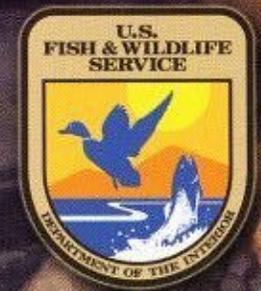
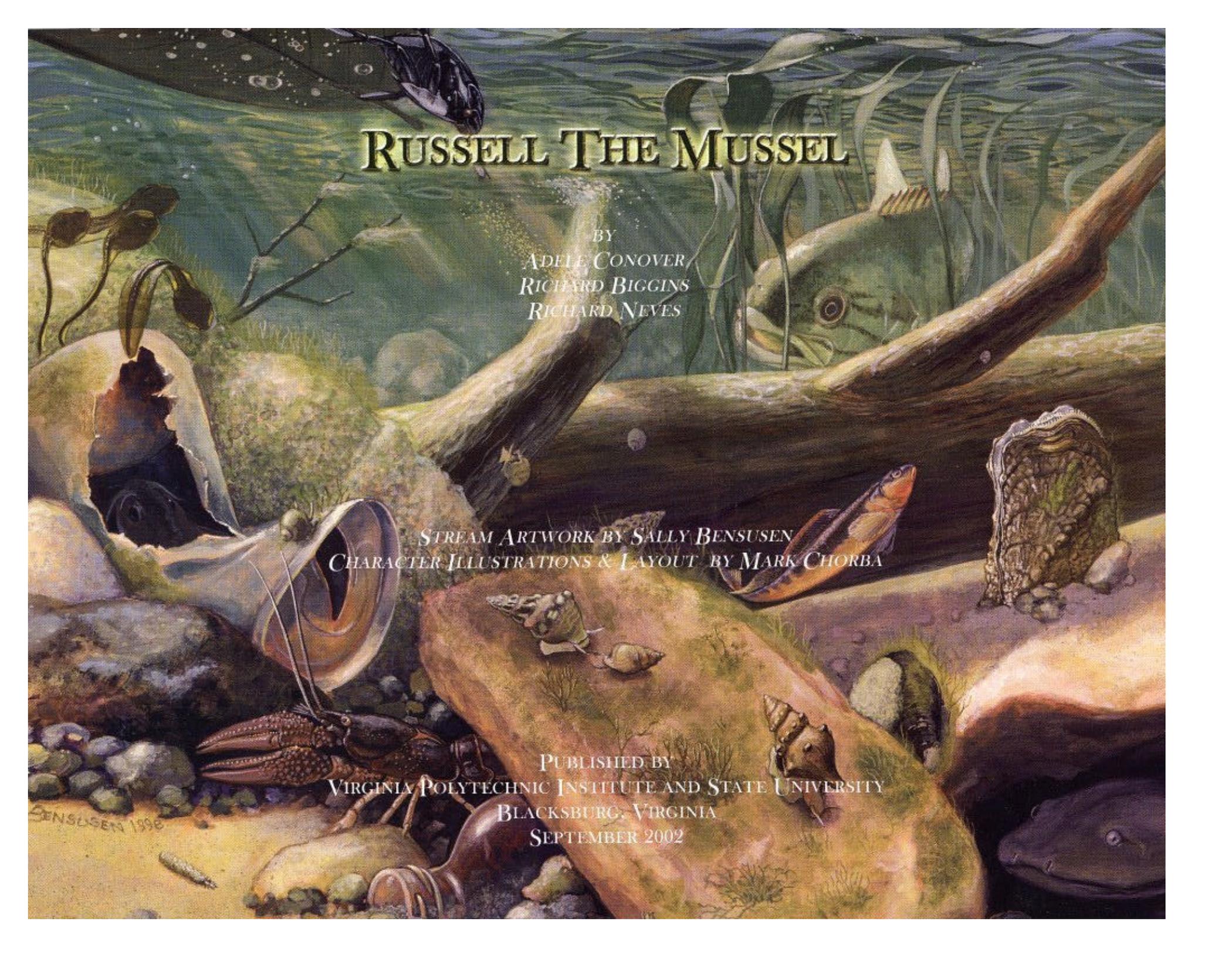


RUSSELL THE MUSSEL

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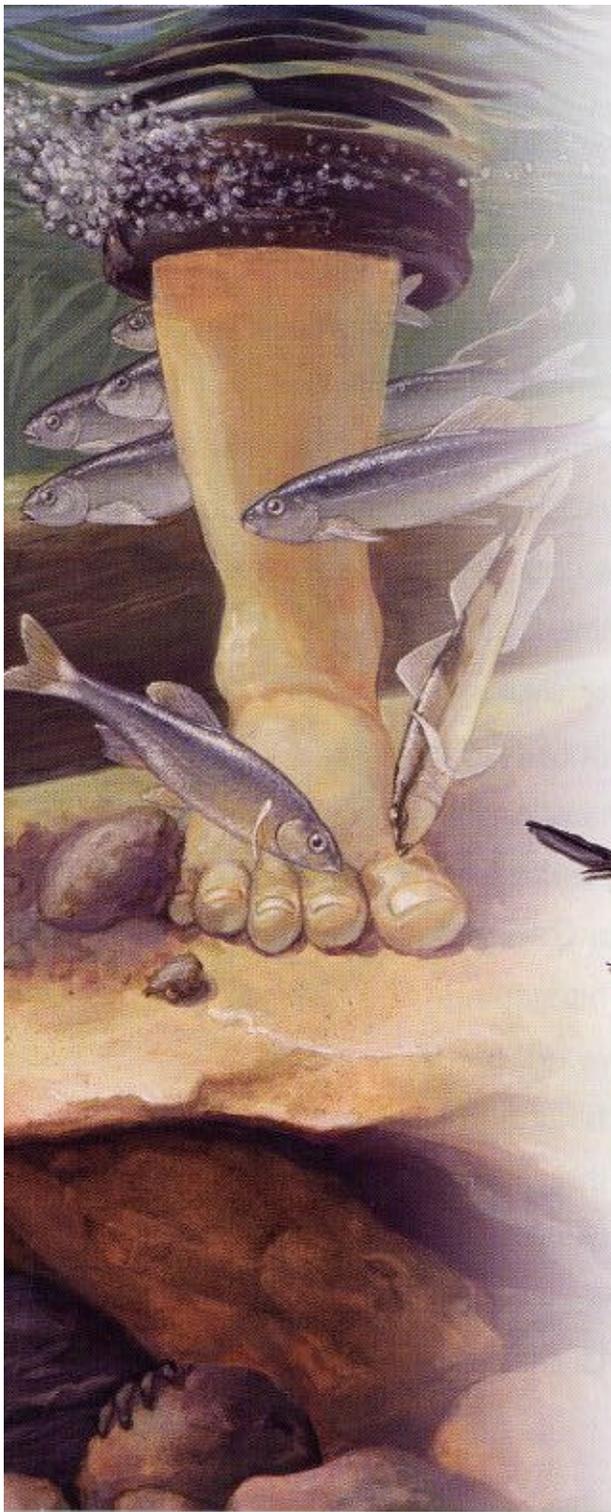
RUSSELL THE MUSSEL

