

Response Strategy for HCBs in Publicly Accessible Surface Waters in Wyoming

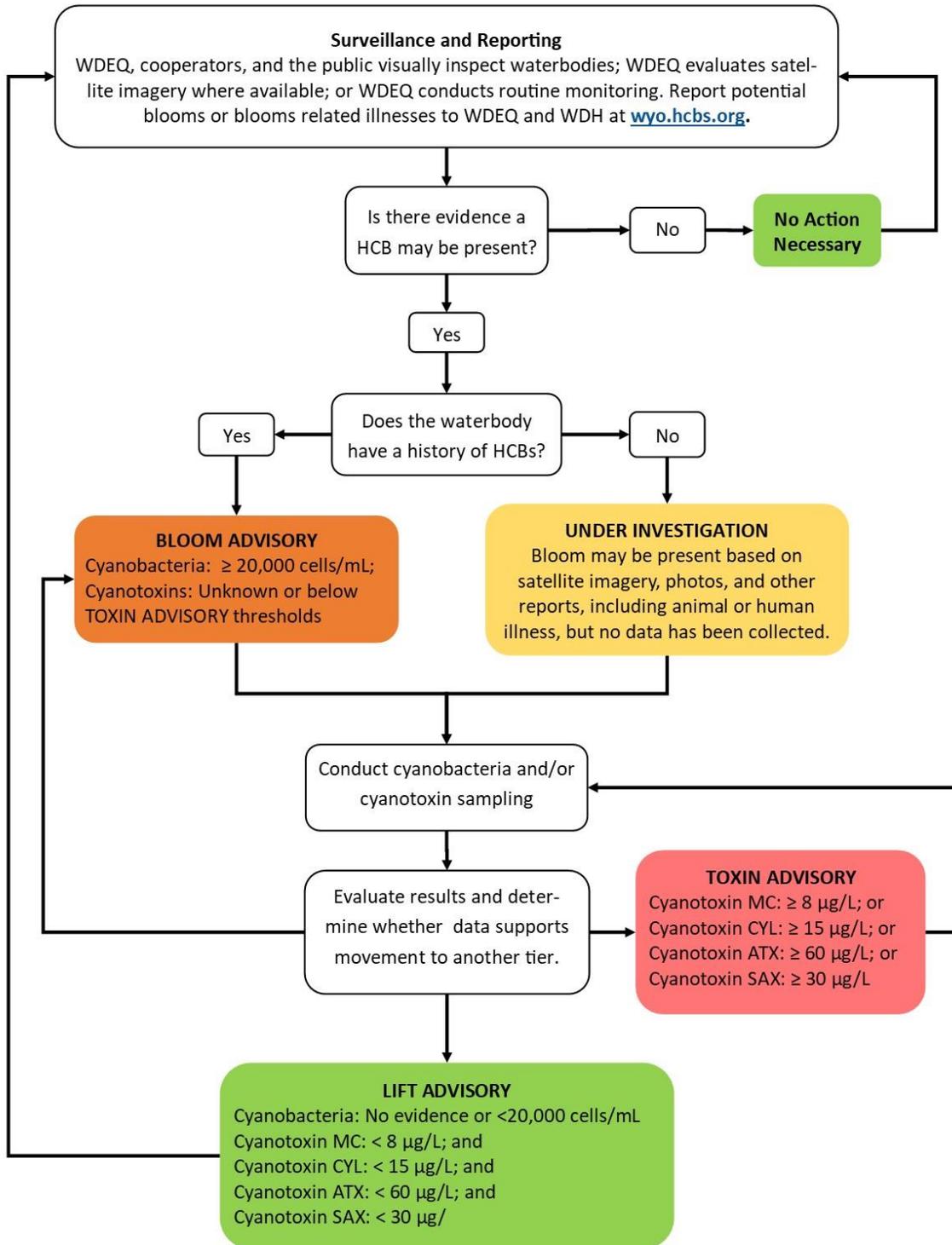
Step	Responsive Action
Step 1: Surveillance and Reporting	<ul style="list-style-type: none"> A public notice will be sent at the beginning of the HCB season with guidance on how to identify HCBs, report HCBs and HCB related illnesses, and health risks associated with HCBs. WDEQ and/or cooperators should visually inspect publicly accessible lakes and reservoirs (see WyoHCBs.org for photos of Wyoming HCBs). WDEQ will review satellite imagery, if available, to monitor lakes and reservoirs for HCBs. Suspected HCBs or possible HCB related illnesses should be report to WDEQ and WDH at WyoHCBs.org. If a waterbody has signs of a potential HCB, the waterbody will be placed Under Investigation on the WyoHCBs.org webmap. When a waterbody is placed Under Investigation, resource management agencies and local health authorities may choose to post a HCB signs in the area where the bloom or illness was reported if permanent HCB signs are not in place.
Step 2: Optional Preliminary Screening	<ul style="list-style-type: none"> WDEQ or a cooperator can use optional jar and/or stick tests¹ to determine if cyanobacteria are present in a bloom or cyanotoxin field test strips to determine if cyanotoxins are present. If tests are indicative of cyanobacteria or cyanotoxins, or the waterbody is known to have had a HCB in the past¹, the resource management agency should ensure a HCB sign is posted at the water body and report the bloom to WDEQ.
Step 3: Data Collection and Issuing Advisories	<ul style="list-style-type: none"> If a waterbody has a history of HCBs and shows signs of a HCB¹ through reports, satellite imagery, or visual inspection, WDH will issue a Bloom Advisory, the waterbody will be included on the HCB webmap, and the public and cooperators will be notified via the HCB listserv. WDEQ or a cooperator should collect three water samples¹ for laboratory analyses: (1) one sample for cyanobacteria identification and enumeration; (2) one sample for microcystin and cylindrospermopsin analysis; (3) one sample for anatoxin-a analysis. Samples should be collected and shipped per WDEQ Standard Operating Procedures². If analyses indicate cyanobacteria densities are ≥20,000 cells/mL and cyanotoxin concentrations below thresholds, the WDH will issue a Bloom Advisory. If analyses indicate total microcystin concentrations ≥ 8 µg/L, cylindrospermopsin concentrations ≥ 15µg/L, anatoxin-a concentrations ≥ 60 µg/L, or saxitoxin concentrations ≥ 30 µg/L³, the WDH will issue a Toxin Advisory. Waterbodies with Bloom Advisory or Toxin Advisory will be included in the HCB webmap, and the public and cooperators notified be via the HCB listserv. When the WDH issues an Advisory, resource management agencies and local health authorities should coordinate posting of signs if permanent HCB signs are not in place. WDH may issue a Closure at any time during the process based on the threat to public health.
Step 4: Lifting Advisories	<ul style="list-style-type: none"> Advisories will remain in place until data indicates a bloom has fully dissipated based on satellite imagery, visual evidence, or cyanobacteria density is < 20,000 cells/mL and analyzed cyanotoxin concentrations are less than the Toxin Advisory levels. Once WDH lifts an Advisory, the waterbody will be removed from the Current Bloom Advisory or Current Toxin Advisory tab of the WyoHCBs.org webmap and the cooperators and the public will be notified via the HCB listserv. Temporary HCB signs may be removed by resource management agencies and local health authorities. Once Advisories have been lifted for all waterbodies, WDH, WDEQ, and WLB will issue a press release and listserv notice documenting the end of the HCB monitoring season. The press release will advise recreationalists to take appropriate precautions because HCBs may continue to be present in Wyoming surface waters in the cooler months.

