

# State of the Environment Reporting

Sonoran Desert Conservation Plan

2002



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# MEMORANDUM

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Date: November 15, 2002

To: The Honorable Chair and Members  
Pima County Board of Supervisors

From: C.H. Huckelberry  
County Administrator 

Re: **State of the Environment Reporting**

The newly formed Science Conservation Commission for the Sonoran Desert Conservation Plan will begin meeting in December of 2002. Members include:

- Mac Donaldson, Empire Ranch
- Dr. Paul Fish, Curator of Archaeology, Arizona State Museum
- Joseph Joaquin, Cultural Specialist, Tohono O'odham Nation
- Dr. Jonathan Mabry, Desert Archaeology
- Don McGann, Recreation Team
- Dan Robinett, USDA Natural Resource Conservation Service
- Dr. William Shaw, University of Arizona, School of Renewable Natural Resources
- Dr. Thomas Sheridan, Curator of Ethnohistory, Arizona State Museum
- Dr. Linwood Smith, Environmental Protection Group
- Dr. Robert Steidl, University of Arizona, School of Renewable Natural Resources
- Frances Werner, Recreation Team

I am forwarding a study issued by the Heinz Center on the *State of the Nation's Ecosystems* and a paper which compares various indicator reports. The Commission will formulate a "State of the Conservation Lands System" annual report which Pima County can use to monitor the progress of the Sonoran Desert Conservation Plan.



# State of the Environment Reporting

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**State of the Environment Reporting: A Discussion Paper**  
**By Neva Connolly, Julia Fonseca and David Scalero,**  
**Pima County Flood Control District**

**Introduction**

Communities, states, and countries all over the world are using a type of reporting called "state of the environment" to provide a summary of the status and trends of key natural resources across and within various regions. Specifically, the purpose of a state of the environment report is to describe and monitor the health of the environment in terms of key indicators.

Pima County may consider producing a state of the environment report for several reasons:

- A state of the environment report would describe environmental indicators that provide a baseline for understanding the health of Pima County's environment. These indicators can be used for anticipating and evaluating the consequences of making specific decisions that affect Pima County's environmental quality.
- By identifying key natural resources, describing current conditions, and developing measurements that indicate trends, the report provides a scientific basis for understanding Pima County's environment. In addition, these indicators can be monitored on a periodic basis, documenting any changes and providing up-to-date information.
- A State of the Environment Report will be considered by the Science Commission as part of an adaptive management plan for the Sonoran Desert Conservation Plan.

The purpose of this paper was to describe what a state of the environment report could contain and how that information may be used. Several aspects of what Pima County may want to consider for an state of the environment report are discussed. Additionally, three regional state of the environment reports are reviewed and summarized

**Background**

The primary purpose of a state of the environment report is to increase the awareness concerning environmental conditions and trends, to understand the relationship between human activities and environmental quality and the sustainability of ecosystems, and to provide a broad basis for improved decision making on environmental matters (Denisov, et al., 1997). A state of the environment report is a monitoring and reporting tool that can assist the environmental decision making in two ways: through the presentation of data; and through its monitoring and assessment of progress of particular outcomes and/or actions.

State of the environment reporting focuses on the condition of natural systems, the pressures that are acting on them through human activities, and the efforts underway to minimize the

impacts of such pressures. The state of the environment reporting process relies heavily on sound environmental and socioeconomic data. The data must go back in time to be able to interpret trends and forecast future directions.

This type of reporting typically discuss general descriptions of the resources; describe key issues and pressures; present a brief outline of what the region is aiming to achieve through its management; discusses results for this year and what they tell us, and give a brief review of progress made towards filling the information gaps identified. Finally, a state of the environment report usually covers current gaps and the steps needed to fill in the gaps.

### **Questions Addressed in a State of the Environment Report**

State of the environment reports differ on how the authors frame the questions to be answered. One report may look at the environment's health by using indicators such as water, air, and land quality. Another report may gauge the environment's health by watershed and ecosystem functions. Other reports may use a combination of abiotic and natural resource indicators to assess their region's health. While state of the environment reports can differ with content and how the report is focused, a report should be able to answer the following questions:

- What defines the health of the resource, and what are the indicators of a healthy system?
- What are the current conditions and trends?
- What are the threats or future risks?
- What data are available and how complete are they?
- What are the main features of our surrounding resources, i.e., air, land, plants, and animals?
- How are we using these resources and why?
- What are the environmental costs of our activities? Can these activities continue?

