The Rattlesnake Conservancy

RATTLESNAKE MOVEMENTS

Before you begin...

This activity uses data collected by biologists on Jekyll Island—one of Georgia's protected barrier islands, as part of the Jekyll Island Authority Conservation Department's ongoing research into the eastern diamondback rattlesnake. In a classroom or at home, these records allow us to give children the opportunity to track the real movements of both male and female eastern diamondback rattlesnakes over a one year period. It's designed to provide a deeper understanding of their behavior and habitat. This activity can be modified for very young children through teens and uses a written story in combination with a guided tracking activity and suggested follow up questions.

Directions

1. Prepare the activity by organizing the classroom packet and printing the pages you'll need. Young children may enjoy using the included story as a coloring book that they can keep, in which case you'll need a copy for each student.
2. Read the story aloud, and discuss afterwards! What factors did you think changed the movement patterns of the rattle-snakes?
3. Begin tracking! It's time for your students to be the scientists. Using their tracking sheet for the male and the female, they can follow and plot the movements using a different color for each month.
4. Check the tracking sheets with the teacher key, and go over the follow up questions as a group.

You will need...

1. Teachers Guide (included)
2. Classroom information page (included)
3. Applicable classroom pages (included)
4. Colored pencils, crayons, or markers in 12 different colors
5. A ruler (optional)

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did you know...



Did you know that populations of eastern diamondback rattlesnakes have declined significantly, and that they may be eligible for listing as a threatened species?

The eastern diamondback rattlesnake is the largest rattlesnake species in the world! This impressive rattlesnake ranges across the southeastern coastal plain of the United States, but unfortunately its population has declined throughout their range. This animal was petitioned to be listed under the Endangered Species Act in 2011, but its listing is still under review by the US Fish and Wildlife Service. One of the largest threats these rattlesnakes face is from habitat loss and fragmentation.

Biologists may play an integral role in understanding the needs of this species and how to protect them. This activity uses data that was collected by a team of dedicated scientists at the Jekyll Island Authority's Conservation Department. Jekyll Island is a protected barrier island in southeast Georgia which is home to numerous plant and wildlife species, including the eastern diamondback rattlesnake! By radiotracking these animals, scientists on the island are able to follow their movements and better understand their behavior, what type of habitat that they use, and how to protect them for better conservation outcomes.

As we read through the story together, take time to think about what factors may cause a diamondback to travel through their home range. Were they looking for food, shelter, or to avoid danger? Does the weather play a role? Do people play a role? What makes an eastern diamondback rattlesnake choose one spot over another? After our story, we will revisit these questions and use data points to plot the real movements of both a male and a female eastern diamondback rattlesnake over a one year period.

Let's get started!

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RATTLESNAKE MOVEMENTS

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The Story of Petunia

A Female Eastern Diamondback Rattlesnake

Produced by

The Rattlesnake Conservancy

Illustrated by Alec Jarboe
Written by Tiffany Bright

Using Data Collected by Joseph Colbert
and the whole team at
The Jekyll Island Authority's Conservation Department