¹ For waterbodies with previous history of blooms, HCB presence can be determined by: positive jar test and photographs of bloom; photographs of bloom; or detections with satellite imagery. For waterbodies without a previous history of blooms, cyanobacteria abundance should be determined using laboratory identification and enumeration.

² See WyoHCBs.org for resources for management agencies, including signs, sampling procedures, information on publicly accessible lakes and reservoirs (e.g., contact information, past HCB occurrence, use as a public water supply, etc.).

³ Saxitoxin is not routinely collected and analyzed by WDEQ.

Wyoming's HCB Action Plan Flow Chart



Wyoming Harmful Cyanobacterial Bloom Advisory Levels for Recreational Waters

Notification Level	Human Health Risk	Health Recommendations	Cyanobacteria ⁴ Abundance	Cyanotoxins ⁵ (µg/L)				Recommended Action
				MC	CYL	ATX	SAX	
Toxin Advisory	Elevated	Toxins exceed recreational thresholds. Avoid areas in proximity to bloom.	Any	≥ 8	≥ 15	≥ 60	≥ 30	Post signs at waterbody. Add waterbody to WyoHCBs.org webmap. Include waterbody in listserv email. Monitor. Waterbodies will remain under a Toxin Advisory until data supports movement to another tier.
Bloom Advisory	Moderate to Elevated	Cyanobacteria bloom present. Toxins may be present. Avoid or use caution in areas near bloom.	≥ 20,000 cells/mL	Unknown or below thresholds.				Post signs at waterbody. Add waterbody to WyoHCBs.org webmap. Include waterbody in listserv email. Monitor. Waterbodies will remain under an Bloom Advisory until data supports movement to another tier.
Under Investigation	Unknown	Cyanobacteria and toxins may be present, but have not been confirmed. Avoid or use caution in areas near bloom.	Bloom may be present based on reports, including animal or human illness, but no other data has been collected.				Add waterbody to WyoHCBs.org webmap. Monitor. Waterbodies will remain Under Investigation until data supports movement to another tier.	
None	Low	No evidence of blooms or toxins at this time.	No evidence or < 20,000 cells/mL	< 8	< 15	< 60	< 30	No signs or electronic notifications necessary.

⁴ For waterbodies with previous history of blooms, cyanobacteria abundance may be determined by: positive jar test and photographs of bloom; photographs of bloom; or detections with satellite imagery. For waterbodies without a previous history of blooms, cyanobacteria abundance should be determined using laboratory identification and enumeration.

⁵MC = Total Microcystins; CYL = Cylindrospermopsin; ATX = Anatoxin-a; SAX = Saxitoxin. Cyanotoxin thresholds represent total concentrations of all congeners. Any of the cyanotoxins can exceed the thresholds for a waterbody to be categorized as under a Health Advisory.

