



The Bridgewater Kids Learn About Pond Life and Stormwater Runoff Pollution

by Barbara Payne with illustrations by Daniel Shaw

The morning sun sparkled on the pond’s still water, illuminating a swarm of tiny insects that hovered just above its pristine surface. A stone bridge crossed one pond inlet, and stately cattails marched along the opposite bank offering a secure place for thirsty critters in search of a drink. Not that there were many predators around; just an occasional cat or raccoon and those pesky kids who came looking for “specimens” to capture in plastic jars. All things considered, the pond was a delightful place to live, with plenty of food, an amazing assortment of inhabitants, and a comfortable sense of security for all who dwelled there. The cycle of life just kept on turning, with new generations of insects and tadpoles continuously re-populating the pond. The vegetation kept changing, too. During the warm months, vibrant pink water lilies made their showy appearance, and the tall, green spade-shaped spears donned their lacy purple “hats”. Multi-colored dragon flies patrolled the area for insects, and water striders flitted nervously across the pond’s surface. A cacophony of insect songs competed endlessly with cheerful bird melodies as one sultry, lazy day followed another.

An old bullfrog wiggled a little deeper into the squishy mud along the pond’s bank, content in the cool moisture. Blending unobtrusively with his surroundings, he kept silent vigil over the watery community. ZAP! His long tongue whipped out with lightning speed, and

returned with lunch...a small, juicy fly. With that tasty morsel digested, there was nothing left to do but take a long nap. Nearby, some neighborhood kids perched on the pond's grassy bank, watching their small plastic boat drift in the water. One of the boys, Eddie, poked at the little craft with a long stick to keep it from going aground. He complained, "The water seems to be a little lower this year, and it's not quite as clean as it was last summer."

Eddie adjusted his cap and pointed to a crumpled Styrofoam cup trapped in the reeds. "Look," he grumbled. "That's just what I'm talking about. Who would throw litter into our pond?"

"People can certainly be careless," Amy answered. "It's not something we would do, but some folks don't seem to care about protecting the environment. They probably don't realize what happens when trash and debris get into our water system. Maybe they didn't do it deliberately," she said, always willing to give people the benefit of the doubt. "Maybe the trash got here through stormwater runoff."

"Technically speaking," Mitchell chimed in, "stormwater runoff is also known as nonpoint source pollution." He adjusted his glasses on his nose and added. "When it rains, stormwater flows across yards and gardens, over driveways, and down sidewalks, parking lots and city streets into the storm sewers or directly into our creeks, streams, rivers and lakes."

"What's your point, Mitch?" Amy chirped.

"As it rushes along," he continued, ignoring Amy's question. "the water picks up lots of stuff in its path...oil, chemicals, fertilizers, grass clippings, trash...all kinds of debris. What folks don't realize is that storm sewers empty directly – without treatment – into the bodies of water we use for swimming, fishing and drinking water." Mitchell adjusted his glasses again and stated with apparent authority. "The U.S. Environmental Protection Agency warns that polluted runoff is the nation's greatest threat to clean water."

"Gee, Mitch, that sounds like a serious problem," Eddie said. "I'd sure hate to see our pond get polluted. I prefer my drinking water to be nice and clean. I wonder if there is anything we can do to help solve this problem."

Nearby, the old bullfrog quietly listened to the kids' conversation. It pleased him that they were concerned about pollution. In fact, they had just mentioned the magic words – asking how they could help. In a flash of splendid color, the huge frog hopped toward them, creating a spray of gooey mud when he plopped onto a glistening pond stone, seemingly growing in size as he

did. Months had passed since the old amphibian had escaped his muddy confines and the warm sun felt good on his warty hide. After landing, he watched with amusement at the startled kids. The youngsters had never encountered such a large frog this close-up.

“Oh, dear!” Amy exclaimed, cautiously peeking around Eddie’s shoulder. “Who...who are you?”



The bullfrog doffed his mud-soiled cowboy hat, shook a layer of drying goop from his homely face, cleared his throat and croaked, “Why, I’m just an old bullfrog who calls this pond ‘home’.

“You...you...you can talk. Frogs aren’t supposed to talk.” Eddie stuttered, his eyes wide with disbelief. “Are you a troll disguised as a frog or a...?”