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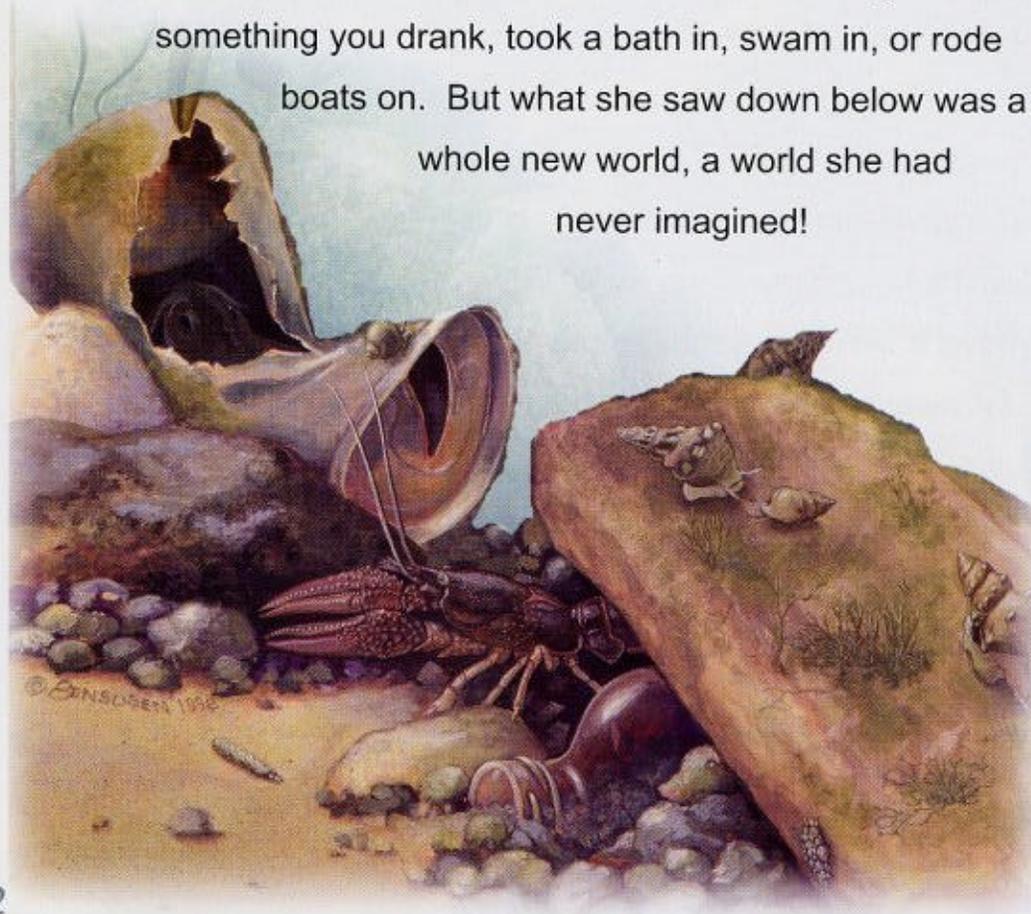
On a warm April morning, a little “boat” fashioned from a big magnolia leaf floated lazily down the clear waters of Crystal Creek with a tiny little passenger on board. Jill, a young girl sitting on an old log at the water’s edge, had just placed Wanda, a little water beetle, on the boat when a sudden puff of wind lifted the leaf’s curled corner and over it went with a splash. Wanda cried out, “Yahoo!!” And, with her four back legs pumping, she dove for the creek bottom. She landed on a rock, or at least what looked like a rock. But then the rock began to move . . . ever so slightly it started to open, and a deep far-away voice from within the rock said, “Wanda! Is that you?”



Jill was afraid for her tiny friend and was about to rescue her when Wanda said, in a high squeaky voice, “Jill, I’d like to introduce you to my friend Russell the mussel. He’s been around here for a long time and knows a lot about creeks and all the animals that live here.”

With that said, Wanda raced to the water's surface, tucked a bubble of breathing air under her tummy, and scurried back under, with her legs moving fast, first one, then another, as if she were rowing a boat.

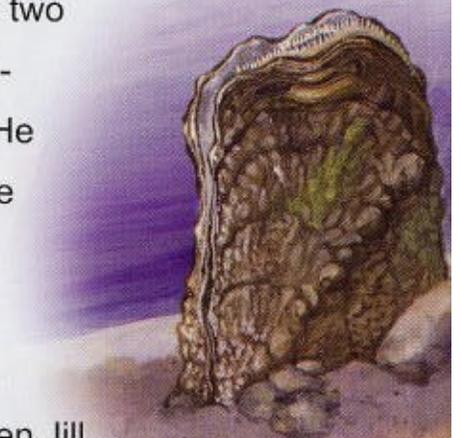
Jill, who was visiting her grandparents' farm, bent down near the water so she could see and hear what was happening beneath the surface. Water, she thought, was something you drank, took a bath in, swam in, or rode boats on. But what she saw down below was a whole new world, a world she had never imagined!



Wanda looked up at Jill and said, "Come closer."

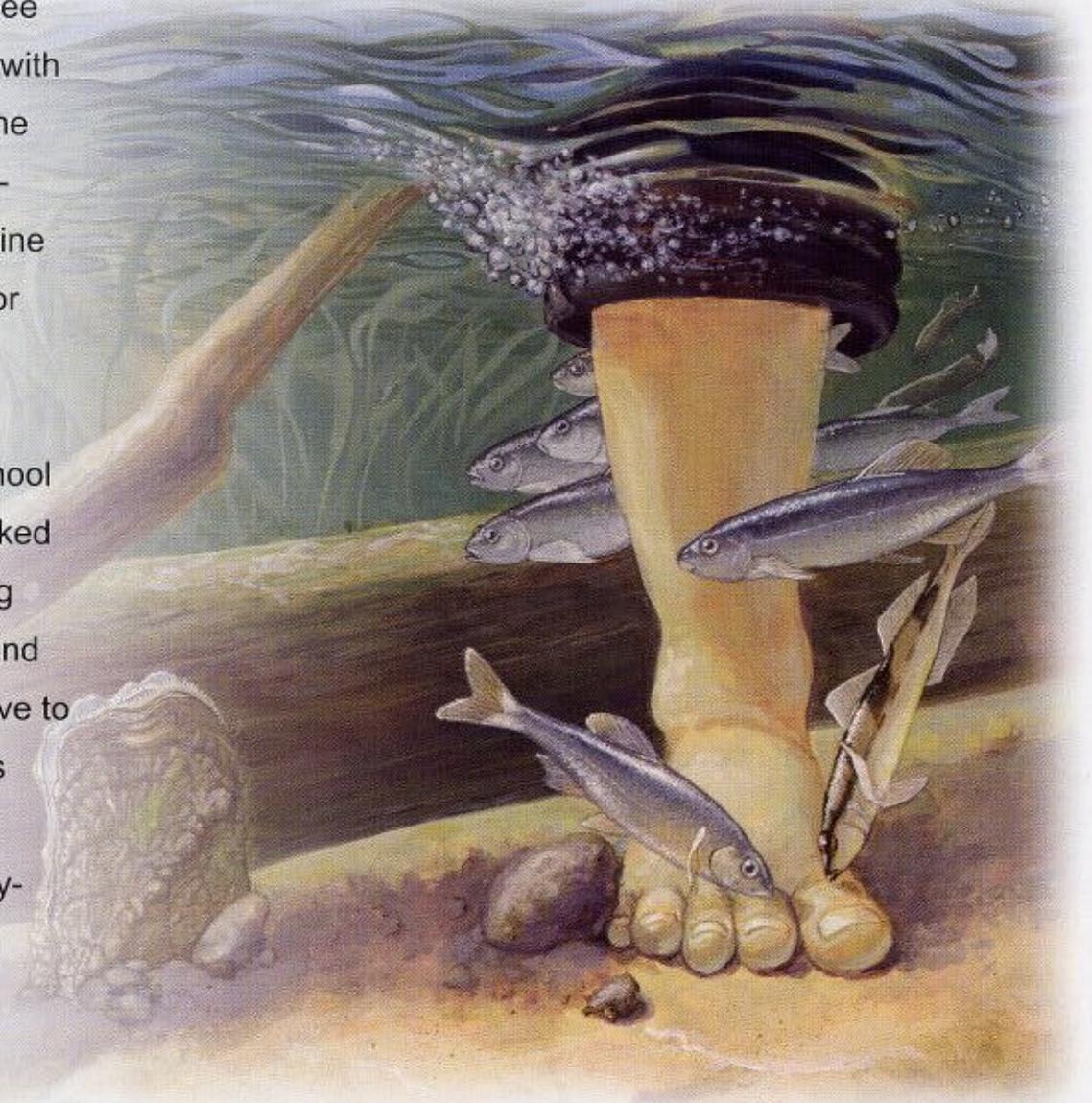
Jill had just scrunched down as close to the water as she could, when Russell, a very dignified rabbitsfoot mussel with bumps and knobs on his two shells, said politely, "Welcome to our world, Jill." He was partially buried in the stream bottom, and Jill peered into his gaping shell.

