

GO! Wild

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Photos: Oregon State University - bee, Gary Stolz/USFWS - yucca

**Visit - Rocky Mountain Arsenal
National Wildlife Refuge**
For information and hours call:
303 289-0930
Visit the web at:
<http://rockymountainarsenal.fws.gov>



Pollinator species are disappearing at alarming rates. Identifying, protecting and restoring endangered and threatened species is the primary goal of the U.S. Fish and Wildlife Service's endangered species program.

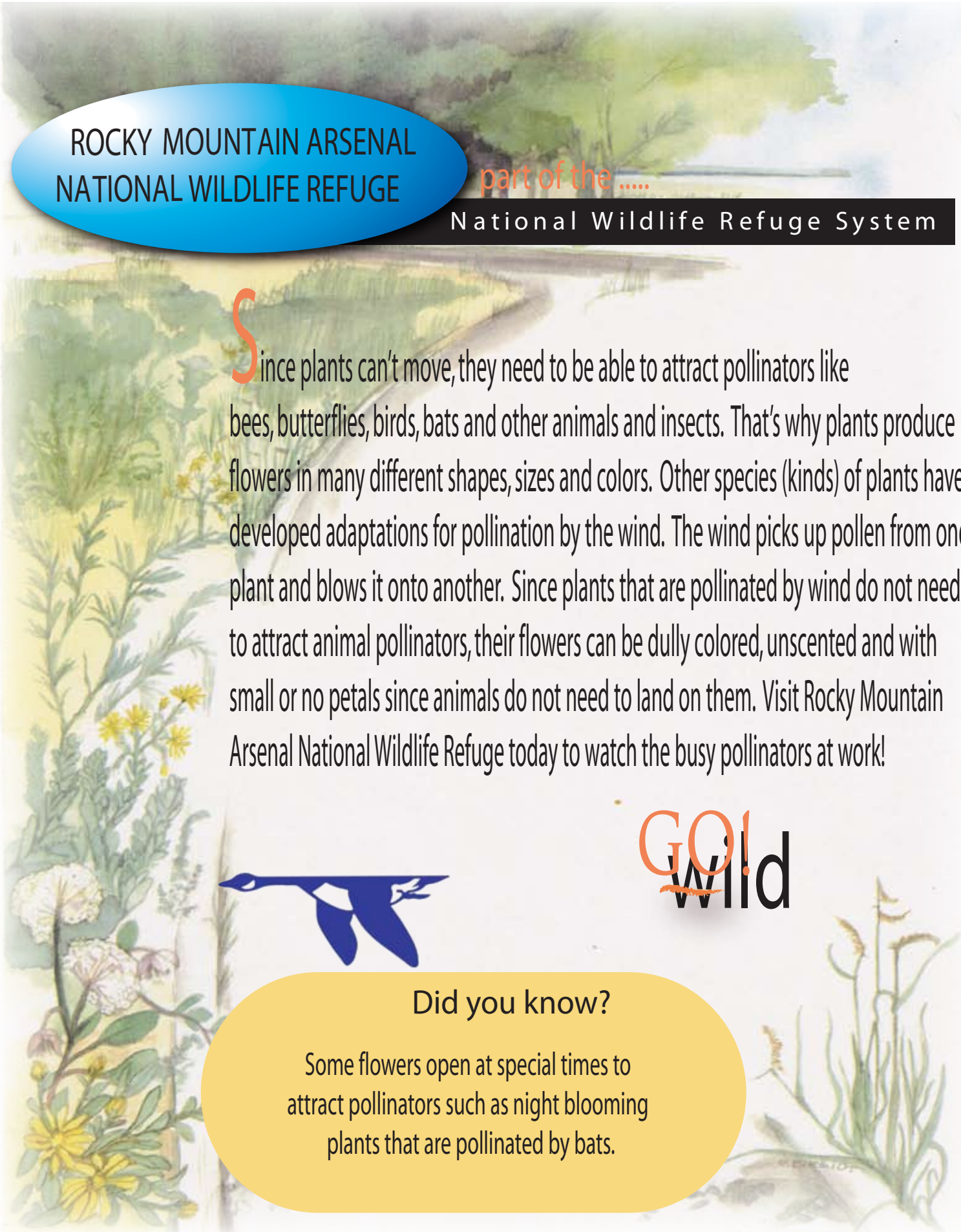




ROCKY MOUNTAIN ARSENAL
NATIONAL WILDLIFE REFUGE

part of the

National Wildlife Refuge System



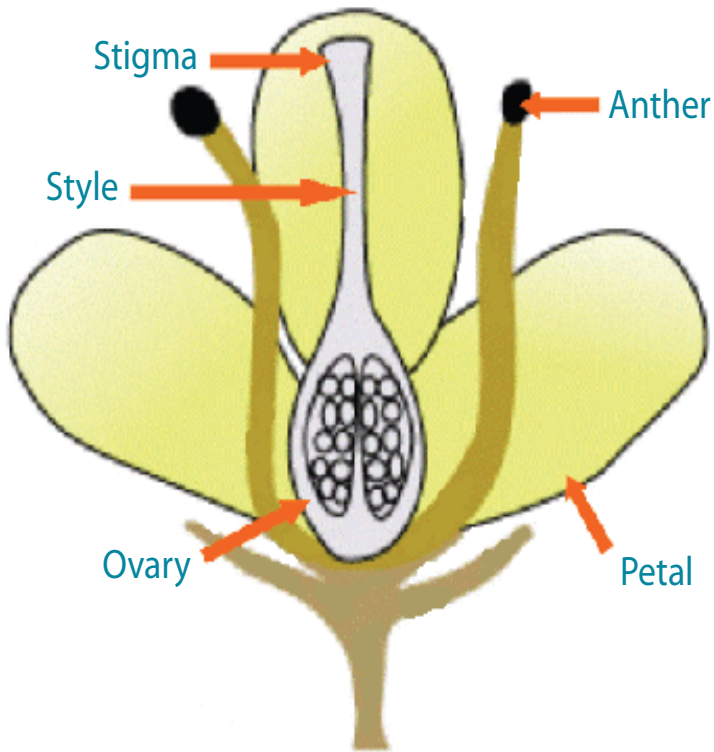
Since plants can't move, they need to be able to attract pollinators like bees, butterflies, birds, bats and other animals and insects. That's why plants produce flowers in many different shapes, sizes and colors. Other species (kinds) of plants have developed adaptations for pollination by the wind. The wind picks up pollen from one plant and blows it onto another. Since plants that are pollinated by wind do not need to attract animal pollinators, their flowers can be dull colored, unscented and with small or no petals since animals do not need to land on them. Visit Rocky Mountain Arsenal National Wildlife Refuge today to watch the busy pollinators at work!



GO!
wild

Did you know?

Some flowers open at special times to attract pollinators such as night blooming plants that are pollinated by bats.



For plants to produce seeds or fruit, they must pollinate! When pollination occurs, pollen moves from the male parts (anther) to the female parts (stigma). The pollen grains land on the stigma and a tiny tube grows from it and down the style into the ovary. We call this fertilization. The fertilized ovary becomes the fruit.



