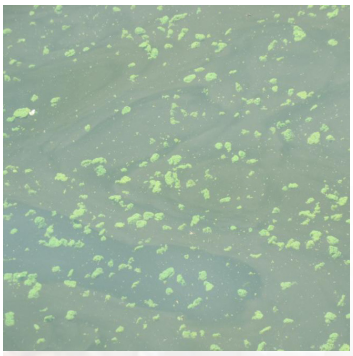
Ohio

Department of Health
Department of Natural Resources
Environmental Protection Agency

Harmful Algal Bloom Response Strategy for Recreational Waters

BEACH MANAGERS GUIDE



VISUAL MONITORING

Cyanobacteria blooms vary in color and texture and may appear on the water surface, appear below the surface, or may move through the water column over the course of the day.

Look for water that:

- **resembles spilled paint.**
- **is discolored or has streaks of color (green, blue red, brown, purple, black or white).**
- **looks wooly or slimy.**
- **has mats, scums or films on the surface.**
- **has globs floating below the surface.**

See www.ohioalgaeinfo.com for additional photos of HABs and sampling methods.

Grab Sampling for Phytoplankton Identification

This method is effective for determining whether cyanobacteria are present, and the dominant and subdominant types, if the bloom is evident at or just below the surface of the water. For more precise information, such as cell counts, or if the bloom is diffuse through the water column, use an integrated tube sampler for composite phytoplankton collections, as described in the State of Ohio Harmful Algal Bloom Response Strategy for Recreational Waters.

You will need:

Clean 1 quart container with a tight fitting lid
Clean bucket
Gloves, goggles, hip waders
Cooler, ice or ice packs
Lugol's iodine

Sampling method:

1.) Thoroughly rinse the bucket in lake water away from where you will be sampling.

2.) Go to the area where the bloom appears to be most dense.

3.) Turn the 1 quart container upside down and lower it into the water where the bloom is thickest.

4.) Fill the container with water and material.

5.) Turn the container upright and bring it the surface.

6.) Preserve the sample with Lugol's iodine, if available. (Add 1 ml of iodine per 100 ml of sample; color of the preserved sample should resemble weak tea.)

7.) Cap the sample container tightly.

8.) Immediately place the container in a cooler with bagged ice or cold packs. Do NOT freeze.

Sampling for Toxin Analysis

To facilitate analysis at state park beaches where HABs are suspected, toxin samples may be collected immediately after the phytoplankton collection, and shipped together to DES Lab.

You will need:

Clean 1 quart container with a tight fitting lid
Clean bucket
Stirring rod
Gloves, goggles, hip waders
Cooler, ice or ice packs

Sampling method:

1.) Thoroughly rinse the bucket and stirring rod in lake water away from where you will be sampling.

2.) Choose 3 equally spaced starting points (transects) at the water's edge.

3.) From the first starting point, walk into the water until you reach ankle depth. Dip the container just below the surface and fill it with water. Empty all of the water in the container into the bucket.

4.) Walk in a straight line to knee deep water. Dip the container just below the surface and fill it with water. Empty all of the water in the container into the same bucket.

5.) Walk in a straight line to hip deep water. Dip the container just below the surface and fill it with water. Empty all of the water in the container into the same bucket.

6.) Return to the beach. Go to the second starting point. Repeat steps 3-5 along the transect from the second starting point (i.e. sample at ankle, knee & hip depth). Each time, empty the container into the same bucket.

7.) Return to the beach. Go to the third starting point. Repeat steps 3-5 along the transect from the third starting point (i.e. sample at ankle, knee & hip depth). Each time, empty the container into the same bucket.

8.) Mix all 9 collected samples in the bucket with the stirring rod.

9.) Dip the container into the bucket and fill it half-way. Cap the container tightly.

10.) Immediately place the container in a cooler with bagged ice or cold packs. Samples may be frozen if there will be a delay in processing (i.e. sample taken on the weekend).

Labeling, Shipping and Reporting

Labeling:

Using a waterproof marker, label the sample container(s) with the following information:
Sample Site (Station ID for state park lakes)
Date
Time
Preservative (if applicable)

Shipping:

Tightly seal the cooler(s) containing the sample(s) prepared as described above, and ship or transport the coolers to the appropriate laboratory.

Public agencies may use OEPA's Division of Environmental Services (DES) Lab for phytoplankton identification and toxin analysis. Other beach managers may use BSA Environmental Services or other commercial laboratories.

- Transport or ship **phytoplankton** samples overnight to OEPA's DES Lab or BSA Environmental Services.
- Transport or ship **cyanotoxin** samples for analysis to be received and processed within 36 hours of collection to OEPA's DES Lab or BSA Environmental Services.

Ohio EPA Division of Environmental Services
Attn: DES Sample Coordinator
8955 E. Main Street
Reynoldsburg, OH 43068
(614) 644-4243
Include the completed DES sample submission form if shipping to the DES Lab. Please call before sending samples.

BSA Environmental Services, Inc.
23400 Mercantile Road, Suite 8
Beachwood, OH 44122
(216) 765-0582

Reporting:

Complete the Bloom Report Form (available at www.ohioalgaeinfo.com) and submit by e-mail to HABmailbox@epa.ohio.gov.