### **Pima County Considerations**

In order to consistently and reliably track environmental conditions year after year, state of the environment reports use environmental indicators. Indicators are measures that can be tracked through time to assess the successes and shortcomings of planned efforts. Indicators are used to help understand where progress is being made, where more effort is needed, and where new solutions might be needed (Dowty, et al., 2002).

For the purpose of discussion, the following list of topics and questions have been compiled for consideration for Pima County and the Sonoran Desert Conservation Plan.

#### Invasive Species

Are invasive species spreading? If so, what species and where? What are the consequences of these species spreading? Where are areas of invasive species management? What are the results of the managed areas?

## Riparian Areas

How many acres have been developed? How many acres have been functionally restored? What are the riparian vegetation and geomorphic condition and trends along selected streams? What measures are appropriate?

## Water Resources

*Groundwater:* Are groundwater levels increasing or decreasing? Where and why? Are water levels in index wells along selected streams useful as indicators of stress to ecosystems? What about the number of wells and the amount of pumping?

*Perennial springs and streams:* Are areas with perennial flow being maintained? If not, why? Are the flows increasing? How many miles of intermittent and perennial stream flows are there along selected streams?

What are the number, location, and acres of new artificial water bodies? What are the number and acres of artificial water bodies with native aquatic species? What is the native aquatic species diversity in selected water bodies?

## Cultural Resources:

How many acres of land have been surveyed for archaeological sites?

How many archaeological sites have been recorded?

How many archaeological sites have been lost through development (sites excavated in advance of construction)?

How many acres with high and moderate archaeological sensitivity have been lost through development?

How many sites have been protected through covenants or other conservation measures? Are these working?

How many sites/acres of priority archaeological sites and priority archaeological site complexes have been lost through development and or protected through conservation measures.

How many historic sites/districts have been listed on the National Register of Historic Places?

How many priority historic sites have been protected through covenants and other conservation measures. Are these working?

Have any new places with traditional cultural values been identified?

What steps have been taken to protect these resources? Are they working?

## Ranching Resources

Acres of conservation lands system (CLS) retired from livestock grazing or lands which were not grazed which become grazed? Increase or decrease in acres of conserved land system using NRCS grazing best management practices?

Acres of Conservation Lands System that have changed fire management practices? Acres of CLS actually burned?

### Ecosystem Functions (plants and animals)

Are our ecosystems being maintained?

Indicator species-pygmy-owl, Pima pineapple cactus, others?

*Vegetation:* Acres with a net increase/decrease in vegetation cover as detected in remote sensing? Total acres classified as developed vs. acres in natural land cover? Acres lost to urban/ag/mining in the conservation lands system. Acres protected by acquisition or conservation easements?

*Animals:* Native species extirpated in Pima County? Native species successfully re-established?

### Abiotic resources (water, air, soil, visual, precipitation, weather)

What is the condition of our abiotic resources? What is the Palmer Drought Severity Index by year and deviation from the average?

### Urbanization

*Infrastructure:*

*Transportation:* new miles road constructed in the Conservation Lands System (location, density)? New miles road/unit area which have been closed, rehabilitated?

*Energy:*

*Education:*

*Sprawl:* using aerial photos to document growth from year to year. Overlay with zoning, conservation lands system.

*Waste:*

### SDCP Implementation

Acquisition of identified priority "acquisition" areas? Policies in comprehensive plan update and conservation lands system being followed and/or implemented? Are ordinances up-to-date? Section 10 policies implemented/followed/adequate for species protection?

