CITY OF PEORIA

Desert Lands Conservation Master Plan

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City of Peoria Desert Lands Conservation Master Plan

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APPENDICES

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"The Nation behaves well if it treats the natural resources as assets which it must turn over to the next generation increased and not impaired in value"

- Theodore Roosevelt

*"No house can ever be **on** any hill or on anything. It should be **of** the hill, belonging to it, so hill and house could live together each the happier for the other."*

- Frank Lloyd Wright

Section One - Introduction

The Sonoran Desert

The lush Sonoran Desert provides one of the most beautiful, and fragile, environments on the planet. It is also one of the most unique, with its native vegetation, dominated by the stately Saguaro Cactus, found only in selected areas of Arizona and Mexico. This beauty has not gone unnoticed, drawing thousands of people to live in or visit the Valley of the Sun. Even with scorching summers, the climate, with its mild winters and abundance of sunshine, has also drawn countless numbers of people to the region for many years.

The beautiful Sonoran Desert attracts people from around the world to visit and live in its unique environment.

In response to these, and other, attractions, the population of the Phoenix metropolitan area has exploded in the past few decades and the region is consistently one of the fastest growing areas in the United States on an annual basis. This rapid growth has resulted in urban and exurban expansion into areas of previously undisturbed desert in order to accommodate the demand for housing and urban services to accommodate new residents. As the Valley's communities expand, thousands of acres of irreplaceable Sonoran Desert are vanishing under a sea of red tile roofs. The loss of habitat also has significant implications for the area's wildlife population.

The City of Peoria is also experiencing the expansion of development into areas that were previously considered remote. The development of Lake Pleasant and the additional recreational opportunities provided by the lake has served as a catalyst for growth in this area. The recreational opportunities offered at the lake, which are in close proximity to jobs and housing, will make the northern areas of Peoria even more attractive for future residents.

The consequences of development on the desert environment are apparent in every city in the Phoenix metropolitan area. Areas that once provided opportunities to enjoy nature, to provide a respite from the rigors of urban life, or that offered habitat for a variety of native species, have been transformed into residential neighborhoods with little of the original character of the land remaining. As the sophistication of the general public expands regarding environmental issues, there has been a growing trend to identify options that will encourage sensitive, sustainable development. In many cases, the public has demonstrated a willingness to participate in funding certain activities to protect the environment, including increasing tax revenues and the payment of property premiums for the benefit of preserving natural areas.

The City of Peoria recognizes that the preservation of these desert spaces is in keeping with the vision of its residents. The City is also aware that there are significant natural features throughout the northern areas of the City that will require some form of protection if they are to remain viable. These areas offer unique opportunities for protecting natural features, which are currently in a

pristine or nearly pristine condition. The City understands that, in order to provide its current and future residents the chance to enjoy the quality of life these residents expect, efforts will need to be made to protect, preserve, and enhance these unique environmental settings.

The purpose of this Conservation Master Plan is to identify the areas that merit special consideration. It will identify strategies that can be used to help protect these special areas and develop a plan that, when implemented, enables the natural character of northern Peoria to remain singularly beautiful. All of this will need to be accomplished while respecting the property rights of individual land owners who currently own many of the most unique features in this area.

The Current Planning Context

For the past decade, opinion polls throughout the Metropolitan Phoenix area have consistently shown that accommodating growth and development while still preserving the deserts unique environment, is the predominant issue of concern to local residents. Although the problems accompanying growth are diverse, such as traffic congestion, crime, overcrowded schools, and increased taxes, it is the loss of the unique and fragile Sonoran Desert environment that has galvanized the actions of thousands of individuals and groups across the Valley in a common drive to protect this valuable resource. Recent events, such as an attempt to place a mandated urban growth boundary proposition on the Arizona ballot and the Growing Smarter Initiative and its subsequent passage, have only amplified the importance of the issue of desert conservation. Projections about growth in Metropolitan Phoenix, which show that Maricopa County's population will grow from 2.7 million in 1998, to more than 4.5 million by 2020, ensure that the debate will not abate. This is also true in Peoria, where population projections in the *Peoria General Plan* indicate that the City's population of 62,200 in 1995 will grow to 95,000 by the Year 2000. The City of Peoria's Home Page on the Internet indicates that the community is the eighth fastest growing city in the country and that the estimated population in 2005 will be 125,000 residents.

Growth and its impacts, particularly on the desert environment, is the most important issue in the Phoenix Metropolitan Area according to a number of opinion Polls.

Currently, many communities across the Valley are proactively examining the implications of growth and are attempting to ensure that future development adds to, rather than detracts from, the quality of life for their residents. Issues such as desert conservation, assessing the fiscal, as well as the environmental and social costs, of development are also being evaluated and action is being undertaken. Several recent examples illustrate this point. In the past several weeks, the Cave Creek

Town Council unanimously adopted a ½ cent sales tax increase to pay for the purchase of land at Spur Cross Ranch. The Town has also actively lobbied the Arizona State Legislature for funding to secure this land. In another jurisdiction, the City of Scottsdale recently applied, under the Arizona Preserve Initiative program, for the purchase of 16,600 acres of desert land in the McDowell Mountains. This is in addition to land that they have already identified for purchase as part of their desert preserve initiative. In Maricopa County, the Board of Supervisors has initiated a process under the Recreation and Public Purpose Act (RPPA) to obtain a long-term lease from the Bureau of Land Management for lands adjacent to Lake Pleasant Regional Park. It is in this context that the City of Peoria decided to prepare a *Desert Lands Conservation Master Plan* for a relatively undeveloped area of approximately 46,000-acres in the northern part of the community in an area proximate to Lake Pleasant.

Section Two - Project Approach

The *Desert Lands Resource Identification and Conservation Master Plan* is a planning work program comprised of a multi-phase plan preparation process intended to identify, catalog, analyze, and protect natural landscape features of significance. The plan will focus on the creation of an acquisition and management plan based upon a thorough analysis of existing conditions, which expresses the vision of the residents of the City of Peoria to conserve and protect important natural landscape features.

The concept for the *Desert Lands Resource Identification and Conservation Master Plan* is to preserve, protect, and enhance important landscape features such as mountains, foothills, rivers, washes, canals, areas of significant vegetation, or areas of critical wildlife habitat, unique geologic features and areas of cultural significance. The plan will identify the locations of these areas within the Study Area and will identify strategies for the conservation, preservation or protection of these features. The final result of the plan will be the formulation of a set of comprehensive policies and strategies which facilitate the implementation of the plan.

A. Data Collection Phase

The effort required to develop this plan is divided into three separate phases. The first phase involves data collection and an inventory of resources. During this phase, research was performed to locate and obtain local, regional and national conservation plans or related documents which have been prepared for other municipalities. These documents were reviewed and procedures or approaches pertinent for this study, were identified.

A second aspect of this first phase effort was the identification and evaluation of significant features within the Study Area. These features were identified through a variety of mechanisms, including interviews with landowners, interviews with organizations familiar with the area (i.e. hiking clubs), review of available maps and field observation. This information was used to prepare a summary of features and areas which should be considered for preservation or some form of protection.

B. Identification of Preservation Areas and Strategies

The second phase of the planning process included the development of strategies and policies which could be utilized to protect the areas identified in Phase One. Because there are a variety of landowners in the Study Area, as well as a variety of landforms or significant areas that merit protection, a number of preservation strategies and options need to be developed to provide the tools necessary to protect the areas identified as sensitive and valuable.

Coordination with a number of agencies and various departments at the City were required to study and develop alternatives for preservation which are realistic and cost effective. The alternatives and strategies identified were reviewed and carefully considered by the consulting team, BRW, Inc., and the Technical Advisory Committee to explore the legality, the cost, the practicality and the effectiveness of the strategies.

Following the review of the recommended procedures and policies with the Technical Advisory Committee, the consulting team prepared a draft of the recommended policies and guidelines. These policies and guidelines are included in this report and will be presented to the Planning and Zoning Commission, the Parks and Recreation Board, and the City Council for their review and comment.

C. Plan Implementation

Phase Three of the process involved the identification of policies and procedures that will contribute to the implementation of the plan. The implementation recommendations will respond to the legal and procedural issues, which could impact the preservation of the land areas. The recommendations address the realities of cost, the rights of landowners, and the enforcement capabilities of the City's review procedures. Close coordination with the Technical Advisory Committee and City Staff was required to identify an implementable plan. In addition to the guidelines and policies, the team explored options for land acquisition and how it would impact the implementation of the final plan.

Summary

A successful desert conservation plan should be comprehensive and cohesive. It should be founded on a comprehensive and mutually agreed upon set of community goals and objectives. It should also include a variety of regulatory and incentive measures to encourage the fulfillment of its goals and objectives. These measures should involve both a micro and a macro approach to desert preservation. That is, the measures should cover the spectrum from regional policies and programs down to polices and programs which affect land at the parcel level. The plan should encourage a public/private partnership between all levels of government and private property owners and developers. Finally, the plan should contain clear mechanisms for implementation, including periodic review of programs and policies. The measures identified in this report will provide the framework to accomplish all of these objectives.

A desert conservation plan should provide a variety of regulatory and incentive measures to fulfill its goals and objectives. The programs will range from limited or restricted development in the most sensitive areas, to normal development densities subject to specific on-site development guidelines designed to integrate the development into the desert environment.

Section Three – Definition of the Study Area

During the initial project development, the City defined the limits of the Study Area for this Conservation Master Plan. It was agreed that the Jomax Road alignment would serve as the southern boundary of the Study Area. Jomax Road is the approximate northern limit for new development currently underway in Peoria. Many areas south of Jomax have been developed and natural space areas are somewhat limited or are already planned for other land uses.

The northern limits of this study extend beyond the city limits and into Yavapai County. This enables the study to include perimeter areas of Lake Pleasant, which are being considered for annexation into the City in the near future. The Study Area boundary to the north follows the alignment of the section lines encompassing the northern park boundary of Lake Pleasant Regional Park. The east and west boundaries of the Study Area follow the current city limits. The easternmost edge of the Study Area aligns with 67th Avenue. The western edge aligns with Cotton Lane. The boundaries of the Study Area are depicted in *Figure 1, Study Area*.

The Study Area was divided into four sections to enable the team to focus on specific areas and to identify particular characteristics of the various sections. For simplicity, the limit of each section was determined by aligning the section boundaries with existing road alignments. The study sections were also based on their juxtaposition to the overall Study Area. The following text describes each of the four sections.

The South Zone (Zone 1):

- North Boundary - Dove Valley Road Alignment
- South Boundary - Jomax Road
- East Boundary - 67th Avenue Alignment
- West Boundary - 99th Avenue Alignment

General Characteristics: The primary features of this area include portions of the Agua Fria River and the New River. The flood-prone area of New River is significant due to the New River Dam. The majority of the area has a relatively even slope. There are several small mountain islands, with the East and West Wing Mountains being the most dominant features.

Central Zone (Zone 2):

- North Boundary - Highway 74
- South Boundary - Dove Valley Road Alignment
- East Boundary - Peoria City Limits
- West Boundary - 115th Avenue Alignment

General Characteristics: The eastern two-thirds of this area is relatively flat, with moderate undulation near the New River and the Agua Fria River. The flatland areas consist of creosote and bursage plant communities. The Agua Fria River flows from the north to the south and divides this zone. The Agua Fria is also the demarcation line of the foothills of the Hieroglyphic Mountains. The West Bank of the Agua Fria has several steep slopes as the Hieroglyphic Mountains cover the western third of the Study Area. The elevation differential is 600 feet, ranging from the riverbed of the Agua Fria (1,400' elevation) to the highest peak in this zone (2,000' elevation). The common increase in plant diversity, density and size is evident along the typically dry desert washes which flow out of the Hieroglyphic Foothills and into the Agua Fria River.

Lake Zone (Zone 3):

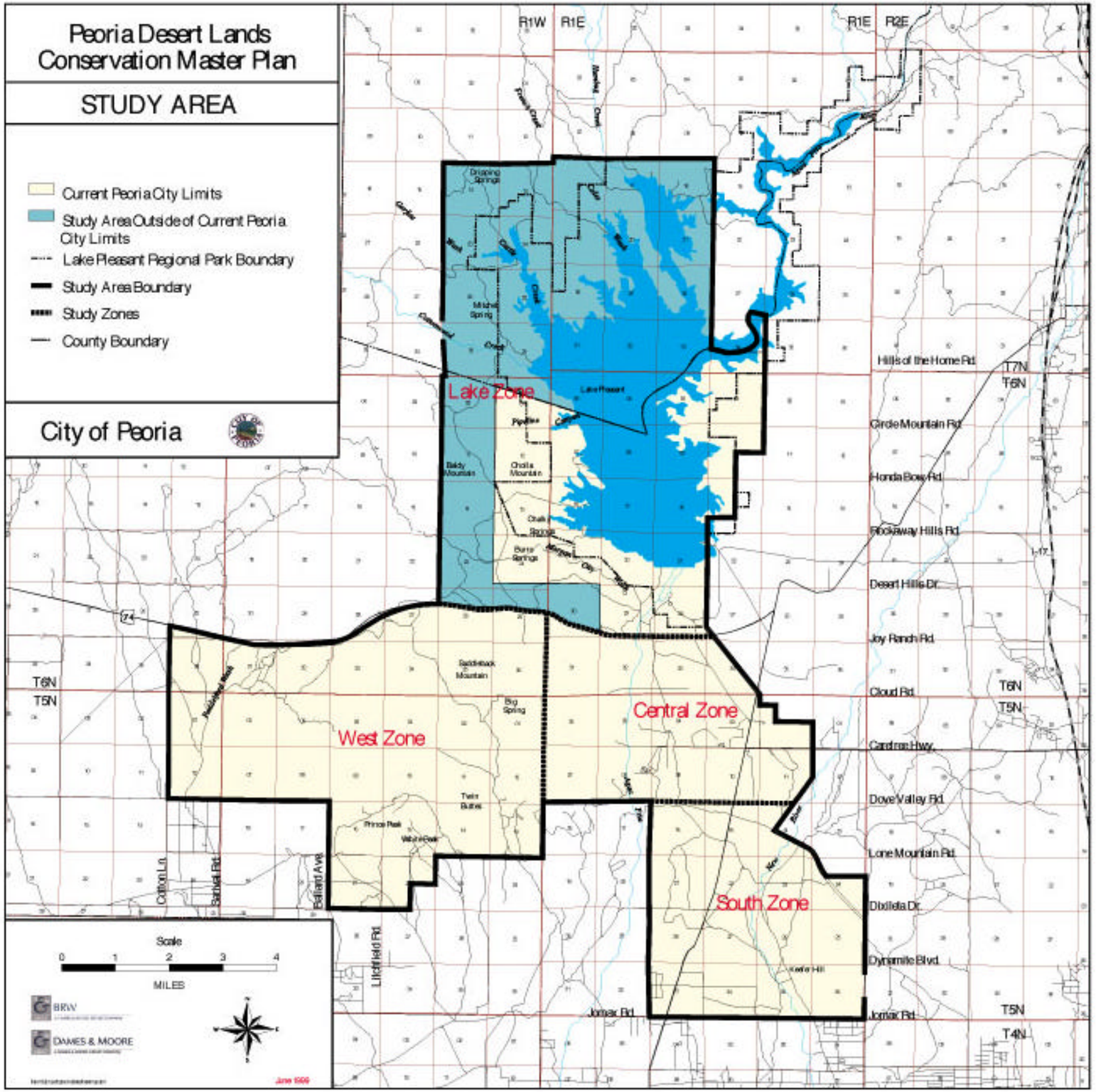
- North Boundary - Section lines north of Lake Pleasant Regional Park boundary
- South Boundary - Highway 74
- East Boundary - Peoria City Limits and 91st Avenue Alignment
- West Boundary - Dysart Road Alignment

General Characteristics: This includes all of the Study Area north of State Road 74. The primary feature of this area is Lake Pleasant. The majority of this area falls within the boundary of Maricopa County's Lake Pleasant Regional Park. There are several significant peaks in this area which stand out as landmarks. These include Baldy Mountain, which has the highest elevation in the entire Study Area at 2,757 feet. There are also several significant washes, which support riparian vegetative communities as they flow out of the Hieroglyphic Mountains and into Lake Pleasant.

West Zone (Zone 4):

- North Boundary - Highway 74
- South Boundary - Peoria City Limits
- East Boundary - 115th Avenue Alignment
- West Boundary - Cotton Lane Alignment

General Characteristics: The majority of this section consists of the southernmost extension of the Hieroglyphic Mountain range. This area is fairly rugged, particularly when contrasted with the south and central zones of the Study Area. There are a number of prominent and visually interesting peaks in this area, including Saddleback Mountain, Twin Buttes, Pinnacle Peak and other unnamed peaks. There are also a number of desert washes, which support a variety of desert trees and associated riparian vegetation. Contained in one of these washes is a very unique natural spring which has been named, Big Springs. This spring is cut into the natural bed rock which lines the wash and it provides a source of water for all but the driest years. Cholla, Ocotillo and Saguaro Cacti are found throughout the area. A significant wash (Paddelford Wash) is located on the western portion of this area. West of this wash and beyond the limits of the Study Area the topography of the area flattens out and is characterized by a series of small braided channels with creosote being the dominant plant.


Peoria Desert Lands
Conservation Master Plan
STUDY AREA
Current Peoria City Limits
Study Area Outside of Current Peoria City Limits
Lake Pleasant Regional Park Boundary
Study Area Boundary
Study Zones
County Boundary
City of Peoria
Lake Zone
West Zone
Central Zone
South Zone
R1W
R1E
R2E
T7N
T6N
T5N
T4N
Hills of the Home Rd
Circle Mountain Rd
Honda Bow Rd
Rockaway Hills Rd
Desert Hills Dr
Joy Ranch Rd
Cloud Rd
Castle Hot Springs Rd
Dove Valley Rd
Lone Mountain Rd
Dixileta Dr
Dynamite Blvd
Jomax Rd
Lake Pleasant
Scale
0 1 2 3 4
MILES
BRW
DAMES & MOORE
June 1999

Section Four – Data Collection and Resource Evaluation

The consulting team has researched a variety of local, regional, and national planning documents and procedures utilized by municipalities to protect or conserve natural open space areas. The local and state information was collected directly from contacting and obtaining the pertinent data from the governing agency. The national information was obtained through the Internet or the National Resource Library of the American Planning Association.

To generalize the findings of this research, it became obvious that the majority of municipalities who have some form of conservation protection have tried to implement their objectives through the use of zoning ordinances. At their own admission, this has often provided less than favorable results because the ordinances are written to cover typical and general conditions and the areas to be preserved do not necessarily fit these general conditions. There have been some successful examples, such as the City of Scottsdale's Environmentally Sensitive Land Ordinance, which was cited by local and national sources as an example of a comprehensive and specific attempt at protecting areas. The difficulty of that plan has come about through the challenges of private landowners that claim the document is too restrictive and limiting to their rights as landowners.

On the national level, the documents reviewed typically address general zoning issues or open space stipulations. The documents that seem to be most effective are tailored specifically to local conditions and identify detailed solutions to well defined areas. The objectives are defined and the solutions recommended could be measured regarding how well they respond to the objectives.

A. Biological Resources – Vegetation and Wildlife

A site visit to the Study Area was conducted in mid-October by Kim Otero, Dames & Moore biologist, accompanied by Tim Wade and Shelly Shepard of the Arizona Game & Fish Department (AGFD). The following is a description of the study zones based on observations and knowledge of the project area.

The area of most concern is the Lake Zone due to the number of high value, significant washes and lush Arizona Upland communities. Major washes which exist in this area are Morgan City Wash, Pipeline Canyon, Cottonwood Creek, Garfias Wash, Castle Creek, French Creek, Coles Wash, and Humbug Creek. Each of these support riparian habitats consisting of cottonwood and tamarisk, while others are characterized by wide dense mesquite bosques. These washes provide for diversity in the area, as well as serving as movement corridors for wildlife species, including deer and javelina. The existing matrix has two categories for washes— Significant and Secondary. Tim and Shelly recommended that a third category be added. Secondary would be those small, incidental drainages, while the other two categories would be defined according to criteria such as the diversity of horizontal and vertical density, the length of the wash, and whether it links the lake area with open, undisturbed habitat outside the Study Area. While this recommendation does have merit in terms of assessing the value of the washes, the evaluation of the horizontal and vertical density of these washes would require specific field research. This is a level of field work not available for this Study; however, as aspects of this plan are implemented, the City should plan to obtain additional and more detailed data pertinent to the environmental and habitat conditions of the natural areas. This recommendation is also made in the implementation section of this report.

The northern and western portions of the West Zone are characterized by rolling hills, dissected by washes supporting healthy stands of saguaros. Protecting these drainages and the slopes supporting such diversity would be preferable. The southern portion of this zone tends to be less diverse and flatter with fewer areas of interest for preservation.

The South Zone is already experiencing more development than the other areas. This zone is typically less diverse overall; therefore, protection of the washes with an adequate buffer would be important for wildlife movement up the Lake Zone.

Tim and Shelly recommended obtaining information from the Bureau of Land Management (BLM), Phoenix District and the Arizona Fish and Game Department (AGFD). BLM has conducted numerous wildlife studies in the area for desert tortoise and pygmy owl, as well as other species. AGFD has conducted bat surveys at many of the mine sites and has identified bat roosting areas. This information would be useful in identifying areas with a high value for wildlife habitat and delineating wash corridors to link such habitats.

Throughout the area, avoiding isolated peaks and sloped areas would also be preferred.

B. Hydrological Features

The natural drainage corridors offer some of the greatest value in terms of the environmental and aesthetic character of the Study Area. There are a variety of stream courses that range from minor drainage to primary river corridors. As is typical with desert washes, the concentrated drainage which flows through these corridors supports a greater variety and greater density of natural vegetation than the surrounding desert. This increased density of vegetation provides food and cover for a wide variety of desert wildlife. These washes serve as the trailways for the larger mammals and the vegetation and rocky outcrops exposed by erosion provide habitat for smaller mammals, reptiles and birds. It is essential to maintain the habitat value of these wash areas if the character and environmental quality of northern Peoria is to be preserved.

There are two primary rivers within the Study Area. The Agua Fria River is the primary drainage and has historically drained the majority of the watershed included in the Study Area. This river environment also played a significant role with the native peoples who dwelt in this area as is evidenced by the number of archeological sites identified along the river corridor. The character of the river has been changed in recent history with the Lake Pleasant Dam and more recently the Waddel Dam, which creates Lake Pleasant. The majority of the river within this Study Area occurs south of the Waddel Dam.

Current conditions of the Agua Fria River still offer areas of riparian vegetation with stands of cottonwood trees and mesquite bosques. The wash bottom is fairly broad and there are areas where years of erosion have left dramatic cliffs and interesting rock formations along its banks. Current uses of the river range from sand and gravel operations to unstructured recreational uses, include hiking, horseback riding, all-terrain vehicular riding, four wheeling, and target shooting.

The recently developed *Rivers Master Plan* commissioned by the City of Peoria outlines a number of potential uses which could occur along the Agua Fria River. The majority of these suggested uses relate to maintaining and preserving the natural areas and open space which occurs along the river. This plan also recommends planning efforts which would lead to a city and regional river corridor network, enabling the river corridors to be linked to other trail routes and recreational opportunities.

The second primary river located in the Study Area is the New River. This river is located in the Southeast portion of the Study Area. The river facilitates a significant watershed but its channel is not as well defined as the Agua Fria. In many areas the New River is a series of braided channels with tributaries, which also parallel these channels before connecting into the main flow. This creates a broader area of riparian vegetation, which is supported by the intermittent flows of the river.

Like the Agua Fria River, there are a number of cultural sites located along or near the banks of the New River. Recent influences of man on the river include the impacts of ranching and residential development. One of the most significant impacts to the New River was the development of the New River Dam as a flood control project. This dam was designed to contain and control surface drainage north of the dam to protect development to the south. The containment of stormwater drainage has contributed to increased vegetation density in the areas where the water is impounded.

The *River Master Plan* also recognizes the New River as a potential recreational resource and it recommends linking it to the other trails and river systems as a part of the regional network. However it also recognizes the development activities planned and anticipated for the lands adjacent to the New River. The plan accounts for the development of active recreational uses in the basin areas of this river.

There are a number of significant desert washes located throughout the Study Area. Most of these start outside the Study Area and flow into the Agua Fria River or Lake Pleasant. These washes include Humbug Creek, French Creek, Castle Creek, Garfias Wash, Cottonwood Creek, and Morgan City Wash. The headwaters of these washes are located in the Hieroglyphic Mountains. The only significant wash which does not flow into the lake or the Agua Fria River is the Paddelford Wash. This wash is located in the western portion of the Study Area and is the primary drainage for the watershed located on the western side of the Hieroglyphic Mountains.

All of the significant washes listed above are primary corridors for regional wildlife and they provide important habitat. These washes are lined with mature desert trees and provide an important aesthetic contrast to the adjacent and comparatively barren slopes of the hillsides.

