Home is where you take it!
The life of the desert tortoise

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distribution of G. agassizii

Presentation Outline:

• Desert Tortoise Natural History
• Threats to Desert Tortoises
• Research
• Recommendations for the future
Distribution of
G. agassizii
Point Locations collected over 4 years for an individual Desert Tortoise at SNP

Home ranges of 4 tortoises at Saguaro National Park
My research objectives:

Use molecular techniques (DNA) to:
- Estimate gene flow among and within populations
- Assess long-term viability of “isolated” populations

Will anthropogenic barriers affect tortoise movement among small, disjunct populations?
Outcome #1
Populations genetically distinct, (gene flow does NOT occur)

Management Implications:
Loss of genetic diversity

Outcome #2
Populations genetically similar, (gene flow occurs)

Management Implications:
Historical gene flow is currently hindered by human development
Sampled Populations

The Cell

- Cell Membrane
- Mitochondria
- Nucleus and Nuclear Membrane
- Chromosomes

Nucleus

Chromosome

DNA

Nucleotide
DNA Sequence data

DNA Fingerprinting

"microsatellite"

Results: Gene flow occurs!
(At least until the recent proliferation of human barriers)

Genetic Distance (Fst) vs. Geographic Distance (km)
(Mantel test; $r = 0.554, p = 0.030$)
Thelma's mad dash
A radio-tagged desert tortoise takes off on a wild trek that leaves her trackers stunned.
Tucson Citizen, May 12, 2003

Thelma didn't exactly run away from home. For one thing, she's hardly a child - one estimate puts her age at about 30. For another, her pace was far from sizzling. After all, desert tortoises aren't known for their speed. But what she lacked in tempo, she made up for in determination. Thelma - her name was inspired by the wanderings of the famous movie duo Thelma and Louise - left Saguaro National Park's east unit in the fall of 2000, not long after being outfitted with a radio transmitter to track her movements.....

Discussion

• Gene flow occurs (or historically occurred) among populations

• Connectivity between seemingly isolated populations is likely important to long-term population viability
Management Implications

- Connectivity of the landscape should be maintained wherever possible.

- Translocation of tortoises from nearest-neighbor populations should be evaluated as a potential management strategy to recover or maintain small populations isolated by anthropogenic barriers.

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