### **Regional Examples of State of the Environment Reports**

Several regional state of the environment reports were summarized and analyzed for content. *Puget Sound's Health 2002* was required by state law and focused on the area of Puget Sound and the counties that surround it. The *Oregon State of the Environment Report* was prepared by a carefully selected Science Panel, with contributions from a wide constituency of Oregonians. The purpose of this report was to describe the health of Oregon's environment in terms of natural structure and function, and how the environment contributes to a sustainable production of goods and services. Both the Puget Sound and Oregon state of the environment reports used indicators to evaluate ecosystem functions. Finally, the *Indiana*

*State of the Environment* report was reviewed. The Indiana report differs from the above mentioned reports because it evaluated environmental health based on indicators of contamination and pollution levels on air, land, and water quality.

### Puget Sound's Health 2002

The Puget Sound Water Quality Action Team produced the *Puget Sound's Health 2002* report on key indicators of Puget Sound's health. This report was prepared in response to the Washington State Legislature's request to evaluate efforts to protect the Puget Sound. The report includes information on 19 indicators that assess the successes and shortcomings of efforts to protect and restore Puget Sound. The environmental indicators were designed to answer these questions:

- Are areas where shellfish can be safely harvested increasing or decreasing?
- Is the water quality for recreation improving or declining?
- Are the size and frequency of oil spills increasing or decreasing?
- Is the area of contaminated sediments increasing or decreasing?
- Is toxic contamination of marine species increasing or decreasing?
- Is fish and wildlife habitat increasing or decreasing?
- Are aquatic nuisance species increasing or decreasing in Puget Sound?
- Are fish and wildlife populations increasing or decreasing?

The Puget Sound Water Quality Action Team recognized the following difficulties and risks in presenting a small set of environmental indicators as measures of the performance of Puget Sound protection (excerpted from *Puget Sound's Health 2002*):

- The environment is continually changing. It is often difficult to determine whether changes observed in environmental indicators reflect natural factors (such as varying ocean conditions) or relate to human actions.
- Our actions and programs to protect and restore Puget Sound do not always have a simple relationship to environmental results. Several programs may act together to bring about the changes we observe in the environment. Actions taken today may not result in an environmental response for a number of years. And, the positive results of our actions and programs might be lost because of the increasing stresses from our region's rapidly growing human population.
- Vital signs, such as the environmental indicators that we track and present in this document, offer a simplified view of a complex system. Selection of a limited number of indicators necessarily limits the breadth and diversity of information that is presented. Turning complex data into simple indicators can sacrifice some of the richness of the underlying information.

The *Puget Sound's Health 2002* report describes the status of the environmental indicators, the stresses on them, and the future trends suggested by the data tracked. The report is presented in a reader-friendly format for those who live and work in the Puget Sound area. The report recognizes improvements in the health of the Sound, such as improved marine

survival of coho salmon, and acknowledges declines in other aspects of environmental health. The report concedes that there are a growing number of people to the Puget Sound area, which increase problems for water quality, plant and animal life, and other ecosystem changes. The *Puget Sound's Health 2002* report does not report on social or economic factors, nor does the report cover ecosystem goals or future actions.

#### Oregon State of the Environment Report, 2000

The Oregon Progress Board authorized the *Oregon State of the Environment Report (SOER)* in 1998. The purpose of the report was to describe the health of the environment in terms of natural structure and function, and how the environment contributes to a sustainable production of goods and services. The development and review of the Report was lead by State of the Environment Report Committee comprised of three groups: the Environmental Stewardship Committee representing multiple stakeholders; an Advisory Group appointed by the Progress Board to ensure a diversity of representation in the report's development; and the Science Panel, who prepared the report in 2000.

The Science Panel considered the health of the environment from three different perspectives ( excerpted from the *Oregon State of the Environment Report* ):

- A healthy environment has naturally functioning landscapes (with a range of structure and function much as would have occurred before intensive land use and conversion).
- A healthy environment can sustainably provide the goods and services that people desire.
- A healthy environment meets the requirements and overall goals of environmental laws (such as the Clean Water Act or the Clean Air Act).

The focus of Oregon's state of the environment report was on an independent assessment of Oregon's environment, and did not directly consider social and economic policy considerations. Several steps were taken to ensure that the Report would eventually guide performance-based policies, such as the inclusion of two resource economists on the Science Panel, and regular meetings with various stake-holders to ensure the analysis would be useful in the context of Oregon's environmental, social, and economic goals. Additionally, the Science Panel selected indicators that were realistically measurable and meaningful to society, as well as science.

