

# FLORIDA SCRUB COLORING BOOK

Written and Illustrated by  
Mark Deyrup and Kevina Vulinec



## WHAT IS FLORIDA SCRUB?

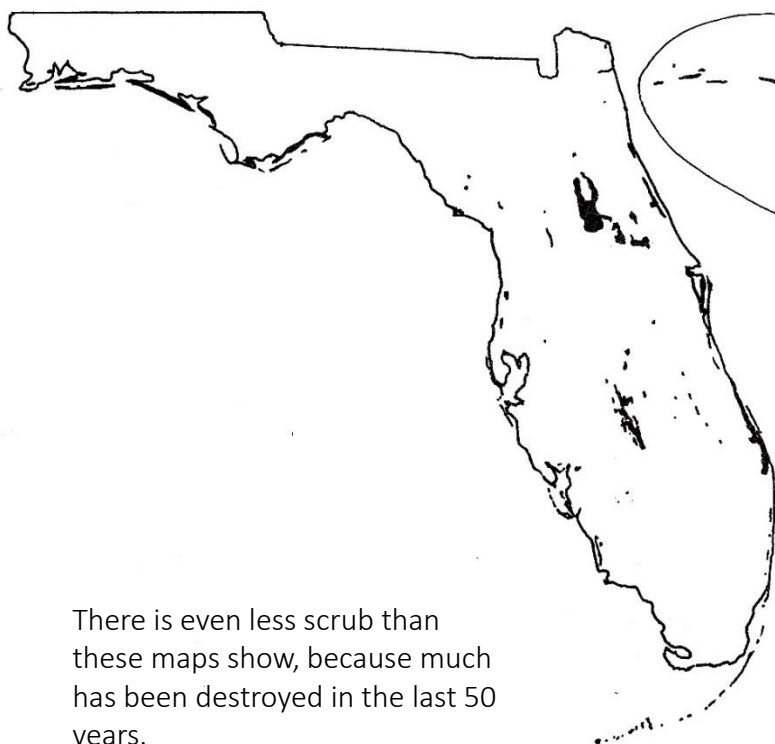
It is not the name of the big government cleanup program for Miami.

It is not the name of the new detergent that contains beach sand.

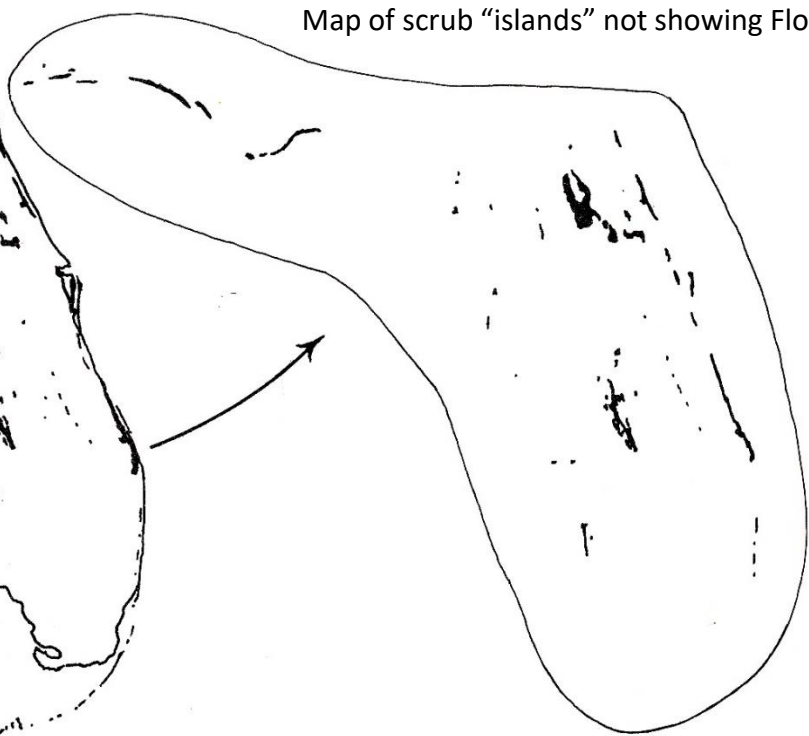
It is not the name of the Hungarian rock star, Burcs Adirolf, spelled backward.

Florida scrub is a habitat: a place where animals and plants live. The word *scrub* means that most trees are short and scrubby. It is called **Florida scrub** because it is a special kind of scrub, found in Florida.

Map of Florida, showing "islands" of Florida scrub



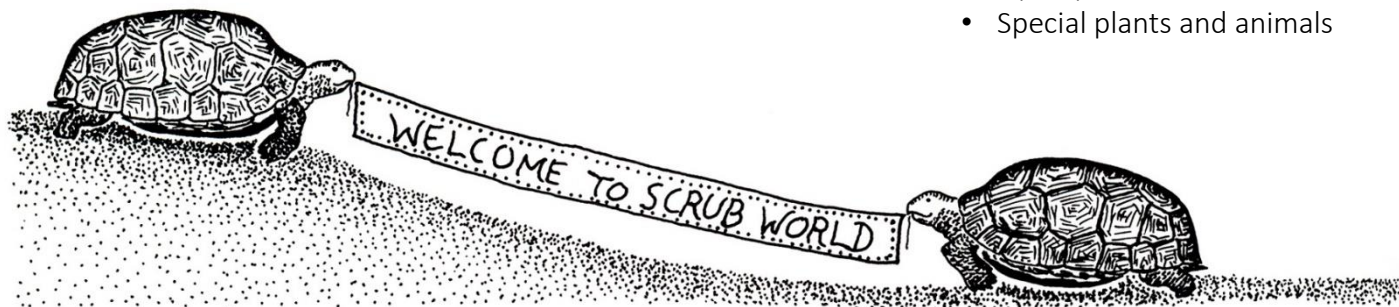
Map of scrub "islands" not showing Florida



There is even less scrub than these maps show, because much has been destroyed in the last 50 years.

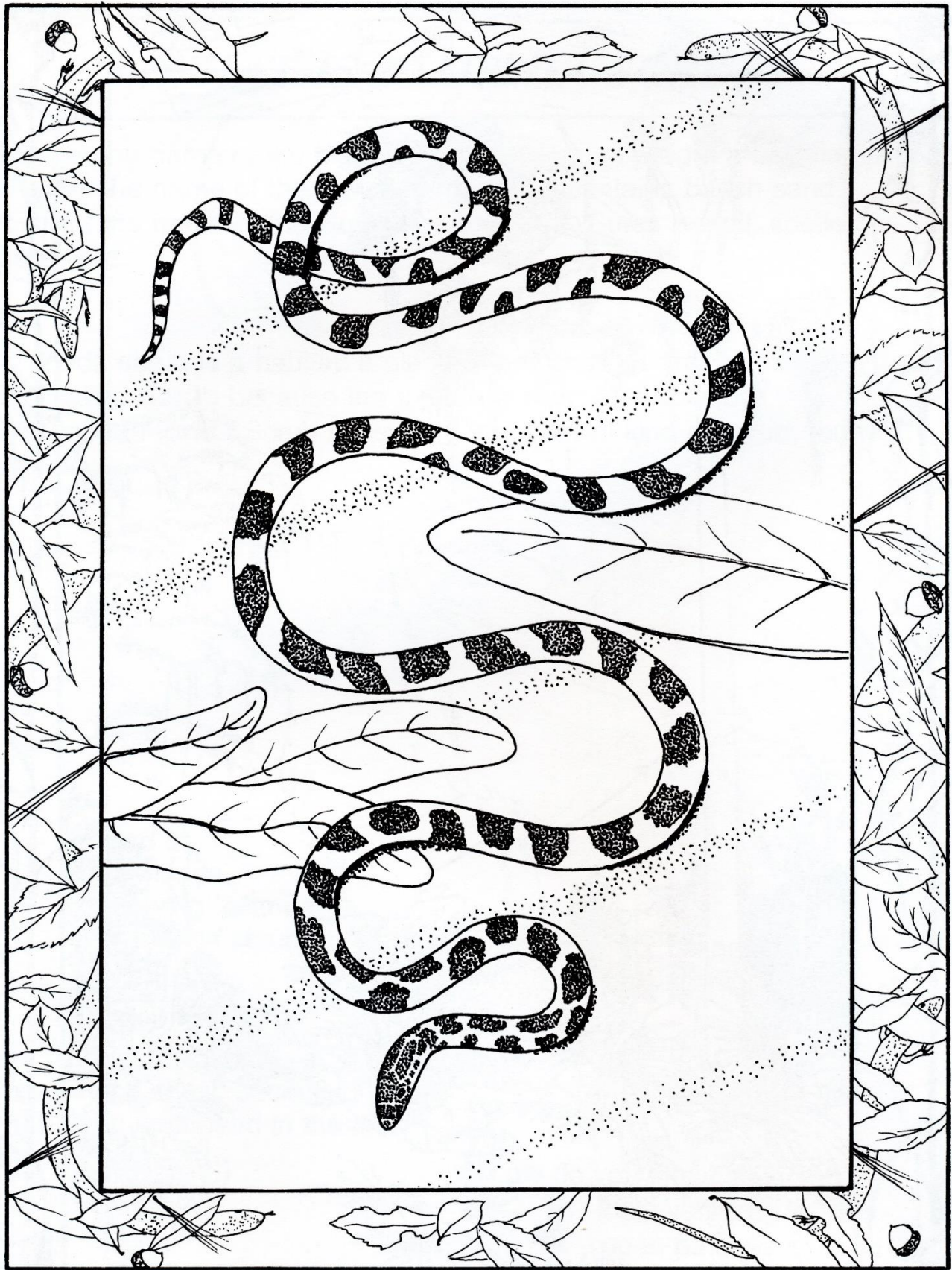
How do you know it's scrub?

- Low evergreen shrubs
- Open patches of sand
- Special plants and animals



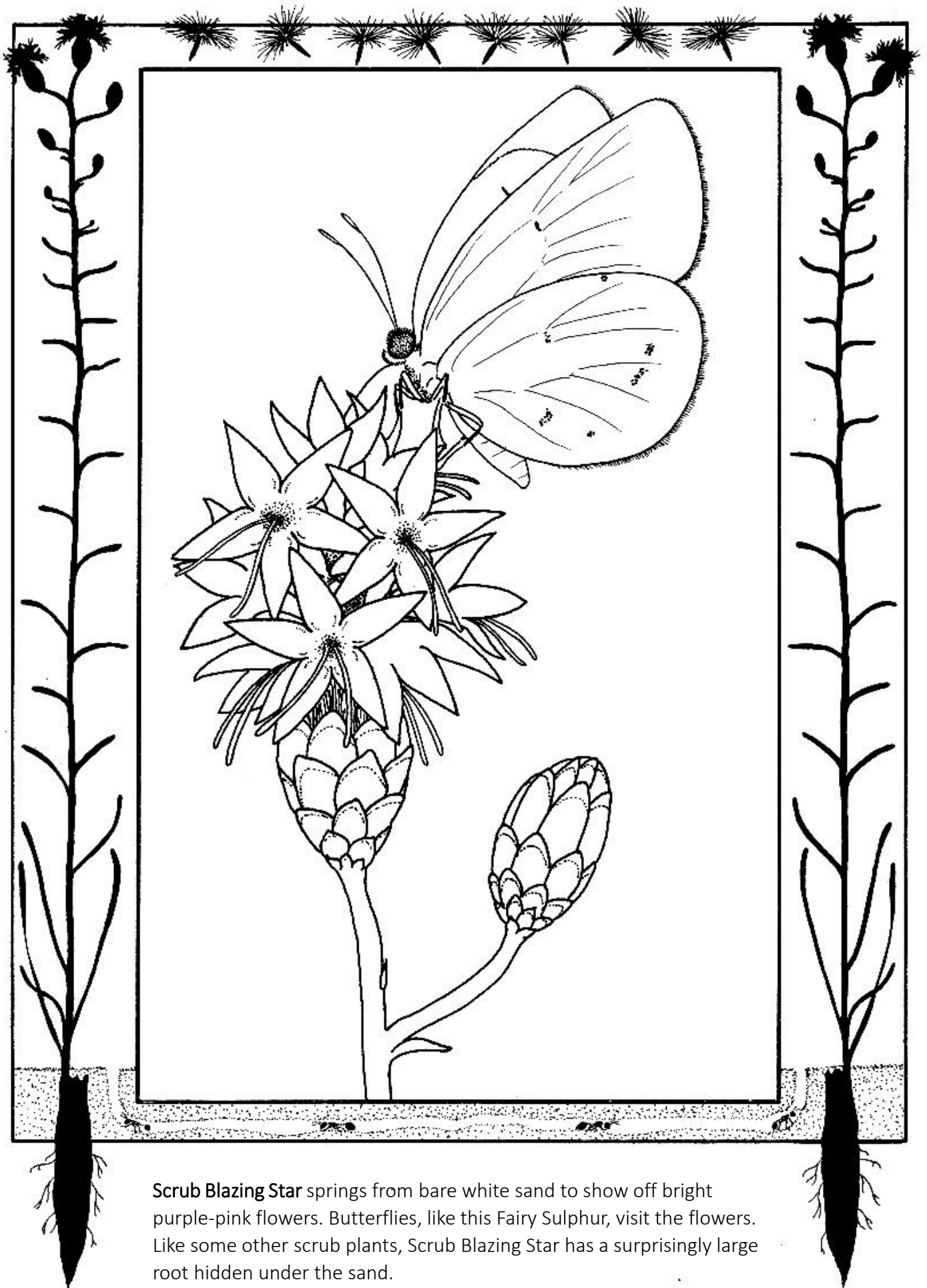






**The Short-Tailed Snake** is a small, extra-slender snake with an attractive pattern of black spots on a light body. If you were lucky enough to see one slither through the leaves, you might identify it by markings and shape, but you might have trouble deciding where the tail begins and whether it is short or not. It is a creature of sandy places like Florida scrub and sandhills, and somehow stays well hidden even in these open habitats. It eats lizards and small snakes.





**Scrub Blazing Star** springs from bare white sand to show off bright purple-pink flowers. Butterflies, like this Fairy Sulphur, visit the flowers. Like some other scrub plants, Scrub Blazing Star has a surprisingly large root hidden under the sand.

## A Mouse-Size World

It might be easier to understand the scrub if you were the size of a mouse with the eyes of a mouse. Most scrub creatures are small, able to hide under a few dead leaves or take shelter beneath a tiny bush. Many of the wildflowers are only a few inches high. Even the oak trees are small. These tough little trees grow in a place where most other trees would die, and can even grow back from roots after a fire. An oak seventy years old may be only four feet tall, but like wise old people, these small trees may have important things to tell us about growing up and surviving in a hard world. We just need to be nice to them and ask the right questions.



Can you find the Old Man of the Scrub?

After dark the **Florida Mouse** comes out of its burrow in the sand. Its big ears are alert for the dangerous sounds made by foxes or owls, and for the appetizing sounds of beetles and crickets walking over dead leaves. The Florida Mouse also eats mushrooms and seeds, especially acorns.



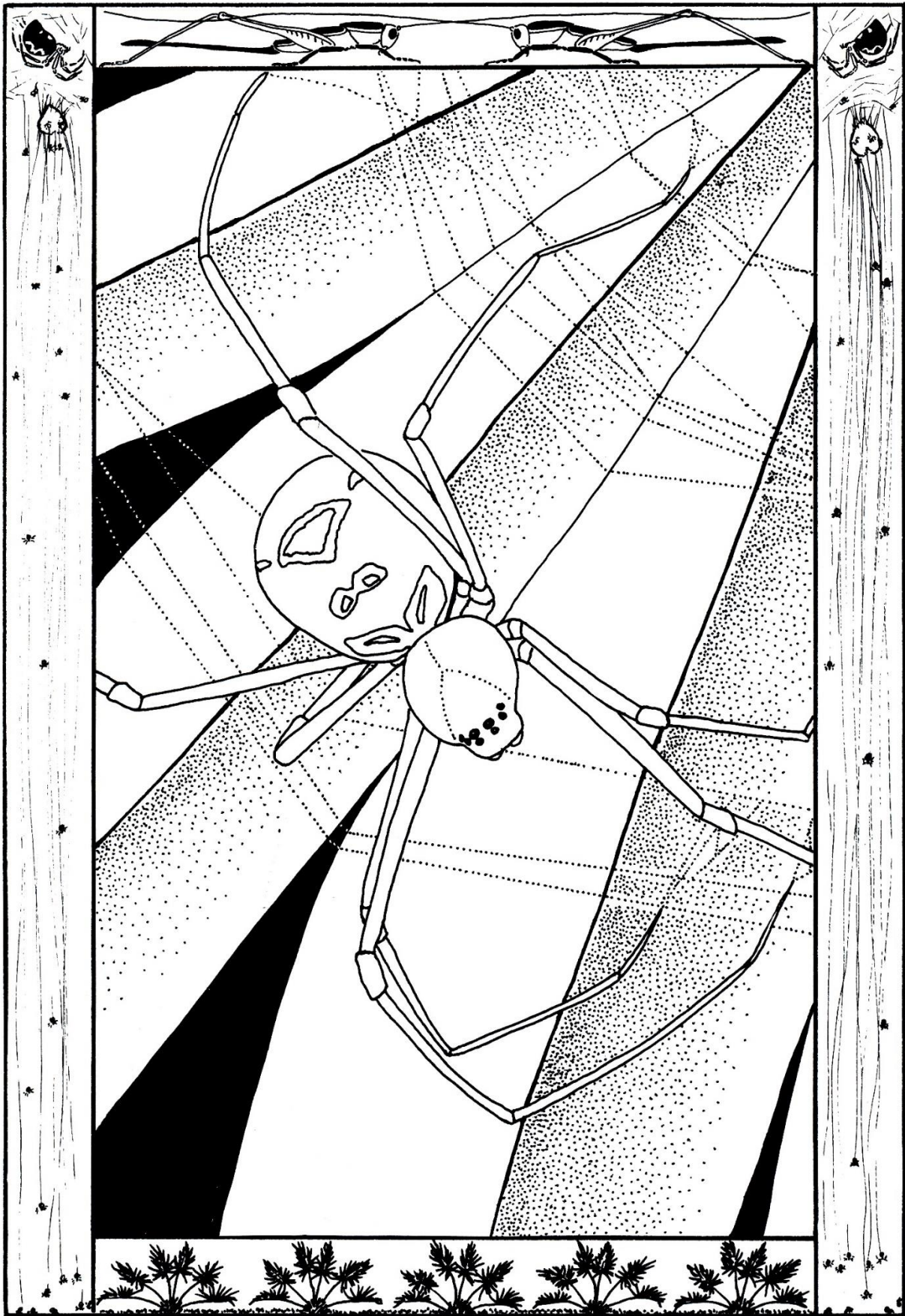






A single **Towhee**, vigorously scratching among the dry leaves, seems to make as much noise as a bear. The scratching uncovers insects and seeds that the Towhee snaps up in his quick black beak. From deep in the palmettos the Towhee repeats his own name in a questioning call: tweee? From the top of a scrub oak he sings out for a life in the wild: think freee! The Towhee is often the commonest bird in the scrub.





**Red Widow Spiders** like to live in the folded leaves of **Scrub Palmettos**, where they can hide to escape hungry Scrub-Jays. This spider is rare and shy, and has never bitten a human, but its bite is known to be venomous. Red Widows mostly eat beetles found only in the scrub.

