Monitoring of Surface Water Features in the McDowell Sonoran Preserve

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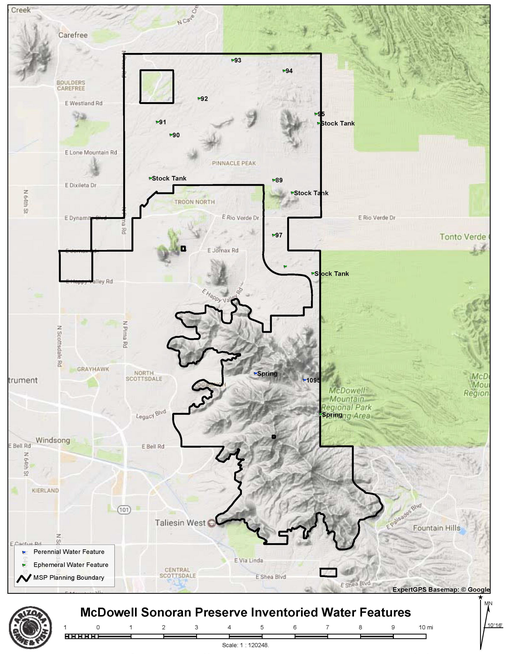

Figure 1. Map of McDowell Sonoran Preserve in Scottsdale, AZ

Introduction

Scottsdale's McDowell Sonoran Preserve (Preserve) contains numerous human-constructed surface water features. Prior to the establishment of the Preserve, the Arizona Game and Fish Department (AGFD) and local ranchers developed and maintained these features for wildlife and livestock use. Today these water features persist on the landscape and provide a varying availability of water for wildlife. Wildlife managers and members of the public have an interest in ensuring adequate water for wildlife exists in the Preserve. This monitoring will benefit the Preserve by providing an up-to-date inventory and evaluation of surface water features.

Methods

Known water features in the Preserve were mapped and inventoried (Figure 1). Starting in 2015, field visits are conducted at ten water features during May, June, September and December to evaluate water levels, estimated wildlife use and any recommended repairs. Where water was present, the depth was measured using a retractable tape measure. Water levels in stock tanks were recorded as present or absent. Field visit assessments are recorded in an online database to facilitate entry by multiple users.

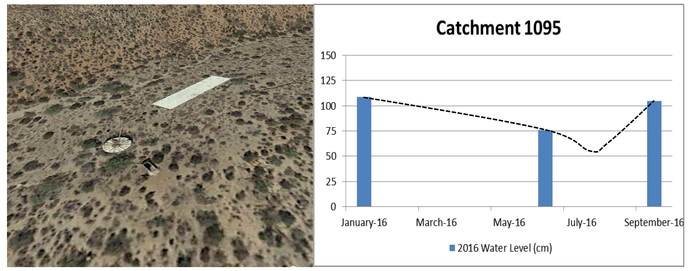

Figure 4. Catchment 1095 is the only water development that holds perennial water. Only 2016 data shown. Black dashed line represents estimated water level throughout the year. Image credit: Google Earth

Field Check	June 2015	October 2015	May 2016	July 2016	January 2017	May 2017
Water	Present	Absent	Absent	Absent	Present	Absent

Figure 3. Cattle tank with water during winter 2017. A total of five tanks were monitored during the project. All tanks went dry prior to summer monsoon rains in 2016 and 2017.

Discussion

The Preserve has eight water features (catchments) built by the Arizona Game and Fish Department during the 1940s and 1950s. These catchments were originally designed for small game use. They have since been modified to allow access by larger wildlife species such as deer and javelina. These eight catchments are far beyond their intended lifespan, and only three remain functional. The water capacity is not sufficient to maintain water year round and would require routine water hauling to maintain water throughout the summer months. Current AGFD standards require catchments to store a ninefold capacity of 10,000 gallons. This increased capacity is to ensure sufficient water can be stored within the system so that it is available year round, without water hauling, even during periods of moderate drought.

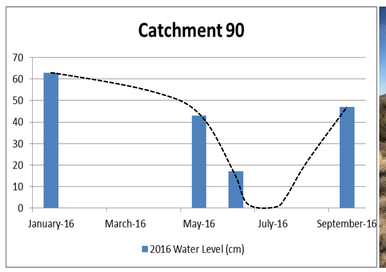

Figure 2A. Catchment 90 typically goes dry prior to summer monsoon rains. Only 2016 data shown. Black dashed line represents estimated water level throughout the year.

Results

Results show that only one water development (catchment 1095) holds water on a permanent basis (Figure 4). Three catchments hold measurable water during winter and spring (catchments 90, 92 and 94) but go dry in June or July prior to onset of monsoon rains (Figure 2A and B). Cattle tanks were dry during summer months, but water was sporadically present during winter months (Figure 3).

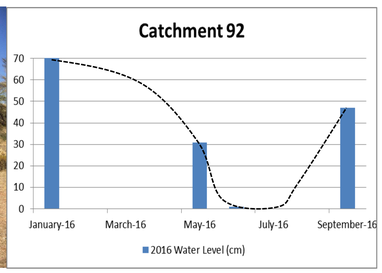

Figure 2B. Catchment 92 typically goes dry prior to summer monsoon rains. Only 2016 data shown. Black dashed line represents estimated water level throughout the year.