



**ANIMAL WELFARE ASSESSMENT CONTEST 2023**



# Desert Tortoises Scenario

2023 Animal Welfare Assessment Contest

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# Advisory

- THESE ARE FICTITIOUS ANIMALS AND SITUATIONS. They have been created using pictures and information collected from multiple sources to generate realistic, yet fabricated scenarios. Neither situation exists as presented here.
- Please use the images provided throughout the presentation as well as text when making your assessment.

# Quechan Mountains Museum

**Species:** Sonoran Desert Tortoise (*Gopherus agassizii*)

- 3 ♂ (Kofa 9y, Dome 8y, Noti 3y)
- 4 ♀ (Xawitt ~25y, Cocopah 10y, Laguna 8y, Colorado 5y)

**Animal Origin:**

- Noti and Laguna were hatched at the Museum
- Other tortoises were taken illegally from wild by others as young hatchlings then either relinquished to Museum or brought in by to Fish and Game

**Location:** Quechan Mountains Museum

- AZA accredited
- Desert Tortoise SSP and TAG member
  - Breeding to support conservation and transfer to other ZOOS
- USFWS Desert Tortoise Recovery Program Partner
- State FW Tortoise Adoption Program Partner



# Ohlone Islands Zoo and Aquarium

**Species:** Sonoran Desert Tortoise (*Gopherus agassizii*)

- 2 ♂ (Caldera ~9y, Hoodoo 8y)
- 2 ♀ (Cinder ~12y, Ember 8y)

## Animal Origins:

- Hatched in a southwest zoo as part of an AZA/USFW conservation breeding program
- Five years ago, the four tortoises were shipped 350 miles (563 km) to current home for use in education programming

**Location:** Ohlone Islands Zoo and Aquarium

- Desert Tortoise SSP
- State FW Tortoise Adoption Program partner



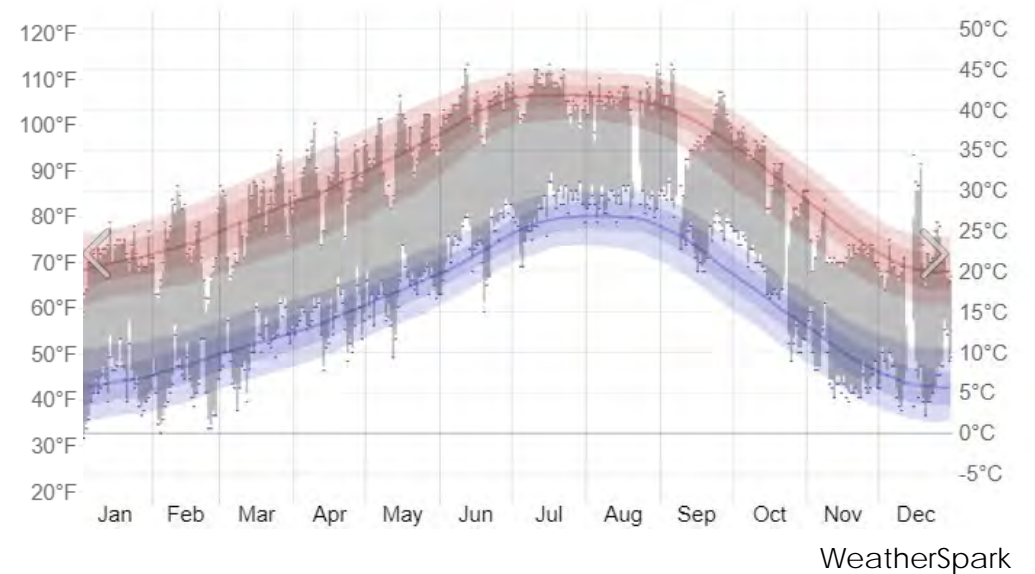
# Quechan Mountains Museum

## Climate:

- Dry Arid Low Latitude: Hot arid summer

## Museum Characteristics:

- 22 acres (8.9 hectares) in rural setting
- ~230 species – specializes in species indigenous to local desert
- Museum and nearby Apatros Mine Conservation Society collaboratively manage 421 acres (170.3 hectares) for wildlife conservation