## A Bit of the Old West

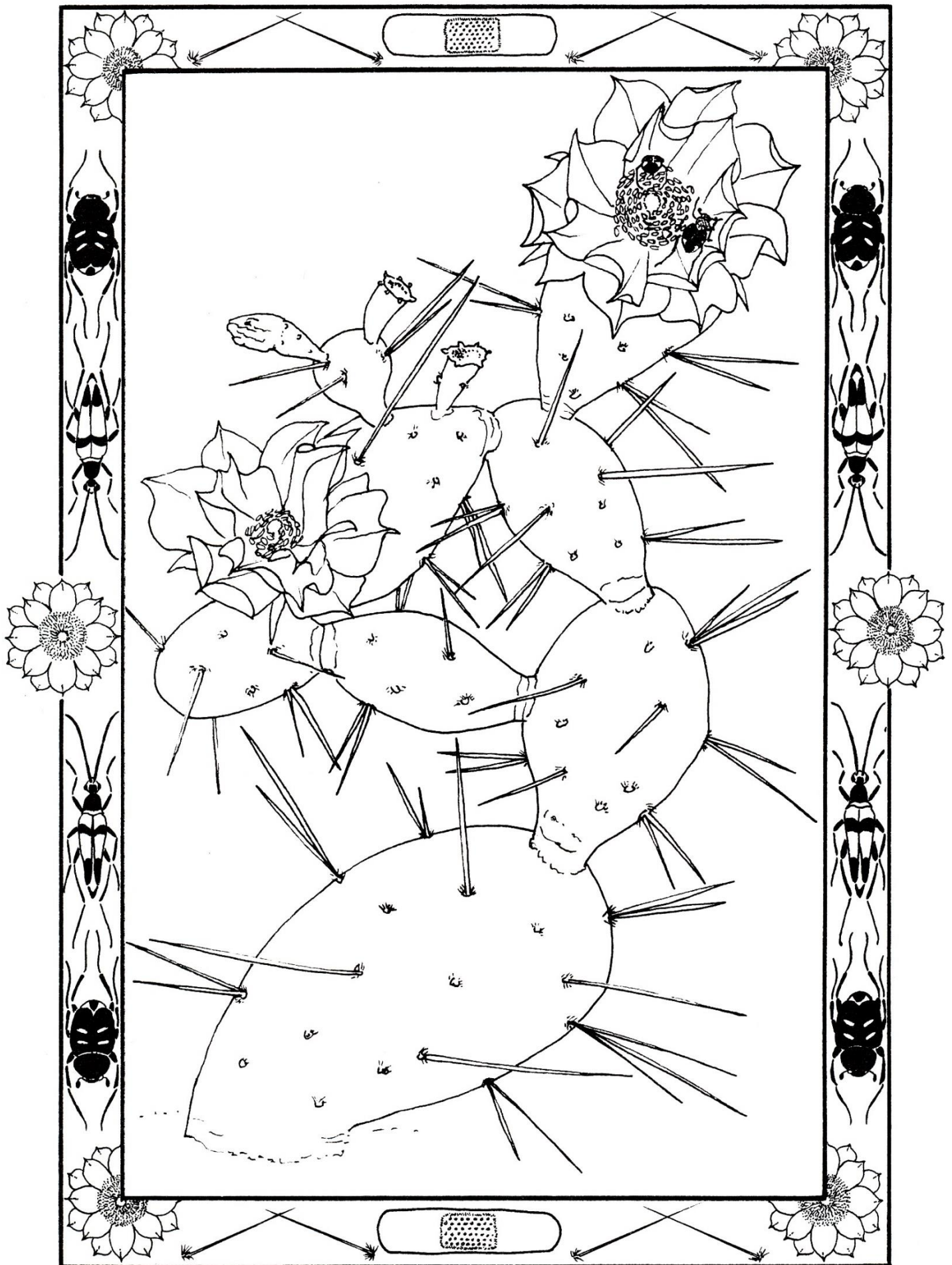
A very long time ago, when the South was a much drier place than it is today, ancestors of some of the creatures of Florida scrub made their way from the west to Florida. When the climate became wetter, some desert animals could still survive on the dry sandy ridges of Florida. Having lived so long in Florida, these animals are now quite different from their western relatives.



**Prickly Pear Cactus** is the most feared inhabitant of the Florida scrub. The long spines, bristling at shin height, are covered with tiny barbs like the quills of a porcupine, and there are a bunch of small spines at the base of each big spine. Prickly Pear is eaten by Gopher Tortoises, and a whole set of fascinating insects feed on the flowers and cactus pads. This handsome native cactus reminds us that the sands of Florida can be as dry as a desert.

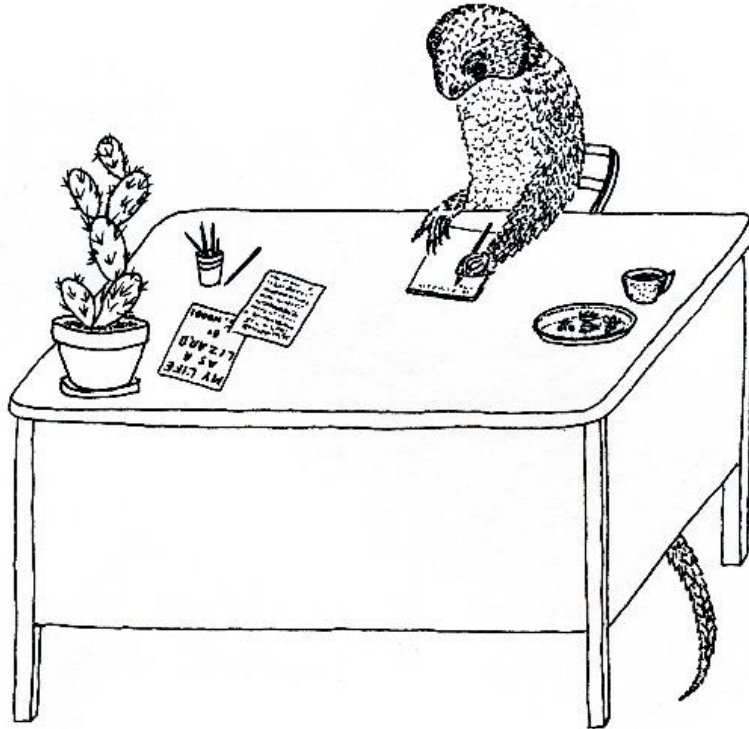






## Nobody Knows

“Nobody knows” would be the answer to most questions about life in the Florida scrub. Nobody knows how long most scrub snakes and lizards live. Nobody knows what most of the insects and spiders eat, or why a species may be rare for many years and then suddenly common for one year. Nobody knows where most of the scrub plants get enough nutrients to grow as well as they do. Nobody even knows how many different kinds of plants and animals live in the scrub, and new species are still being discovered. Some biologists are studying life in the scrub, but there are thousands of interesting things to study, and these biologists can only work on a few. If you think of the scrub as a library filled with the stories of animals and plants, biologists have only just gone in and started to read the first few books nearest the door.



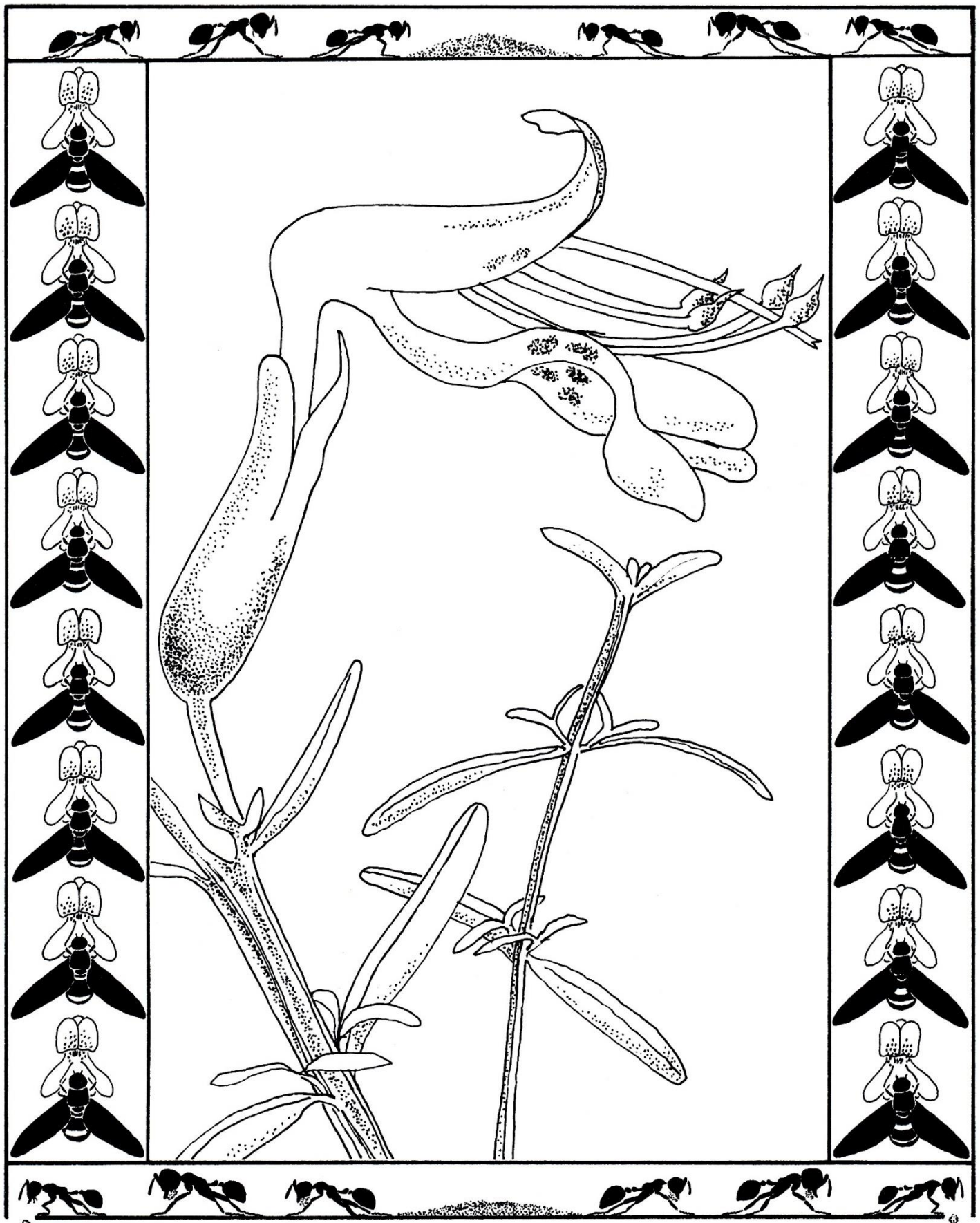
When palmettos push out their big stalks of little white flowers, they attract many insects, including the **Scrub Palmetto Scarab**. It probably smells the flowers with the big plates on the ends of its antennae. Until recently, nothing more was known about the life history of this elegant beetle. It was like a mysterious person who would sometimes appear at the grocery store, always buying the same thing, and then disappearing. We now know that it spends its time as a larvae in dead wood, but there is still a lot more to learn.







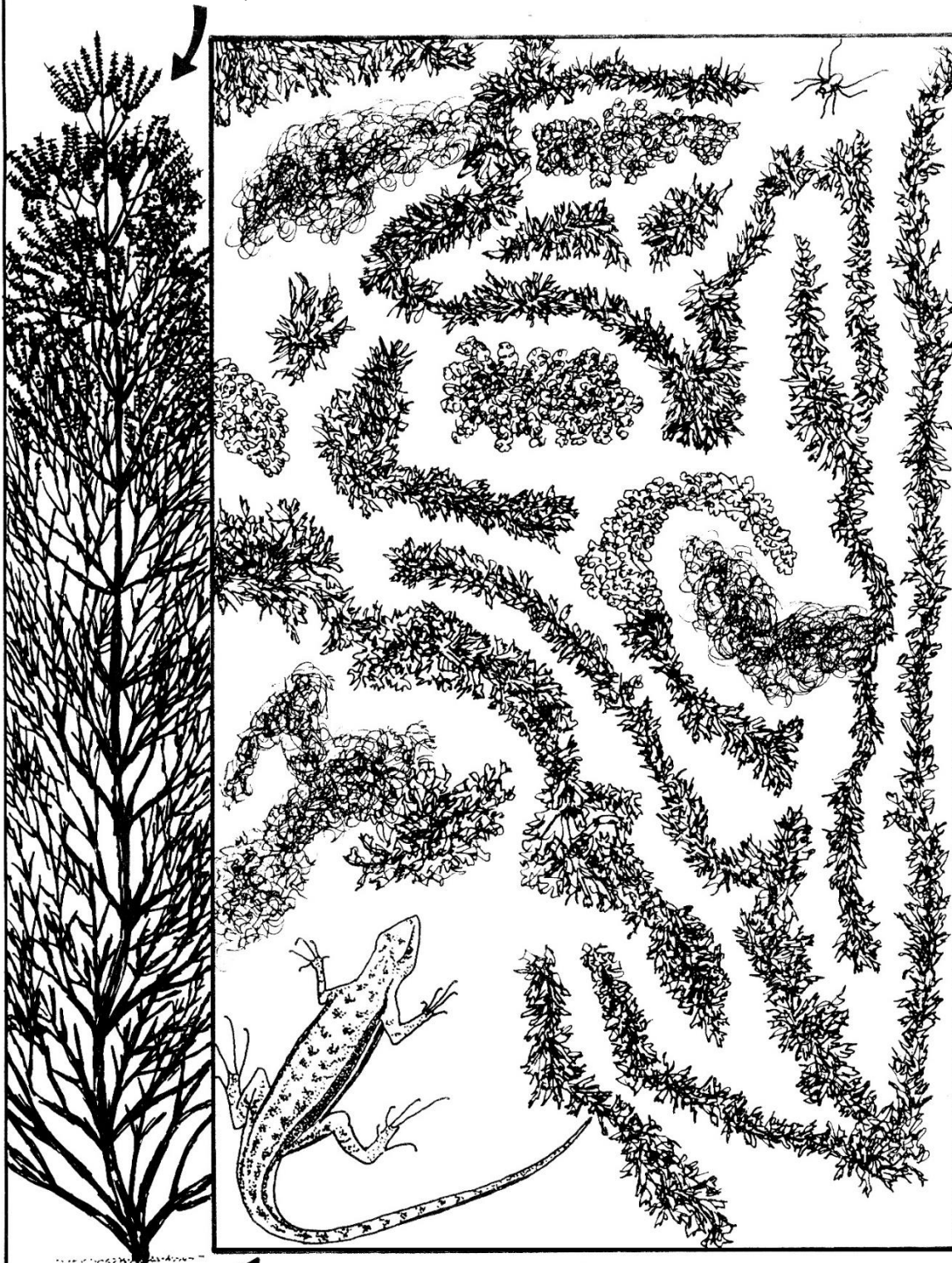




Lake Placid Scrub Mint is a beautiful plant with a strong minty fragrance. It lives in only a few places around the town of Lake Placid in Highlands County. Its flowers bloom in the fall, and are eagerly visited by large dark-winged bee flies.

Scrub Rosemary usually puts out one set of branches each year. About how old is this scrub rosemary?

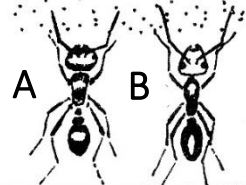
Where will the losing ant be when the winning ant reaches the fly?



Guide this hungry scrub lizard to the spider at the top of the maze.

### Racing Ants

Ant A runs twice as fast through sand as Ant B.  
Ant B runs twice as fast through the pine needles as Ant A. Which ant will reach the dead fly first?

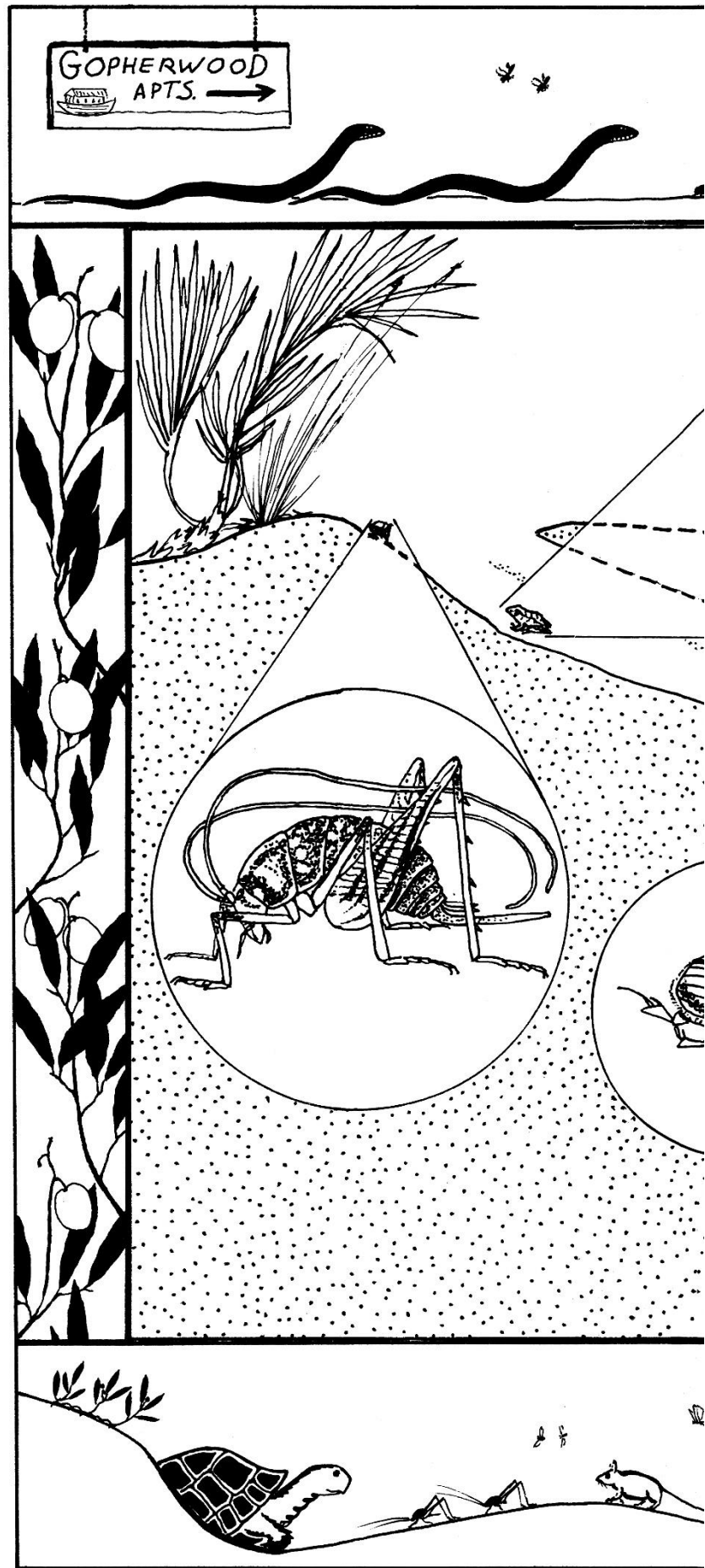


Answer on next page

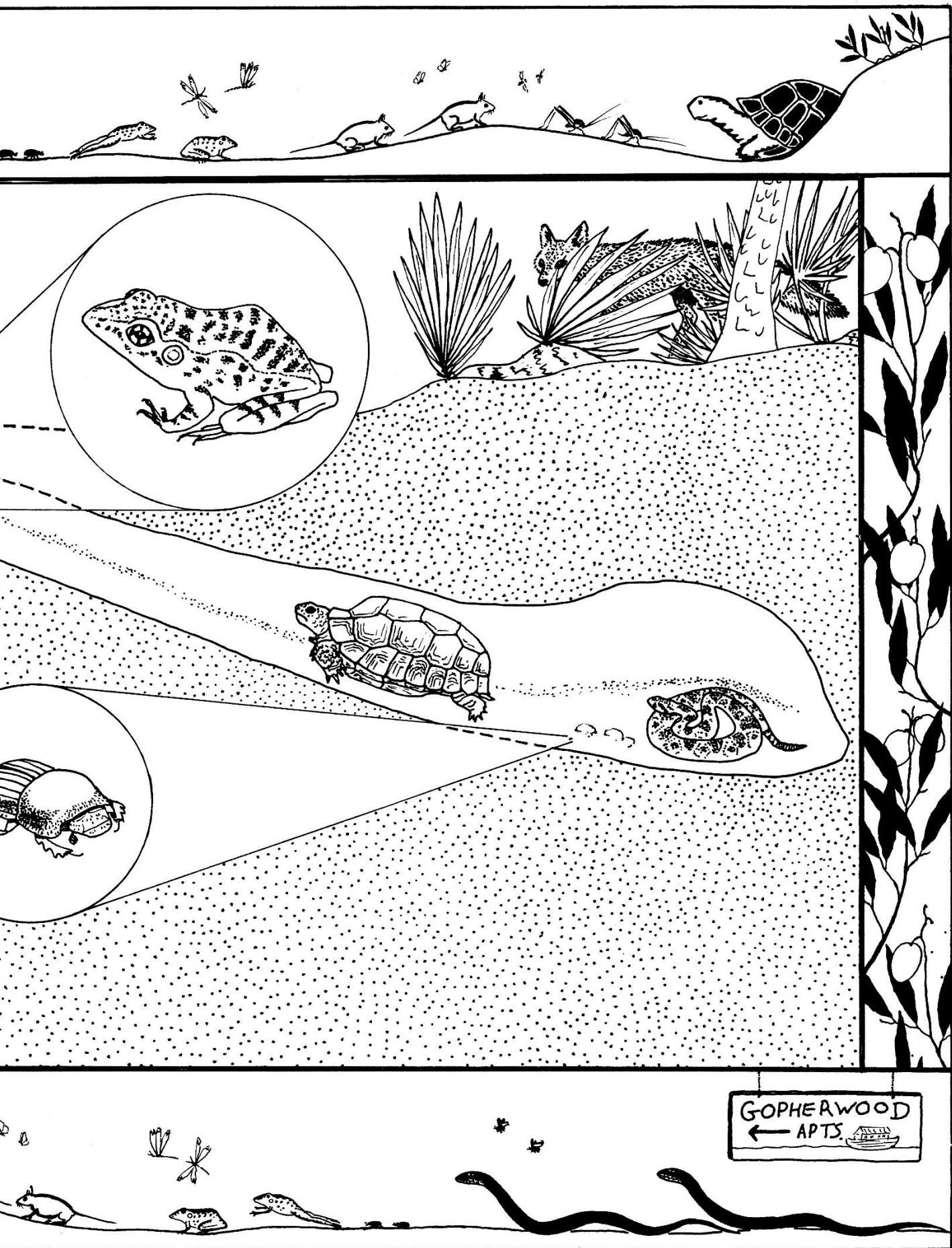
## Living Together Underground

Life in Florida is much more pleasant if your home is kept cool; that is why people began flooding into the state only after air conditioning was invented. The **Gopher Tortoise** discovered this simple fact at least a million years earlier. With powerful front legs the gopher tortoise digs a long, deep burrow, ending in a room that is never too hot or too cold, and always slightly moist. This wonderful air conditioned home has room for many other species, such as snakes, cave crickets, and scrub mice. Some species, such as Gopher Frogs, Gopher Scarab Beetles, and Gopher Moths, live nowhere else. The Gopher Tortoise supports a little world of interesting animals.

Gopher Tortoises are not demanding. All they want is an open sandy area for a burrow, low plants to eat, and a chance to meet other tortoises. They live long, slow lives, safe in their hard shells and deep burrows. Nowadays they are no longer safe. They are killed by people and by dogs, they are crushed by cars on the roads, their habitat is destroyed by bulldozers. This is not a good time for Gopher Tortoises, but there are people who care about them, and who are protecting them by preserving habitat where gopher tortoises live.

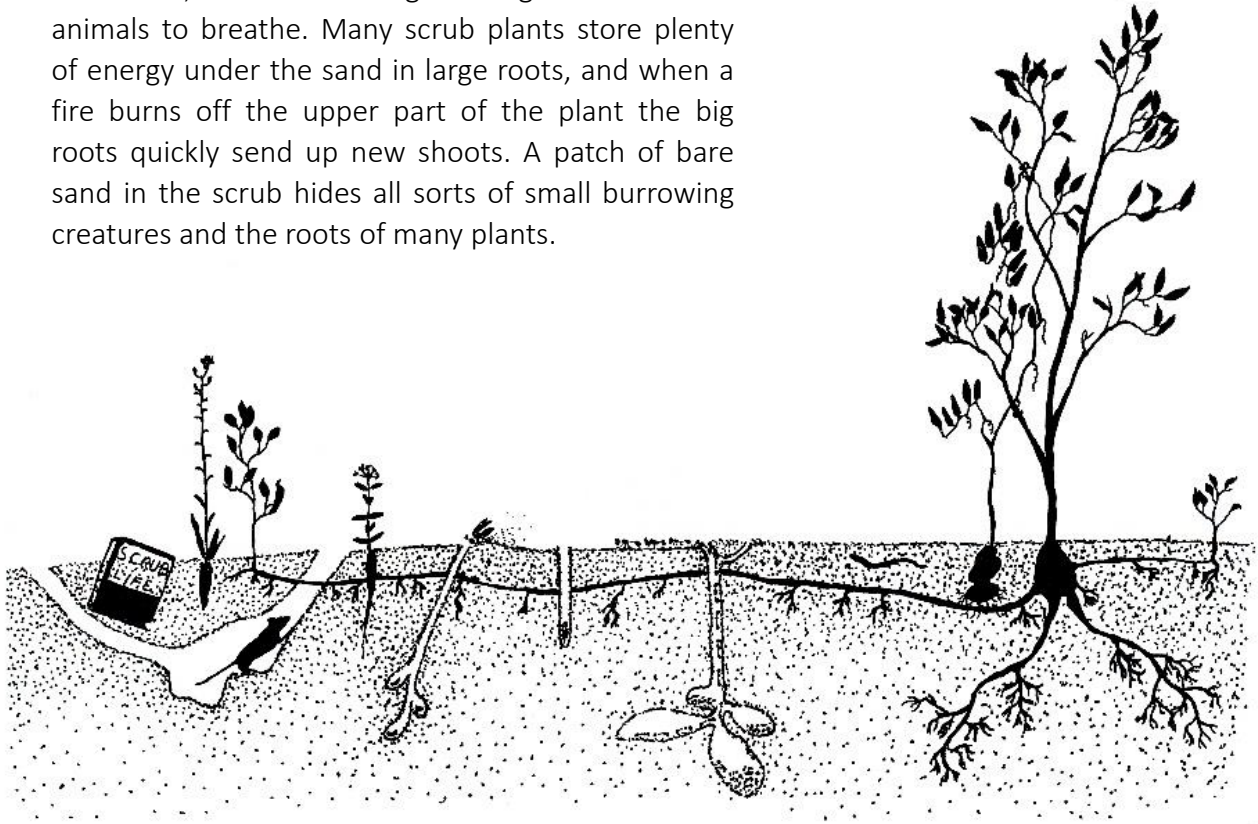






## Understand the Wonders Under Sand

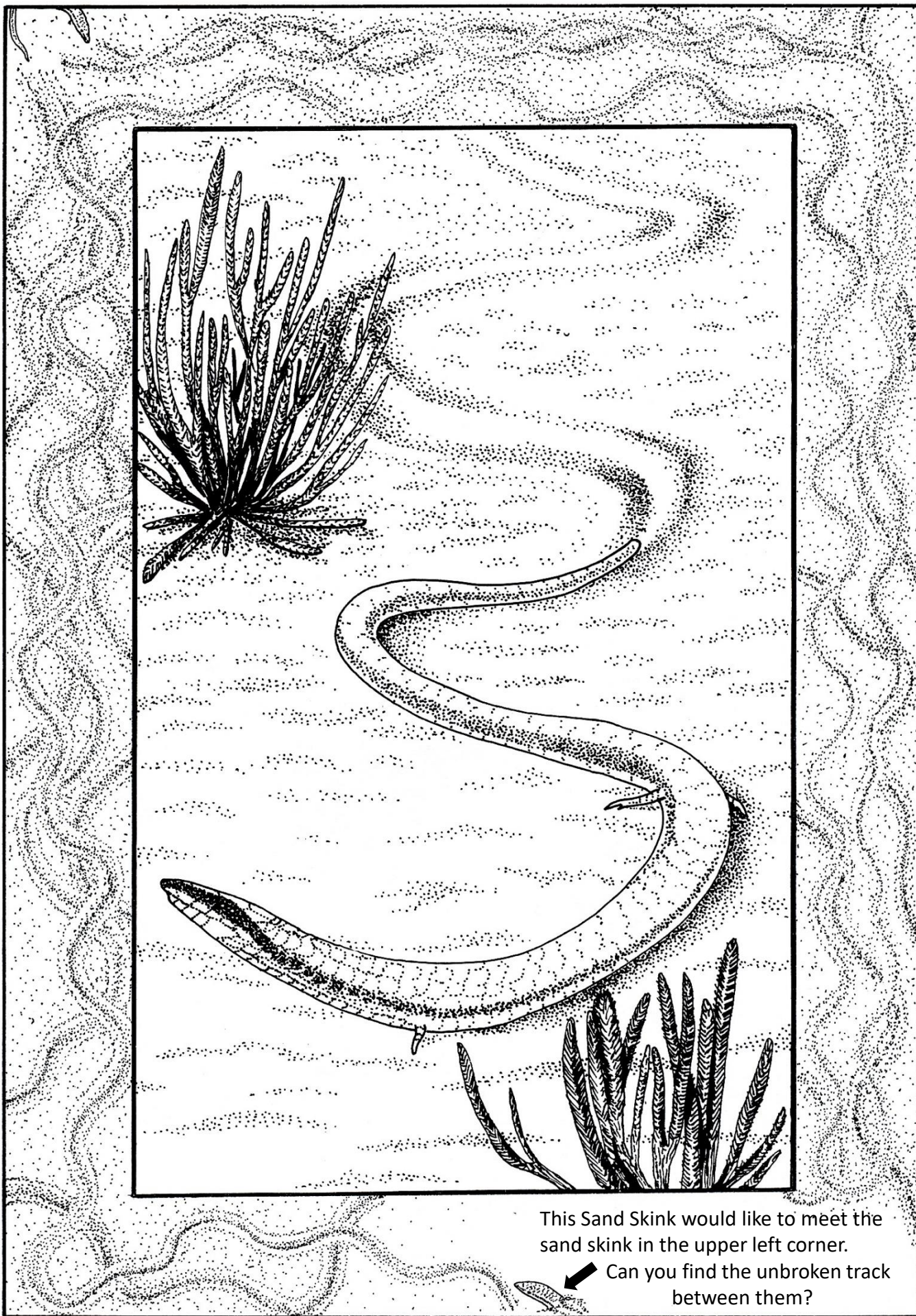
In the scrub a lot of the action goes on under the sand. Many scrub animals spend almost their whole lives under the sand where they are hidden from the eyes of enemies. Under the sand it is cooler in summer and warmer in winter. Sand is easy to burrow in, and lets through enough air for small animals to breathe. Many scrub plants store plenty of energy under the sand in large roots, and when a fire burns off the upper part of the plant the big roots quickly send up new shoots. A patch of bare sand in the scrub hides all sorts of small burrowing creatures and the roots of many plants.



