

Desert Trends

A Quarterly Newsletter for the Pima County Ecological Monitoring Program

Issue No. 1 January 2008

"To provide periodic assessments of ecological health in Pima County to make more informed management decisions"

Welcome to the first newsletter of updates on a new program that will provide periodic assessments of ecological health in Pima County. As you will read, the Pima County Ecological Monitoring Program (EMP) is just now in the design phase, and when implemented will mark a new chapter in land stewardship in the Sonoran Desert. This newsletter will provide a platform for describing the program's activities, tools, and products.

DETERMINING TRENDS IN ECOLOGICAL CONDITIONS

SDCP, MSCP, and Pima County EMP? What is the Connection?

Pima County initiated the Sonoran Desert Conservation Plan (SDCP) in 1998 in response to the listing of the cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*) by the U.S. Fish and Wildlife Service. The listing prompted the development of the SDCP, a comprehensive, long-term strategy for conservation of biological and cultural resources threatened by human population growth and its associated impacts. One of the guiding principals of the SDCP is its comprehensive biological goal: to "ensure the long-term survival of the full spectrum of plants and animals that are indigenous to Pima County through maintaining or improving the habitat conditions and ecosystem functions necessary for their survival".

The SDCP has become the guiding document and principle to help ensure that human impacts to the environment comply with the regulatory requirements of the Endangered Species Act, which prohibits "take" (i.e., harassment, hunting, killing, etc.) of listed species. However, Section 10(a)(1)(B) of the act allows "incidental take" of listed species provided that a Multi-species Conservation Plan (MSCP) is in place. Though many activities towards implementation of the SDCP have taken place including, but not limited to, acquisition of open space and developer set asides, Pima County has yet to apply for a Section 10 permit. Most of the work to complete an MSCP is complete. All that remains is the development of the Pima County EMP.

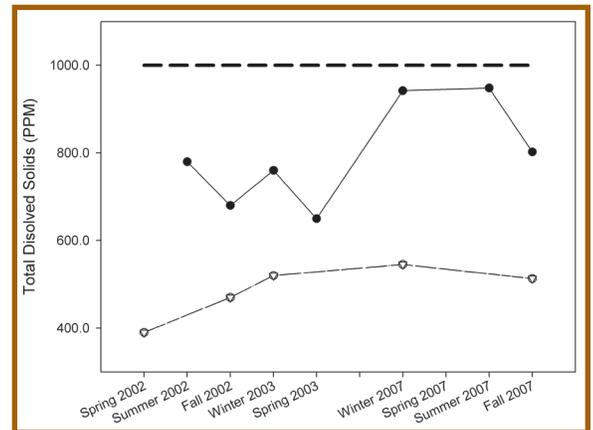


Figure 1. Monitoring of total dissolved solids (parts per million; PPM) at Cienega Creek Preserve (solid circle) and Davidson Canyon (open triangle) in Pima County reveals an increasing trend in both areas. In Spring and Summer 2007, readings in Cienega Creek Preserve neared 1000 PPM, which is considered an important "threshold" in riparian systems; prolonged exposure above this level can lead to changes in species composition of animals and riparian plants.

What is Monitoring?

In essence, monitoring is the repeated measurement of the same attribute over time to determine its status and trend. In other words, monitoring allows us to periodically answer questions like: How many do we have? Where are they located? Are they increasing, decreasing, or not changing? In recent decades ecological monitoring has grown in importance as policy makers and the general public demand more accurate information on the status and trends of a wide range of natural resources, from air quality to wildlife populations, from entire ecosystems to individual species.

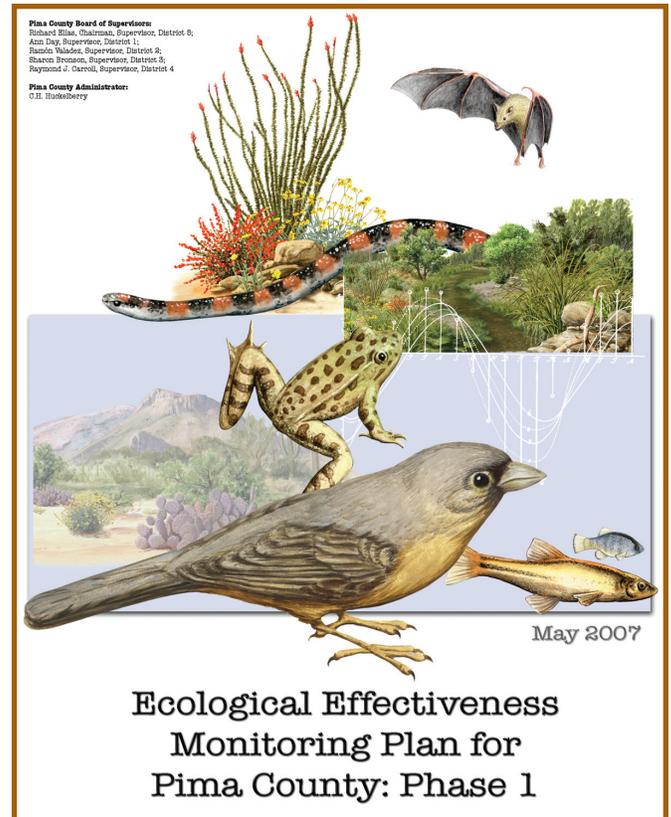
Ecological monitoring has some parallels to a periodic health checkup with a medical professional. When visiting the doctor, one is administered a host of simple “indicator” tests: heart rate, blood pressure, weight, and temperature. Changes in these measures alert the doctor as to what, if any, intervention is needed. Ecological monitoring can also provide early warnings of change, but unlike in medicine, there is no agreed-upon suite of indicators for ecosystem-level monitoring, in part because of the lack of attention devoted to ecological monitoring and in part because of the hundreds of potential indicators that could be included in such a program. The key challenge is to choose the right indicators.

