

The Great Turtle Adventure



Sand Pine Scrub. Source: Rebekah D. Wallace, University of Georgia, Bugwood.org

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This story was written for Junior 4-H youth in Florida to study the Sand Pine Scrub ecosystem for the Annual Forest Ecology Contest.

While many of the events narrated in this story are fictional, the places, plants, and animals described are real, and facts about them are true.

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The Beginning

“I’ll race you to the lake!” Lydia shouted as she leapt out of the car.

“Hey, no fair! You got a head start,” Marybell and Quinn said almost in unison. The two took off after their cousin towards the shore of Lake Fore.

“Oh, don’t worry kids, I’ll unload the car!” Rosie called after her son and daughter with a smile to let them know she was teasing about the effort. She was delighted to see them so excited about the adventure to the park with their cousin Lydia, who was staying in Florida with them for the summer. Florida was very different than Lydia’s home state of Maine, where she lived near the border of Canada. She wasn’t used to the heat in the “sunshine” state, and Rosie knew she was glad for the opportunity to go swimming and cool off.

The Novak family was visiting the Ocala National Forest on a hot July morning. It was a Wednesday, so there weren’t many other visitors at the park. The family had come to the forest to do a little swimming and take a walk in the scrub part of the forest. Rosie unloaded a picnic lunch, some beach towels, and a blanket from the car and headed towards the lake. The kids had already shed their shoes and T-shirts and were laughing and splashing one another in the water.

Rosie chose a shady spot under a sprawling live oak and opened up a book she'd been reading. She listened as the children played.



The sprawling limbs of a live oak (*Quercus virginiana*) provides shade on a hot day. Source: UF IFAS3

“Hey, Lydia let’s look for mussels and clams,” said Quinn, who had recently learned about Asian clams in school. He had discovered that they are an invasive exotic species that is threatening the native freshwater mussels. He wanted to see if he could find any clams so he could tell the Science teacher.



The invasive Asian clam (*Corbicula fluminea*) competes with native mussels for food and places to live. Source: US Geological Survey, Bugwood.org

The three youngsters dug in the sand along the shore of the lake, while Rosie dozed off for a little nap. She dreamt of raindrops falling on her face.

“Ohhh, and the kids were having so much fun,” she thought to herself. She dreaded having to round them up and go home.

Rosie opened her eyes and realized that it wasn’t raining after all; Marybell was standing over her, dripping.

“Mom, we’re hungry! It is time for a picnic?”

A little dazed, Rosie sat up and looked at her watch. “Oh my, it’s after 12:30. Yes, let’s eat!”

Marybell helped her mother spread out the blanket and unpack the picnic. They had Lydia’s favorite—peanut butter, honey, and banana sandwiches for the main course and watermelon for dessert. Once they were ready, Rosie called for Quinn and Lydia to come out of the water.

They raced each other and Quinn was running so fast, he couldn’t stop once he got to the blanket.

“Hey, Quinn you’re dripping all over the sandwiches and you’re getting the blanket all dirty!” His sister loved having a reason to fuss at him. He jumped back and grabbed a towel.

“Marybell, that’s funny, you didn’t mind dripping water all over me while I was napping so peacefully over there. I thought it was raining and we were going have to go home,” Rosie teased her daughter.

Marybell blushed, “Sorry about that, Mom.”

The family began eating their sandwiches.

“Aunt Rosie, where are we going after we leave the lake?” Lydia liked to plan ahead for adventures; she always tried to picture in her head what new places would look like.

Rosie had a mouth full of sticky peanut butter and honey, “Wuhh, ba wubfite fed vells eh skrib foruf.”

The kids started laughing and Quinn said, “What, Mom? We can’t understand you; your mouth is full of food.”

“You couldn’t tell what I was saying? You kids can understand Pig Latin, but you can’t understand peanut butter gibberish? I said, the Web site said there’s a scrub forest here,” she said after swallowing her sandwich.