Russell had often seen Jill wading in the water with her grandparents as they picked up bottles and rusty cans that careless humans had tossed into Crystal Creek.



*B*efore Jill could offer a “thank-you,” a tiny fish, with a body so clear you could almost see through it, swam up and tickled Jill’s big toe with its fins. “I’m Jason the crystal darter,” said the little fish. Then, from beneath the old log another darter arrived. It was Tyrone, a tangerine darter, and he was such a bright orange color that he seemed to glow.

The two little darters were joined by a school of silvery whitetail shiners, and they all frolicked back and forth through a sunbeam streaming down from above. Tyrone looked up at Jill and said, in a slightly out-of-breath voice, “We love to play around where Russell lives. He and his relatives always live where the water is very clean. Clean water like this used to be everywhere, but now it’s sometimes hard to find.”

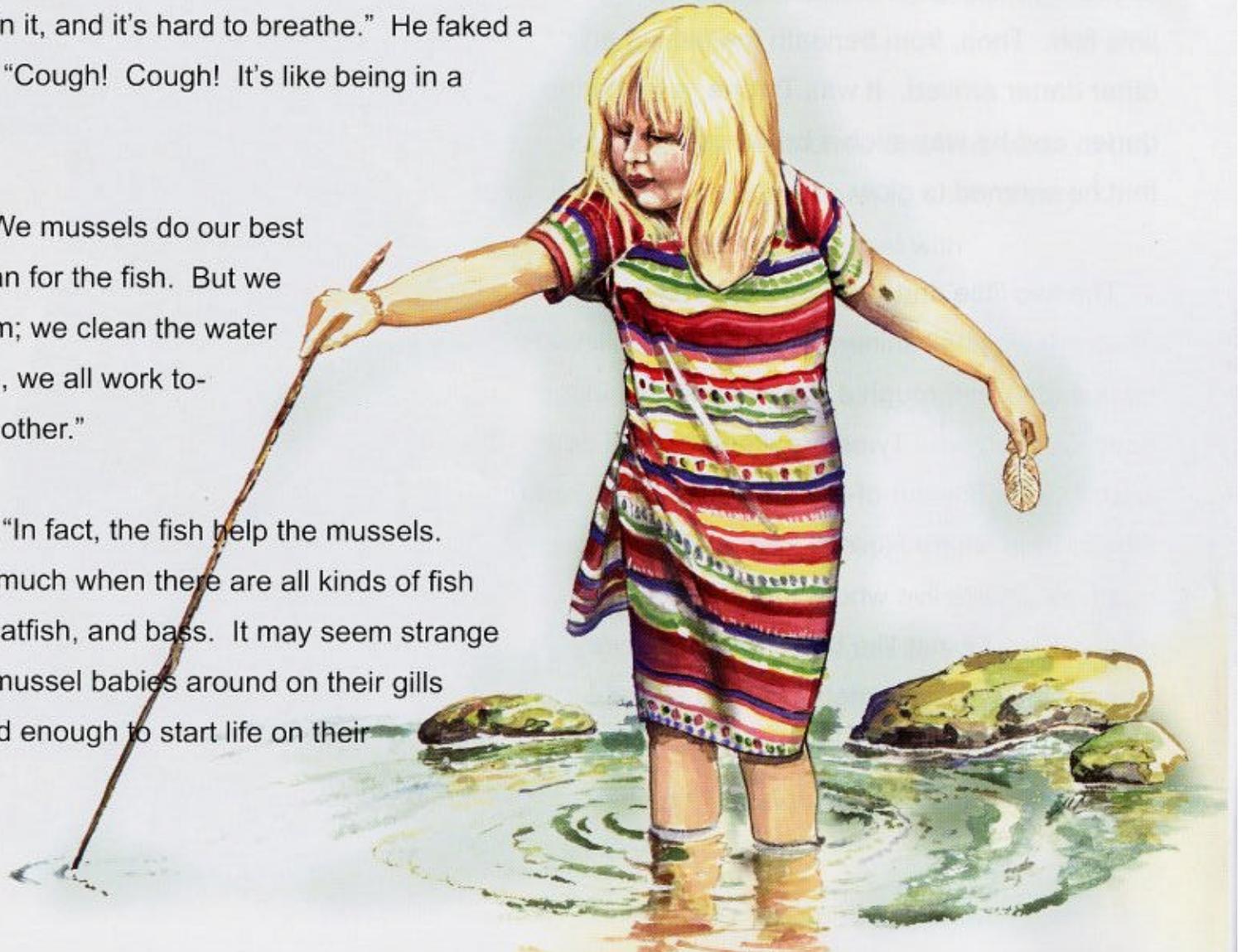


Jason explained, "Mussels are filter feeders. They pump the creek water through their bodies to strain out their food, and at the same time they strain out some of the yucky stuff and clean the water."

Russell said, "None of my friends like living in dirty water. It's nasty. You can't see in it, and it's hard to breathe." He faked a little cough for effect. "Cough! Cough! It's like being in a room full of smoke."

Russell went on, "We mussels do our best to keep the water clean for the fish. But we don't do it just for them; we clean the water for everyone. You see, we all work together and help each other."

Russell continued, "In fact, the fish help the mussels. That's why I like it so much when there are all kinds of fish around, like sunfish, catfish, and bass. It may seem strange to you, but fish carry mussel babies around on their gills until the babies are old enough to start life on their own."



Jill was astonished! She asked, "Fish carry baby mussels on their gills?!"