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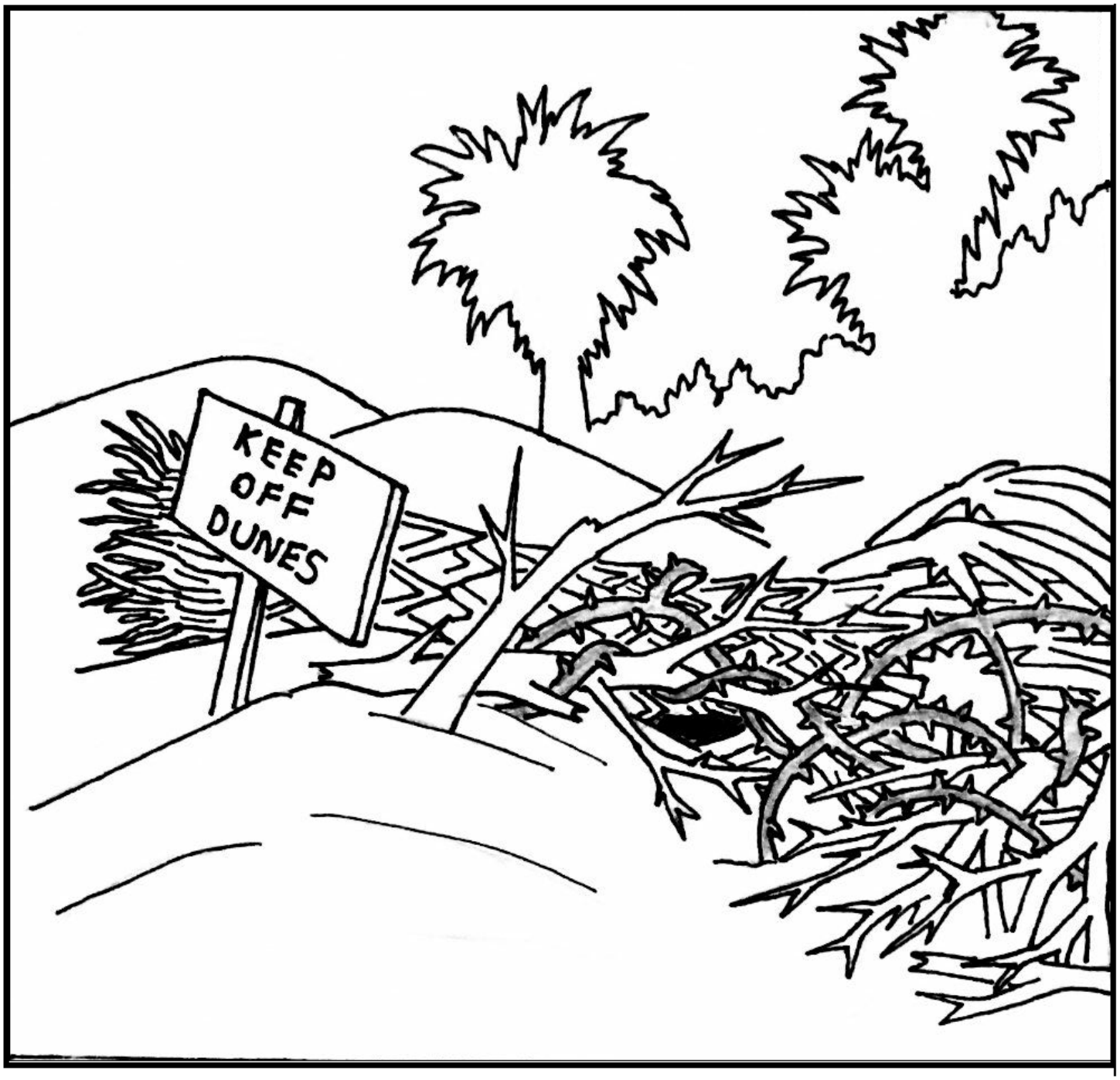
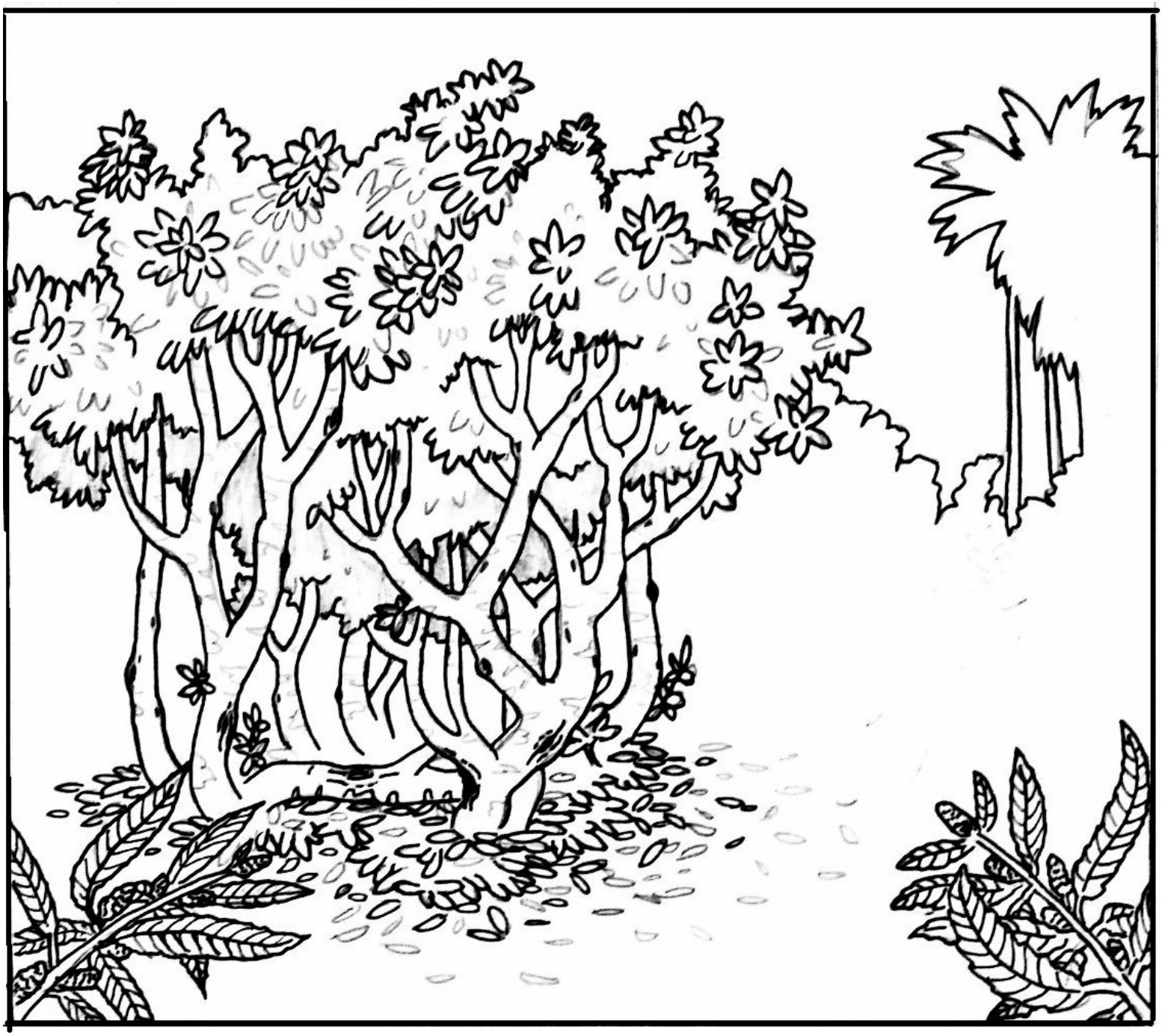


“It’s so cold”, said a young boy to his mother. The beach was abandoned for winter except for these two figures running through the sand. “Of course it is”, she responded with a laugh as she tagged him and ran further. He laughed and chased her back. The ocean churned and the sky was dark, looming. Wind howled from the sea onto the land while the salt spray washed the shore with the chilling cold of a January day.

Beyond the mother and son playing, the beach seemed devoid of life. The sandy dunes, typically alive with the color of speckled wildflowers and the sounds of songbirds were utterly quiet, and still. Beneath the surface, though, a whole world was dreaming, waiting for warmer days. A squiggly, s-shaped track curved its way through the sand and disappeared under a strong, impenetrable maze of wax myrtle roots—the last sign of Petunia, the eastern diamondback rattlesnake, who had taken shelter underneath them before the winter’s grasp.



Several weeks later, on an unseasonably warm February day—the sun rose high in the sky. Even though winter's cold touch could still be felt, sunny patches of earth provided small recesses of warmth and light in the sand.

