

a tree named *Lily*

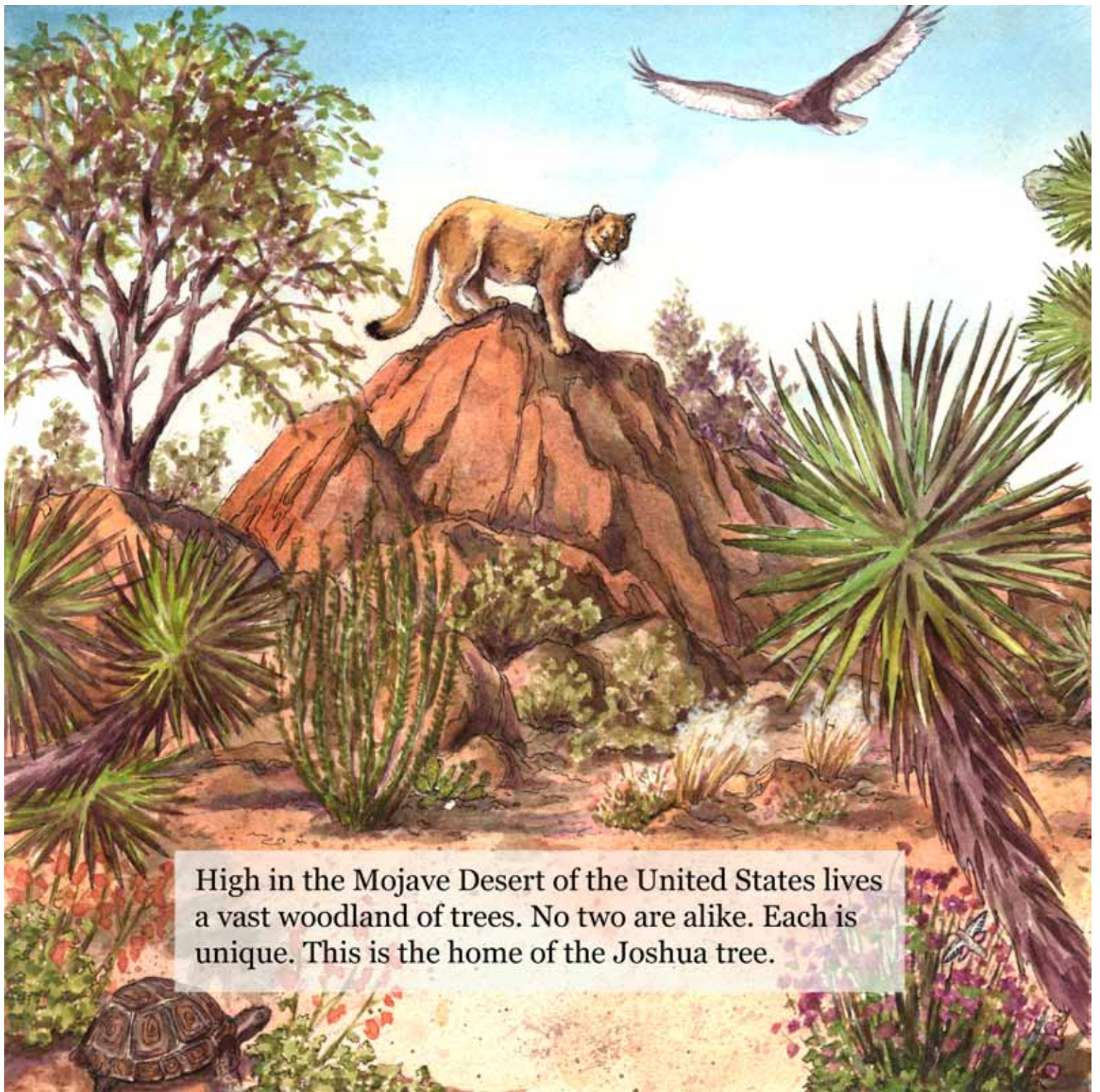


written by L. S. Lange
illustrated by Diana Rice Bonin

*In memory of Diana Rice Bonin
and Joshua Grady*

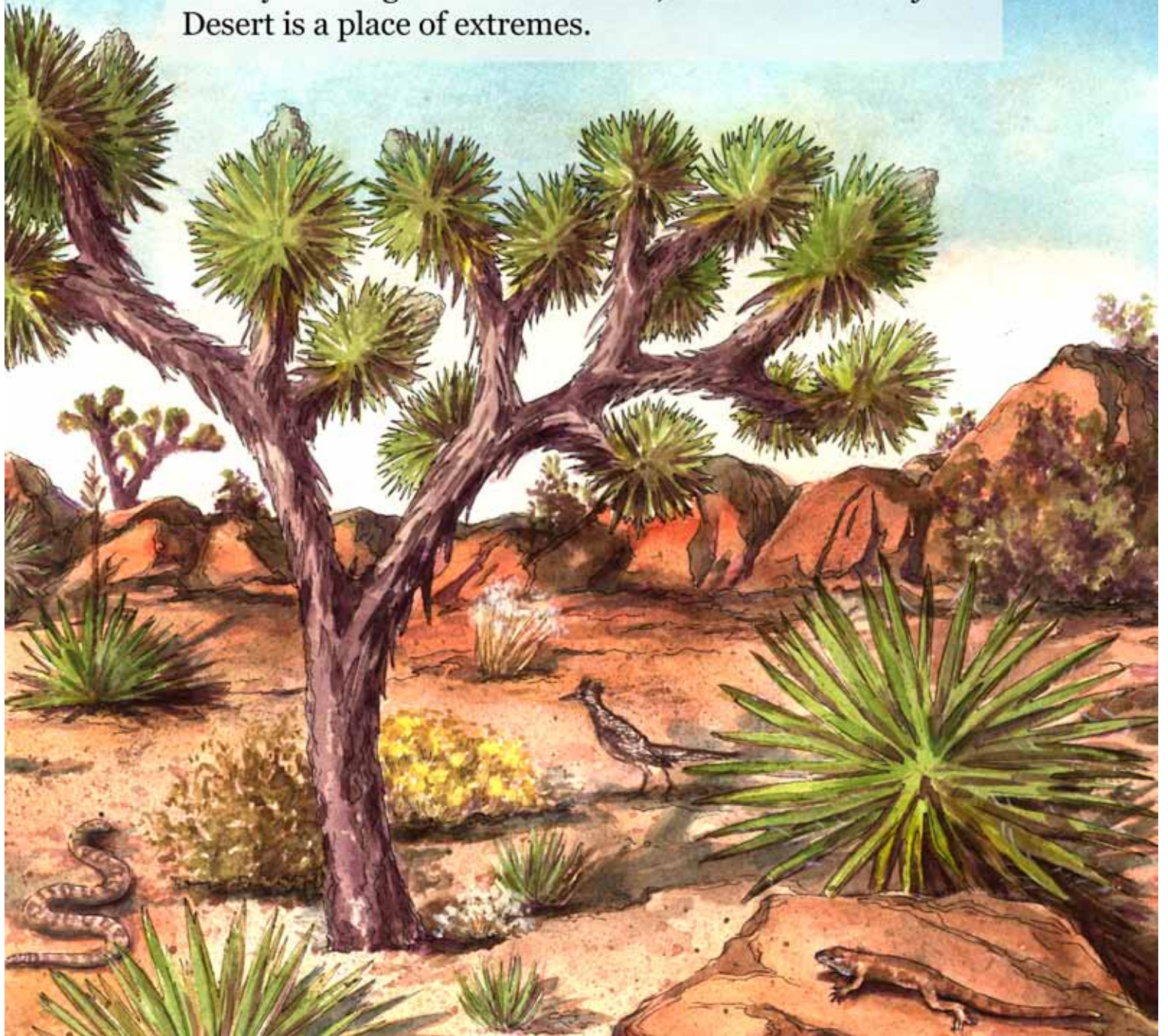
Funds for this book were donated to Joshua Tree National Park by family and friends of Joshua Grady and by a National Park Service, Parks As Classroom grant.

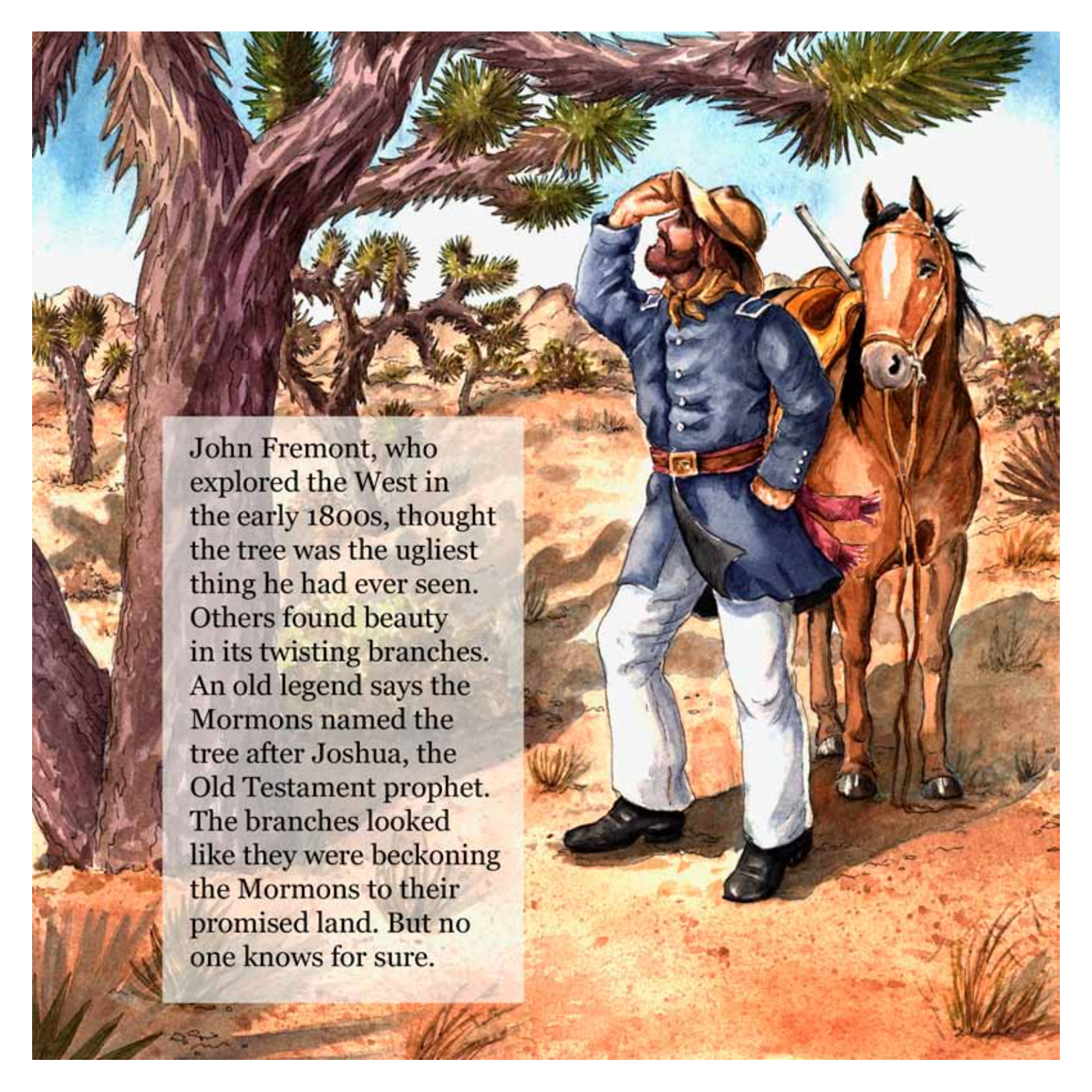
Copyright 2008 National Park Service, Joshua Tree National Park
This is a work of the National Park Service, Joshua Tree National Park, however all illustrations are protected under U.S. copyright laws and may not be used without written permission of the copyright owner.



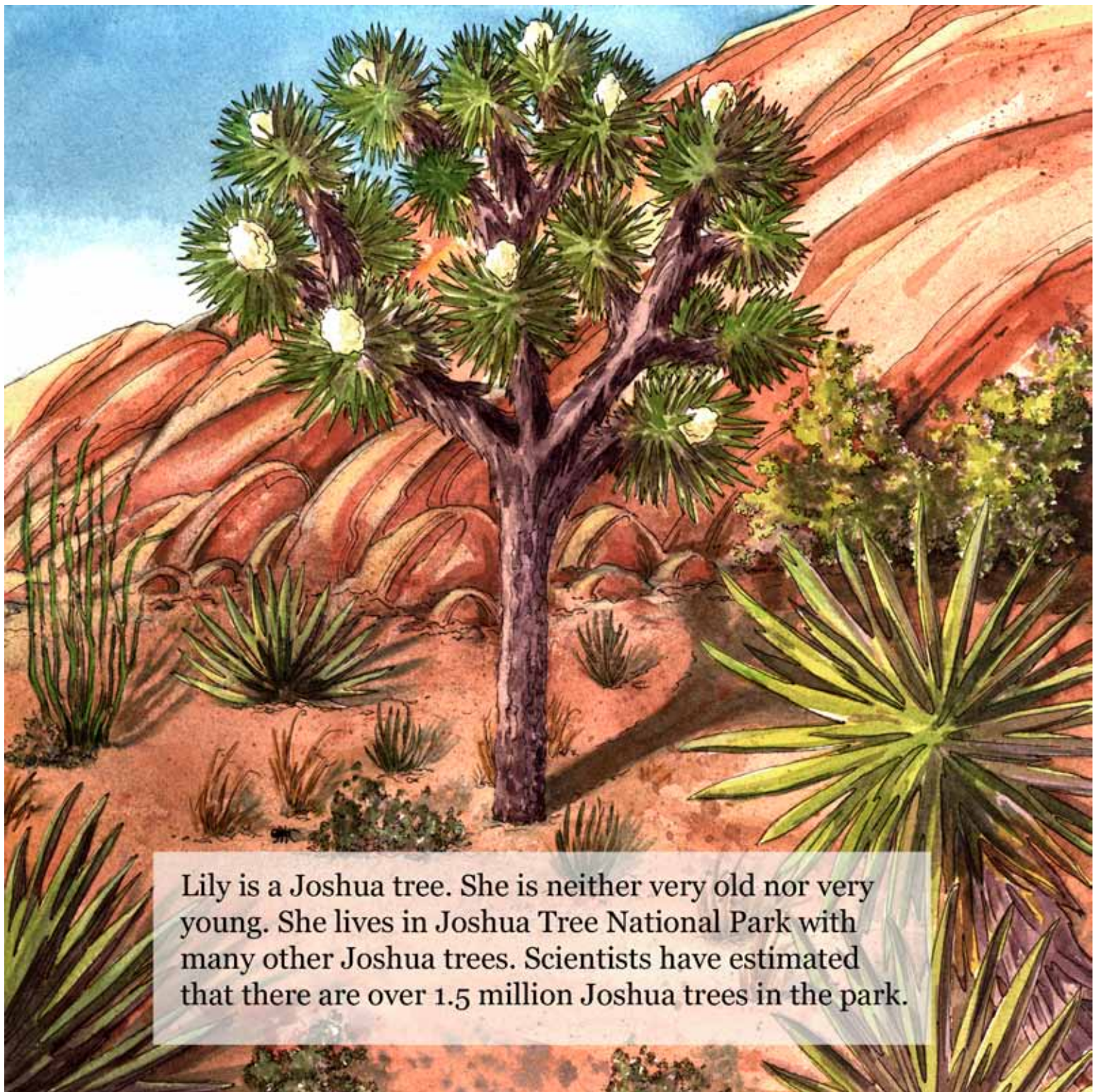
High in the Mojave Desert of the United States lives a vast woodland of trees. No two are alike. Each is unique. This is the home of the Joshua tree.

In the summer, the temperature can reach one hundred twenty-five degrees. In the winter, it snows. The Mojave Desert is a place of extremes.

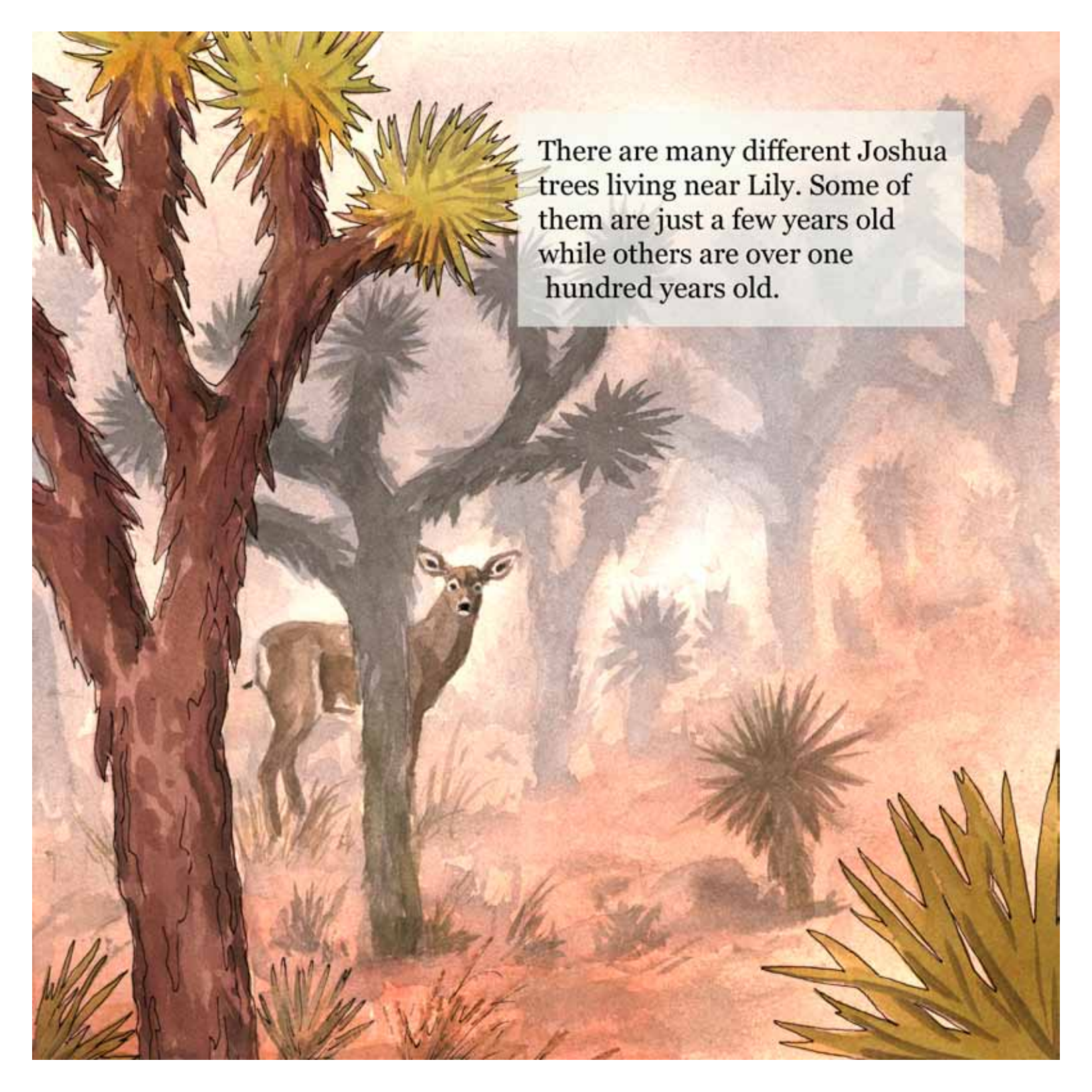




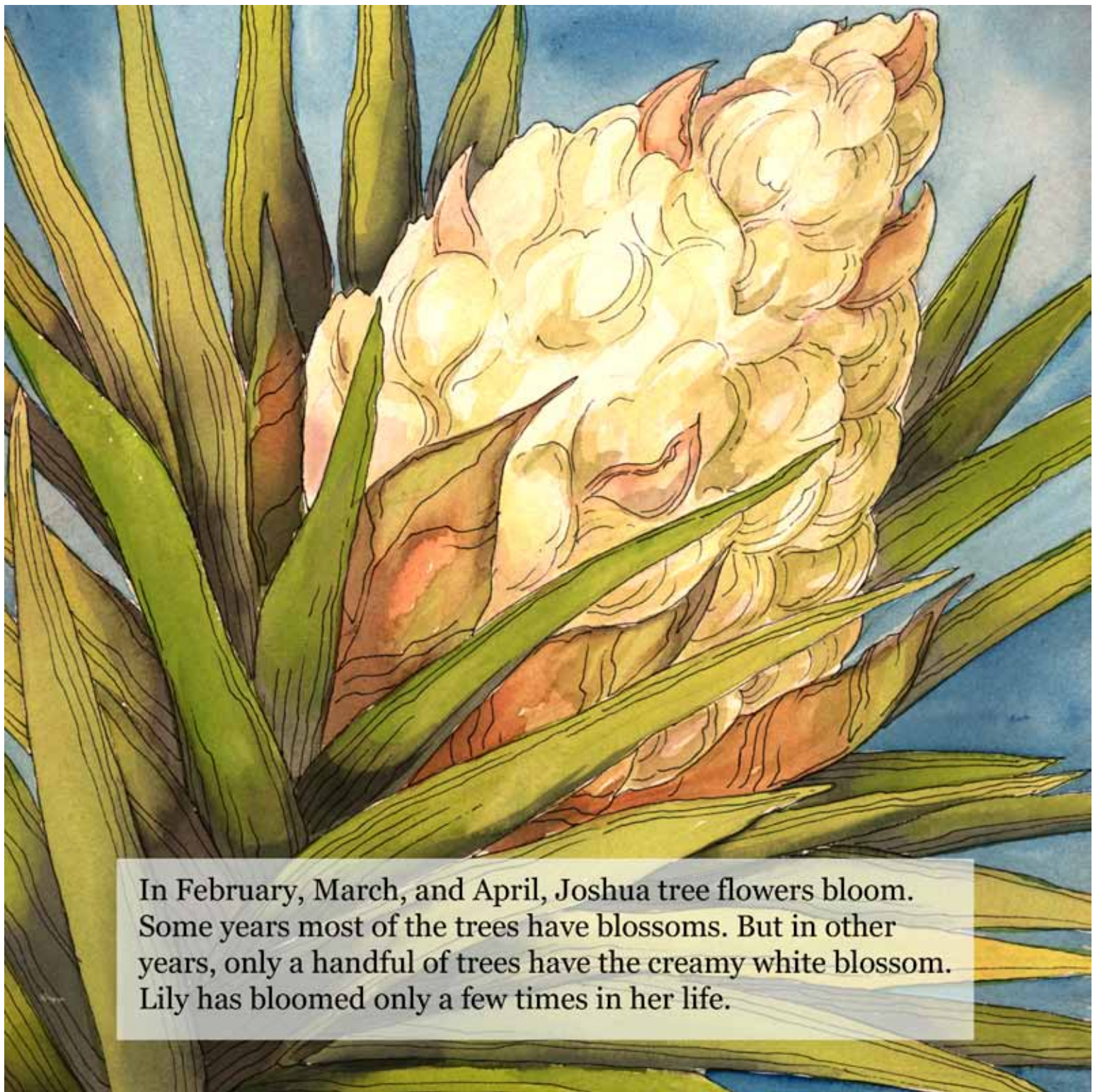
John Fremont, who explored the West in the early 1800s, thought the tree was the ugliest thing he had ever seen. Others found beauty in its twisting branches. An old legend says the Mormons named the tree after Joshua, the Old Testament prophet. The branches looked like they were beckoning the Mormons to their promised land. But no one knows for sure.