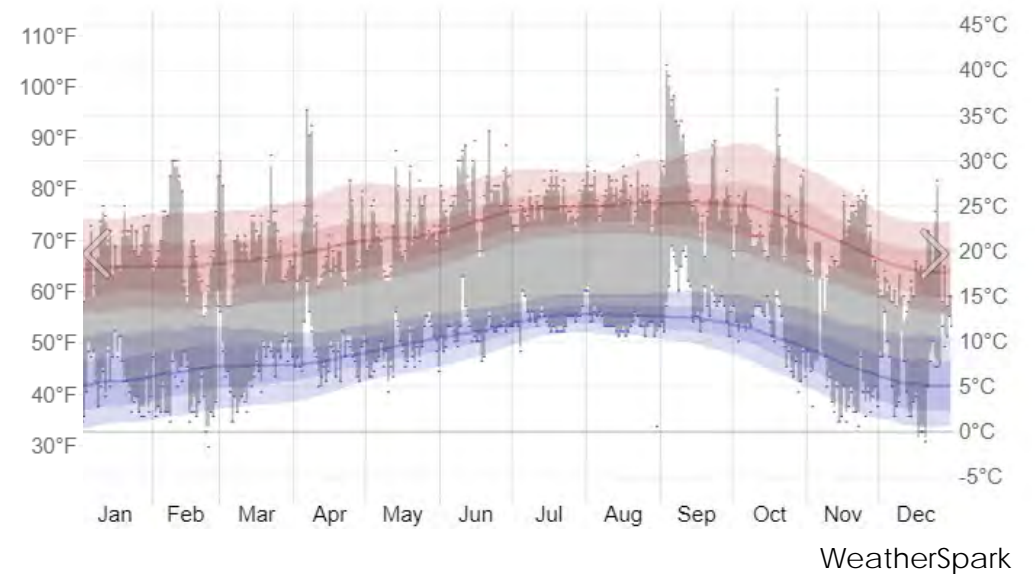
# Ohlone Islands Zoo and Aquarium

## Climate:

- Mediterranean: dry | warm summers

## Zoo and Aquarium Characteristics:

- 128 acres (51.8 hectares) in suburbs
- ~600 species in collection
- Zoo and aquarium facilities managed by State University – Ohlone Islands. The University shares the land with Dune and Sea State Park (1,000 acres | 404.7 hectares)



# Personnel

## Quechan Mountains

**Curator of Herpetology and Ichthyology:** BS in Conservation Ecology, Tortoise TAG member. Oversees all reptile and fish collections

### **Four Full-time Herpetology Keepers:**

- Care of all museum reptiles (~382 animals)
- BS in Evolutionary Biology or Conservation
- All took AAZK development course on reptile care
- Worked at zoo for between 3 and 10 years

### **Six volunteer educators:**

- Trained by care team
- Two have >5 years experience
- Four are new

## Ohlone Islands

**General Curator:** MSc in conservation science. Oversees all animal collections

**One Director of Education** with doctoral degree in K-12 education. Supervises education team







### **8 Full-time Educators:**

- Education team is responsible for care and management of the four tortoises and other education program animals (50 animals)
- 7 educators: BS in biology, conservation, or psychology
- 5 educators: certification or an associate degree in positive reinforcement training (PRT)
- Lead and relief lead: bachelor and associate degrees, respectively, in animal training



# Facility Design: Quechan Mountains



-  **Total:** 10,000 ft<sup>2</sup> (3048 m<sup>2</sup>) walk-through style outdoor exhibit
-  Exhibit border 3ft (0.9m). The bottom of the exhibit is lined with wire mesh buried 48 in (121.9cm) below the surface
-  Tortoise area (2,300ft<sup>2</sup> (701 m<sup>2</sup>)). Subdivided into three interconnectable plots
-  Tortoise passages between habitats (under guest walkway)
-  Education Cart Areas
-  Arroyo/wash (shallow streambed, dry most of year)

**Notes:** Natural landscape includes native plants, friable soil, rocks, boulders, and ravines



# Facility Design: Ohlone Islands

## Outdoor Education Compound

Sexes managed separately in 36ft<sup>2</sup> (10.9m<sup>2</sup>) pens.  
Compound housing is not visible to the public

Hutch/Burrow filled with hay, shredded paper.  
Includes supplemental heater (95°F (35°C))



