify other potential stressors within the watershed. The aquatic biota indicated agricultural activities (non-point) along the stream to be the major source of in-stream effects.
- **Impact Assessment of Long Term Industrial Activities at Department of Defense (DOD) facilities.** GBM^c personnel monitored macroinvertebrate and fish using qualitative and/or semi-quantitative techniques (aquatic dip nets and Hester-Dendy artificial substrates) to determine the extent of impacts and/or recovery of the aquatic community in DOD streams over a multi year period. Assessment projects were completed at one arsenal and two training facilities.



BIOLOGICAL ASSESSMENT (cont.)

- **Bioassessment to Facilitate Site Specific Criteria Development in Missouri.** A multi-season intensive field survey was completed that included collection of fish, macroinvertebrates, habitat and water quality data. Quantitative macroinvertebrate protocols were utilized including identification of all taxa, including Chironomidae, to the genus and/or species level.
- **Caddo River Quantitative Macroinvertebrate Seasonal Assessment.** GBMc personnel documented AMCA of the Caddo River in Arkansas to demonstrate the seasonal variation in least disturbed systems.
- **Bioassessment to determine the impact of Various Point and Non-point Source Discharges.** During the past several years, GBMc[®] has completed characterizations and analyses of aquatic biota in the following named waterbodies:
 - Flint Creek – Benton County, AR,
 - Sager Creek – Benton County, AR,
 - Coon Creek – Lawrence County, AR,
 - Horsehead Creek – Columbia County, AR,
 - Bayou De Loutre – Union County, AR,
 - Honey Creek – Delaware County, OK,
 - Cave Springs Branch – Delaware County, OK and McDonald County, MO,
 - Yashoo Creek – McCurtain County, OK,
 - Town Branch Creek, Hot Springs County, AR,
 - Flat Creek – Union County, AR,
 - Sewell Creek – Union County, AR,
 - Caney Creek – Hempstead County, AR,
 - Hurricane Creek – Saline County, AR,
 - Garland Creek – McCurtain County, OK,
 - Little Muddy Creek – Pettis County, MO
 - Kellogg Creek – Pulaski County, AR,
 - Leopard Creek – Pulaski County, AR,
 - Jim Creek – Pulaski County, AR, and
 - German Bayou – Avoyelles Parish, LA.
- In addition to the named waterbodies, biological assessments have been completed in numerous unnamed tributaries in several states (OK, MO, LA, MS, VA) and in all Arkansas ecoregions.
- **Limnology of Lake Siloam Springs.** A bioassessment and trophic status analysis of Lake Siloam Springs was completed. The assessment included surveys of fish, zooplankton, phytoplankton, macrophytes and riparian habitat. Data was used to assign a trophic status to the lake and recommend management options.



GBMc Contacts

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