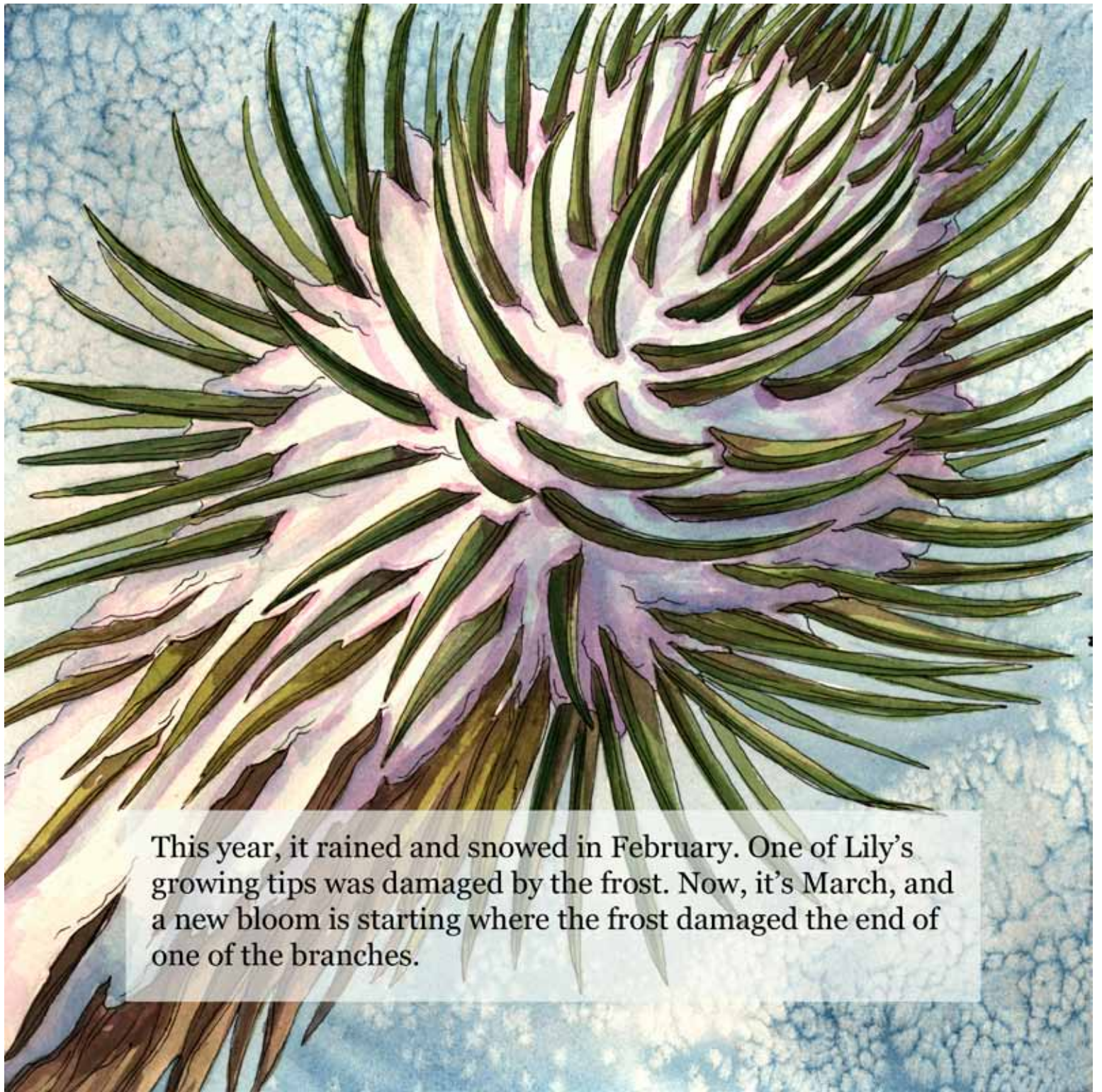
Lily is a Joshua tree. She is neither very old nor very young. She lives in Joshua Tree National Park with many other Joshua trees. Scientists have estimated that there are over 1.5 million Joshua trees in the park.

A watercolor illustration of a desert landscape. In the foreground, a large, thick-trunked Joshua tree with spiky green leaves and yellow flower heads stands on the left. In the middle ground, a brown deer with small antlers stands facing the viewer. The background is filled with more Joshua trees of various sizes, rendered in soft, hazy colors. The ground is a mix of reddish-brown and tan, with some small green plants. The overall style is soft and painterly.

There are many different Joshua trees living near Lily. Some of them are just a few years old while others are over one hundred years old.



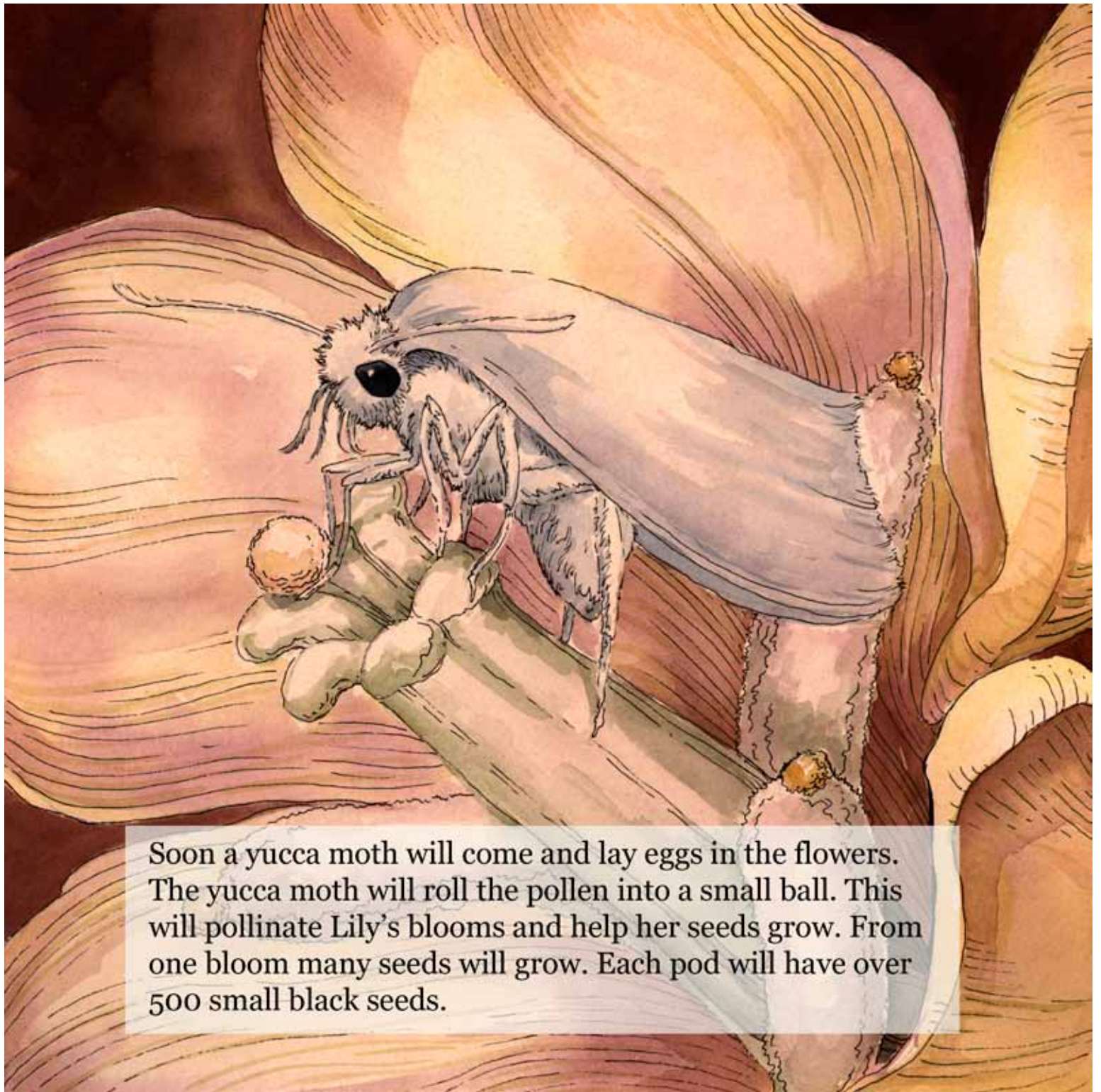
In February, March, and April, Joshua tree flowers bloom. Some years most of the trees have blossoms. But in other years, only a handful of trees have the creamy white blossom. Lily has bloomed only a few times in her life.



This year, it rained and snowed in February. One of Lily's growing tips was damaged by the frost. Now, it's March, and a new bloom is starting where the frost damaged the end of one of the branches.