Ceramic  
drinker/soak  
station

30in  
(76.2cm)  
wall height

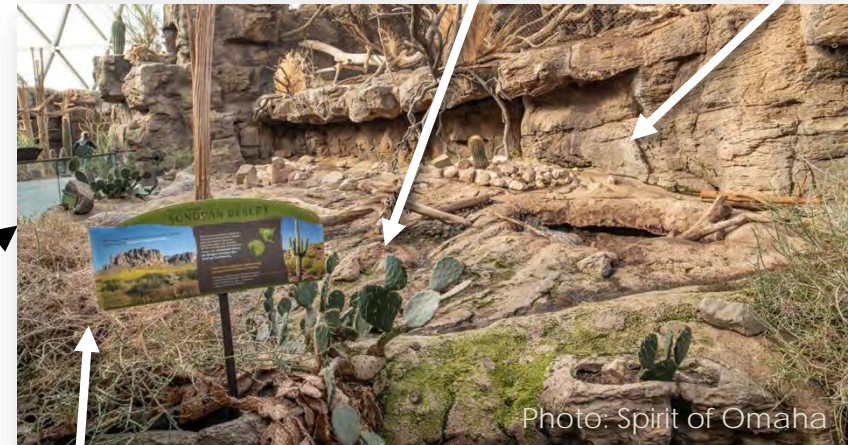
8in (20cm) deep  
dirt substrate

Tortoises are moved between  
spaces via crate at the end of  
the day. < 5 min walk between  
these spaces and to ed. center

## Reptile Dome

Sexes managed separately in 100ft<sup>2</sup> (9.3m<sup>2</sup>)  
display habitats

Native plants with artificial  
rockwork. Covered with soil  
and stones



8in (20cm) deep  
digging area w/  
drinker/soak station

Dome is climate  
controlled to  
average 85°F (29°C)  
during the daytime

# Social Management

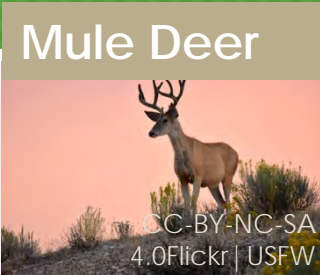
## Quechan Mountains

Tortoises are managed in one group and used opportunistically for education programs. They share their habitat with:

- Five collared peccaries
- 16 jack rabbits
- 7 skunks
- 6 mule deer
- Various free-range wildlife species (e.g., reptiles, birds, insects)

Breeding occurs naturally

- ~16-25 eggs laid each year
- Some are allowed to hatch;
- Young are exported



## Ohlone Islands

- Tortoises are scheduled to spend four days on education program and three days off per week.
- Educators try to manage the tortoises in same sex pairs. Each spends two to three days a month housed individually

		Su	M	T	W	R	F	SA			
Caldera	♂	On Program	Off Program	Off Program	On Program	Off Program	Off Program	On Program			
Hoodoo	♂	Off Program	On Program	On Program	Off Program	Off Program	On Program	On Program			
Cinder	♀	On Program	Off Program	Off Program	On Program	On Program	Off Program	Off Program			
Ember	♀	Off Program	On Program	On Program	Off Program	Off Program	On Program	On Program			

- Tortoises share space with chuckwalla and beaded lizards in the Reptile Dome

# Hibernation

## Quechan Mountains

- Tortoises select and dig burrows in habitat. Hibernation begins in October when soil is below 50°F (10°C)
  - If a tortoise hibernates outside of a burrow, keepers contact the vet for a health check
  - If healthy the tortoise is moved to a burrow
  - If tortoise does not pass the health check, it is moved to the hospital for monitoring
- Tortoises emerge in late February / early March



CC-BY-NC-SA 4.0: Flickr: Joshua Tree National Park

## Ohlone Islands

- Care team shifts all tortoises to off-exhibit area of the reptile house in late October for hibernation
- Tortoises placed in cool dry hibernation boxes
  - Box lined with straw and shredded newspaper
  - Room kept at 45°F (7°C); humidity at 35%
  - Tortoises offered water every 4-6 weeks during hibernation
  - Tortoises weighed every three weeks
- Room temperature slowly elevated to match outdoor temperature in late March
  - Tortoises are monitored for activity
  - When activity noticed, moved to Reptile Dome for two weeks of acclimation and monitoring