Oregon is a large state with many different environmental conditions. In order to analyze data in areas where environmental conditions are relatively homogenous, the Science Panel selected a well-established hierarchical system of ecoregions (used by the U.S. Environmental Protection Agency). The ecoregions are based on the similarity of several environmental characteristics, such as geology, vegetation, and average precipitation. Another area of analysis was organized by drainage basins. Gathering data by ecoregions provides insights into vegetation, land use, and land cover, while gathering and analyzing data by drainage basin provides information on water quality, sedimentation, and aquatic habitat. Both approaches use landscape characteristics rather than political boundaries to define study areas.

The first section of Oregon's SOE report provides an examination of the status of individual natural resource systems and resources (listed below), covering 18 environmental indicators. The indicators were intended to provide a quantitative answer to this question, "From a scientific perspective, what is the health of Oregon's environment?" Because the 18 indicators (listed below) cannot fully convey the state of the environment in Oregon, additional indicators are listed with the resource summary chapters, for a broader index for in considering the health of Oregon's ecosystems. The authors attempt to define the health of each resource in terms of the three perspectives listed previously, describe the current condition and trends, and project where there may be future risks to the health of these natural systems.

The 18 Indicators (excerpted from *Oregon State of the Environment Report*):

*Water Quantity*

1. Degree to which stream flows meet ecological needs based on the proportion of in-stream water rights that can be met.

*Water Quality*

2. Proportion of streams and rivers with good to excellent water quality according to the Oregon Water Quality Index.

*Marine Ecosystems*

3. Number of at-risk stocks of marine fish and shellfish, as defined by state or federal listing as over-fished or at risk of being over-fished; or by listing as threatened or endangered under state or federal Endangered Species Act.

*Estuarine Resources*

4. Areas of estuarine wetlands (tidal marsh/swamp habitat) compared to historical area (acres and percent).

*Freshwater Wetlands*

5. Change in area of freshwater wetlands as compared to historical distribution (acres/percent).

*Riparian Ecosystems*

6. The amount of intact or functional riparian vegetation found along streams and rivers.

7. Trends in the health of stream communities using an index comparing invertebrate populations to those expected in healthy aquatic habitats.

*Freshwater Fish Communities*

8. The percentage of wild, native fish populations, including salmon, that are classified as healthy.

*Forest Resources*

9. Amount of commercial forest types in different structural stages compared to amounts in healthy forest systems.

10. Timber harvest relative to sustainable levels (reference: estimated sustainable levels in plans and management intentions).

### *Agricultural Ecosystems*

11. Trends in soil quality and erosion rates.
12. Area of land in agricultural production.

### *Urban Areas*

13. Percentage of assessed groundwater that meets the current drinking water standards.
14. Frequency that the Air Quality Index exceeds the existing standards.
15. The amount of carbon dioxide emitted.

### *Biological Diversity*

16. Change in area of native vegetation types.
17. Percentage of at-risk species that are protected in dedicated conservation areas.
18. Number of nuisance invasive species.

The following section of the report considers the interaction of many natural systems in particular regions of the state. This section provides an overview of current condition of the regional environment, its strengths and threats, and its key resources. The ecoregions were defined largely by physical parameters such as elevation and relief. The watersheds that drain across them may be contained in several different ecoregions. Each ecoregion is described by landscape structure and function, biological communities, production of environmental goods and services, regional resource planning and regulatory compliance, and a conclusion summarizing past and future environmental challenges.

The *Oregon State of the Environment Report* analyzes the status and trends of the state's most important environmental resources, and gives an assessment of their current health. Space and time constraints forced authors to limit their analyses. The report is not an exhaustive list of environmental issues in Oregon, nor was it possible to discuss every negative environmental impact. The data available for analyzing each resource varied considerably. Consequently, the report's conclusions are a result of both analysis of existing data and best professional scientific judgement.