Public Advisories

If toxin analysis detects toxin levels that equal or exceed the established thresholds for a Recreational Public Health Advisory (see table), an orange level advisory should be issued, and an orange sign with the following text (black lettering) should be posted at the beach:

WARNING

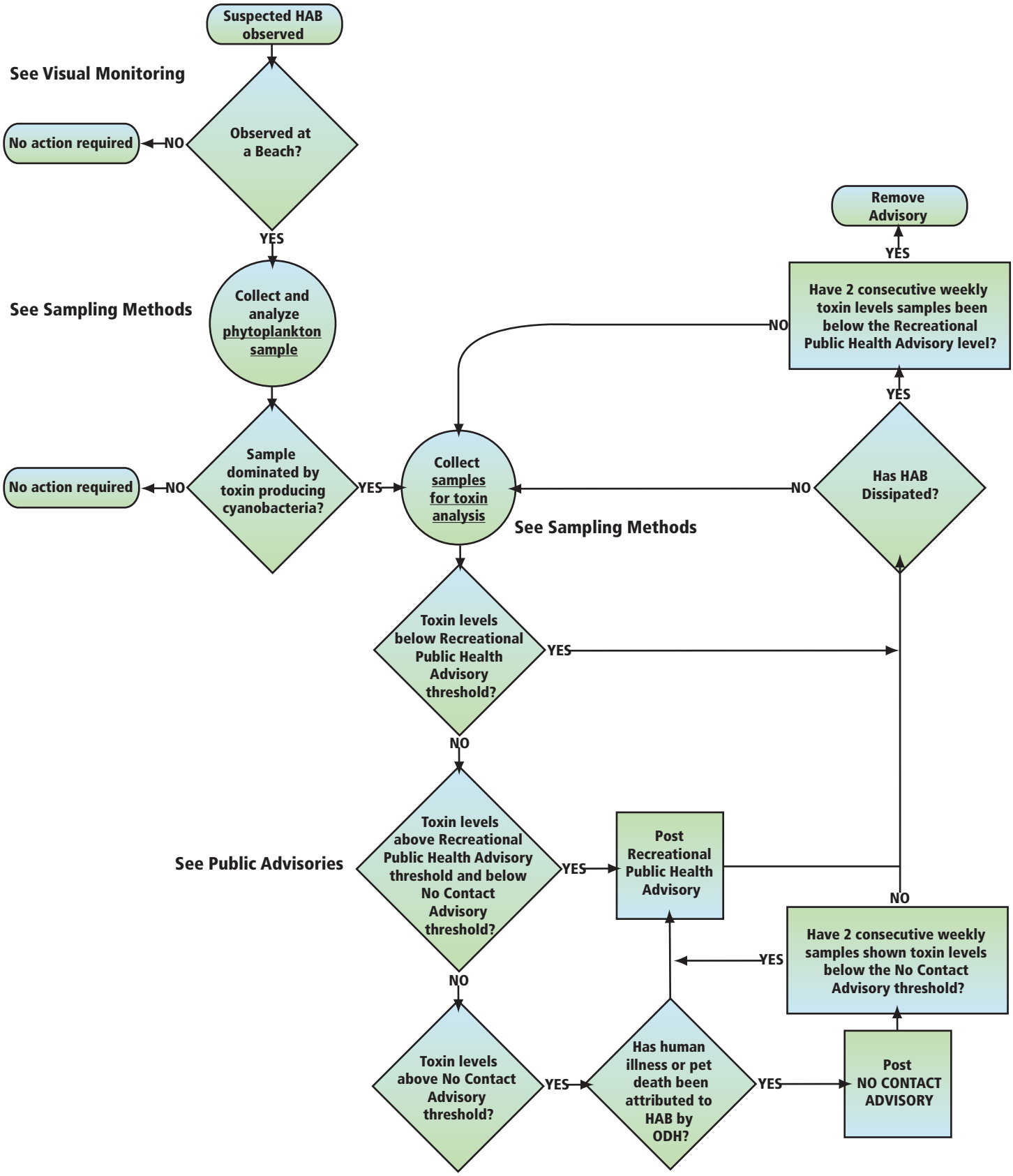
High levels of algal toxins have been detected. Swimming and wading are not recommended for the very old, the very young and those with compromised immune systems.

If toxin analysis detects toxin levels that equal or exceed the established thresholds for a Recreational No Contact Advisory (see table), AND there are one or more probable cases of human illness or pet deaths attributable to cyanotoxins, a red level advisory should be issued, and a red sign with the following text (white lettering) should be posted at the beach:

DANGER

Algal toxins at UNSAFE levels have been detected. Avoid all contact with the water.

Advisory	Threshold			
Public Health Advisory	Microcystin 6 µg/l	Anatoxin-a 80 µg/l	Cylindrospermopsin 5 µg/l	Saxitoxin 0.8 µg/l
No Contact Advisory	Microcystin 20 µg/l	Anatoxin-a 300 µg/l	Cylindrospermopsin 20 µg/l	Saxitoxin 3 µg/l


Suspected HAB observed
See Visual Monitoring
Observed at a Beach?
NO
No action required
YES
See Sampling Methods
Collect and analyze phytoplankton sample
Sample dominated by toxin producing cyanobacteria?
NO
No action required
YES
Collect samples for toxin analysis
See Sampling Methods
Toxin levels below Recreational Public Health Advisory threshold?
YES
NO
See Public Advisories
Toxin levels above Recreational Public Health Advisory threshold and below No Contact Advisory threshold?
YES
Post Recreational Public Health Advisory
NO
Toxin levels above No Contact Advisory threshold?
YES
Has human illness or pet death been attributed to HAB by ODH?
YES
Post NO CONTACT ADVISORY
YES
Have 2 consecutive weekly samples shown toxin levels below the No Contact Advisory threshold?
NO
Has HAB Dissipated?
NO
YES
Have 2 consecutive weekly toxin levels samples been below the Recreational Public Health Advisory level?
NO
YES
Remove Advisory