# Diet: Quechan Mountains

- Habitat includes native and planted food items:
  - Cottontop, bamboo muhly, deer grass, and curly mesquite (>70% of diet)
  - Cassia, spurge, globe mallow, prickly pear pads, rock hibiscus, and other flowering plants (~30% of diet). If not available in the habitat, these are integrated into enrichment
- Prickly pear fruits are offered as reward after education events and with enrichment (<2% of diet)
- Sediment and stones in habitat support lithophagy



Adult ingesting stones



# Diet: Ohlone Islands

- Bermuda grass, alfalfa, and clover grasses are placed in temporary portable grazing gardens (~25% of diet)- always available.
- Leafy green vegetables (e.g., collards, dandelion, escarole, endives, grape leaves, mustard greens, and watercress)(~60% of diet) – always available.
- Vegetables and fruit rewards for participating in education programs (e.g., acorn squash, bell peppers, butternut squash, apples, pears, carrots, green beans, prickly pear fruits, and sweet potatoes)(~8% of diet).
- Monkey chow biscuits (~7% of diet) as part of enrichment activities or as reward for participating in education programs.



# Health Care



## Quechan Mountains

### Veterinary Care:

- Three fulltime veterinarians on staff. One specializes in reptiles
- Animals are given two vet checkups annually. One prior to hibernation and one after hibernation
- Veterinarians are on call
- Care team performs health and behavior checks weekly, and concerns are reported to the veterinarians

### Disease risk:

- Tortoises share space with free-range wildlife

## Ohlone Islands

### Veterinary Care:

- Six fulltime veterinarians on staff. Two have specialization in reptiles. A third “backup vet” specializes in birds
- Animals have quarterly vet checkups
- Veterinarians are on call
- Educators complete health and behavior reports daily, and the electronic records are accessible to the veterinary team

# Education Program Activities: Quechan Mts

- Three 30-minute education programs offered daily featuring multiple species (reptiles, birds, insects)
- ~15 minutes before beginning the team sets up an education station along the guest path in the walk-through exhibit space
- Educators enter habitat and pick up one to two tortoises
  - Tortoises temporarily housed in tubs until used for discussion
  - Tortoises are often picked up and placed down quickly
  - Smaller tortoises sometimes picked up with one hand
- Educators show guests the tortoises
  - Guests can touch shells and the plastron
  - Some educators rotate the tortoises side over side to show the plastron
- After the program tortoises are returned to their habitat





# Education Program Activities: Ohlone Islands

- Two 45-minute programs offered daily featuring a variety of species (reptiles, mammals, birds, insects)
  - Individual tortoises used <10 minutes per session
  - Positive reinforcement focused interactions
- Opportunity to participate announced: 20 min prior to transport (30 min prior to public program), the care team places a transport crate in the habitat, rings a bell, and turns on a red light
  - Interested tortoises enter their crate <10 min
  - Uninterested tortoises are not used, educators use plastic models instead
- After being carried to the ed. center, tortoises touch target placed on crate door
  - If touches, the tortoise is gently removed with two hands and placed on ground for demonstrations
- After session: tortoise gets high value reward
- After the last session of the day: tortoises returned to the next day's housing (compound or dome)

## Education Programs Events Include:



Photo: Indianapolis Zoo

Target training demos \*

\*This is a radiated tortoise. The Ohlone desert tortoises were camera shy.

Photo: Kid Space Children's Museum



Discussions about desert tortoise conservation, behavior, and physiology

Children interact with tortoise on flat surfaces



# Enrichment: Quechan Mountains

Enrichment philosophy focuses on naturalistic experiences

- Enrichment opportunities are offered 2 times per week. The day and time is randomly selected
- The team ensures there are more enrichment opportunities per session than there are tortoises

## Portable Gardens

- Fresh grasses and flowers planted in the habitat

## Buried Treasure

- Prickly pear fruits attached to pads sticking up out of the ground as if planted

## Furniture Move

- Exhibit rocks, boulders, and logs are shifted



Photo: AZPM

Tortoises navigating habitat after a furniture move



Photo: Utah Division of Wildlife Resources

Tortoise working on burrow and nest



Photo: Los Angeles Times

# Enrichment: Ohlone Islands

## Enrichment Plan:

Sunday, Nov 19, 2023

Delivery Time: 13:45

- Enrichment philosophy focuses on behavioral and physical skill expression
- **Reptile Dome:** Multiple experiences delivered once or twice per day (3-6 times per week)
  - Habitats mapped and divided into zones
  - Enrichment experiences cataloged according to behavioral or physical skill goals
  - Dice rolls used to randomize date of delivery, time of day, placement in the habitat, and activities to include
  - Care team enters the habitat without signaling to place experiences
- **Education Compound:** At the end of the day any remaining diet is delivered in foraging enrichment apparatus (e.g., boomer balls)