She pulled out a printed map and description of the trail they were going to go on and began reading it to them.



Lake Eaton Trail Map, Source: USDA Forest Service, fs.usda.gov

“This says that the scrub forest-type is located in upland areas where the water table is low and that is maintained by huge, but infrequent fires.”

“What kind of trees will we see, Aunt Rosie?” Lydia was eager to see trees that don’t grow where she lives.

Rosie read over the brochure and answered, “It looks like we’ll find sand pine trees, Chapman oaks, myrtle oaks, sand live oaks, palmettos, and various shrubs, including gopher apple and milk pea.”

“That’s a lot of oak trees, Aunt Rosie.” Lydia said. “How will we be able to tell the difference between them?” she asked.

“Well, sand live oaks have leaves that are thick and leathery and shaped like boats, myrtle oaks have oval shaped leaves although they are a little broader at the tip of the leaf than near the base of the leaf, and Chapman oaks have thin leaves with wavy or shallowly lobed margins.” She answered.



Left: Leaves of Chapman oak (*Quercus chapmanii*). **Center:** Leaves of myrtle oak (*Quercus myrtifolia*). **Right:** Leaves of sand live oak (*Quercus geminata*). Source: Rebekah D. Wallace, Bugwood.org

“Oh. That seems easy! I hope we find some!” She said eagerly.

Aunt Rosie continued reading the brochure. “It says that scrub forests were formed during the period of time when Florida was under water. The areas that were higher in elevation remained above water and developed adaptations that allowed them to survive in such a harsh environment. So as a result, many of the trees and shrubs have twisted, gnarled trunks and many of the leaves on the plants have small, thick leaves and little hairs to help them retain water.”

Lydia chimed in. “Aunt Rosie, before I came here to visit, I was reading up on wildlife that lives in the Ocala National Forest. I read about the scrub jay, does that brochure mention it? I read that it *only* lives here in *only* a certain kind of forest, I can’t even believe that!”

“Oh, let me see,” Rosie said as she read on. “Yes, it says that the scrub jay is found only in Florida scrub forests and it is listed as a threatened species. Their habitat is in danger of disappearing because scrub forests are desirable places for people to build homes. They are upland and dry, but remember what I what I said about them being maintained by big fires?”

“Yes!” the three youngsters answered.

“So what does that mean for people who build homes in forests that have big fires?” As a seventh-grade environmental science teacher, Rosie seized any opportunity to teach.

The kids thought for a second before Lydia asked, “Do they have to fight fires on their property all the time?”

“Remember, I said the fires are infrequent, but big. So there is danger of really big fires coming through and destroying their property. Homes and fire don’t usually mix very well. So when people move into forests that already have a fire regime, they have to



Florida scrub-jay (*Aphelocoma coerulescens*). Source: Ken Gioeli, UF IFAS Extension

take great measures to keep themselves safe, like not having any trees near their house,” Rosie explained.

“But trees provide shade,” Marybell said.

“And places to climb!” Quinn added.

Rosie continued, “Well, that’s true, but this area is called a ‘Wildland Urban Interface’ and it is much different than living in a neighborhood.”

“The wildland what?” Quinn asked.

“The Wildland Urban Interface is where people’s homes and land meet the edge of wild lands, like a forest or scrub forest. It can be a beautiful place for people to live, but it is also dangerous.”

“Will we see a forest fire, Aunt Rosie?”

“Oh no, they close the forest off to visitors when there is fire. And I haven’t read about any fires burning recently. Let’s hurry and finish our lunch so we can see for ourselves what’s out there!”

Turtle Disaster

The family finished their lunch and packed up their stuff. They loaded up in the car and headed towards the Lake Eaton Trail. The drive was dusty because the road was made of clay and dirt and it was the middle of summer, so the road was also sun-baked and hot. They could even see the heat waves radiating from the road ahead of them.

