Cover Feature

Floating Islands—New Dimensions in Pond Management

by Bob Lusk

Picture this…a beautiful island in your pond, covered with blooming flowers, decorative plants, maybe even some vegetables. Lots of color, and function. All you need to do is drain the pond, hire a bulldozer, push up some dirt, and presto-chango, an island. Nothing an earthmoving bill of ten or twenty thousand dollars can't solve.

But wait, there's more, simply speaking.

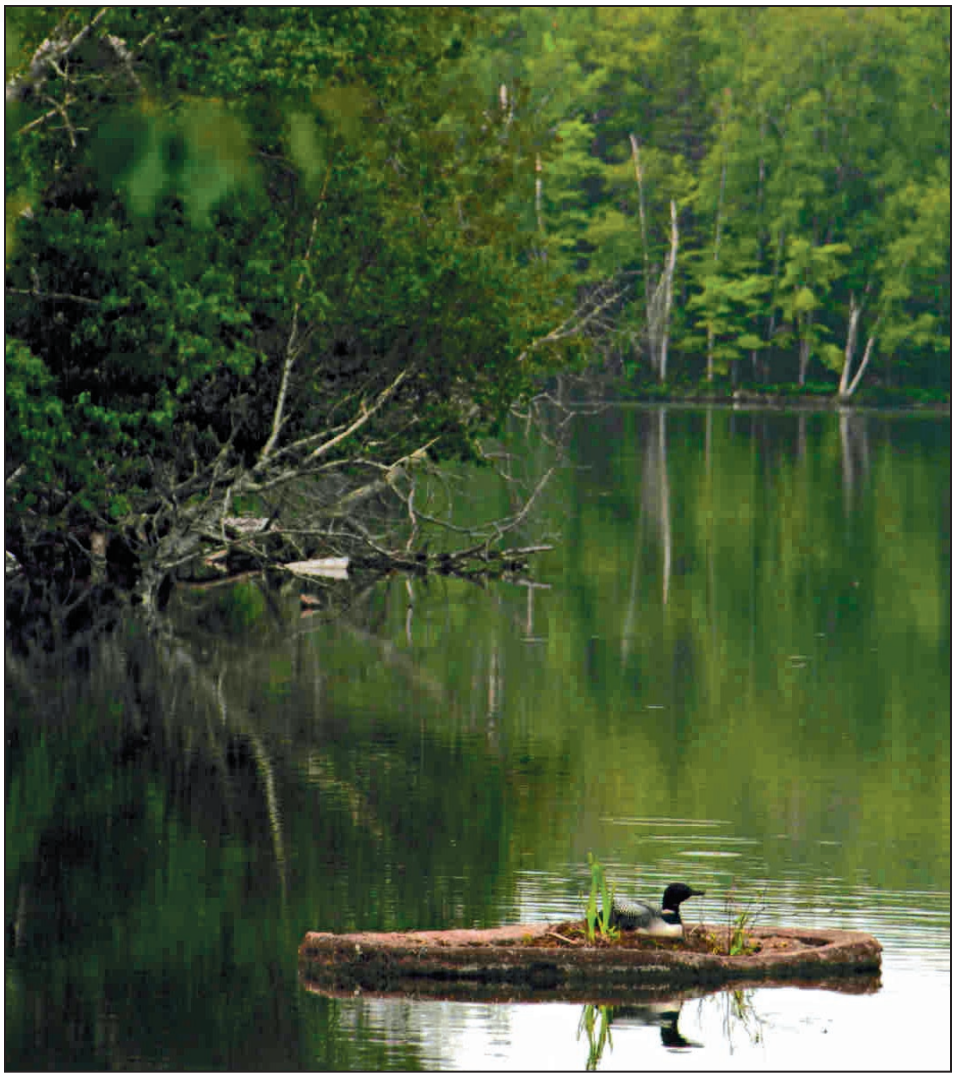
A company in Shepherd, Montana has a better idea.

How about a floating island? A what, you ask?

That's right…you can buy an island, install it yourself, plant the plants of your choice and anchor it wherever you wish it to be.

Meet Bruce Kania and his think-tank of colleagues and friends. Bruce is a serious guy, reflective and passionate in his pursuits. He is also CEO of Floating Islands International, inventors and makers of BioHaven Islands. Bruce hired yours truly here to consult with him about building a pond on his experimental farm which borders the Yellowstone River, just east of Billings, Montana. During several phone calls prior to our site meeting, I learned much of what Kania stands for. First, and foremost, he's an inventor holding many, many patents on useful devices. His most recent intellectual property inventions are floating islands. Second, he feels obligated to have a positive environmental impact on land and water.