Photo: Cults3D



Boomer balls:  
Foraging



Photo: r/tortoise:  
pogonax13



Obstacles:  
climbing

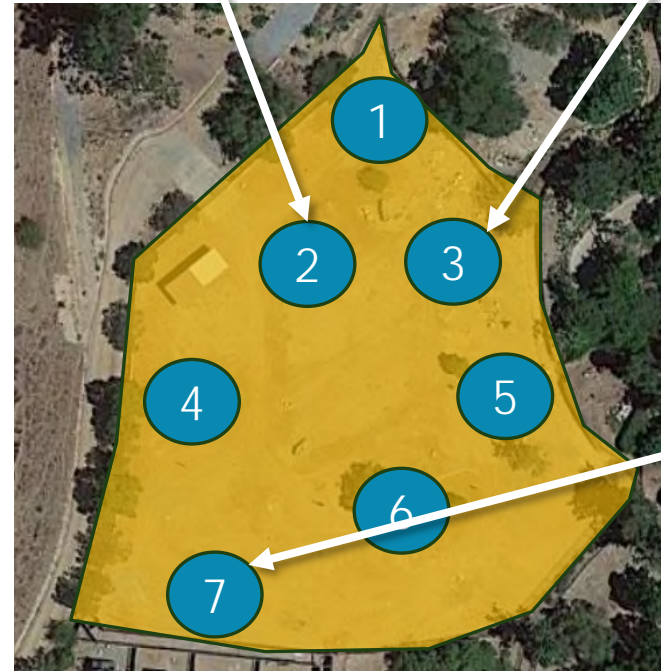


Photo: Wild  
Enrichment

Sensory garden:  
grooming |  
sensory

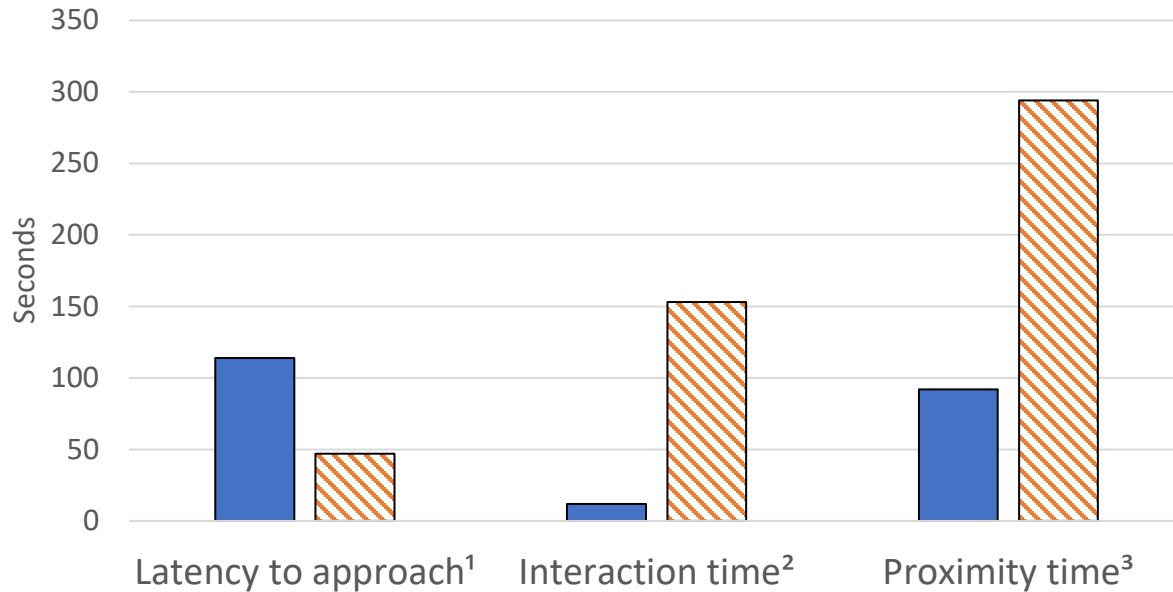


# Behavioral Outcomes

Testers noted Quechan Mountains tortoises spent more time unmoving or tucked into their shells than Ohlone Islands tortoises