“I’d sure hate to be an animal out here. It’s so hot!” Quinn exclaimed.

“Most of the animals in this forest keep cool by staying in the shade during the hottest parts of the day,” Rosie said. “So, does that mean we won’t see any animals on our hike?” Marybell asked, a bit disappointed.

“What kinds of animals live in the forest, other than the scrub jay, Aunt Rosie?” Lydia asked.

“Well, I’m sure you kids could answer that question, right?” Rosie prodded.

Marybell thought for a minute, and said, “I would say white tailed deer, rabbits, and gopher tortoises.”

Quinn, who is interested in smaller animals that inhabit the forest, said, “And mice, beetles, and pocket gophers.”

“Good job, kids! Once we get to the trail, we can look at the brochure and the kiosk to see what else lives here. Maybe we will see something

despite the heat,” Rosie said as she glanced out the window at some dark clouds in the sky.

About that time Lydia yelled. “Look out, Aunt Rosie! Turtle, turtle!!”

Rosie swerved and slammed on the brakes. The car came to a screeching stop in a thick cloud of swirling dust.

Everyone just sat there for a few seconds, looking at each other.

They weren’t sure if they’d run over the turtle or not. “Wh-whose going to get out first?” Quinn stuttered, with obvious dread in his voice. He wasn’t sure if he’d imagined the bump he felt under the tires or not. The thought of getting out of the car and seeing a broken, dead gopher tortoise was too much for him. He felt like throwing up.

“I’ll get out.” Rosie felt horrible. She had brought the kids to the forest to hopefully see some wildlife and she might have killed the first animal they came across. Not to mention the gopher tortoise is a threatened species. She opened the door and stepped out. She held her breath and crouched down to look under the tires. Rosie had prepared herself for the dead tortoise, but she had not prepared herself for what she saw.

As soon as she saw it, she leapt up told the kids to get out of the car.

“Mom, is it dead?” Marybell woefully asked.

“Oh, I don’t want to Mom. Can’t we just go?” Quinn was on the verge of losing his lunch.

Lydia obediently got out and peered under the car.

“Oh my goodness! You guys have got to see this!”

The siblings hopped out and went around the car to where Rosie and Lydia were standing.

“What is it?” Lydia was looking down at the biggest and strangest looking turtle she had ever seen. It was ferociously digging in the clay bank on the side of the road. It had a shell that looked like stretched leather and its eyes, nose, and mouth were caked with sand and clay.



The Florida soft shell turtle (*Apalone ferox*) enjoys swimming in freshwater ponds and basking in the sun. Source: David J. Moorhead, University of Georgia, Bugwood.org

The turtle didn't seem to realize that it had almost become roadkill. It was going about its business, digging what seemed like an impossible hole.

“Well, kids, it's a soft shell turtle, but it is really in the wrong habitat. It is an aquatic turtle and they come out of water to lay their eggs, but we are a *long* way from the water. I don't think this is a safe place for her to lay eggs. I think she may get hit by a car if we leave her here and besides, I don't think she'll have much luck laying eggs in this hard clay.”

Rosie wasn't quite sure what to do.

“What if we take her back to the water? She looks like she's baking in the sun,” Quinn asked.

“Well, I agree she's looks pretty desperate out here. How about we put her in the car and take her down the Lake Eaton trail? We'll let her go at the

water's edge and she can cool off and then come back out of the water to lay eggs if that's what she's doing."

The kids were thrilled. Marybell opened up the hatch door so Rosie could put the turtle in the back of the car.

Rosie stood over the turtle and with her knees bent she placed her hands on either side on the turtle's midsection and hoisted her up in the air.

"Oh my, she's really heavy, kids, I bet she weighs 30 pounds!" The startled turtle began kicking its feet in the air wildly and reaching her neck around to try and bite Rosie as she carried her to the back of the car. Rosie had grabbed a hold of the turtle far enough back so it couldn't reach her hands.