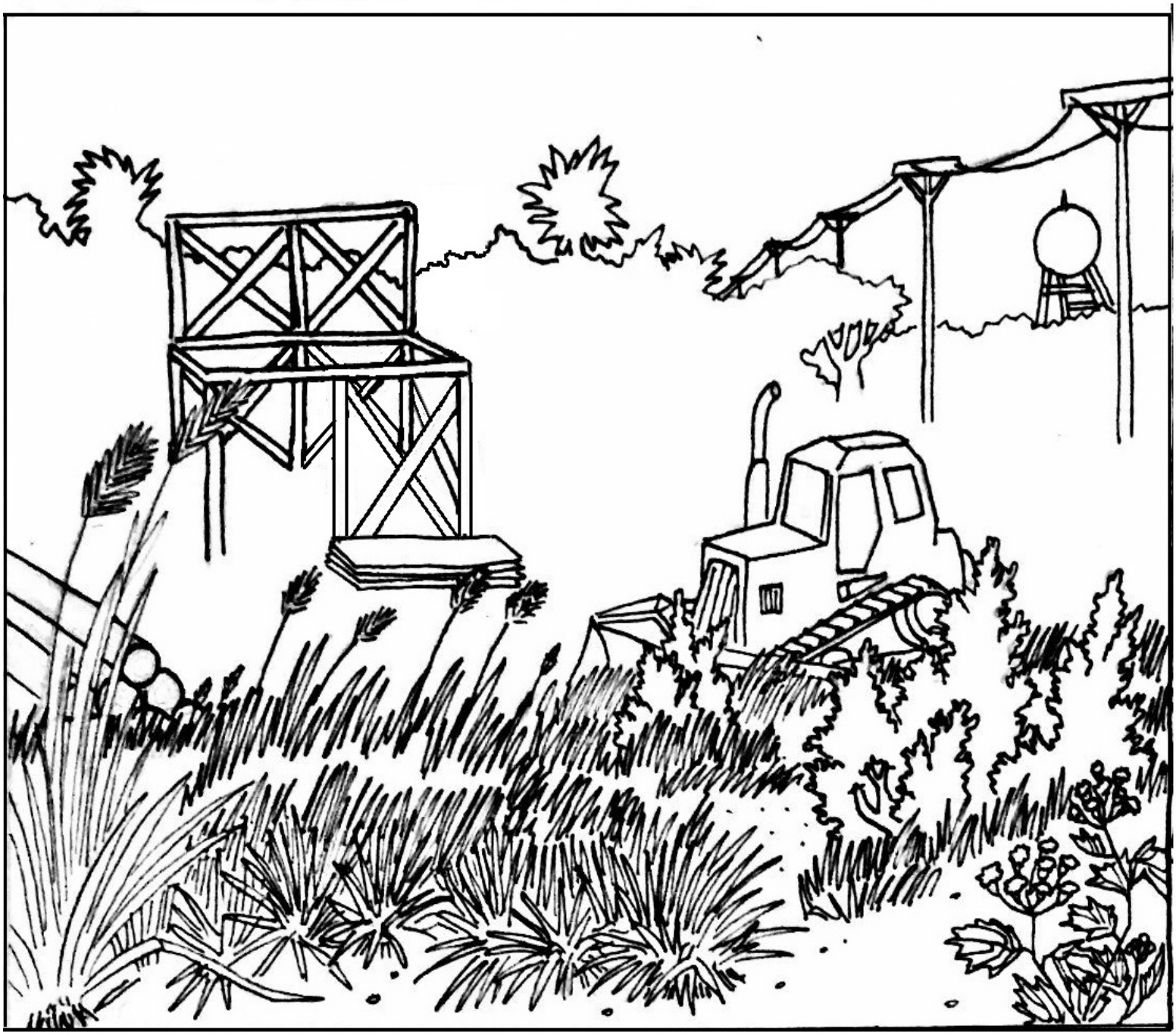
Petunia stretched her body, and opened her mouth in a large yawn. She could feel the sanctuary of her root mass warming in the sunshine, and she decided to venture out for the very first time this year. It wasn't warm enough to eat, or to forage, or to find a new refuge—but it was warm enough to rest in the soft gleam, and to bathe in the scattered patches of sunlight.

She coiled just underneath her wax myrtle tree, so that she was still close enough to the safe shelter she had relied on for protection all winter. She basked in the warm glow of the sun, as the first signs of spring began to radiate through her body.

As more weeks passed, winter gave way to the spring equinox—a time when the sun crosses the celestial equator and days become longer, and warmer. The earth is alive with plants reaching towards the sky in growth, wildflower blooms dotting the landscape, and babies throughout the animal kingdom taking their first breath.

Petunia could feel the season changing on her sun-kissed skin, and she welcomed the warmth. It was time for her to begin looking for a delicious meal, and finding a new spot to rest. She traveled almost a half mile, slowly, and purposefully through tall grass and cover. She rested finally in a safe thicket of prickly smilax vine that tangled its tendrils and sharp thorns every which way—seemingly crawling along the ground with her.

She was hidden, secure, warm, and content.



When April arrived, Petunia was very hungry. She hadn't eaten yet this year, and she was ready to find a meal. She tasted the fresh air—using her tongue to collect important molecules that she returned to a special organ in the roof of her mouth to be skillfully analyzed and interpreted. She used what scientists call chemosensory cues to understand her environment, and she quickly found herself following a mammal's scent trail.

Petunia moved methodically through the understory of a martime forest, under the canopy and through shrubs, and wax myrtle, and smilax, and tall grass. She rested strategically in the overgrown landscape behind a construction site. She sat still, waiting to ambush an unsuspecting prey item. Just when she was ready to lunge for a small rodent, she was startled by the loud grind and roar of a tractor's engine and shouts from the men and women working the construction site. She quietly fled the scene, glad to be undetected, and hoping to find a safer place where she could eat.

