

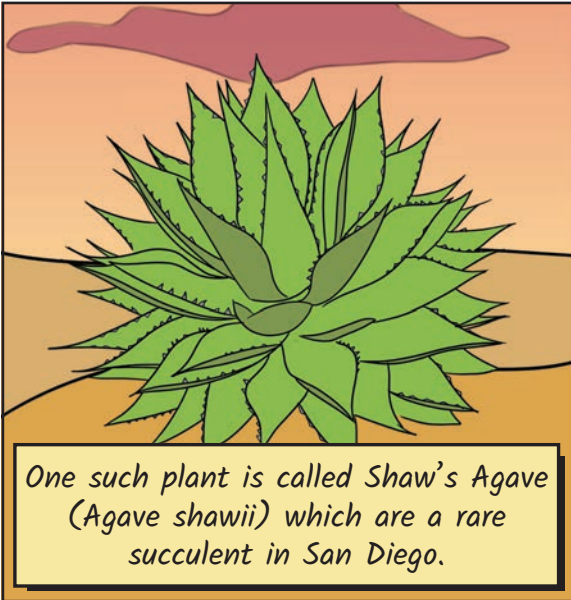
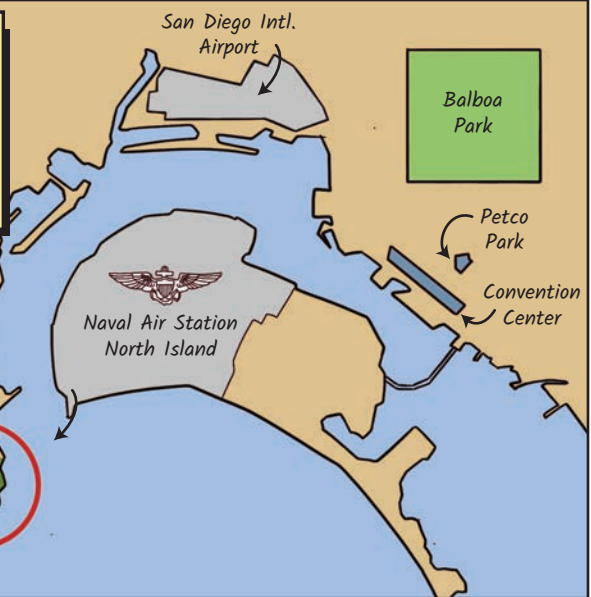
# BATTY ABOUT AGAVE



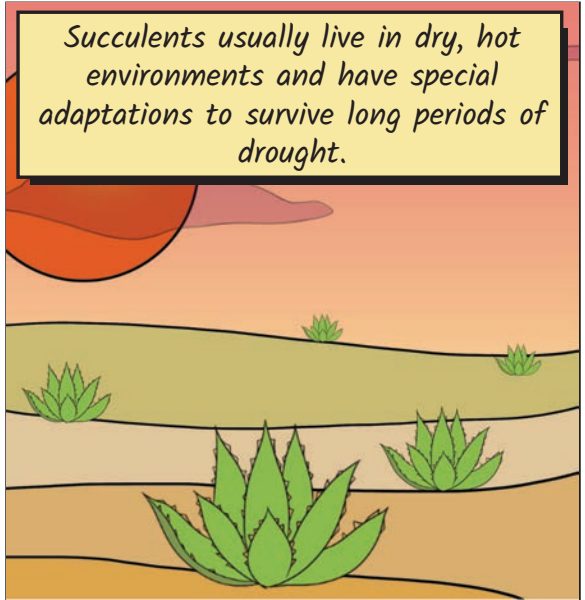
At the tip of a peninsula in San Diego lies Cabrillo National Monument (CNM). This preserved and protected space in the National Park System is home to **endemic** species of plants.