Rosie set the turtle down in the back of the car and closed the hatchback.

"Alright, let's get this girl down to the lake!" Rosie said as the children piled back into the car. They drove ahead, each child looking out the window for signs of water, until they reached a parking lot with a sign indicating that they had made it to the Lake Eaton trailhead. Everyone got out of the car and Rosie tossed a bottle of insect repellent to Quinn.

"You kids need to spray yourselves well. I have the feeling the mosquitoes and yellow flies will be as thick as thieves down there on the trail."

Lydia gave Rosie a confused look. "Aunt Rosie, how come you keep saying, 'down there'? Like we're up in the mountains or something."

Rosie smiled and explained. “This is considered upland because it is higher in elevation than the lake. That’s in part why there’s even a lake at all. Rain flows down to the areas where the elevation is lower and water collects in the lowest lying areas, which eventually become lakes or ponds. So we really are above the lake.”

“Oh, I think I understand,” Lydia said, as she sprayed her bare legs with bug repellent.

“Make sure you guys get the backs of you necks and your ears. The biting bugs can be fierce.”

Rosie sprayed herself and then rinsed her hands from the bottle of water she had. She wasn’t sure if the bug spray would be toxic to the turtle or not but she wanted to play it safe. After all, she’d hate to cause the turtle any further distress after almost running over her. The family had no idea what *they* were about to go through.

The Longest Walk

Rosie picked up the turtle, being careful to keep her fingers safe from the powerful jaws, and the family began walking toward the trail.

“Mom, if you need a break, I can carry her too,” Quinn offered. They headed down the dirt trail through the scrub forest. The brush along the trail’s edge consisted of wild rosemary, broomsedge, and other grasses, called low panicums. They had walked for a few minutes when Marybell let out a yelp.

“Ouch, I just got bit by a yellow fly!”

“Did you spray yourself thoroughly?” Rosie asked accusingly.

“Yes. Are you sure it repels yellow flies?” Marybell asked her mother.

It occurred to Rosie that the repellent she grabbed didn’t say anything about biting flies, only mosquitoes.

“Look, there’s a sign,” Lydia said pointing to a kiosk.

They stopped to read the trail map and so Rosie could rest her tired arms. She set the turtle down and read the sign. “Ok, the trail is a loop. So we can go left or right. We’ll end up at the lake either way. Either way we go, it’s almost a mile. Anybody have a preference?” Rosie felt a stinging sensation on the back on her leg. She reached down and swatted a horsefly.

“Ouch!” Rosie looked at the kids and saw a swarm of yellow flies flying around each of them.

“RUN!! But carefully,” Rosie said as she picked up the turtle and trotted after them. They were kicking their legs up and slapping at them trying to keep from getting bitten. They had taken the trail to the left, which was a bit overgrown with brush on both sides. Everyone ran as fast as they could, being careful not to trip on any vines or roots. At one point Quinn looked back to see how his mother was doing but she wasn’t behind them.

“Mom? Mooooooom?” he shouted.

“Yeah?” He could barely hear her, but he could tell she was out of breath.

He called up to his sister and cousin, “You all go on, I’m going to help Mom.”

Quinn ran back to his mother and she was sort of dancing over the turtle.

“Mom, what are you doing? Are you okay?” he asked her. He wanted to laugh, but he thought it might not be a good idea. “Yeah ... yeah ... I’m ... just taking a break. And I don’t want ... the flies to bite me so I’m trying to keep moving a little too.” She was drenched in sweat and looked exhausted.

“She is one ... heavy turtle, Quinn.” Rosie looked like she was going to pass out or have a heat stroke.

“Mom, I’ll take her and you jog ahead of me.” Quinn picked up the turtle and she began thrashing in his hands. She *was* really heavy. Quinn

wasn't sure if he'd be able to make it without dropping her. He was at least glad that he had already started training for the soccer team, and so he was somewhat in shape.

