Combining Art and Ecology to Understand Changing Biotic Communities of the Urban Salt River

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While most of the urban Salt River has rarely flowed since Granite Reef Diversion Dam’s construction, human activity provides water year-round to several parts of the riverbed, sustaining wetland landscapes in the midst of one of the country’s largest and fastest-growing urban areas. CAP LTER’s Salt River Biodiversity Project (SRBP) has monitored birds, reptiles, and plants in these ecosystems since 2012 to understand how urbanization, climate change, and management affect ecological communities in the urban river. Here we review changes in three SRBP sites with year-round water availability: a remnant wetland on the urban outskirts (Tonto), an accidental and unmanaged wetland formed by urban runoff (Price), and a publicly-managed restoration area in downtown Phoenix (Rio). Each site changed in a unique way in response to its land use history and management style, and some overarching trends were shared across all three.

Our plant surveys revealed more abundant vegetation in urban sites than on the urban periphery. The remnant, less urban reach, however, supported the highest plant species richness and diversity (using the Shannon Diversity Index), which had increased since 2012.

To visualize these changing communities in more detail and using a more experiential and artistic approach, we integrated printmaking, papermaking, and landscape management into data visualization. We collaborated with the City of Phoenix and Salt River Pima-Maricopa Indian Community to remove unwanted plants from wetlands they are currently rehabilitating, and used the most abundant marsh plants at case study sites (Arundo donax, Schoenoplectus californicus, and Typha latifolia) to make paper. This paper became the background for hand-printed community composition charts for each site’s plant community in 2012 and 2022 (below). Each relief-printed pixel represents 1% annual cover of a classification group (i.e. growth habit, wetland indicator status, etc.).

**Bird and reptile communities showed opposite trends:**

Total bird species richness increased, and bird abundance increased at the restored wetland.

But both richness and abundance of reptiles and amphibians declined, especially at urban sites.

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