EPA United States Environmental Protection Agency

US Army Corps of Engineers

ERDC

Great Plains Streamflow Duration Assessment Method: Total aquatic macroinvertebrate abundance

Video Training

2025

Great Plains SDAM is based on 8 indicators:

All eight indicators are measured in the **field.**

*Indicators evaluated along the entire length of the assessment reach

In recommended order of data collection:

- Bankfull channel width
- **Total aquatic macroinvertebrate abundance**
- Number of hydrophytic plant species*
- Presence/absence of rooted upland plants in the streambed*
- Differences in vegetation*
- Riffle-pool sequence*
- Particle size or stream substrate sorting*
- Sediment on plants or debris*

Total aquatic macroinvertebrate abundance for Great Plains

Total aquatic macroinvertebrate abundance

- Count the total abundance of aquatic macroinvertebrates. No further ID required.
- Measured with a 15-minute search in at least 6 locations that represent all habitat types.
- Do not differentiate between live organisms and non-living material (cases, shed skins, etc.). All are counted for this metric.
- <u>Ignore terrestrial life stages or species.</u>

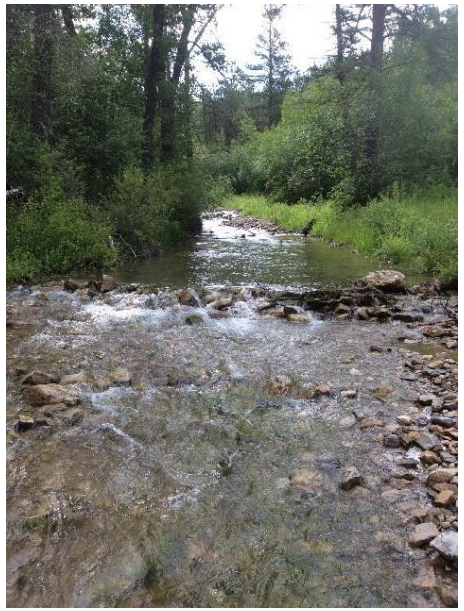
Macroinvertebrates.org

Recognize common terrestrial taxa

Use of field guides is recommended if not familiar with common types of aquatic macroinvertebrates, especially to discern aquatic vs. terrestrial taxa or life stages.

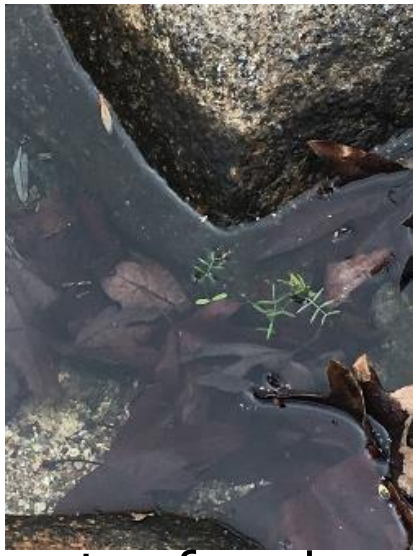
Total aquatic macroinvertebrate abundance for Great Plains

Target all habitat types

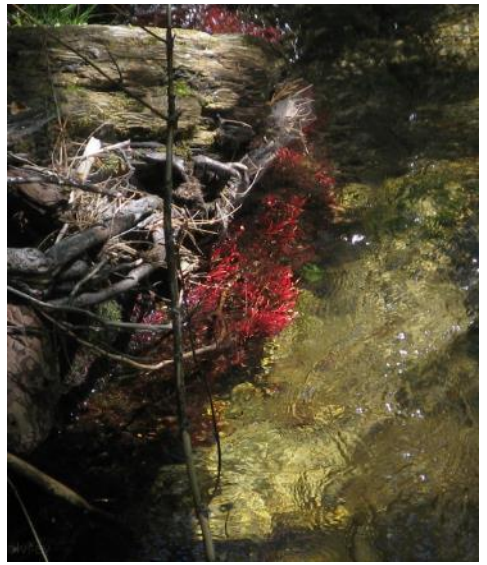


Riffles

Pools



Leaf packs



Tree roots

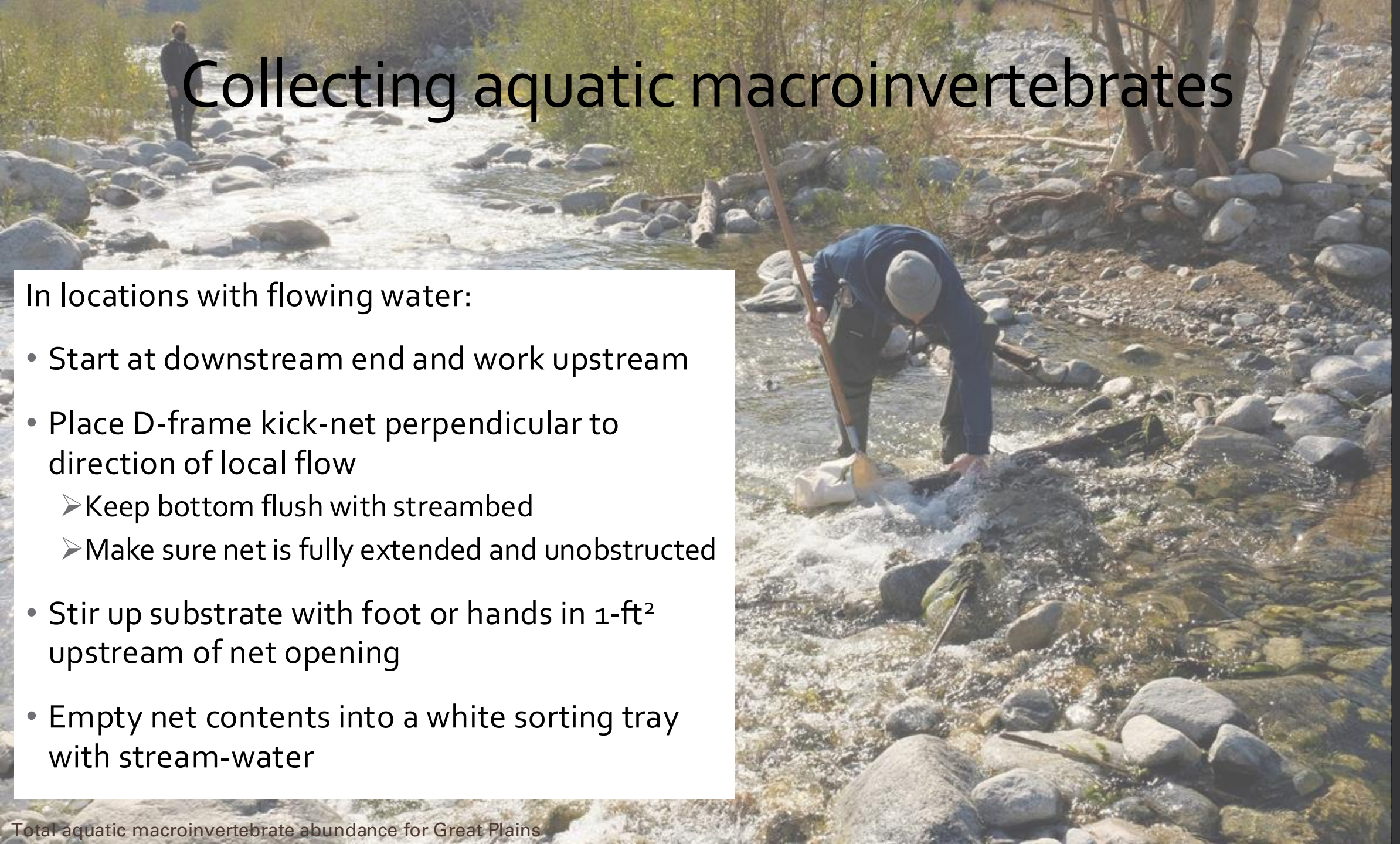
Woody jams

Undercut banks

Use the appropriate technique for the conditions

Total aquatic macroinvertebrate abundance for Great Plains

Collecting aquatic macroinvertebrates



In locations with flowing water:

- Start at downstream end and work upstream
- Place D-frame kick-net perpendicular to direction of local flow
  - Keep bottom flush with streambed
  - Make sure net is fully extended and unobstructed
- Stir up substrate with foot or hands in 1-ft^2 upstream of net opening
- Empty net contents into a white sorting tray with stream-water

Total aquatic macroinvertebrate abundance for Great Plains

Collecting aquatic macroinvertebrates

Total aquatic macroinvertebrate abundance for Great Plains

In locations with still water:

- Place net in water
- Kick up substrate
- Rapidly move net through water, sweeping up suspended invertebrates and material they may be clinging to

Collecting aquatic macroinvertebrates

In woody jams, root mats, and undercut banks:

- Jab with a D-frame net

Total aquatic macroinvertebrate abundance for Great Plains

Collecting aquatic macroinvertebrates

- Pick up and examine large cobbles or other substrate
- "Clingers" will be evident; for example, heptageniid mayflies are flattened and will often be found clinging to rocks.

Total aquatic macroinvertebrate abundance for Great Plains

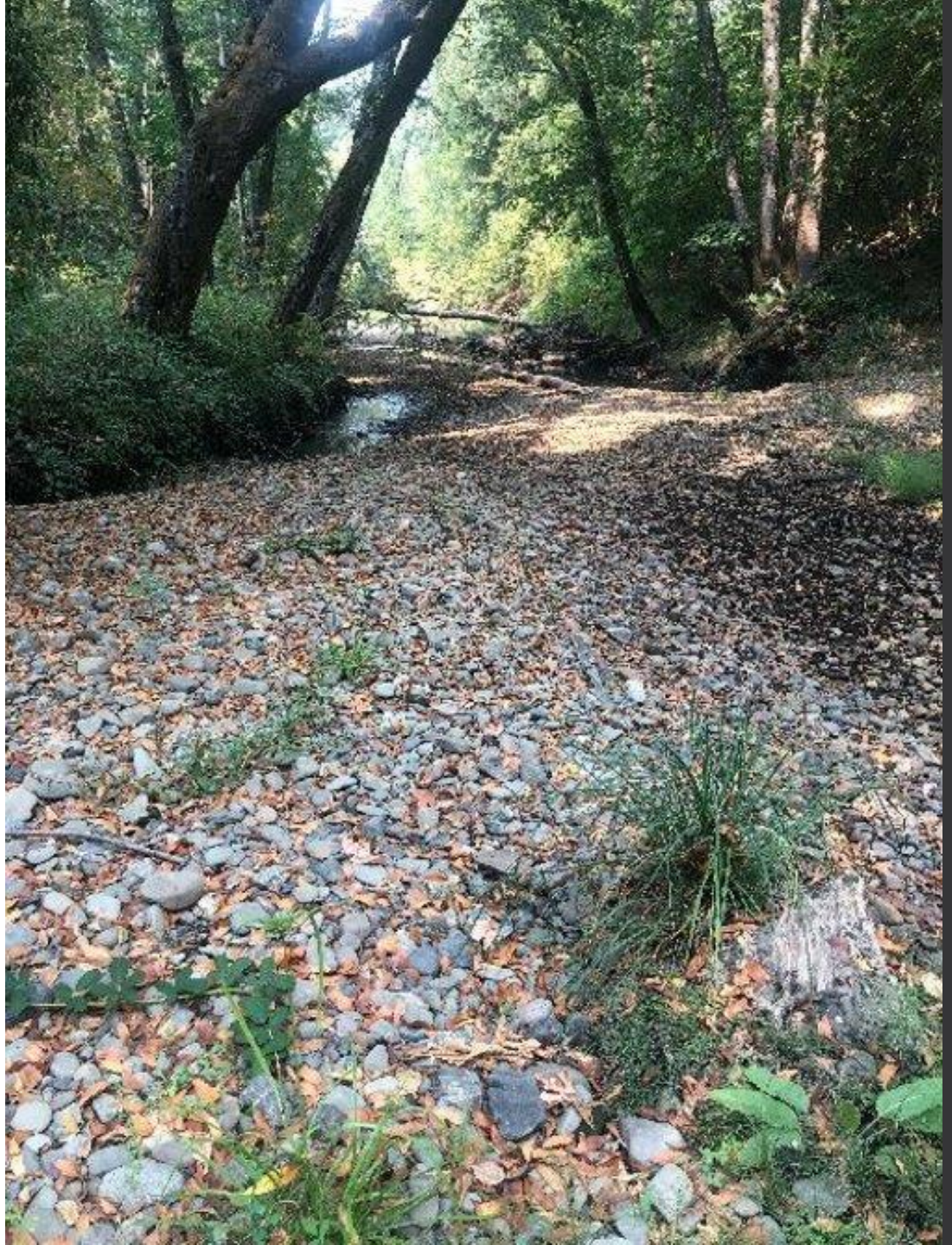
In partially dry and dry streams

- Look for areas where water may have persisted; focus on remaining wetted habitats, if they exist
- Turn over cobbles and boulders in areas where water likely persisted longer (dry streams)
- Look at streamside vegetation or large boulders for shed skins or cases

Shed larval skins (exuviae)

Caddisfly cases

Total aquatic macroinvertebrate abundance for Great Plains



Ignore terrestrial lifestages

Total aquatic macroinvertebrate abundance for Great Plains

Field measurement

- Use net to filter out fine sediment but retain invertebrates.
- White-backed tray makes it easier to see.
- Feather-weight forceps, eye-droppers can help.
- Be patient: Some invertebrates will start moving and become obvious.
- Search for macroinvertebrates clinging to the net as well.
- Recommend collecting specimens to confirm that specimens are aquatic species, if possible.