As he jogged, the sweat began rolling down his arms, making his hands slippery. It got difficult to hang on to the heavy reptile. Not to mention the fact that his legs were being *devoured* by yellow flies. He was beginning to tire out and his legs felt like rubber. He stopped to take a break and could see his mother up ahead in the distance. The moment he stopped running, at least six horseflies and five yellow flies landed on his arms and legs.

He picked up the turtle and took off again. For most of the time that Quinn and his mother had been running with the turtle, she had remained relatively calm, only kicking them occasionally. But as they neared the water, the turtle began frantically trying to escape his grip. She was craning her neck around trying to bite him and scratching him with her powerful back flippers. The sweat on his hands was making it very hard to hold on to her, especially since she was being so feisty.

Quinn noticed standing water next to the trail and as he ran by and the turtle really went crazy! She was kicking all four flippers in the air, almost like she was trying to swim. Quinn could hardly keep her in his hands. He started running faster.

His muscles were so tired and since he didn't know how far the lake was, he began wondering if he would be able to make it. He might have to slow down and resign himself to being eaten alive by the flies. Just when he

thought there was no way he was going to make it the rest of the way, he heard his mother calling to him.

“Quinn, can you hear me? We’re at the lake! We found it! You’re almost there!”

The sound of his mother’s voice gave him the push he needed to keep going. Finally, he could see her, Lydia, and Marybell. But as he got closer, the turtle became impossible to hold onto.

As Quinn leapt onto the boardwalk, running as fast as he could, the turtle broke free from his hands. Quinn dove to the ground, hoping to break her fall. He and the turtle hit the boardwalk with a thud.

Stunned, Quinn laid there, looking out over the lake. The turtle, hardly missing a beat, scurried off the edge of the dock and landed in the water with a splash.

The family was cheering and laughing.

“Yeah, Quinn! You did it, you saved her life!”

“Did you see her go? She swam away so fast!”

He closed his eyes and almost cried. The pain reminded him of his first practice on the Freshman soccer team, and he knew it would probably be worse tomorrow. But he was relieved and happy, and was even happier for the turtle.

After laying there for what seemed like an hour, Quinn got up and joined his mother, sister, and cousin, who had let him lay there to recoup his

strength and to cool off. They walked along the boardwalk looking for ospreys and alligators.

All's well that ends well ... maybe.

"Quinn, thank you so much for carrying that turtle as far as you did. I couldn't have done it without you," Rosie said, putting her arm around her son.

"Well, I couldn't have done it without you either, Mom."

"Alright kids, let's head back up the other side of the scrub trail."

They all braced themselves for another fly attack. They walked in a line so they could warn the person up ahead of flies on their legs.

The trail sloped up gently and was lined with palmettos, rusty lyonia, and the occasional sand live oak. Quinn grabbed a few leaves from the sand live oak. He loved the way the leaves looked like boats and wanted to see if they would float away in the lake. He put the leaves in his pocket for safe keeping for the next lake they found.

The sugary sand made the trail hard to walk on sometimes, but the group pressed on. After a while, Lydia piped in and asked, "Hey, have you noticed that there aren't any flies on this side of the loop?"

Rosie thought for a moment and then answered, "Did you notice how there were grasses and shrubs growing out over the edge of the other trail, but this side has been cut back recently?" Everyone nodded in agreement.

"Well, I read that biting flies like to hide in low-hanging vegetation, and then they come out when something brushes up against their hiding place.

So that may explain why they were biting us on the other side, but not bothering us over here,” Rosie explained.

“Now that we aren’t saving lives and fighting off attacks by killer flies, maybe we can actually look around at the forest,” she said.

Quinn’s bug bites were becoming less painful and he was ready to see what the scrub forest was all about.

“Aunt Rosie, do you know what those scraggly trees are?” Lydia was pointing up at a clump of tall, skinny trees.



