

To: BBV Lakes, Ponds & Drainage Committee

AUGUST MTG. REPORT

From: David Scheirman, Committee Member

RE: BBV LAKES & POND ALGAE, CURRENT CONDITIONS

This is the fourth report for the 2026 season, with photos and notes on five different water bodies being taken. These include **Thunderbird Lake** SE corner, **Kwann Lake** [NE corner + SE corner] the **South Golf Course Pond #5**, and the **North Golf Course Pond #1**. When available we also include photos and notes from the other (mid-course) golf course ponds # 2,3 and 4. The **Beaver Pond** is also now being included.

The purpose of this activity is to ensure a documentary record of algae conditions as they develop in our water bodies each season. This document shows current conditions and includes photos taken at the usual, pre-established observation sites.

A brief summary shows the following:

LOCATION: PHOTOS TAKEN ON 8/01/26	IS ANY SURFACE ALGAE PRESENT NOW?	DESCRIPTION OF CURRENT CONDITIONS
1. Thunderbird Lake, SE corner near boat launch	YES, very small amount	Some minor signs of what looks like filamentous algae on the edge of the lake, a re-appearance since last month. Other aquatic plant growth.
2. Kwann Lake, NE corner near the blocked culvert	NO	No signs of any type of algae are visible on the surface at present except for a few small globs in the far NE corner.
2a. Kwann Lake, SE corner near launch	NO	No visible surface algae of any type here.
3. South Golf Course Pond (#5), viewed from the road	YES, at edges	Filamentous algae mats are still visible on both eastern and western edges, about the same as last month.
4. North Golf Course Pond (#1), viewed from east shoreline	YES, minor	Very few patches of shoreline-edge filamentous algae mats are present. Other aquatic plant growth evident.
5. Beaver Pond	YES	Natural, unmaintained conditions. Riparian area, mature tree growth overhanging the water area on both sides. Algae and other aquatic plant growth on surface.

8/1/26 2:00pm / Conditions: 66° F (18.8 C). Mixed sun/cloud cover. Steady 5-6 mph breeze.



1. **SE Corner of Thunderbird Lake, 8/1/26.** Thunderbird Lake water generally clean and clear. The lake surface is essentially devoid of filamentous algae as seen from this viewing location. Some very modest amounts near the edge that can be seen in the distance of this photo.

Shoreline plant growth (including blackberry bushes) along the southern edge (boat launch side) has been trimmed.

Bonus photo:





Closeup at this observation point on Thunderbird Lake shows a relatively barren bottom with little signs of aquatic plant growth, as last month. Reduced amount of goose feces compared to last month.



West edge as viewed from South end, at boat launch: something that bears watching is the plant growth showing up at the base of the cattails, visible on the surface. This does not appear to be filamentous algae (unless it is in a die-off phase) and does not appear to be milfoil. It is similar to a newly appearing surface plant at the Beaver Pond (see closeup photo in that section of the report). With what seem to be tiny, clustered leaflets and a grey green/rusty-red appearance, this may be Azolla. This plant in this location of Thunderbird Lake needs positive identification.

2. **NE Corner of Kwann Lake, 8/1/26.** No sign of any algae on the surface or along the edge here.

Maintenance recently cleared patches of the shoreline-edge plants including canary grass, the usual/typical blackberry bushes, and some cat-tails in this area, down to the water's edge. This growth is recovering, and the openings appear to have encouraged proliferation of the nightshade that is present at this corner of Kwann Lake.



Closeup [below] of this northeast corner of Kwann Lake shows a less-than-usual amount of 'pond scum' on the surface: a mix of dead leaves, pollen, feathers and dust. More submerged, built-up trimmed vegetation in this corner than usual. Some small globs of what may be filamentous algae, unusual for Kwann Lake.



Maybe
Filamentous
Algae?



2a. **SE corner of Kwann Lake near boat launch.** 8/1/26. No signs of blue-green algae (or any other type of algae) are present on the surface at this location. Lake as viewed here generally clean and clear.



Closeup at this SE Corner (boat launch). Ultra-shade UV-blocker is still clearly present (note bluish tint).



3. **South Golf Course Pond (#5)** –8/1/26. Filamentous algae still appearing on the surface at both the eastern and western shoreline edges. About the same as last month. Plants at edge are higher.



On the left, the typical filamentous algae mats at SE corner. On the right, Pond #5 next section, view from north of the bridge. Aerator is functioning; small amount of algal mats on surface, similar to last month.



4. **North Golf Course Pond** - 8/1/26. Surface condition: More plant matter on the surface than last month, but apparently not much filamentous algae. Possibly milfoil now appearing here. (see below).



East edge, milfoil appears to be present here.
(But could be first growth of Azolla). Needs I.D.



Far N.E. corner (near culvert): less plant debris
present than last month. Duckweed reduced.