### Indiana Annual State of the Environment Report 2001

The Indiana Annual State of the Environment Report, authored by the Indiana Department of Environmental Management, is intended to provide a framework for environmental discussion and decision making in the state. This report differs from the previously discussed SOE reports because the focus is primarily on environmental contaminants rather than ecosystem functioning. The report consists of six subject chapters: air quality; land quality; water quality; measuring pollutants; children; and finally a "what can you do?" chapter. The first 3 chapters discuss pollution factors and their impacts on air, water, and land quality. An overview of the main pollutants, their impacts, and major sources for the pollutants are also discussed.

The fourth chapter, "Measuring Pollutants," discusses chemicals found in the environment, and measures toxic chemical, known and potential carcinogen, and environmental waste release to the environment from industry. This information is based on data gathered for the Toxic Release Inventory (TRI). Facilities must file a TRI report if they have 10 or more employees, are included in the Standard Industrial Classification codes that are required to report, and

manufacture, process or otherwise use a listed toxic chemical in quantities greater than established thresholds in a calendar year.

The report includes a short discussion on environment issues that affect children's health. The report explains, "Pound for pound of body weight, children eat more food, drink more water and breathe more air than adults. Consequently, they may be exposed to higher levels of contaminants in our environment as well," (Indian Department of Environmental Management, 2001). This chapter centers its discussion on educational programs developed for children's care facilities (such as day cares, schools, and family households). Most of the educational programs focus on protecting and educating children and care-givers on environmental threats and concerns.

The final chapter provides ideas on how individual Indian residents can reduce their impact on the environment. The chapter contains suggestions on how to protect Indiana's air, land, and water quality, as well as where to obtain more information on Indiana's environment.

The Indiana State of the Environment Report presented its environmental pollution data in easy-to-read graphs, pie-charts, and color-coded graphics. Website addresses were provided for more precise information on the environmental data. The report provided information on Indiana's environmental health using indicators for pollution and toxic chemicals. Future goals or actions for pollution control were not discussed in this report. The report provided very limited information on Indiana's natural resources and ecosystem intactness and functioning.

### **National Examples of State of the Environment Reports**

In addition to the regional examples, a couple of national state of the environment reports were reviewed and summarized. *State of the Nation's Ecosystems* was produced in 2002 by the Heinz Center, a nonprofit institution dedicated to improving the scientific and economic foundation for environmental policy. Another report, currently in the process of development, is the Environmental Protection Agency's *State of the Environment Report*, for which an outline was available for this review. Both of these reports use, or will use, a developed set of indicators to evaluate ecosystem functions and the impacts to human health.

#### State of the Nation's Ecosystems

*State of the Nation's Ecosystems* was developed in response to a request made by the White House Office of Science and Technology Policy (OSTP) in 1995, during its review of the federal government's environmental monitoring efforts. OSTP's request was for the Heinz Center to create a "nonpartisan, scientifically grounded report" on the state of the nation's environment, with the focus placed primarily on ecosystems (Heinz Center, 2002).

The development and review of the report was led by the Design Committee, convened by the Heinz Center. Several technical work groups were also assembled to provide technical expertise for particular ecosystems. Both the Design Committee and Technical Work Groups were made up of a large number of experts from many disciplines (i.e., ecology, hydrology, oceanography, etc.) and sectors (i.e., government, private, environmental organizations, academia, etc.). The report presents the results of their intense, 5-year collaboration to

provide an overview on “what the nation needs to know about the changing state of its ecosystems” (Heinz Center, 2002).

In developing a framework for the report, the Design Committee reviewed a wide range of previous reporting efforts and consulted with a number of relevant stakeholders and experts. During this process, the committee developed the following list of goals (excerpted from the *State of the Nation’s Ecosystems*):

- The report is written for decision makers and opinion leaders concerned about the “big picture” of the nations ecosystems.
- The report identifies a succinct set of strategic indicators to characterize the nation’s ecosystems.
- The report provides scientific information on which decisions can be based, while avoiding value judgements and policy recommendations.
- The report focuses on the state (or condition) of the nation’s ecosystems.
- The indicators selected for this report reflect both key properties relating to ecosystem condition and the goods and services derived from ecosystems.
- The report identifies critical gaps in data and in monitoring programs that must be filled in order to fully, and in a balanced way, characterize the state of the nation’s ecosystems.

