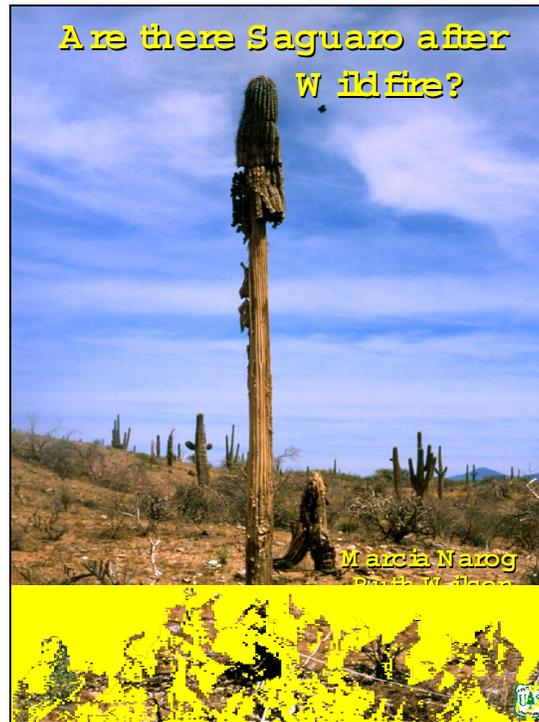


Slide 1

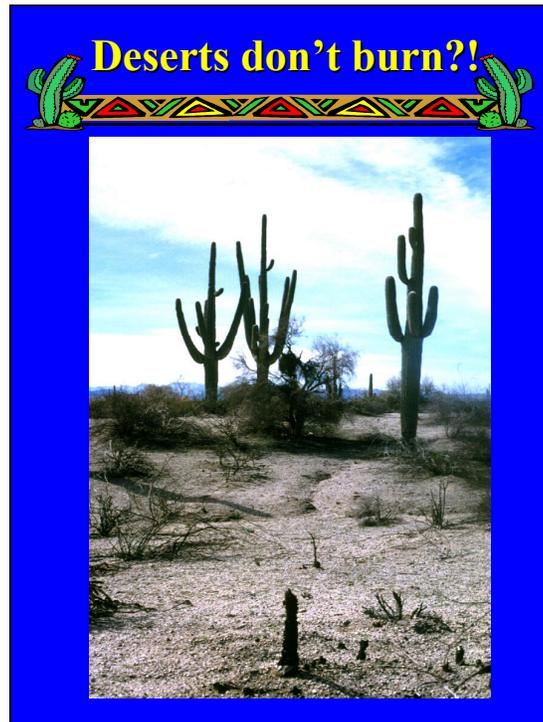


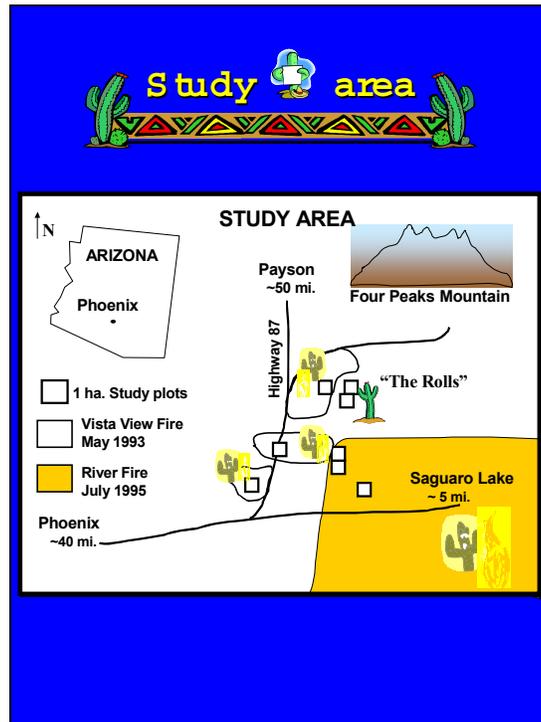
Above normal rainfall is often followed by more frequent fires.
Fire frequency and acres burned has increased during the last few decades.
Over 30 % of saguaro shrub habitat on the Tonto NF has burned in recent years.
Fire may alter species composition and reduce cacti abundance.

