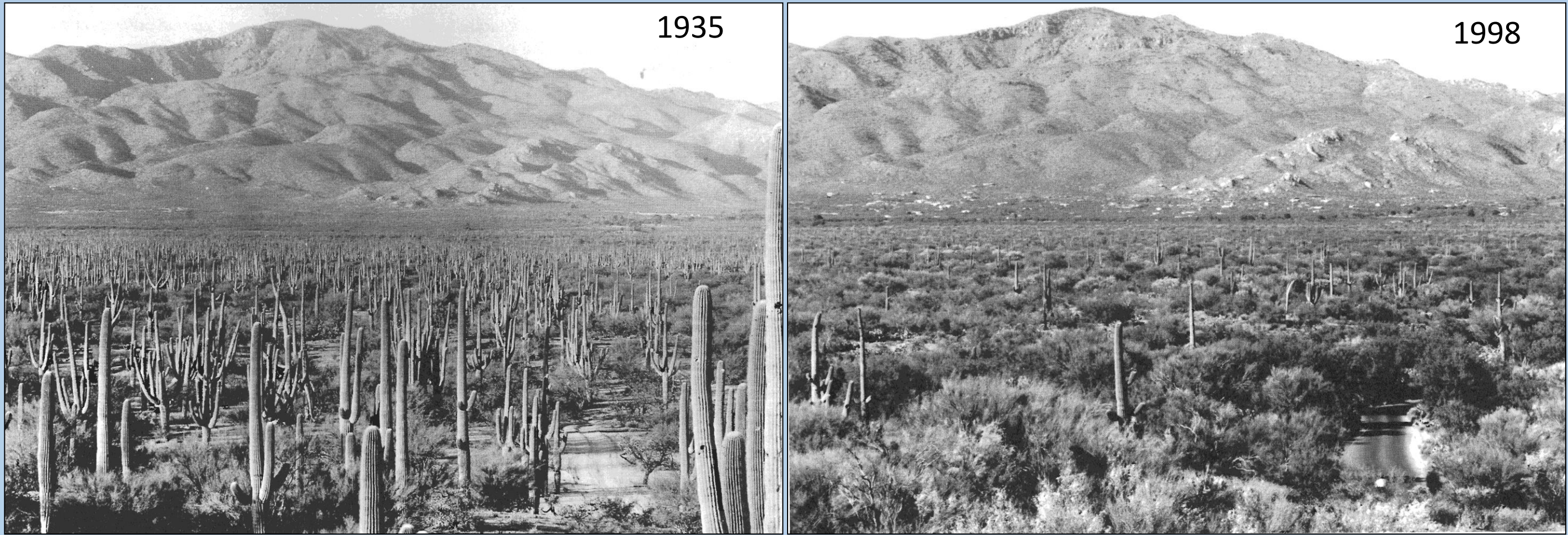