Petunia moved slowly, silently, and expertly. She wanted to evade any construction workers who could step on her—and especially that terrifying equipment whose sounds pulsed into the earth and shook the ground she traveled on.

She moved almost one thousand feet until she came across an area of thick grass, palmetto fronds, and peppervine. She found animal tracks and sensed a prey item was near, but as she was finding her bearings a biologist was finding her! When the biologist got too close, Petunia quickly darted into briar, sticks, and palmetto thickets—she narrowly escaped danger again! Luckily, the biologist wouldn't have hurt her, and was only tracking her as an effort to better understand how she, and other rattlesnakes, can be protected, but Petunia didn't know that.

Startled again, and hungry, Petunia finally caught her first prey item and lucky break of the year!

If you've ever eaten a feast, then you know just how Petunia was feeling. Imagine all of your favorites—ice cream, pizza, apples, strawberries, potato chips, sausages, watermelon, and anything else tasty! How would you feel after eating all of that?

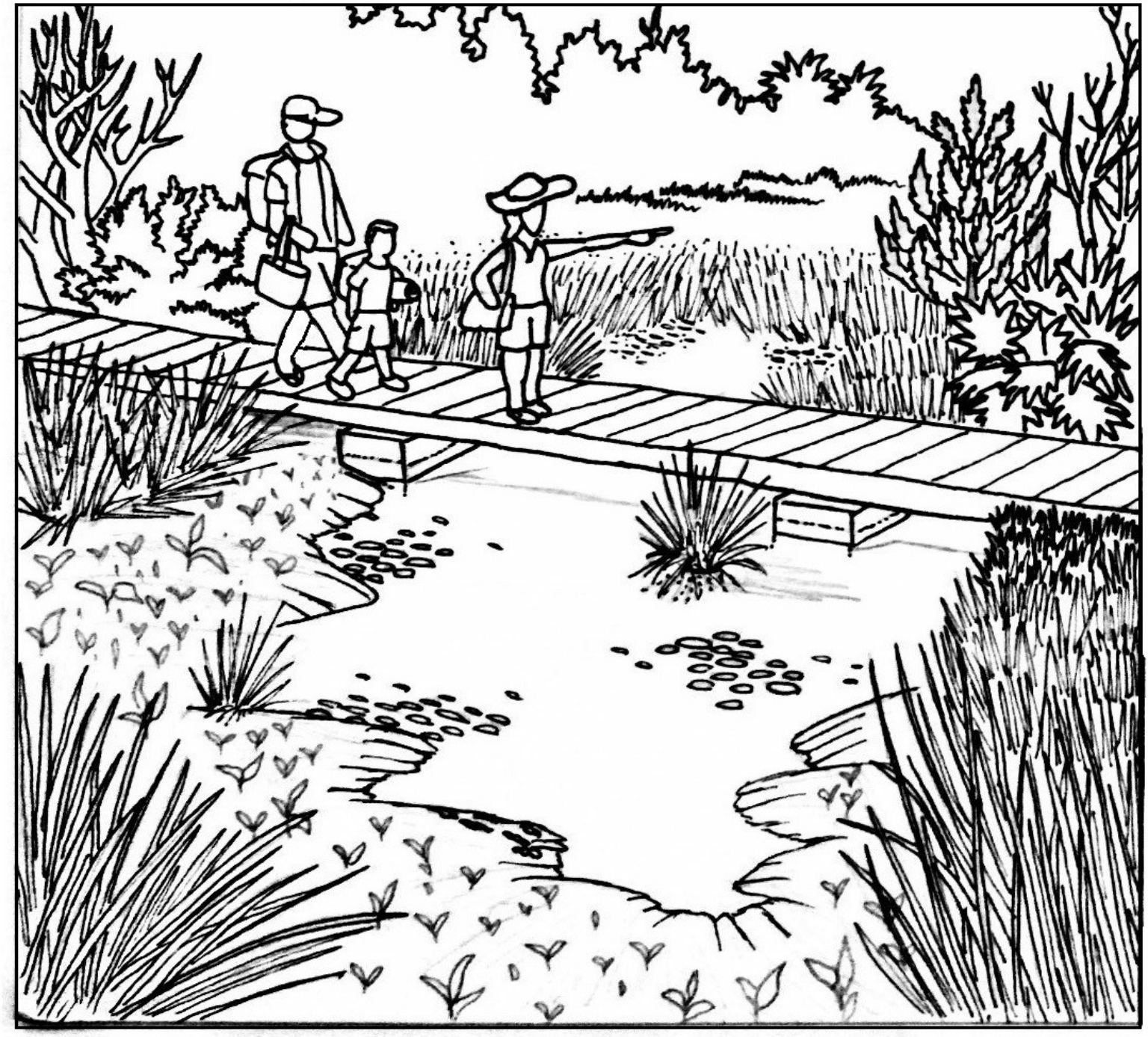
Well, Petunia isn't so different from you and me in that way—and she was stuffed. Now, you must be wondering how Petunia could feel so full after so many months passing with only one meal; however, unlike you and me, Petunia—and all snakes, are uniquely adapted to eat large meals rather infrequently. A healthy adult eastern diamondback like her could last an entire year on just one meal! Petunia didn't know if she'd need to have another meal this year, but she knew that she needed to find a safe, warm space to rest so that she could thermoregulate, increase her metabolism, and digest her meal in peace.

Soon, the days became much longer, and much warmer. It was the summer solstice, and after resting for a couple of weeks in the palmetto thicket and digesting her meal, Petunia moved 600 feet east to a more shaded spot underneath fennel and a winding labyrinth of smilax vine near a boardwalk. Once she arrived, Petunia felt something strange was happening to her. She couldn't see very well as her eyes glossed over in an opaque sky blue. Her skin was tight, and she was shedding. All rattlesnakes will shed their skin as they grow, even their eye caps—or spectacles. Scientists call this process ecdysis. During this phase, their skin will look cloudy and dull, their eyes become blue, and they may feel very nervous and afraid as they can't see very well. In a few days, their skin and eyes will clear up—and they're ready to shed their skin.

