

# CHAPTER 8

## PLANKTON

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### Disclaimer

Methodologies for assessing ALU based on plankton have not been developed for Texas waters. Before conducting any biological monitoring activities using plankton, it is imperative to coordinate this work with the TCEQ and the TPWD. As methodologies and metrics become established, this manual will be updated to reflect those changes.

### Non-Wadeable Streams, Rivers, Lakes, Reservoirs, and Bays

The objective of this chapter is to describe methods recommended by the TCEQ for the collection and assessment of plankton assemblages.

The purpose of plankton sampling is to collect data that can be used to assess water quality trends and compare water quality between sites. Phytoplankton may also be sampled during a fish kill or other harmful algal bloom event. Special handling may be required for red tide, golden alga, or cyanobacteria blooms. Contact the laboratory that will be analyzing the samples before sample collection for specific instructions.

### *Netplankton Collection Method*

1. Collect a minimum of two vertical net tows per station.
2. Lower a clean plankton net with bucket attached to a depth of 1 m above the substrate.
3. Keeping the net line as vertical as possible, raise the net through the water column at a rate of 0.6 m/sec.

### Low Abundance

Low netplankton abundance is indicated by the net bucket draining rapidly and freely as the net is lifted from the water. In this circumstance, rinse the plankton on the surface of the net down into the bucket. This can be accomplished by holding the net upright and dunking it several times into the water, up to the mouth. Alternatively, water can be splashed on the outside of the net and the plankton will be washed down to the bucket. Disconnect the bucket and rinse into a clean waterproof container using a rinse bottle filled with either 3 to 5 percent formalin (three to five parts full-strength formalin and 97 to 95 parts water) or ambient water prefiltered through the plankton net. If formalin is used, add several grams of borax to buffer the formalin solution.

### High Abundance

High netplankton abundance is indicated by the net bucket draining slowly in a restricted manner as the net is lifted from the water. Discard the net sample and collect water samples at specified depths with a Kemmerer or Van Dorn sampler. Pour the water samples into the plankton net. Sample depths are:

- 0.3 m below the surface
- 1 m above bottom
- At 3 m intervals between surface and bottom (a minimum of three samples are collected)

## Sample Processing

Once all the water samples have been poured through the plankton net, wash the plankton down into the bucket and then rinse the net and bucket into a clean, waterproof container using a rinse bottle filled with ambient water prefiltered through the plankton net.

## Sample Preservation

Preserve by adding 1 mL of Lugol's solution per 100 mL of final sample volume. The Lugol's solution is prepared by combining 180 mL of deionized water, 20 mL of glacial acetic acid, 20 g of potassium iodide, and 10 g of iodine crystals (APHA 1999).

**Safety Note:** Label secondary container with solution components. Be sure to add the acid to water. Wear safety glasses and latex gloves when preparing this solution.

## Labeling Sample Containers

Affix the label to the outside of the container making sure the container is dry. Wrap with clear tape to make sure the label stays fixed to the container. Labels must contain the following information:

- Station number and location description
- Date and time of collection
- Preservative used
- Name of collector(s)
- Sample type
- Container replicate number (for example: 1 of 2 or 2 of 2), if needed

Additional labeling is necessary depending on the method of collection.

For net hauls include:

- Number of net hauls
- Depth of net hauls
- Diameter of net mouth

For Kemmerer (or Van Dorn) samples, subsequently filtered with a net, include:

- Volume of sampler (liters)
- Sampling depths
- Number of samples

## Sample Storage

Samples must be stored at a moderate temperature in the dark until analysis.

## ***Nannoplankton Collection Method***

Collect a minimum of 500 mL of sample per station.

Measure and record Secchi disk transparency for the location (see *Secchi Disk Transparency* in RG-415, Chapter 3).

Using a Kemmerer, Van Dorn, or other type of sampler capable of collecting water samples from specific depths, collect samples from the following depths.

- 0.3 m
- 1 x Secchi disk transparency
- 2 x Secchi disk transparency
- 3 x Secchi disk transparency

**Note:** Do not collect samples closer than 1 m above the substrate.

Upon retrieving the sampler from the water, quickly pour 200 mL of sample into a clean, graduated cylinder. Empty the graduated cylinder into a clean, 1 L cubitainer.

Repeat until samples are collected from the required depths and 200 mL from each sample is composited into the same cubitainer.

As an alternative to compositing water from various depths, a plastic tube can be used to take a continuous sample to a depth equal to three times the Secchi disk transparency. Slowly lower a weighted tube (of the same continuous inner diameter) to the desired depth, cap the end, and pull up the tube, full of water. Release the water into the sample container or net. Repeat as necessary to obtain at least 500 mL of sample.

## **Sample Preservation**

If the sample cannot be analyzed within 24 hours, preserve it with Lugol's solution, i.e., 1 mL of Lugol's solution per 100 mL of sample (APHA,1999). If the sample will be analyzed within 24 hours, store the sample in a cool, dark location with 5 cm of air space in the container. Do not refrigerate or place a live sample on ice.

## **Labeling Sample Containers**

Affix the label to the outside of the container making sure the container is dry. Wrap with clear tape to make sure the label stays fixed to the container. Label the sample container with the following information and also include it in the field logbook:

- Station number and location description
- Date and time of collection
- Sampling depths
- Secchi disk transparency
- Volume (mL) composited from each depth
- Preservative used
- Name of collector(s)
- Sample type
- Container replicate number (for example: 1 of 2 or 2 of 2), if needed

## **Sample Storage**

The sample container must be stored in a cool, dark location until analyzed (it is not necessary to refrigerate preserved samples).