There are also a number of secondary and tertiary washes which feed into the significant washes from the adjacent hillsides and flatlands. These washes vary in width from small narrow canyon washes to sand bottom washes wide enough to accommodate a vehicle. These smaller washes also provide important vegetation areas and wildlife habitat. They serve as a link to the hillsides, mountains and canyon of the Hieroglyphic Mountains. Because the flow capacities of these washes are relatively small, they are often the most susceptible of being channeled or realigned during development activities.

The natural drainageways are a strong element of the natural character for this desert environment. They are sensitive to development because the vegetation along the banks has established itself and matured based on the availability of moisture provided by the watercourse. Impacts to these washes often permanently change their appearance and environmental function. Protection of these areas will need to be a key component of the Conservation Master Plan. Figure 2 depicts the hydrological features in the Study Area.

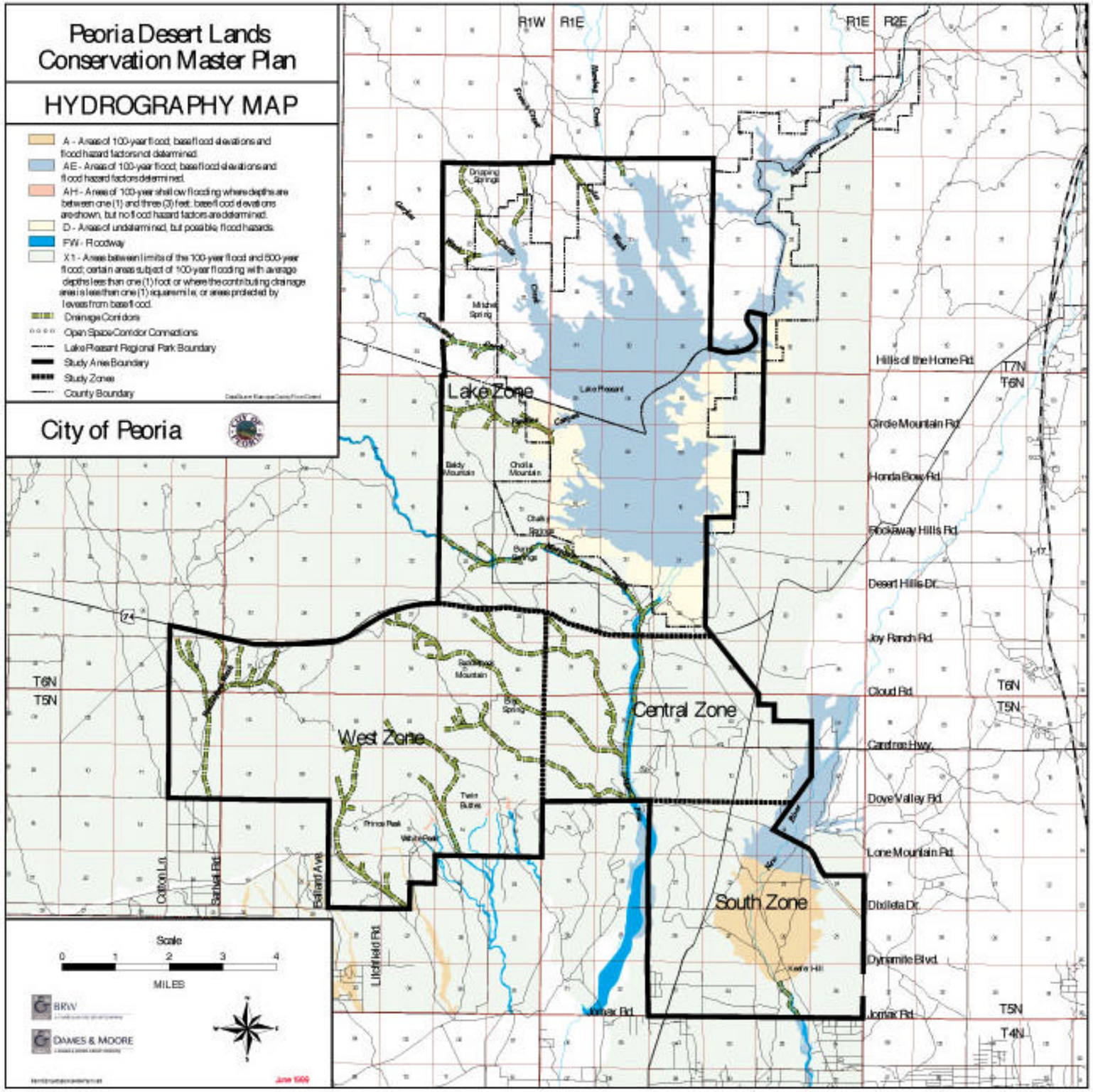
Peoria Desert Lands Conservation Master Plan

HYDROGRAPHY MAP

- A - Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
- AE - Areas of 100-year flood; base flood elevations and flood hazard factors determined.
- AH - Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
- D - Areas of undetermined, but possible, flood hazards.
- FW - Floodway
- X1 - Areas between limits of the 100-year flood and 500-year flood; certain areas subject of 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one (1) square mile, or areas protected by levees from base flood.
- Drainage Corridors
- Open Space Corridor Connections
- Lake Pleasant Regional Park Boundary
- Study Area Boundary
- Study Zones
- County Boundary

Data Source: Maricopa County Flood Control

City of Peoria



C. Topography and Slope Conditions

When contrasted to most areas of Peoria and much of the Northwest Valley, one of the most unique characteristics of the Study Area is the variation in the topography and the landforms. The most significant variations are found where the Hieroglyphic Mountains occurs. This range extends well beyond the Study Area to the northwest. The mountains within the Study Area are actually the southernmost extension of the Hieroglyphic Mountains. There are several significant peaks which stand out as visual landmarks scattered throughout the Study Area. These peaks and hillsides are often surrounded by areas which are relatively level in terms of grade. The Hieroglyphic Mountains terminate at the interface with the Agua Fria River, where there is a definite change in landform from the mountainous hillsides to the floodplains of the river environment.

The *Slope Analysis Map* provides a clear graphic depiction of the slope conditions of the Study Area. The majority of the Study Area is below a 10 percent slope, which is typically considered suitable for development with a reasonable amount of earth grading. When steeper slopes are encountered, the severity of cuts and fills and the visual scaring of grading activities becomes much more apparent. These steeper areas are also associated with rocky hard dig conditions, which often lead to a higher development cost.

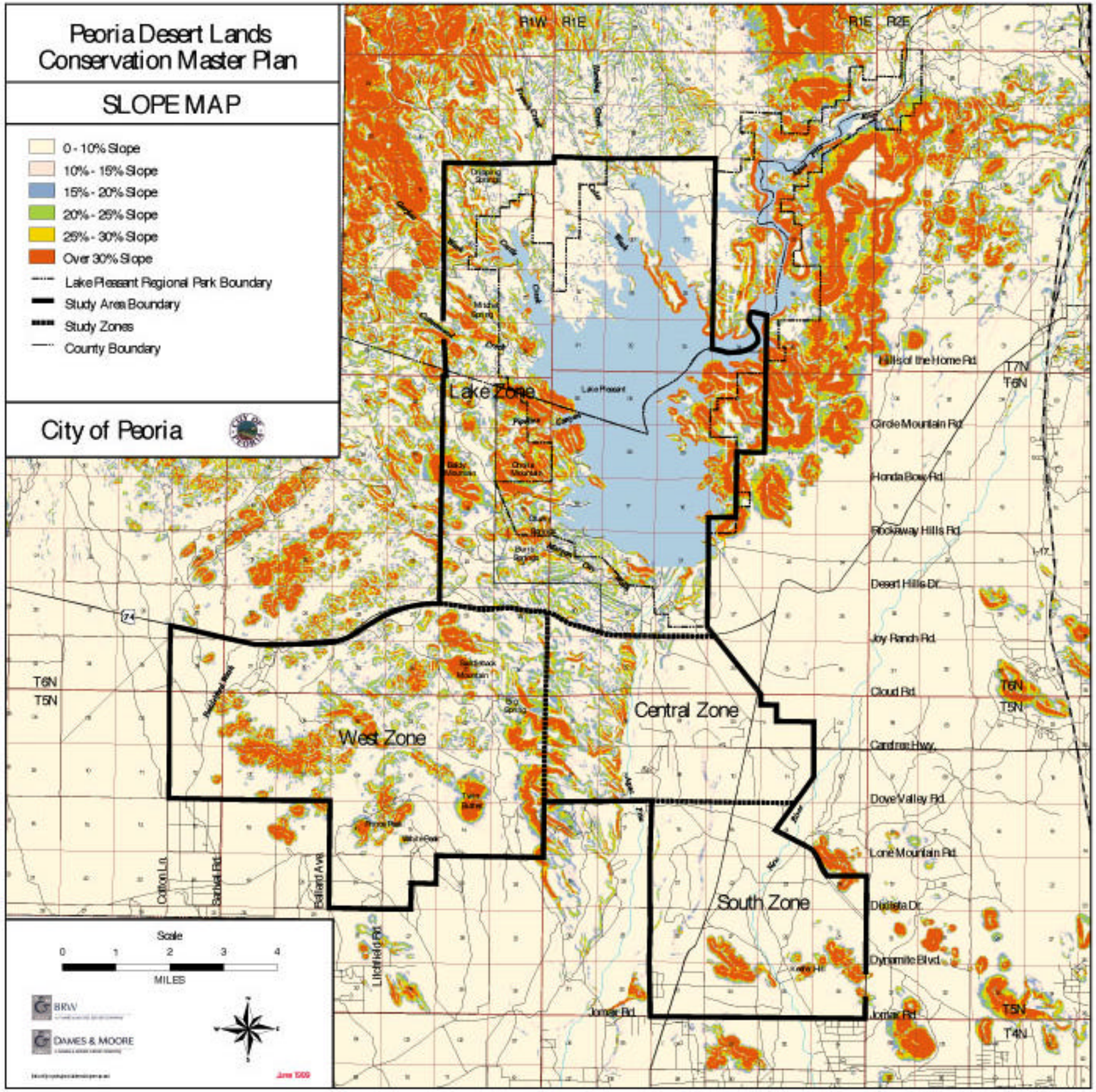
Development on steep slopes often leads to scarring because of cuts and fills, is costly because of rocky hard dig conditions, and is susceptible to rock and landslides.

In many cases, the character of the peaks includes very steep side slopes jutting out of basin areas. This characteristic is further demonstrated by the slope graphic, which indicates that the majority of the peaks and ridges consist of slopes which are steeper than 30 percent. Several of the peaks appear very rugged, with rock outcrops, cliffs and escarpments, which are extremely steep and also add a dramatic visual appearance to the slopes. Other hillsides are very uniform in appearance with a consistent slope.

The slope map was one of the primary tools used to identify areas that merit consideration for protection. The “isolated peaks” provide habitat for a variety of wildlife. They are visually prominent and are a strong element of the visual character of the Study Area and they are less tolerant of development activities.

D. Cultural Resources

The cultural resources inventory was accomplished by compiling existing data for the entire Study Area, excluding Lake Pleasant Regional Park. Records were reviewed at the Arizona State Historic Preservation Office (SHPO), Arizona State University Department of Anthropology (ASU), and Arizona State Museum (ASM) (where properties recorded by the Museum of Northern Arizona [MNA] also are on file). Native American consultation was not undertaken, nor were any field checks conducted. Thus, the results must be understood as preliminary.


Peoria Desert Lands
Conservation Master Plan
SLOPE MAP
0 - 10% Slope
10% - 15% Slope
15% - 20% Slope
20% - 25% Slope
25% - 30% Slope
Over 30% Slope
Lake Pleasant Regional Park Boundary
Study Area Boundary
Study Zones
County Boundary
City of Peoria
Lake Zone
West Zone
Central Zone
South Zone
R1W
R1E
R2E
T7N
T6N
T5N
T4N
Hills of the Home Rd
Circle Mountain Rd
Honda Bow Rd
Rockaway Hills Rd
Desert Hills Dr
Joy Ranch Rd
Cloud Rd
Castner Hwy
Dove Valley Rd
Lone Mountain Rd
Dixileta Dr
Dynamite Blvd
Jomax Rd
Cotton Ln
Sarival Rd
Bellard Ave
Litchfield Rd
Scale
0 1 2 3 4
MILES
BRW
DAMES & MOORE
June 1999

Cultural resources judged to be of the highest sensitivity include National Historic Landmarks and Monuments, other properties listed on the National or State Register, districts or individual buildings and structures designated as important by local governments or communities, and traditional cultural places. Somewhat less sensitive, but nonetheless providing serious constraints (or interpretive opportunities), are substantial archaeological sites or site groupings that require extensive mitigative data recovery if they are disturbed and that also have a high potential to contain human burials. If any locales were identified as being of particular concern to Native American communities, they also would be regarded as constraints irrespective of whether or not they had been formally identified as traditional cultural places or sacred sites.

Site descriptions and locations were identified on U.S. Geological Survey (USGS) topographic quadrangle maps and listed in a table. This information is on file at Dames & Moore's Phoenix office.

The extent of prior cultural resource inventory and locations of recorded cultural resources were mapped on 1:24,000 scale USGS maps. This information was transferred to the smaller scale project map. While a number of archaeological surveys have been conducted within the project area, much of the area has not been inventoried. With few exceptions, cultural resources recorded within the project area are archaeological sites (most of them prehistoric in age) concentrated along the Agua Fria and New rivers. In total, 115 properties have been recorded. These are enumerated on the accompanying table, which documents the recording institution, delineates site designations (names and numbers), briefly characterizes site types and sizes, and identifies properties that may have potential for public interpretation. These properties also pose the highest constraints to future development because they are likely to be viewed as deserving in-place preservation.

Many of the archaeological sites recorded in the project area have been recommended as eligible for National Register listing and some have been determined eligible in consultation between federal and state agencies and the State Historic Preservation Officer. The recorded properties have not actually been listed on the National or State Registers, nor does the project area contain National Landmarks or Monuments. The Study Area does not appear to contain traditional cultural properties or other locales of concern to Native American communities, but it is important to recognize that studies to document such resources are in their infancy.

Prehistoric archaeological site types recorded within the project area include villages, hamlets, farmsteads, field houses, and various short-term activity sites. Features noted at these sites include ball courts, trash mounds, terraces and other agricultural features, pit houses, above ground masonry structures, ramadas, middens, petroglyphs (rock art), lithic reduction loci, quarries, and general artifact scatters. These sites and features range in age from Archaic (beginning as early as ca 8000 BC) to Protohistoric (sixteenth and seventeenth century Yavapai), but most pertain to the Formative Hohokam archaeological tradition, which may have begun as early as AD 300 and persisted until mid 1400's. A limited number of historic buildings and structures that reflect the area's ranching and mining history have also been recorded.

Despite the absence of cultural properties defined as exceptionally sensitive, two areas that extend into the extreme southeastern portion of the Study Area are worthy of note. One is the Calderwood Butte Area, which contains at least 30 prehistoric archaeological sites within about 7 square miles. During the mid 1970s, the Archaeological Conservancy completed an informal district description of this area. One other very substantial site or site grouping is the Hohokam Palo Verde Ruin, an extensive village site containing over 50 separate occupational loci, a series of irrigation canals and

agricultural field systems, and a possible ball court. A private developer is currently funding investigation of a portion of this site, with plans for possible future public interpretation. The project team has identified 17 individual properties that, provisionally at least, have the potential for public interpretation. These include large prehistoric village sites with above ground stone masonry, rock art, and a few historic buildings and structures.

E. Land Ownership

There are four primary entities with ownership or jurisdiction over the land included in the Study Area. These entities include the Federal Government, State Trust Lands, Maricopa County Parks and private ownership. Each of these entities control land which has features that merit protection, so it will be important to identify measures or procedures that can be implemented within the legal limitations that pertain to each of these entities.

The Bureau of Reclamation (USBR) and the Bureau of Land Management (BLM) previously controlled the area surrounding Lake Pleasant. Through the Recreation and Public Purposes Act (RPPA), the Maricopa County Parks Department has committed to utilize and manage these areas for recreational purposes. These recreational activities are primarily water related. However, the County's Master Plan does indicate recreational uses. These include overnight camping, interpretive facilities and other support services, which contribute to the use of the lake and park area.

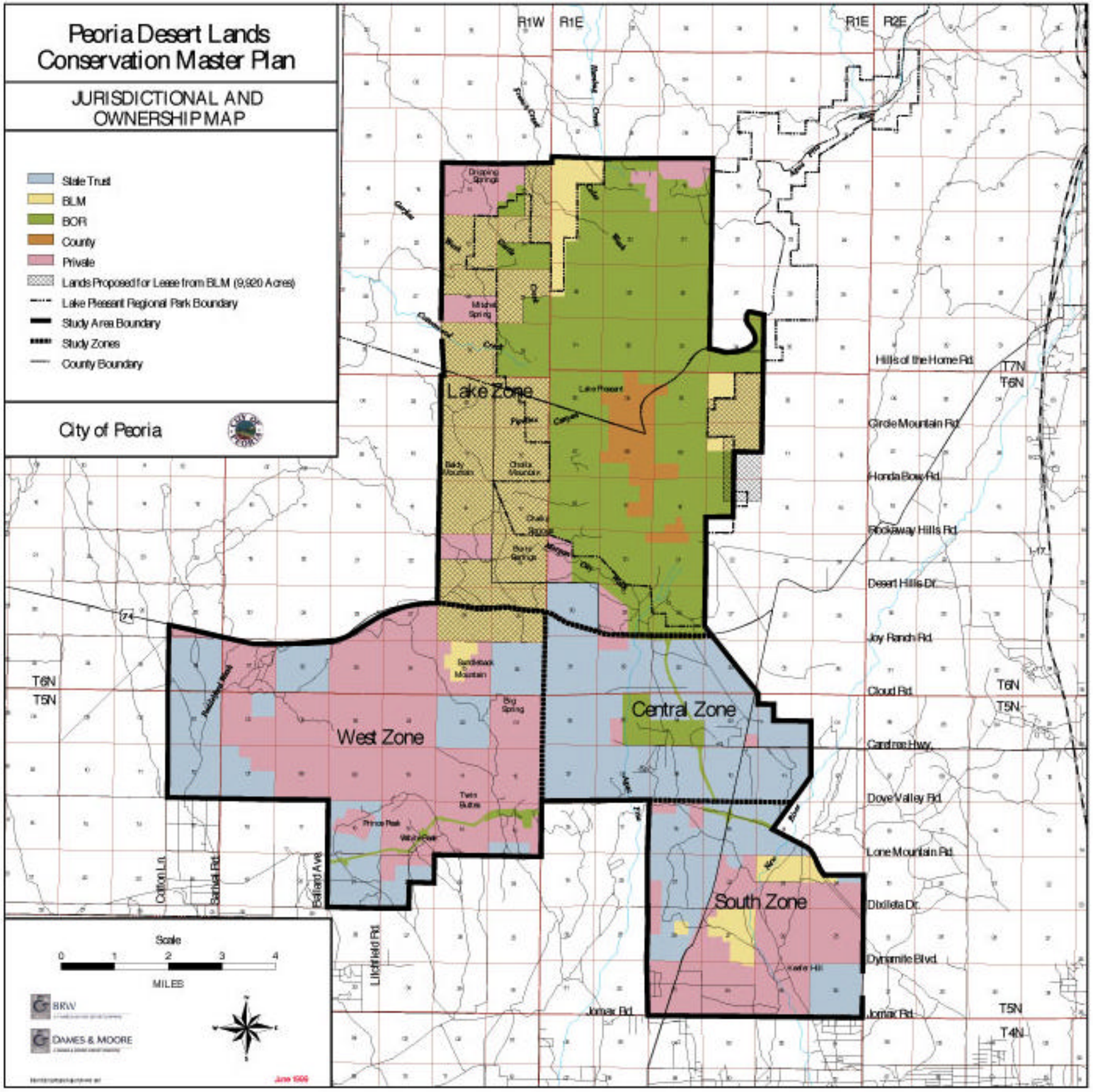
The City of Peoria and the County have a cooperative relationship and typically support each other when working toward common goals. The County recognizes the value of the natural setting and the lake features and considers protecting and preserving these features when developing recreational facilities at the lake. While the relationship is cooperative, the City of Peoria does not have jurisdiction over the County's improvements at the lake. Because the County is examining ways to protect unique environmental areas within the park limits and the City has limited input into what the County does within the park, that area is being excluded for consideration from this Conservation Master Planning effort. The lake is an asset for the City of Peoria and will continue to be an attraction for the residents of the Northwest Valley. The County will continue its efforts of protecting the aesthetic and environmental value of the regional park. This Master Plan will focus on the areas within the City limits, but outside of the park boundary.

The Federal Government has jurisdiction over a number of separate parcels within the Study Area. The federal agencies owning parcels include the USBR and the BLM. Some of the areas owned by these agencies address a very specific use, such as an irrigation or water distribution canals, such as the Central Arizona Project. These special use areas have an irregular and specific alignment or boundary which includes the feature under the agency's control. Other areas controlled by the agencies are much broader and are, typically defined by section lines or partial sections as boundaries. There are limited and specific land uses currently allowed on these federal parcels (primarily cattle grazing). However, these are generally considered low impact and the visual character of these areas should not experience a significant change with these uses. There is a specific procedure associated with acquiring the opportunity to utilize these parcels. The procedure falls under the Recreational and Public Purposes Act. This procedure will be examined later in this study.

A second significant landholder within the Study Area is the Arizona State Land Department. Their parcels are typically associated with an entire section or portion of a section. There are a number of natural features, environmental areas and cultural sites worth protecting which occur on parcels of land under the jurisdiction of the State Land Department. Like federal properties, the areas owned by ASLD are somewhat protected from immediate development by the process established for acquiring these properties. The procedures and stipulations associated with obtaining these areas or protecting unique and valuable features within these State Land parcels will be explored later in this report.

The third major category of land ownership involves parcels that are privately owned. Due to recent land trades between the federal government and private landowners, the amount of land under private ownership has increased significantly within the last three to four years. The current population growth trends of the metropolitan area, combined with the attraction of the Lake Pleasant/north Peoria area makes these private areas available for near to long-term development activities. The private ownership also occurs in some of the more environmentally and visually interesting areas, particularly areas within the Hieroglyphic Mountains.

In somewhat of an unusual circumstance, the large majority of the private areas within the Study Area are owned by a single owner. There are a number of smaller tracts which are scattered throughout the Study Area owned by others, but the large consecutive parcels of private land are under one ownership. The owner of this property is currently master planning these parcels. The current master planning efforts demonstrate a sensitivity and appreciation for the value of open space areas to protect the unique and rugged areas of the property. The fact that there are significant tracts under the control of a single owner is encouraging because it allows for the comprehensive planning of the entire area, which will allow for more options in terms of finding fair and effective ways of protecting the unique areas.


Peoria Desert Lands Conservation Master Plan
JURISDICTIONAL AND OWNERSHIP MAP
State Trust
BLM
BOR
County
Private
Lands Proposed for Lease from BLM (9,920 Acres)
Lake Pleasant Regional Park Boundary
Study Area Boundary
Study Zones
County Boundary
City of Peoria
Lake Zone
West Zone
Central Zone
South Zone
R1W
R1E
R2E
T7N
T6N
T5N
T4N
Hills of the Home Rd.
Circle Mountain Rd.
Honda Bow Rd.
Rockaway Hills Rd.
Desert Hills Dr.
Joy Ranch Rd.
Cloud Rd.
Castrano Hwy.
Dove Valley Rd.
Lone Mountain Rd.
Dixileta Dr.
Dynamite Blvd.
Jomax Rd.
Lake Pleasant
Scale
0 1 2 3 4
MILES
BRW
DAMES & MOORE

The following matrix provides a preliminary comparison of the land ownerships and associated area for each Study Zone. It is important to note that these estimates are general area calculations measured form the land ownership map included in this report. Ownership boundaries and configurations represent the data provided from a number of sources. These areas are subject to change. The information provided is general in nature and should not be used beyond its intended purpose of comparative data for this study.

LAND OWNERSHIP

	State Trust		BLM		Bureau of Reclamation		County		Private		Lands Proposed for Lease from BLM		*Total Acres*
	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	
South Zone	3,200	35%	860	9%	60	1%	0	0%	4,960	55%	0	0%	9,080
Central Zone	7,800	90%	0	0%	800	9%	0	0%	80	1%	0	0%	8,680
West Zone	5,760	31%	320	2%	320	2%	0	0%	11,360	60%	960	5%	18,720
Lake Zone *	1,120	11%	960	10%	0	0%	0	0%	1,920	19%	6,080	60%	10,080 *
Total All Zones	17,880	38%	2,140	5%	1,180	3%	0	0%	18,320	39%	7,040	15%	46,560

- *Area shown for the Lake Zone does not include the area within the boundary of Lake Pleasant Regional Park.*

Section Five – Areas Recommended for Conservation Consideration

The primary objective for the first phase of this Conservation Master Plan Study is to identify areas that should be considered for some form of protection from development. In order to identify these areas, the project team solicited input from a variety of sources who had familiarity and information about the unique natural areas within the Study Area. The team also evaluated aerial photography, topography maps and a variety of other data sources to gain an understanding and awareness as to what types of features occur in the project area. The third means of developing a familiarity with the site conditions included going off road and driving the jeep trails of the site and hiking to a number of peaks or through the washes. Even with these efforts it is doubtful that the team was able to identify every area which merits some form of protection. The intent of the implementation will take this into consideration and work towards defining features and/or conditions which need to be protected and could be used in conjunction with specific identified areas.