“Don’t be afraid, young man,” the bullfrog gently interrupted. “I was listening to your conversation and heard you ask the magic question: how can I help stop pollution. That encouraged me to visit with the three of you a bit about this critical subject.”

The youngsters huddled together more in amazement than fear. Now curious, they took a tentative step toward the old frog. An inquisitive dragonfly darted in to investigate what was causing the commotion, but quickly departed. “A frog that enormous might enjoy dining on a plump dragonfly,” he quickly surmised. “I’ll not take any unnecessary chances.”

“You simply cannot imagine what shows up here in my pond,” the frog grumbled, his bulging eyes shifting from the perhaps tasty but departing dragonfly back to the kids. “Plastic cups are fairly common, along with candy wrappers, bits of newspapers, and empty drink cans. And those plastic 6-pack can rings are especially nettlesome,” he groaned. “Not only are they unsightly, but birds and small animals can really get tangled up in them.”

“Poor Mister Frog, I can see why you are so concerned,” Amy replied.

“Yeah, young lady, and these are the things we CAN see when they get into the pond. It’s the things we CAN’T see that really worry me. I don’t like the idea of living with toxic chemicals or pesticides lapping at my tender hide. I’m homely enough as it is,” he chuckled, “but toxic material in the water could make me really ugly, giving me a few extra legs...or killing me.”

Finally warming up to the troubled amphibian, the kids relaxed and took a seat on the grassy bank. They were now an attentive audience for the old frog as he discussed the importance of protecting his pond’s environment.

“Look at it this way,” he croaked. “This pond is home to many living things; far more than you can actually see. Some of us...even me...are in the food chain, providing tasty meals for others. The big frog paused for a moment and contentedly patted his large belly. He grinned, and then continued. “And others just cohabit here comfortably, being neither prey nor predator. But each of us is important in the overall scheme of things, and so are you kids.”

The old bullfrog carefully studied his young audience to see if he still commanded their attention. Satisfied, he continued, “Basically, everything that lives here is interrelated. Even sunlight is important to life in this pond; and plants are important, too.

“We know sunlight is important to life in the pond, Mister Frog...and everywhere else, but plants?..What makes plants so important?” Mitchell inquired, adjusting his glasses again.

“Well, Mitchell, I’m glad you asked. Tiny aquatic plants called phytoplankton serve as food to some of the really tiny critters, which then multiply and become food for the smaller fish and insects. And do you know what happens next?” He paused for an answer. None was forthcoming. Seeing their perplexed looks, he said, “Well, then, let me explain. These little fish and insects are eaten by crawfish or bigger fish, and in turn, they are gobbled up by even larger fish. When the large fish get big enough, then you humans catch ‘em and have ‘em for dinner.

By the way, I hope none of you develop a taste for frog legs,” he chuckled, but his eyes narrowed as he checked their reaction.

“So there you have it. The food chain starts with microscopic plants and ends up with you!” The big bullfrog paused again to organize his thoughts, and then continued. “That’s why whatever happens to any single part of the pond impacts the whole pond. It is considered an ecosystem with an amazing variety of plant and animal life, ranging from microscopic bacteria to insects and critters that swim, hop and fly. Here’s a new word for you...limnology...the study of the interrelationships of living things that exist in a pond or other aquatic environment.”

“Are all ponds the same,” Eddie cautiously inquired, still amazed that he was talking to a frog.

“Nope,” the old amphibian responded. “Limnologists – that would be the folks who study ponds – say there are at least five different types. Their characteristics vary by geographical location and whether or not they are man-made. Eddie, think of the pond as a community that has a number of different levels, each one being home to or the habitat of certain critters or organisms.”

“Wow, I’ve never thought of a pond as having different levels,” Mitchell exclaimed.

“I’m not surprised, my boy. Very few people realize that. Let’s start at what you first see, the surface. The film that sits on the water’s surface makes a fine home for floating, air-breathing animals or insects. That’s where you’ll find those amazing creatures that walk on water, the water striders. These creatures eat floating plants, dead bugs or insects, and other items – like insect larvae -- that may have drifted to the surface.”

Amy’s face scrunched up in distaste. “Yuck...that’s just awful!”