Petunia found a smooth rock to rub herself against, and slowly her old skin began to slough off of her body in one, large piece. She looked vibrant and iridescent, and even gained a new segment on her rattle to help warn off threats! She was so proud.

Once she finished her shed cycle, Petunia was on the move again. She traveled through dense patches of soft vines and grasses where the scent of a marsh rabbit brought her to the same briar patch as another eastern diamondback rattlesnake who must have been enticed by the same treat. Luckily, rattlesnakes aren't territorial and there was plenty of room for them both in this corner of the marsh which overlapped each of their home ranges.

The marsh was brimming with activity from the summer sun reflecting on the water, fiddler crabs darting into their subterranean homes, longwing butterflies pollenating the vibrant passionflowers, rattlesnakes unseen in the brush, and the marsh rabbit splashing as it hopped away from it all.



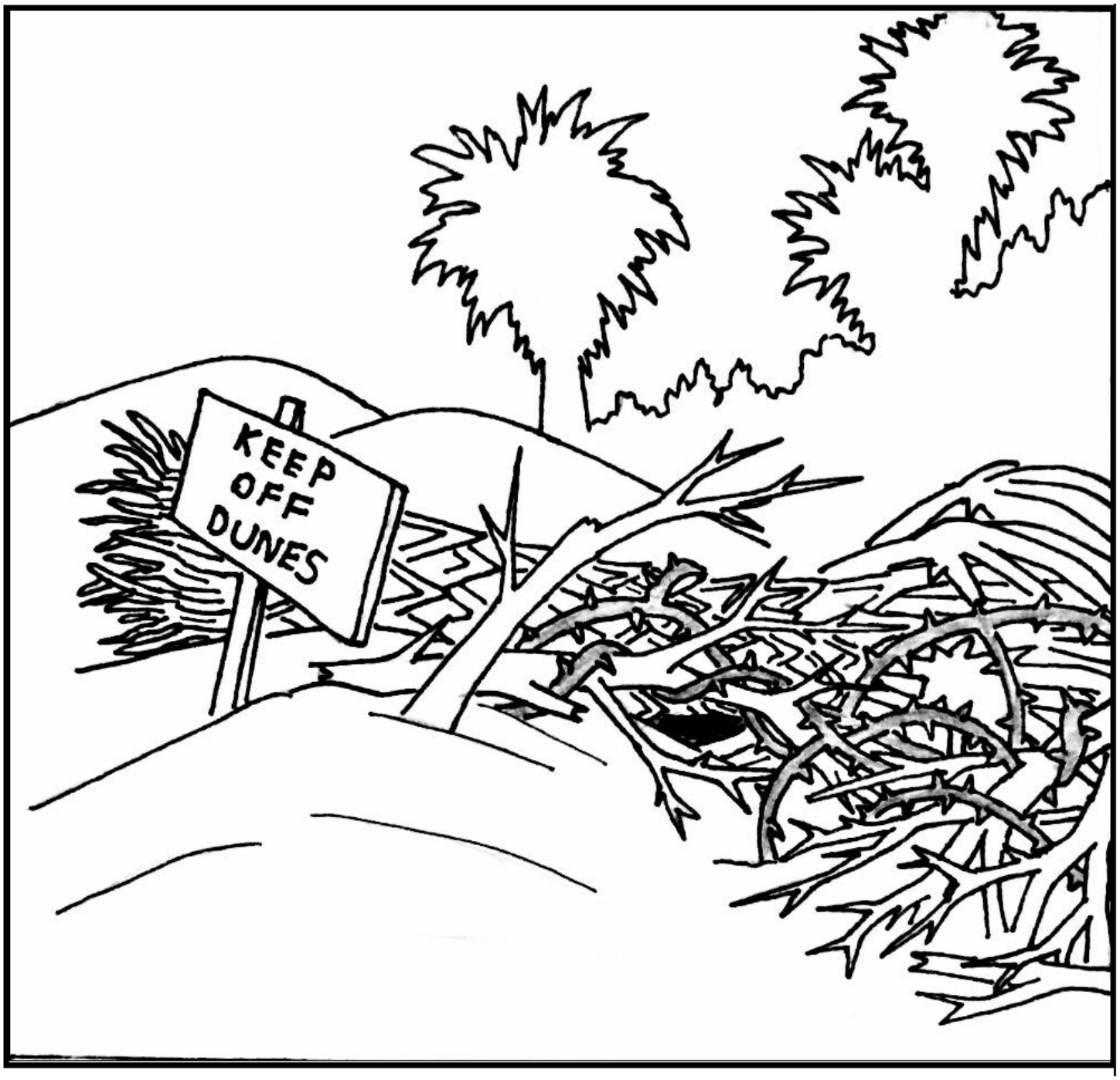
Petunia stayed in the protection of her shaded spot in the marsh until she felt the expeditious footsteps of a family traveling over the bridge. “Was that a rabbit?!”, the mother called excitedly. “Look at those striped butterflies!”, responded the child. Petunia was close, but unnoticed and when it was safe she began moving slowly a bit further east, away from the risks of the boardwalk and the people who raced over it.

The autumn equinox had came and went, and the air was still with an anticipatory calm. Days were still warm, but much shorter, and the nights were cool. Petunia spent her time coiled against the base of a wax myrtle tree, she was facing the ocean and could feel the sea breeze on her face.

She took advantage of the remaining warmth and ate her second meal of the year. She felt full, and calm, and gave herself time to rest in the sunshine.

Petunia had traveled more than half a mile—a longer distance than she had traversed all year when she reached a pile of branches, muscadine leaves, and palm fronds. She had noticed that the weather was changing and knew that winter was approaching. The nights had become longer, and colder. The days—more still. The squirrels had retreated to their homes with collections of nuts and seeds, the cicadas had predicted the year's first frost, and the migratory birds could be seen making their new homes in warmer places.