Recognizing the limitations of this initial Data Collection Phase, the team is comfortable with identifying a number of significant features whose conservation will contribute to maintaining the unique and attractive natural character of this Sonoran Desert environment. The primary basis for identifying the areas for conservation consideration are the Slope Analysis Map and the Hydrography Map. The features identified on these maps clearly indicate the primary landforms of the Study Area. The landforms play a significant role in defining the visual character of the area. They also indicate natural conditions which pose increased costs and difficulties in order to build in these areas. By combining the mountains, hillsides and ridges, which are portrayed on the Slope Map, with the rivers and primary washes of the Hydrography Map, a majority of sensitive lands, valuable vegetative and wildlife habitat can be identified. The land areas identified as having steep slopes (greater than 10%) or being influenced by significant drainage corridors also offer the most visual appeal.

The slopes of the hillsides are often the most prominent feature on the landscape. The vegetative cover and/or unique rock formations of these slopes contribute to the their visual appeal. The ridge lines of these hillsides contribute the skyline and the varied rugged forms provide a natural aesthetic value which is considered very desirable to the majority of the public.

The wash and river corridors identified on the hydrography map indicate the areas within the Study Area which offer the greatest diversity and densities in terms of natural vegetation. These areas stand out in contrast to the majority of the natural areas where influence of the increased moisture in these drainage areas is not available. The diversity and quantity of the plants within these drainage corridors also carries a high visual appeal to the general public.

An important consideration, which was emphasized by representatives from Arizona Game and Fish, along with other biologists, is the need to provide open space connections among the various areas identified for conservation. The connection of the sensitive areas enhances the opportunities for wildlife to move in and out of these areas. The value of the drainage corridors to accommodate this wildlife movement is significant. This Study utilized the hydrography map to identify significant washes and drainage ways. Subsequent studies will be needed to consider the size, length, width and depth of the drainage areas and also to determine the value of a specific wash as a wildlife corridor. These natural corridors can also serve to provide the critical "linkages" to the other natural areas designated as sensitive.

The *Sensitive Land Areas Map* identifies general configurations for the areas which have been identified for protection. The areas identified should serve as a constraint to future development. How these areas should be protected is explored later in this study.

The subsequent matrix provides additional detail regarding specific features, conditions and characteristics of each area identified. The matrix is separated into the Four Study Zones and individual features within each zone are identified. When a specific name is listed to identify a mountain, peak or river, that is a name which is listed on the USGS Map or is a feature in immediate association with a USGS named feature. Examples include Saddleback Mountain in the West Zone and the reference to Big Spring Wash which flows through a portion of the West Zone and into the Agua Fria River in the Central Zone. There are a number of areas identified which do not have specific names on the USGS maps. For the purpose of this Study, these areas are identified with a simple code. The code indicates the general landform feature, the zone number in which the feature occurs, and an alphabetic designation to identify which landform feature is being referred to within a particular zone. For example, Peak 4-M is a peak that occurs in Zone 4 (the West Zone). When one refers to the Constraints Map, they can locate the 4-M designation on the peak and know which feature is being referenced.

To further explain the matrix and the types of features identified on the matrix, the following definitions are provided:

Landform Type

Primary Peak: These are the prominent peaks which are located throughout the area. They create the skyline and are visual landmarks from various points of view. The elevations and configurations of these peaks are varied. However, in most cases, peaks that have elevations above the 2,000 foot mark are the prominent skyline peaks and are considered a primary peak for the purposes of this evaluation.

Mountain Area: The Hieroglyphic Mountains occur in the lake, central and west zones of the Study Area. There are a number of peaks which occur in these areas and the surrounding topography is fairly rugged with steep slopes and with small V-bottomed washes flowing out of these areas.

Isolated Peak: These are the prominent peaks which jut out of a typically flatland area. These are landmark features whose rugged vertical form contrasts with the horizontal ground plain.

Riverine Area: These areas include the environmental setting which is created in association to the two rivers which run through the Study Area. Both the New River and Agua Fria rivers offer riparian areas along their banks.

Significant Wash: The areas identified as being significant washes typically are wide sand bottom washes that carry drainage from a relatively broad watershed and are fed by a number of smaller tributary washes. These washes often have dense thickets of vegetation along their shorelines and are easily identified from aerial photographs.

Secondary Wash: These are the tributaries to the significant washes and the rivers. The majority of these washes are the finger washes which occur between the slopes in the rugged areas. They have narrow sand bottoms or are V-shaped. There is increased vegetation densities along these washes but the height of the vegetation is more in the large shrub category with a height of 5 to 15 feet tall.

Corridor: These areas are the linear landforms which occur within the Study Area. They are designated for their importance in providing links between various areas for both human and wildlife activities.

Specific Site: These are features which are unique and identifiable as a variation from their immediate surroundings. Many of the specific sites identified are springs which, because of the added moisture, have lusher forms of vegetation.

Broad Area: There are numerous areas which include a number of peaks with interconnecting ridge lines and/or side slopes that drain into common washes. When these features occur proximate to one another, the entire area was designated as an area that should be protected.

Unique Characteristics

Skyline Ridges: A skyline ridge is a mountainous landform which is at an elevation high enough to create a skyline feature. This could occur as a ridge between several peaks or a long running hilltop that, when viewed from lower elevations, creates the visual perimeter.

Prominent Feature: This includes the natural features which stand out as landmarks throughout the Study Area. They are typically unique in form or texture and contrast with adjacent features and/or landforms.

Rock Formations: The rock formations include escarpments, cliffs or pinnacles which consist of exposed rock faces with limited vegetative cover.

Valuable Vegetation: Valuable vegetation includes areas where the density or type of vegetation provides visual interest or potential food and cover for wildlife.

Riparian Vegetation: This occurs in areas of drainage flow where the concentration of drainage water provides enough moisture to sustain native vegetation that can grow to a larger size and the plants can occur at a greater density. These areas of increased vegetation line the washes and rivers throughout the Study Area.

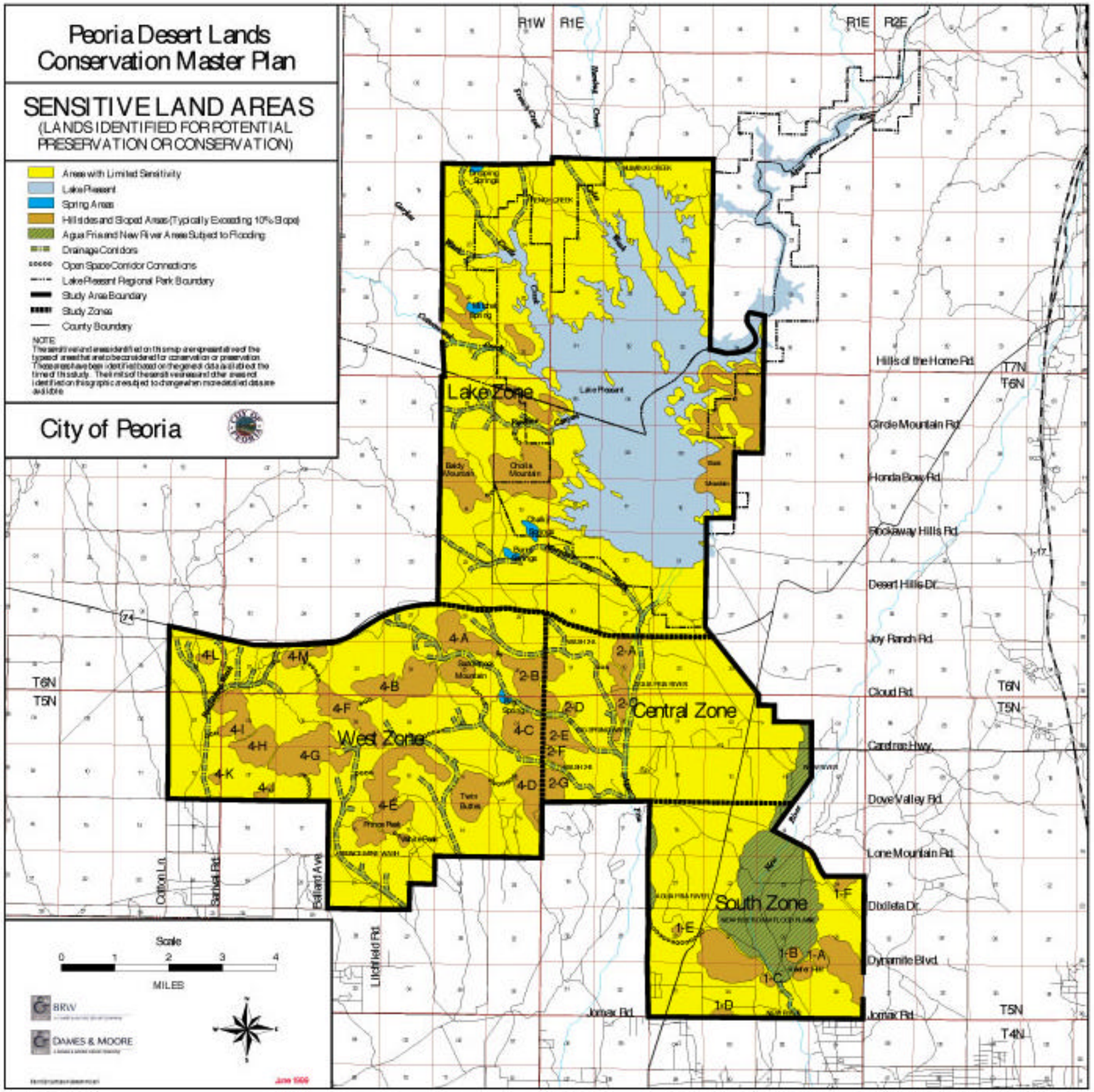
Wildlife Habitat: These are the areas where native wildlife has the tendency to congregate. The attraction of wildlife to these areas is associated with the availability of food, shelter, and water.

Cultural Resource: Research at the State Historic Preservation Office has identified a number of prehistoric and historic sites throughout the Study Area. When these sites occur in conjunction with an identified feature, we have indicated the association of a cultural site. For the protection of these sites, the location is not specifically indicated on the maps of this study.

Slopes Over 10%: These areas are identified as a limit of where development activities become more difficult. The Peoria Hillside Ordinance uses the 10% limit as a grade where constraints are applied to development activities. In most cases within the Study Area, the slopes graduate up the side of a hill or mountain with the slopes above an area of 10% being steeper.

The Constraints Map identifies a variety of areas and landforms that should be protected. Many of these areas are relatively large and in most cases are linked or are in very near proximity to one another. Typically, the areas designated would be more costly to develop because they have steep slopes or carry drainage.

Areas of steep slopes, washes, spring areas, and rocky outcroppings are just a few of the impediments to development in the Study Area.


Peoria Desert Lands
Conservation Master Plan
SENSITIVE LAND AREAS
(LANDS IDENTIFIED FOR POTENTIAL PRESERVATION OR CONSERVATION)
Areas with Limited Sensitivity
Lake Pleasant
Spring Areas
Hillsides and Sloped Areas (Typically Exceeding 10% Slope)
Agua Fria and New River Areas Subject to Flooding
Drainage Corridors
Open Space Corridor Connections
Lake Pleasant Regional Park Boundary
Study Area Boundary
Study Zones
County Boundary
City of Peoria
Lake Zone
West Zone
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South Zone
Scale
MILES
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Desert Hills Dr.
Joy Ranch Rd.
Cloud Rd.
Carefree Hwy.
Dove Valley Rd.
Lone Mountain Rd.
Dixileta Dr.
Dynamite Blvd.
Jomax Rd.
Lake Pleasant
Bradley Mountain
Chalk Mountain
Sunset Mountain
Sugarloaf Mountain
Twin Buttes
Prince Peak
Cotton Ln.
Barnes Rd.
Ballard Ave.
Lichfield Rd.
4-A
4-B
4-C
4-D
4-E
4-F
4-G
4-H
4-I
4-J
4-K
4-L
4-M
2-A
2-B
2-C
2-D
2-E
2-F
2-G
1-A
1-B
1-C
1-D
1-E
1-F

Peoria Desert Lands Conservation Plan

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Study Area and Feature	Landform Type									Unique Characteristics								Accessability				Ownership						Ac. & Elev.	
	Primary Peak	Mountainous Area	Isolated Peak	Riverine Area	Significant Wash	Secondary Wash	Corridor	Specific Site	Broad Area	Skyline Ridge	Prominent Feature	Rock Formations	Valuable Vegetation	Riparian Vegetation	Wildlife Habitat	Cultural Resource	Slopes Over 10%	Paved Roadway	Dirt Road	Jeep Trail	Hiking	Private Land	State Trust	BLM	County RPPA Request	County Park	BOR	Approximate Area *	Peak Elevation
South Zone (Zone 1) *Jomax Road North to Dove Valley Road. 67th Avenue West to 99th Avenue*																													
West Wing Mountain		●							●	●	●	●	●		●	●	●		●	●	●	●		●			●	504	1930
Peak 1-C		●							●	●		●	●		●		●		●	●	●	●						28	1586
East Wing Mountain		●							●	●	●	●	●				●		●	●	●	●	●					572	1934
Peak 1-A		●							●	●		●	●		●		●		●	●	●	●	●					54	1696
Peak 1-B			●						●		●	●	●		●		●		●	●	●	●						48	1600
Keefer Hill			●					●			●	●					●	●	●		●	●	●					67	1696
Peak 1-D		●							●		●	●	●				●			●	●	●						37	1921
Peak 1-E			●					●			●	●					●	●	●	●	●			●				19	1557
Peak 1-F		●							●	●	●	●	●		●		●		●	●	●	●	●					60	1967
Agua Fria River			●	●		●		●			●	●	●	●	●	●	●	●	●	●	●	●	●					–	–
New River			●	●		●		●		●		●	●	●	●	●		●	●	●	●		●	●		●		–	–
New River Dam Area			●					●		●		●	●		●			●		●	●	●	●				●	2302	–
Central Zone (Zone 2) *Dove Valley North to Highway 74. 75th Avenue West to 99th Avenue.*																													
Portions of the Hieroglyphic Mountains		●			●	●	●		●	●	●	●	●	●	●	●	●		●	●	●		●					–	Varies
Peak 2-A		●							●				●		●		●			●	●		●					144	1626
Peak 2-B	●	●							●	●			●		●		●				●		●					135	1920
Peak 2-C		●							●				●		●		●			●	●	●	●	●				179	1586
Peak 2-D		●							●			●	●		●		●				●		●					34	1638
Peak 2-E	●	●							●	●		●	●		●		●				●		●					194	2000
Peak 2-F	●	●							●	●			●		●		●				●		●					60	1899
Peak 2-G	●	●							●	●		●	●		●		●			●	●		●					161	1900
Agua Fria River				●	●		●		●		●	●	●	●	●	●	●	●	●	●	●	●	●	●				–	–
New River				●	●		●		●		●		●	●	●	●	●		●	●	●		●					–	–
Wash 2-A					●		●		●			●	●	●	●		●			●	●	●	●					–	–
Big Spring Wash					●		●		●			●	●	●	●		●			●	●	●	●					–	–
Wash 2-B					●		●		●			●	●	●	●		●			●	●		●					–	–
Lake Zone (Zone 3) *Highway 74 North to Limits of Study Area. 83rd Avenue West to Dysart Road.*																													
Cholla Mountain	●	●							●	●	●	●	●		●		●	●		●	●			●	●		●	608	2396
Baldy Mountain	●	●							●	●	●		●		●		●				●				●			356	2757
Portions of the Hieroglyphic Mountains		●							●	●		●	●		●	●	●		●	●	●	●		●	●			–	Varies
Portions of Black Mountain	●	●				●	●		●	●	●		●		●		●			●	●			●	●			316	2437
Burro Springs								●					●	●	●					●	●			●	●			24	–
Chalky Springs								●				●	●	●	●		●			●	●			●	●	●		45	–
Mitchell Spring								●					●	●	●					●	●				●	●		33	–
Dripping Spring								●					●	●	●					●	●		●					26	–
Agua Fria River				●	●		●		●		●		●	●	●	●	●	●	●		●	●				●	●	–	–

* NOTE: The Acreages shown are approximate and subject to significant variations when more specific site data is available.

Peoria Desert Lands Conservation Plan

BRW — DAMES & MOORE

Study Area and Feature	Landform Type									Unique Characteristics								Accessability				Ownership						Ac. & Elev.	
	Primary Peak	Mountainous Area	Isolated Peak	Riverine Area	Significant Wash	Secondary Wash	Corridor	Specific Site	Broad Area	Skyline Ridge	Prominent Feature	Rock Formations	Valuable Vegetation	Riparian Vegetation	Wildlife Habitat	Cultural Resource	Slopes Over 10%	Paved Roadway	Dirt Road	Jeep Trail	Hiking	Private Land	State Trust	BLM	County RPPA Request	County Park	BOR	Approximate Area *	Peak Elevation
Lake Zone (Zone 3) cont'd. *Highway 74 North to Limits of Study Area. 83rd Avenue West to Dysart Road.*																													
Morgan City Wash					●		●		●			●	●	●	●		●	●	●	●	●					●			
Pipeline Canyon					●		●		●				●		●		●		●	●	●			●	●	●			
Cottonwood Creek					●		●		●				●	●	●		●		●	●	●			●	●	●			
Garfias Wash					●		●		●				●	●	●						●	●				●			
Castle Creek					●		●		●				●	●	●				●		●	●				●			
French Creek					●		●		●				●	●	●				●			●				●			
Coles Wash					●		●		●				●	●	●				●			●				●			
Humbug Creek					●		●		●				●		●				●							●			
West Zone (Zone 4) *Dixileta Road North to Highway 74. 115th Avenue West to Cotton Lane.*																													
Twin Buttes	●	●							●	●	●	●			●		●		●	●	●	●						343	2194
Saddleback Mountain	●	●							●	●	●	●	●		●		●			●	●			●				165	2372
Portions of the Hieroglyphic Mountains		●				●	●		●	●	●	●	●	●	●	●	●		●	●	●	●	●	●					
White Peak	●		●					●			●	●					●		●	●	●	●						27	1760
Prince Peak	●	●							●	●	●	●	●	●	●		●		●	●	●	●	●					365	2066
Peak 4-A	●	●							●	●	●	●	●		●		●	●	●	●	●	●		●				673	2219
Peak 4-B	●	●							●	●		●	●		●		●			●	●	●						489	2200
Peak 4-C	●	●							●	●		●	●		●		●			●	●	●						325	2146
Peak 4-D	●	●							●	●	●	●	●		●		●			●	●	●					●	293	2120
Peak 4-E	●	●							●	●	●	●	●		●		●			●	●	●	●					665	2065
Peak 4-F	●	●							●	●		●	●		●		●			●	●	●						356	2116
Peak 4-G	●	●							●	●	●	●	●		●		●			●	●	●						551	2368
Peak 4-H	●	●							●	●	●	●	●		●		●			●	●	●						271	2345
Peak 4-I	●	●							●	●	●	●	●		●		●			●	●	●						274	2126
Peak 4-J			●					●			●	●	●		●		●		●	●	●		●					35	1851
Peak 4-K			●					●			●	●	●		●		●			●	●		●					23	1837
Peak 4-L			●					●			●		●		●		●		●	●	●		●					39	2021
Peak 4-M			●					●			●		●		●		●	●	●	●	●		●					122	2084
Padleford Wash					●		●		●				●		●		●		●	●	●	●	●						
Wash 2-B					●		●		●			●	●	●	●		●			●	●	●	●						
Wash 2-A					●		●		●			●	●	●	●		●			●	●	●	●						
Big Spring Wash					●		●		●			●	●	●	●		●			●	●	●	●						
Twin Buttes Wash					●		●		●			●	●	●	●		●			●	●	●							
Prince Mine Wash					●		●		●			●	●	●	●		●		●	●	●	●	●				●		
Big Spring					●			●				●		●	●	●	●			●	●			●				34	

* NOTE: The Acreages shown are approximate and subject to significant variations when more specific site data is available.

Recognizing the development growth trends in Peoria, the project team realizes there will be strong desire for the development of residential and commercial uses in this area. The majority of the Study Area is designated with no constraints. In many cases, the areas identified as not having constraints will provide a setting and a topographic condition that will be very suitable for development. It should be recognized that because of the broad scale at which this inventory has been prepared and the limitations of the team to provide visual observation of the entire site, there is a high probability that there are other sensitive areas which have not been identified.

The following evaluation demonstrates, in very approximate figures, the total area of each zone, the area designated to be protected, the area available without constraints, and the percent of area for each zone that is designated for protection.

AREAS RECOMMENDED FOR PROTECTION

	Total Area	Suggested Areas to be Protected	Areas without Constraints	Percent of Total Area Being Protected
South Zone **(Zone 1)**	9,080 ac	4,350 ac	4,730 ac	48%★
Central Zone **(Zone 2)**	8,680 ac	3,200 ac	5,480 ac	37%
Lake Zone **(Zone 3)**	10,080 ac*	2,150 ac*	7,930 ac*	21% *
West Zone **(Zone 4)**	18,720 ac	7,250 ac	11,470 ac	39%

Note: All areas are approximate and subject to significant variation.

* *The total area indicated for the Lake Zone does not include the area within the Lake Pleasant Regional Park.*

★ *Acreage identified includes the area subject to flooding upstream of the New River Dam.*

Section Six - What is Desert Conservation?

Before proceeding very far in preparing a desert conservation plan, the question needs to be answered: "What is desert conservation?" The Study Area for the desert conservation plan contains more than 46,000 acres. Obviously, for a variety of reasons, not all of this land will be off-limits to development. Consequently, desert conservation does not mean the exclusion of development in the Study Area. In a general sense, desert conservation implies programs and policies directed at two geographic levels. At the macro level, conservation will mean the restriction and maybe even the prohibition of development in certain ecologically or biologically important areas, as well as in some culturally sensitive areas. This could include riparian areas, hillsides, floodplains, and archaeological sites. At this large scale, the conservation plan will identify areas for parks, open space and corridors that should link together as much open space as possible to provide contiguous open space throughout the Study Area. As will be discussed later, programs which have applicability at the macro level will include overlay zoning districts and land purchases.

However, recognizing that development will occur in the Study Area, another component of the desert conservation plan is to ensure that when development occurs, it is integrated into the environment sensitively and that, through sound development policies, it improves the overall quality of life for all of the residents of Peoria. At this scale, which is a site-specific scale, applicable programs will include design guidelines, minimum lot sizes, and native plant regulations.

A final component of desert conservation includes land management. This is particularly important for large tracts of undeveloped land. Traditionally, desert conservation has been viewed as a passive process. That is, preventing development, either through acquisition or some other mechanism, has been viewed as sufficient to sustain the natural environment. The assumption being that, if we leave nature alone, we will protect nature and its habitat. However, this intuitively appealing approach has

For this study, desert conservation implies programs and policies directed at two geographic levels – the macro (encompassing the entire Study Area) and micro (relating to specific on-site development guidelines and standards). The City of Peoria Desert Lands Conservation Master Plan will contain a variety of policies and programs designed to affect property throughout the Study Area and at the site-specific level.

been challenged in recent years because ecologists have realized that "disturbance" of the landscape through events like fire, flooding is fundamentally important to maintain the plants and animals native to those landscapes. Maintaining appropriate levels of disturbance will frequently require active management of the land rather than passive protection.

Other land management issues involve determining the appropriate uses of desert open spaces. In this context, a host of questions need to be addressed. Will camping be permitted? If so, what type of camping? Will hiking trails be established and, if so, how elaborate will the trails be and how much maintenance will they require? How close should parking be to the open space sites and how many parking spaces should be provided? Should the area be patrolled by park rangers? These, and many other questions will need to be continually addressed as part of a comprehensive land management program. In this regard, the operating costs of maintaining open space will quite often, in the long run at least, be more expensive then the original costs of acquisition.

In sum, the *Desert Lands Conservation Master Plan* will amalgamate a series of programs and policies into an implementation plan which will provide for large open spaces, suitable for both active and passive uses, as well as for site-specific policies which promote high quality, sustainable development beneficial to the City of Peoria. A key component of the plan will ensure that these large spaces are connected to one another for optimal use as linear hiking trails and wildlife corridors. These programs will be supplemented by land management programs designed to ensure the integrity of the natural landscape in perpetuity. All of these programs will promote desert conservation while also ensuring that all property owners in the Study Area retain economically viable rights to their land.

Desert conservation entails much more than short-term acquisition and protection of vital natural resources. It also encompasses long-term management and sustainability of those resources.