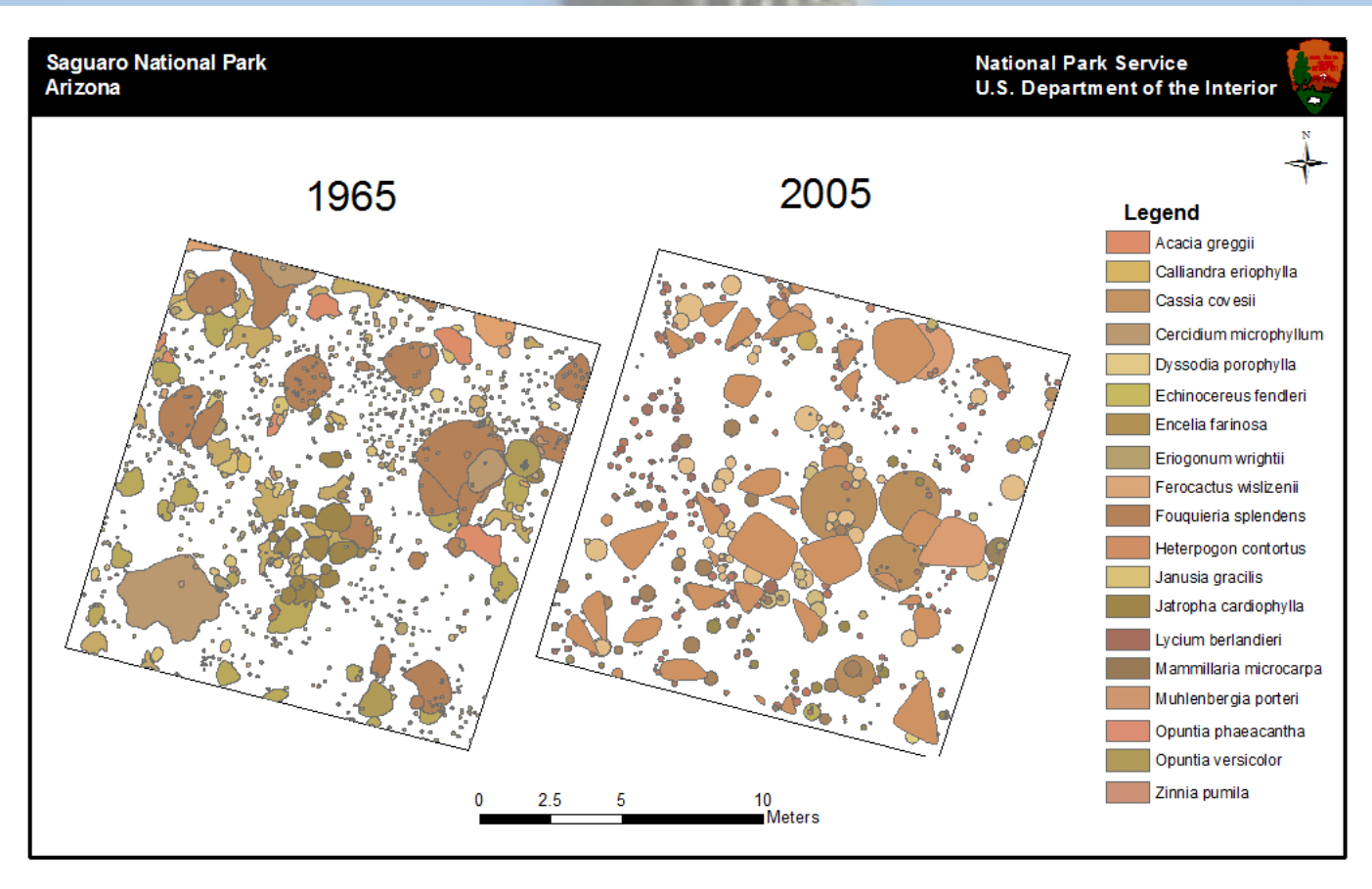