Since many of the natural resource management decisions and a number of government and private activities were considered to be associated with different land cover types, the Design Committee decided to use a land cover approach as the basis for determining the types of ecosystems that would be described. The six major ecosystem types chosen as the “reporting units” were 1) Coasts and Oceans, 2) Farmlands, 3) Forests, 4) Fresh Waters, 5) Grasslands and Shrublands, and 6) Urban and Suburban Areas.

The health of each ecosystem type was determined using ten major characteristics of ecosystem function, with fourteen to eighteen indicators covering each of the characteristics (over 100 indicators in total). A list of the ecosystem characteristics and a brief description of the related indicators are provided in the table below (excerpted from the *State of the Nation’s Ecosystems* report).

Ecosystem Characteristic	Indicator Description
<b>SYSTEM DIMENSIONS</b>	
Extent	Area of an ecosystem or land cover type and its major components
Fragmentation and Landscape Pattern	Shapes and sizes of patches of an ecosystem type, and their relation to one another
<b>CHEMICAL AND PHYSICAL CONDITIONS</b>	
Nutrients, Carbon, Oxygen	Amounts and concentrations of key plant nutrients (nitrogen and phosphorus) and key ecosystem elements (oxygen and carbon)
Chemical Contaminants	Numbers of selected contaminants found in ecosystems, and how often these chemicals exceed regulatory or advisory thresholds

Physical Conditions	Condition of key aspects of the physical makeup of an ecosystem, such as erosion or water temperature
<b>BIOLOGICAL COMPONENTS</b>	
Plants and Animals	Status of native and non-native plants and animal species
Biological Communities	Condition of the plant and animal communities that make up an ecosystem
Ecological Productivity	Plant growth on land and in the water
<b>HUMAN USE</b>	
Food, Fiber, and Water	Amounts and values of key products for human use
Other Services, Including Recreation	Tangible and intangible services provided by ecosystems

The final piece of the report's framework was data selection. Since the indicators were selected based on what was perceived as being required to characterize the nation's ecosystems and not on data availability, the Design Committee had to develop a set of criteria for obtaining data from particular sources, determining what to do when adequate data was not available, and providing meaning to the measurements that were reported. The criteria they came up with are as follows (excerpted from the *State of the Nation's Ecosystems*):

- Data had to be of sufficiently high quality to provide a scientifically credible description of actual ecosystem conditions;
- Data had to have adequate geographic coverage to represent the state of the nation's ecosystems;
- Data had to be collected through an established monitoring program that offers a reasonable likelihood of future data availability;
- Provide one or more of the following items to give context to the data: information on how the indicator has changed over time (trends), information on regional differences, and comparisons with widely accepted reference points.

The bulk of the report presents an overview of the findings by the Design Committee and Technical Work Groups. Highlights are provided for ecosystem conditions, as well as the availability of data and indicators. This overview is organized according to the ten ecosystem characteristics provided in the table above and includes a number of tables that summarize the data collected and display data availability.

State of the Nation's Ecosystems does not report on any of the stresses or threats to the nation's natural resources. Nor does it provide any conclusions to the data or recommendations for future policy. The report simply provides the best available scientific information on the state of the nation's ecosystems and a framework for future monitoring and reporting efforts on a national scale. This report is considered to be a "first step" for reporting on the state of the nation's ecosystems, with similar reports to follow every five years (Heinz Center, 2002).

## State of the Environment Report (EPA)

In November 2001, the Administrator of the Environmental Protection Agency (EPA) launched an agency-wide effort, referred to as the "Environmental Indicators Initiative." This endeavor was undertaken to gather and develop the information necessary to help guide the agency in its goals "to make our air cleaner, our water purer, and our land better protected." In cooperation with the EPA, the President's Council on Environmental Quality agreed to convene a federal interagency work group to inventory and evaluate all of the ongoing work on environmental indicators across other federal agencies (EPA, 2001). Once complete, the State of the Environment Report will provide the results obtained from this initiative.