Section Seven - The Importance of Desert Conservation

As noted in Section One, a successful plan of any type will be founded on a vision and/or goals which provide a clear policy direction for public and private sector decision-makers. However, before discussing the role of goals and providing examples of the goals embraced by other communities involved in desert conservation planning, a brief examination of the importance of desert conservation will be useful. This will help place the role of goals in a larger context. Because goals are often general and abstract, in isolation, they often have little significance. For example, a typical goal in desert conservation is to "conserve and protect natural resources." The goal becomes more meaningful when it is understood that conserving natural resources is a value embraced by the community, that it has important economic implications, or that it contains important and sensitive wildlife habitat.

In general, desert conservation is important because it enhances the quality of life, has important economic implications, helps promote tourism, and provides recreational opportunities for residents and visitors. There are also ethical and moral considerations related to protecting wildlife and its habitat and preserving non-renewable resources for future generations. Finally, desert conservation also has an intrinsic value that cannot be quantified, but is every bit as important as any of the more quantifiable components described above. A brief overview of each of these elements is provided below.

For many people, the presence of wildlife, such as javalinas, add significantly to their quality of life and help differentiate life in Peoria and Maricopa County from life in other urban areas around the United States. The presence of wildlife also contributes to the economic vitality of the region through increased tourism and outdoor recreational activities.

Quality of Life

Most people realize that the presence and protection of natural areas and wildlife improves the quality of their lives. For example, it is well known that natural open spaces, as opposed to buildings and other impervious areas, help reduce the "heat island" impact of urban areas and also reduces smog and air pollution. From another perspective, view lots and lots fronting on natural greenspace, such as washes, usually have an economic value higher than lots without these environmental amenities. This is a monetary reflection of the fact that people place a high intrinsic value on open space and the natural environment. Additionally, the Sonoran Desert environment, with the majestic saguaro and other indigenous plants and animals, provides a strong visual identity to the metropolitan area and contribute to a "sense of place or community" which inspires strong feelings in many people. Also, for those people who enjoy wildlife and a desert lifestyle, the presence of javalina, coyotes, rattlesnakes, bobcats and hawks, to name just a few, add an immeasurable amount to their quality of life.

Recreational Value

The protection and preservation of natural areas, such as mountain ridges, washes, and other riparian areas, contributes substantially to the recreational opportunities available to residents of the City of Peoria. Birdwatching, photography, archaeology, jogging, hiking, biking, horseback riding, fishing, and hunting, are only a few of the many recreational activities that depend on the availability of natural open space. Lake Pleasant and the rugged terrain traversing much of the Study Area provide abundant opportunities for all types if recreational activities. The continuation of these activities may be altered as development occurs within the Study Area. An objective of this plan is to allow many of the passive recreational activities to continue; however, activities such as hunting with firearms and archery equipment will need to be restricted and perhaps, eventually, disallowed as the developable parcels are built out or as jurisdictions enact and enforce regulations which may restrict these activities for the protection of the wildlife and the future residents.

Economic Importance

As noted above, desert conservation has site-specific economic implications in that lots with natural amenities usually will command a higher price than those without such amenities. Additionally, the economic importance of hiking, hunting and fishing is significant in Arizona. Subdivisions which are well planned with ample open space and recreational amenities are able to command premium prices relative to haphazard developments with little or no emphasis on desert conservation.

In addition, open space has natural system value when it provides direct benefits to human society through such processes as ground water storage, climate moderation, flood control, storm damage prevention, and air and water pollution abatement.

Desert conservation also has a specific economic development importance. Many visitors, companies, and new residents move to Arizona because of the beauty and uniqueness of the Sonoran Desert environment. A recent article in the *Arizona Republic* also noted that many conventioneers are attracted to the Valley of the Sun because of the desert and the western opportunities is affords in terms of trail rides and other similar activities.

Ethical and Moral Considerations

Although it is sometimes difficult to imagine, at one time, millions of bison roamed the Great Plains of the United States. Loss of habitat and senseless exploitation nearly resulted in the extermination of this magnificent animal. History is replete with examples of man-caused extinctions or near extinctions of many species of animals. Edward LaRoe, of the National Biological Service has noted that:

> Extinction is natural; it naturally occurs as newer forms of life evolve. But under the forces of population growth, technology and special interests, humans have driven the rate of extinction today to about 100 times the natural rate. Even

worse, the rate of extinction is still increasing and will be 100 to 1,000 times faster yet in the next 55 years.

The vibrant Sonoran Desert, a seemingly inhospitable domicile, is home to many magnificent creatures, such as coyotes, bobcats, rattlesnakes, javalina, roadrunners, gila monsters, tarantulas, and hawks. However, their numbers are forced out under a relentlessly expanding sea of red tile roofs. Because of these facts, polls have shown that many people are concerned about the implications of increasing development on wildlife, as well as the implications that the vanishing desert will have on the quality of life for future generations of Arizonans. As the metropolitan area expands, we are witnessing the decline of many desert species.

Educational Importance

By preserving riparian areas and significant amounts of open space, the conservation of these natural areas will contribute to a better understanding of the interrelationships between urban development and natural areas. It will also enable students to study the ecology of the Sonoran Desert, as well as desert wildlife and its habitats. The conservation of important historic sites in the Study Area will promote and encourage further study into the lifestyles of the original inhabitants of this area and will promote the study of archaeology and its related disciplines.

Intrinsic Value

Although not easy, and perhaps impossible, to quantify, desert conservation also has intrinsic social, cultural, and spiritual values that differ with every person. Open space and desert conservation will provide some people with a sense of freedom and others with a sense of solitude and inspiration. The qualitative value of desert conservation was expressed by Frank Lloyd Wright. Wright, whose love of the Sonoran Desert is well established, noted that, "Nature is my manifestation of God. I go to nature every day for inspiration in the day's work. I follow in building the principles which nature has used in its domain."

The intrinsic value of a beautiful scenic vista cannot be calculated, but provides inspiration and spiritual uplifting to countless residents and visitors.

Section Eight - Legal Issues Relating to Desert Conservation

Introduction

One of the crucial issues confronting the City of Peoria, as well as other communities around the state and the country, is to what extent can it engage in the regulation of private property without violating constitutional guarantees. The most pertinent sections of the U.S. Constitution relating to the regulation and taking of private property involve the Fifth and Fourteenth Amendments. The relevant sections of the Fifth Amendment applicable to private property state:

> No person shall be …… deprived of life, liberty, or property, without due process of law; nor shall private property be taken for public use, without just compensation.

The salient portion of the Fourteenth Amendment involving private property rights reads as follows:

> ….nor shall any State deprive any person of life, liberty, or property, with due process of law; nor deny to any person within its jurisdiction the equal protection of the laws.

With these amendments providing a legal framework for the limitations of land use regulation in the United States, the primary legal concerns for prospective desert conservation regulation involve whether due process has been afforded property owners affected by the regulation, whether the local government has taken private property rights without just compensation, and whether a governmental action is outside the regulatory authority of the jurisdiction conducting the action (*ultra vires*). This section will examine each of these issues.

Enabling Legislation

One of the first legal issues involving government regulation relates to the scope of a community's ability to engage in desert conservation. The classic statement on the limitation of municipal powers was made by John F. Dillon and is now well known as Dillon's rule:

> It is a general and undisputed proposition of law that a municipal corporation possesses and can exercise the following powers, and no others; first, those granted in express words; second, those necessarily or fairly implied in or incident to the powers expressly granted; third, those essential to the accomplishment of the declared object and purposes of the corporation – not simply convenient, but indispensable.

Consequently, any regulation proposed by the City of Peoria should be founded on powers which have already been granted to the municipality. In this context, state planning enabling legislation is critically important, as are provisions in state statutes governing intergovernmental agreements, annexation, extra-territorial jurisdiction, and subdivision regulation, to name just a few. In this

context, the recent change in state legislation involving the Growing Smarter regulations are particularly important. For instance, the recent changes now mandate that cities and towns having populations of more than 2,500 residents prepare an open space element as part of their general plans. A stipulated component of the open space element is that it contain "policies and implementation strategies designed to promote a regional system of integrated open space." In this context, it appears that municipalities now have a much stronger legal footing upon which to engage in desert conservation, particularly as it relates to the promotion "of a regional system of integrated open space."

However, even though the state may provide a municipality with the authority to engage in a particular activity, such as the promotion of open space, the courts may still find a city regulation illegal because of the doctrine of "supremacy." Under this doctrine, state authority supercedes municipal authority. Therefore, if a municipal regulation conflicts with a state regulation, there is a high likelihood that the state regulation will prevail. This issue is particularly important when regulating land owned by the State of Arizona and the State Land Department.

Due Process - Procedural and Substantive

Another legal hurdle to be overcome when drafting desert conservation ordinances and regulations relates to issues of procedural and substantive due process. Procedural due process relates to the mechanisms by which local government adopts the regulation in question. The three most important elements of procedural due process are:

- The kind of notice required to be given to the public.
- The type of a hearing required.
- Principles guiding the decision-making process to ensure that it is fair and informed.

Substantive due process involves the rationality of the proposed decision and requires that the regulation be rationally related to the goal that the community wants to achieve. A key issue often addressed during substantive due process arguments is whether the ordinance in question is vague or ambiguous. Consequently, crafters of legislation need to ensure that legislation is clear, precise, and provides reasonable review standards.

Many ordinances in the United States have been invalidated because citizens were not afforded due process to learn about legislation affecting their property rights. Public hearings and legal notification are two elements required to ensure procedural due process.

Takings

A final legal issue to surmount in crafting valid desert conservation regulations relates to the taking of private property for a public purpose without paying just compensation. One of the principal purposes of the Takings Clause is "to bar Government from forcing some people alone to bear public burdens which, in all fairness and justice, should be borne by the public as a whole" (*Armstrong v. United States* 364 U.S. 40, 49 (1960). Although early court cases dealt with the physical appropriation of land, it quickly became apparent that government could, through land use regulation, "take" property without actually dispossessing the property owner. However, in a landmark decision, the Supreme Court noted that "Government hardly could go on if to some extent values incident to property could not be diminished without paying for every such change in the general law." *Pennsylvania Coal Co. v. Mahon*, 260 U.S. 393, 413 (1922).

In order to evaluate whether a proposed desert conservation regulation might constitute a taking, the local government should try to answer the following three questions:

- Does the regulation deprive the landowner of all reasonable economic use of the property?
- Does the regulation interfere with the landowner's reasonable investment-backed expectations?
- What is the character of the government's action?

Reasonable Economic Use of the Property

Most courts have typically required an almost total wipeout of value before they find a taking. The mere fact that a specific regulation will seriously reduce the value of the owner's property does not by itself create a taking. In most cases, the courts will focus on whether the landowner is left with any "reasonable economic use" of the property. This was noted in *Nollan v. California Coastal Commission*, where Justice Scalia wrote that "We have long recognized that land-use regulation does not effect a taking if it 'substantially advances legitimate state interests' and does not deny an owner economically viable use of his land." In this vein, courts have upheld strict floodplain and wetlands regulations because an owner is able to pursue farming and/or recreational uses that could produce a reasonable economic return. In one of the leading U.S. Supreme Court case on the issue of reasonable economic use, the court held in *Penn Central Transportation Co. v. City of New York* 438 U.S. 194 (1978), that reasonable economic use does not mean maximum economic use.

Reasonable, Investment-Based Expectations

If a municipality enacts an ordinance which provides for a reasonable economic use of the property, the courts may still find that it is a taking if the owner had a reasonable, investment-based expectation which is thwarted by the regulation. For example, if a landowner had received government permission to develop a private resort with trails through habitat areas and had actually built the resort and trails, and the local government later decided that trails should not be built through those habitat areas and refused to grant an occupancy permit for the building, the courts might well find that the local government's actions are unconstitutional. In order to claim interference with reasonable, investment-backed expectations, the landowner must show that:

- The expectations were reasonable, not just a speculative expectation
- The expectations were investment-backed—which generally means that the landowner has gone beyond just buying the land to constructing the project with all of the required permits
- The landowner did not know of the regulation prohibiting the project when the land was purchased and construction was started.

In Arizona, this principle is encompassed within the framework of "vested rights." Under this concept, if substantial funds are expended prior to a zoning change, the property owner has a right to complete the project. A landmark case on this subject in Arizona is *the Town of Paradise Valley v. Gulf Leisure Corp*., 27 Ariz. App. 600, 557 P.2d 532 (1976). In this case the court ruled that, even though physical construction had not commenced on the project, the property owners had acquired a vested right to build a hotel which had been approved under a special use permit. When the Town tried to revoke the permit, the court ruled that the right to construct the hotel was vested because the owner had expended $400,000 on architectural fees, feasibility studies, building permits, overhead expenses, and clearing the land.

The Character of the Government's Action

To ensure success in this area, local governments should be particularly careful that any regulations they draft that limit development or activity in certain areas not look like attempts to acquire those areas as public open space without paying just compensation. In order to avoid this pitfall, the community should always be able to answer these questions:

- What reasonable economic use is still allowed on this property, taken as a whole?
- Does the landowner retain the right to exclude the public from the land?
- Does the regulation affect the value of the land so dramatically that it would be more fair to buy the land?

Takings through Exactions

A final constitutional issue relating to takings involves the practice of requiring that land be dedicated or that money be paid as a condition of development approval. An exaction may be ruled illegal if it goes beyond the authority of the local government or fails other constitutional tests. While the law in this area continues to evolve, the general rule holds that there must be a reasonable relationship between the required land dedications or cash payments and an actual impact created by a project. Furthermore, the land dedication requirement needs to be roughly proportional to the need created by a development.

In *Nollan v. the California Coastal Commission*, the Court ruled that conditioning the approval of their request to replace a small bungalow on a beachfront lot with a larger house upon the granting of an easement to cross the Nollan's beach was unconstitutional. The public purpose enunciated by the Coastal Commission as a rationale for its action was that of visual access to the ocean. While the

Court concluded that protecting visual access to the ocean constituted a legitimate public purpose, "the Coastal Commission's regulatory authority was set completely adrift from its constitutional moorings when it claimed that a nexus existed between visual access to the ocean and a permit condition requiring lateral public access along the Nollan's beachfront lot."

Another landmark case in this area of law is *Dolan v. City of Tigard*, 114 S.Ct. 2309 (1994). While *Nollan* advanced the doctrine of having an essential nexus between the governmental regulation and the stated public purpose, the Supreme Court's decision in *Dolan* attempted to adjudicate the required degree of connection between the exactions imposed by the city and the projected impacts of the proposed development.

In *Dolan*, the owner of a hardware store wanted to expand the store. The City of Tigard imposed a requirement that the store dedicate land for a storm drainage ditch and a trail along the ditch. Although the Court explicitly upheld the legality of planning to prevent floods and ensure adequate transportation, it noted that, as part of a site-specific requirement, the city needed to make an individual determination that the required land dedications were "roughly proportional" to the store's impact on storm drainage and transportation. If the expansion of the store would directly or indirectly create additional road and trail traffic sufficient to justify construction of a trail to alleviate congestion, the trail would be legal. Although the City of Tigard had made the determination that the bicycle pathway system "could offset some of the traffic demand," the Court ruled that, while "no precise mathematical calculation is required…the city must make some effort to quantify its findings in support of the dedication for the pedestrian/bicycle pathway beyond the conclusory statement that it could offset some of the traffic demand generated." Since the city had made no such determination, the Court ruled that the exaction exceeded the municipality's authority.

To avoid invalidation through the Takings Clause, dedications of land must be for a public use and must be reasonably related to the burden imposed by the new development.

Section Nine - Community Vision and Desert Conservation Principles

Before preparing a plan, which will be based on community goals, it is important to have a guiding vision and desert conservation principles which will provide cohesive direction for the *Desert Lands Conservation Master Plan*. A vision is a statement describing the community at least ten to twenty years in the future. It encompasses the values and aspirations of the general community and provides a unifying framework for the development of specific goals.

The Vision that has been developed for the Study Area is:

> *That it will provide a high quality lining environment, offering a diverse mixture of quality housing opportunities for various income levels, accompanied by employment and commercial opportunities that minimize the necessity to drive long distances and which are designed for sensitive integration into the desert environment. Weaving throughout the Study Area will be a series of significant active and passive desert open space areas that provide wildlife habitat, scenic vistas, recreational and cultural opportunities, and enhance the overall quality of life for residents in the Study Area and the City of Peoria and which will be managed to ensure their use and preservation for future generations.*

A principle is an adopted rule or method for application in action. In that sense, a principle will serve as a guiding doctrine which provides uniform direction to the goals, objectives, and policies of the *Desert Lands Conservation Master Plan*. For instance, one objective might be to identify and protect all riparian areas, while another objective might be to identify and protect important natural landmarks. The programs selected to pursue these policies can be quite varied. However, if a fundamental principle guiding the planning process is to focus on programs that leverage activities and monies, other programs and policies will be viewed in a different light and the ultimate action plan will be shaped by the overarching principles.

The guiding principles for the *Desert Lands Conservation Master Plan* are:

- Focus on flexible and voluntary, incentive-based approaches
- Focus on programs and policies that leverage activities and monies
- Encourage collaboration with private and/or public partners
- Use a systems approach
- Focus on key lands, preserve identified sensitive lands and features if at all possible.
- Channel development into areas that are already disturbed or areas which will minimize impacts on the natural environment
- Given the rapid rate of growth in the community, coupled with a commensurate loss of desert land, a proactive approach, rather than a reactive approach is preferred

Section Ten – Goals, Objectives, Policies, and Programs

Introduction

Formulating a comprehensive and mutually-agreed upon set of goals and objectives is one of the fundamental early steps in preparing a successful desert conservation plan. With scarce resources and community goals which are often mutually exclusive, it is paramount to focus program efforts on those issues which are most important to the community. Additionally, the articulation of goals, objectives, and policies provides a framework upon which public and private decision-makers can coordinate their actions and ensure that programs and policies are not working at cross-purposes. It can also have that same impact upon decision- and policy-makers in adjacent jurisdictions and for other government agencies. Finally, by providing policy direction and focus, well-articulated goals, which are grounded upon protecting and maintaining a community's health, safety and general welfare, help sustain the constitutional validity of a plan if it is ever legally challenged.

Before examining the goals, objectives, and policies for *the City of Peoria's Desert Lands Conservation Master Plan*, it is important to understand that this plan in not being prepared in a vacuum. Objectives and policies already exist in the *Peoria General Plan* and for other plans that should have an impact on this plan, such as Maricopa County's *Desert Spaces Plan*. Ideally, as noted above, the goals, objectives, and policies adopted in this plan should complement the desert conservation efforts of other jurisdictions and other land use policies adopted by the City of Peoria. Therefore, before determining the goals, objectives, and policies for this plan, a brief examination of Maricopa County's *Desert Spaces Plan* and the *City of Peoria's General Plan* is warranted. Although prudent planning practice dictate the coordination of plans and goals among adjacent jurisdictions, the newly enacted Growing Smarter legislation also mandates that the open space element include "policies and implementation strategies designed to promote a regional system of open space and recreational resources and a consideration of any existing regional open space plans."

Definitions

Finally, before examining goals, policies, and objectives, it is important to have a common understanding of the meaning of these terms. The following generalized definitions, which are taken from the *Peoria General Plan*, should be referred to as a guide when reading this section of the plan.

- **Goal**: A desired end which, if pursued over the long-term, will ultimately result in the attainment of a desired living environment.

- **Objective**: A desired short-term end which, if pursued and accomplished in conjunction with other objectives, will ultimately result in the attainment of the goal to which it relates.

- **Policy**: A means to attain the established objective, and ultimately the established goal. Policies prescribe, or represent, a course of action.

- **Program:** A specific course of action with a well-defined implementing authority designed to attain an objective and complementary to articulated policies.

Maricopa County's Desert Spaces Plan

Perhaps the most ambitious desert conservation plan, at least in terms of its geographic scope, is the *Desert Spaces Plan* for Maricopa County. The overall goal for the *Maricopa County Desert Spaces Plan* is to "identify a regional system of integrated open space and to outline various strategies for the establishment and management of the system." The plan is intended to develop appropriate policies to:

- Conserve and preserve important natural and cultural resources
- Provide opportunities for inter-jurisdictional cooperation to develop a regional open space system that builds on the existing efforts of the public and private sectors
- Further regional goals of economic development and quality of life
- Identify compatibility and identify and resolve conflict between desired open space objectives and local, state and federal land management objectives
- Assist local government to evaluate the effect of private development on open space resources

Conservation-Related Goals/Policies in the General Plan of the City of Peoria

The *City of Peoria General Plan* has a series of goals, objectives, and policies related to environmental conservation. The specific goals and objectives related to this issue are provided below. Since the objective of "promoting the preservation of the natural environment in and around Peoria" relates very directly to the desert conservation plan, the six policies relating to that objective are also listed.

Environmental Conservation Goals and Objectives (*City of Peoria General Plan*)

Goal A: Create and maintain a high level of environmental quality consistent with a healthy, safe and enjoyable living environment in Peoria

Objective A-1: Strive to maintain high standards of air quality in Peoria
Objective A-2: Strive to maintain a high level of water quality in Peoria
Objective A-3: The City will strive to encourage water conservation
Objective A-4: Work to make the City of Peoria as energy conserving as possible
Objective A-5: Promote the preservation of the natural environment in and around Peoria.
Policy A-5a: The City shall minimize natural and man-made environmental hazards
Policy A-5b: The City shall limit development in areas that may pose natural or man-made environmental hazards such as steep slopes and floodplains
Policy A-5c: The City shall limit residential development from areas of 60LDN

noise levels or greater (e.g. truck routes, airports, highways).

Policy A-5d: The City shall insure that land use intensities do not create the need for water in excess of available water supplies

Policy A-5e: The City shall require all disturbed land to be revegetated to protect nearby areas from damage due to wind-blown dust and sand

Policy A-5f: The City shall designate truck routes and encourage residential developments adjacent to designated truck routes to use noise mitigation measures

Objective A-6: The City shall strive to maintain a long-term water supply for all portions of the City.

Recommended Goal, Objectives, and Policies for the City of Peoria's Desert Lands Conservation Master Plan

Based on a research of the literature that encompassed numerous ordinances in all parts of the country, a review of the goals, objectives, and policies of the *Peoria General Plan*, as well as other plans related to this plan, discussions with city staff, the Technical Advisory Committee, and with citizens at community workshops, the following goal and objectives are proposed to provide the foundation for the City of Peoria's *Desert Lands Conservation Master Plan*.

The recommended goal is similar to the goal articulated in the *Peoria General Plan* for environmental conservation. In addition, the goal is sufficiently broad enough to encompass a wide variety of objectives which will focus the policies and programs of the *Desert Lands Conservation Master Plan*. The goal is expressed below and is followed by applicable objectives and policies. Specific programs will be identified in *Section Twelve, Desert Conservation Master Plan*.

Goal A Maintain the vitality of the unique Sonoran Desert environment by providing high quality passive and active open space areas, while encouraging development that is sustainable and supportive of that environment

Objective A-1 Increase public awareness of the importance of desert conservation.

Policy A-1.1: Encourage and support programs and activities which promote desert conservation and increase public awareness of conservation.

Policy A-1.2: Require pre-application meetings before submitting development proposals so that applicants can be made aware of the importance of desert conservation in the plan review process.

Objective A-2 Coordinate desert conservation goals, objectives, policies, and programs with other land use codes, jurisdictions, agencies, and private interest groups.

Policy A-2.1: Review development proposals or other actions that may impact the desert environment.

Policy A-2.2: Encourage staff collaboration on joint development projects with other communities.

Policy A-2.3: Encourage staff attendance at local events promoting desert conservation programs.

Policy A-2.4: Coordinate development plans with the existing General Plan and general plan elements, Open Space, Recreation and Trails Plans, and design review ordinances.

Objective A-3 Promote the establishment of large, intact areas of native vegetation by preventing fragmentation of those areas by development.

Policy A-3.1: Encourage cluster development to minimize the disturbance of native desert vegetation.

Policy A-3.2: New developments should promote the conservation of contiguous open space areas which contain stands of native vegetation.

Policy A-3.3: Open space areas should be linked by open space corridors.

Policy A-3.4: Significant stands of vegetation should be identified, inventoried and a method of probable protecting these areas should be defined during the early phases of a project design.

Policy A-3.5: An area designated for natural open space should be of adequate size to support the natural ecological systems required to maintain the vigor and the habitat conditions for the existing flora and fauna.

Policy A-3.6: Promote the use of building envelope construction and similar construction and development techniques which minimize grading and protect native desert vegetation.

Policy A-3.7: Recognize and protect areas of significant natural vegetation such as areas along washes around natural spring areas or on slopes which are advantageous to the increased densities of the native desert vegetation.

Policy A-3.8: Promote enhanced landscaping along washes and wildlife corridors to promote the use of such areas by native wildlife.

Policy A-3.9: Promote the restoration and revegetation of disturbed areas with native plant species and match the plant densities of these revegetated areas to be consistent with the undisturbed setting.

Policy A-3.10: Impacts to riparian areas should be limited to utility, infrastructure and road crossings and all disturbed areas should be restored to their pre-disturbed condition.

Policy A-3.11: Encourage the sue of indigenous or desert adapted plant materials in new developments and minimize the use of invasive and non-native plant species.

Objective A-4 Create a meaningful open space network throughout the Study Area which is connected to existing and future open space systems.