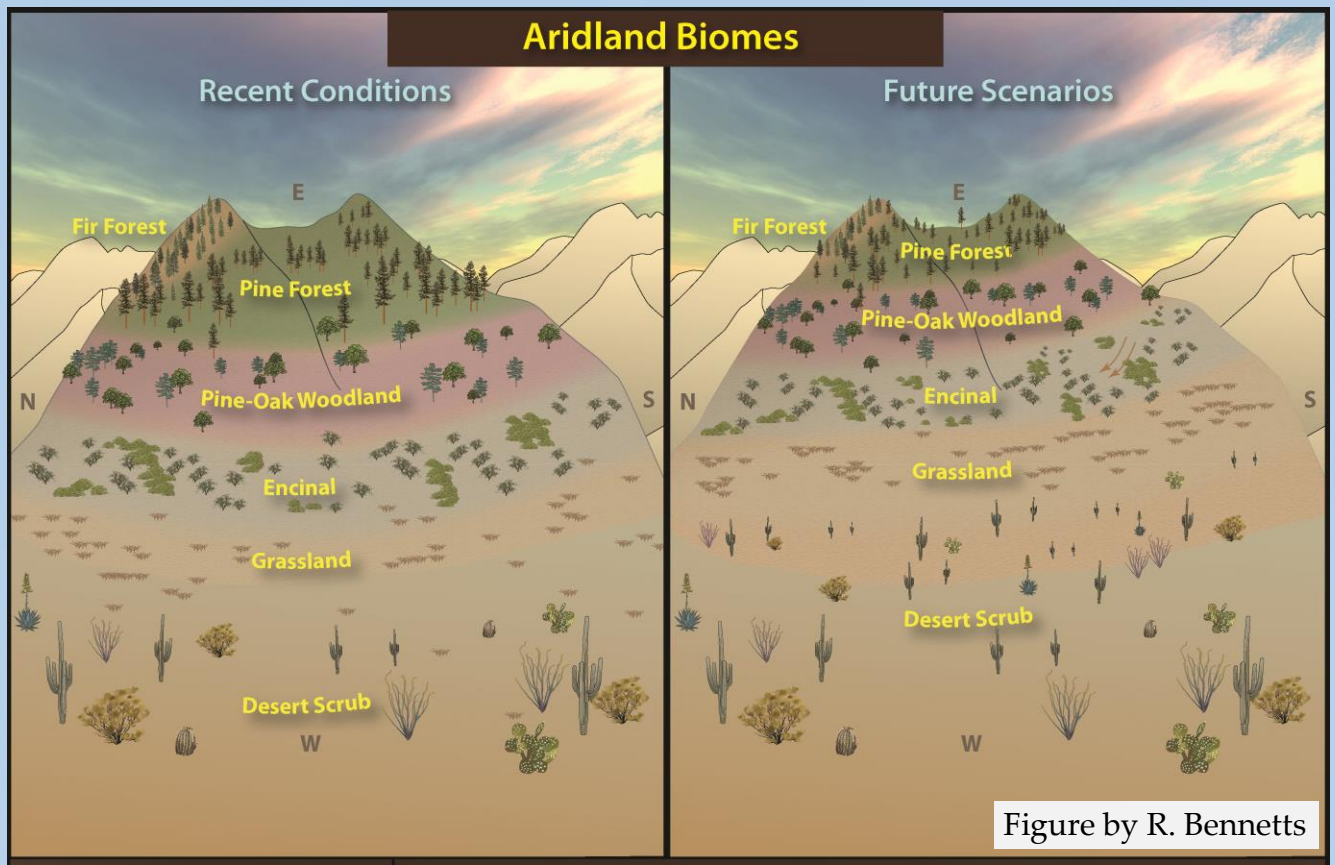