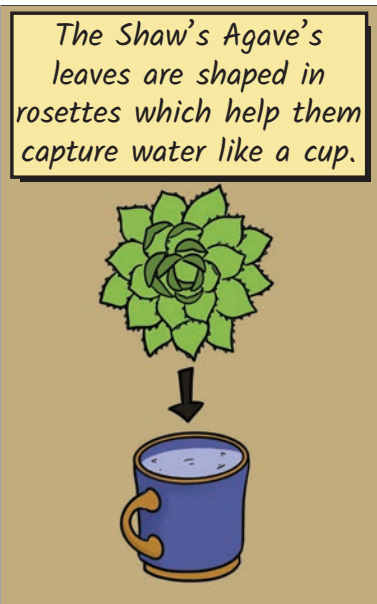
**Cabrillo National Monument**



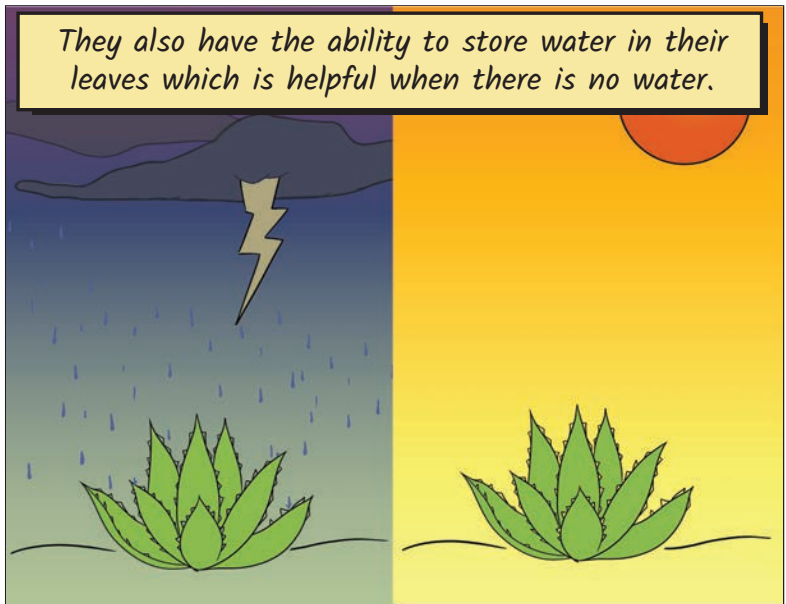
One such plant is called Shaw's Agave (*Agave shawii*) which are a rare succulent in San Diego.



Succulents usually live in dry, hot environments and have special adaptations to survive long periods of drought.



The Shaw's Agave's leaves are shaped in rosettes which help them capture water like a cup.



They also have the ability to store water in their leaves which is helpful when there is no water.

Shaw's Agaves take 20-50 years to mature when they shoot up a long stalk called an **inflorescence**.



At the top of this stalk, a cluster of flowers will bloom.



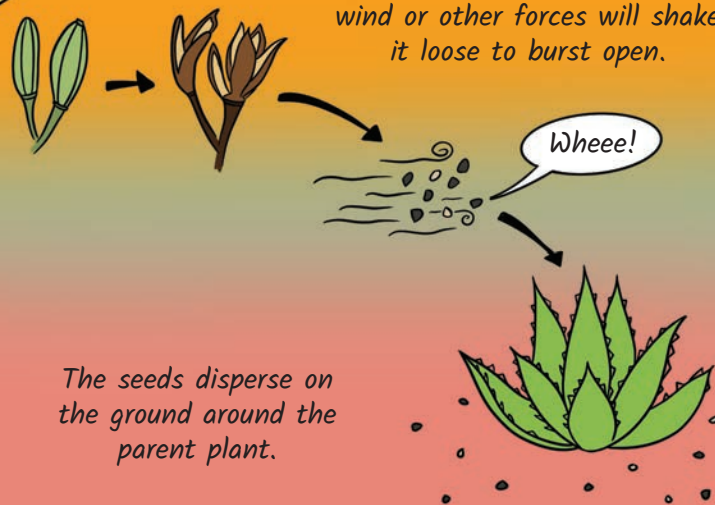
The flowers contain the reproductive organs of the plants and the **pollination** of the flowers is a key part of their sexual reproduction.