Policy A-4.1: Developments in areas identified as part of the open space network should be minimized and efforts should be made to reduce the impact if development does occur in these areas by implementing cluster design techniques.

Policy A-4.2: Establish sufficient trails, wildlife corridors, and other linear linkages between large open space areas.

Policy A-4.3: Work with developers during the master planning stage and the plan review process to set aside key linkages through dedications, conservation easements, or open space designations.

Policy A-4.4: Provide an effective means for the safe and uninterrupted movement of wildlife through open space corridors at all infrastructure and roadway crossings (i.e. bridges, ramps, overpasses, oversized culverts).

Objective A-5 Maintain appropriate or sufficient buffers between areas dominated by human activities and environmentally sensitive areas (Open space corridors or buffers must be at least 25' wide).

Policy A-5.1: During the Site Plan Review Process, identify development envelopes and environmentally sensitive areas and encourage development to occur in the envelopes and away from environmentally sensitive areas.

Policy A-5.2: Encourage the location of project open space areas in close proximity to dedicated or reserved open space areas to provide a transition between developed and undeveloped areas and to provide a buffer between natural and developed open space areas.

Objective A-6 Preserve features of the natural local landscape in developed areas.

Policy A-6.1: Minimize disturbed areas during the construction process.

Policy A-6.2: Discourage cut and fill techniques which leave visible scars on hillsides. When cut and fill is necessary, limit cuts to the smallest extent possible and require revegetation and/or restoration to a condition that appears natural.

Policy A-6.3: Encourage shared driveways whenever possible.

Policy A-6.4: Identify areas to be maintained in an undisturbed condition and establish an effective means of protecting these areas during development activities.

Policy A-6.5: Roadways should follow natural contours when possible and roadway size should be as narrow as possible to still permit safe passage.

Policy A-6.6: New development should preserve wildlife habitat whenever possible.

Policy A-6.7: New development should protect the desert dark skies environment to the greatest extent possible.

Policy A-6.8: Buildings and other structures should adapt to the terrain in placement and appearance to avoid excessive cuts and fills.

Policy A-6.9: Utilize the use of constructed retaining walls to minimize disturbance from cuts and fills.

Policy A-6.10: Utilities and other infrastructure necessary for development will be developed in a manner that protects and preserves the desert environment.

Policy A-6.11: When natural features are disturbed, encourage restoration and revegetation with native plants at the same density as the surrounding undisturbed desert.

Objective A-7 Protect Environmentally Sensitive Lands.

Policy A-7.1: As part of the Site Plan Review Process, require Site Plans to designate rare landscape elements.

Policy A-7.2: Grading should be kept to a minimum, with the encouragement to conform to the natural contours of the land.

Policy A-7.3: Riparian areas and wash corridors should be protected whenever possible.

Policy A-7.4: Changes in natural drainage patterns should be avoided. Where changes to the natural drainage patterns are necessary, a master drainage plan showing how the altered flows will be handled shall be prepared.

Objective A-8 Maintain connections between wildlife habitats by identifying and protecting corridors for unimpeded movement.

Policy A-8.1: All development within areas containing desert conservation corridors shall be subject to the provisions of a Corridor Overlay District.

Policy A-8.2: Minimize . man-made environmental hazards.

Policy A-8.3: Limit development in areas that may pose natural or man-made environmental hazards, such as steep slopes and floodplains.

Policy A-8.4: Ensure that land use intensities do not create the need for water in excess of available water supply.

Policy A-8.5: Limit residential development from areas of 60 Ldn noise levels or greater (e.g., truck routes, airports, and highways).

Policy A-8.6: Designate truck routes and encourage residential development adjacent to designated truck routes to use noise mitigation measures.

Policy A-8.7: Require all disturbed land to be revegetated with native plants to protect nearby areas from damage due to wind and water erosion.

Policy A-8.8: Allow walls and fences only where they do not disrupt natural wildlife movement patterns and design all infrastructure and roadways to minimize the impact on wildlife corridors

Policy A-8.9: Incorporate design techniques and measures which minimize conflicts between humans and wildlife.

Objective A-9 Balance the opportunity for recreation by the public with the habitat needs of wildlife.

Policy A-9.1: Set aside specific areas of open space for passive recreational uses and design public recreational spaces to be wildlife friendly whenever possible.

Objective A-10 Maintain the natural aesthetic qualities of the areas which are visually prominent or offer unique settings

Policy A-10.1: View corridors should be protected through the judicious placement of structures, as well as the imposition of reasonable height limitations on structures and signs

Policy A-10.2: Whenever possible, open space areas should align with prominent natural features to ensure view corridors and vistas.

Policy A-10.3: Limit development on the side slopes of the hillsides and mountains so the natural conditions of these features remain undisturbed when viewed from adjacent low lying areas.

Policy A-10.4: Require a visual assessment be prepared for new developments. This assessment should identify areas with visual quality and present the methods of protecting and/or mitigating impacts to visual qualities of these areas.

Section Eleven – Desert Conservation Techniques

Introduction

The purpose of this section is to identify a complete palette of desert conservation techniques and evaluate their appropriateness for inclusion into the *Desert Lands Conservation Master Plan's* implementation program. In assessing their feasibility, a number of variables will be examined, including their cost (both short- and long-term), ease of implementation (both technically and politically), legality, degree of cooperation required with other agencies or political jurisdictions, impacts, ability to meet established goals, etc.

Planning Techniques

Unfortunately, in examining techniques for desert conservation, sound planning is often slighted or even overlooked. However, the key to a successful desert conservation program should be founded on a strong and coordinated planning program which ties seemingly disparate agencies and policies together. Traditionally, the central element to the entire planning program is the general or comprehensive plan. For the City of Peoria, that document is the *Peoria General Plan*.

Before examining the *Peoria General Plan* and its role in promoting desert conservation, this section will begin with an overview of the state's enabling legislation, and will also include an examination of statewide planning and regional planning programs and how they might be integrated into a desert conservation program. After that, the role that can be played by the *Peoria General Plan* will be assessed, along with the role that area or specific plans should play in the overall desert conservation planning process. Next, other planning programs, such as capital improvements programming, urban growth boundaries, targeted growth strategies, and coordination with other development codes and other jurisdictions and agencies will be explored as planning techniques which can be employed to meet the goals and objectives of a desert conservation plan.

Arizona State Planning Enabling Legislation

Arizona planning statutes require that "each planning agency shall prepare and the legislative body of each municipality shall adopt a comprehensive, long-range general plan for the development of the municipality" (A.R.S. 461.05). A new required component of the plan for cities and towns having a population of more than 2,500 residents is the preparation of an open space element that includes:

- A comprehensive inventory of open space areas, recreational resources and designations of access points to open space areas and resources

- An analysis of forecasted needs, policies for managing and protecting open space areas and resources and implementation strategies to acquire additional open space areas and further establish recreational resources

- Policies and implementation strategies designed to promote a regional system of integrated open space and recreational resources and a consideration of any existing regional open space plans.

Another new component of the general plan for cities and towns larger than 2,500 residents is the inclusion of an environmental planning element that contains analysis, policies and strategies to address anticipated effects, if any, of the plan's other elements on air quality, water quality and natural resources associated with proposed development under the general plan. The policies and strategies developed under this element shall be designed to have community-wide applicability and shall not require the production of an additional environmental impact statement or similar analysis beyond the requirements of state and federal law.

State law mandates that the general plan shall also include, for cities of 50,000 or more, a conservation element for the conservation, development and utilization of natural resources, including forests, soils, rivers, and other waters, harbors, fisheries, wildlife, minerals, and other natural resources. The conservation element may also cover:

- The reclamation of land
- Flood control
- Prevention and control of the pollution of streams and other waters
- Regulation of the use of land in stream channels and other areas required for the accomplishment of the conservation plan
- Prevention, control and correction of the erosion of soils, beaches, and shores
- Protection of watersheds

These regulations provide the City of Peoria with a broad mandate to become actively involved in the provision and preservation of open space and, as noted *Section Four, Legal Issues Relating to Desert Conservation*, they provide a solid enabling foundation for subsequent ordinances and regulations which promote the purposes of the Growing Smarter legislation.

Statewide Planning

While individual local government jurisdictions typically administer land use plans related to development within their borders, where the spread of growth and development brings communities into close proximity to one another, growth patterns in each community begin to affect neighboring communities without regard for political jurisdictional boundaries. Where this occurs, statewide planning has sometimes been adopted to address multi-jurisdictional areas of mutual concern.

States in the forefront of state land use planning, although pursuing it with very different programs in scope and context, include Colorado, Oregon, Florida, and Washington. Some of these programs involve extensive, direct state involvement. Others have not involved "top-down" regulatory requirements. Rather, they have utilized broad goals to guide local decisions and have established frameworks within which the state and local governments can coordinate their policies and actions. In other states, the programs are mainly voluntary.

One oft-cited example of state involvement in planning is Oregon. In 1973, the state instituted a set of fairly specific state goals relating to issues such as agricultural land preservation and economic development. Local government, with some state funding assistance, must develop plans and implementing regulations consistent with these state goals. All local plans are reviewed by a state Land Conservation and Development Commission to ensure consistency with these goals and may be challenged in court to determine compliance. Under the system, all communities are encouraged to establish urban growth boundaries to limit sprawl into the countryside.

The State of Washington has also undertaken statewide planning, but has followed a different path than Oregon. Adopted in 1990 in reaction to growing pressures to protect a "Northwest" way of life and preserve the state's mountains, rivers, and forests, the Growth Management Act requires that each county experiencing growth pressures must create a comprehensive regional plan with its constituent towns and cities. The plans must contain certain mandatory elements that must be internally consistent, as well as consistent with plans of adjacent counties. Each plan must also designate an urban growth area sufficient to handle projected development in the country for the next twenty years. Later legislation added financial assistance for planning, authorization to increase local real estate excise taxes to raise funds for implementing the plans, and sanctions for non-compliance.

Advantages to statewide planning efforts are that it can expand the vision of local governments to consider the impacts of their growth beyond their boundaries. A disadvantage is that local governments lose some autonomy over land use and development decisions. Also, statewide planning mandates can be burdensome and expensive without state funding assistance. Statewide planning may necessitate the creation of another state bureaucracy.

Regional Planning

In the absence of statewide initiatives for land use planning and desert conservation, some jurisdictions have adopted regional planning efforts to address land use development issues. These initiatives vary greatly from place to place.

For example, in Minnesota, the state created the Metropolitan Council in the Minneapolis/St. Paul region and vested it with strong authority over such regional systems as transportation. The council has also instituted a regional tax revenue sharing program and adopted a regional comprehensive plan that must be followed by local governments. All local plans must be approved by the Council, which also has established a Metropolitan Urban Services Area line, outside of which water, sanitary sewer, and other urban infrastructure is not allowed in most circumstances.

In Colorado, cities and counties may create Regional Planning Commissions (RPC) and Regional Service Authorities (RSA). However, the regional plans of the RPC and the development guides of the RSA are not binding on constituent governments nor do they need be consistent with the planning and zoning decisions of local governments. At least eight regional planning commissions have been established in Colorado, but none of these combine counties with municipalities and none appear to possess any significant land use planning or regulatory authority, except in a few limited areas, such as transportation planning, where federal legislation provides them with a special standing.

An advantage to regional plans is that they can suggest development patterns that can benefit all participating entities by providing coordinated regional transportation, open space, infrastructure for the benefit of all inhabitants. Regional planning also help foster cooperative attitudes among participating jurisdictions that might otherwise take competitive stances toward one another. Such cooperative attitudes can lead to productive working relationships that can be effective in resolving other regional land use issues. Weaknesses include the local government perspective that regional planning bodies will erode local prerogatives over land use decisions and the fact that regional plans usually have "less teeth" than local plans and are often only advisory plans. Also, regional planning commissions may create an additional layer of bureaucracy and expense.

Municipal General Plans

In formulating a desert conservation plan, all activities should be consolidated within the framework of the *Peoria General Plan*. With recent changes to Arizona's planning enabling legislation strengthening the legal status of general plans and requiring a much more proactive approach to natural resource conservation and open space planning, this fundamental truth becomes even more compelling.

This section will examine the statutory requirements for preparing general plans and their relationship to the goals and objectives of the *Peoria Desert Lands Conservation Master Plan*. Aside from the legal framework mandating certain actions, a general plan can promote desert preservation in three distinct ways. First, goals, policies, objectives, and programs articulated in the plan can provide a solid legal foundation upon which to base desert conservation programs. Examples of conservation goals, objectives and programs contained in the general plans of other communities will be provided in this section.

The second instance in which general plans can promote desert conservation is through the designation of specific land uses on the general plan map. The general plan can be used to, either generally or specifically, identify areas for open space and conservation. A general plan can also identify areas of low density development which might be compatible with desert preservation.

The third way that general plans can enhance desert conservation efforts is by providing policy direction for a community's zoning ordinance. The recent changes to state enabling legislation require that zoning ordinances must now conform to the community's adopted general plan. Therefore, if a community wants to use its zoning ordinance to promote desert conservation objectives, it will be on a much stronger legal foundation if the ordinance is directly based on goals, policies, and objectives enunciated in the general plan.

Conservation-Related Goals/Policies in the General Plan of the City of Peoria

The *City of Peoria General Plan* has a series of goals, objectives, and policies related to environmental conservation. The specific goals and objectives related to this issue have already been listed. Since the objective of "promoting the preservation of the natural environment in and around Peoria" relates very directly to the desert conservation plan, the six policies relating to that objective were also listed.

Area Plans/Specific Plans

An area or a specific plan is a detailed plan for a specific area of a community. It should be based on the general plan and, because it has a more narrow geographic focus, is able to provide much more specific policy direction than a general plan. The Arizona Revised Statutes (9-461.08) provides cities with the authority to prepare specific plans "based on the general plan and drafts of such regulations, programs and legislation as may in the judgment of the (planning) agency be required for the systematic execution of the general plan." The enabling legislation states that specific plans may include:

- Regulations determining the location of buildings and other improvements with respect to existing rights-of-way, flood plains and public facilities

- Regulations of the use of land, buildings and structures, the height and bulk of buildings and structures and the open spaces about buildings and structures

- Measures required to ensure the execution of the general plan

The *Peoria Desert Lands Conservation Master Plan* is an excellent example of a specific plan for an area and, in providing recommendations for open space, accommodates the stated intent of the enabling legislation.

Capital Improvements Programming

Communities the size of Peoria typically have multi-million dollar budgets. Over a five-year programming period, millions of dollars will be invested in municipal infrastructure, including the construction/widening of roads, the extension of water and sanitary sewer lines, and the expansion of water and wastewater treatment capacity, to name a few of the most visible capital improvement projects. The recommended budget for the City of Peoria for Fiscal Year 1999 is $219 million, with almost $80 million in capital expenditures.

A strong relationship has been shown between the presence of infrastructure and development of the land. Local governments can effectively discourage the development of habitat areas by not planning for or budgeting for water or sewer lines or roads in the area, and by discouraging the creation of special districts to finance those elements of infrastructure in environmentally sensitive areas.

Urban Growth Boundaries

Urban growth boundaries allow cities to guide new development patterns by directing urban services to specified areas and withholding them from areas outside the growth boundary. Because of the focus on urban services, they are often called Urban Service Areas. Communities with urban growth boundaries can ensure that those boundaries do not include sensitive habitat areas, thereby preserving those areas as long as the boundary remains in place. Portland, Oregon and Boulder, Colorado are examples of communities which have employed this strategy for a number of years. One of the criticisms of urban growth boundaries is that, by restricting the supply of land available for

development, the land inside the growth boundary becomes more valuable, which results in higher land prices and, ultimately, higher housing costs.

An advantage to an urban growth strategy is that, when used in conjunction with capital improvement policies, adequate public facility ordinances, intergovernmental agreements, and coordinated annexation policies, it can guide development toward specified areas and prevent is the costly over-extension of public services. Additionally, if environmentally sensitive areas are correctly identified and are not part of an urban growth boundary, it can be an effective mechanism to protect these critical areas.

On the other hand, urban growth boundaries are controversial in Arizona. Proposition 303, which was passed by Arizona voters in 1998 and signed into law by Governor Hull on December 10, 1998, prohibits the state from mandating that cities, towns or counties "establish or recognize, formally or informally, urban growth boundaries, however, denominated, that effectively prevent new urban development and extension of public services outside those boundaries." Another controversial component of Proposition 303 is that it provided for $220 million in funding for open space acquisition over an eleven-year period. However, this funding was contingent upon voters not approving a proposition requiring communities to provide urban growth boundaries. Since that proposition did not appear on the ballot due to lack of signatures, the issue became moot. Nonetheless, the Sierra Club, one of the primary sponsors of a proposition to mandate urban growth boundaries in Arizona, has pledged to ultimately bring the issue to Arizona voters in an upcoming election. Another weakness is that, particularly if the boundary is not properly delineated and too little land is provided for growth, a poorly defined growth boundary will lead to an increase in land and housing costs. Finally, unless all communities in an area adopt urban growth boundaries, they will have little impact because developers and growth can occur in adjacent communities which do not have these restrictions.

Targeted Growth Strategies

Targeted growth strategies is simply designating development areas to which new growth will be directed within a region. One example comes out of the MetroVision 2020 Task Force of the Denver Regional Council of Governments. As an alternative to dispersed development patterns that may result as the region adds a predicted 900,000 people over a 25-year period, the MetroVision 2020 Task Force recommended consideration of the development of satellite cities where growth would be channeled. The concept is that prudently targeting growth to selected areas would result in the preservation of open space, particular in environmentally sensitive areas, and would also reduce infrastructure costs. These satellite cities, which could be existing communities or new planned communities, would be physically separated from the central urban area by open space or undeveloped land. Most of the new growth would be directed to existing satellite communities with the capacity for growth.

Perhaps a better known aspect of this technique is known as "infill" development. The strategy behind promoting infill development is to channel or target growth to areas which have available infrastructure and public services and which is adjacent to, or even surrounded by, existing development. Infill development programs can be comprehensive, which includes targeting all sizes of undeveloped parcels throughout a municipality, or they can be focused on a specific area.

Coordination with Other Land Development Codes

A desert conservation plan must be consistent with, and reflected in, all of the land use control systems for a specific community. That is why it is recommended that desert conservation be a critical component of Peoria's general plan. State law then mandates that the zoning ordinance conform to the plan, which ensures that these two elements of the community's land development code are consistent. Next, the subdivision ordinance should articulate policies and programs that are complementary to the general plan. The community's capital improvements program, annexation policies, and street improvements should be part of the total package of programs promoting the objectives of desert conservation. Unless all of a city's or county's land use controls work together to treat conservation areas in a consistent way, they will probably not be effective.

Coordination with Other Jurisdictions and Agencies

The individual efforts of a community aggressively pursuing a plan can be quite formidable. Through such mechanisms as the zoning ordinance, capital improvements programming, and the power of taxation, a municipality has a number of tools to effectuate public policy. However, it is well known that governmental boundaries are artificial and usually have no relationship to natural boundaries, such as watersheds or habitat areas. Consequently, to be even more effective, it is important for jurisdictions and governmental agencies to collaborate with each other. This can be done in a number of ways. Enhanced notification, intergovernmental agreements, and/or technical working groups are ways to increase communication between these groups and help promote collaboration on mutually important issues.

A partial listing of communities and agencies that will have a direct impact on the success of Peoria's desert conservation actions include Maricopa County, the City of Glendale, the City of Surprise, the City of Phoenix, and the State of Arizona (particularly, the State Land Department).

Concurrency Requirements (Adequate Public Facilities)

The pressures of growth and concern about urban sprawl has encouraged some communities to adopt "concurrency" ordinances. Concurrency ordinances are intended to ensure that growth cannot occur in an area unless adequate public facilities are either in place, planned, or occur concurrent with proposed development. These programs have been adopted to prevent unacceptable declines in the provision of urban services to existing residents and to meet the demands of new residents. A key point is that, in its pure form, concurrency does not require that new development be paid for by developers, only that the required improvements be made prior to or concurrent with the development. The question of financing the improvements is related to impact fees and other funding mechanisms.

Because of state enabling legislation, Florida has been a national leader in the field of concurrency ordinances, although communities in the State of Washington have also employed this technique to manage growth. Orlando has a concurrency program that begins with the establishment of basic levels of urban services. Of course, this requires that the standards are realistic and obtainable. The next step is using the Capital Improvements Program (CIP) to identify capital projects and their funding sources. Proposed development projects undergo a review procedure requiring a "certificate of concurrency" after an analysis of the project's impacts. After development, the city monitors service levels to ensure that public facilities are keeping pace with the new growth.

An advantage of concurrency ordinances is that they reduce or eliminate leapfrog development and the high cost of infrastructure expansion. It incorporates the CIP into the planning process and directs development to areas where the delivery of services is the most cost-effective. Disadvantages include requiring regional cooperation and coordination of planning. Without an effective regional planning framework or intergovernmental agreements supporting the endeavor, a single community's efforts while probably fail. The adoption and implementation of a concurrency ordinance program will also require a significant amount of staff time and expertise and, if not fairly administered, will be subject to legal challenges. Finally, while concurrency ordinances may offer short-term protection of some environmentally sensitive lands that are far removed from existing infrastructure, it does not offer long-term, permanent protection for these areas.

Carrying Capacity Limits

The concept of carrying capacity evolved from the natural sciences, where it was used to identify an area's environmental constraints, such as how many elk can be supported by the existing ecosystem of a particular area. In the 1970's, the planning profession began to use the carrying capacity concept to quantify the resource based and environmental limits to growth.

One of the best known examples of the utilization of this concept by a local government was the comprehensive plan of Sanibel Island, Florida, which based its plan on the island's carrying capacity. At the time of the plan's preparation, the existing zoning allowed approximately 30,000 dwelling units to be constructed in the community. Based upon their analysis, which was strongly influenced by the work of Ian McHarg and his book, *Design with Nature*, several growth alternatives were formulated. The development intensities of these alternatives ranged from 6,000 to 24,000 dwellings. The city ultimately selected an option providing for 7,000 dwelling units.

An advantage to this approach is that the environment and the impact of development upon the environment is directly integrated into planning decisions. In theory, development which is approved will be able to coexist with the environment without a significant ecological deterioration. Disadvantages include imperfect knowledge about the specific environmental impacts of development and knowing when a "tipping point" will occur. Not surprisingly, for this reason, some of the most successful applications of this approach have been used on island environments, which are isolated and self-contained. It will be far more difficult to trace precise environmental impacts to communities which are not coterminous with natural boundaries, such as watersheds.

City Ordinances

In general, the comprehensive or general plan will provide overall policy direction for a desert conservation program. Specific programs can be undertaken through a variety of measures. In particular, regulations can be codified through adoption as city ordinance, which enable them to enjoy the full force of the law in their implementation. From a desert conservation perspective, the zoning ordinance and the subdivision ordinance are two of the most important types of ordinances that affect development and can mitigate its impact on environmentally sensitive areas. These two ordinances will be evaluated in some detail in the ensuing two sections.

The Zoning Ordinance

Among the most important is using the zoning ordinance to help implement the goals and objectives of the *Peoria Desert Lands Conservation Master Plan*. Like the general plan, the zoning ordinance can impact the plan in several ways. First, the Zoning Map will depict land uses for areas throughout the city. Open space and conservation areas can be identified on the Zoning Map to limit or restrict development in environmentally sensitive areas. Additionally, the text of the zoning ordinance can be used in a number of ways to encourage the conservation or sensitive development of specified areas. A comprehensive listing of the specific tools of the zoning ordinance are provided in this section, together with representative examples of how these tools have been used in other communities in Arizona and around the United States.

Before proceeding, it should be specified that the presumption of this section is that all of these tools would be encompassed within a community's zoning ordinance. However, an alternative to this approach is to prepare a stand-alone ordinance, such as Scottsdale's *Environmentally Sensitive Lands Ordinance*, to accomplish the objectives articulated in the desert conservation plan. The primary reason to subsume specific regulations relating to desert conservation within the zoning ordinance is that the zoning ordinance then becomes a "one-stop-shop" whereby prospective developers are able to obtain all of the pertinent development information related to their projects within one document. A case can be made, however, that by providing desert conservation measures in a stand-alone document, its importance is magnified and will not get lost in a maze of other development regulations. Additionally, if the resulting desert conservation measures are particularly complex, a case can be made that they should be part of a stand-alone document to help ease their interpretation.

Use Restrictions

Through its listing of land uses by right, conditional uses, and the criteria for approving conditional uses, a zoning ordinance can prevent traffic-intensive or people-intensive activities from occurring close to ecologically sensitive areas, prime habitat areas, migration corridors, calving areas, and similar lands. In some cases, it might be wise to amend existing zoning ordinances to convert current uses by right into conditional uses subject to criteria designed to measure the impact of the activity on wildlife and desert preservation. Use restrictions can be provided in regular zoning districts, or can be applied to several zoning districts through the use of an overlay zoning designation.