Needles and cones of sand pine (*Pinus clausa*). Source: Niels Proctor, UF/IFAS

“Well, they must be Ocala sand pine, which, like the scrub jay, can only be found in this kind of forest.” Rosie recalled while reaching in her back

pocket to get the trail brochure. “These pine trees have short needles, and the pinecones are small and stay on the tree for a long time. Look,” she pointed at the tall sand pine tree surrounded by smaller ones, “This tree looks like it has hundreds of pinecones!”

The group continued walking until Lydia noticed someone was missing.

“Hey, where’s Marybell?”

“Marybell!” Rosie called out to her, but heard nothing. “Marybell! Where are you?” They looked at one another, nervously.

They were listening, waiting for her to respond.

Then they heard a muffled sound.

They all started running back toward the sound. It was growing louder and they could hear also hear the sound of footsteps. As they turned the corner, they ran into Marybell, who was also running. She had purple stuff all around her mouth and chin and she looked guilty.

“Marybell, why didn’t you answer me when I called you?” Rosie was relieved and a little angry at the same time.

“I heard you and I tried to answer, but my mouth was full of these blueberries.” She held out her hand to show her mother. She presented a handful of squished blueberries.

Everyone started laughing.

“How did you know they were blueberries, Marybell? It’s dangerous to eat wild plants unless you’re sure they are safe to eat.”

“Oh, no, Mom. I knew they were blueberries. We had someone from the State Parks Department come to the school and talk to us about edible wild plants. He even told us where we could find each of them. I paid special attention to the part about blueberries; you know they’re my favorite. See, they are the small bushes with the tiny leaves and small dark blue berries.”

Lydia had no idea that she still had evidence of her snack all over her face while she was showing everyone the plant. The family turned around and continued to make their way back. They were each looking along the trail’s edge at the different plants. When Marybell stopped and took off her shoes. “What are you doing *now*?” asked Quinn.

“My shoes are full of sand!” she said as she shook them out. “Scrub forests,” Rosie told them, “have very sandy soils and they don’t hold moisture at all. As a result, rain flows through the layers of soil very quickly and drains into the aquifer. Scrub forests play a very important role in recharging the aquifer. So the fact that they are threatened by development is an important issue for everyone who lives in Florida because almost everyone in the state gets water from the Floridan aquifer,” she added.

“Aunt Rosie, don’t you mean F-l-o-r-i-d-i-a-n aquifer?” Lydia sounded out the word, *Floridian*.

“No, it’s spelled F-l-o-r-i-d-a-n. And it’s the aquifer that flows underground beneath almost the entire state of Florida.” Rosie enjoyed teaching her family about the great state that they live in. They walked along

and recalled the events of the day. They could hardly believe the things they had done and seen.

“Aunt Rosie, can I come back and visit next summer?” Lydia was having so much fun, she wanted to be sure she could come again next year.

“Of course you can, Honey. Next year we’ll go somewhere new.”

The siblings were nodding in agreement. They wanted Lydia to come back, too.

They made it back to the trailhead and piled into the car. Quinn was exhausted from the carrying the turtle and dozed off almost immediately. The girls played road games on the way home and Rosie listened to a book on tape that she borrowed from the library.

“What a day ...” Rosie said quietly, smiling to herself, thinking of great stories she would be able to tell her class when school started in the fall.

Places to See Sand Pine Scrub in Florida

The scrub ecosystem is usually dominated by shrubby oak trees and sand pine. It usually is found on well-drained, nutrient poor, sandy soils. This community is adapted to and maintained by huge, infrequent fires. Because they are unlikely to flood, these areas are often converted to citrus orchards, golf courses, and housing developments. Visit the scrub forest at:

- Ocala National Forest
- Jonathan Dickinson State Park
- Merritt Island National Wildlife Refuge
- Silver River State Park
- St. Joseph Peninsula State Park
- Oscar Scherer State Park