After pollination, baby plants develop into many seeds in a seed pod.



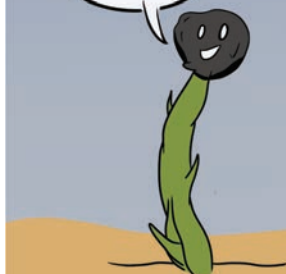
As the seed pod dries out, wind or other forces will shake it loose to burst open.



The seeds disperse on the ground around the parent plant.

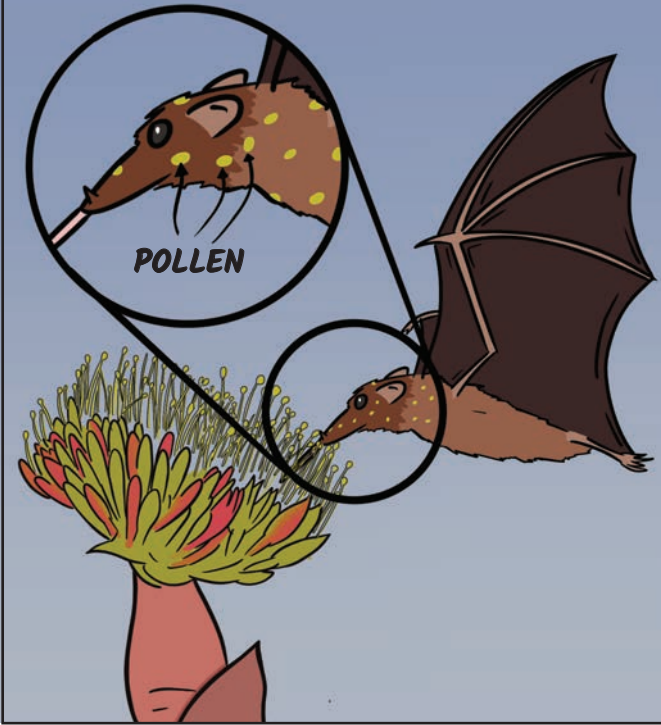
Pollination is important for the survival of a species, as new offspring will ensure it lasts for generations.

I am AGAVE!