Total aquatic macroinvertebrate abundance for Great Plains

Record on the Field Form

2. Total aquatic macroinvertebrate abundance

Collect aquatic macroinvertebrates from at least 6 locations in the assessment reach and determine total abundance using the following categories:

Mark the appropriate box for the total number of aquatic macroinvertebrates observed.

- ☐ Total abundance of aquatic macroinvertebrates is zero.
- ☐ Total abundance is ≥1 and <10.
- ☐ Total abundance is ≥10.

Notes on total aquatic macroinvertebrate abundance:

Total aquatic macroinvertebrate abundance for Great Plains

Knowledge check!

True or false: No aquatic macroinvertebrates will be found in a dry reach.

A. TRUE

B. FALSE

Total aquatic macroinvertebrate abundance for Great Plains

Knowledge check!

True or false: No aquatic macroinvertebrates will be found in a dry reach.

A. TRUE

B. FALSE

False: Count individuals or evidence of aquatic macroinvertebrates you observe in a dry reach, whether living or dead. The most common evidence may be things like caddisfly casings or snail shells.

Knowledge check!

When is sampling for aquatic macroinvertebrates complete?

A. When you've collected at least 100 individuals
B. After you've collected from the richest habitats
C. After you've collected from 6 locations over 15 minutes
D. Immediately, in a dry reach

Total aquatic macroinvertebrate abundance for Great Plains

Knowledge check!

When is sampling for aquatic macroinvertebrates complete?

A. When you've collected at least 100 individuals
B. After you've collected from the richest habitats
C. After you've collected from 6 locations over 15 minutes
D. Immediately, in a dry reach

Sampling is complete after at least 6 locations have been sampled over 15 minutes of searching. (not including the time needed for sorting and counting)

Total aquatic macroinvertebrate abundance for Great Plains

For more information about SDAMs:

https://www.epa.gov/streamflow-duration-assessment