Scottsdale's *Environmentally Sensitive Lands Ordinance* provides a typical example of how uses can be restricted through an overlay zoning district by noting that land uses shall be those permitted in the underlying zoning district except as follows:

> Land uses in the Hillside Landform areas with land slopes over twenty-five percent (25%), special features or unstable slopes are restricted to the following, provided that (these) uses must also be permitted by the underlying zoning: residential uses, including resort units, and related streets and utilities; the activities identified in the Conservation Open Space (COS) district, and golf tees. Ancillary resort uses, such as restaurants, meeting rooms, or parking areas for more than five cars are not permitted.

Density Restrictions

Minimum lot size requirements or maximum residential densities can be included in the zoning ordinance to reduce the number of people on sensitive land and the frequency of human-animal interactions in specified areas. In the Town of Cave Creek, which wanted to preserve and protect its residential character, when the Town adopted a new zoning ordinance in 1994, minimum lot sizes of one unit per five acres were placed on many areas which previously had enjoyed densities of as much as one unit for every acre. The philosophy behind this approach was that the reduced density and increased minimum lot sizes would encourage desert conservation and promote the Town's rural lifestyle. Some communities have density restrictions even greater than one unit per five acres, an employ densities of one unit per twenty or even forty acres. While these measures can dramatically reduce the intensity of development in specific areas, care must be taken to ensure that property owners are treated fairly and that a taking of property, which is protected under the Fifth and Fourteenth amendments to the U.S. Constitution, does not occur. This issue is particularly sensitive to several legislators in Arizona who periodically offer legislation, which has never passed, that would restrict a municipality's ability to diminish property values.

Cluster Development

Cluster development is an incentive which provides flexibility for developers to construct buildings in clusters, while remaining within the constraints of overall average density restrictions. Under cluster zoning, maximum densities are calculated not for individual lots, but for overall development areas. Rather than requiring uniform intervals between buildings sites, cluster ordinances waive minimum lot size and dimension requirements to allow tight clusters of buildings in some areas, with other, more sensitive, portions of the parcel set aside for open space or habitat use.

A good example of cluster development comes from Montgomery County, Pennsylvania. The intent of the Land Preservation District in Montgomery County is to preserve open space and natural lands on development parcels of 10 acres of more. The regulations permit development of compact residential areas that are carefully located, designed to reduce their intensity, and preserve agricultural lands, so long as a minimum of 75% of the site is protected as private open space.

Design Guidelines

Design guidelines in a zoning ordinance can relate to a wide range of specific activities, such as building heights, outdoor lighting, landscaping, construction materials, etc. This section examines a few of these elements and provides examples of how some communities have used them to control development in environmentally sensitive areas, or to ensure that, if development occurs in these areas, it does not dominate the landscape.

> Topography: Natural features of the land, such as hillsides, views or other features should be considered when designing the site. Awareness of existing conditions can avoid site design problems associated with floodplains, steep slopes, drainageways, or other features.

Lighting: The City of Scottsdale's *Environmentally Sensitive Lands Ordinance* requires that "exterior lighting should be low scale and directed downward, recessed, or shielded so that the light source is not visible from residential development in the area or from a public viewpoint."

Heights: The City of Scottsdale's *Environmentally Sensitive Lands Ordinance* stipulates that "the maximum building height in the ESL district shall be established by a plane measured vertically above the existing natural terrain elevation prior to grading; as the natural grade rises, the maximum height will rise accordingly. Small areas of rugged terrain inconsistent with this plane will not increase or reduce building height. Small areas are those features with a maximum width of 25 feet.

The maximum building height in the Hillside Landform shall be the height prescribed by the underlying district or 30', whichever is lower."

Low Water Usage: The City of Mesa requires that "drought resistant shrubs and trees should be the predominant accent plants used in the landscape design. Attractive desert landscaping allows for a reduction in water usage, and can provide shade and screening. A list of low water plants is available through the Utilities Department."

Building or Construction Materials: In an attempt to ensure that development does not dominate the landscape, many ordinances contain provisions about the types of materials that are permitted in specific districts. A common feature is the prohibition of mirrored or reflective surfaces. Scottsdale's ESL stipulates that "materials used for exterior surfaces of all structures shall blend in color, hue, and tone with the surrounding natural desert setting to avoid high contrast." For the Upper Desert and Hillside Landforms Districts, Scottsdale's ordinance is quite specific regarding paint colors:

No paint colors shall be used which have a Light Reflecting Value (LRV) greater than 40%.

Exterior paint and material colors shall not exceed a value of 6 and a chroma of 6 as indicated in the Munsell Book of Color on file in the Planning and Zoning Department.

Native Plants/Vegetation: The purpose of native plant ordinances is to ensure that the ambience of the desert is preserved and that new development does not look like it is has been transplanted from the Midwest, complete with lawns, oak trees, and other vegetation which is not indigenous to the Desert Southwest. It is also to ensure that water needs of planted material is consistent with the desert environment and a water use management plan. As one example, the Cave Creek Zoning Ordinance requires that, for properties one acre or larger, at least 25 percent of the lot be designated as undisturbed. If any area designated as undisturbed is disturbed during construction, it must be revegetated "by the establishment of native indigenous plants at a density similar to existing topographic and soil conditions. A list of accepted native plants is provided in Appendix B."

Planned Unit Developments (PUDs)

Often called PUDs (Planned Unit Developments), the purpose of this overlay zoning district is to provide flexibility in the zoning ordinance to enable developers to creatively develop in and around environmentally sensitive areas. A common intent is to allow for the preservation of open space or common areas in the area encompassed by the PUD. Such open space is usually required to be maintained by a Homeowners Association. These objectives are usually accomplished through a relaxation of the standard lot size and minimum yard requirements.

The Mesa planned development section is emblematic of these objectives and the approach to achieving them. Mesa's ordinance states that "the intent of this Overlay Zoning District is to provide for creative, high-quality development which incorporates the following:

- Substantial Open Space and/or recreational facilities held in common ownership

- The preservation of significant aspects of the natural character of the land"

Article 14-22 of the *City of Peoria Zoning Ordinance* provides the parameters for PUD development in the community. The stated intent of PUDs is "to assist a developer in density requirements when the developer elects to leave large, open space areas for recreational use." However, the ordinance states that "the maximum gross population density and building intensity of the overall development shall not exceed that permitted under conventional single-family standards." The primary component of Peoria's PUD development is that:

> For each square foot of land gained for permanent open space through reduction of lot sized below minimum requirements established in Article 14-5, an equal amount of land shall be either dedicated to the common use of the residents of the development in a manner to be approved by the Council or, subject to the approval of the Council, dedicated to the City for public park purposes.

Special Overlay Districts

As mentioned above, Planned Developments are customary districts which can overlay a specific zoning district and impose additional or different requirements than the underlying zoning district. Other types of overlay districts relate to historic preservation, environmentally sensitive land, and special wildlife habitat districts. In general, almost any issue of special concern can be addressed through a special overlay zoning district designed to meet the special needs of the issue in question. One of the most notable overlay districts in Arizona is the Environmental Resource Zone in the City of Tucson. Excerpts from this regulation are provided below.

<u>The City of Tucson's Environmental Resource Zone (ERZ)</u>

The Tucson ordinance states that the regulations are intended to recognize the value of Tucson's natural open space resources, particularly the critical and sensitive wildlife habitat of eastern Pima County associated with public monuments, forest and preserves. The regulations relate to areas

associated with Tucson's public lands and preserves, including Saguaro National Monument, Coronado National Forest, and Tucson Mountain Park. The intent of the Environmental Resource Zone is to protect valuable habitat resources to the greatest extent possible. Development is allowed if compatible with these public resources.

Parcels which may contain critical riparian habitat are shown on a series of maps (Environmental Resource Zone overlay maps) approved by the Mayor and Council, which kept on file in the Planning Department. ERZ maps include all parcels along the subject washes which may contain riparian habitat, including those parcels that are not vacant.

New development which occurs on parcels shown on the ERZ maps is reviewed for compliance with the regulations of the ERZ district, as are rezoning applications.

The regulations do not apply to the following:

- Any single-family residence or other development existing as of the date of adoption of this ordinance, or any expansion of up to 25 percent of either an existing residence or other development, or

- Any lot or parcel to be developed with one single-family residence where all development and the residence and any accessory structures are located outside of the critical riparian habitat area, or

- Any subdivision which is recorded prior to August 3, 1990, so long as substantial construction occurs within 5 years after August 3, 1990 and construction occurs in accordance with the approved plat.

When the regulations affect a parcel which is also subject to the Hillside Development Zone regulations, they do not apply so long as there is no encroachment into the 100-year floodplain.

Two options are available for development under the ERZ regulations.

- No Encroachment in Floodplain: Where the owner of a lot or parcel affected by these regulations chooses to leave the 100-year floodplain undisturbed, the ERZ does not apply except that fencing will be placed between the project site and the floodplain areas as provided in section 23-472.6; where permitted by the floodplain ordinance development in this floodplain area is allowed as provided in section 23-472.6.

- Study of Resource Corridor: Where the owner of a lot or parcel affected by these regulations chooses to do a study of the resource corridor, a development submittal containing the following information is made to the planning department.

If preservation of the critical riparian habitat cannot be accomplished as provided in the ERZ regulations, the development proposal must include a mitigation plan.

Tucson's ordinance also has the following prevision for the preservation of critical riparian habitat:

> Preservation of 100% of critical riparian habitat areas within the resource corridors for parcels shown on the ERZ maps is required, except as provided in section 23.472.4 and 24-472.6. The critical riparian habitat areas may be included as part of any required open space on the site.
>
> Residential development of 4 or more dwelling units is allowed only as a Residential Cluster Project, except as provided in section 23-472.3B. Use of the RCP provides for the maximum amount of critical riparian habitat preservation while preserving density options.

Performance Zoning

Performance zoning regulates development primarily by limiting development impacts rather than densities or uses. Such ordinances may target either a single type of impact or a broad range of impacts. Some of the impacts typically targeted in performance zoning ordinances include traffic generation, pollutant emissions, stormwater runoff, and open space preservation.

In the area of wildlife protection, performance standards may be expressed in terms of minimum open space ratios, maximum vegetation disturbance limits, maximum noise or glare limits, minimum contiguous landscaping standards, or similar standards.

While performance zoning regulations have been employed since the 1950s, they have become increasingly popular in the wake of an influential work on the subject by Lane Kendig, entitled Performance Zoning, which established a comprehensive system dealing with a variety of project impacts.

Probably the best known performance based zoning system is Fort Collins, Colorado's Land Development Guidance System (LDGS). The LDGS does not specify a particular use for any parcel of land. Instead, it grants substantial latitude to the developer to propose from a wide variety of land uses. The LDGS regulations focus on the quality of development and insulating adjoining uses from any adverse impacts through the use of a variety of performance standards, particularly relating to buffering and landscaping.

In the regulatory scheme of things, performance zoning can either replace or complement traditional zoning ordinances. In Fort Collins, for example, conventional zoning is in place, but developers have the option of developing under the LDGS.

Floodplain District Zoning

Floodplain zoning districts are very common and are incorporated in zoning ordinances throughout the United States. It is not uncommon for these districts to refine the floodplain into two areas: the floodway and the floodway fringe. Development restrictions are must stricter in the floodway, while some development may be permitted in the floodway fringe if the base of the proposed structure is a specified distance above the 100-year flood elevation.

A typical example of a floodplain zoning regulation is contained in the Menlo Park, California zoning ordinance.

Permitted Uses: The following uses are permitted in the FP District:

- Agricultural uses
- Accessory buildings
- Dredging

Conditional Uses: The following conditional uses are permitted in the FP District:

- Public or private recreation facilities
- Sanitary landfills
- Kennels

As can be seen, uses are severely restricted in Menlo Park's floodplain zoning district and do not include residential development.

Open Space Zoning

Compulsory open space zoning is a relatively new concept and is similar to cluster development. It has been successfully implemented by communities in New England and the Mid-Atlantic states, and by several counties in Virginia, Washington, and California. Under this concept, open space zoning allows the same overall intensity of development that is already permitted. The key difference is that this technique requires new construction to be located on only a portion of the lot.

An example of this technique is the Open Space and Conservation District in Menlo Park, California. The purpose and intent of this district is to:

- Protect and preserve open space land as a limited and valuable resource
- Assure its continued availability for the following: as agricultural land, scenic land, recreation land, conservation or natural resource land, for the containment of urban sprawl and the structuring of urban development, and for the retention of land in its natural or near natural state to protect life and property in the community from the hazards of fire, flood and seismic activity
- Coordinate with and carry out federal, state, regional, county and city open space plans

There are no permitted uses in the OSC district, rather the following uses are permitted as conditional uses if they comply with the standards used to determine the appropriateness of conditional uses in this zoning district.

- Public or private recreation facilities
- Public buildings

- Agricultural uses
- Botanical conservatories, outdoor nature laboratories and similar facilities
- Native wildlife sanctuaries
- Accessory buildings and uses

An example of a local Open Space Zoning District is found in the Town of Fountain Hills. In their zoning ordinance, the Town requires all of the following procedures to be met prior to rezoning land to either OSR or OSC Zoning Districts:

- The property owner and any lienholders of record shall specifically request, in writing, that the zoning district designation be applied to their property

- The property owner and any lienholders of record shall sign a forbearance agreement that would be recorded in the office of the Maricopa County Recorder, stating that:

- If the property is rezoned to the OSR district, the owner must voluntarily request a zoning district designation that provides for little economic use of the property and indicate that he is fully informed and aware of this fact

- If the property is rezoned to the OSC district, that the owner has voluntarily requested a zoning district designation that provide for no viable economic use of the property and that the owner is fully informed and aware of this fact.

The purpose of the Town's Open Space Zoning Districts is to conserve and protect open space, natural desert lands, wildlife habitat, and lands agreed to be left undeveloped in master plan approval through hillside disturbance transfers. The primary purpose of designating these areas is to raise the degree of assurance that designated open space and recreational areas will remain open.

Under the Fountain Hills ordinance, permitted uses in an OSC District are:

- Undeveloped natural land
- Trails, with the approval of the Town Council
- No other uses or structures, except those specifically allowed above, are permitted in the OSC Zoning District

Permitted Uses (in the Town's Open Space Recreational Zoning District) include:

- Golf course, including club houses
- Park land
- Public and private wildlife reservations
- Publicly and privately owned or operated fire and/or public police stations

- Undeveloped natural land
- Utility services, but not including offices, wastewater treatment plants, generating stations, and wireless communications towers and antennas, unless otherwise specifically permitted elsewhere in the ordinance

Agricultural Zoning

An Agricultural Zoning District is an area which only allows agricultural uses and their ancillary activities, which usually includes one residence per farm area. The State of Wisconsin has a comprehensive farm protection program that includes an emphasis on strong agricultural zoning. Under the Wisconsin program, counties must first adopt an agricultural preservation plan as a foundation upon on which to base their exclusive agricultural zoning districts. Wisconsin statutes provide certification standards that exclusive agricultural zoning districts must meet so that landowners may obtain tax credits under the farmland preservation program.

Locally, the City of Mesa has an agricultural zoning district. The Mesa ordinance states that the purpose of the agricultural zoning district is "to protect and preserve agricultural lands and related activities in their present character." The intent of the zone is to protect agricultural lands from incompatible land uses and urban encroachment.

An advantage of agricultural zoning is that, while the agricultural district is in place, it provides protection from other, more intense land uses. Probably the primary weakness of agricultural zoning districts is that, as development encroaches and the land becomes more valuable, there is considerable pressure to sell the land for significantly more than it was originally purchased. As a result, many communities view agricultural zoning as a "holding" zone, holding the land to a specific use (agricultural) until a higher and better use comes along. Another disadvantage of agricultural zoning is that, while being effective in preserving open space and preventing intensive development, it will be incompatible with desert preservation objectives that require the land to remain undeveloped and in a pristine condition. Finally, since there are few, if any farms in the Study Area, the concept has limited applicability in the short term.

Tree Protection and Vegetation Management

A 1984 national study published by the University of Pennsylvania identified fewer than 100 tree protection ordinances in use in the United States, with most of the ordinances coming from California or Florida. By 1989, a survey of all incorporated cities in California showed that there were 159 city tree ordinances in that state alone.

In vegetation management, the Town of Cave Creek's Zoning Ordinance has a Native Habitat Preservation section that requires newly developed areas to maintain at least 25% of the lot in an "undisturbed area." The ordinance stipulates that "the undisturbed areas shall remain in a natural state and, wherever possible, the design of the site shall allow for contiguous areas both on-site and to adjacent sites. Special consideration shall be given to the preservation of washes and other riparian areas." Regulations in the zoning ordinance also mandate the revegetation of any "undisturbed areas" which are disturbed during construction.

River Corridor Protection Standards

River corridor standards are found in many communities around the United States. For example, Park City, Utah has adopted standards requiring that development be set back at least 100 feet from rivers and streams and be buffered from view. In the Denver Gateway area, development must be set back from First Creek a minimum of 200 feet, and other buffering controls apply to development in this area.

Vegetative Barriers or Buffer Areas

Vegetative barriers can be used to increase the perceived separation between developed and natural areas. They can also be used to either attract or repel different species of wildlife. Buffer zones can be used to decrease line of sight distances for wildlife and humans, reduce noise disturbances, protect critical habitat, and protect bodies of water. Examples of buffers and/or vegetative barriers are found in most zoning ordinances and can easily be restructured to ensure that significant buffers exist between new development and environmentally sensitive areas.

Controls on Fencing

In many ways, fencing is an anathema to environmentally sensitive lands and desert conservation planning. Such man-made structures can impede migration patterns, as well as the daily travel and hunting patterns of wildlife. On the other hand, when development occurs, a compromise may need to be struck to enable property owners to delineate their property, and to ensure their privacy and safety. In general, fences lower than 40 inches tall will not be a barrier or a source of entanglement to large game animals. In other cases, the goal may be to make sure that wildlife see the fences as they approach so that they can avoid entanglement. Height restrictions on fences are found in most zoning ordinances and could be adopted to incorporate particular goals relating to scenic corridor and vista protection, as well as to promoting the preservation of local wildlife. In addition, walls and fences should have escape routes so desert wildlife does not get trapped in a residential neighborhood.

Controls on Public or Vehicular Access

Access restrictions could include permanent road closures, locked or manned gates, or signs. In some cases, merely requiring that the point of access be hidden from the public may be adequate and may still leave a road or trail open for use by emergency vehicles and others.

Phasing of Development

In some cases, significant wildlife benefits can be gained by requiring new development to be constructed in specific phases. If a wildlife species to be protected can adjust to the presence of humans nearby, a phasing strategy might require that the first stages of development occur far from the prime habitat area, so that the animals are not presented with a dramatic disruption of their habitat. Additionally, lessons learned during the first phase of construction and habitation can be used to ensure that subsequent development patterns are minimally disruptive to local wildlife.

Controls on Construction Activity

As part of the planned development process, several communities around the Valley are requiring the imposition of "development envelopes" which can be seen as growth boundaries on micro (parcel) level. The concept of a development envelope is that no construction should occur outside its boundaries. Unfortunately, what some communities have discovered is that during construction, land outside the envelope is damaged and precious desert vegetation is lost. As a result, controls are often placed on construction activities. A typical control might be a stipulation in the development approval that the development envelope be fenced and that no construction equipment be permitted out of the envelope. Inasmuch as some controversy exists about the destruction associated with erecting a large chain-link fence, other communities have a stipulation mandating that the development envelope be delineated with yellow ribbon tape. In almost all cases, any disturbance outside the development envelope is required to be revegetated after the completion of construction.

To conserve the desert proximate to development, construction controls may need to address:

- Prevention of accidental cutting of trees or vegetation
- Restrictions on excavation near roots or root masses
- Limitations on severe grade changes near the vegetation or in mating or calving areas
- Restrictions on dumping construction materials, or toxic materials, near important vegetation, other cover or desert washes
- Limitations to the use of fires to clear vegetation prior to construction
- Limitations on the duration or hours of construction
- Limitation on timing of construction to avoid critical times for wildlife
- Limitations on the number of project personnel or construction vehicles on site any one time through the use of transportation pools or staggered shifts
- Restrictions on construction personnel access to wildlife areas
- Speed restrictions on access roads
- Erosion and siltation control in significant washes during construction

Density Bonuses

One of the most common forms of incentive is providing development density bonuses. In these programs, the local government offers landowners a chance to construct more residential or commercial development on their land if they take certain actions to promote desert conservation. The required actions can include locating development outside of prime habitat areas, implementing groundwater runoff controls to avoid erosion into streams used by wildlife, planting specific types of vegetative cover that attract (or repel) wildlife, or avoiding glare and traffic movements near wildlife areas or corridors. The amount of additional development density allowed should vary depending on the importance and difficulty of the landowner's action to protect the desert, but bonuses are commonly in the range of a 25-50 percent density increase. Larger bonuses may create fairly significant development impacts and may raise questions about the rationale behind the base zoning density. Care should be taken to avoid granting incentives that results in additional wildlife impacts that are greater than the benefit gained by the landowner's desert conservation measures.

Hillside/Slope Restrictions

This technique includes provisions in zoning ordinances which govern development on slops and hillsides of a defined parameter. A common parameter is slopes of 10 percent or larger. Most of these ordinances do not prohibit development on these areas, but reduce the intensity. The City of Peoria's hillside provision (Article 14-22A of the Zoning Ordinance) stipulates that:

> The maximum number of residential lots or units permitted within hillside development areas shall be the sum of the number of lots allowed by the zoning district, or the sum of the number of lots allowed in each slope category of land as shown by the following table, whichever is the lesser number.

The table contains a range of 1.5 lots per gross acre for slopes between 10 and 15 percent and .10 lots per gross acre for slopes of 40 percent and greater.

Advantages include the utilization of the state's ordinance power as opposed to regulatory or voluntary measures. Weaknesses include the potential for legal challenge.

The Subdivision Ordinance

In order to protect wildlife habitat, subdivision standards could require the use of large lots to limit the number of people living in the area or could prohibit the creation of lots in sensitive areas. In addition, many subdivision ordinances impose strict buffering requirements in an attempt to protect undeveloped areas. Subdivision ordinances could also include standards requiring that storm drainage be managed to promote riparian vegetation where that is desired or to avoid disturbing desert vegetation.

Some states explicitly authorize county governments to require landowners to dedicate a portion of their land as future school and park sites as a condition of development. The U.S. Supreme Court has required that these dedications be roughly proportional to the impacts of the proposed development. The *City of Peoria Subdivision Regulations* contains the following requirement for parks:

> Where the tract contains all or any part of the site of a school, park or other public site, as shown on the Community Development Plan or as recommended by the Commission, such site shall either be dedicated to the public or reserved for acquisition by the public within a specified period of time. An agreement shall be reached between the subdivider and the appropriate public agency regarding time, method, cost of such acquisition. In the vent of failure to reach such agreement with a reasonable period of time for reasons satisfactory to the Commission, the Commission may determine that requirements for this section have been met.

Under these provisions, rather than dedicate the land to the public, it is probable that developers will choose to sell a tract to a public entity. Of course, if the price is too high or funds are not available for acquisition, the property can easily revert to the developer for the construction of additional units. Furthermore, because of the ambiguity of the language in the ordinance (if the deal is not reached within a reasonable time for reasons satisfactory to the Commission), it might be very difficult to legally extend the time period for negotiation.

Another significant portion of Peoria's Subdivision Regulations is a paragraph relating to land unsuitability.

> No land shall be subdivided which is held by the Commission to be unsuitable for residential use by reason of flooding, concentrated runoff, inadequate drainage, adverse soil or rock formation, extreme topography, erosion susceptibility or similar conditions which are likely to prove harmful to the health, safety, and general welfare of the community or the future property owners. The Commission, in applying the provisions of this section, shall state in writing the particular facts upon which its conclusions are based, and shall also define the conditions under which the land may, in its opinion, become suitable for the proposed development. Any subdivider proposing development of such land shall have the right to present evidence to the Council contesting such determination of unsuitability, whereupon the Council may affirm, modify or withdraw the restriction.

Sanctuary Regulations

One increasingly popular tool is the creation of legislatively adopted "sanctuaries" for existing types of land uses. Many agricultural areas encounter difficulties when new development locates nearby. Where local governments wish to retain agricultural land, they can create sanctuaries that prevent the encroachment of incompatible uses. "Right to operate" provisions in such sanctuary zones immunize local farmers or ranchers against nuisance claims, rezonings, or other pressures to require changes in operations that would be detrimental to the farm or ranch, and they might lead it to stop operations. The Colorado General Assembly has adopted a variation of this protection against nuisance claims by specifying that an agricultural operation cannot be defined as a nuisance. More specifically, the law states that "an agricultural operation is not, nor shall it become, a private or public nuisance by any changed conditions in or about the locality of such operation after it has been in operation for more than one year."

Care should be taken in drafting sanctuary protections to avoid making them so tight that they exclude all other uses. If alternative uses are prohibited, there may be increased pressure to rezone for development rather than move to alternate, less-intensive, permitted uses when market forces render the farming or ranching operation infeasible.

Land Acquisition Techniques

Land use attorneys often refer to land ownership as a "bundle of rights." These rights include the rights of possession, access, and various uses, such as hunting, mining, and construction. These rights are severable and can be sold, either in whole or in part, to other individuals or entities. This section describes different ownership options relating to the bundle of property ownership rights. Offering the most control, and the greatest amount of rights, is fee simple ownership of land. At the other end of the spectrum are easements or other similar conveyances which provide specified, and limited, ownership rights.