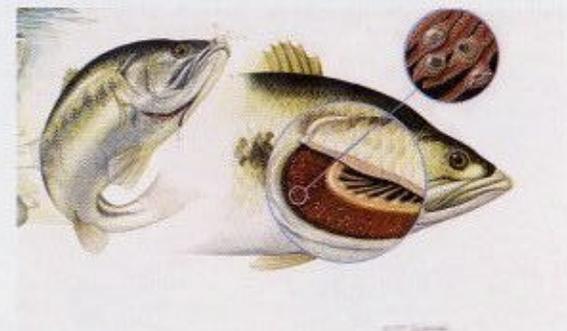
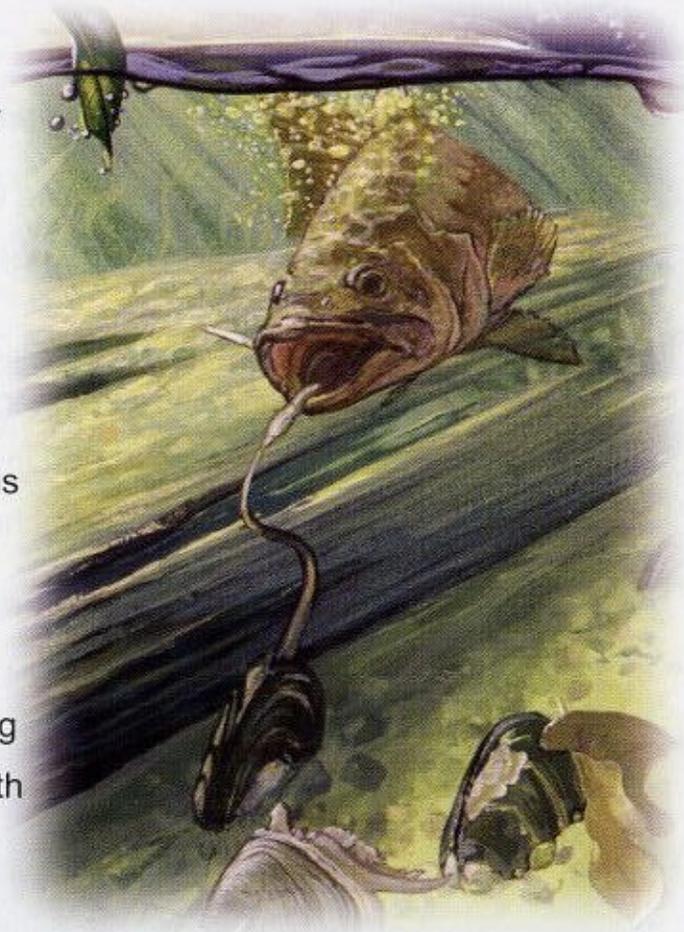
"Yes!" Russell answered. "And people call these baby mussels larvae." See those tadpoles over there. Those are frog larvae, and they will turn into adult frogs someday."

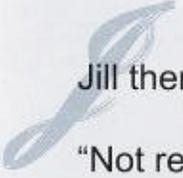
Russell's voice grew quiet. "Look over there," he said. "Maybe this will help explain about mussel larvae."

Jill saw the dark outline of a foot-long bass hiding in a shadowy jungle of underwater plants. The bass was eyeing a slowly undulating caterpillar bobbing along in the slow current. In a flash, with his mouth wide open, the bass slurped up the caterpillar in one bite.

"Oh, that poor caterpillar!" said Jill.

"That wasn't a caterpillar," Russell explained. "You see, that was a package made up of thousands of little mussel larvae. A mother mussel dressed up her babies to look just like a caterpillar so the hungry bass would want to eat them. When the fish tries to swallow the package of babies, it will break open, and the babies will attach to the fish's gills."





Jill then asked, “Will those mussel larvae hurt the bass?”

“Not really,” said Russell. “The larvae will make themselves at home on his gills for a few weeks, where they will get food and shelter. Then, when the larvae grow up, they will drop off the fish and begin their new life on the stream bottom.”

Just then a cocoon that had been hanging from a cattail almost five feet above the creek burst open. A packet of bristly young insects plopped in the water and started racing toward a clump of soft greenish-brown gunk attached to an old mussel shell.

“Look! Jill exclaimed. “Those bugs are rushing for that algae!”

“That looks like algae, but it’s not,” Russell said. “It’s not even a plant. It’s an animal--a freshwater sponge. In fact, it’s really a lot of animals living together to make up the sponge. When you see sponges around, you know the water’s clean.



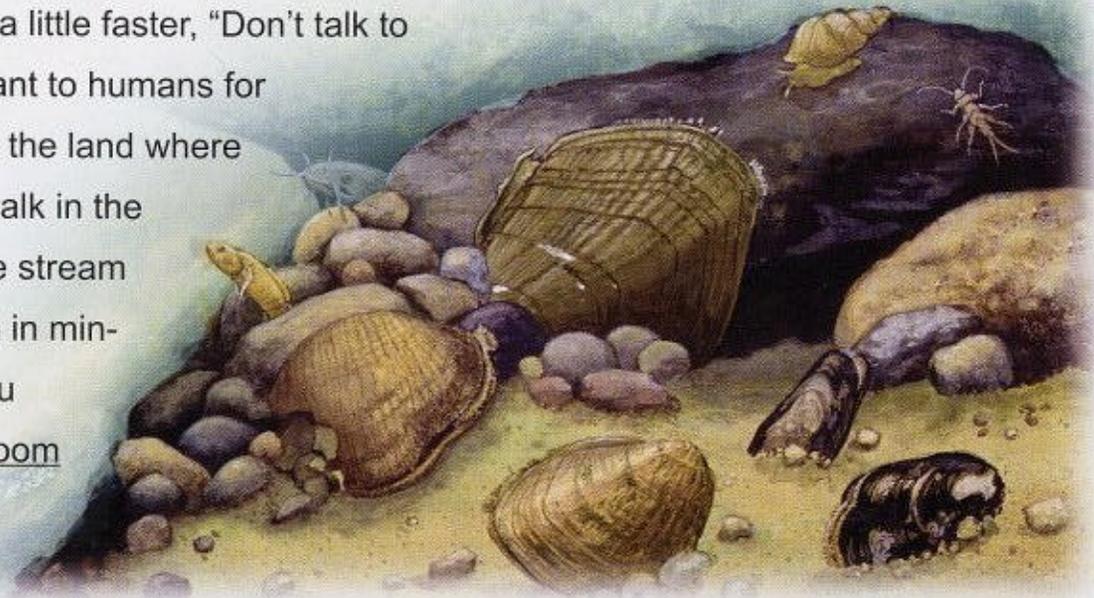
The school of whitetail shiners was watching the scurrying larvae with keen interest. Shiners are always hungry, so they dashed over and made a quick snack of a few before the rest of the larvae reached the safety of the sponge.

“Those fish sure like to eat insects,” drawled another voice with a distinct Southern accent. “But I’m a vegetarian, and I love to eat plants. I surely do,” said Sally, an ornate spiny riversnail, as she munched her way over an algae-covered rock.



Jill, who had become comfortable with all of Russell’s friends by now, said to Sally, “So you’re sort of like an underwater cow, grazing on the algae.”

Russell stirred and started to pump a little faster, “Don’t talk to me about cows! I know they’re important to humans for milk and meat, but they should stay on the land where they belong! I don’t like it when they walk in the water, stir up the mud, and damage the stream banks. They can wreck a good stream in minutes with their big clumsy feet. And you know what else? They go to the bathroom in the stream! Disgusting!!”



He then added, "Your grand-daddy knows cows don't belong in the creek. So, he put up a fence to keep his cows out, and he gave them a big tank of cool water to drink from under those shade trees."

"Run! Hide!" Wanda yelled. "It's the hellbender! And he looks very hungry!" Russell, with Wanda sitting on top of him, pulled his shell together with a snap; the other animals scattered. Out of the corner of her eye Jill saw a gigantic two-foot-long salamander, with great folds of skin and small unblinking eyes, move slowly out from under a rock. Then the huge creature slid slowly between two large boulders on his way downstream to look for a tasty snack.

Wanda, peering from behind a clump of algae attached to

Russell's shell, sounded the all clear. And, with the big predator gone, the little creatures felt safe again. They crawled out from their hiding places--from under rocks and inside old mussel shells--and gathered around Russell and Jill again.



