Habitat BioHavens – the path to pristine water.

Bruce Kania, January 2016

Imagine living next to a waterway. Imagine being a participant in many of the natural systems that go on in and around it, and along the way gaining a sense of its health, or lack thereof. With this depth of understanding, this living empathy for the water, imagine playing a major role in making the water clear and alive with diversity, competition, synergy and symbiosis. Imagine the biodiversity expanding nearly every season.

I've been blessed with ownership and stewardship responsibility of several waterways, and I've lived around the transition from sickness to health within these waters. Initially we could not dive or snorkel or fish or hunt the water I am responsible for. The water was turbid, you could not see to dive, nor would you risk swallowing a mouthful of cyanobacteria toxin while swimming. There were no fish to catch in this oxygen limited water. Up watershed, the same nutrient polluted water generates a hemorrhagic disease among waterfowl… with periodic massive bird die off.

Today I dive, snorkel, swim, catch northern yellow perch, red ear sunfish, bluegill and black crappie by the thousands, kayak and canoe, hunt ducks and geese, trap mink, beaver and muskrat, gig bullfrogs by the hundreds, harvest tens of thousands of minnows on and from this water. Today there are literally clouds of damsel and dragon flies over this water, and similar clouds of daphnia, usually adjacent to edges of BioHaven floating islands. Along the way I've watched water clarity improve from 14"s to as much as twenty feet. I've watched mid summer carpets of filamentous algae go away. Today the same nutrients that previously grew massive volumes of this filamentous algae cycle into fish, and these fish vector with perennial aquatic vegetation like chara, with its almost fluorescent green brightness, and a growing variety of other healthy, perennial aquatic vegetation.

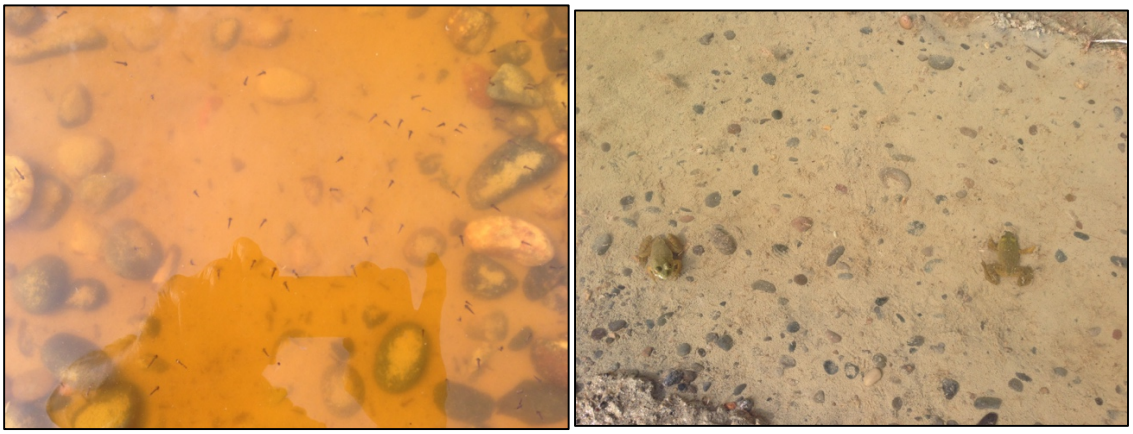
The one stewardship tool that, more than any other, has brought about this transition has been nature's wetland effect. Surface area, combined with circulation, has enabled nature's filtration system, the wetland effect, to initiate the process of bringing these impaired ecosystems back to health.

Today there are hundreds of island masters employing nature's wetland effect to transition water back to health. The result is invariably new, higher levels of biodiversity. Frequently non native species play a role in these dynamic systems. There's no stopping them, and in fact, they are an inevitable component of dynamic ecosystems, living examples of evolution. Do battle with noxious invaders, but don't expect to win. Welcome other invaders… for example, today a native invader apparently from the mountains to the west, a form of fresh water sponge, has showed up on Fish Fry Lake. It's a basic form of animal, and is a filter feeder and thus contributes to water clarity. It is welcome, and we hope to see it fully naturalize here, just like countless other life forms have done forever across this planet.

The riparian edge habitat islands provide maximizes for niche habitat, for biodiversity. Even in small waterways, in urban settings, this will manifest. In your stewardship role, concentrate on aiding

biodiversity. Employ nature's wetland effect in order to resurrect nature's food web. Surface area and circulation are key.

Whenever a waterway begins this process of transition, the limited forms of life that are adapted to low levels of dissolved oxygen are bolstered by new arrivals. In fact, we have learned that when the wetland effect dominates a waterway and dissolved oxygen is no longer limiting, nutrient cycling increases by a factor of at least 4.5. Dead, oxygen deficient water transitions into water in which nutrients do not stack up, but instead cycle through the system's food web. This is an upward spiral, instead of the reverse. It results in amazing abundance, and is reflective of why humanity has always valued proximity to healthy water.



The minerals and nutrients in the first puddle cycle into mosquito larvae. In the second puddle, these same minerals and nutrients transition into bullfrogs, and water quality improves.