■ Quechan Mountains   ■ Ohlone Islands

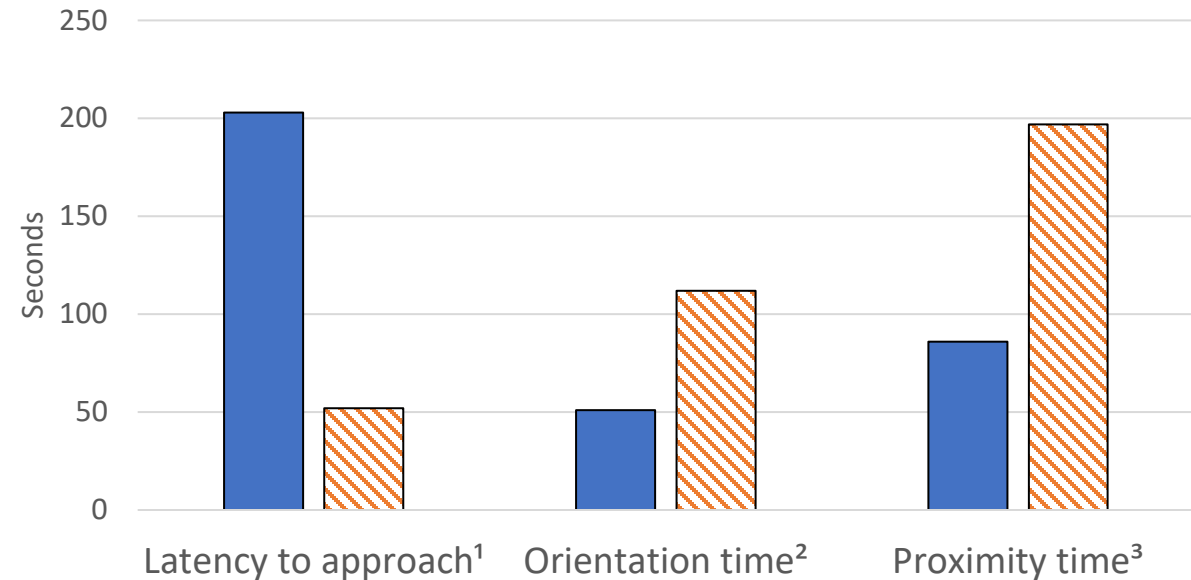
### Novel Object Test



Five minute novel object test with each tortoise

- 1) Latency to approach: number of seconds before first step towards object
- 2) Interaction: the number seconds physically in contact with object
- 3) Proximity: the number of seconds within one body length of the object

### Novel Person

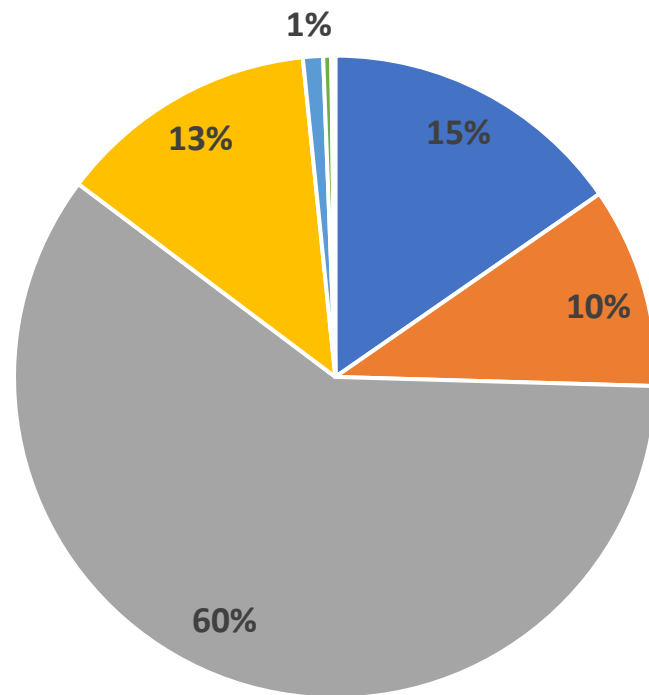


Five minute novel person test with each tortoise. Person sits in tortoise habitat and offers food reward