Using a series of in-house workshops, the EPA developed a list of 166 potential indicators, and associated data, for various questions related to five themes of environmental health: Ecological Condition, Human Health, Air, Water, and Land. A panel of 18 experts in various disciplines from within and outside the agency was then charged with refining the list, with special attention directed to data quality and coverage, suitability of the indicators, alignment of the indicator to the question being asked, additional or alternative indicator(s) to the questions asked, and a query for other questions and associated indicators to better address the issues (EPA, 2002a).

Using the comments from the expert panel, theme work groups placed the indicators into three categories: Type I, Type II and Type III. Type I indicators are those for which adequate data is available on a national basis through ongoing, systematic monitoring or data collection efforts. Type II indicators have full or partial data available, but either a complete cycle has not been collected, the data are not available on a national scale, the underlying monitoring design does not permit making inferences, or a quantitative estimate of condition cannot be made. Type III indicators have no ongoing monitoring or data collection efforts in place. The Type III indicators are considered useful for revealing data gaps that may need to be filled to provide quantitative information (EPA, 2002b). A list of the indicators and relevant questions for each of the themes are provided on the EPA's website at [www.epa.gov/indicators/scnotes.htm](http://www.epa.gov/indicators/scnotes.htm).

Once completed, the *State of the Environment Report* will provide a synopsis of the information obtained through the "Environmental Indicators Initiative." The report will be organized by the five themes listed above, and will include the identification of data gaps and discussions on the challenges that may be faced in filling those gaps. A draft copy of the report is expected to be released in November 2002 for public discussion.

### **Conclusion**

A state of the environment report would be a potential tool to provide a basis for measuring progress on goals of the Sonoran Desert Conservation Plan. This type of report may be useful to Pima County for a variety of reasons:

- A state of the environment report can help increase the awareness concerning environmental trends and conditions, and increase understanding of the relationship between human activities and environmental quality. A baseline report would provide

initial information, with updates on an annual or biannual basis.

- State of the environment reporting incorporates monitoring data and presents it in such a way that progress and outcomes of particular decisions can be assessed and monitored over time.
- Over time, the monitoring data and results gathered for the report may lead to a greater understanding of the condition of natural systems, and the pressures acting on them through human activities. The information gathered may be useful in assessing the successes and failings of efforts to protect and restore areas of Pima County.

Several things need to happen before a state of the environment reporting project can be developed. A set of questions need to be defined in a way that the answers will provide information useful for attainment of the long-term goals of the Sonoran Desert Conservation Plan. Environmental indicators that can assess the progress towards those goals will need to be identified and monitored through time to provide data useful for evaluation. The data gathered will need to be processed by a team of experts who can fully comprehend and process the information into meaningful terms understood by the community.

## References

Denisov, N.B., Mnatsakanian R.A., and A.V. Semichaevsky. 1997. *Environmental Reporting in Central and Eastern Europe: A Review of Selected Publications and Frameworks*. UNEP/DEIA/TR.97-6, GA/205031-97/1, and CEU /50-97.1

Dowty, Pete and Scott Redman. 2002. *Puget Sound's Health 2002*. Puget Sound Water Quality Action Team. < [http://www.wa.gov/puget\\_sound](http://www.wa.gov/puget_sound) >.

EPA. 2001. Memo from Administrator Whitman. Text of memo from Administrator Christine Whitman, dated November 13, 2001. Accessed October 31, 2002 < <http://www.epa.gov/indicators/memo.html> >

EPA. 2002a. Expert Reviewers and Affiliations. Accessed October 31, 2002 < <http://www.epa.gov/inidcators/experts.html> >

EPA. 2002b. Indicator Review Results. Accessed October 31, 2002 < <http://www.epz.gov/indicators/scnotes.html> >

The Heinz Center. 2002. *The State of the Nation's Ecosystems*. Cambridge University Press, New York, New York. From Website: [www.heinzctr.org/ecosystems/intro/toc.shtml](http://www.heinzctr.org/ecosystems/intro/toc.shtml)

Indiana Department of Environmental Management. 2001. *Indiana State of the Environment Report*. Indiana State Government.

State of the Environment Report Committee. 2000. *Oregon State of the Environment Report*. Accessed July 1, 2002. < <http://www.econ.state.or.us/opb/soer2000/> >.