Petunia chose this spot to rest because the canopy of branches provided protection while still allowing the year's last remaining traces of sunlight to penetrate and offer her the warmth she'd need to make it through the season. She began to move more slowly, and she felt very sleepy. As she tried to allow herself to rest, she was jolted awake by the harsh movements and low drone of traffic from a nearby road.



Finally, Petunia returned home to her preferred refuge, her strong and safe root mass—the very space that she started the year in the coastal dune system.

Again, the beach seemed devoid of life. The sandy dunes, typically alive with the color of speckled wildflowers and the sounds of songbirds were utterly quiet, and still. Beneath the surface, though, a whole world was dreaming, waiting for warmer days.

The end.

The Rattlesnake Conservancy

RATTLESNAKE MOVEMENTS

Female Tracking Instructions



Follow these instructions to plot the movements of our female eastern diamondback over one year! Be sure to use a different color to plot each month.

Now you are ready to track a rattlesnake and plot her movements, let's get started!

Choose one color for each month of the year, that means you should have 12 colors! Mark your color of choice next to each month in the color key so that you can keep track. Listen to the following prompts and slowly move from point to point along with our rattlesnake.

JANUARY—We begin our year brumating underneath wax myrtle roots on a coastal dune. Since we don't move this month, you can just circle your starting point	JULY—This month we finally ate a delicious meal! We move 606 feet east to find a shady spot near the boardwalk to rest
FEBRUARY—This month we have moved 25 feet southeast to coil up underneath a wax myrtle tree	AUGUST—We followed a rabbit's scent 756 feet west to the same catbriar patch as another rattlesnake, but there's room for us both
MARCH—As Spring weather comes we've moved 2,116 feet southwest this month to a safe thicket of prickly smilax	SEPTEMBER—We moved 900 feet northeast to a nice grassland under a boardwalk
APRIL—We begin our hunt for food, moving 767 feet northeast to sit in ambush and forage behind a construction	OCTOBER—After eating another tasty treat, we move 54 feet east further into the marsh to avoid human footsteps
MAY—We move 875 feet northeast to avoid a close call with construction workers while foraging! We found a grassy area and started moving again after a noisy biologist found us	NOVEMBER—It's starting to get cold! This month, we travelled 3,335 feet north to a nice pile of sticks where we can hide while still feeling the sunlight during the day
JUNE—We tracked a scent and moved back 1,135 feet southwest to a cozy palmetto thicket in the maritime forest	DECEMBER—This month we're ready to go back to where we know it's safe—we travel southeast to the coastal

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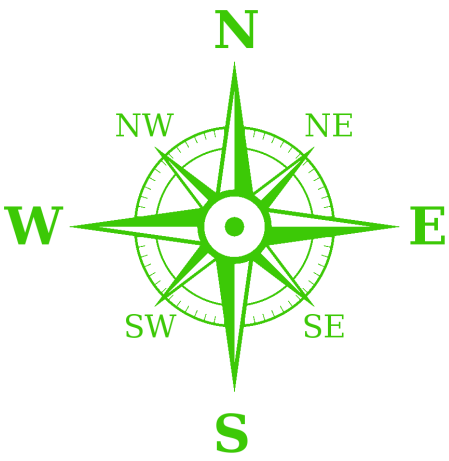
RATTLESNAKE MOVEMENTS

Name:_____ Date:_____

Color Key

Jan	April	July	Oct
Feb	May	Aug	Nov
Mar	June	Sept	Dec



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RATTLESNAKE MOVEMENTS

Female Tracking Answer Key

Color Key

Jan	April	July	Oct
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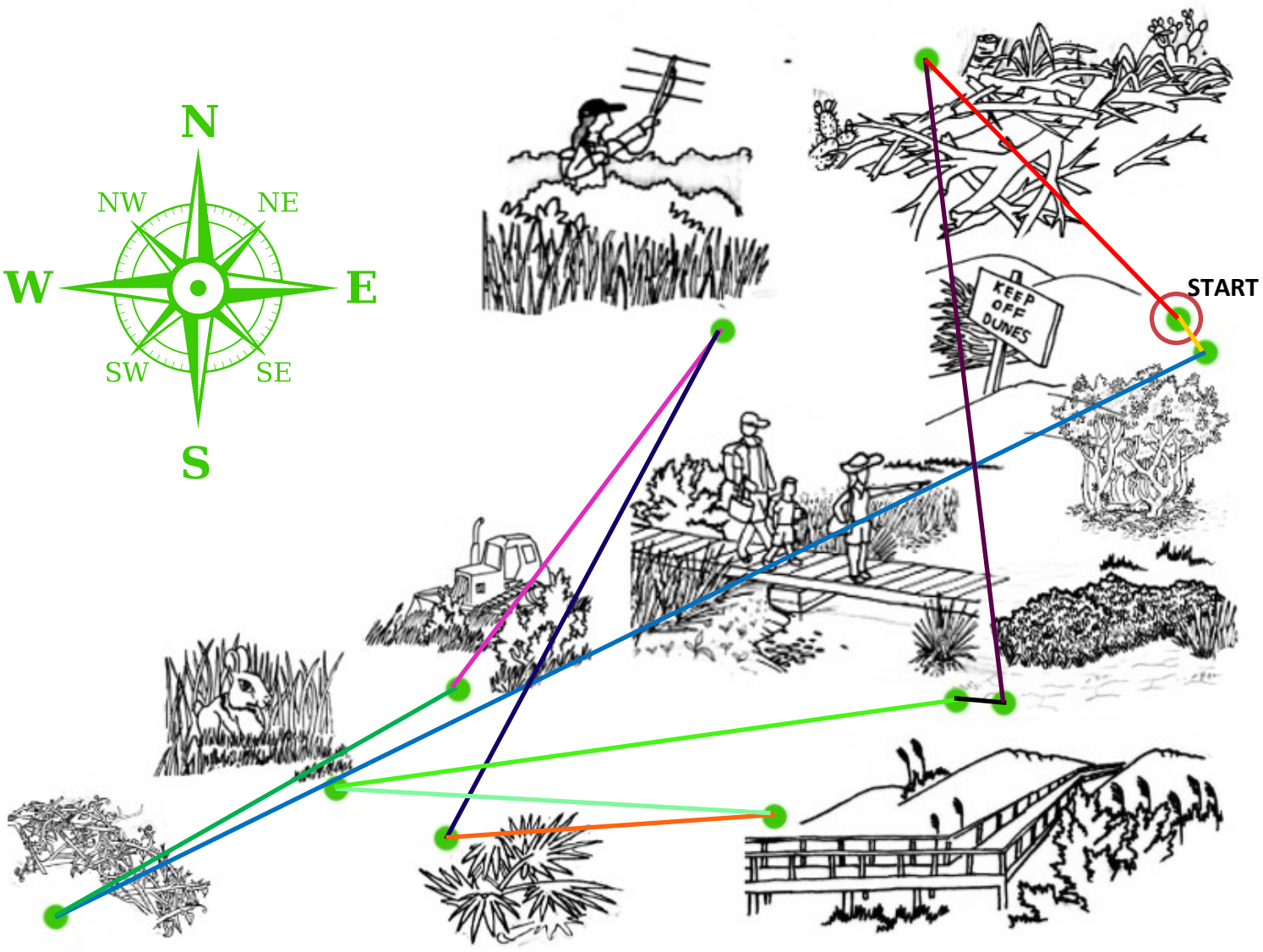