As might be expected, land acquisition programs can be quite effective in promoting desert conservation goals. For instance, the City of Boulder has the oldest open space program in Colorado and has used a specially earmarked .073 percent sales tax to raise $100 million and buy 25,500 acres of dedicated open space in a greenbelt around the city. The sales tax revenue stream now produces about $15 million each year. Another 8,000 acres of mountain parks in the Boulder foothills have been separately set aside through the parks and recreation department. Some of the Boulder open space land is leased to farmers to maintain the agricultural uses. Other parcels are maintained as natural areas, allowing passive recreational uses, such as walking, bicycling, and horseback riding.

Jefferson County, Colorado has had an open space acquisition program in place since 1972. Funded by a one-half percent sales tax that generates $22 million in annual revenue, the county has spent approximately $123 million to acquire 29,500 acres of land. The lands are used for a variety of purposes, including natural areas, buffers, and trail corridors. Open space funds are also distributed to eight cities in the county, with Lakewood receiving more than $13 million and Arvada receiving more than $11 million since 1972.

Fee Simple Purchase

As noted above, ownership of land includes rights of possession, access, exclusion, disposition, and rights to specified uses. Where one party owns the entire bundle of these rights, that party owns the land in "fee simple" and is subject only to the constraints imposed by nuisance laws and valid public regulations. Fee simple ownership provides the most effective means of control. If the City of Peoria assumes fee simple ownership, it possesses a wide range of options. It may re-convey selected interests in the land, restrict future uses of the land, lease the land, or otherwise control the bundle of property rights in a manner appropriate to its intended objectives. Generally, federal, state, and local governments have used fee simple purchases for properties to be reserved as parks.

Advantages include full landowner control of land and the highest degree of flexibility and protection. Permanent protection and public access are allowed (if desired). Weaknesses include the cost of purchase, which may be beyond the government's or non-profit's ability to pay. In addition to the initial acquisition costs, carrying costs – interest on debt, foregone interest on alternative investments, taxes, and maintenance costs, plus property management costs – can also be quite high. Another disadvantage is that publicly-owned land is removed from the property tax rolls.

Installment Sale

An installment sale allows a public sector or non-profit buyer to pay for property over time. Advantages include lower taxes for the seller. Weaknesses include the long term financial commitment to a mortgage and the owner's lien rights on the land.

Purchase and Sellback or Leaseback

Government entities may use the purchase and subsequent resale or leasing of property to direct land development patterns. A municipality may acquire property in fee simple and retain certain development rights – essentially affixing a negative easement to the property – and then re-convey the property less the retained rights.

Alternatively, a governmental entity may purchase the property and then lease it, subject to conditions and restrictions as provided in the leases. These arrangements, known as "purchase and sellback" and "purchase and leaseback" arrangements, enable the government to recover at least a portion of its acquisition costs while exercising direct control over the sort of development activity that occurs on the purchased property.

The California Coastal Conservancy, charged by the state to assist in the protection of undeveloped coastal land, has a successful program that provides grants to land trust organizations to purchase agricultural and other land and resell with conservation restrictions. Funded by the state, the experience of the program is that agricultural lands purchased at full market value, can be resold with conservation restrictions that allow for agricultural and other open space uses at nearly the original purchase price. Therefore, the cost of the program is minimized and land is kept in productive use.

Advantages of this technique are a relatively low cost of imposing development restrictions, a high level of control with the opportunity to impose specific types of development controls, and keeping the land in productive use. Disadvantages include less control that fee simple acquisition and enforcement of restrictions placed on the land that is sold or leased.

Right of First Refusal

While a local government may not need to keep ownership of an entire fee interest in land to achieve its goals, it may also not need to purchase the property at all until an alternative use or sale of the land is contemplated. Under this concept, a landowner agrees to provide first right of purchase to designated public sector or non-profit entities. This right is usually triggered through the prospect of a sale or proposed redevelopment of the property.

Advantages include short term preservation of open space and low (or no) cost of rights. Weaknesses include no control over eventual asking price for land and, if the government decides to purchase the land to ward off the threat of development, the ultimate purchase cost will be higher than if initially purchased because of increases in property values over time and the addition of the costs incurred by obtaining a right of first refusal.

The Sword of Damocles

This technique has been employed to protect federal reserves and national recreation areas from adverse development on private property holdings. This system has been used in Idaho's Sawtooth National Recreation Area, where regulations and design controls imposed on private properties to preserve the natural setting. Under this approach, the government agency devises a comprehensive land use plan for the area and designates various zones for different uses and developments. As long as the landowner voluntarily agrees to comply with the plan and restrictions, the government's power to condemn is suspended. However, if a use in contravention of the plan is proposed or undertaken, the power to condemn is triggered and the land is taken into public ownership to prevent the undesirable development.

A primary advantage is that the technique offers effective protection in interim periods during which government budgets may not allow for immediate purchase. It allows the land to remain in private ownership and on the tax rolls if uses are compatible with conservation goals. Disadvantages include the increased costs of purchase if property values rise over time. Also, the technique is only as effective as the resolve of the relevant agency to exercise its power of condemnation and the availability of money to pay compensation – both of which may waiver or fall short under political and/or fiscal pressures.

Bargain Sale

A bargain sale involves selling a parcel for less than its market value. In this instance, it becomes part donation and part sale. Entities, such as land trusts, can purchase land at less cost, while the difference in value can be offset to some degree by tax benefits through the donation of the difference in value between the sale price and the market price.

Advantages of this approach include tax benefits to the seller for donation portion of the transaction and, as noted, lower purchasing costs to the buyer. Weaknesses include the willingness of a seller to engage in a more complicated transaction that a sale at market value and an agreed-upon definition of what constitutes fair market value.

Condemnation/Eminent Domain

As noted in *Section Four, Legal Issues Relating to Desert Conservation*, eminent domain is permitted under the Fifth and Fourteenth Amendments to the United States Constitution, which grant the right of government to take private property for public purpose upon payment of just compensation. Communities throughout the United States have employed this technique for a wide variety of public purpose projects, including the provision of parks and open space.

Advantages of this approach include using the power of the state as a last resort if no other techniques are feasible. Weaknesses include cost the just compensation and ill will engendered by the technique. Additionally, there is the ever-present possibility that these actions will be litigated. If that is the case, another drawback is that the legal environment for any measure related to takings is uncertain and will be evaluated on a case-by-case basis.

Land Exchange

This technique entails swapping developable land for property with high open space value.

Advantages of this mechanism include no hard cost for public or non-profit entities and avoidance of capital gains tax for landowner. Weaknesses include the potential unwillingness of landowners to swap, and complexity of closing the deal.

Dedications

Strapped by budget limitations and encouraged by the quest to ensure that new development pays its fair share of infrastructure costs, a number of local governments in Arizona and around the United States are imposing dedication requirements, exactions, fee in lieu, or impact fees, as conditions for permit approvals. Fees in lieu and impacts fees will be examined in greater detail under the category of funding or financing techniques. As noted in the discussion about legal issues related to desert conservation, the national and local legal environment related to these techniques continues to evolve.

A dedication is a conveyance of land by a private owner in the nature of a gift or grant and the acceptance of that land by or on behalf of the public. Streets in a subdivided development are usually acquired by local governments through a dedication to the public of the property comprising the streets. Other dedications may be required that require land for parks and recreational facilities, school sites, bike paths, or local transit facilities.

Advantages of this technique include the equity of development helping to finance the open space which it threatens. Weaknesses include the difficulty of calculating fair fees or dedications, the substantial amount of staff time needed to craft and review dedication and exaction requirements, and ensuring that all of the legal requirements are met. Also, opposition from the development community can usually be anticipated, which prefers property taxes, public bond issues, and other traditional sources of funding to provide for infrastructure. Finally, dedications and exactions will increase the cost of new housing.

Exactions

An exaction is a payment or dedication made by a developer for the right to proceed with a project requiring government approval. They can be in the form of a fee, the dedication of public land, the construction or maintenance of public infrastructure, or the provision of public services. As noted previously, the purpose of the exaction must directly relate to the need created by the development. In addition, its amount must be proportional to the cost of the improvement.

Advantages of this technique include the equity of development helping to finance the open space which it threatens. Weaknesses include the difficulty of calculating fair fees or dedications, the substantial amount of staff time needed to craft and review dedication and exaction requirements, and ensuring that all of the legal requirements are met. Also, opposition from the development community can usually be anticipated, which prefers property taxes, public bond issues, and other traditional sources of funding to provide for infrastructure. Finally, dedications and exactions will increase the cost of new housing.

Partial Property Acquisition Techniques

For any number of reasons, including cost, it may not be necessary to obtain full ownership rights to a parcel. In these instances, the goals of the desert conservation plan may be fulfilled, at a lower cost, by acquiring only partial rights to a specific piece of property. Among other things, by allowing the property to remain in private ownership, taxes continue to be collected and governmental maintenance costs are reduced. Several techniques for acquiring partial ownership are examined below.

Easements – General Issues

Easements are severable rights or interests in land. The severable nature of easements allows a landowner to convey or reserve specific rights associated with a property, apart from other essential rights of possession and use. There are two distinct types of easements. Positive easements grant an affirmative right to use property in a specified manner, or to interfere with the title holder's otherwise enforceable property rights. A right of access across a neighboring property is a common example of a positive easement.

In contrast, negative easements affix restrictions upon the landowner's property rights. Negative easement do not grant affirmative rights. The purchaser of a negative easement simply affixes a restriction. Particular restrictions vary in accordance with the objective. Where the aim is the preservation of scenic vistas, scenic easements may prevent new construction that exceeds height limitations or block specified views. Where the object is historic preservation, government entities may affix easements prohibiting certain specified types of property alterations. A few of the more common easements related to desert conservation are examined below.

Conservation Easements

Partial interest in property generally for expressed purpose of protecting open space. Advantages include low purchase cost and landowner retention of non-conflicting development rights, including keeping the property on the tax rolls. Weaknesses include the need for enforcement, limitations to resale opportunities, and potential public access restrictions.

Preservation Easements

Same as conversation easements, with an emphasis on historic landscapes. Advantages and weaknesses are the same as for conventional easements.

Prescriptive Easements

A prescriptive easement is a means of acquiring an access easement in or on the land of another by continued regular use of a statutory period of time. It is similar in legal doctrine to the concept of adverse possession.

Purchase of Development Rights

Governments or non-profit organizations purchase the rights of more intensive land use from the current owner. In the Seattle metropolitan area, King County has administered a successful purchase of development rights program for the purpose of preserving agricultural land in the face of metropolitan growth pressures. Utilizing a $50 million bond issue, the program has provided for the county's purchase of development right for properties facing development pressures, with priority rankings determined in accordance with the intensity of such pressures.

Advantages include lower initial purchase costs (if only a portion of the development rights are purchased), landowner incentives for selling rights, lower residual property value, the land remains on the tax rolls, and the government avoids management and maintenance costs. Weaknesses include the cost of purchase (if most, or all, of the development rights area purchased), which may be beyond the government's of non-profits ability to pay.

Purchase Right-of-Way Easement

Provides the public with the right to access and use a parcel of land for a specified purpose. Strengths include avoiding the cost of outright purchase. Weaknesses include time limits, and the ability of the landowner to exercise development rights.

Lease Techniques

Lease/Use Agreements

Short and/or long term public sector rental of land with use agreement for open space. Strengths include low cost of leases, and landowner incentive to receive a regular income stream. Weaknesses include lack of equity and long term protection.

Life Estates

Not infrequently, the owners of agricultural or ranch lands would prefer not to develop their lands and would like to see the farm or ranch remain intact as long as possible. However, many of these same owners would like to be able to pass their land on to their children for them to do with as they wish. For that reason, they are unwilling to grant easements or impose deed restrictions or covenants that would bind their children's use and disposition of the land. The local government may want to purchase a life estate in the land and lease the property back to the current owner at roughly the same cost. The terms of the transaction allow the government to control the use of the land during the owner's lifetime, but terminate that control at the time of the owner's death. Even though the land could be put to incompatible use some time in the future, the purchase of a life estate can buy time for the community to consider follow-up steps and/or to raise money for the eventual purchase of the property.

Transferable Development Rights (TDRs)

Density transfers involve the shifting of permissible development densities from unsuitable development areas to more appropriate sites – in this case, from important habitat areas to less important areas. Under this concept, the local government studies and designates appropriate "sending" and "receiving" areas on a map. TDR programs can be designed to be voluntary in the sending and receiving areas, mandatory in both areas, or voluntary in one areas and mandatory in the other.

The TDR concept has been used in a number of different jurisdictions in the United States. Montgomery County, Maryland has used a TDR program to protect agricultural lands against strong urban growth pressures. The Montgomery County program involves three elements:

- The identification of a "sending area" that includes the county's best agricultural lands
- Downzoning in the sending area from five-acre minimum lots to 25-acre minimum lots, with landowners retaining TDRs equal to their original five-acre lot development rights
- The identification of a "receiving area" in which landowners may augment their development rights with additional rights purchase from the sending area.

Another successful TDR program for natural area protection has been employed in the Pinelands National Reserve in New Jersey. To date, more than 10,000 acres have been preserved, and the TDR market provided by the program was recently held to be an important consideration in rejecting a takings challenge to the Pinelands' strong system of regulatory controls designed to protect existing agricultural lands and open space.

Land Acquisition Funding Techniques

Grants and Loans

Listed below are a number of purchase options which will enable a community implement the policies of the Desert Conservation Plan. In order to participate in these options, a community must have a source to obtain the necessary financing. Grants are one way that a community can obtain financing to implement the goals of the Desert Conservation Plan. A partial listing of sources for grants is identified below.

Arizona Preserve Initiative (API)

The Arizona Preserve Initiative was adopted by the Arizona State Legislature in 1996. It was designed to encourage the preservation of specific parcels of State Trust land in or adjacent to urban areas for open space. The law specifies a process by which Trust land can be leased for up to 50 years or sold for conservation purposes. Conservation is defined in the law as "protection of the natural assets of State Trust land for the long-term benefit of the land, the beneficiaries, lessees, the public, and unique resources such as open space, scenic beauty, protected plants, wildlife,

archaeology, and multiple use values." Changes to the law in 1997, created a public/private matching grant program under the State Parks Board for acquisition or lease of State Trust lands for conservation, and ties the program into the Urban Lands Act.

Proposition 303

Proposition 303 was approved by Arizona voters in November, 1998. A portion of that act established a land conservation fund consisting of public monies appropriated from the state general fund. In fiscal years 2000-2001 throughout 2010-2011, the sum of $20 million was appropriated each fiscal year from the state general fund to the public conservation account in the land conservation fund.

Recreation and Public Purposes Act

This program allows the lease or conveyance for recreational or public purposes under specific conditions. The application process includes preliminary discussions with the Bureau of Land Management (BLM), an application, with a $100 non-refundable processing fee, the appraisal of the land, an Environmental Assessment, and a publication of a Notice of Realty Action in the Federal Register. If there are no adverse environmental impacts and no opposition to the lease or conveyance, the BLM requests payments of fees and executes the lease or issues a patent for the proposed use. A recent notice in the Federal Register recommended the transfer of 40 acres to the State of California, who proposed to incorporate the land into Richard Grove State Park and manage the land under plans approved for the park.

Heritage Fund Grants

The source of Heritage Fund monies is the Arizona State Lottery. The funds are administered through the Arizona State Parks Board Heritage Fund for its Trails, LSRP (Local, Regional and State Parks), and Historic Preservation programs. LSRP funding is up to $3.5 million annually to support land acquisition and development of facilities for outdoor recreation improvements in Arizona. The Historic Preservation program provides up to $1.7 million annually to support historic preservation efforts, including rehabilitation of historic properties and preservation education. Trails funding amounts up to $475,000 annually to support trail acquisition and improvements in Arizona.

The Nature Conservancy

The Nature Conservancy is a national organization with a chapter in Arizona. The mission of the non-profit group is to preserve ecologically important resources throughout the United States. In Arizona, the group has purchased and manages natural resource areas in Ramsey Canyon, Aravaipa Canyon, and the San Rafael Conservation Project, to name just a few. Throughout the United States, the Nature Conservancy has completed over 19,700 real estate transactions protecting over 10,000,000 acres of habitat in the United States.

The Trust for Public Lands (TPL)

Founded in 1972, the Trust for Public Land is the only national nonprofit group working exclusively to protect land for human enjoyment and well-being. TPL helps conserve land for recreation and

spiritual nourishment and to improve the quality of life of American communities. TPS's legal and real estate specialists work with landowners, government agencies, and community groups to:

- Create urban parks, gardens, greenways, and riverways
- Build livable communities by setting aside open space in the path of growth
- Conserve land for watershed protection, scenic beauty, and close-to-home recreation
- Safeguard the character of communities by preserving historic landmarks and landscapes

TPS pioneers new ways to finance parks and open space, promotes the importance of public land, and helps communities establish land-protection goals. TPL believes that connecting people to land deepens the public's appreciation of nature and the commitment to protect it. Since 1972, TPL has help protect more than a million acres in 45 states, from expansive recreation areas, to historic homesteads, to vest-pocket city parks.

Private Land Trusts

Private, non-profit land trusts manage and own environmentally sensitive land all over Arizona and the United States. When governmental budgets do not have enough money to acquire critical tracts of land in a given time frame, land trusts may be able to purchase and hold the property for future government acquisition. In addition to purchasing land in fee simple, land trusts can employ any of a number of other forms of conservation, such as easements and purchase and sellback arrangements, for desert conservation purposes. Nationally, there are over 1,000 land trusts. A good example of a local land trust is the Desert Foothills Land Trust, which has nearly a million dollars and owns 150 acres of land valued at $1.5 million.

Advantages of private land trusts include the fact that they can often be good partners in wildlife habitat protection and desert conservation because they can work effectively with private landowners. This is true, in part, because the involvement of a land trust often creates possibilities for tax incentives through land donations and bargain sales and, in part, because landowners may be wary of working with the government. Weaknesses include the fact that land trust objectives may change over time and may not coincide with those of the local government.

The Land and Water Conservation Fund (U.S. Fish and Wildlife Service)

The U.S. Fish and Wildlife Service acquires lands and/or interests in lands, such as easements or leases, consistent with legislation or other Congressional guidelines and Executive Orders, for the conservation of fish, wildlife, and plants and their habitats and to provide wildlife-dependent public use for educational and recreational purposes. The Service land protection policy is to acquire land only when other protective means (e.g., zoning or regulation to achieve program goals) are not appropriate, available or effective.

Arizona Game and Fish Department (Heritage Funds)

Eligible applicants include the federal government or any federal department or agency, Indian tribe, the state and its departments, agencies, boards and commission, counties, school districts, cities, towns, all municipal corporations, and any other political subdivisions in Arizona. Funds are available for environmental education, schoolyard grants, IIPAM (Identification, Inventory, Acquisition, Protection and Management of Sensitive Species and Habitats), Urban Wildlife and Urban Wildlife Habitat, and public access.

Donations

For some landowners, the charitable donation of land to a public entity or a non-profit land trust is attractive for tax, family, and estate planning reasons. Of course, donations can also be in the form of cash for the purpose of land or other property rights for a desert conservation program.

Bonds

General Obligation Bonds

General Obligation Bonds, which are backed by the full faith and credit of the jurisdiction issuing the bonds, may be issued by a municipality or county for any lawful or necessary purpose (A.R.S. 34-451). Each municipality and county has a constitutionally set debt cap, which limits the bond issuance capacity. Prior to issuing general obligation bonds, the municipality or county must receive authorization by a majority vote of qualified electors at an election.

The primary advantage associated with general obligation bonds is the ability to use the bond proceeds for almost any purpose and to spread the benefits and burdens of the funds uniformly throughout the community. The disadvantages are that voter approval is required to authorize the issuance of bonds.

Revenue Bonds

Revenue Bonds are bonds issued by the municipality or county and backed by a dedicated revenue stream. Improvements to existing sewer and water facilities are often made utilizing revenue bonds because there is evidence of a steady stream from the utility users (rates) to attract bond buyers. Revenue bonds are attractive because they do not require voter approval, and the constitutional debt cap does not apply to the issuance of revenue bonds. Municipalities with a population of 75,000 or less may issue revenue bonds for utilities and recreational facilities, which includes swimming pools, parks, playgrounds, municipal golf courses, and ball parks (A.R.S. 9-521,522). However, municipalities with a population greater than 75,000 are limited by state statutes to the issuance of revenue bonds only for utilities.

The advantage to utilizing revenue bonds is that the people who use the facilities pay for the facilities via park entrance fees or other charges. The disadvantages are that only municipalities with a population of 75,000 or less have express authority to utilize revenue bonds to finance recreational facilities, and it may be difficult practically to assess a user fee for open space recreation areas in order to back the revenue bonds.

Municipal Property Corporations

A so-called 63-20 Municipal Property Corporation (named after the IRS Ruling Number 63-20) is a non-profit corporation, the obligations of which are treated as issued on behalf of a political subdivision. The advantages of such an entity are two-fold. Bonds issued by the corporation do not have to be voted on by the people, and the bonds are not considered "debt" for purposes of the debt limitations set by statute for counties. To ensure that the corporation complies with the requirements of the revenue ruling and that the bonds maintain their tax-exempt status, several requirements must be met:

- The corporation must engage in activities that are essentially "public" in nature
- The corporation may not be one organized for profit (except to the extent of retiring indebtedness)
- The corporate income must not inure to any private person
- The political subdivision must have a beneficial interest in the corporation while the indebtedness remains outstanding and it must obtain full legal title to the property of the corporation with respect to which the indebtedness was incurred upon the retirement of such indebtedness
- The corporation and the specific obligations issued by the corporation must have been approved of by the political subdivision.

The disadvantage of using a Municipal Property Corporation for open space recreation areas is that it may be difficult to ensure that the open space areas will generate a steady revenue stream to back the bonds.

Certificates of Participation (COPs)

Under this method of financing, private parties purchase COPs, which are the equivalent of tax exempt bonds, and which represent an ownership interest in property belonging to a local government. The property is then leased back to the local government, which makes "lease" payments to the COP holders to cover the bond program.

The advantage to this financing mechanism is that the local government receives cash up front from the sale of the COPs which may be used for other purposes, such as open space recreation improvements. The disadvantages are that the transaction costs are substantial, the local government must come up with an annual stream of revenue to pay to the COP holders, and the COPs may be difficult to sell if the property is not seen as essential to the local government (which could choose to default on its lease payments if the property was not essential to the local government).

Taxes

Property Tax

A property tax is a tax levied on land and improvements on a specific parcel of land. For many communities, it is their primary source of revenue. There are, however, some communities in the metropolitan area which do not impose a property tax, relying instead on a number of other funding mechanisms. Under Arizona statutes, there are several options relating to the tax levy. These options are explained below.

Increased Property Tax Within Levy Limit

Local governments may levy a property tax which is a percentage of the fair market value of property. The burden of the tax is greater on higher valued property. Local governments may levy taxes without a vote of the people so long as the tax does not exceed the levy limit established for local governments by the Arizona Constitution and state statutes.

The advantages of using an increased property tax (within the limits) to fund open space recreation areas are that no election is required and, if used by the city, the burden of funding open space recreation areas would be equitably spread over all benefited property owners within the community.

There are several difficulties associated with using a city-wide increase in property taxes to fund desert conservation. First, there is always voter resistance to raising the property tax rate. Second, the City of Peoria is close to its levy limit. Third, even if the property tax is increased, funds are still subject to appropriation for other public uses and it is unclear whether the city can commit to set aside a portion of the tax rate for open space recreation areas without establishing a new tax.

Probably the best example of this conservation technique is the City of Scottsdale's imposition of a 0.2 percent sales tax in 1995 for the sole purpose of acquiring land for the McDowell Mountain Sonoran Preserve. The latest vote on the issue occurred in 1998 when voters, by more than a 2-1 margin, voted to purchase an additional 19,000 acres, mostly north of the existing McDowell Sonoran Preserve.

As another example, in early February, the Cave Creek Town Council unanimously adopted a one-half percent sales tax increase for the purpose of providing $350,000 annually to be applied for the purchase and preservation of Spur Cross Ranch.

New Property Tax or Over Levy Limit

Municipalities do not have statutory authority to increase property taxes over the levy limit. Cities may levy primary property taxes to fund maintenance and operation of municipal government services. Primary property taxes may not exceed the municipality's levy limit. Costs associated with public infrastructure funding are funded by secondary property taxes, which are levied back to general obligation bonds issued by a municipality. Secondary property taxes are not subject to the levy limit. However, the municipality may not issue general obligation bonds in excess of its constitutionally set debt cap. Thus, while municipalities may not set a primary property tax or create

a new property tax over its levy limit, it can, once it receives voter authorization to issue general obligation bonds, levy property taxes that are not subject to the levy limit as necessary to cover the bond obligations.