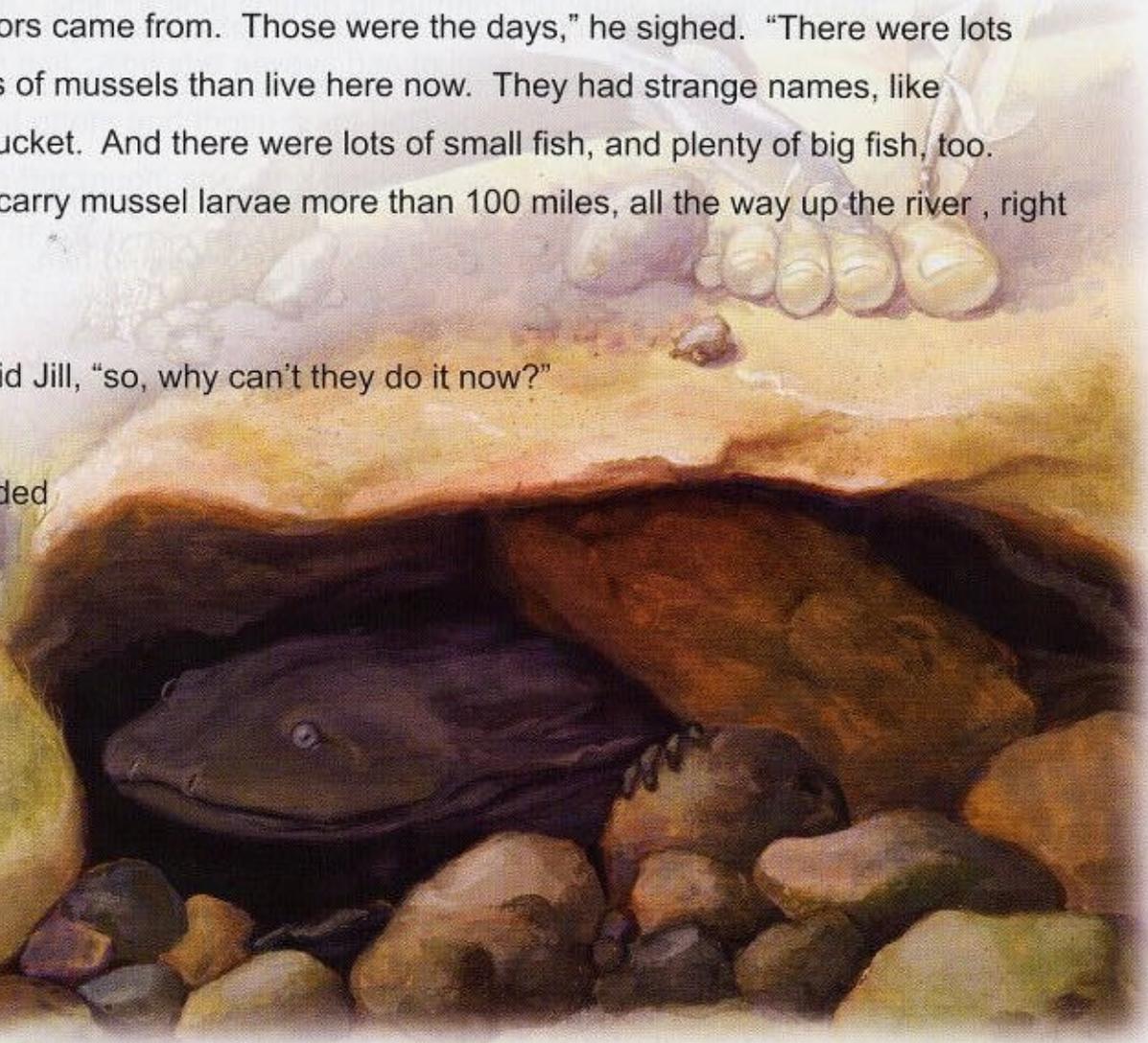


“Everything I’ve seen and heard about today is so amazing!” Jill said. “I never knew that so many interesting creatures lived just below the surface of Crystal Creek.”

Russell pumped water faster, yet he seemed sad. “You think this is amazing,” he said, “you should have seen the big river, where my ancestors came from. Those were the days,” he sighed. “There were lots more mussels and many more kinds of mussels than live here now. They had strange names, like pimpleback, pigtoe, fanshell, and mucket. And there were lots of small fish, and plenty of big fish, too. Fish so big and fast that they could carry mussel larvae more than 100 miles, all the way up the river, right into Crystal Creek”.

“There are still some big fish,” said Jill, “so, why can’t they do it now?”

“Well,” Russell said, “people needed to make the river easier for boats to travel on. And, I’d have to agree, it was hard for them to push and pull their big boats through the shallow parts of the river. So they built dams that flooded the shallow shoals.”



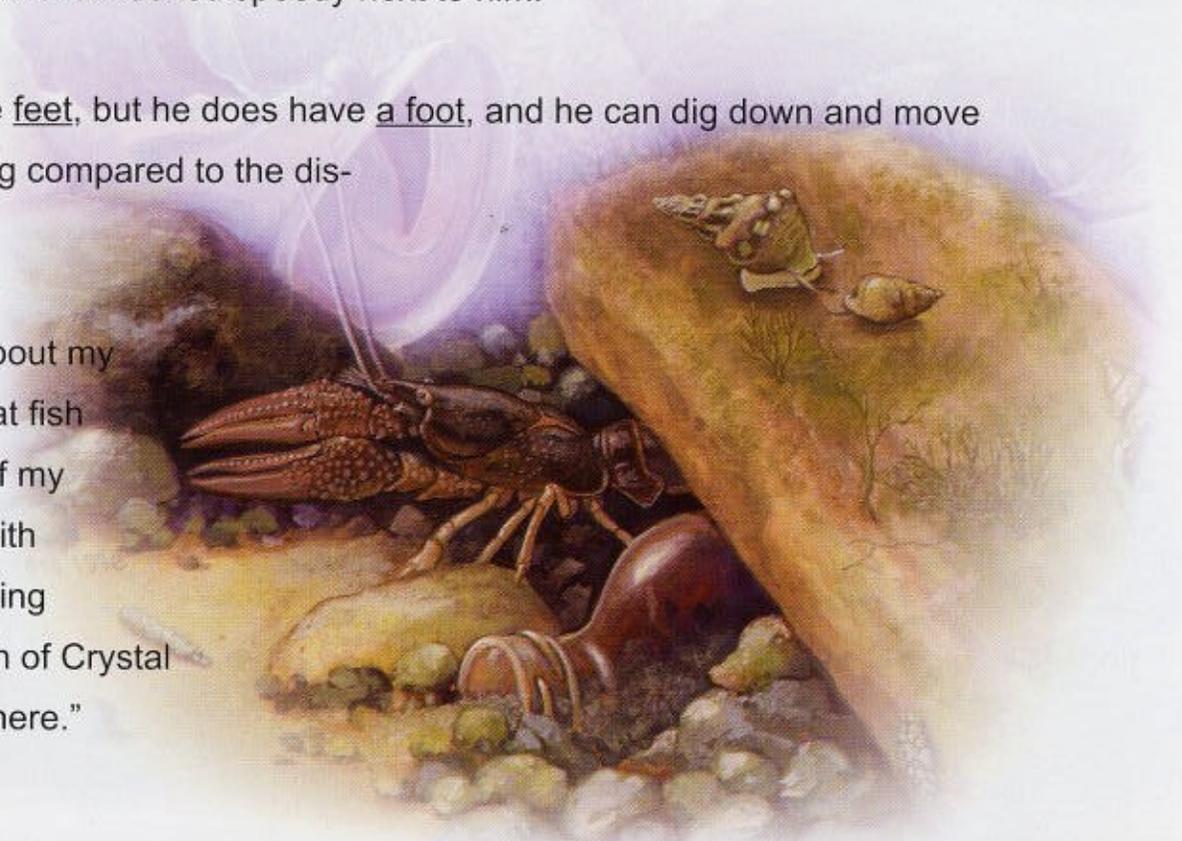
*T*hat's not the only reason they built dams," said Marie, a bright red crayfish who had poked her head out from under a rock as soon as the hellbender was gone. "People generate electricity at the dams to heat their homes and light their lights. And the dams also help to control flooding."