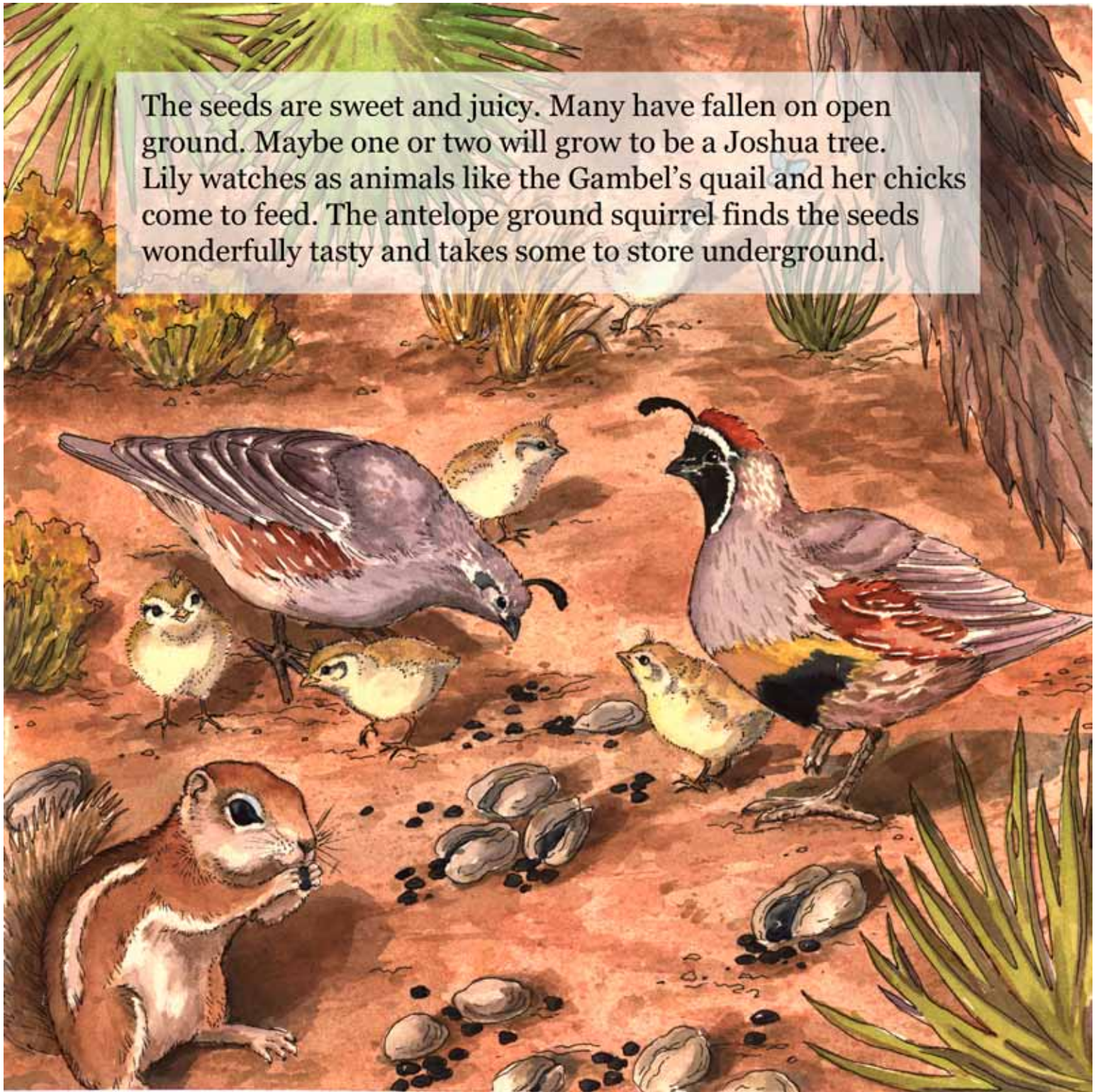


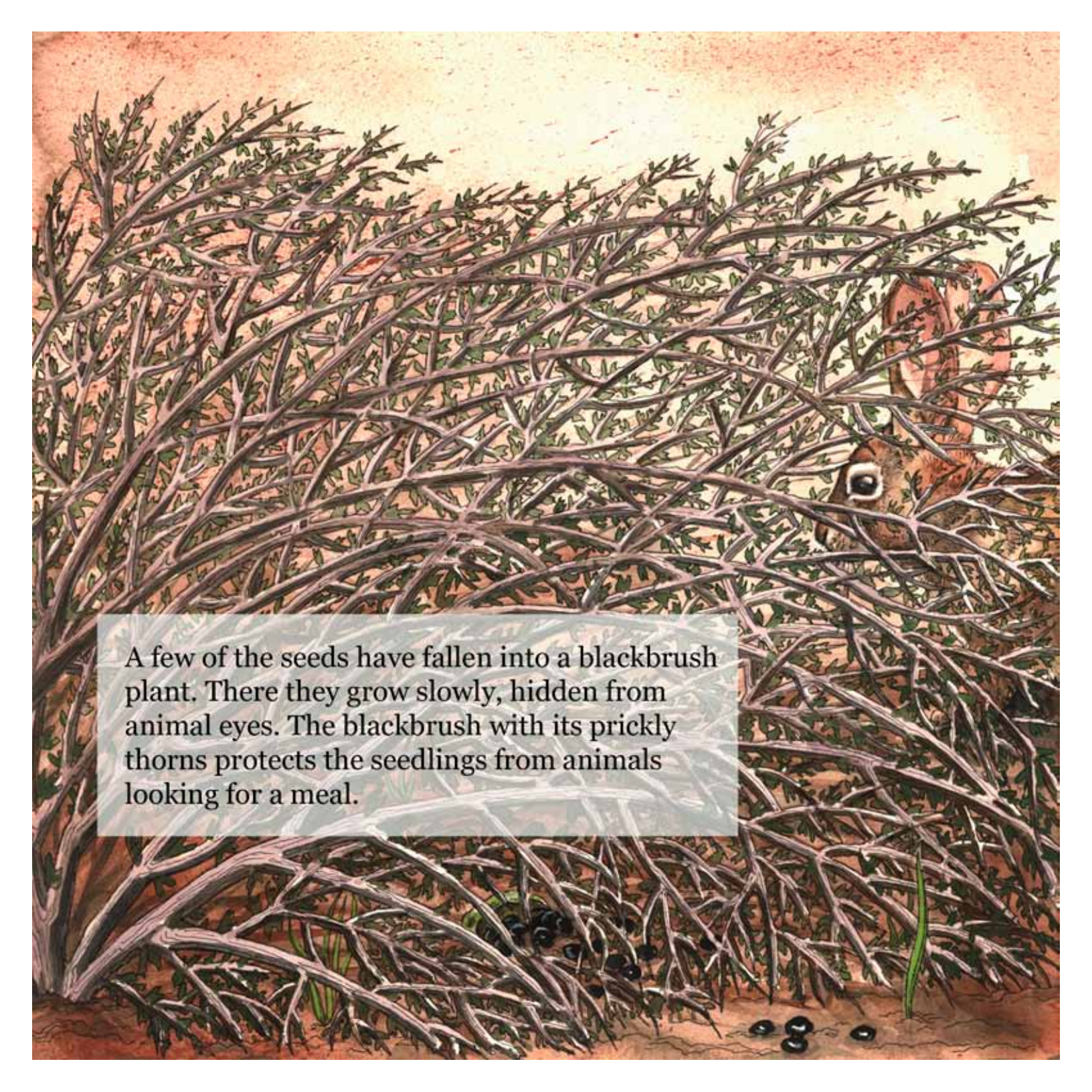
A Scott's oriole has made its nest in Lily's branches. The nest hangs from the spikey leaves. It is woven tightly of grasses and other plants. The Scott's oriole feeds its babies with nectar from the Joshua tree blooms.



Soon a yucca moth will come and lay eggs in the flowers. The yucca moth will roll the pollen into a small ball. This will pollinate Lily's blooms and help her seeds grow. From one bloom many seeds will grow. Each pod will have over 500 small black seeds.

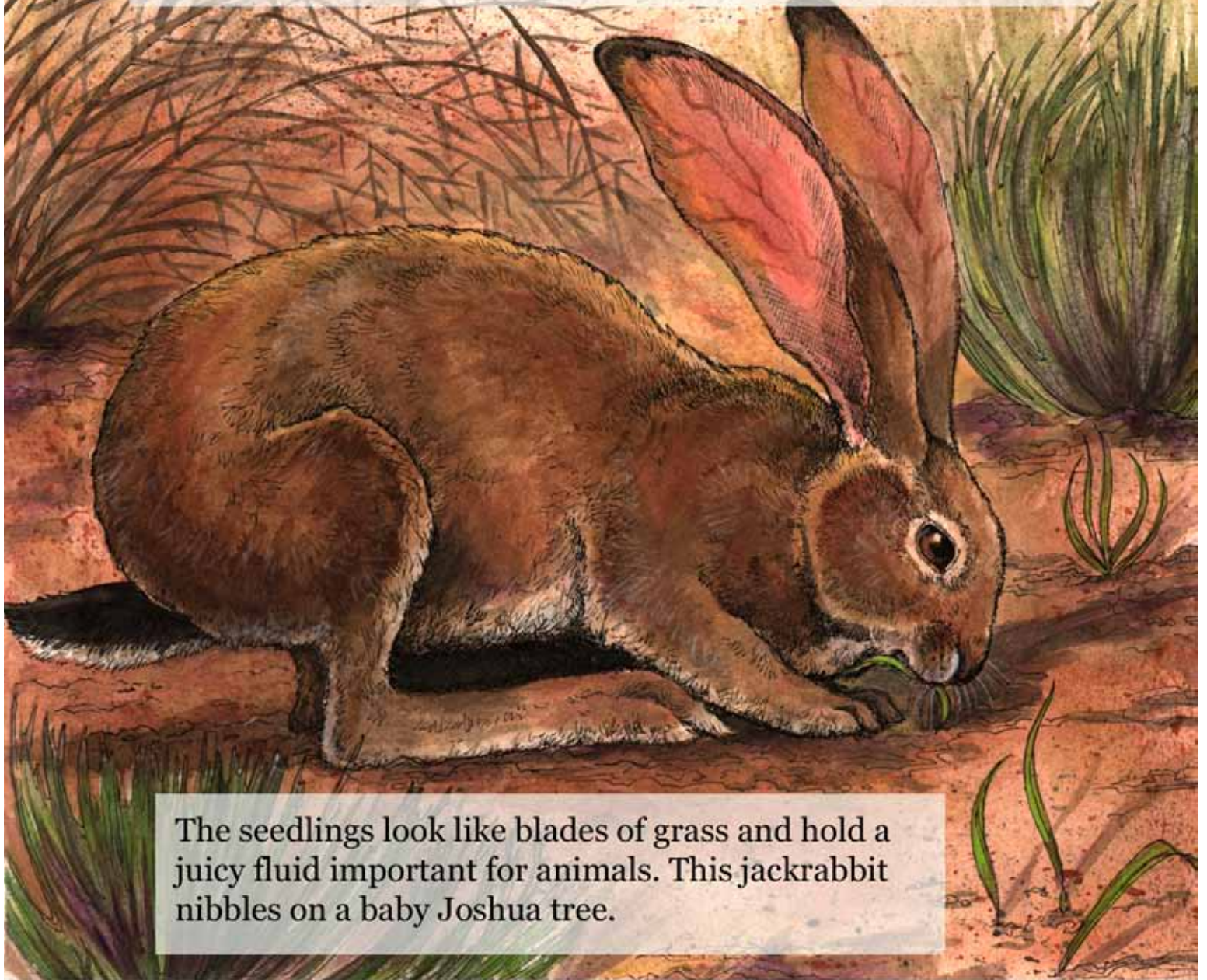
The seeds are sweet and juicy. Many have fallen on open ground. Maybe one or two will grow to be a Joshua tree. Lily watches as animals like the Gambel's quail and her chicks come to feed. The antelope ground squirrel finds the seeds wonderfully tasty and takes some to store underground.





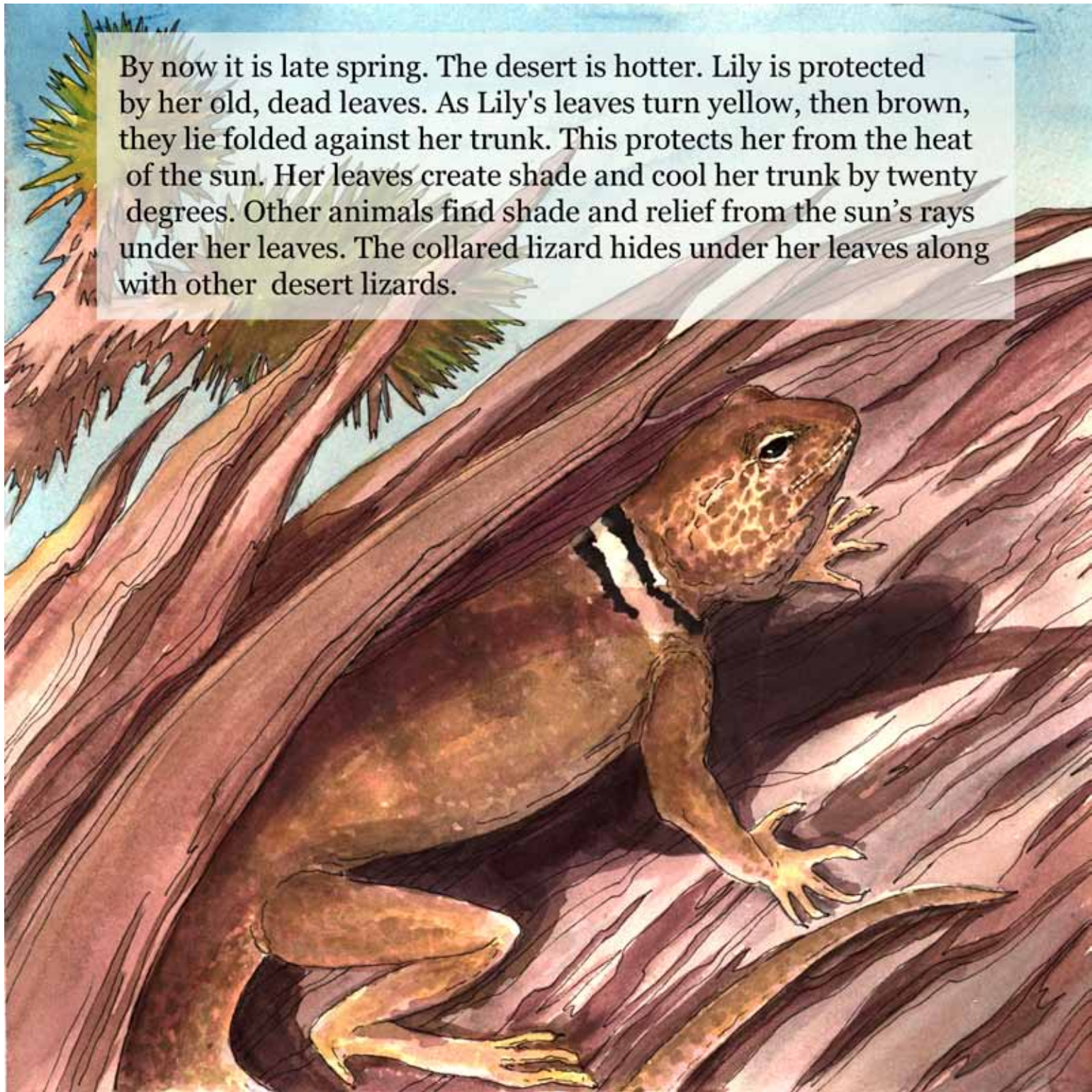
A few of the seeds have fallen into a blackbrush plant. There they grow slowly, hidden from animal eyes. The blackbrush with its prickly thorns protects the seedlings from animals looking for a meal.