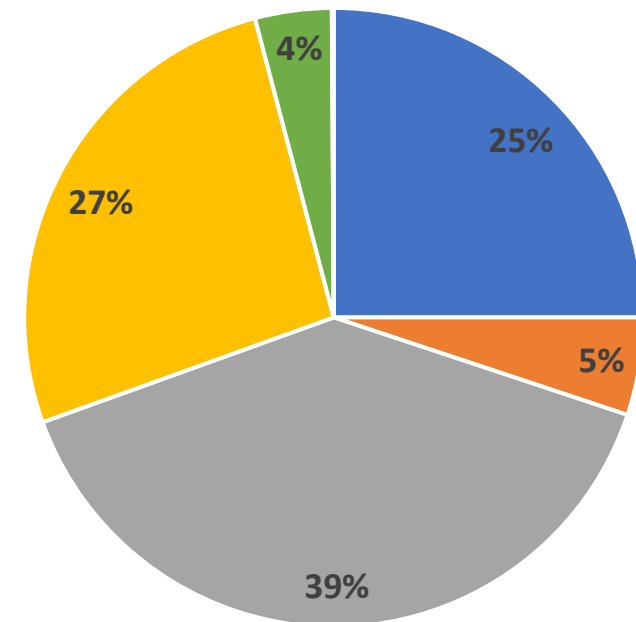
- 1) Latency to approach: number of seconds before first step towards object
- 2) Orientation: the number seconds the tortoise is oriented toward the person and close enough to take food
- 3) Proximity: the number of seconds within one body length of the person

# Behavioral Outcomes: Quechan Mountains

## Autonomous Time



## 15 Minutes Prior to Education Event



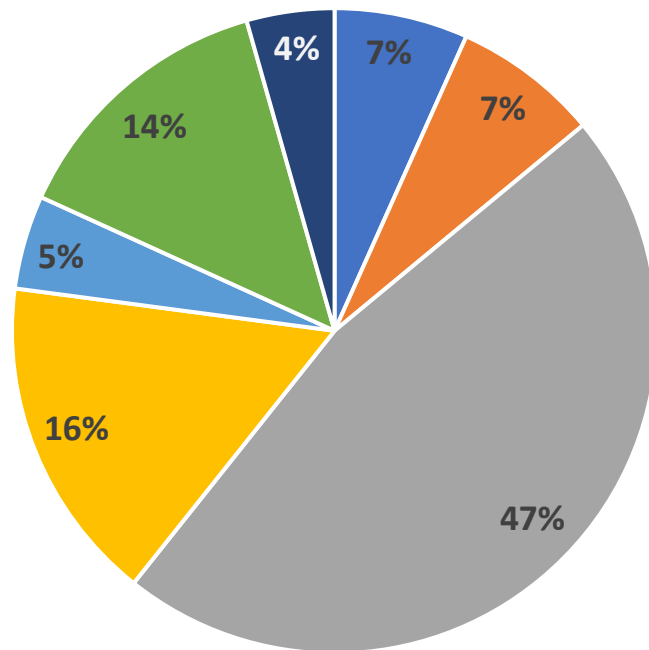
Average rates: Focal sampling | Instantaneous recording at 1 minute mark  
Data collected between May and September 2023  
Three 15-minute observations per day

<sup>1</sup>Waiting/Anticipation: Animal is focusing all attention on a gate, door, food distribution area, or people standing behind any of these area. Animal is within two body lengths of the area.