"Well, yes," said Russell, "I can understand wanting a cozy place to live. When the water gets too cold, I like to close up my shell a little, dig myself down in the mud with my foot, and just wait around 'til spring."

"You have feet?" Jill asked with surprise. She was still thinking of Russell as sort of a rock that didn't get around much. Even Sally the spiny riversnail looked speedy next to him.

"Well," said Marie, "he doesn't have feet, but he does have a foot, and he can dig down and move around a little with it. But that's nothing compared to the distance I can go with my ten legs!"

"Marie," said Russell, "you forget about my days as a baby. Back then I traveled at fish speed! Along with several thousand of my brothers and sisters, I hitched a ride with some whitetail shiners who were heading upstream from way down by the mouth of Crystal Creek. That was over ten miles from here."



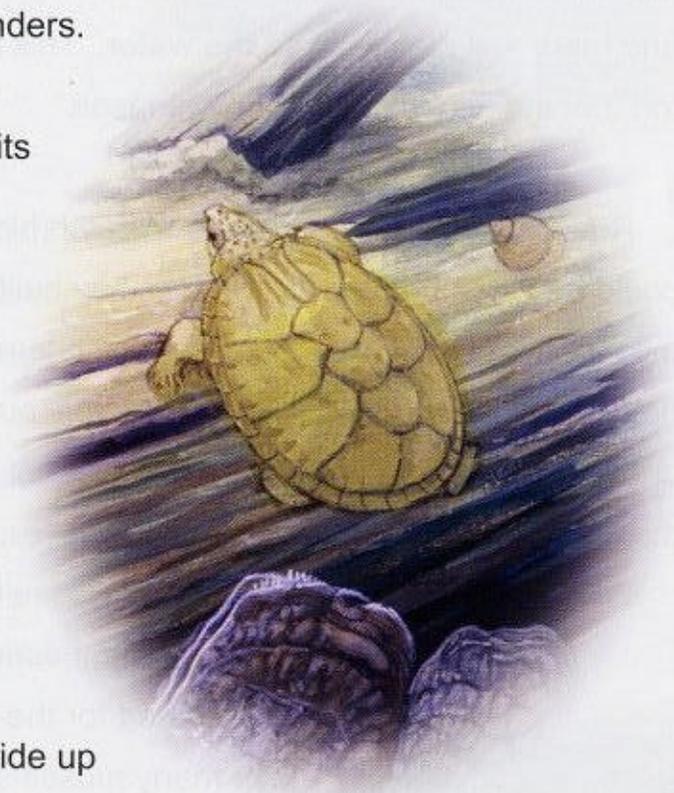
“Well, yes,” Marie reluctantly admitted, “you have done some traveling thanks to a friendly fish.”

Russell whispered to Jill, “You know, we should be honored to see Marie. She doesn’t come out much in the daytime. She’s a little scared of humans because they like to eat crayfish and use them for fish bait. And she always has to keep an eye out for big fish and herons and otters and those giant hellbenders. But even though we don’t see her much, she sure helps me keep the creek neat and tidy. If a fish or turtle doesn’t finish its meal and leaves a few scraps behind, she’s there to clean up after them.”

“I like to eat most anything,” said Marie.

“That’s just another example of how we all work together,” Russell said. “But let’s get back to my family history.”

“Sure!” said Jill. “So, all those baby mussels can’t get a ride up here now from the big river because of dams?”



*T*hat's right," said Russell. "But that wasn't our first problem. Long before there were any big dams, many of my relatives suffered because of the mud. The settlers needed to clear their land for farms, and towns, and factories. But they didn't understand what happens when too much vegetation is cut down. You see, the roots of bushes and trees help keep the soil in place. Without them, the heavy rains wash mud into the rivers and streams, and the mud smothers us. On top of that, some people planted their crops right at the water's edge, and more soil plopped into the water. This made it even worse for us and for the farmers, too, because they lost their rich topsoil."

Russell stopped for a minute to catch his breath and went on sadly, "Then, since humans could now ride boats everywhere, they built their factories along the riverbanks! And some of those factories dumped pollution, like chemicals and dyes and other bad things, right into our homes. We sure didn't like that! In fact, pumping as hard as we could, we couldn't pump fast enough to keep the water clean. In a lot of places all the younger mussels died because of these chemicals." Jill could tell it made Russell very sad to talk about this. She was sad, too.

Wanda, from her perch on top of Russell, spoke up again, "Now, of course, our rivers are beginning to get cleaner, because people finally realized that what they were doing was bad for the environment. But you'll notice that we still don't have many mussels. Except for Russell, and a few other older mussels, most of his relatives don't live here anymore."



Just then, Jill heard sweet music coming from the stream bank. She looked up to see a small bird land at the creek side and take a drink.

“That must be Luis, the Louisiana water thrush,” said Russell.

Russell cried out to the water thrush, “*Hola, Luis!*”

Luis called back, “*Que pasa, Russell!*”

Russell told Jill that Luis and the warblers that were taking a bath in the creek speak two languages. He also said that they had all spent the winter in South America and had just arrived back here to nest in the trees along the creek.

Luis finished drinking and said, “We just saw a strange creature down the creek. At first I thought it was a large otter crawling around looking for mussels, but I think it’s a person wearing a rubber suit and underwater goggles. He’s carrying a bag that looks sort of like a fish net, and it’s full of all kinds of beautiful young mussels. But the weirdest thing is, it looked like he was putting the mussels into the creek!”



Russell froze in fear. He stopped pumping. "What did you say he was doing with those mussels?"

"Putting them in the creek," Luis said.

"That doesn't make any sense to me," Russell exclaimed. "I'm outa here!" And, with that said, he quickly "clammed" up.

Jill stood up in the creek beside the old log where she had been watching and listening to her new underwater friends. She saw the man with the rubber suit and goggles standing just downstream.

The man peeled off his goggles and said to Jill, "Hi! I'm Dr. Richards."
"Hi!" said Jill politely. "What are you doing?"

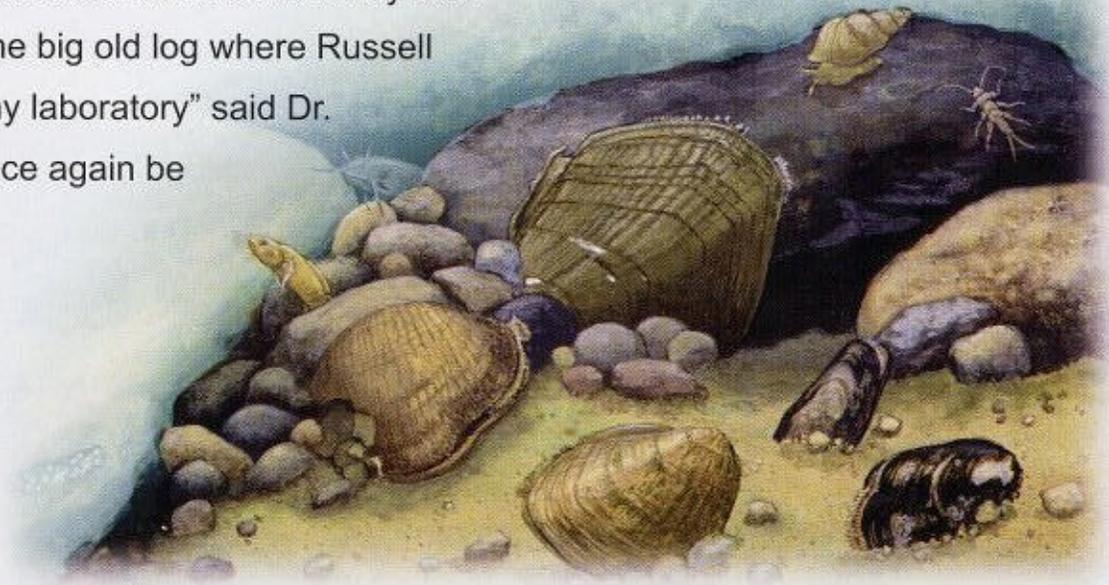
"I'm a biologist with the U.S. Fish and Wildlife Service," he said as he walked over to Jill. "I'm putting certain kinds of mussels back into Crystal Creek."