Research needs:

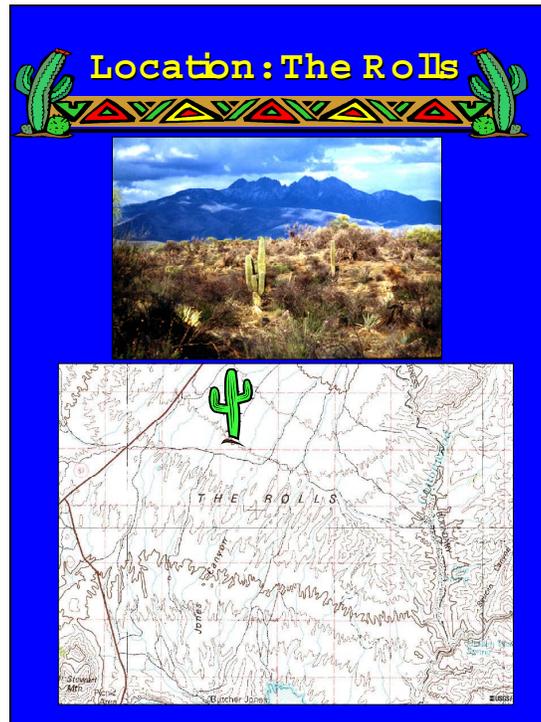
- Examine fire effects on sag. community composition, structure & recovery.
- Analyze impact of fire on sag survival and abundance.
- Gather info on flammability, fire damage, & restoration.