Long-term vegetation monitoring at Saguaro National Park



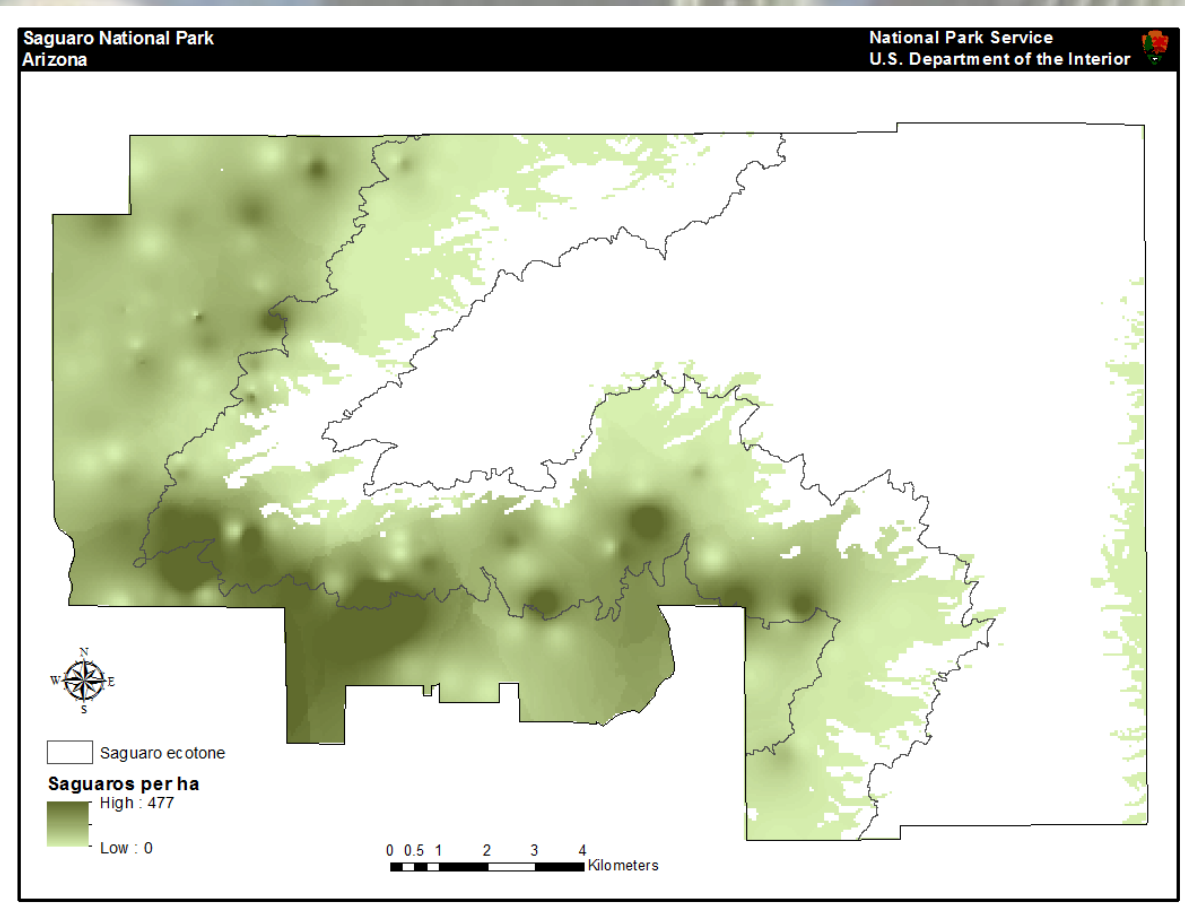
Repeat photos courtesy of Ray Turner



The Value of Repeated Studies

Historic plant studies provide some of the best insight into how the landscape has changed. The figure above shows two surveys of the same 15 meter by 15 meter area in 1965 and again in 2005. This study not only provides insight into the change that has occurred in the past 40 years, but also creates a reference point that can be used in future surveys.

In addition to revisiting historic studies to see how the landscape has changed, we are also creating new baseline studies that will provide information for future researchers. One of the major concerns about climate change is that plant communities may alter their ranges due to changing conditions. We are particularly interested in ecotones (areas in which the dominant vegetation type changes). The saguaro's ecotone (shown by the dark line in the map below) is the area between 3,500 and 5,000 feet in which saguaros start to disappear from the landscape. We hope to closely monitor this area in the coming years to better understand the dynamic changes that occur in these elevation bands.



Vegetation Change in the Sonoran Desert

The repeat photos above wordlessly capture the dramatic shifts in vegetation that have occurred at Saguaro National Park. What caused these changes and what changes can we expect in the future? Park researchers are working to address these questions through long-term vegetation monitoring projects.

The challenge of understanding changes in Sonoran Desert ecosystems is that many of its plants have exceptionally long lives. The saguaro cactus can live for 175 years and many other plants in this ecosystem can survive for more than a century. Change can happen so slowly that decades may pass before significant changes are detectable.

In addition to patience, monitoring plant communities at Saguaro National Park require researchers to be forward-looking and try to anticipate what changes might occur in the future. Some of our biggest concerns for the future are climate change, invasive buffelgrass, and changes to historic fire patterns.

Vegetation Response to Climate Change

How will a changing climate impact vegetation communities? In the Sky Island Region, scientists expect that the boundaries between historic biomes will shift. As the figure above indicates, plant communities are expected to move to higher elevations in response to these changes.

The vegetation response to climate change also includes invasion by exotic species. Buffelgrass is the most concerning of these invaders. It is already causing alarming disturbances to native plant communities and is expected to flourish under the conditions predicted by climatologists. We continually monitor for new locations of buffelgrass and expansions of current infestations to inform our buffelgrass eradication program.



Buffelgrass-infested desert landscape (L) & a buffelgrass fire (R)



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