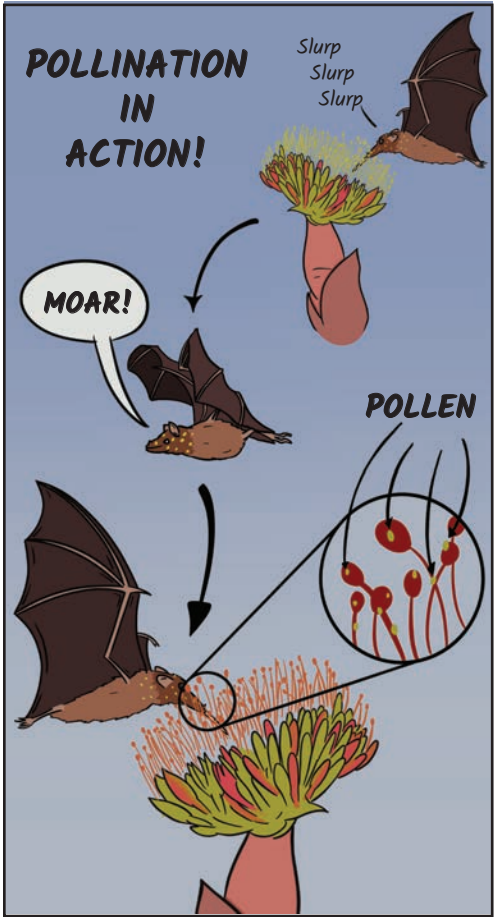




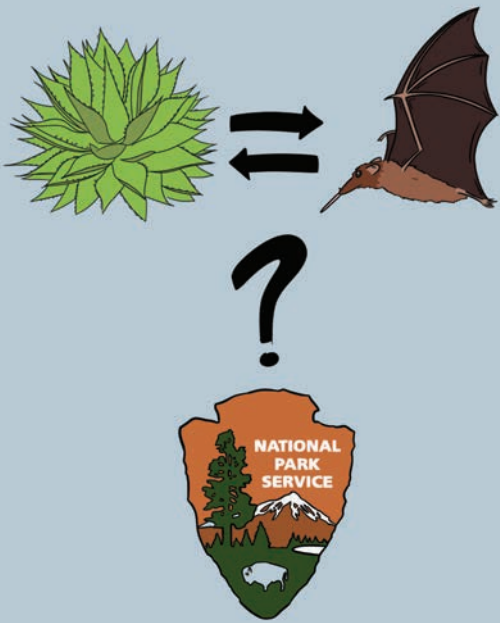
This plant is pollinated by a special group of animals - bats! Specifically, the Mexican Long-tongued Bat (*Choeronycteris mexicana*).



**POLLINATION  
IN  
ACTION!**

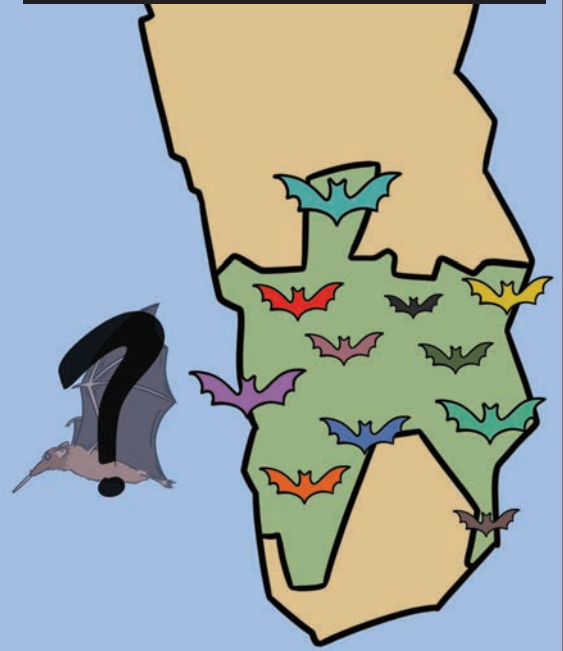


We know so much about bat-agave interactions because of scientists like Dr. Kristen Lear. Kristen is a bat **conservationist** who studies how bats relate to their environment, like the plants **nectarivorous** bats pollinate.

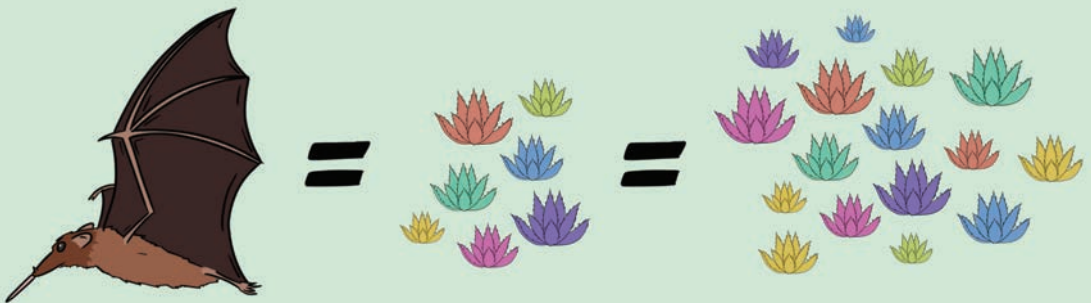


Understanding the different **ecosystems** and the species that live there is essential for conservation organizations like the **National Park Service (NPS)** to preserve and protect them.