Pima County EMP Goal

The primary goal for the next phase in the development of the Pima County’s EMP is to identify a set of indicators that can determine if the biological goal of the SDCP is being achieved and to provide information to managers to help them take more informed management actions. This is a challenging assignment, particularly given the need to monitor threatened and endangered (T&E) species, which tend to difficult to find and expensive to monitor. Therefore, the program will be designed to monitor some T&E species, but also many of the habitat components that they and other species need for survival. These

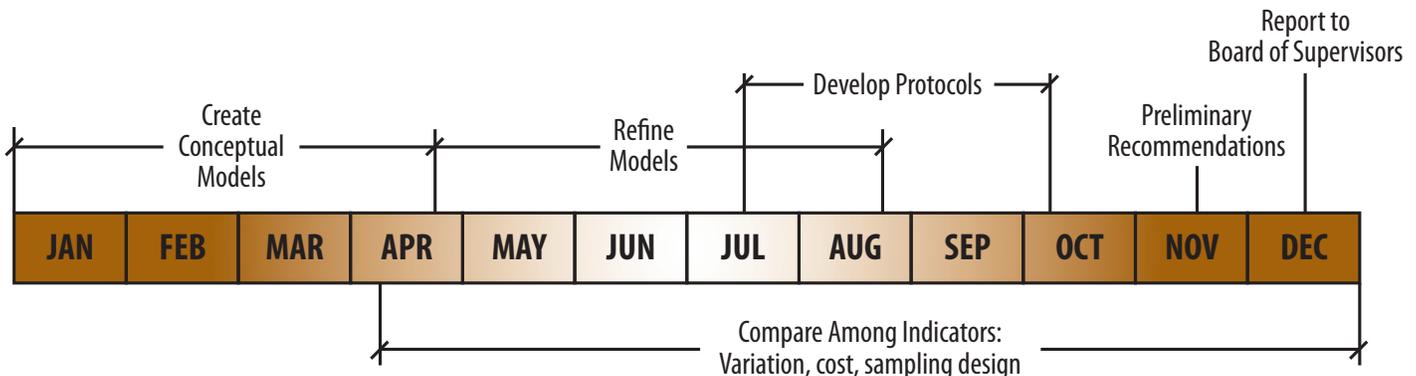
broader structural and functional ecosystem indicators include vegetation, water resources (quantity and quality), and land cover. Much of the work in the coming months will be devoted to choosing these indicators. The next edition of this newsletter will provide an overview of this process.

Choosing indicators is the main task in the development of the Phase II monitoring plan (the Phase I plan is now complete; see inset). The Phase II plan will be completed by December 2008, at which time it will be presented to the Pima County Board of Supervisors for approval.



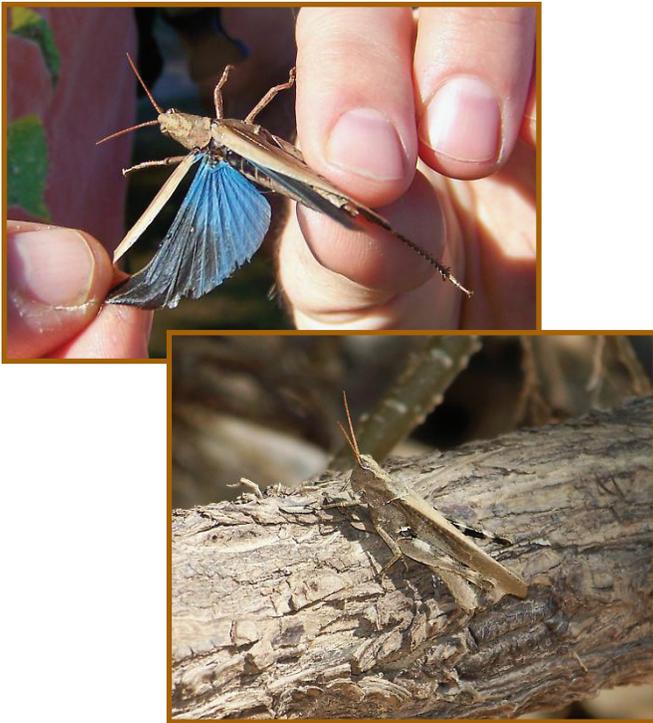
The Phase I Monitoring Report was completed in the spring of 2007 and can be found online at <http://www.pima.gov/cmo/sdcp/reports/d30/EEMP.pdf>.