When he and colleague Anne Lamont-Low, from New Zealand, picked me up from the airport, I knew it would be a productive couple of days. One of his first questions was, "What do you believe about global warming?" I gave him my spiel of unsubstantiated beliefs that we



Floating islands have many different purposes. This one was purchased by a group in Wisconsin. The mission was to provide a nesting site for a declining population of loons. It's working.

Above. *This decorative floating island has been planted with a variety of shoreline and bog plants.* ***Right.*** *This floating island has been planted with a variety of native plants. It covers approximately 250 square feet.*

humans are pretty arrogant to believe we can have a rapid influence on the climate. With that, he pulled out a plastic bookstore bag, handed me a brand new book called, "The Weather Makers" and made it mandatory reading. He explained, "As editor of a magazine, you have influence. Your thoughts are important. I think you should educate yourself about global warming." The calm, conservative republican inside of me remained skeptical. The screaming scientist inside said, "Read the book." Then, go find another book, and read it. Then, ask questions of knowledgeable people and report the findings.

I absolutely knew it would be an exciting few days in tropical Montana in August.

While the main mission was to design an experimental pond to be a laboratory for his think-tank, a secondary mission was to take time to learn about his floating islands. I knew Pond Boss readers would want to know.

Kania grew up in Wisconsin, spending much of his time hunting, fishing and running trap lines. In his late teens and early twenties, he was able to carve out a living as a guide, and a writer. He started a local newsletter, a rag designed to inform people of the local out-of-doors news and events. It still exists, to this day. Selling ads was a chore, but it paid some bills, and between guiding trips, put some food on the table to go with the bounty of his harvest.

Imagine looking on your pond and seeing turfgrass growing in the middle. One enterprising pondmeister bought an island, sodded it, and drives golf balls toward it. Why?

He learned many lessons.

One thing he learned did not become a lesson until well after he moved to Montana and got into the intellectual property business.

"In Wisconsin, there are natural floating islands in the lakes, especially the Chippewa Falls Flowage area. The islands are made mostly of peat, and over many years have developed into their own ecosystems, with big trees, ferns and low growing plants. The world record musky was caught in that area. Fish were always attracted to the islands"

Those islands are gathering points for fish and other wildlife. And, the islands move around with wind and currents, an interesting phenomenon which keeps wildlife on its toes. Imagine a nesting mallard, going for food, and coming home to….no home.

As his career unfolded, Kania began to take more interest in what he calls "biomimetics" or the mimicking of nature. His goal with the

Bruce Kania stands on an island he is preparing to launch.

Top. *Here's a small island, designed for backyard water gardens. Notice the goldfish underneath, nibbling on root mass.* ***Bottom.*** *An underwater shot of goldfish hiding underneath a small island.*

Three different islands, attached with cables and anchored, decorated.

To prove just how buoyant his islands are, Kania had a "wine-tasting" on one of them. Seriously, the island can carry lots of pounds.

Another example of a floating island. This one is used for vertical landscaping with native plants.

manufactured floating islands is to take the best from what nature has done, copy it and make it available to those who need and want it.

Basically, here's how the island works. He has developed a flexible matrix with slightly positive buoyancy. Shape it nicely, adjust the matrix where roots can penetrate into the water, add a special mix of plant friendly soils and other proprietary stuff to the top, and you have the setting for a floating garden. Add plants and you have your very own floating island. Anchor the thing wherever you want it, and soon your very own private island is sprouting. Water wicks upward into the soil-like material, so plants never need to be watered. Roots spread downward, into the water, and plants thrive.

Here's where it gets interesting.

The roots glean nutrients from the water. In Montana, along the Yellowstone River, excess phosphorus is a biggie. Kania explained, "Much of the land on both sides of the river is irrigated. Farmers grow corn, soybeans, barley and other small grains. They flood irrigate on top of fertilized farm land. Inevitably, much of the fertilizer, especially phosphorus, makes its way into ponds and groundwater around here."

Too much phosphorus can lead to heavy planktonic algae or bluegreen algae blooms. Plants growing in the islands readily take up excess nutrients.

"Part of our mission is to quantify what the islands will do in respect to cleansing the water. We have some good results, so far."

But wait, there's still more.

When the roots push through the island, another interesting thing happens. Fish are doubly attracted. Not only are the islands great cover for fish, roots become a substrate for naturally occurring bacteria which in turn attracts aquatic insects. The bottom of a BioHaven island becomes a buffet for small fish. Young fish nibble on the roots, medium size fish take charge of the bugs, and bigger fish eat the fish. Sounds like an underwater supermarket, doesn't it?