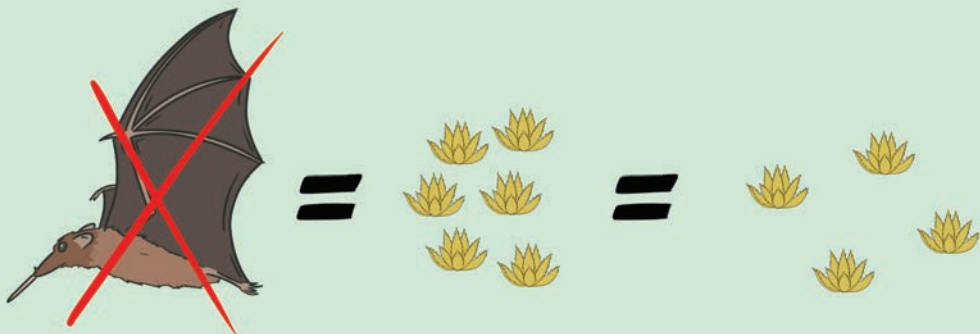
Unfortunately, though eleven species of bats have been detected at CNM, none of them have been the Mexican Long-tongued Bat.



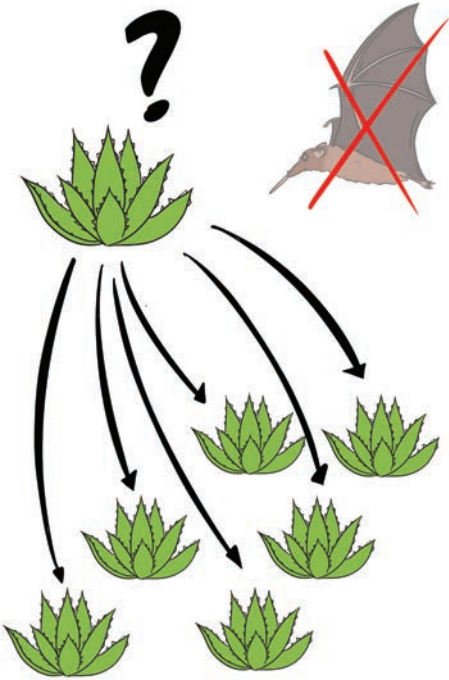
NPS scientists are worried that, without pollination from the Mexican Long-tongued Bat, there is low genetic diversity in CNM's agave population.



Genetic diversity - or variability in a species' **DNA** - is important for most species' survival.



So how are the Shaw's Agaves at CNM currently reproducing without their primary pollinator?

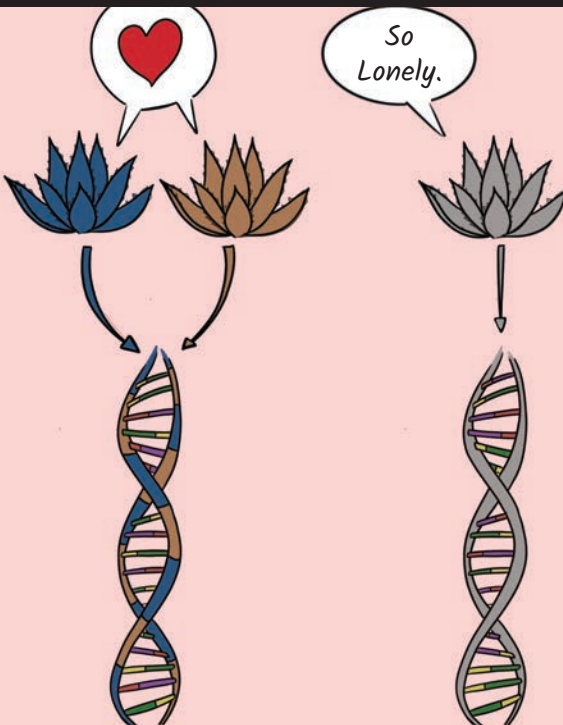


They look just like me!



By **cloning** themselves! Cloning is a type of asexual reproduction, a method for organisms to reproduce without two parents.

Instead of a mixture of DNA from two parents, clones are an exact copy of one parent - they are **genetically identical** meaning their DNA is 100% the same.



If Shaw's Agaves can reproduce asexually, why are scientists worried about pollination? Find out when you visit CNM!