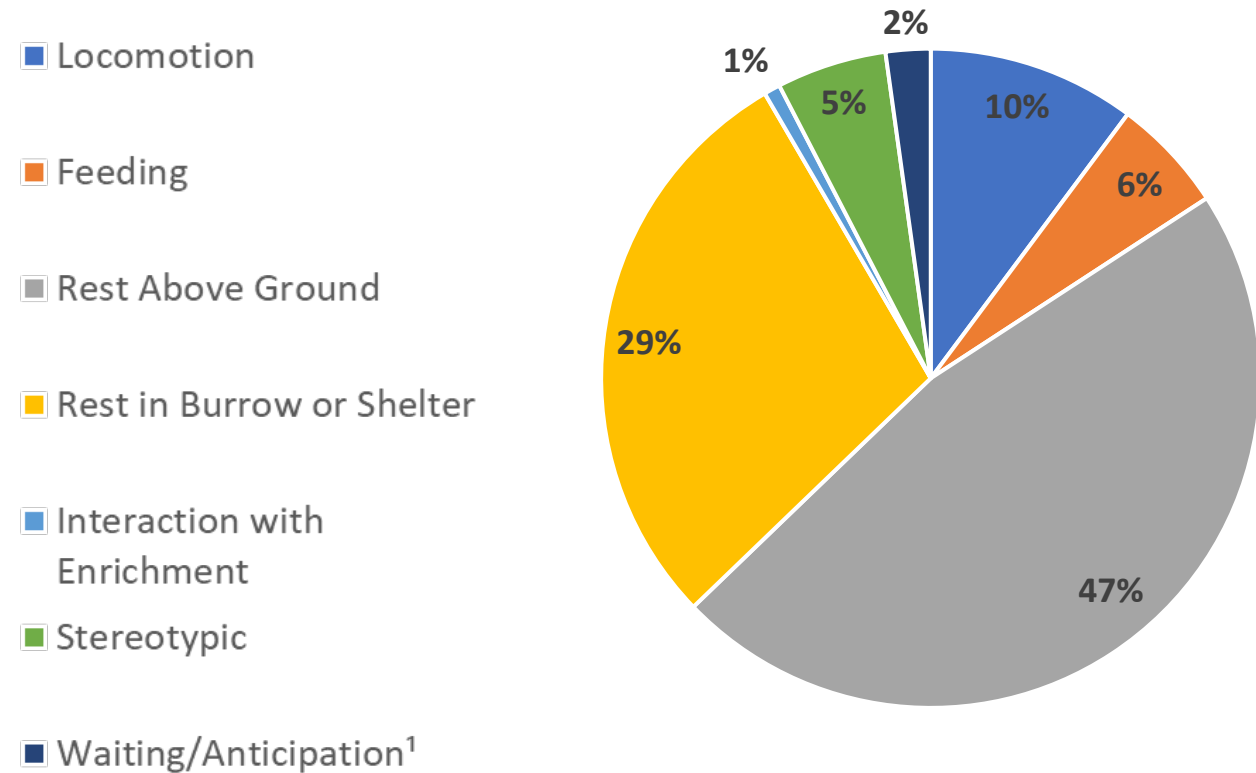


# Behavioral Outcomes: Ohlone Islands

Off Program: Reptile Dome



On Program: Education Compound  
15 minutes prior to notification of program event



Average rates: Focal sampling | Instantaneous recording at 1 minute mark  
Data collected between May and September 2023  
Three 15-minute observations per day

<sup>1</sup>Waiting/Anticipation: Animal is focusing all attention on a gate, door, food distribution area, or people standing behind any of these area. Animal is within two body lengths of the area

# Physical Outcomes: Body Condition Score

		Quechan Mountains				Ohlone Islands	
		Pre-hibernation	Post-hibernation			Pre-hibernation	Post-hibernation
♂		6	4	♂		8	5
♀		4	3	♀		7	5

1-3	Underconditioned
4-6	Good Condition
7-9	Over conditioned



Photo: Los Angeles Zoo

# Health Outcomes

	Quechan Mountains	Ohlone Islands
Upper Respiratory Tract Disease	60% average infection rate over the past 5 years	25% average infection rate over the past 5 years
Herpesvirus	Three tortoises tested positive and were euthanized over the past 5 years	One tortoise tested positive and was euthanized over the past 5 years
Loose Stool	Rarely observed	All tortoises produce loose stool once or twice per year, typically in late summer
Ticks	Tortoises regularly carry ticks ( <i>O parkeri</i> , <i>O turicata</i> ). Care team does opportunistic tick checks	One tortoise had ticks in the last 5 years
Physical Injury	<p>Care team/educators report minor shell cracks / chips to veterinary staff a few times each summer. Reported from sparring and handling accidents</p> <p>Two tortoises received surgery for intestinal torsion</p> <p>Tortoises can get swept up in flash floods. Care team installed mesh catches after two tortoises drowned in 2019</p>	<p>One tortoise was dropped during an education demo and suffered a minor shell crack in the summer of 2021</p> <p>Tortoises show minor abrasions/callous development on their face, limbs, and shell</p>
Hibernation death	Three tortoises have died during hibernation over the past 15 years	No deaths during hibernation