Smoothly curving tracks in the open sand are all you are likely to see of the **Sand Skink**. This peculiar little lizard swims through the sand without much help from its tiny legs. The Sand Skink feeds on insects that live in the sand. Nobody knows much about the life of the sand skink because it is so hard to find and to observe, and because it lives only in a few scrub areas in central Florida.







This Sand Skink would like to meet the sand skink in the upper left corner.

Can you find the unbroken track between them?



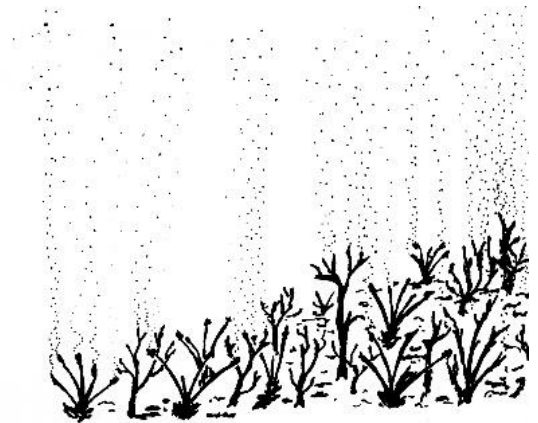
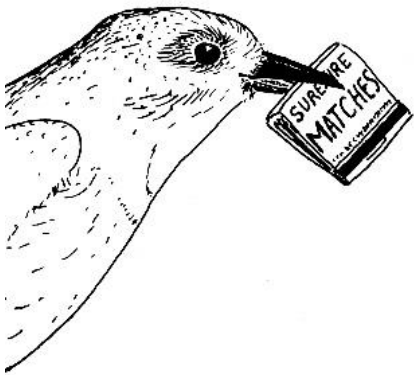


Flying fast through the scrub, the female **Zebra Swallowtail** hunts for **Scrub Pawpaw**. Her caterpillars eat tender young pawpaw leaves. The caterpillars have nasty-smelling horns they can stick out if they are attacked.

In spring Scrub Pawpaw has beautiful big white flowers. The strange smell of the flowers attracts beetles to carry pollen from plant to plant. Many animals like to eat the fruit of the Scrub Pawpaw.

## Fire in the Scrub

Fire has always been part of life in the scrub, and scrub plants and animals have ways of surviving fires. Many plants have big underground roots so they can send up new shoots after a fire. Other plants have seeds that sprout after being heated by fire. Animals flee or burrow underground during a fire, and move right back afterward. Many scrub species have come to depend on fire, and die out if the scrub never burns. **Florida Scrub-Jays**, for example, usually do best in scrubs that burn every 10-20 years. Where there are fewer fires than there used to be, biologists may carefully set fires to improve the habitat. It is not easy to decide when to do this: some scrubs grow faster than others, and some scrub species need more frequent fires than others. Nature is complicated – helping nature challenges our minds.



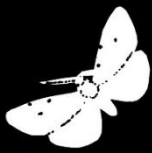
Bolder and smarter than most birds, Florida Scrub-Jays quickly learn that people can be trained to bring edible treats, such as raw peanuts. No other wild bird in the U.S. is more easily persuaded to fly down to your hand. The good will of humans, however, is not enough to ensure the survival of Scrub-Jays. These birds also need scrub habitat. They need thickets of scrub oak to hide their nests. They need patches of bare sand in which they bury their food supply. Each bird buries thousands of scrub oak acorns and later digs them up to eat in winter and spring. Scrub-Jays also eat many scrub insects, and they know how to hunt for each kind of insect in the scrub. Scrub-Jays need open scrub habitat where they can easily see enemies such as hawks and snakes.



Scrub-Jays prefer to live in families, and each family owns a piece of scrub, usually 20 or more acres. Each Scrub-Jay knows its family land and how to make a living on it; the land is passed on from one generation to the next. To be a real friend of Florida Scrub-Jays, you must be a friend of the Florida scrub.

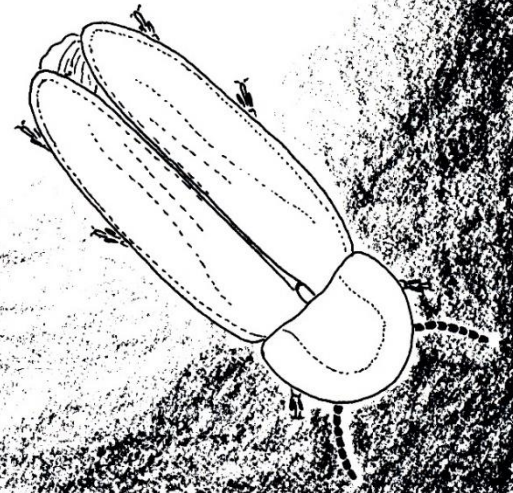
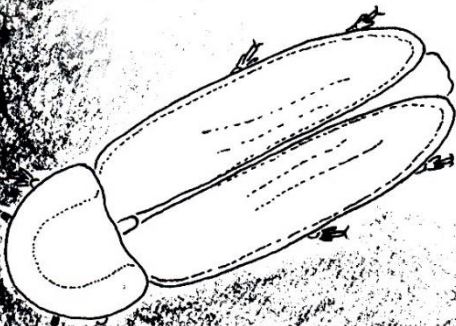






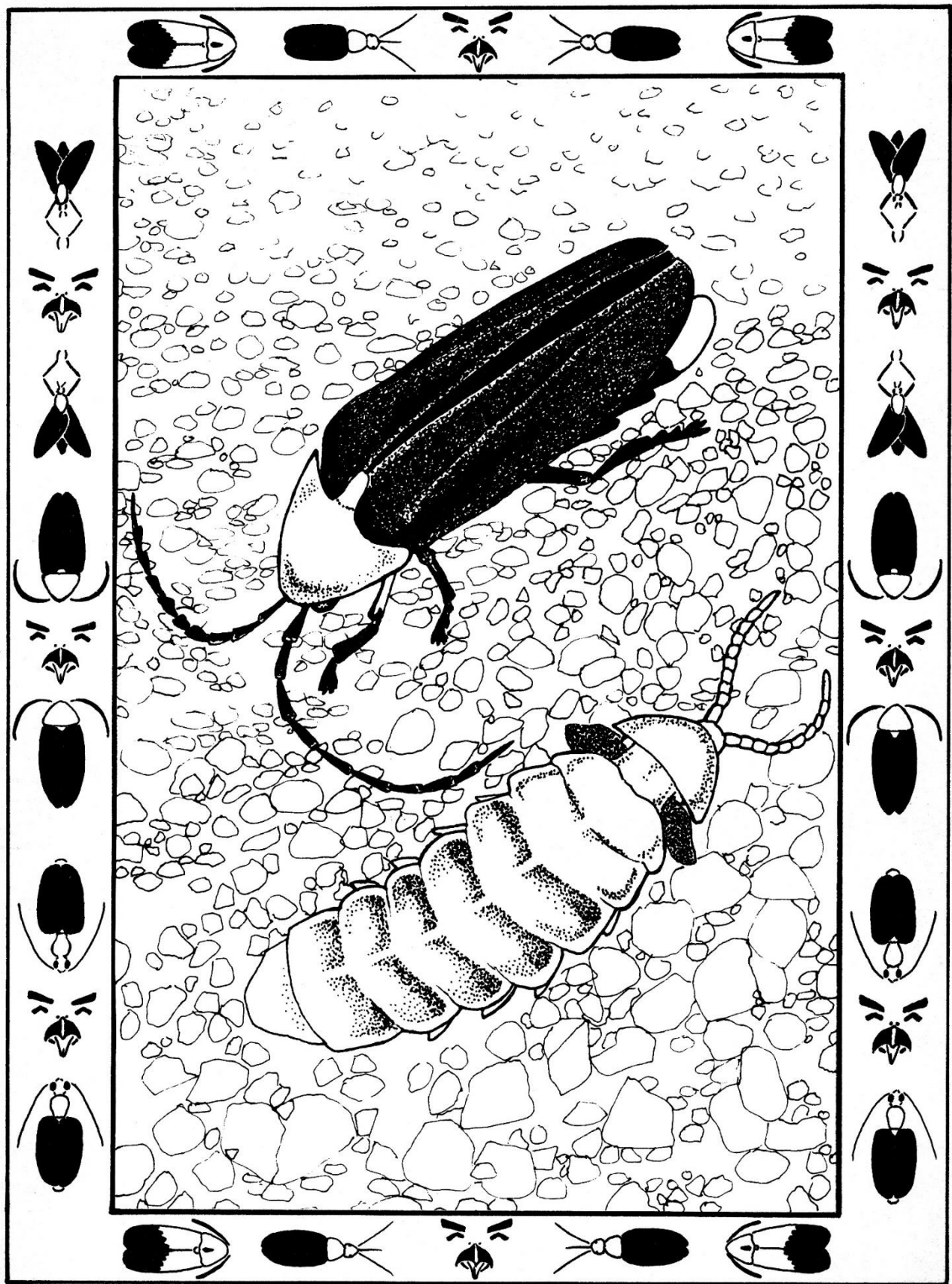
## Night Life in the Scrub

If you visit the scrub on a summer day you will feel heat and thirst and see a blinding glare off the sand, but you will not see many animals. This is because many of the animals play it smart, and do not come out until evening when the temperature is lower, when the humidity is higher, and when they are less exposed to enemies. From thickets come deer and bobcats, from burrows in the sand come foxes and skunks and mice, to say nothing of a wonderful selection of spiders, ants, beetles, roaches, and scorpions. Crickets and katydids tune up at night, and there are squeaking and scufflings in the palmettos.