Pond management has come a long way, especially in the last fifteen years. Aeration systems, stocking for recreational management, creative pond design…innovative concepts for their time. This floating island concept is one of those revelationary ideas.

Kania is as excited as any 53 year old serious inventor can be. He knows he is on to something, and is spending time and money to figure it out.

Recently, his firm installed 25 islands in the middle of Chicago, Illinois, in a nutrient rich river. A conservation group added another 64 in a suburb northwest of the city. More research to come.

When Kania bought his farm, about eight years ago, he completely changed land management practices. An ardent pheasant hunter, he soon decided to do what he could to increase pheasant numbers. He designed an experiment, took a census of existing birds and went to work.

In simple terms, Kania improved pheasant habitat, added edge cover, nesting areas and

planted food crops. At the same time, he began to trap and harvest ground predators of pheasants. Over a period of seven years, Kania saw numbers of pheasants soar. That garnered the attention of local and regional wildlife biologists. The harvest went from 14 birds in the first year, to 207 in year seven.

All the while, Kania and his group, made up of engineers, a stream bank ecologist, terrestrial and riparian plant specialists, his office staff and support from his patent attorneys and production team worked feverishly to develop products which can have the same positive impact on ponds and lakes.

Using the same principles as his pheasant experiment, Kania is chasing down the needs for water. “I know that water will be the oil of the future. Think about it. We have only so much water, and more and more people using it. It’s up to us to do something about cleaning it.”

The islands are a good start, and a nice complement to thoughtful pond management. Expect to hear more about these island in the not too distant future.

In the meantime, I’m about halfway through his mandatory reading assignment. Expect your fisheries biologist/editor to know a bit more about global warming before Kania gives the test on my return trip.

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Feature

Fish Only Die Once

by Mark Cornwell

Fish do not have nine lives. One of my college fisheries professors spoke that wise little ditty in an aquaculture class years ago. It stuck in my brain and I often repeat it to students and pond owners. What it means is essentially this: conditions in your pond only have to be bad for less than one hour of one day during a fish's lifespan to kill them. Your pond environment may be suitable one day, then bad the next. When you see dead fish, it's too late. In my experience, fish can die quickly and often unexpectedly.

In the aquaculture business, a famous quote is, "You aren't a fish farmer until you have killed some fish."

Fish only die once.

What can you do to avoid that deadly hour? Pay attention to water quality. Water may tell you when things are going south. Here's a brief water quality primer with key terms and a few monitoring tips.

Let's get some scientific stuff out of the way. You've heard the adage that water is the "universal solvent." Many things dissolve in water, including gasses and minerals. When something dissolves in water, like table salt, components of the substance ionize. Salt ionizes into its constituents, sodium and chloride. Concentrations of dissolved substances are usually measured in parts per thousand, parts per million (most common water quality measurements), milligrams per liter (mg/L) or parts per billion (heavy metals, contaminants and phosphorus). So, one part per million (ppm) is exactly what is sounds like, one part of something in one million parts of water. A milligram per liter is one milligram of something dissolved in 1000 milliliters of water (1L). Therefore, one milligram per liter is exactly the same as one part per million and one microgram per liter (µg/L) is the same as one part per billion. This is all possible because one liter of water weighs one kilogram. Yikes! No! Not the metric system! Anything but that!

What about pH? Trust me, you do not want the textbook definition of pH. All you need to know is that pH is a measure of how acidic or basic the water is. The pH scale goes from 0-14, where 7 is neutral. If your pH is less than 7 the water is acidic and if greater than 7 the water is basic. Battery acid has a pH of 0, vinegar has a pH of 2, distilled water has a pH of 7 (neutral), soapy water has a pH of 12 and drain cleaner a pH around 14. Optimal pH for most fish is 6.5 to 8.5. Brief exposure to higher and lower pH is often not a huge problem. Brook trout like water slightly acidic and tilapia like water more basic, often thriving in water with a pH of 8.5 or higher. Simply speaking, a pH of 6 is 10 times more acidic than a pH of 7. A pH of 5 is 10 times more acidic than a pH of 6. And, so on.

A popular water chemistry analysis kit is this model, designed for fish farmers and manufactured by Hach.

Alkalinity is a measurement of the ability of water to resist changes in pH. In fancy speak; it is a measure of carbonate and bicarbonate ions. Throw some baking soda (sodium bicarbonate) in water and you will increase alkalinity. Alkalinity is simply Nature's Rolaids. Fish do best in water that has 100-400 mg/l total alkalinity. Levels below 50 mg/l can result in rapid pH fluctuations, which is not good for most fish. We learn this lesson in spades here in upstate New York. Acid rain falls in