

RIPPLE EFFECT Woody cover is overlooked gift.

by Marsha Stelzer

The storm that twisted and uprooted century-old trees around the town house largely missed Mud Lake. We phoned the cabin as distant sirens sounded and were relieved to hear it was merely pouring there. But 2 weeks later, what sounded like gunshots from the side woods revealed itself as tree trouble.

A large sugar maple at the edge of our viewing corridor suddenly split, and half the crown landed on the cabin roof. We labored with hand blades much of the day, since our chain saw was still in town. Then a lake neighbor arrived and, with an oily roar, made the final cut that opened a path. He helped us pull the largest branch up to the driveway, but we should have dragged it the opposite direction.

At the shore, the resplendent maple we'd admired each fall would have been transfigured into LWS, limnologist speak for "large woody structure." And its life in the lake would have far exceeded its upland existence in usefulness. Trees fallen in water are also called "coarse woody debris," but their benefit to the food web of lakes and streams is now understood to be so great that the negative word "debris" is falling away.

LWS at first glance may seem unsightly, a waterfront nuisance that needs cleaning up as summer shuts down. But woody cover is a long-evolved gift from Mother Nature to aquatic and riparian ecosystems. Over time, trees along undeveloped shorelines have matured, decayed and finally toppled into the water. Where they'd stood, seedlings took hold, ensuring continued generations of LWS. Centuries of woody deposit and new recruitment has created the diverse fisheries and the rich mix of plant and animal life that characterizes our northern lakes.

Below the waterline, a single thick, branching conifer can provide spawning sites; necessary shelter for young; and food for 15 species of fish at a time. According to UW researcher Michael Bozek, diurnal species such as walleye seek out the shade provided by trunk and branches; predator pike stage ambushes from its structure; and "different organisms continue to use the tree until the cellulose [is] completely broken down and its chemical constituents [are] fully integrated into the web of life in the lake." Since woody structure degrades more slowly in water than on land, a single submerged bole, the tree trunk, can live on as LWS for 300-600 years, he wrote.

In the near-shore littoral zone, partially submerged LWS becomes a basking platform for turtles, water snakes

and wood ducks. Herons probe for crayfish and frogs around its structure. Male bass fan their nests beneath its protective and cooling shadow and minnows dart from predators into its latticework. Dragonflies, kingfishers and insect-eating songbirds perch on its branches. Mayflies munch algae on slowly decomposing wood and, in turn, become a bluegill's lunch.

Since 90% of all lake life is born or raised within 30 feet of where water meets land, the presence of LWS is critical to sustained biodiversity. A 1996 study of north temperate lakes by Christensen et. al. found that undeveloped lakes in our northern tier average 555 logs/km of shoreline. Where homes have been built on developed lakes, LWS drops to 57 logs/km of shore. The loss is NOT lake-healthy. We landowners pull trees from the water that either dropped or were carried to our shorelines by wind or ice scour. We also cut down trees growing in the riparian zone, mow over seedlings and clip understory to create manicured lawns and deforested views.

A tree allowed to mature next to the water and another left in the water is a start. But a lake with an extensive network of submerged trees provides exponentially better habitat, a Vilas County study determined. In a test basin, 75% of near-shore LWS was yanked out. Within 2 years, bass growth on the test side was stunted and the perch population dropped. Taking woody structure out of that basin also churned up methyl mercury that had been trapped in sediment. Since surface water mercury became three times more concentrated after LWS was removed, the prediction was that MeHg contamination would increase in fish flesh and up the food web.

Unless treefalls and snapped branches become dangerous to swimmers and boaters, lake science says LWS should stay in the water. Fisheries biologist Larry Damman said Long Lake has just enough undeveloped wooded shoreline and steep banks without lawns that "lack of woody cover is not a major problem—yet." But he figures that recruitment of new woody material "will be unnaturally low for decades to come," and he hopes for better public understanding of the fish-forest connection. Bozek urges long-range thinking: restoration of riparian areas to provide future trees rather than focusing on today's fish.

A DNR lake stewardship brochure reminds that "the best care is no care when it comes to natural shorelands. Resist the urge to tidy up" Music to riparian ears, throughout the seasons!