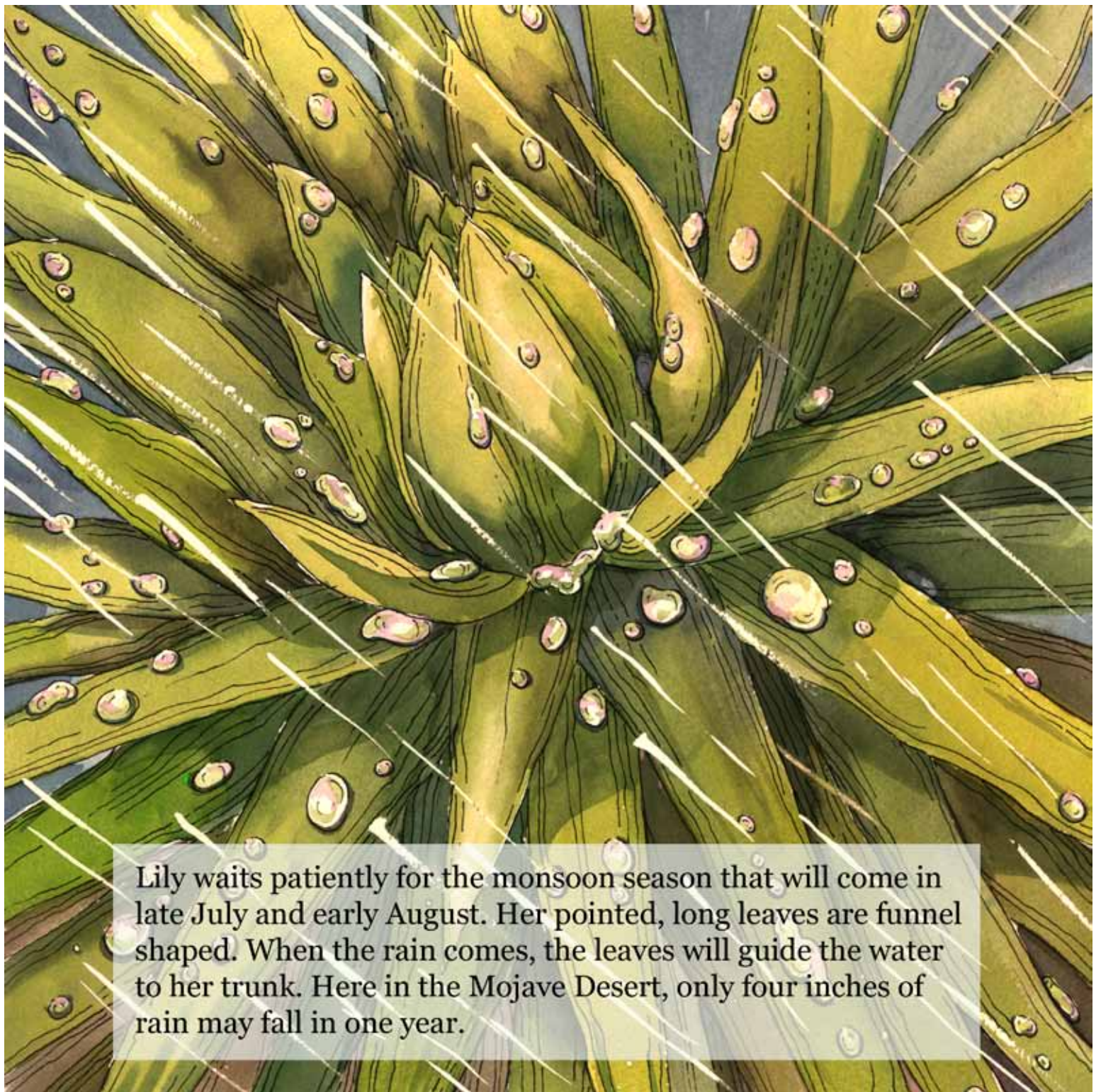
A few of the seeds in the open were not eaten by animals. They wait in the soil for a little water from the rain and snow so that they can grow. They are not protected by the blackbrush or any other plant.



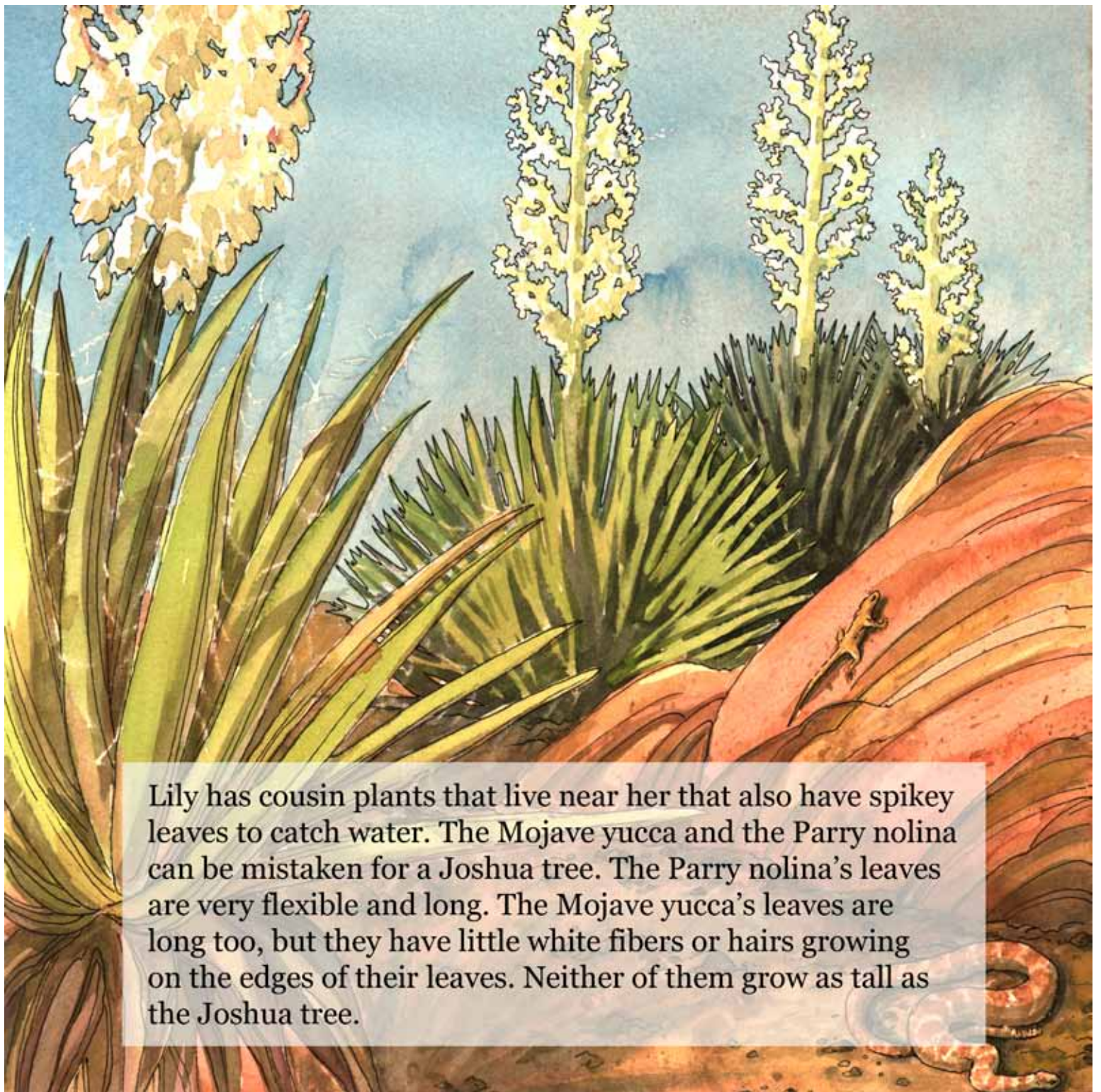
The seedlings look like blades of grass and hold a juicy fluid important for animals. This jackrabbit nibbles on a baby Joshua tree.

By now it is late spring. The desert is hotter. Lily is protected by her old, dead leaves. As Lily's leaves turn yellow, then brown, they lie folded against her trunk. This protects her from the heat of the sun. Her leaves create shade and cool her trunk by twenty degrees. Other animals find shade and relief from the sun's rays under her leaves. The collared lizard hides under her leaves along with other desert lizards.





Lily waits patiently for the monsoon season that will come in late July and early August. Her pointed, long leaves are funnel shaped. When the rain comes, the leaves will guide the water to her trunk. Here in the Mojave Desert, only four inches of rain may fall in one year.



Lily has cousin plants that live near her that also have spikey leaves to catch water. The Mojave yucca and the Parry nolina can be mistaken for a Joshua tree. The Parry nolina's leaves are very flexible and long. The Mojave yucca's leaves are long too, but they have little white fibers or hairs growing on the edges of their leaves. Neither of them grow as tall as the Joshua tree.

Hanging from one of Lily's leaves is a granite spiny lizard. It was left by a bird called the loggerhead shrike. The shrike spears its food on sharp objects like the Joshua tree leaves, and hangs it there to rot for a few days before eating it.



A Relic From An Earlier Time

The Joshua tree, *Yucca brevifolia*, is actually a relic from an earlier time when the climate was wetter and cooler. According to the fossil record, Joshua trees existed during the Pleistocene era. The range (place where a plant is found) of the Joshua tree is much smaller than in previous time periods. The tree's range extended up to 225 miles beyond its current location.



Outside of Las Vegas in Gypsum Cave, the remains of prehistoric ground sloths were found. Within this cave exists the dung or droppings of these 2 types of giant ground sloths, *Paramylodon harlani* and *Northrotheriops shastensis*. The dung contains large amounts of Joshua tree seeds, leaves and fruits. Scientists have been able to determine that the Joshua tree was a favored food. The sloth would travel up to 10 miles before it deposited its dung with