Research opportunity:

Looks matter! See if you can match the animal to the flower it would best pollinate.

HINT - visit conservatoryofflowers.org/education/butterfly_pollination.htm



Photos: Terry Wright/USFWS

Yucca

and yucca moths are an amazing example of pollination.

For lack of the yucca moth we would be lost!



★ Yucca

- pointed, stiff, narrow leaves
- bell-shaped, creamy-white flowers
- flowers every year



In spring, yuccas send up big stalks covered in flowers. A female yucca moth will crawl into a flower, carrying pollen from a yucca flower she just visited. The moth will stuff the pollen into the flower's stigma. Before the moth flies away, she will lay her eggs on the newly growing seeds. When the moth caterpillars hatch, they will eat some of the yucca seeds, leaving others to grow. It is truly a mutually beneficial or symbiotic relationship. Without the yucca moth putting pollen on the stigma, the yucca wouldn't make seeds and new yucca plants wouldn't grow. It has NO other pollinator! The yucca moth also depends on the yucca for food and shelter for her young. She doesn't lay her eggs on any other kind of plant. The yucca moth and yucca plant need each other. If one became extinct, the other one probably would, too!

Wow! Biologists have recently discovered that every species of yucca has its own species of yucca moth to pollinate it.

Did you know?

There are approximately 50 species of yucca throughout the U.S.

How Many?

A yucca moth must lay 100 eggs and can only lay 3 eggs in a yucca flower - **HOW MANY** flowers does she need to be able to lay all her eggs?

