Protocol for Tolerance Values/Habit/FFG for GA EPD

A GA EPD taxa list is provided on the website (www.gaepd.org), which includes tolerance values, functional feeding groups, and habit. This information is needed to calculate metric scores. However, taxa may be encountered that are not on this list, but do occur in Georgia. This may be due to the level of identification or that it was not identified for the Ecoregions project.

A hierarchal priority list was developed to determine the tolerance values, habit, and functional feeding group of a taxon. If a taxon does not occur on the taxa list, follow the priority list depending on what taxonomic level you identified the taxon.

For example, if a specimen has been identified to genus level, start with the priority list of genus level. First, refer to the value in the Rapid Bioassessment Procedures (RBP) manual for SE (North Carolina), if that value is not available, then refer to the RBP Average Species in SE (North Carolina), if that value is not available then refer to the RBP (Mid-Atlantic Coastal Streams Workgroup) MACS Genus Value, if that value is not available than refer to RBP Average species anywhere in US (If not listed in SE take average all species for that genus for all regions), if not available refer to RBP Nearest Geographically (genus value) Midwest (Ohio) and if this is available this is your tolerance value. The other taxonomic levels work in the same manner as well as habit and functional feeding group.

The complete, hierarchical priority list follows:

Order of Priority for Tolerance Values

Family Level

RBP SE (North Carolina)
↓
RBP MACS
↓
RBP Average SE genera and species average
(Take the average of all genera and species that have a SE value)
↓
RBP Average Countrywide genera/species
(If no SE values take the average of all genera and species for the other regions in the RBP)
↓
RBP Nearest Geographically (Family value) Midwest (Ohio)
↓
RBP If have values for both Upper Midwest (Wisconsin) and Northwest (Idaho) then average the two
↓

RBP Upper Midwest (Wisconsin) genus value
↓
RBP Northwest (Idaho) genus value
↓
Best Professional Judgment

Genus Level

RBP SE (North Carolina)
↓
RBP Average Species in SE (North Carolina)
↓
RBP MACS Genus Value
↓
RBP Average species anywhere in US
(If not listed in SE take average all species for that genus for all regions)
↓
RBP Nearest Geographically (genus value) Midwest (Ohio)
↓
RBP If have values for both Upper Midwest (Wisconsin) and Northwest (Idaho) then average the two
↓
RBP Upper Midwest (Wisconsin) genus value
↓
RBP Northwest (Idaho) genus value
↓
Tribe, Subfamily, Family value, or Superfamily (At this level, go to Family Level and follow that procedure)
↓
Best Professional Judgment

Species Level

RBP SE (North Carolina) species value
↓
RBP MACS species value
↓
RBP SE (North Carolina) genus value
↓
RBP SE Average Species Value
↓
RBP if MW, UM, or NW is listed for that particular species than use Nearest Geographically (see below)
↓
RBP average species value any region

(If not listed for SE, then take the average of all species of that genus for all other regions)
↓
RBP MACS genus value
↓
RBP Nearest Geographically (genus value) Midwest (Ohio)
↓
RBP If have values for both Upper Midwest (Wisconsin) and Northwest (Idaho) then take the genus average
↓
RBP Upper Midwest (Wisconsin) genus value
↓
RBP Northwest (Idaho) genus value
↓
Tribe, Subfamily, Family value, or Superfamily (Once get to this level, go to Family Level and follow that procedure)
↓
Best Professional Judgment

Order Level

If nothing else use the Order Level (or Best Professional Judgment)

RBP SE (North Carolina)
↓
RBP MACS
↓
RBP Average SE family, genera, and species average
(Take the average of all family, genera, and species that have a SE value)
↓
RBP Average Countrywide family/genera/species
(If no SE values take the average of all genera and species for the other regions in the RBP)
↓
Best Professional Judgment

Complexes

Species complex

When listed as species complex or species group
RBP SE species value listed for that species use that value (RBP SE Species Value)
↓
RBP SE Genus Value
↓
RBP SE Average Species (take an Average all species for that genus for the SE)

Species/species complex

When listed as species/species complex or species/species group
RBP SE value, take the average of the two SE values (RBP SE Average Complex (or group) Value)
↓
When no SE value given for either species than take RBP SE Genus Value
↓
When no SE value given for either species and no SE Genus Value, then take the RBP SE species average for all species of that Genus

Exceptions for species/species complex:

When one listed for MAC and one not listed at all, then drop down to SE Genus value
And
If one listed and one not listed for SE 1st take Average species for that Genus, if several SE species values are listed

Genus/Genus complex

Listed as Genus/Genus complex or Genus/Genus Group

RBP SE Average, if have both Genera than take the average of them (RBP SE Average Genus (or group) Complex

Exceptions for Genus/Genus complex:

If one is listed for SE, but the other genus priority list would indicate to take MACS Family Value; then take the SE Average Genus/Species for entire Family (Average Genus/Species Complex) (Average for Family)

And

If one listed for SE, but other not listed and Average taken to get that value, which would include the other genus that is part of the complex, then use the RBP Average Genus/Species Complex

And

If there are two different regions (1 genus listed for 1 region and 1 genus listed for a different region), average the two different regions for those two genera (Average Genus Complex, don't specify regions).

Order of Priority for FFG and Habit

FFG and Habit/Behavior

RBP value
↓
Merritt and Cummins value

↓
If have species, but none listed can go to genus or family if everything else listed is the same in RBP, similarly for genus, - go to family, etc.
(Do not use if several different ones occur, leave as unidentified)
↓
If have species, but none listed can go to genus or family if everything else is the same in Merritt and Cummins, also can use that value if says generally; same for genus go to family, etc.
(Do not use if several different ones occur, leave as unidentified)

The above protocol is for the general tolerance value in the taxa list. The North Carolina tolerance value is the column in the RBP listed as Southeast (NC). This value is used for the North Carolina Biotic Index. The tolerance values cannot be modified for use with this index. If a value is not listed in the Southeast (NC) column, the specimen is not included as part of the North Carolina Biotic Index.

Additional Sources for Habit & FFG

Thorp & Covich
Maxted 2000 list if CN or not for Habit

Note:

Lenat 1993 is the same as the SE (North Carolina) value in the RBP
Maxted 2000 is the same as the MACS value in the RBP

Tolerance values/Habit/Functional Feeding Group Sources:

Barbour, M. T., J. Gerritsen, B.D. Synder, and J. B. Stribling. 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Macroinvertebrates and Fish, 2nd Edit. EPA 841-B-99-002. U.S. Environmental Protection Agency; Office of Water; Washington, DC.

Lenat, David R. 1993. A biotic index for the southeastern United States: derivation and list of tolerance values, with criteria for assigning water-quality ratings. Journal of North American Benthological Society 12(3):279-290.

Maxted, J. R., Barbour, M. T., Gerritsen, J., Poretti, V., Primrose, N., Silvia, A., Penrose, D., and Renfrow, R. 2000. Assessment framework for mid-Atlantic coastal plain streams using benthic macroinvertebrates. Journal of North American Benthological Society 19(1):128-144.

Merritt, R. W. and Cummins, K. W. (Editors). 1996. An Introduction to the Aquatic Insects of North America. Kendall/Hunt Publishing Company, Dubuque, Iowa.

Thorp, James and Covich, Alan. (Editors). 1991. Ecology and Classification of North American Freshwater Invertebrates. Academic Press, New York, New York.