Slide 2





Slide 5



**Different fire behavior =
different fire effects**



Vista View Fire
May 1993



River Fire
July 1995

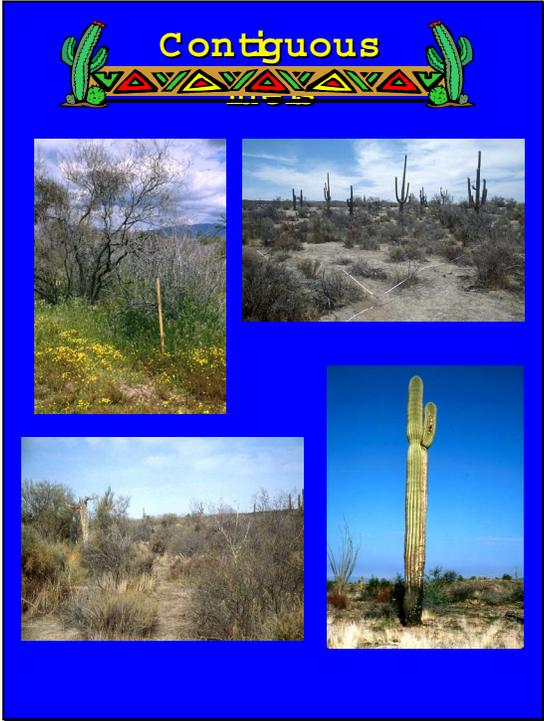
Slide 7



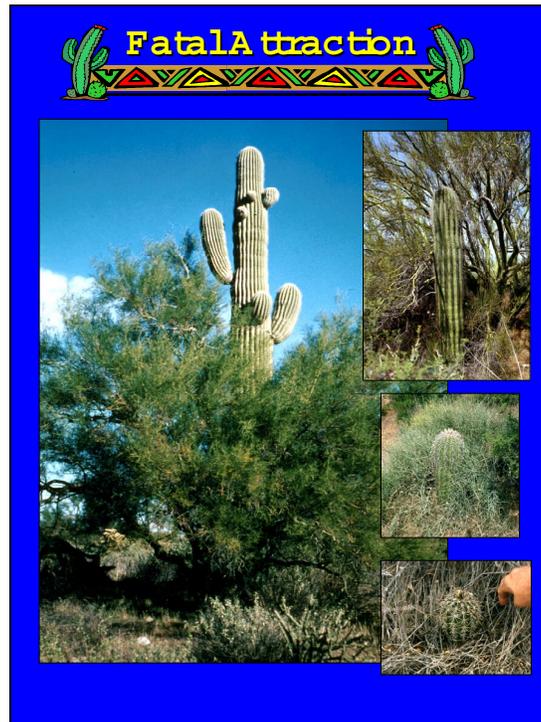
Slide 8

Methods: 1 ha Pbt/Point

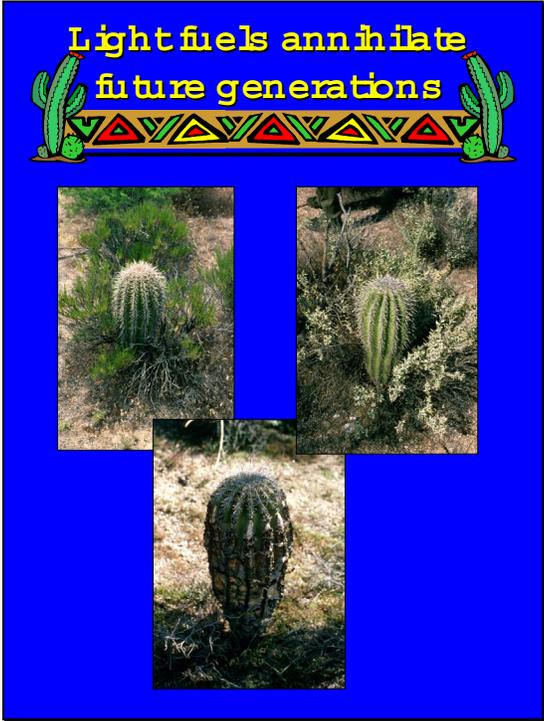
The diagram illustrates a 1 ha Pbt/Point sampling method. It features a 50m x 50m grid divided into four quadrants (Quad 1, Quad 2, Quad 3, and Quad 4) by a central point. A 'sample point' is marked at the center. Various plant species are shown in each quadrant: a tree in Quad 2, a cactus in Quad 3, a cactus in Quad 1, and a shrub in Quad 4. A vertical scale bar on the left indicates 50 m. A large photograph of a saguaro cactus is positioned to the right of the diagram. Below the diagram are five smaller photographs showing field sampling activities: a desert landscape with saguaros, two researchers in a field, a researcher measuring a cactus, a desert landscape with saguaros, and two researchers in a field.



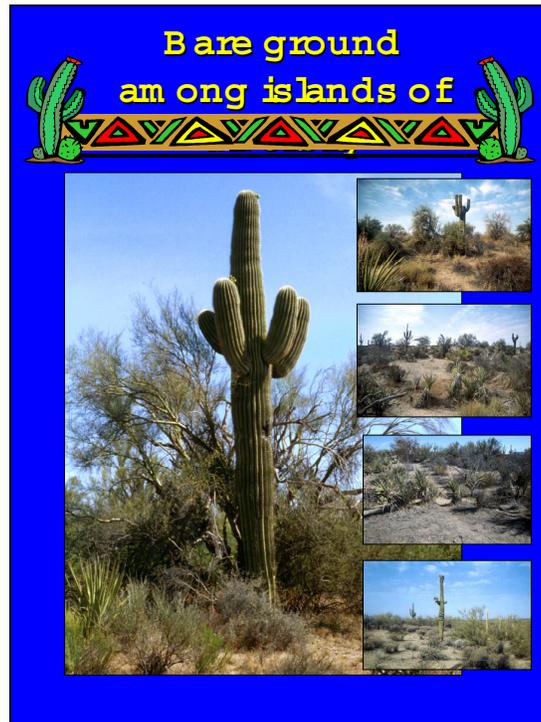
Slide 10



Nurse plants increase fuel loading in close proximity to saguaro.
This close association of heavy fuels may lead to increased saguaro fire mortality.