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Male Tracking Instructions



Follow these instructions to plot the movements of our male eastern diamondback over one year! Be sure to use a different color to plot each month.

Now you are ready to track a rattlesnake and plot his movements, let's get started!

Choose one color for each month of the year, that means you should have 12 colors! Mark your color of choice next to each month in the color key so that you can keep track. Listen to the following prompts and slowly move from point to point along with our rattlesnake.

JANUARY—We begin our year brumating underneath an elevated root mass surrounded by flood water. Since we don't move this month, you can just circle your starting point	JULY—This month we continued moving west 235 feet to an ephemeral wetland where we tracked the scent of a cotton rat
FEBRUARY—This month we have moved 305 feet southeast to coil in the sun on top of sticks and branches.	AUGUST—This month we are looking for our favorite mate and followed her scent 705 feet northeast to find her
MARCH—As Spring weather comes we've moved 44 feet northeast this month to forage underneath wax myrtle trees	SEPTEMBER—This month we've moved 1,260 feet southeast to be back in the coastal dune systems closer to the
APRIL—This month we had our first meal after tracking the scent of a squirrel 250 feet southwest to the transition	OCTOBER—This month we moved 1,321 feet west to bask in a grassy marshland before being scared into a burrow
MAY—This month we move 415 feet south into the coastal dune system— the weather is warm and it's a great time to be	NOVEMBER—It's starting to get cold! This month, we travelled 952 feet northeast to a cedar myrtle tree deep in the
JUNE—We moved 591 feet northwest deep into a palmetto thicket to avoid all the increased summer activity at	DECEMBER—After a heavy downpour and lightning storm this month we move 167 feet southwest to take cover

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Name:_____ Date:_____

Color Key

Jan	April	July	Oct
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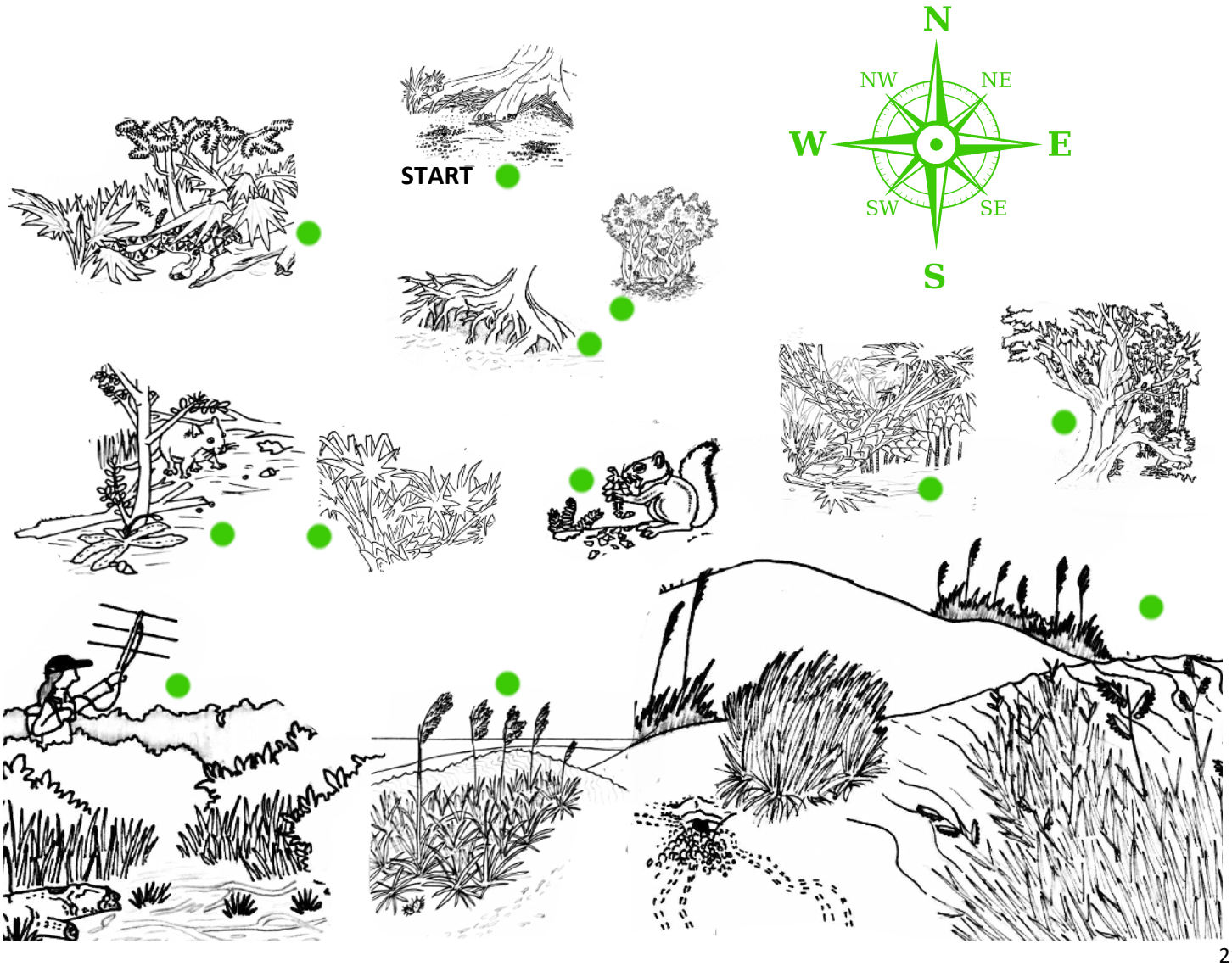