The old frog chuckled at Amy’s reaction but kept talking. “Okay, I want all of you to look toward the middle of the pond. It’s surrounded by all kinds of plant life that grow along the banks. Lot’s of critters live out there; everything from the tiny phytoplankton and algae to some pretty sizable fish. There are also lots of small animals, insect eggs (larvae), snails and invertebrates that provide food for the larger animals and fish. And there are other critters that don’t actually live in the open water but come there to eat, including birds, turtles and the bigger fish. So, Eddie, you can see how lots of living things come to depend on the pond’s nice, clean water.”

“What lives all the way down on the bottom of the pond, Mister Frog,” Mitchell asked.
“It looks pretty dark down there?”



“Well, Mitchell, it depends on the kind of bottom a pond has. If it is shallow with a sandy bottom, there might be colonies of earthworms, snails, and even some insects living there. If the bottom is more muddy than sandy, you might find some crayfish burrowed in the mud. In the deeper ponds,” the bullfrog said, “where light doesn’t shine all the way to the bottom, plants can’t grow so there’s no natural shelter or food source for most animals. Even so, you still might find some earthworms or small clams.”

A look of concern suddenly clouded the old frog’s face. “Sadly, as we see here today, pollution is becoming a problem in many of our bodies of water. While some can accommodate certain levels of organic pollution – where the water’s oxygen content isn’t seriously reduced – there is no way for a pond to survive extreme levels of chemical, toxic or industrial waste and other potent pollutants.”

The bullfrog paused and idly scratched his big belly. Then he said, “Curiously, about the only creatures that can tolerate severe pollution are some of the tiny clams (bivalves) and snails. But when they disappear, it’s a pretty good sign that the pond in question is history.”

“And when that happens,” Eddie sadly concluded, “there’s no more fishing, no more sailing, and no more clean drinking water.”

“That’s about the size of it, young man,” the frog agreed.

“Is there anything we can do to keep this from happening to our little pond?” Amy asked. “I’ll help. It would be awful to lose this wonderful pool...and to lose you, too, Mister Frog,” she quickly added.

“Why thank you, Amy, and yes, there are some things that you can do to help. One of the most important steps you can take is to discuss this problem with your parents. They may not realize how threatened our water supplies are. Once they understand, I’m sure they will want to help.”

It pleased the bullfrog that his young audience was so concerned about water pollution, particularly stormwater pollution. He decided to give them the full treatment about how they could help. “For example,” he said. “When your dad changes the oil in the family car, he’ll need to recycle the used oil and other automotive fluids at a participating service station or at a hazardous household waste event held in many communities. The same goes for half-empty cans of paint, cleaners, and solvents. Of course, it’s even better if the family uses nontoxic, biodegradable, recyclable products whenever possible. This means using detergents and cleaners that are low in phosphorous to reduce the amount of nutrients discharged into our lakes, streams and coastal waters.”

“Tell us more, Mister Bullfrog,” Amy clamored. “We want to help in any way we can. What else can I suggest to my father?”

“Glad you asked, Amy. Let’s talk about yard work,” the frog replied. “It’s important to use pesticides and fertilizers wisely. Remember not to use them if the weatherman calls for rain that might wash these pollutants into the storm sewer. And grass clippings should be bagged and disposed of properly...never hosed into the storm sewer. And, kids, clean up after your pets. Don’t let animal wastes get into gutters and storm drains.”



“Mister Frog, It’s pretty obvious that stormwater runoff pollution is something we all need to learn about.” Mitchell said. He proudly stated, “I have already discovered a great website with lots of useful information about education programs and other things that kids and scouts and classrooms can do to help.

“Good work, Mitchell. Tell us about it.”



“The website, *Clean Water Clear Choice*, is sponsored by Harris County, the City of Houston, Harris County Flood Control District and the Texas Department of Transportation.” Mitchell told his audience. “And you should visit www.cleanwaterclearchoice.org and watch the stormwater runoff animation and play some interesting games, too. It is a great way to learn and have fun at the same time!”

“That’s very impressive, Mitchell. You’ve already done a lot of homework. Keep it up.” The frog said.

“Edd-eeee!”

The kids heard the familiar call of Eddie’s mom summoning him to dinner. They had been so totally immersed in their conversation with the magical pond bullfrog that the approaching sunset took them by surprise.

“Good bye, Mister Frog,” they cried in unison, racing across a grassy meadow toward home. “May we come visit you again?”

“I’ll be right here,” the big bullfrog croaked, leaping back into the water with a giant splash. “See you soon,” he gurgled. “We still have plenty to talk about!”

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