MONITORING PLAN TIMELINE FOR 2008



Project Team

Much work remains before the Phase II plan is complete. In addition to staff at Pima County Natural Resources Parks & Recreation (Maeveen Behan, Neva Connolly, Julia Fonseca, and Brian Powell) the team was recently expanded to include Andrea Litt, who will receive a Postdoctoral Fellowship through Colorado State University for her work on the development of the plan. Andrea will be co-advised by Bob Steidl (University of Arizona), who has contributed his expertise throughout the SDCP process, and Barry Noon (Colorado State University), who is recognized as an international expert on ecosystem monitoring. An additional position will be hired through the University of Arizona in the coming months. Key advisors to the program will be Sherry Barrett and Scott Richardson (U.S. Fish and Wildlife Service), Lori Woods and Carriane Funicelli (RECON Environmental Inc.), Bill Shaw (University of Arizona), and Mike Ingraldi (Arizona Game and Fish Department).



*One component of monitoring can be periodic assessments of species in our natural areas. This grasshopper, in the genus *Machaerocera*, was recently found at the Cienega Creek Natural Preserve by Carl Olson at the University of Arizona. Prior to this discovery, the genus had only been found as far north as Sinoloa, Mexico, over 500 miles away! Photos by Phillip Kline.*

Monitoring Committee

An ad hoc monitoring committee was recently convened to review products and approaches at critical stages of the plan's development. The committee includes members of the Science Technical Advisory Team that developed the Conservation Lands System and biological goals for the Sonoran Desert Conservation Plan. The committee was recently expanded to add members with technical expertise in ecosystem research and monitoring.

Meeting minutes will be posted at <http://www.pima.gov/cmo/sdcp/monitoring>. At their last meeting, the Committee members provided preliminary input to the design team on a variety of approaches to choosing indicators, including whether to take a stressor-based approach. Very simply, this approach advocates that indicators be chosen based on their known response to the most significant ecosystem stressors. For example, indicators of development might include native species abundance (expected to decrease) or non-native species abundance (expected to increase). In the coming months, the project team will evaluate the advantages and disadvantages of this approach, and this will be a topic of discussion at the next meeting, scheduled for March 10, 2008. The committee also would like to see the development of a communication plan that will outline steps to be taken to share information obtained from the monitoring program with a variety of audiences, from land managers to educators.



Monitoring data can be used for a variety of environmental education and outreach programs. Older students can also help participate in monitoring activities.

Report on the History of Ecological Monitoring in Southern Arizona

A new report provides a review of eight monitoring efforts in southern Arizona to highlight their accomplishments and to critique their efficacy. Monitoring indicators and programs are: water resources at Cienega Creek Preserve; vegetation at the Santa Rita Experimental Range, Tumamoc Hill, Arizona-New Mexico borderlands, and Las Cienegas National Conservation Area; vertebrates at Organ Pipe Cactus National Monument, Tucson metropolitan area, and Las Cienegas National Conservation Area; and a stream monitoring program at National Park Service units in southern Arizona. The report provides an overview of important attributes of a monitoring program, which include determining if management objectives are being achieved, ensuring sufficient field sampling to detect trends if they are occurring, providing timely dissemination of data to decision makers and the general public, and ensuring that funding is adequate and consistent. This review of projects and successful attributes will provide information to better guide the development of the Pima County EMP.

The report will be posted to <http://www.pima.gov/cmo/sdcp/monitoring>.



David Scalero with net (Pima County Regional Flood Control) conducts a native fish inventory of Davidson Canyon. Photo by Julia Fonseca (112-1261)

SDCP Monitoring Webpage at <http://www.pima.gov/cmo/sdcp/monitoring>

We are expanding and updating the SDCP website! In addition to the monitoring webpage, new features include a search function for SDCP reports, and a way to retrieve a plant list tailored to the climate and soils of specific townships, contributed by Bill Kendall, formerly a native plant officer for the State of Arizona.

REVIEW OF MONITORING IN SOUTHERN ARIZONA:
Lessons for the Development of the Pima County Ecological Monitoring Program

Report to the Pima County Board of Supervisors
14 January 2008

1988

1995

2003

Brian Powell
Pima County
Natural Resources,
Parks and Recreation
Tucson, Arizona

The Review of Monitoring in Southern Arizona Report was recently completed and can be found online at <http://www.pima.gov/cmo/sdcp/monitoring>.

Next Meeting

The next monitoring subcommittee meeting will be on Monday, March 10, 2008 from 9-11 A.M. at the Water Resources Research Center, 350 North Campbell Avenue.