Just then Dr. Richards saw something in the water and bent down to pick it up. Jill gasped. It was Russell! His shell was tightly closed, and she could tell he was trying to look as much like a knobby rock as possible.

"Well," Dr. Richards said, "here's a rare mussel. It's an old rabbitsfoot, the largest I've seen. Wow!" Jill could just imagine how poor Russell was feeling.

Then, Dr. Richards very gently put Russell back down in Crystal Creek in exactly the same spot where he had found him. "I have brought this rabbitsfoot some new friends," he said. With that he began to take the beautiful mussels out of his bag and place them in Crystal Creek--some along the creek side where the water bubbles quietly by, others in the riffle where the water runs swiftly over colorful stones, and some up close to the big old log where Russell lived." I raised these baby mussels in my laboratory" said Dr. Richards, "so that Crystal Creek can once again be home to these kinds of mussels".



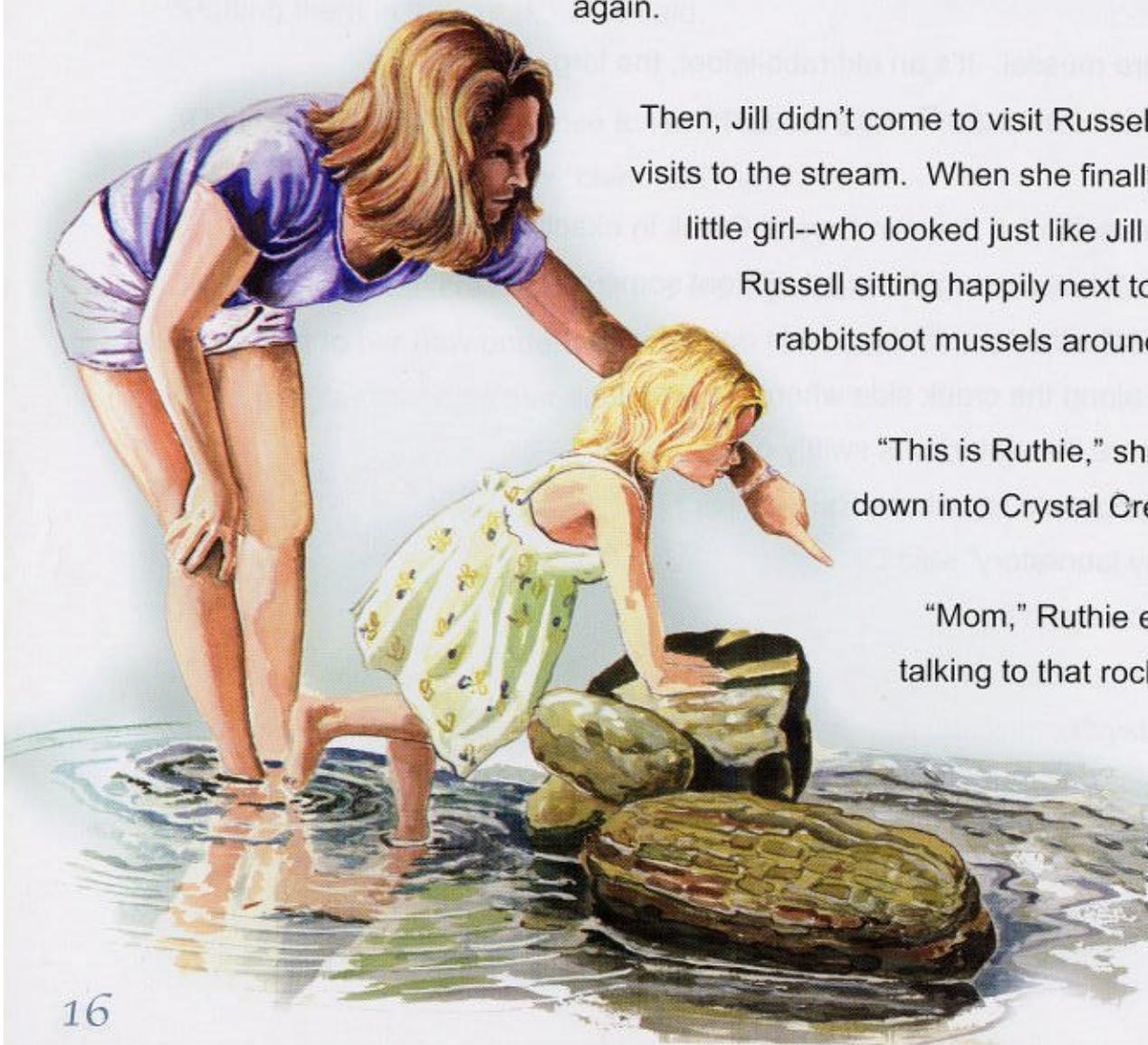
Many more Aprils came and went. Jill visited her grandparents and saw Crystal Creek begin to sparkle with new life. She and Russell had many long conversations, and he told her how pleased he was to see so many young mussels around him once again.

Then, Jill didn't come to visit Russell for a long time, and he missed her visits to the stream. When she finally did return, she had a child with her--a little girl--who looked just like Jill when Russell first saw her. She found Russell sitting happily next to the same big log with several smaller rabbitsfoot mussels around him.

"This is Ruthie," she told Russell as the little girl looked down into Crystal Creek.

"Mom," Ruthie exclaimed in a puzzled voice, "are you talking to that rock!"

"It's not a rock," Jill laughed. "Look a little closer. It's an old friend of mine, Russell the mussel, and see those smaller mussels all around him."