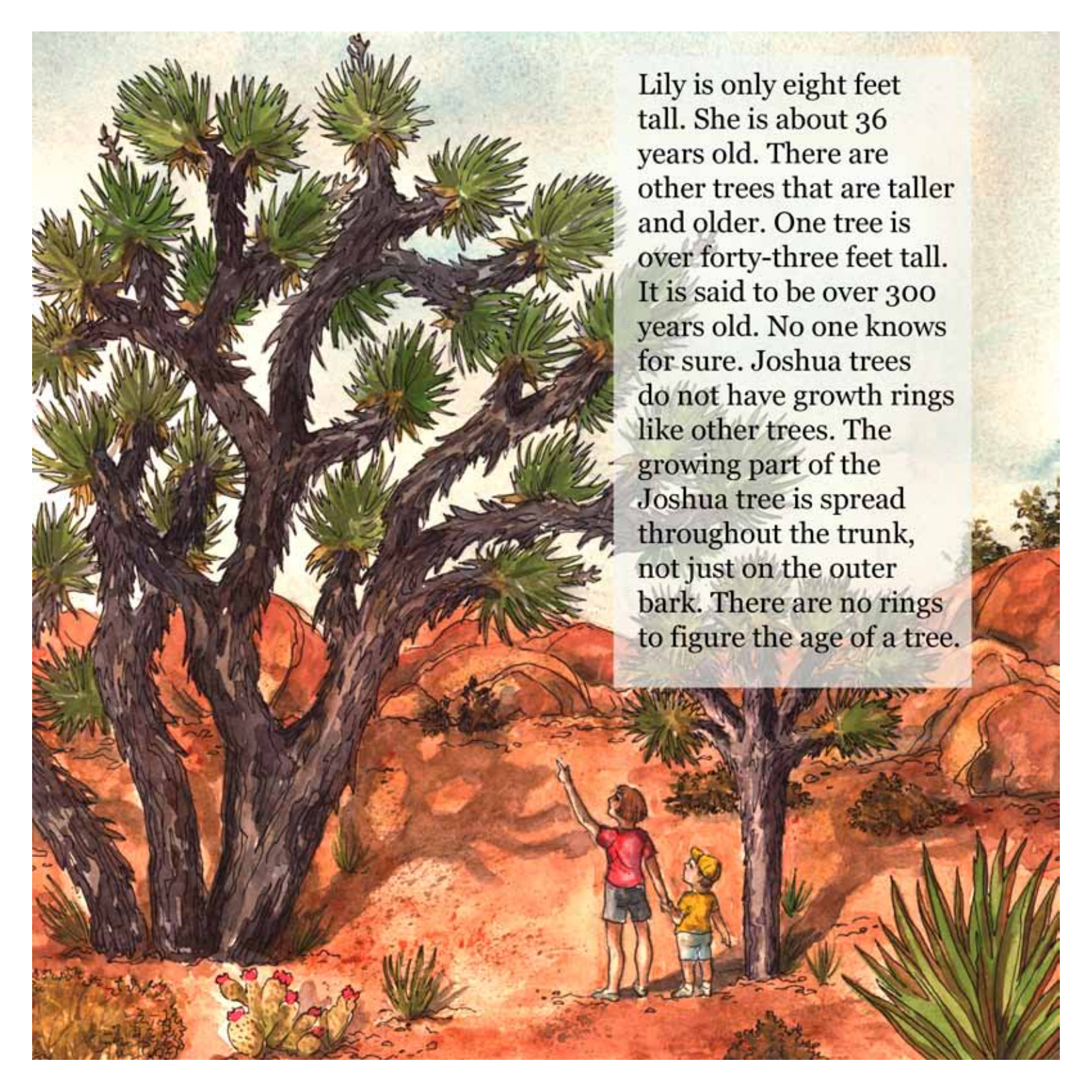
the seeds. This provided a supply of fertilizer for the seeds to grow in. The sloth was a major mover of Joshua trees and has been referred to as the “Johnny Appleseed” of the Joshua tree.

When the sloths became extinct 13,000 years ago due to climate change, the Joshua tree lost the major way of moving its seeds from one location to another. Since that time, the Joshua tree range has been shrinking. Today it is mainly found within the Mojave Desert.

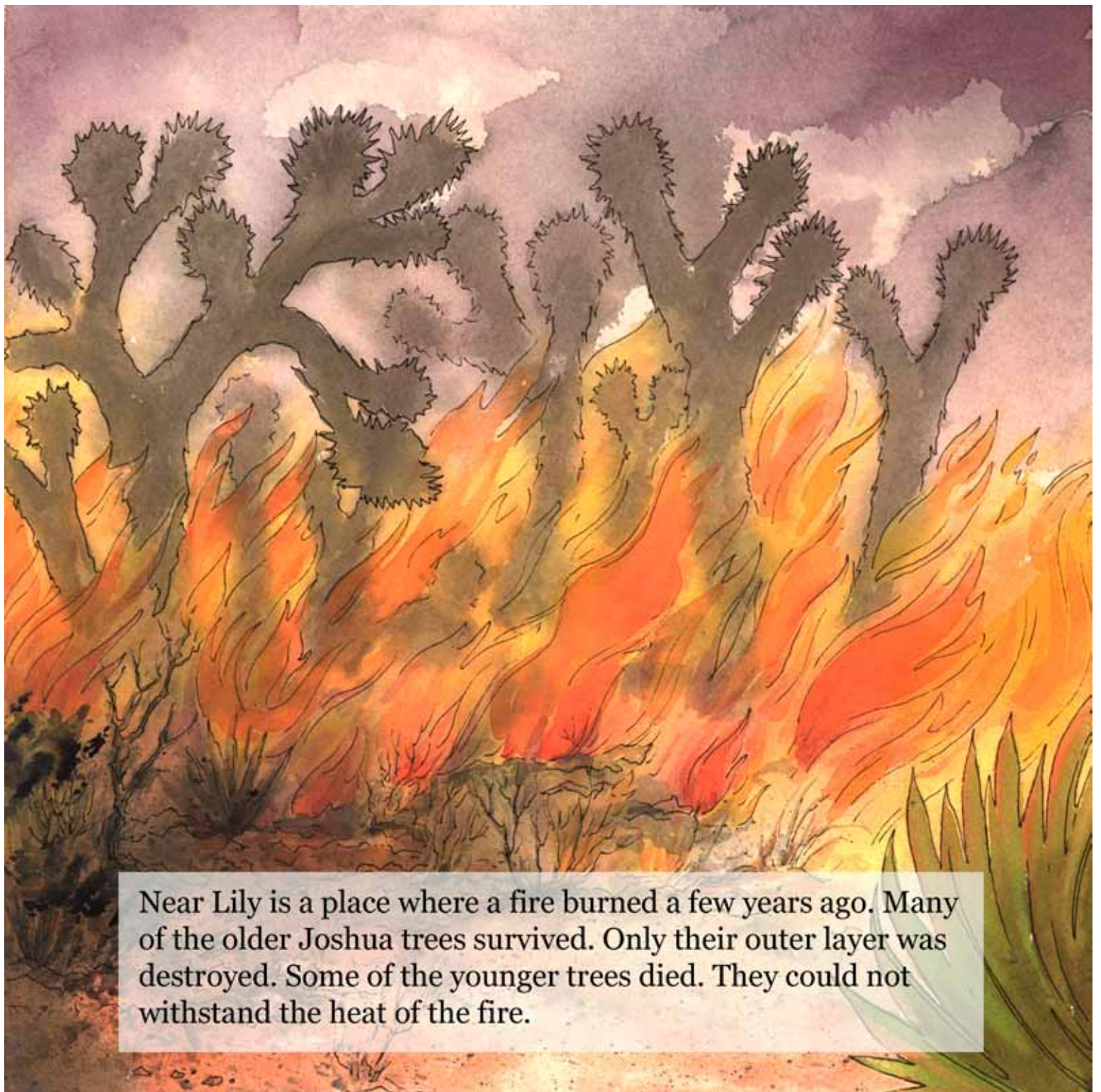
Some scientists have predicted that the Joshua tree will not exist in Joshua Tree National Park within a hundred years. Reasons vary. Most are related to a combined effect of climate change, change in fire regime, increase in exotic or non-native plants, and loss of habitat. So once again, the Joshua tree faces another climate change. The question remains, will it survive this one? No one knows for sure.

On the ground underneath Lily there are pups or little baby Joshua trees. The pups are part of Lily, connected by her roots. Lily's roots grow along the ground. From these roots, called rhizomes, little Joshua trees sometimes grow.



An illustration of a large, gnarled Joshua tree with many green, spiky branches. In the foreground, a woman in a red shirt and a child in a yellow shirt are standing on a dirt path, looking up at the tree. The background shows a desert landscape with red rocks and a clear sky.

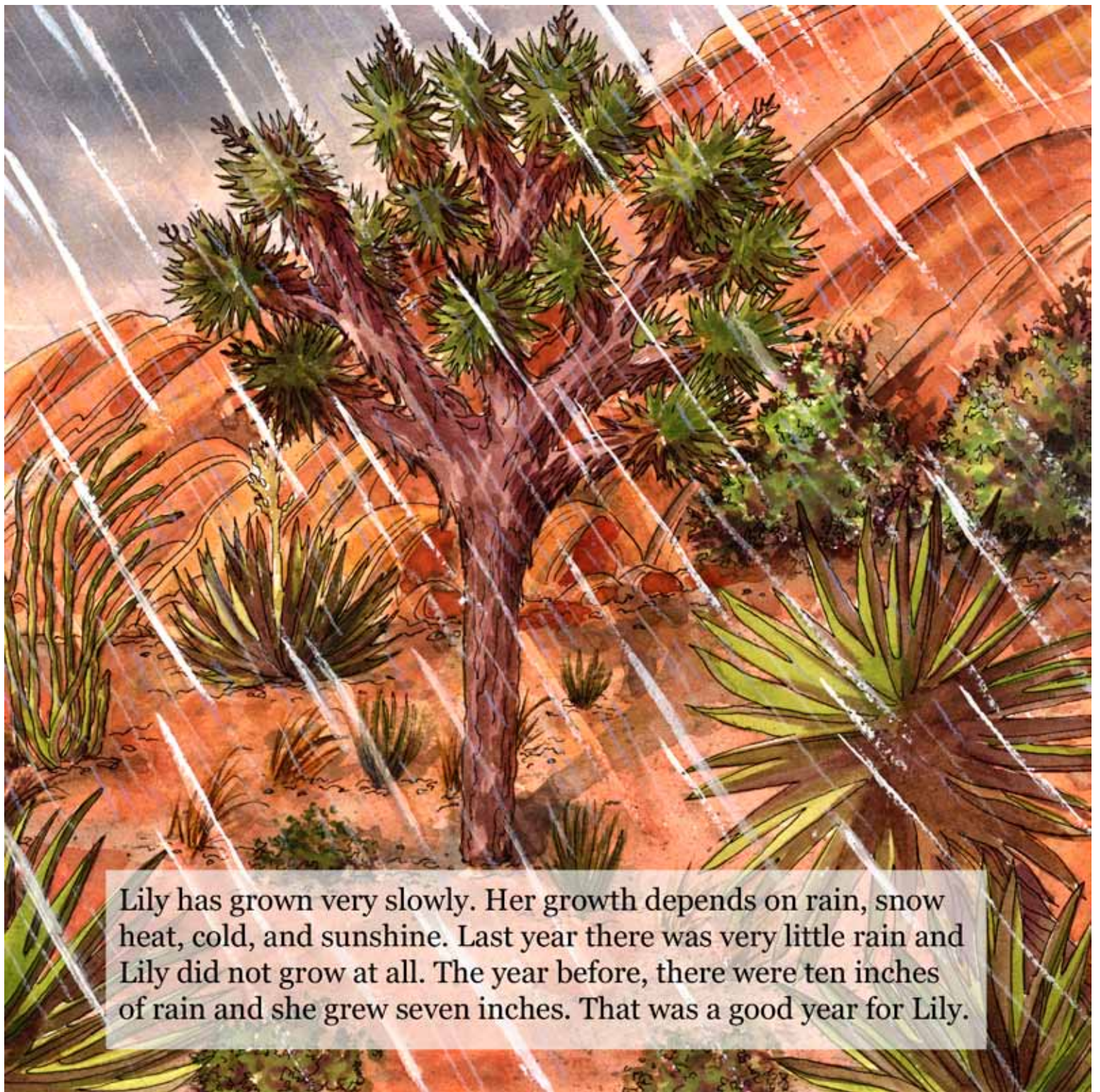
Lily is only eight feet tall. She is about 36 years old. There are other trees that are taller and older. One tree is over forty-three feet tall. It is said to be over 300 years old. No one knows for sure. Joshua trees do not have growth rings like other trees. The growing part of the Joshua tree is spread throughout the trunk, not just on the outer bark. There are no rings to figure the age of a tree.