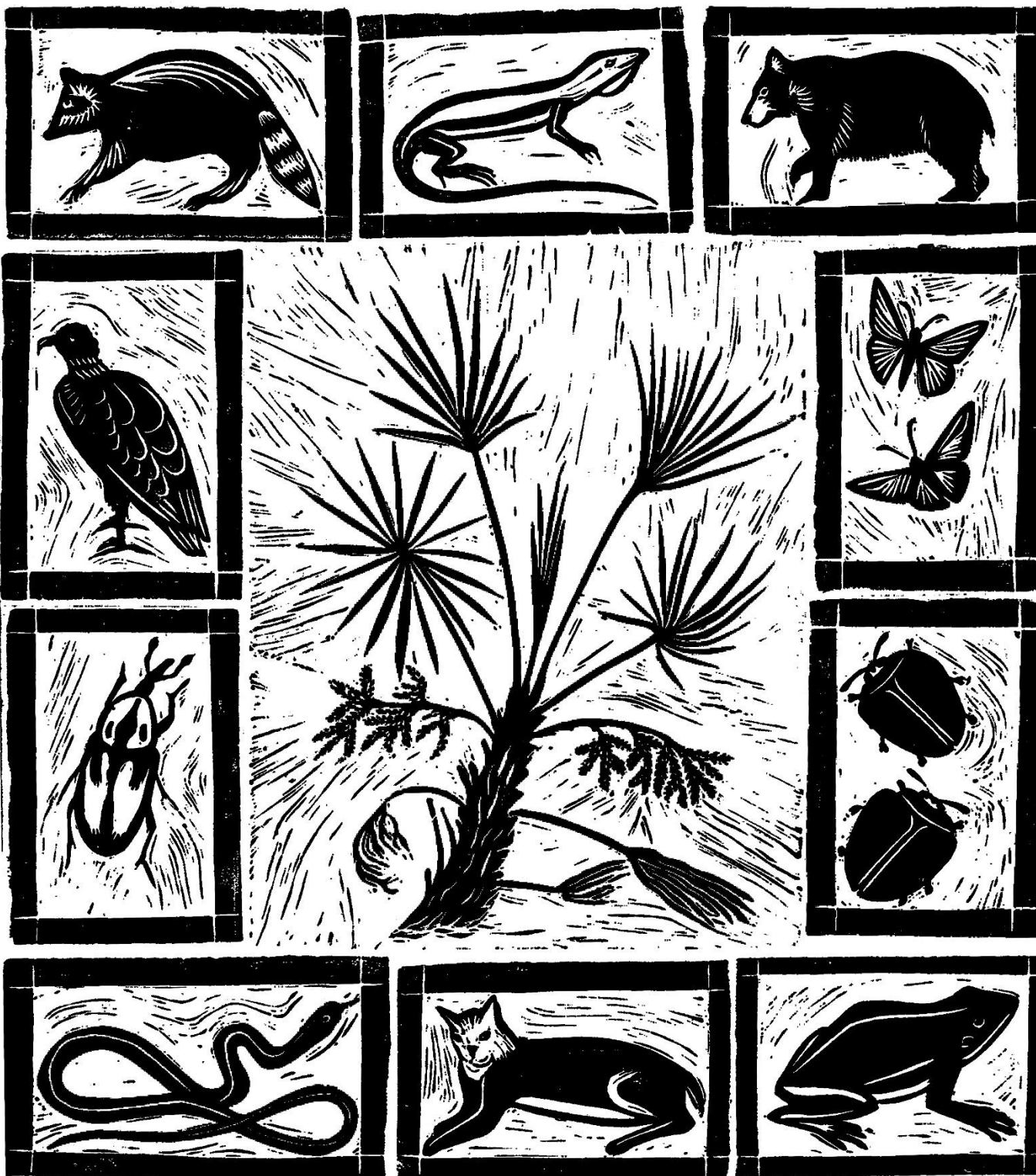
With a quick pounce, this **Spotted Skunk** will grab a big beetle and crunch it up with sharp little teeth. The spotted skunk is a lively creature that even climbs trees. It eats almost anything it can catch. It does not mind living around people, and may find a good home beneath a shed or trailer. Skunks do not seem to object to the smell of people, but most people dislike the smell of a neighborly skunk!





Most fireflies fly at night, but the male **Scrub Firefly** is active during the day. The female has tiny wings and stays buried in the sand. The orange and black pattern of the male scrub firefly is a warning signal to birds, telling them this beetle is not good to eat. Many other insects have this same warning pattern.

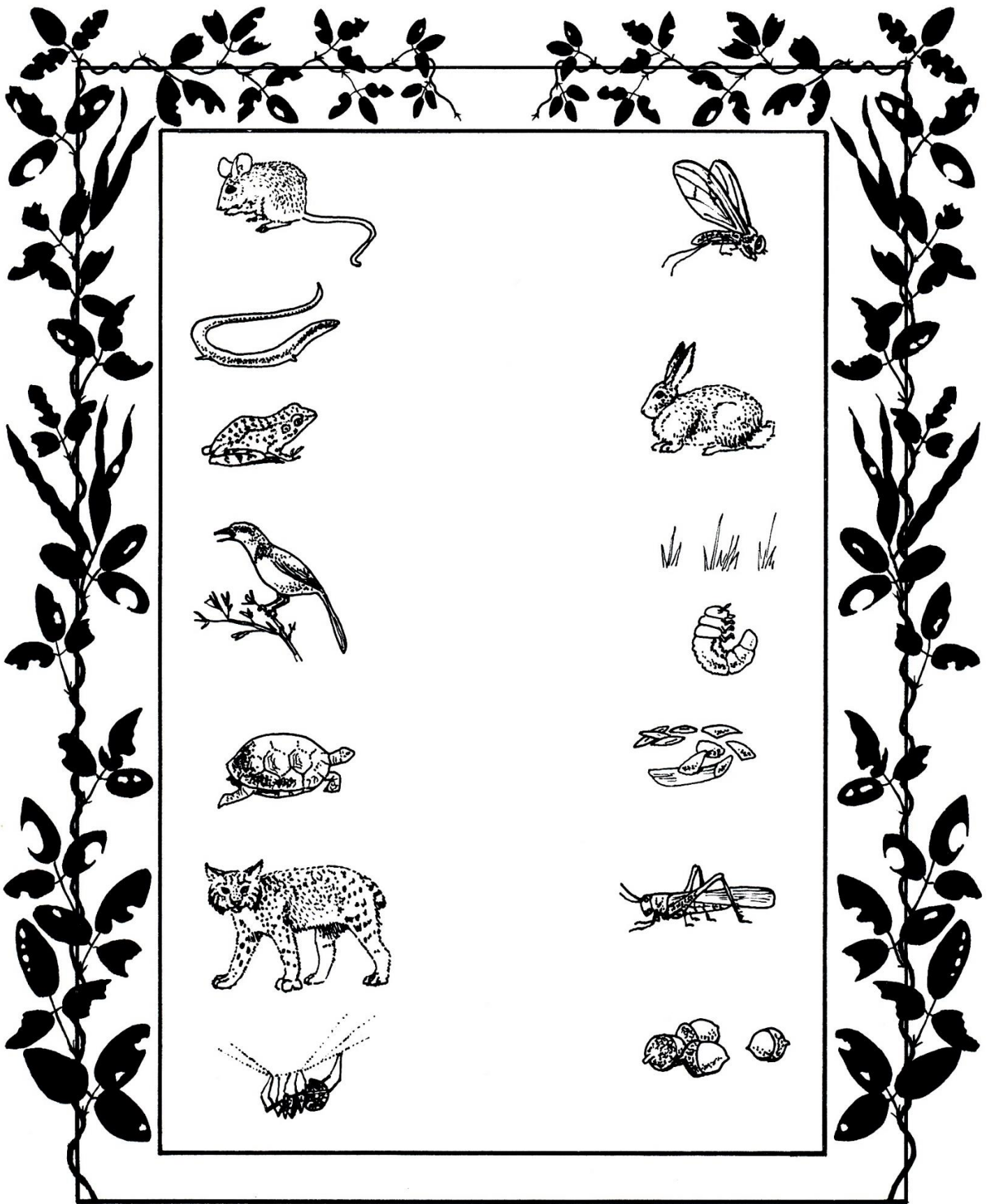




Racing Ants Answer: ant A wins

Color each area based on the type of organism:

Plants = Green, Mammals = Orange, Birds = Blue, Reptiles = Red, Insects = Purple, and Amphibians = Yellow



Draw arrows from each animal to its food. An animal may eat more than one thing and more than one animal may eat the same thing. When you are finished, this page may look complicated, even messy. Nature is like that.

## Estimating the Age of a Saw Palmetto

Scientists discovered that the age of a saw palmetto could be estimated by measuring the growth rate of the palmetto stem. After they measured hundreds of palmettos over multiple years, they found that the average stem growth for palmettos was 1.2 cm per year.

**Historic Stems:** By measuring the length of a saw palmetto stem and dividing the length by 1.2, the above-ground age of any saw palmetto can be estimated. Scientists have measured saw palmettos stems that were 800 years old.