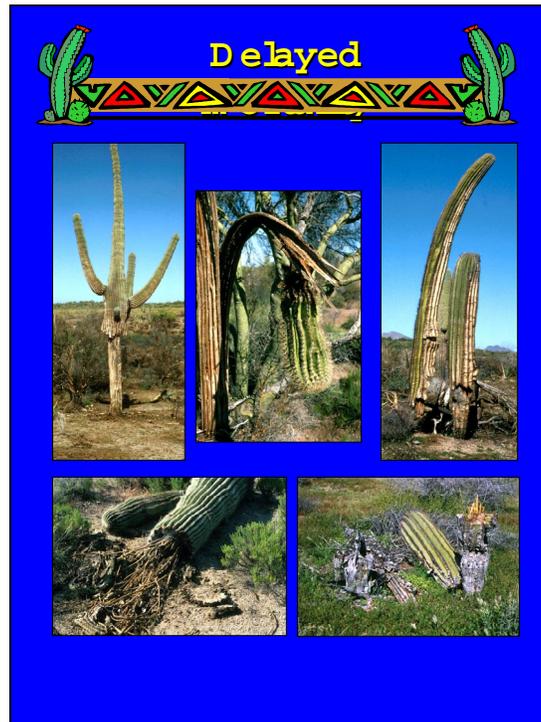


Slide 12



Native herbaceous material is often too sparse to carry fire between shrub clusters.
35 plant species were observed & classed by physiognomic characteristics:
tree-2; Shrub: lg-5, med.-13, sm. 3; yucca-1, cacti-7; perennials-4
28 species were observed resprouting after fire.

Slide 13



Fuels observed were ≤ 1.5 m away from girdled saguaro.
45% of saguaro had trees or shrubs w/in 1 m or less

Slope position



Crest
Shoulder
Midslope
Footslope
Toeslope

Five points on each slope (crest, shoulder, midslope, footslope, toeslope) in the burned and unburned areas were selected for intensive sampling.

Soil Pit & GPR



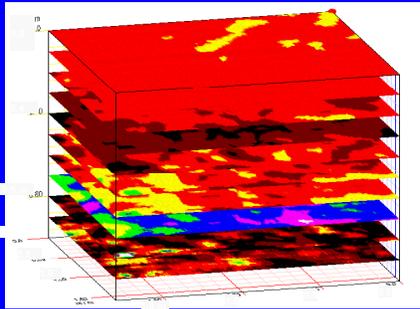
Soil samples, collected at 5 m intervals, were used to validate GPR images and evaluate soil composition and moisture content.



GPR Scan



3-D vertical GPR scan of soil pit from unburned slope crest. Blue is calcium carbonate layer.

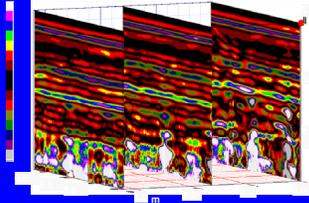


High Positive Reflection No Reflection High Negative Reflection

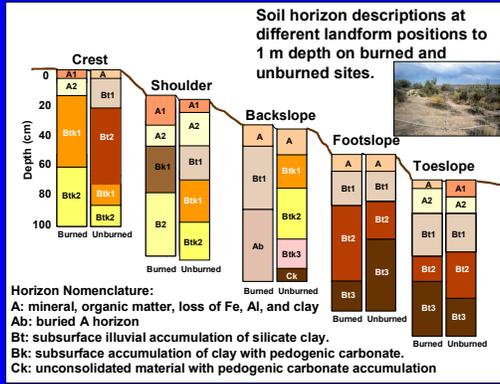
Tunnels and roots



3-D horizontal GPR scan of soil pit from unburned slope crest. Blue is calcium carbonate layer. White shows burrows.



Soil Profile

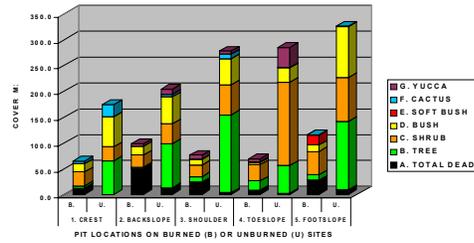




Vegetation changes with slope



PLANT DISTRIBUTION AROUND SOIL SAMPLE PITS AT A 10M RADIUS



Slide 21



Conclusion

Burn plots only had about 25% of live plant cover and number compared with unburned.

Trends in species presence were observed at the various landscape positions.

Burned crest and toe-slope positions had more live plants than the others.

Different slope positions may be 'safer' during a fire (higher survival), favor more rapid plant recovery, or species present may be more resilient.

Further analyses are needed to determine which trends observed in plant distribution, cover and density are correlated to soil composition and if this is a factor to consider in post fire site rehabilitation.