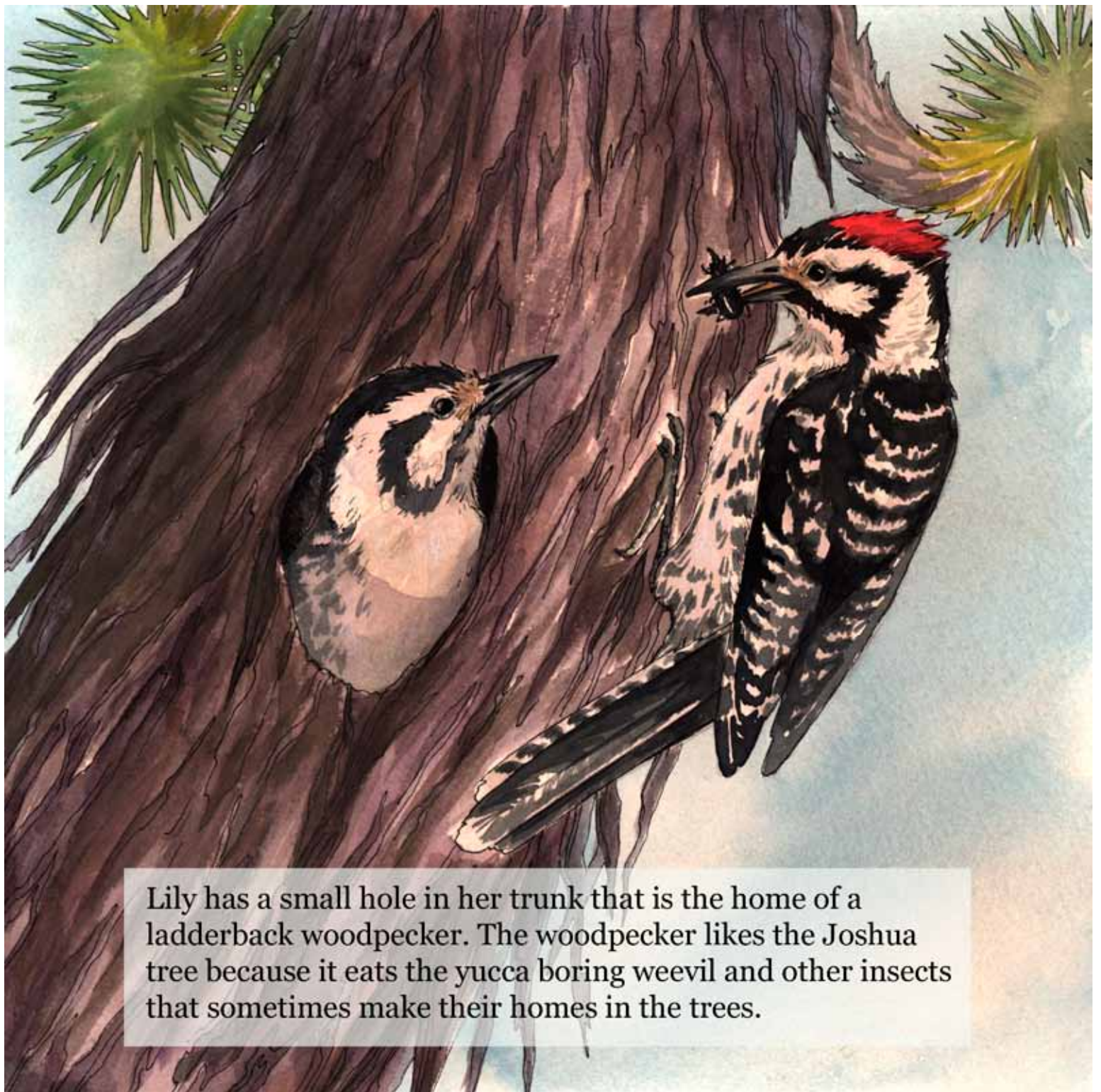
Near Lily is a place where a fire burned a few years ago. Many of the older Joshua trees survived. Only their outer layer was destroyed. Some of the younger trees died. They could not withstand the heat of the fire.

A pair of kangaroo rats visit Lily. They like what they see and dig a burrow, a hole in the ground, near her roots to make a home. Later a red racer snake visits the hole looking for a meal, but finds no one home.

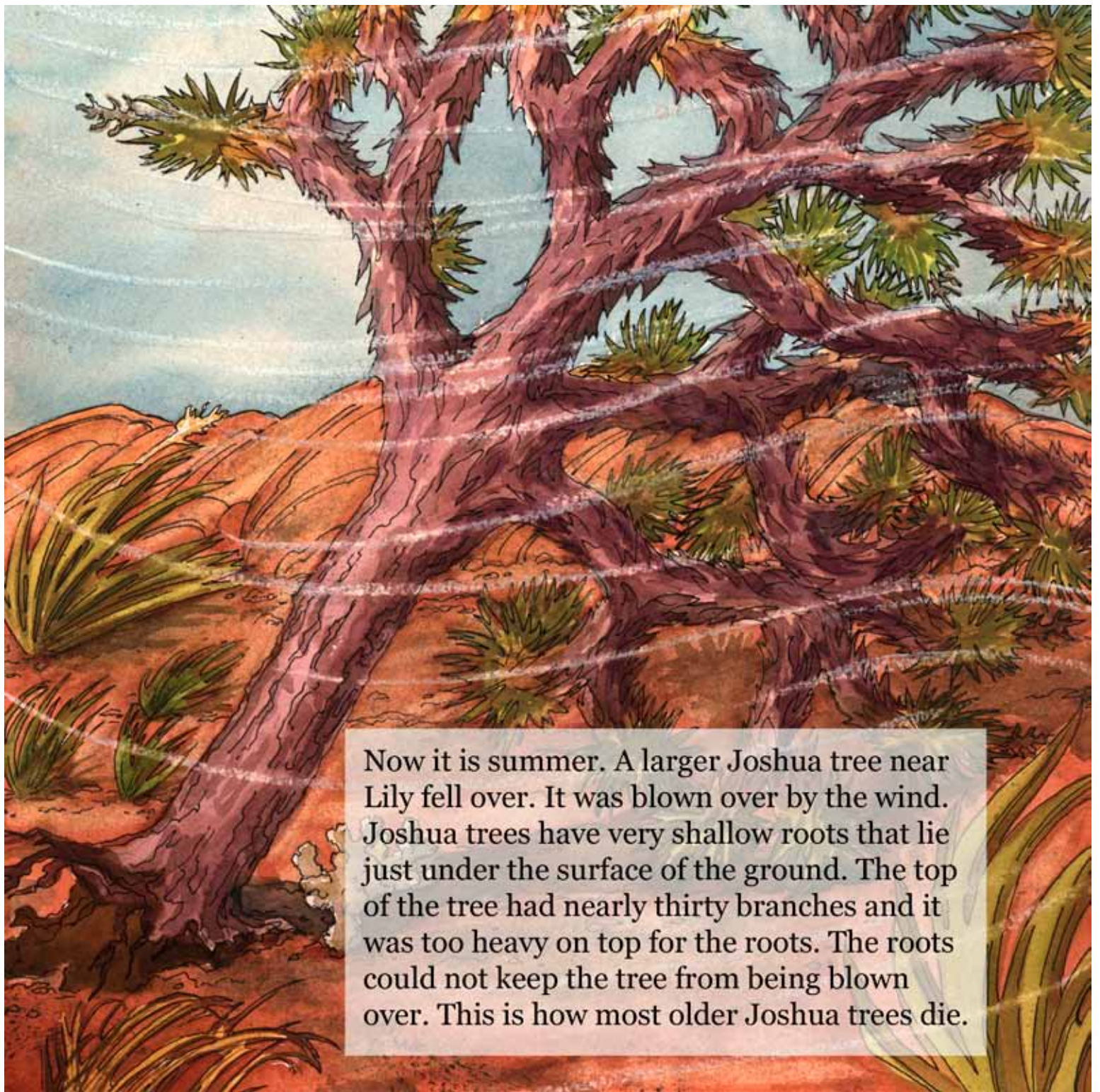




Lily has grown very slowly. Her growth depends on rain, snow heat, cold, and sunshine. Last year there was very little rain and Lily did not grow at all. The year before, there were ten inches of rain and she grew seven inches. That was a good year for Lily.

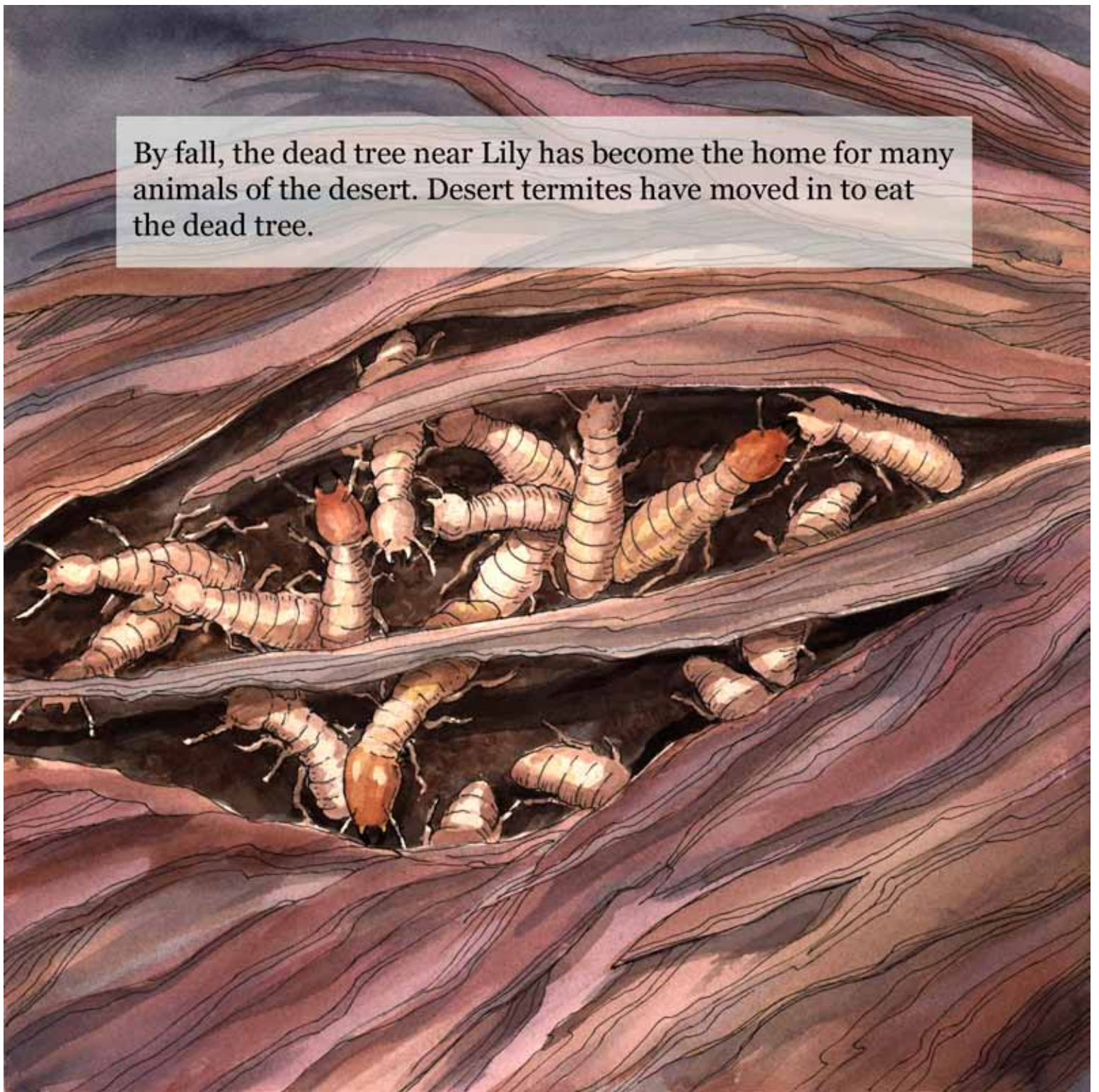


Lily has a small hole in her trunk that is the home of a ladderback woodpecker. The woodpecker likes the Joshua tree because it eats the yucca boring weevil and other insects that sometimes make their homes in the trees.