In days when Native Americans roamed the open prairie they depended on plants to help them survive. They would use almost every part of a yucca plant. Native Americans would use the strong leaf fibers to make cloth, weave baskets and sandals. The plants raw flowers were eaten in salads or boiled as vegetables and dried seed pods were ground into flour. The roots were made into soap that was used to treat rashes and the leaves and roots were boiled for tea to treat headaches.

Research opportunity:

Yucca moths are all white so they are able to hide from predators by blending in with the yucca's white flowers. What other prairie animals use camouflage to hide from predators?



The white flower of a yucca plant closes by day and opens by night. During the day, the yucca moth sleeps safely within the flower. At night, when the flower opens, the white moth comes out and guided by its sense of smell, flies from flower to flower.



Bzzzzzzzzzzzzzz...

We are the only insect
that produces food
for humans...
HONEY!



©Shattil/Rozinski

There are around 30,000 different species of bees in the world, but probably the best known is the honey bee. They are a very important insect pollinator. The honey bee is responsible for pollinating 1/3 of all the foods we eat. We would have a hard time growing fruits and vegetables if we didn't have bees or other insects to pollinate these crops. So, next time you're at a picnic think of what foods you would be able to eat if we lived in a bee-free world!

★ Bees

- insect
- four wings
- six legs
- one queen per hive
- feed on nectar and pollen



Honey bees tell each other things by "dancing". The dance tells worker bees where to find food!



Did you know?

To make a pound of honey, workers in a hive will have to collect pollen from about 2 million flower blossoms and travel about 55,000 miles!

How Many?

A honey bee queen can lay up to 2,500 eggs a day! What is the maximum number of eggs that one honey bee queen can produce in a year?

Honeybees live in hives or colonies. A small hive contains about 20,000 bees, while some larger hives may have over 100,000 bees. Hives include one queen, hundreds of drones, and thousands of worker bees. The worker bees are female, but they do not breed. The queen bee is female and creates all the babies for the hive. The drone bees are male and do not have stingers.

“Bee Smart”

I N S E C T T D F X U G U S U
 X E T B J Y V O X F M O E Z X
 M E K R W P G S G D Q P O N Z
 K U R T S I E B J T Q Z J U U
 D Q L F U V M O R S Y H R Y P
 M V M K I G H E Z P W D R T Q
 C P D H R L P L W C I F G S N
 E N O R D E R O A C I O L W E
 W H F L E T R M T C N Z Z R M
 Y Q U K L K X F T X U T B W N
 C E E W E E D L Y K E V L J G
 B E N R P T N O Y K L V A R G
 B O S O G Z M W S A N Q H H T
 S R N J H O R E H B E E F V O
 S S Z H D X M R V R A F U O E

Drone
 Honey
 Bee
 Insect
 Pollen
 Flower
 Queen
 Hive
 Worker

Research opportunity:

Write a letter to a pollinator expressing the benefits of your plant and why they should visit. For example: “Dear Mrs.. Bee, Please come visit me because”
 Ideas that you can include:

- There is a lot of nectar for you to eat.
- I am the perfectly shaped flower for you.
- You can find water and shelter with me.

4 wings - bees can fly forward, sideways and hover

Thorax

Head - 3 small eyes on top of head and 2 large eyes on side of head

Abdomen

2 antennae used for smelling and touching



6 legs used for collecting pollen

Learn about life inside a hive at www.pbs.org/wgbh/nova/bees/hive.html. Then visit Rocky Mountain Arsenal NWR to see a real bee hive in action!





John and Karen Hollingsworth

Cabeza Prieta National Wildlife Refuge in Arizona is the third largest refuge in the lower 48 states encompassing 860,010 acres. It is home to many beautiful cacti like the towering saguaro and an important flyway for many migrating birds - like the Rufous hummingbird. Each spring while migrating to their breeding grounds up north, the hummingbird will fly from plant to plant sipping the nectar from the blossoms in turn pollinating each flower with pollen collected from previously visited plants.



Dean Biggins / USFWS

The Rufous hummingbird makes one of the longest migratory journeys of any bird in the world, as measured by body size. Its 3,900 mile journey from Mexico to Alaska is equal to 784,500 body lengths!

HELP! Rufous has lost his way. Can you help the humminbird find its way to the flowers on the catus?

