

THE LIVING DESERT ZOO AND GARDENS LECTURE NOTES

Definition of a desert:

- Less than 10 inches of rain a year
- When evaporation exceeds precipitation

What are the causes of evaporation?

- High temperatures
- High solar radiation
- High winds

What are three different ways a desert can form?

1. high atmospheric pressure in this region can cause dry, cold air from the upper altitudes to compress and come down to earth. causing high ground temperatures with very low humidity.
2. Rain shadow effect
3. An area in a climate that is so cold, that the air can only hold a small amount of moisture.

What is the cause for our local deserts?

- Rain shadow effect

The Deserts of North America

1. Great Basin Desert – Calif., Utah, Nevada, and Idaho
Cold Desert – 150 + basins
2. Mohave – California, Nevada, Arizona
Hot desert – less than 6 inches of rain per year
Death Valley – Lowest point in U.S. –
Badwater CA - 282 feet below sea level
Air temps = 120 degrees (134 degrees is record)
3. Sonoran Desert – CA, Arizona, Mexico
Hot desert – Young (10,000 years old) subtropical
Air Temps: 120 degree
4. Chihuahuan desert – Arizona, N Mexico, Texas, Mexico
Hot desert – higher elevations



Deserts of the World

% of earth's surface: 33%

Largest (size): Saharan (3.3 million sq miles)

Smallest (size): Carcross (1 sq mile)



Animal Adaptations

What are the four modes of gaining or losing heat to and from the environment?

Ectotherm:

Poikilotherm:

Endotherm:

Homeotherm:

Small Animal House

Rattlesnakes:

Western Diamondback:

Largest
Hemotoxic

Speckled:

Hemotoxin

Mojave:

Hemotoxin
Presynaptic neurotoxin
May be most toxic

Southern Pacific:

Hemotoxin
Neurotoxin

Sidewinder:

Movement - eyes



Small Animal House (cont.)

Constrictors:

Common King Snake: Boa Constrictor – kills rattlesnakes (immune to Venom) but also eat rodents, lizards, birds and eggs

Gopher Snake: Boa Constrictor – eats rodents, acts like rattlesnake
Will coil and even shake tail – round pupils -



Other Animals:

Desert Iguana:

They are capable of tolerating body temperatures of 42 °C (108 °F) which is higher than any known vertebrate.

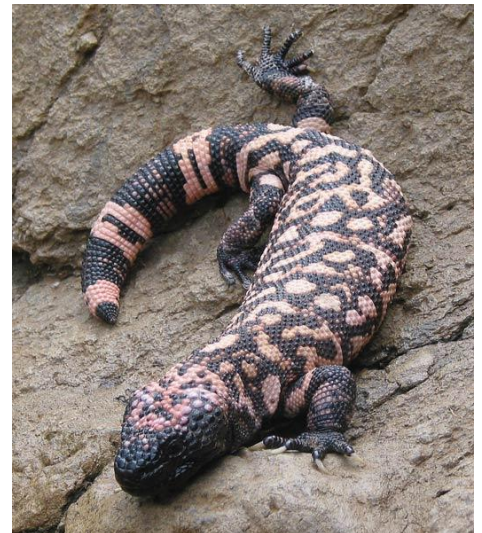


Gila Monster:

One of three venomous lizards

Beaded Lizard

Komodo Dragon



Plant Adaptations on Pathway:

Fremont Cottonwood:

Long Petioles for wind
Introduced by settlers



Palo Verde:

Green Stem – State tree of Arizona
Most common tree of the Sonoran Desert
Drought Deciduous
Spiny stems
Grows on slopes (washes)
Nurse plant for Saguaro cactus
Scarification of seeds

Cactus:



Barrel Cactus:
Designed to hold water
Dirty Cactus – antibiotics for bad cuts
2 genera

Beavertail Cactus:
Chladophylls
Glochids

Mojave Prickly Pear:
spines and Glochids

Saguaro:
State flower of Arizona
Sonoran Desert
Up to 75 years to grow a side arm



Other Desert Plants:



Desert Willow:
Both deserts
Desert washes
Not a true willow – on family
Indicator of higher water table



Smoke Tree:
common to Joshua Tree NP
Desert Washes
Pea family
leaves only 3 weeks a year
PS through stems



Honeylocust Mesquite:
up to a 200 foot tap root

Mojave Desert Plants:



Creosote:
Oldest tree 11,700 year old clone
Grows uniform – like
Use to think chemical
very good at absorbing water

Both deserts
antioxidants



Joshua Tree:
Yucca family
monocot
age by size
Prophet Joshua
agave family



Mojave Yucca:

Mojave Desert Animals:

Desert Tortoises:

Just removed from
Endangered species list
Numbers down due to:

- Pet trade – Virus in captive tortoises get out in population
- Stress in wild causes issues
- Eaten by Ravens
- Only young are vulnerable
- Ravens have increased due to humans in desert



Mourning Doves: Suck up water

Red-tailed Hawk: 4 ft wingspan

- Up to 3.5 lbs
- Most common large hawk in U.S.
- Eats Rodents
- Females larger than males
- Sit on nest
- Allows for resource partitioning



Cactus Wren:

Multiple nests



Gambel's Quail:

Up to 50% of their water
104 but can raise temp



Sonoran Desert Plants



Ocotillo:

Sonoran desert
leaves for several weeks
PS through stem
Red flowers - migrants



Jumping Chollo:

cactus with spines that jump
from species to species

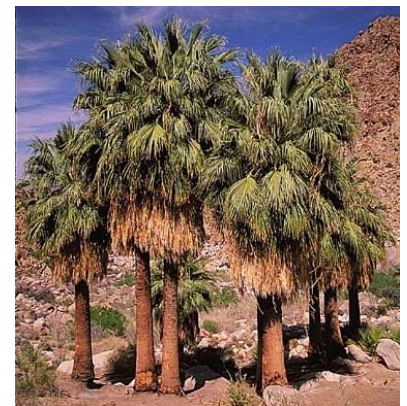


Saltbush:

secrete salt

California Fan Palm:

Only native palm in U.S.(keep skirt) – adapted to fire –



Sonoran Desert Animals

Desert Pupfish:

Up to 100 degrees
High salinity



Harris Hawk: Found in Arizona

Wolves of the sky – “Cooperative Hunting”

Will share food – unusual for a hawk

One will go to ground and chase out prey which others catch on the other side

Oasis Animals



Green Heron



Black-crowned Night Heron:



Great Egret:



Turkey Vulture:



Roadrunner:



Great Horned Owls: (Hoot)



Barn Owls: (Screech)

14 cervical vertebrae (turn head 240 degrees)
Ears not symmetrical to hear prey and judge distance

Vizcaino Desert of Baja:

Elephant Trees:

Found in Anza-Borego
Trunk makes up for
fluctuating water amounts



Boojun Tree:

Related to Ocotillo
Baja Calif.
Dr. Seuss – The Hunting of the Snark

Eagle Canyon



Coyote:

Evolved in NA in Pleistocene
Increased due to man
15 – 45 lbs
Run – Omnivores



Golden Eagle:

6 – 7.5 inch wingspan
3.5 feet tall
Eats rodents, rabbits,
8-11 lbs

Eagle Canyon (cont.)



Mountain Lion: largest small cat
About 8 ft long
Males weigh up to 220 lbs



Thick-billed Parrot:
In U.S. – Arizona
Endangered – eat pine nuts
In danger due to habitat destruction



Bobcat:
small cat
up to 4 ft long
Up to 40 lbs
Ambush hunter



Ringtail:

Raccon family
Also called a miner's cat
Not a cat
Very agile
Used to hunt mice



Badger:

Weasel family
Huge front claws for digging
found in prairies
Will hunt with coyote
badger chases underground
share food



Javelina:

not a true pig
3 stomachs/nonruminating
found near water holes
do not regulate their body
temp well



Mexican Wolf:
Use to most widespread mammal
In the world



Coati: raccoon family
turn ankles 180 degrees
go head first down tree



Jaguar: Rosettes w/ spots
Large cats – once thought to
be extinct in U.S. (Texas)



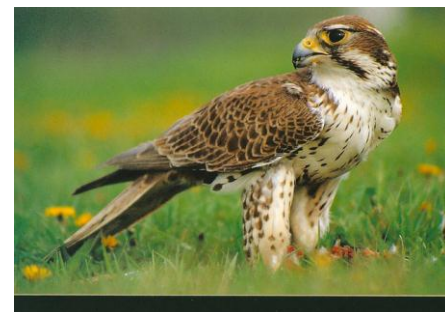
Burrowing Owl:
Diurnal
nest in ground
babies click to
sound like rattlers



American Kestrel:
smallest falcon in U.S.
eat insects
Kiting – hovering
over fields



Peregrine Falcon:
fastest animal on planet
220 miles per hour
hunt birds



Prairie Falcon:
desert bird



Big Horn Sheep:
Horns weigh 40 lbs
Males fight for females
Must go to water hole every three days



Pronghorn
fastest land mammal in U.S.
Fast because of American Cheetah
Curious – hunters draw them in with
White flag

African Animals:



Arabian Oryx:
Found in Middle East
Extinct in wild since 1972
Bred in captivity
Live in areas that are extremely hot
Non aggressive for an oryx
Unicorn myth



Meerkat:
Mongoose family
Social (unusual)
Altruistic behavior



African Wild Dogs:
Hunt in packs
Chase prey long distance
2 dogs chase until tire and
then replaced with other



Zebra:
Stripes for confusion effect
Animals aggressive
Genetically want to be next to stripes
(stand by painted wall)



Cheetah:
Fastest land mammals
60-70 miles a night
only for 1 minute
overheat quickly
Most dog-like cat
Semiretractable claws



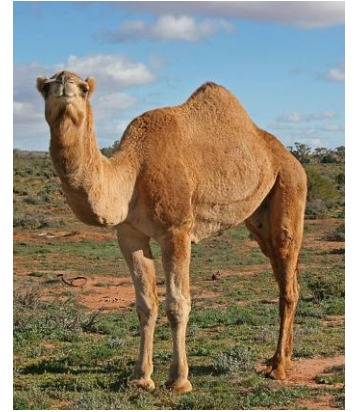
Warthog:
True Pig
Tusks – upturned canines
warts may be for attraction
or protection
being hunted for fear of
Swine Flu



Leopard: smallest large cat
Rosettes with no spots
Carry prey into trees to avoid
Other predators



Hyenas:
very strong jaw
aggressive
high testosterone – female with
Pseudopenis



Camels
Dromedary – one hump
Bactrian – two humps (fat)
adapted to desert
Ship of the desert
Lose up to 30% of weight in
water



Giraffe:
18 feet tall
7 vertebrae
Ossicones – calcified cartilage (thermoregulation)
Necking – maybe why they have long necks
18 inch tongue
Trifurcate teeth to deal with thorns on Acacia
25 pound heart to pump blood up neck



Ostriches:
8 ft – 320 lbs
Males - Black
Female - Gray
Males make nest – multiple females
lays eggs in nest
Males care mostly for young
Can break femur in our legs

Hunan Survival in the Desert

	Maximum Temp (degrees f)	Days of Survival
Person at Rest	120	
	110	
	100	
Person Walking	120	
	110	
	100	

Animal Show Notes:

Animal:

Characteristics: