The Lake Tahoe Report

From Under the Water – Part Two

By John Cobourn, Water Resource Specialist, and
Heather Segale, Environmental Education Coordinator
University of Nevada Cooperative Extension

Date: May 13, 2003

The future of Lake Tahoe's water is being shaped by living organisms, both microscopic and macroscopic. The microscopic life forms that will determine the future health and clarity of the lake are influenced by the actions of much larger, macroscopic life forms – humans.

Remember the phytoplankton algae we described last week? It can be difficult to see with a naked eye, but sometimes during a particularly productive period, known as an "algae bloom," the water will appear greenish. Researchers can either measure the chlorophyll in the water to detect this type of algae, or, lower the Secchi disk to a depth where the millions of suspended microscopic plankton and soil dust in the water actually make the disk disappear out of view.

By comparison, the attached algae, also known as periphyton, is very easy to see. In fact, in some locations it can be hard to miss. This is the type of algae most people are familiar with and it occurs mainly near the shore where the sun can warm the water and these furry green plants can attach to rocks and grow. This attached algae coats the rocks with colonies of hair-like filaments that feel slimy and can be slippery if you step on them on your way to go swimming. In some areas of the lake, these attached algae can grow many inches in length. The larger mats of these algae seem to be especially common in areas where developed residential and urban areas drain into the lake. If phytoplankton or suspended sediment doesn't cloud the water, you can sometimes see periphyton algae on rocks 30 feet deep.

Periphyton, or attached algae, has noticeable blooms, when their growth rate speeds up, particularly in spring and to a lesser extent in the fall. The best time to look for algae-covered rocks is usually during April or May, when spring runoff is generally greatest. During the summer, the periphyton population dies back as part of its natural life cycle, and mats of decaying algae accumulate at the shoreline.

While there has been significant attention paid to the algae that live in Lake Tahoe, the tiny animals that graze on the phytoplankton receive much less press. These microscopic consumers are known as zooplankton and have been the subject of considerable study by the Tahoe Research Group. In general, the zooplankton graze on the phytoplank-

(Continued on page 2)

Periphyton in Lake Tahoe

Watch for "The Lake Tahoe Report" each week and tune in to KOLO-TV News Channel 8 Tuesdays at 5 p.m. "The Lake Tahoe Report" is a collaborative effort of the Lake Tahoe Environmental Education Coalition, University of Nevada Cooperative Extension, UC Davis and the USDA Forest Service. For more information, contact Heather Segale, University of Nevada Cooperative Extension, (775) 832-4138, or logon to www.lteec.org.

(Continued from page 1)

ton. And of course, the larger lake shrimp and many fish feed on the smaller zooplankton. The Tahoe food web is relatively simple, but this simplicity makes the lake vulnerable if a change should cause even a single species to enter or leave the lake. This is why resource managers from both Nevada and California are very concerned about the introduction of exotic species to Lake Tahoe and why efforts are taken to prevent this from happening.

Because most residents agree the relatively clear water in the lake is desirable, they are instructing their property managers to go easy with the fertilizer. The impact of fertilizers draining into the Lake and causing attached algal growths can be startling. In a study by the Tahoe Research Group in the 1980s, significantly more periphyton growth was observed in an area where a lawn received fertilizer than was observed at a section of shoreline just 300 feet away that did not receive fertilizer. Property managers are being encouraged by publications such as The Home Landscaping Guide for Lake Tahoe to apply no more fertilizer to lawns than is needed for plant health – generally a light application of fertilizer in May and just one more in September. Lawn-care companies that strive for deep green color can cause the inadvertent escape of excess nitrogen and phosphorus into local rain ditches, streams, or even beach gravel and sand and directly into the lake. Humans adding nutrients into lakes can lead to "cultural eutrophication." This gloomy term means humans can turn clear lakes into highly productive green ponds, with slimy bottoms and a wide variety of pond life and insects, such as mosquitoes.

The microscopic organisms that will ultimately shape the future of Tahoe's waters can only react to the conditions they live in – they have no choice or awareness. We, the macroscopic life forms, do have awareness and do have choice. Lake Tahoe is truly fortunate to have such an aware population that knows and cares about the need to reduce erosion and nutrient inputs to its water. We are beginning to see that the choices we make can have a positive effect, and that an algae-green Lake Tahoe does not have to be inevitable.

Decaying algae along the shoreline of Lake Tahoe

Attached algae are good indicators of localized nutrients entering the lake. Researchers at the UC Davis – Tahoe Research Group have been studying the attached algae in the shore zone of Lake Tahoe for the past 20 years. While the steady loss in lake clarity is sometimes difficult to visualize, the proliferation of periphyton is a readily apparent indicator to the public that the lake is changing in a detrimental way. The monitoring has indicated that there is a greater amount of growth in lakeshore areas where the upland is more developed. Current efforts are focusing on how periphyton growth has changed since the monitoring started. This includes determining how much is present at different locations around the lake and how long it persists. Generally, the heaviest growth occurs in the spring (March – May) and is associated with water flow into the lake as streams, groundwater, or