Beaver Pond - This water body receives flow from higher ground located north of Birch Point Rd. It is one of the only locations in Birch Bay Village still presenting as a natural, unaltered riparian zone. It is not impacted by BBV Maintenance, and there is no attempt to control algae.



8/1/26- Beaver Pond, lower (south) end, viewed from Chinook Way. Conditions similar to last month; slightly more surface plant growth since July 1st. Also, new appearance of a different plant type.



The south end of the Beaver Pond now has a surface plant growing that appears to be similar to that seen on the southwest corner/edge of Thunderbird Lake (it has what seem to be tiny, clustered leaflets and a grey green/rusty-red appearance). At first glance it seems to be a reddish-hued version of duckweed. But that is unlikely. It is possible we are now seeing an appearance in several different water

bodies (including here in the Beaver Pond) of “Azolla”, as seen in the Golf Course Pond #4 and photographed last month by Betsy Just. Here is her early July photo for reference:



Azolla (“Fairy Moss” or “Mosquito Fern” is a common aquarium plant: Why does it turn red?)

Azolla’s red color is primarily due to **two related factors**: the presence of a symbiotic nitrogen-fixing cyanobacterium and stress-related pigment changes.

1. Symbiotic cyanobacterium (*Anabaena azollae*)

Azolla hosts *Anabaena azollae* inside its fronds. This cyanobacterium fixes atmospheric nitrogen, providing Azolla with a vital nutrient, while Azolla offers the bacterium a protected environment [Angola Transparency](#). When Azolla is exposed to **direct sunlight**, *Anabaena* produces **phycoerythrin**, a red pigment that absorbs blue-green light and enhances photosynthesis under low-light conditions [Angola Transparency](#). This pigment is responsible for the reddish hue.

2. Stress-related pigment (anthocyanin)

In addition to phycoerythrin, Azolla can accumulate **anthocyanin**, a red pigment that appears under stress such as **phosphorus deficiency** or **excessive sunlight** [farmroots.in](#). Anthocyanin is similar to the pigment in human skin that tans in the sun, acting as a protective response to environmental stress.

3. Environmental triggers

- **Light intensity:** High light exposure, especially in high latitudes during spring, can cause Azolla to turn brick red [Azolla Foundation](#).
- **Nutrient imbalance:** Low phosphorus levels can cause pink to deep red coloration and weak growth [farmroots.in+1](#).
- **Optimum conditions:** Azolla grows best in pH 5.5–6.5, temperatures 18–28 °C, and with adequate molybdenum, cobalt, and other micronutrients [Angola Transparency+1](#).

In summary:

Azolla turns red because of the **phycoerythrin** from its symbiotic cyanobacterium under sunlight, and sometimes due to **anthocyanin** from nutrient stress or excessive light. Both are protective adaptations, but nutrient management and light control can help maintain healthy green growth.

SUMMARY

BBV's primary water bodies started this season almost entirely free of surface-level algae. UV-blocking dye was added early in the season to Kwann Lake and Thunderbird Lake. Fortunately, there has been no significant "outbreak" of filamentous algae as might have been anticipated, even though no phosphate-locking treatments [EutroSorb-G] were applied in April as originally planned. Maintenance is now free to apply Eutrosorb-G without restrictions from the Dept. of Ecology.

The most notable change in our water bodies since last month is the appearance of a new/different aquatic plant, which appears to be Azolla. This is a plant commonly bought for decorative use in aquariums. A new/different plant (not seen in our water bodies since the first report from Golf Pond #4 during June and July), Azolla now seems to be gaining a toehold in the following water bodies,

- Golf Course Pond #4 (and maybe Golf Course Pond #1, needs positive confirmation)
- Thunderbird Lake, south end (western edge)
- Beaver Pond (southern, outlet end)

A sample could be most readily attained at the south end of the Beaver Pond (from Chinook Way) for positive plant identification.

The Washington State Department of Ecology "Guide to Aquatic Plants" notes that Azolla found in the wild in our area is usually *Azolla mexicana*, common name Mexican water fern, family *Azollaceae*. *Azolla mexicana* (Mexican mosquitofern) is **not currently listed as a prohibited or regulated invasive species in Washington State. Potential Concerns:**

Azolla species are known to form dense mats in water, which can:

- Block sunlight and reduce oxygen levels.
- Alter nutrient cycling.
- Displace native aquatic plants.

RECOMMENDED ACTIONS:

1. Consider determining a way to reduce the large Azolla mat in Golf Pond #4: could cause a fish kill due to oxygen level reductions. And monitor the new growth in Golf Pond #1.
2. Closely watch what is possibly Azolla growing on the west edge at the south end of Thunderbird.
3. Monitor the south end of the Beaver Pond to see if Azolla mats increase next month.

Photos will be taken again at the same locations next month, for the August meeting report.

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