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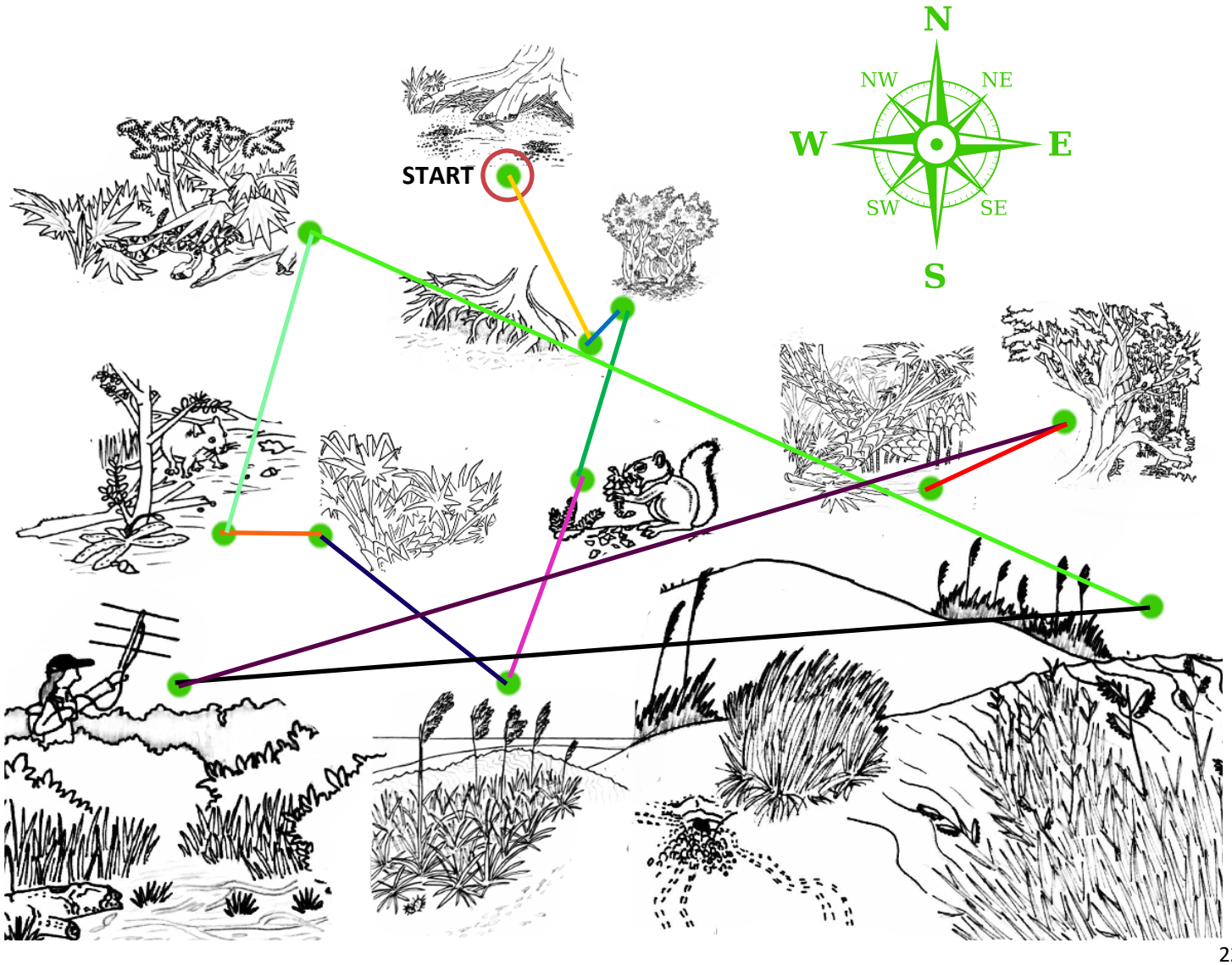

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Follow up & Group Discussion



Use these questions as a guide to start an engaging group discussion with your students about the lessons they learned in this activity!

Do rattlesnakes move more or less than you imagined they might?

What were some factors that caused the rattlesnakes to move?

Does human activity have an impact on rattlesnake movements?

Do the changing seasons have an impact on rattlesnake movements?

Are rattlesnakes strategic in choosing a location?

What are some advantages of some of the shelters our rattlesnakes chose?

Do rattlesnakes share their home range with other rattlesnakes?

Did you notice any differences between the male and female rattlesnake movements?

Who moved more over the course of one year—Petunia, or Rocky?

Are prey items the only scents that rattlesnakes track and actively follow?

If a rattlesnake is forced to move by outside factors before catching a prey item, what may happen?

If a rattlesnake cannot find a secure shelter for winter, what may happen?