**Pre-historic Clones:** Saw palmettos reproduce with seeds from fruits, but are also *clonal* reproducers, meaning they branch off and grow underground before popping up again. Most of the saw palmettos you see in the scrub don't come from seedlings, but grow as clones from older saw palmettos, which may have grown as clones from even older saw palmettos. Using DNA sampling to sort out which palmettos in an area were actually related clones, scientists found that most saw palmetto clonal patches were actually thousands of years old. The oldest clonal patch had over 150 saw palmettos that were all clones of a palmetto that started growing 8,000 years ago.

### Palmetto Measuring Activity

#### Part I: Measure a Saw Palmetto (outdoors)

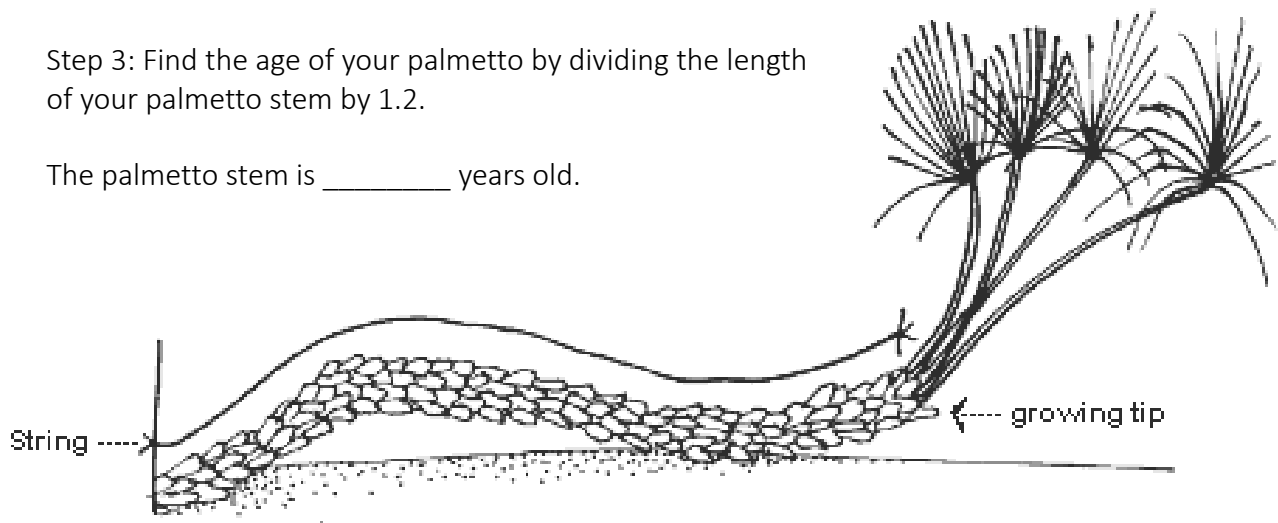
Step 1: Visit a nature preserve and find a live saw palmetto with a long stem. Their armored stems look like alligator backs.

Step 2: Carefully stretch a string along its stem. Cut the string so it is the length of the stem. Measure the string to discover the length of the stem.

The stem is \_\_\_\_\_ cm long.

Step 3: Find the age of your palmetto by dividing the length of your palmetto stem by 1.2.

The palmetto stem is \_\_\_\_\_ years old.



*This activity is adapted from Archbold's Discovering the Florida Scrub Curriculum, written by Nancy Deyrup and illustrated by Virginia Carter, 1999.*



## Palmetto Measuring Activity

### Part 2: Palmetto Timeline (indoors)

Step 1: What was the year of the oldest part of the palmetto stem you could measure?

\_\_\_\_\_ (fill in the current year)

-- \_\_\_\_\_ (fill in the age of your palmetto)

\_\_\_\_\_ This is the year your palmetto started growing

Step 2: List 10 important historical and personal dates that occurred after your palmetto started growing. Example: 1845 - Florida becomes a state

### Part 3: Timeline Poster (indoors)

Step 1: Stretch your string out as straight as you can from the top to the bottom of a piece of posterboard and tape it down.

Step 2: Make a mark on the posterboard beside the top of your string. Beside the mark, write the current year. The top of your string represents the growing tip of the palmetto.

Step 3: The other end of the string represents the year the palmetto started to grow. Make a mark on the posterboard beside the end of the string and mark the year the palmetto started to grow.

Step 4: Next, figure out where the ten events you looked up earlier belong on your string. This requires several steps:

- First, subtract the year the event happened from the current year.
- Now multiply the answer by 1.2 and round off the number. (We multiply by 1.2 because, on average, palmettos grow 1.2 cm. per year.)
- Example:
  - 1845-Florida becomes a state.
  - $2020-1845 = 175$  years
  - $175 \times 1.2 = 210$  cm.

Step 5: From the top of your string, measure down the same number of centimeters as your answer (example: 210 cm.) and make a mark. Beside the mark, write the year (1845) and the event that happened that year (Florida becomes a state).

Step 6: Repeat this process for every event you listed earlier.

Dear Parents/Educators,

The Florida scrub is an intriguing world full of discovery. We hope you and your children or students enjoy a journey of discovery in this coloring book. As you become more familiar with this unique habitat, consider visiting Archbold Biological Station or another preserve with Florida scrub.

When you find a spot to explore, walk slowly and observe the area with all your senses. Listen for birds singing or scratching for insects, or for lizards scuttling in the fallen leaves. Watch for butterflies siphoning nectar, scrub-jays caching acorns, and wildflowers surrounded by foraging bees. Smell the flowers, the leaves and the air. Has a skunk been nearby recently? Touch the rough pine bark and the thick waxy leaves of the scrub oaks. Stop at a patch of sand. Can you see any animal tracks or wolf spider burrows? Watch ant lions build their pits, or use a magnifying glass to view this “mouse-sized” world.

The Florida scrub is an ancient habitat, and under-appreciated. Found only on ancient sandy ridges in Florida, the scrub is endangered because of extensive previous habitat loss, and is continually threatened by increasing land development, lack of fire management necessary to maintain the habitat, and invasive species. State and federal programs such as Forever Florida and the Lake Wales Ridge National Wildlife Refuge have protected many important scrub sites and are attempting to buy remaining areas of scrub before they are destroyed. These efforts will allow future generations to observe and enjoy the rare plants and animals that live in the scrub. Extensive observations and studies by naturalists and scientists have highlighted the remarkable conservation importance of the Florida scrub. These studies have also revealed that there is still so much more to learn. Much of the hard work of preserving and managing for remaining areas of scrub habitat is carried out by agencies and non-profits, helped considerably by local community groups who live nearby and value scrub habitats. Please look out for a neighboring scrub habitat that is waiting to be adopted and championed by a local community.

Thank you for taking the time to learn about Florida scrub. This knowledge will give you a new appreciation and understanding of this ancient and exciting habitat and, hopefully, encourage you to participate in its long-term conservation. Enjoy your adventures in the fascinating Florida scrub.

Sincerely,

Archbold Biological Station

Archbold Biological Station, 123 Main Drive, Venus, Florida 33960, (863)465-2571. Archbold Biological Station is a private, non-profit organization dedicated to long-term ecological research and conservation. Its primary focus is on the organisms and environments of the unique Lake Wales Ridge and adjacent central Florida. The station’s program is part of a global effort to understand, interpret and preserve the Earth’s natural diversity.

This fourth edition of The Scrub Coloring Book is made possible  
through the financial support of Dr. Warren and Chris Abrahamson.

This Scrub Coloring Book is dedicated to our daughter, Jill Raye Abrahamson (1973-2017), who first visited Archbold Biological Station and Florida Scrub in 1974 at 6-months of age. She was fortunate, as we were, to know the Archbold Biological Station's founder, Richard Archbold. Jill spent many Januaries in Florida including all of her second-grade year at Lake Placid Elementary School. Surrounded by scientists and educators at Archbold, Jill learned about many Scrub plants and animals. Scrub was literally her childhood playground. As she gained an appreciation for organisms and their many interactions, she developed a love for and a commitment to nature. During college, Jill coauthored a scientific publication reporting the effects of reintroducing fire to long-unburned Scrub. Following graduation from Gettysburg College in Pennsylvania, Jill served as an Environmental Educator at the YMCA's Camp Sea Gull on the Outer Banks of North Carolina, subsequently as a research assistant studying snail kites in the Florida Everglades, and later as an Environmental Planner in Pennsylvania.

Seeing how our daughter's appreciation of and respect for natural communities was cultivated by her experiences at Archbold, we are delighted to support the publication of this, the fourth edition of Archbold's Scrub Coloring Book. We hope that you will gain an appreciation and a respect for not only Florida Scrub but also for all of Earth's biodiversity and natural communities.

Warren & Chris Abrahamson

February 7, 2019

Dr. Abrahamson is a longtime Research Associate of Archbold Biological Station and is Professor of Biology Emeritus at Bucknell University in Pennsylvania. Warren and Chris have studied and written about Florida Scrub since 1972 with studies that include the natural communities within Scrub; the effects of fire on Scrub; the longevity and reproductive biology of palmettos; fruit production by oaks, palmettos, and hickories; and the effects of fire on oak gall wasp communities.

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## Authors

**Mark Deyrup** is an emeritus research biologist at Archbold Biological Station with a specialty in Entomology (the study of insects). He conducts ecological, taxonomic, and behavioral research on ants, grasshoppers, crickets and beetles of the Florida scrub. His recent book “Ants of Florida: Identification and Natural History” identifies the 239 species of Florida ants with detailed and beautiful scientific drawings, making for convenient identification of what is considered to be one of the most inaccessible groups of conspicuous and intrusive insects.

**Kevina Vulinec** is an Assistant Professor of Wildlife Biology at Delaware State University. Her main focus is the ecology of rainforests. She created these drawings while a research intern at Archbold Biological Station, and was formerly a research biologist for The St. Johns River Water Management District.

**Charlotte B. Wilson** designed and colored the cover while she was an education assistant at Archbold.

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***Thank you!***

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