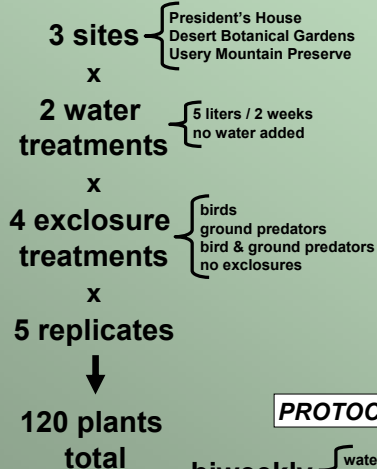


Comparing trophic dynamics in urban and desert ecosystems using arthropod communities on brittlebush (*Encelia farinosa*)

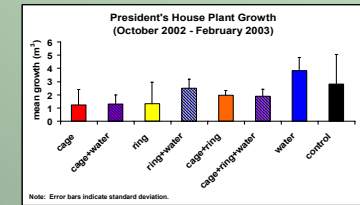
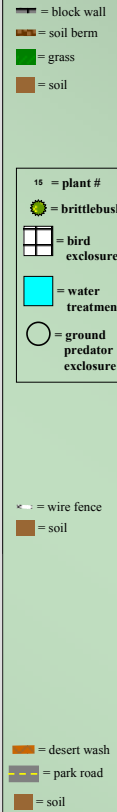
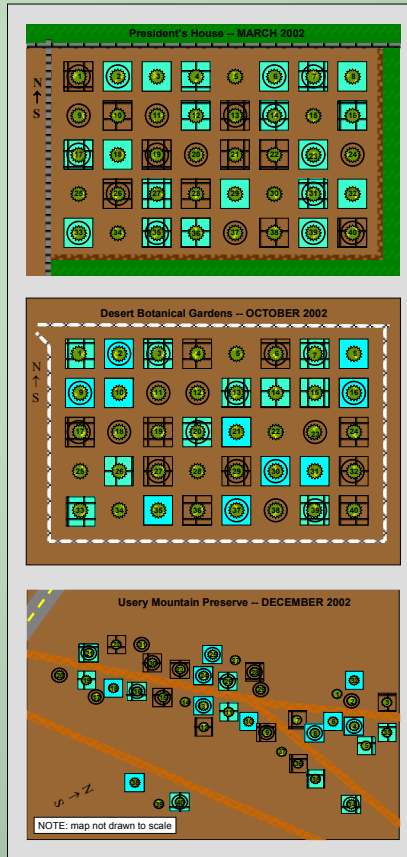
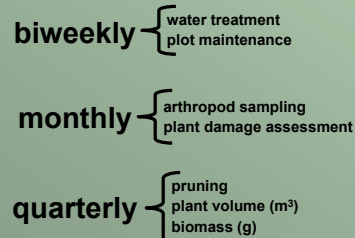
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Do trophic dynamics differ in urban vs. 'natural' systems? Is trophic structure controlled by 'top-down' (natural enemies) or 'bottom-up' (limiting nutrients) forces in these systems? To address these questions, we have established long-term arthropod monitoring experiments at two permanent LTER study sites (President's House and Desert Botanical Gardens) and one natural desert preserve (Usery Mountain Park) on brittlebush plants. Brittlebush (*Encelia farinosa*) was selected because it is a common native desert perennial that is often used in urban landscaping. We are sampling the arthropod community and plant damage once per month, applying a water treatment every two weeks, and measuring plant volume and biomass accumulation four times per year. Arthropods are being identified to family and feeding-guild. By using the LTER permanent sites we hope to link these experiments to other LTER core areas by quantifying changes in ecosystem function as functions of trophic complexity and patch type. Ultimately, we will combine our experimental results with a patch dynamic model to better understand how inter-patch differences in tropho-dynamics impact regional fluctuations in plants, herbivores, and predators.

EXPERIMENTAL DESIGN



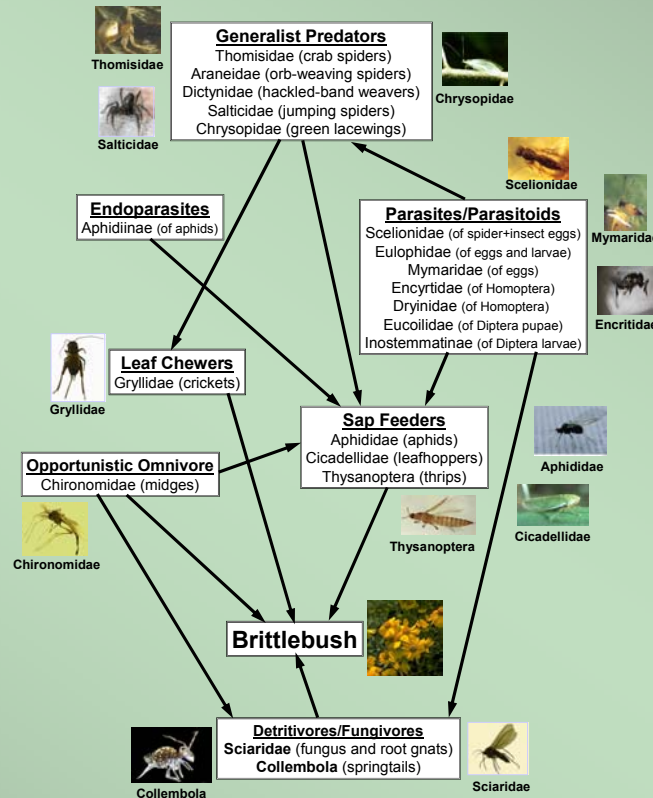
PROTOCOL



Mean change in plant volume over a four month period at the President's House. There was an effect of enclosure treatment (2-way ANOVA: F=5.219362, df=3, p=0.0048) but not water treatment (F=2.104717, df=3, p=0.156578) on plant growth.

GUILD ANALYSIS

While trophic levels provide a good description of community organization, they are not sufficient for defining community structure and function. It is often useful to divide trophic levels into guilds, or groups of species species exploiting similar resources in a similar manner. As guild membership is based solely on resource use and does not include taxonomic restrictions, it is especially useful when examining complex communities containing smaller organisms such as bacteria, protists, and invertebrates, which are often taxonomically difficult to identify. We are classifying the invertebrates found on brittlebush into guilds to better understand the types of communities that develop on brittlebush and how changes in top-down and bottom-up trophic dynamics affect community structure and function.



Amy Dilorio and Diane Miller pruning at the President's House (October 2002)



Amy Dilorio installing a ground predator enclosure ring at the Desert Botanical Gardens (October 2002)



Christopher Putnam and Diane Miller installing a bird enclosure cage at Usery Park (December 2002)



Biomass samples from the President's House waiting to be weighed (February 2003)

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