Guide to Aquatic Invertebrates of the Upper Midwest

Identification Manual for Students, Citizen Monitors, and Aquatic Resource Professionals

AUTHOR

R. William Bouchard, Jr.
University of Minnesota
Department of Entomology

EDITORS

Leonard C. Ferrington, Jr.
University of Minnesota
Department of Entomology

Mary L. Karius
Volunteer Stream Monitoring Partnership
University of Minnesota
Water Resources Center

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Cover macroinvertebrate photos by Dean C. Hanson. Front cover photo by Leonard C. Ferrington, Jr.. Back cover photo by R. William Bouchard, Jr.

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FOREWORD

This new taxonomic key will permit identification of macroinvertebrates to the Family level and is intended for use by students, teachers, other volunteers, or anyone who requires that level of identification. This key was developed to replace or augment existing macroinvertebrate keys that were incomplete or confusing for volunteers monitoring biological communities. Families common to Minnesota and the Upper Midwest that were missing in earlier keys have been included. New drawings have been created to highlight distinguishing characteristics that will increase accuracy and consistency. It is designed to help volunteers strengthen their identification skills and, in conjunction with a well-designed monitoring program and proper field protocols, will improve the quality of biological data that can be used for decision-making.

Biological communities serve as good indicators of overall stream health. Macroinvertebrates may spend years maturing in the stream. Thus, the size and diversity of their population reflect an integration of all the stream conditions that occur during their life cycles, such as water chemistry, habitat characteristics, pollutant loading, and changes in water flow, temperature, or velocity. Certain species are intolerant of pollution and will be absent from streams with degraded water quality or habitat. Biological monitoring adds a significant component to the overall assessment of stream health, but it requires training in proper sampling and identification, specialized equipment, access to a microscope, and appropriate interpretation of biological indices.

Many volunteers and local organizers prefer to monitor biological communities because volunteers may find it more engaging than other types of monitoring. Volunteers can augment limited agency resources and expand ambient water quality records, adding to the length or completeness of the data record by supplementing agency monitoring, or by sampling additional sites. By monitoring macroinvertebrates at a site where professionals sample water chemistry, volunteers add significantly to the knowledge base about that site. They often broaden the scope and context of agency monitoring because they know a great deal about the land use in the watershed and the history of their stream. Volunteers can help identify areas of concern and changes or trends that should be investigated. Volunteers also increase public awareness of water resources; they can motivate action and bring attention to under-appreciated natural resources.

The information volunteers collect is helping state and local governments, natural resource professionals, and local decision makers gain a better understanding of the health of our water resources. At the same time, volunteers learn for themselves how human uses affect the rivers and streams in their communities. Students learn scientific methods and gain life skills, as well as understanding more about natural systems. Neighborhood groups find out more about the streams that run through their backyards. Organizations can follow up on problems and use the data they collect to undertake stewardship actions to improve the health or habitat of their streams. Some groups monitor to help develop Total Maximum Daily Load allocations or assess whether implementation of pollution-reduction strategies is effective.

Whatever your reasons for getting involved, there are monitoring options that will match your goals, skill level, and available resources. VSMP has developed a guide that will help get you started assessing the biological - or the physical or chemical - characteristics of streams and their watersheds. See www.VSMP.org for the "Guide to Volunteer Stream Monitoring" for more help on designing a program.