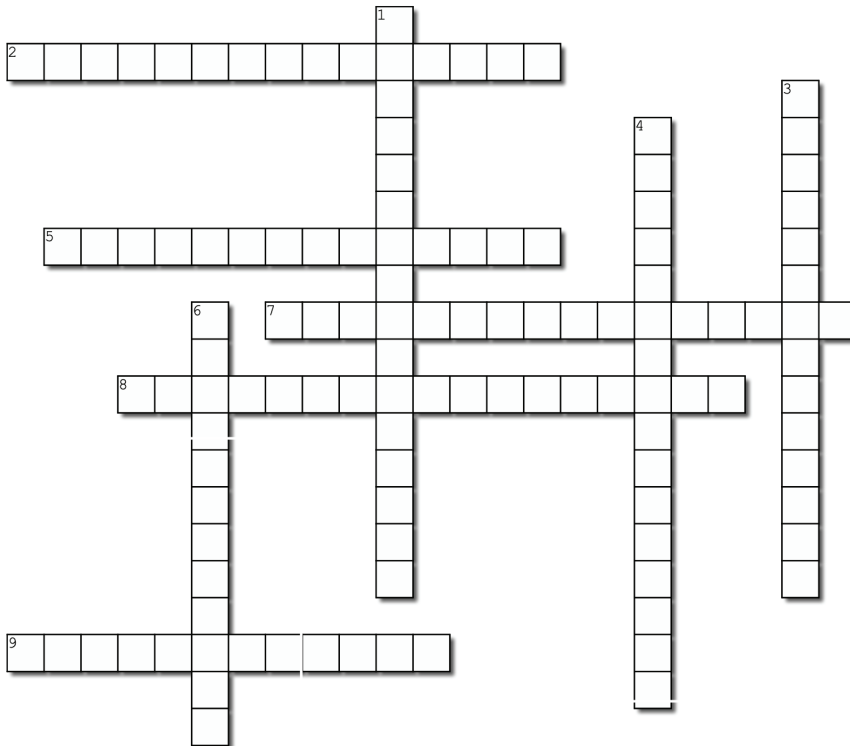




Name: \_\_\_\_\_

Read the definitions, then use the hints to fill in the crossword puzzle below. Hint: #3 is abbreviated!

- **Biodiversity** - the variety of life in the world or in a particular habitat or ecosystem.
- **Mass extinction** - The extinction of a large number of species within a relatively short period of geological time.
- **Ecological island** - an area of land which is isolated from the surrounding land.
- **Population bottleneck** - an event that drastically reduces the size of a population. The bottleneck may be caused by various events, such as an environmental disaster, the hunting of a species to the point of extinction, or habitat destruction that results in the deaths of organisms.
- **Genetic diversity** - is the diversity or variability of genes within species, a community or group.
- **Habitat fragment** - when a large expanse of habitat is transformed into a number of smaller patches. These patches are "fragmented", or isolated from each other.
- **Invasive species** - is an organism that causes harm in a new environment where it is not native.
- **Ecosystem services** - the contributions of ecosystems to human well-being. They support our survival and quality of life, such as clean water or air.
- **Urbanization** - the process by which large numbers of people become permanently concentrated in relatively small areas, forming cities.



### ACROSS

- intruder alert!
- what happened to the dinosaurs?
- cut into pieces.
- helpful to humans.
- the opposite of becoming rural.

### DOWN

- an assortment of jeans.
- find a message in one of these.
- not quite where Gilligan landed.
- variety is the spice of life!

# KNOW BEFORE YOU GO

*On your virtual field trip, you'll be digitally visiting one of our nation's most culturally, historically, and naturally valuable places! Cabrillo National Monument is part of the National Park System, which means it is preserved and protected land. To make your virtual field trip enjoyable please follow these guidelines:*

- **Be prepared** – make sure you have read the comic book and finished your crossword puzzle.
- **Be polite** – raise your hand when you wish to speak and do not interrupt each other: Please keep mic muted unless you are instructed otherwise. If comfortable, please turn on your camera. The use of an appropriate background is fine. All voices are welcome! This is a discussion where curiosity, questions, and respectful dialogue is encouraged.
- **Be present** – come awake, alert, and ready to learn.
- **Have fun** – enjoy digitally exploring San Diego's only National Park!