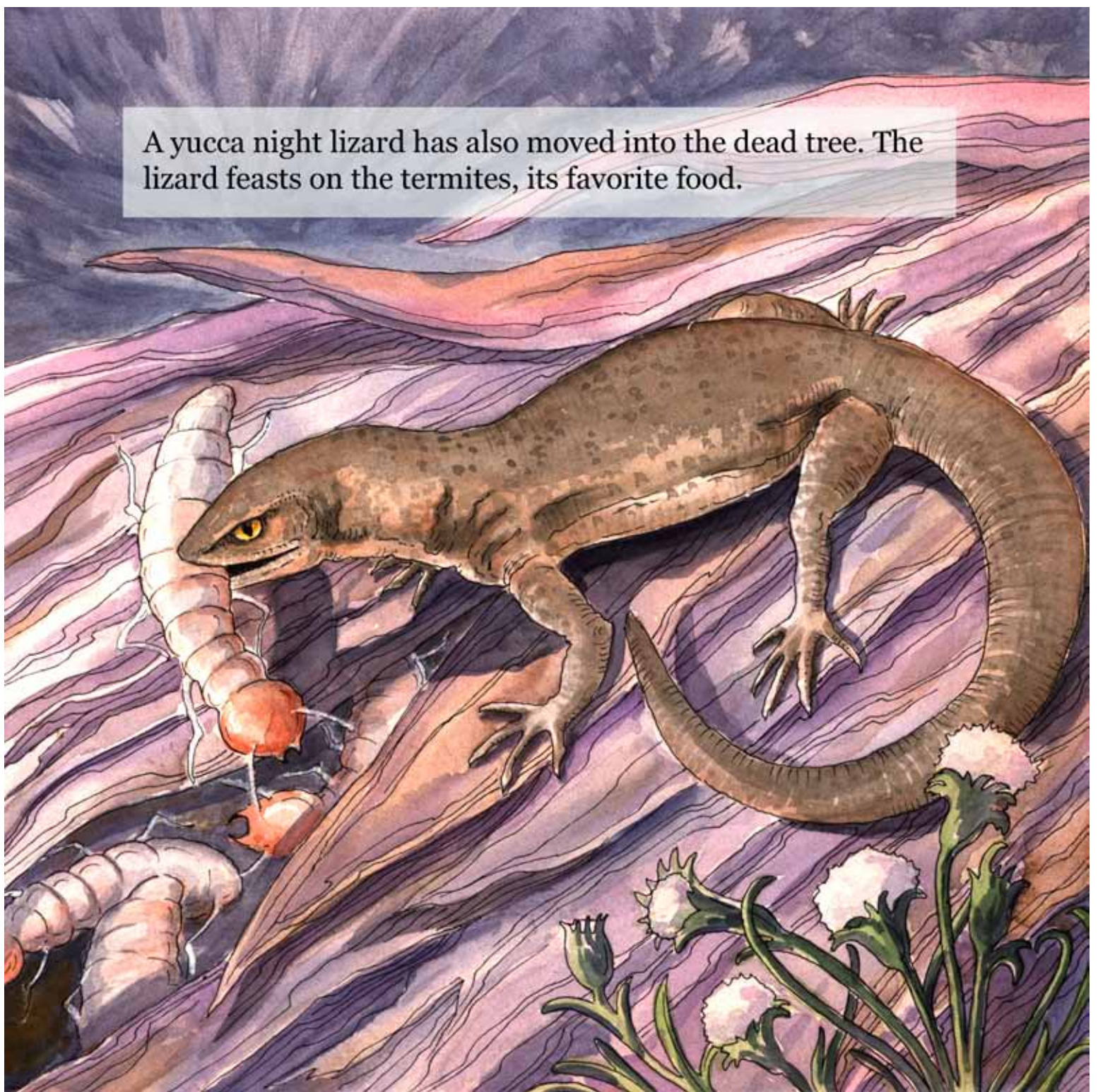


Now it is summer. A larger Joshua tree near Lily fell over. It was blown over by the wind. Joshua trees have very shallow roots that lie just under the surface of the ground. The top of the tree had nearly thirty branches and it was too heavy on top for the roots. The roots could not keep the tree from being blown over. This is how most older Joshua trees die.

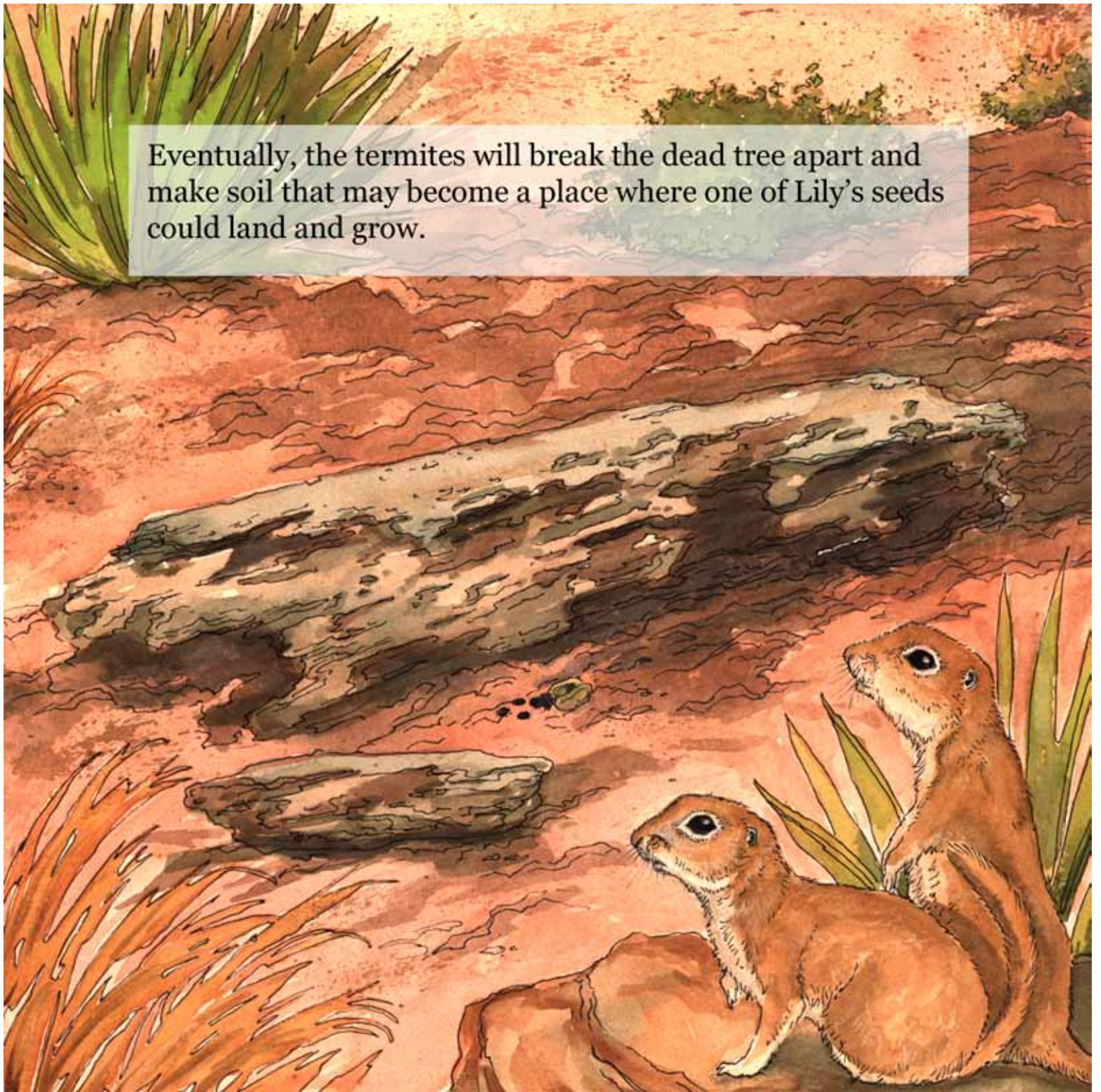
By fall, the dead tree near Lily has become the home for many animals of the desert. Desert termites have moved in to eat the dead tree.

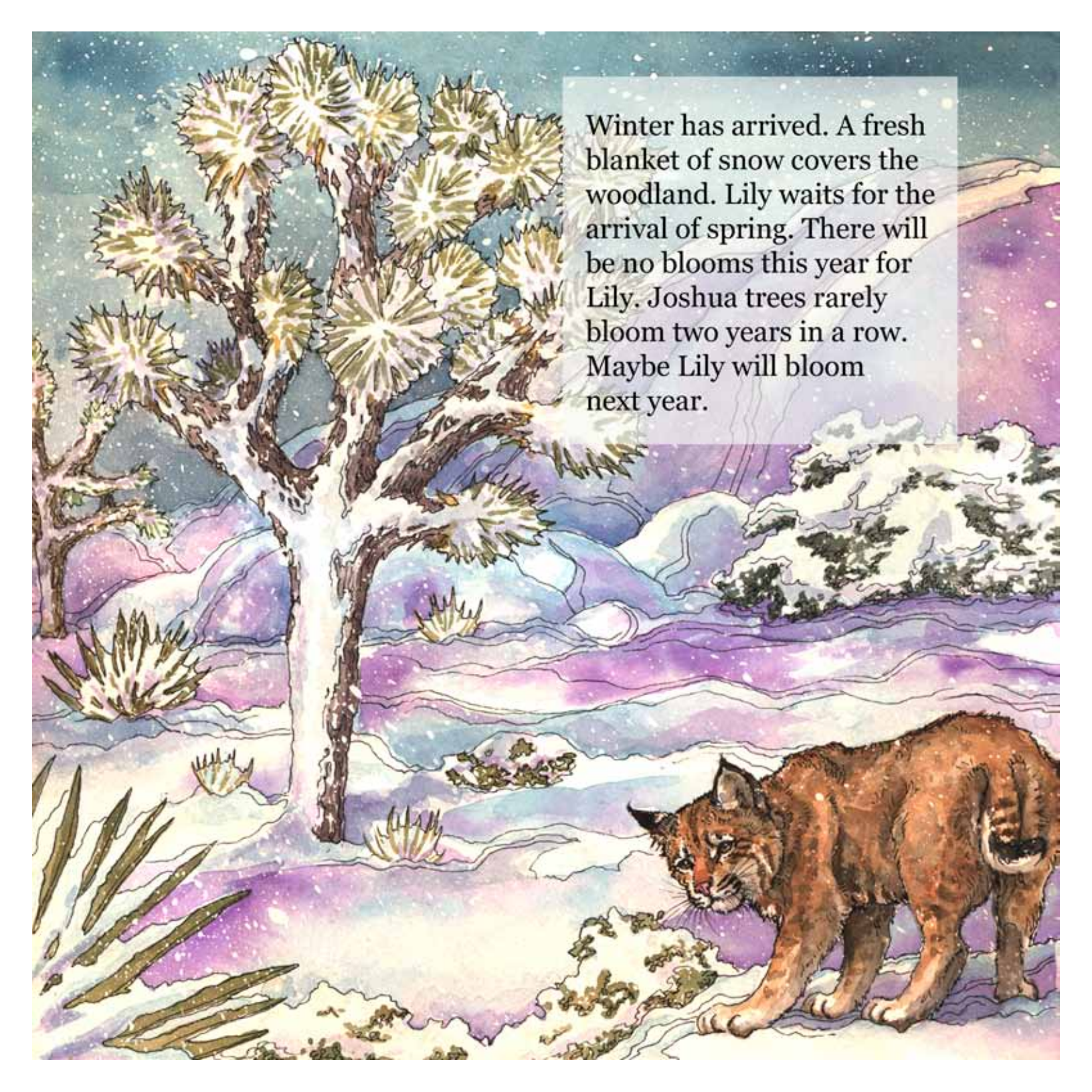


A yucca night lizard has also moved into the dead tree. The lizard feasts on the termites, its favorite food.



Eventually, the termites will break the dead tree apart and make soil that may become a place where one of Lily's seeds could land and grow.





Winter has arrived. A fresh blanket of snow covers the woodland. Lily waits for the arrival of spring. There will be no blooms this year for Lily. Joshua trees rarely bloom two years in a row. Maybe Lily will bloom next year.