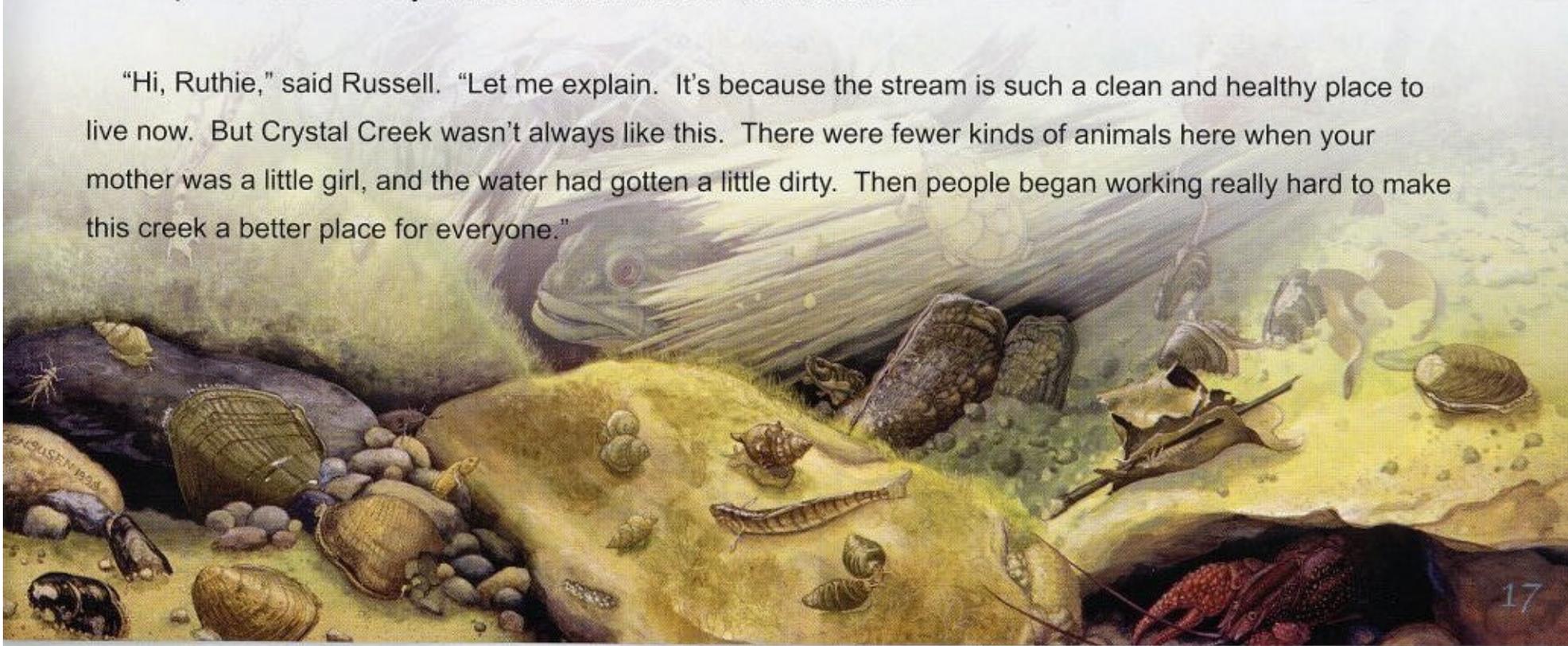
Ruthie bent down and peered more closely into Crystal Creek.

“You’re right, Mom, those aren’t rocks. They’re alive! Look at all the different kinds of mussels and fish and snails. It’s like that big aquarium at the dentist’s office that I like to look at. Oh! How beautiful,” she said.

There were leopard frog tadpoles resting in the shallows. Sponges were attached to many rocks. Crayfish, some with blue claws and some with red ones, were poking their heads out from under almost every flat rock. There were more animals and more kinds of animals than Jill had ever seen in Crystal Creek.

“Why are there so many kinds of animals here?” Ruthie asked.

“Hi, Ruthie,” said Russell. “Let me explain. It’s because the stream is such a clean and healthy place to live now. But Crystal Creek wasn’t always like this. There were fewer kinds of animals here when your mother was a little girl, and the water had gotten a little dirty. Then people began working really hard to make this creek a better place for everyone.”

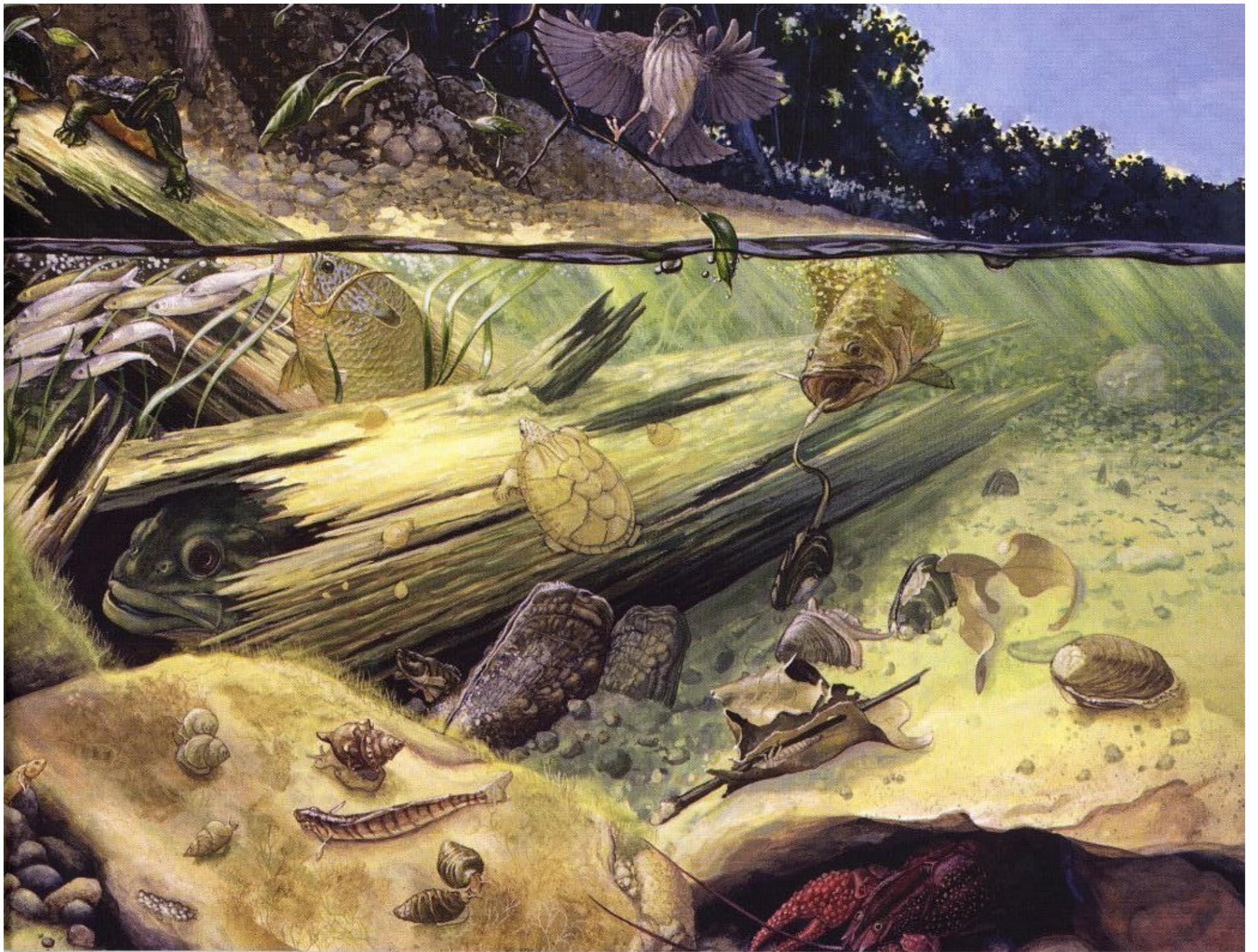


“That’s right,” Jill said to Ruthie. “People from all over the Crystal Creek valley joined together to improve the creek. They reduced soil erosion from roads, yards, and farms so that when it rains the creek doesn’t turn brown with mud anymore. People became more careful with the use of pesticides, and now no one would even think of dumping trash into the creek. They even brought back some of Russell’s relatives by raising young mussels in hatcheries.”

“They sure did,” Russell said, “and besides making Crystal Creek a better place for me and all my underwater friends, humans made it a better place for themselves as well--a great place for them to swim, fish, get drinking water, and just to look at.”

“Ruthie,” Russell concluded, “if you people continue to take good care of Crystal Creek, this pretty stream and all these wonderful creatures will be here for all of us to enjoy for a long, long time.”





Acknowledgements

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