Transaction Privilege (Sales) Tax

As the Arizona Department of Revenue notes, the Arizona transaction privilege tax is commonly referred to as a sales tax, however, the tax is on the privilege of doing business in Arizona and is not a true sales tax. Aside from the state tax rate, a municipality may impose a transaction privilege or sales tax within its jurisdiction to fund the costs of the desert conservation plan. Counties may not impose a county-wide transaction privilege without legislative authorization. Like an increased property tax, a transaction privilege tax would provide a secure funding source and spread the burden equally among all residents.

Specialty Industry Tax

Specialty Industry taxes have been used to fund the stadium district (rental car tax) and tourism (hotel bed tax). Cities do not need legislative authorization or voter approval to enact a specialty industry tax, while counties must have legislative authorization.

The advantage to a specialty industry tax are that the local residents do not pay the tax, a vote of the people is not required.

Excise Tax

Any kind of tax which is not directly on property or the rents or incomes of real estate. It is imposed directly and without assessment and is measured by the amount of business done, income received, etc. Excise taxes are commonly used by counties to support and enhance county services. Mohave and Pima counties are the only Arizona counties that do not have county excise taxes. County excise taxes apply to any transactions that are subject to the state's transaction privilege tax.

Improvement Districts

While counties may form an improvement district to establish and maintain a park or recreational area for the benefit of the property within the district, the statutory list of improvements financed and constructed by a municipal improvement district does not include recreational facilities.

Fees

Development (Impact) Fees

Municipalities and counties may impose development fees on landowners in a "benefit area" to pay for a proportionate share of the public facilities required to serve a development. The county development fee statute defines public facilities to include only neighborhood parks intended to serve development within a one-half mile radius, but excludes regional parks. The statue applicable to municipalities allows development fees to be assess for necessary public services, which has been interpreted to include parks and open space areas. A "benefit area" is a geographic area in which

public facilities are of direct benefit to development within the area. Courts typically apply a "rational nexus test" when evaluating the constitutionality of development fees. For a development fee to be imposed, three standards must be met:

- There must be a reasonable relationship between the cost of the public facilities for which the development fee is assessed and the service demands of the benefit area

- The development fees assessed must not exceed a proportionate share of the costs incurred or to be incurred in providing a public facility

- Development fees must be used and expended for the benefit of the area that pays the development fee.

Due to these requirements, and because development fees are assessed at the time of issuance of building permits, the open space or park planned is not located near any proposed development (e.g., if the community already exists), then development fees will not be a viable mechanism to fund open space acquisition and maintenance because no fees will be collected. In addition, even in a growth area, the new development only has to pay its fair share. If other inside or outside the area will make use of the facilities, then the development does not have to pay more than its proportionate share. The development fee option probably is not viable for use by a county because the open space recreation areas would not be considered "neighborhood parks that serve development within a one-half mile radius." But each municipality could establish a development fee program for their growth areas.

User Fees

User fees are assessed for the specific use of a service or activity. An example is a fee charged for admission to a state or county park. Another example is a toll assessed for using a bridge or roadway. A user fee can be employed to defray a portion or the entire cost of a project. The advantage of a user fee is that the charge is incurred by the person using the specific service.

Preferential Tax Treatment

One of the most important forms of preferential taxation is current use assessments. Local governments levy real property taxes against the assessed value of property. Under standard practice, tax assessors determine value based upon the "highest and best use" of a property, which reflects the highest potential use of a property. Current use assessments alter assessment practices by requiring assessments to reflect actual current uses rather than prospective potential uses. Where development pressures create higher property values and tax burdens, current use assessments provide tax relief to landowners who choose to continue agricultural, forestry, rangeland, or other low-density uses that are consistent with continued habitat value.

Restrictive Covenants

A restrictive covenant is a promise existing as part of an agreement restricting the use of real property or the kind of buildings that may be erected on a property. In order for a grantor to enforce the covenant against remote grantees (subsequent owners who take title from the first grantee), the covenant must "run with the land."

Advantages include long term preservation of open space and no public sector hard costs. Weaknesses include difficulty in implementation either voluntary or with state power and enforcing the provisions of the restrictions if they are violated. Enforcement is left in the hands of private property owners or homeowner's associations, with little, if any input from the local government.

Development Agreements

Development Agreements are permitted under A.R.S. 9-500.5, and permit a municipality to enter into an agreement with a private property owner to regulate the permitted uses, density, maximum height, and other aspects of the land subject to the agreement. More specifically, state statutes enable a municipality to enter into an development agreement containing "provisions for reservation or dedication of land for public purposes and provisions to protect environmentally sensitive lands" and for the preservation and restoration of historic structures.

Advantages of development agreements is that they are voluntary and, therefore, mutually-agreeable to all parties involved in the negotiations. Also, they can enable municipalities to attain desert conservation goals at minimal, or no, costs. Another strength is that, coupled with annexation, they can be used for land outside of the incorporated area of a municipality. Weaknesses include the fact that the agreements are voluntary, so if a landowner does not want to promote desert conservation, there is no compulsion to enter into an agreement.

Intergovernmental Agreements (IGA's)

As is typically the case, the boundaries of watersheds, wildlife habitat areas, mountain ranges, and other natural resources rarely are coterminous with the boundaries of a single governmental entity. Effective conservation management will therefore often require the collaboration of two or more units of government. Intergovernmental Agreements are agreement between two or more governmental entities agreeing to a specified course of action.

In the realm of desert conservation, the City of Boulder, Colorado and Boulder County have used an intergovernmental agreement to preserve open spaces around the city. One of the key aspects of the agreement provided that new development would occur only in those areas where the city and county agreed to provide urban services. This application of capital improvement policies in a regional intergovernmental agreement has effectively preserved open space, including strategic vistas, recreational areas, and entrance corridors around the City of Boulder while directing urban development to the urbanized core of the city.

An advantage of IGA's is that they can provide an alternative to state-authorized regional planning commissions, where two or more jurisdictions create their own planning frameworks rather than relying upon the framework created in state enabling statutes. Also, since intergovernmental agreements are negotiated voluntarily, participating local governments do not feel coerced into participating. In negotiating IGA's, officials of constituent localities establish a working relationship that may help address a variety of other public policy issues. One disadvantage of IGAs is that they sometimes do not have effective enforcement mechanisms. Furthermore, local governments are often reluctant to agree to the inclusion of specific enforcement tools that could be used against them and are also reluctant to use the courts to try to enforce the contract against another signatory government.

Annexation Policies

Annexation is a process governed by state law, which enables municipalities to expand their boundaries to include adjacent lands. In Arizona, annexation is permissible only if sanctioned by a majority of the landowners in the property proposed for annexation, or by the owners of more than 50 percent of the total assessed value in the area proposed to be annexed. Developers will often seek annexation as a mechanism to obtain urban services provided by municipalities, such as water and wastewater treatment. From a desert conservation perspective, annexation can promote the goals of this plan by enabling the City of Peoria to place its standards and policies on an area that might otherwise be outside of its control and which might have no standards for desert conservation.

An advantage of annexing an area into Peoria is that it enables the community to have planning, zoning and subdivision authority over an area outside of its jurisdiction. A weakness of this approach is that it is often difficult to obtain the consensus of a majority of property owners in the area proposed for annexation. Also, without a coordinated approach to annexation, adjacent communities may engage in a competitive "land rush" to obtain areas for economic development purposes, as opposed to desert conservation purposes.

Enhanced Notification

Regular notification is the solicitation of public comment on the sale or development of a specified property which has open space value. Enhanced notification is an official component of the Maricopa Association of Government's review process. Under this doctrine, comments should be solicited from affected jurisdictions within a specified distance from a proposed project or development proposal.

Advantages include the potential to mesh with MAG's existing general plan review process. One weaknesses is that, due to heavy workloads or other reasons, affected jurisdictions may not have the capability to comment on all referrals. Another weakness is the lack of an enforcement mechanism if public or agency comment is opposed to the particular development.

Resource Inventories

This technique includes preparing inventory programs that identify critical environmental and wildlife resources. These inventories can be invaluable in educating the public, local governments, and landowners about where development should and should not occur. The private sector has also been active in producing inventories and developers are often asked to produce baseline natural resource information as part of the development review process. This information should be integrated into the community overall resource inventory database.

A strength of this tool is that it enables a community and developers to identify environmentally sensitive areas and, hopefully, steer development clear of these areas. Weaknesses include the time and cost of obtaining this information and problems associated with precisely identifying the locations of these areas down to the development scale level.

Federal Land Management

Protect open space on federal lands through open space compatible land designation including wilderness, wild and scenic rivers designation or areas of critical environmental concern. Federal land management plans would include protection of open space through compatible land uses in areas of high wildlife or open space value.

Mitigation

This process requires enhancement or creation of open space and environmental features in exchange for subdivision authority. Strengths include no public sector hard costs. Weaknesses include the potential for disconnected open space and possible legal challenges regarding takings.

Industrial Restoration Showcase Projects

The rise in environmental litigation backed by serious penalties under federal environmental protection laws has caught the attention of many large industrial companies and utilities. Some of these organizations are now implementing expensive reclamation and restoration projects. The creation of new, high-quality habitat is a win-win solution to a cleanup problem, since it also allows the industry to create a reuse that does not require clean up of the land to standards acceptable for human occupation. Strengths of this approach is that there are minimal or no public costs involved and environmentally degredated areas are remediated. Weaknesses include clean ups which are not as complete as would be required for human habitation and the bureaucratic costs associated with enforcement which is often the key triggering mechanism to get many companies “off the dime” and into remediation.

Endangered Species Act

Protecting endangered and threatened species and restoring them to a secure status in the wild is the primary objective of the endangered species program of the U.S. Fish and Wildlife Service, and agency of the U.S. Department of the Interior. Responsibilities of the endangered species program include the following:

- Listing, reclassifying, and de-listing species under the Endangered Species Act
- Providing biological opinions to Federal agencies on their activities that may affect listed species
- Overseeing recovery activities for listed species
- Providing for the protection of important habitat
- Providing grants to States to assist with their endangered species conservation efforts

Strengths of this approach include evoking stringent environmental protection and land use planning measures which ensure the preservation of habitat. Weaknesses include connotations associated with the Act, which has had significant economic implications for several communities around the United States. Adding another layer of regulation, particularly when imposed by the federal government, automatically triggers negative responses from some citizens.

Education

In most opinion polls, residents indicate that the quality of life in the Valley is very good, particularly in comparison with the rest of the country. However, most of these same residents believe that the quality of life will diminish in the future, in large part because of rampant growth and the loss of the Sonoran Desert environment. In many respects, the beneficiaries of a comprehensive desert conservation program are the children who will inherit either the benefits or the costs of current actions or inactions. One of the ways to ensure that a strong desert conservation legacy will be supported in the future is to inculcate in current students the value of the natural environment and its wildlife. There many programs that can assist in this undertaking. A few of the more noteworthy are listed below.

The National Wildlife Federation

The mission of the National Wildlife Federation (NWF) is to focus its efforts on five core issue areas: endangered habitat, water quality, land stewardship, wetlands, and sustainable communities. Within this framework, education is central to the National Wildlife Federation's mission. The NWF offer environmental education programs in communities, in the outdoors, and in the classroom.

- Community Based Education

  Backyard Wildlife Habitat: This program aid and encourages landscaping with the needs of wildlife and the health of the environment in mind. Through this program, the NWF has certified over 20,000 properties worldwide. Building on the program's success,

NWF's Schoolyard Habitats and Workplace Habitats programs create wildlife habitat learning places, respectively, at educational institutions and corporate locations throughout the United States.

Campus Ecology: This program provides factual resources, organizing tools, and one-on-one consultation to students, faculty, and administrators to facilitate the establishment and maintenance of campus-based conservation projects and help develop the next generation of conservation leaders.

- Outdoor Education

Youth and Teen Programs: Offer youngsters and teens the chance to study nature, learn outdoor skills, and gain environmental knowledge under the auspices of the nation's leading conservation education organization.

Nature Link Program: Increases public awareness and appreciation of the outdoors by bringing families together for weekend excursions centered around conservation education and hands-on outdoor activities.

Conservation Summits: They are the NWF's premier outdoor adventure and education experience. Families, friends, and people of all ages can immerse themselves into the culture and environment of each unique and intriguing destination through field trips, classes, special presentations, and daily youth programs.

- Classroom Education

Animals Tracks: This program offers on-line and printed conservation education materials geared for elementary and middle schools to assist teachers in instructing children about the environment and its care.

National Wildlife Week: This program brings free conservation curriculum materials to more than 620,000 teachers who reach more than 20 million students.

One example of a Schoolyard Habitat program is the Helen Keeling Elementary School in Tucson, Arizona. To create a place for children to learn the importance of habitat and a healthy environment for people and wildlife, a team of teachers, students, administrators, volunteers and neighbors converted an unused, grassy area at Helen Keeling Elementary into a certified schoolyard habitat. During the planning, the team learned about the inter-connectedness of the physical and living aspects of habitat and began to build a community commitment to conservation. In planting, young children practice important sharing and helping skills; and in using and maintaining the habitat, students hone math, mapping, spelling, writing, science, and observational skills. The team at Helen Keeling Elementary learned that every stage of a schoolyard habitat project can be fun and educational.

Arizona Games and Fish Department (Heritage Funds)

Eligible applicants include the federal government or any federal department or agency, Native American communities, the State of Arizona, all departments, agencies, boards and commissions of this state, counties, school districts, cities, towns, all municipal corporations, and any other political subdivisions of Arizona. In addition, eligible applicants may sponsor an application through an Inter-Governmental Agreement or a Memorandum of Understanding on behalf of a private or not-for-profit organizations.

Funds available for 1999 Grant Cycle (FY 1999-2000)

Environmental Education	$35,600
Schoolyard Grants	$60,000

Arizona Native Plant Law

A.R.S. 3.903 provides guidelines for the protection of native plants which are included by the Director of the Department of Agriculture on a list of plants in the following categories:

Highly Safeguarded Native Plants – This category includes those species of native plants whose prospects for survival in this state are in jeopardy.

Salvage Restricted Native Plants – Includes those plants subject to a high potential for damage by theft of vandalism.

Export Restricted Plants – Encompasses plants subject to overdepletion if their exportation from Arizona is permitted.

Salvage Assessed Native Plants – Are those plants that have a sufficient value if salvaged to support the cost of salvage tags and seals.

Harvest Restricted Plants – Plants in this category are subject to excessive harvesting or overcutting because of the intrinsic value of their by-products, fiber or woody parts.
Strengths of the law include providing a degree of protection for identified plant species throughout the state. Also, by placing certain plants on the highly safeguarded list, it raises the public's awareness of the importance and the fragility of these plants. Problems with the program include issues relating to the difficulty of enforcement and criticisms with the degree of protection that it actually affords native plants. Under the regulations, plants can still be removed or destroyed on private property.

Arizona Antiquities Act

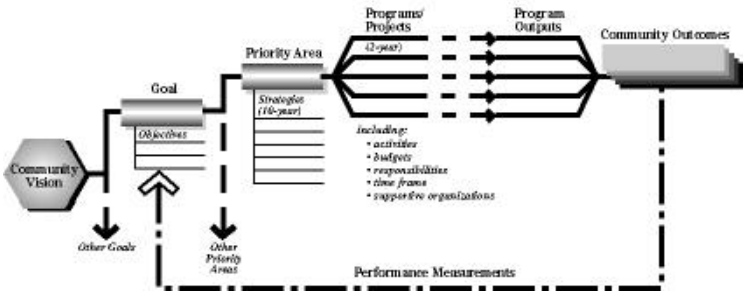
This act relates to the treatment of the land when archaeological remains or Native Indian burial grounds are located on property in the State of Arizona. The Arizona Department of Agriculture is responsible for enforcing the act to preserve and protect evidence of Arizona's cultural heritage. The

Department is also directed to educate the public about cultural resources and to foster an appreciation of ethnic and aesthetic values.

Implementation and Monitoring

Once the desert conservation plan is adopted, along with its policies and programs, it is critically important to ensure that it performs as anticipated. As depicted in Figure 1, which illustrates the implementation planning process for the preparation of a strategic plan in Clark County, Nevada, there are a number of steps in the implementation process. Quite typically, after articulating a community vision, a series of goals are established. The goals are supported by programs which result in community outcomes. A crucial component of the implementation process is to ensure that the community outcomes are harmonious with the community vision and the goals. If there are unanticipated results, or community goals change, programs will need to be modified.

Figure 1
Strategic Planning Process
Southern Nevada Empowerment Zone



A conventional implementation program to monitor the *Peoria Desert Conservation Master Plan* might include an annual report identifying the number of acres developed in the Study Area, the number of acres devoted to open space or protected through a variety of measures. The report might also include an overview of the state of the remaining vegetation and habitat in the Study Area and identify new issues or threats to the implementation of the plan.

Desert Preservation Commission

There are a number of ways to ensure that the *Peoria Desert Conservation Master Plan* is implemented and monitored. The Planning Department can be responsible for monitoring the plan as it relates to the comprehensive general plan. The Parks Department can play a role in terms of assessing the condition and use of open space and recreation areas associated with the desert preservation program. Both the Planning and Zoning Commission and the City Council can play a role in monitoring and implementation. One common technique used to monitor and implement plans is to empower a committee or commission to perform this function. Scottsdale's Sonoran Preserve Commission is a good example of this technique.

One advantage of this approach is that, unlike the City Council or the Planning and Zoning Commission, which are often consumed with a multitude of issues, a Desert Preservation Commission can focus exclusively on this important issue. Also, creating a standing commission enhances the visibility of the issue and gives it importance. A commission can also be used to explore additional implementing techniques and, if the members represent a broad cross-section of the community, it can help facilitate community involvement.

Section Twelve – Desert Conservation Master Plan

The Phase I report, *Data Collection*, culminated with a map identifying sites in the Study Area with no environmental or development constraints. The remaining areas on the map were constrained by springs, hillside and/or sloped areas, and drainage corridors. In terms of size, the five Spring Areas comprise the smallest areas. The Hillside/Sloped Areas and the Drainage Areas appear to be of equal size. The policies and programs developed for the *Desert Lands Conservation Master Plan* should be tailored to the specific needs of these distinct areas. These areas are depicted on the attached map, *Conservation Areas*.

Hillsides and steep slopes were identified as constraints to development in Phase I of the Desert Lands Conservation Master Plan

The Data Collection report also provided information about land ownership in the Study Area. Not surprisingly, a large portion of the Study Area is owned by a relatively small number of individuals or agencies. Much of the land is owned by the government. The Bureau of Land Management has 2,140 acres (5% of the total land area in the Study Area), the Arizona State Land Department has 17,880 acres (38%), and the Bureau of Reclamation has 1,180 acres (3%). Almost 40% of the land (18,320) acres is under private ownership. As is the case for specific geographic features, the policies and programs developed for the *Desert Lands Conservation Master Plan* should be tailored to the specific needs of these distinct areas. Polices and programs for the Arizona State Land Department, which has a mission to sell its land at its highest and best use value, will need to be different than those owned by the Bureau of Land Management, for instance. The different ownership areas are depicted on the attached map, *Land Ownership,* which is shown in Section Four.

Implementation Plan

The Plan to implement the Desert Lands Conservation Plan is detailed in the table at the end of this Section. The table is arranged in a hierarchical fashion, with everything being linked to the goal of the Desert Lands Conservation Plan. Under each objective, a series of programs are identified which will fulfill that objective. Lead and support agencies needed to prepare or administer the program are then identified. The timeframe for implementing the program is shown on a five year scale. The time needed to prepare or start the program is depicted with a diamond-shaped symbol, and the administration time of the program is depicted with a circle. A rough estimate of the budget and other resources needed to implement the program is shown, as is the possibility of leveraging other funds. Finally, anticipated outputs are shown. The following text provides an overview of some of the most important programs listed in the implementation program.

Establish a Peoria Desert Conservation Advisory Committee

The purpose of the Peoria Desert Conservation Advisory Committee would be to provide the City Council and Plan Commission with recommendations and input regarding City actions and incentives to protect desert land resources in the City of Peoria. The Committee would be responsible for monitoring the implementation of the *Desert Lands Conservation Master Plan*.

The committee would be appointed by the City Council and should include broad representation of various interests in the community, such as landowners, developers, attorneys, conservation and environmental groups. The primary functions of the Advisory Committee would be:

- Evaluate open land protection options identified in this plan to determine which techniques would be appropriate to be encouraged or adopted by the City

- Provide policy guidance to the City Planning and Zoning Commission and input from the community regarding specific land protection actions, use of City funds, and potential projects

- Look for grants and other funding sources to help implement the goals and objectives of this plan

- Work with a variety of land protection partners, such as land trusts, state and federal agencies, foundations, and landowners to creatively and efficiently meet land protection objectives

- To prepare an annual report on the "State of Desert Preservation" in the City of Peoria. This would include evaluating the impacts of various desert conservation techniques that have been used to implement this plan. It would also include a yearly status report on the number of acres developed, as well as the number of acres protected in the Study Area. The Committee could also host an annual award ceremony honoring schools, businesses, and individuals who promoted desert preservation during the year.

Designate State Lands for Purchase under the Arizona Preserve Initiative

Assuming that all environmentally sensitive lands owned by the Arizona Land Department identified in the Phase I Report's Desert Lands Inventory will not be purchased, but will be susceptible to development, the most of important of these lands should be identified and targeted for purchase under the Arizona Preserve Initiative.

Work with Maricopa County and the Bureau of Land Management to Prepare a Conservation Plan for Lands Leased under the Recreation and Public Purposes Act

The City of Peoria should work with and support Maricopa County and its Parks Department in their effort to lease land from the Bureau of Land Management. The City should work closely with the

County to ensure that subsequent uses of the land will complement the goals and objectives articulated in the *City of Peoria Desert Conservation Master Plan*.

Identify Lands for Lease with the Bureau of Land Management under the Recreation and Public Purpose Act

The City of Peoria should identify strategic areas under the jurisdiction of the Bureau of Land Management and work with that agency to prepare a Conservation Plan for the lease of these lands to promote the goals and objectives of this Plan.

Create a Fund for Desert Conservation Education Programs

A citizenry well-educated about the importance of desert conservation is a critical component of a sound desert conservation program. In the short-term, such citizens will support the goals and objectives articulated in this plan and take the necessary actions to ensure its effectuation. In the long-term, particularly when students understand the implications of desert conservation, educational programs will ensure that the future residents and community leaders in Peoria will continue, and maybe even expand upon, the goals and objectives contained in this plan.

Explore the Establishment of a Dedicated Funding Source

In order to make a significant contribution to desert conservation, the City of Peoria should explore the establishment of a dedicated funding source to enable it to purchase land critical to the goals and objectives outlined in this plan. As noted in the text of this document, many communities around the country have increased taxes to fund open space acquisition and maintenance programs. The Town of Cave Creek and the City of Scottsdale are two local communities that have recently raised taxes to fund the acquisition and preservation of critically important desert lands in their communities. In his State of the City address in 1999, Mayor Skip Rimzsa indicated that nothing would get more attention this year than the Sonoran Valley Preserve, which will entail the purchase of 15,000 acres of State Trust Land. Other communities have earmarked impact fees for the acquisition of active and passive parks in their jurisdictions. These are just two potential funding sources which should be examined.

Add Desert Conservation Elements to the City of Peoria Subdivision Ordinance

As noted, the Peoria Subdivision Regulations contain only a few references to providing open space or park areas for community or neighborhood use. The Regulations can be strengthened in this area, as well as in providing incentives for cluster development.

Add Desert Conservation Elements to the City of Peoria Zoning Ordinance

The Peoria Zoning Ordinance does contain regulations governing development on hillsides. However, a host of other elements can be added to the ordinance to make it more compatible with the goals and objectives of the *Desert Lands Conservation Master Plan*. A partial listing of these elements include:

- Preparing an overlay zoning district for environmentally sensitive areas

- Mandating specific buffer and landscaping standards for land uses adjacent to environmentally sensitive lands
- Adding a Native Plant Section to the ordinance and make it applicable for developments within the Study Area
- Providing incentives, such as density bonuses, for cluster development in the Study Area
- Preparing design guidelines for development in the Study Area

Add a Desert Conservation/Open Space Element to the City of Peoria General Plan in Compliance with the Growing Smarter Legislation and in Conjunction with an Overall Update of the Plan

As noted in the text, to be successful, a desert conservation plan should be comprehensive and work in harmony with other land use development plans and ordinances. Foremost among these is the community's general plan. Given recent changes in Arizona's enabling legislation for comprehensive planning, and given the focus on desert conservation, not only in the Study Area, but throughout the community, the City should undertake a complete update of its General Plan. Appropriate land use designations can be made regarding the amount and location of open space areas throughout the Study Area and incorporated into the General Plan. Additionally, development densities compatible with the objectives of the desert conservation plan can be added to the General Plan's Land Use Map. The goals, objectives, policies, and programs in the *Desert Lands Conservation Master Plan* can be added to the *Peoria Comprehensive General Plan* and an Open Space element can be added to the Plan in accordance with the new state legislation.

City of Peoria Desert Lands Conservation Master Plan – Implementation Program

Goal1: Maintain the vitality of the unique Sonoran Desert environment by providing high quality passive and active open space areas, while encouraging development that is sustainable and supportive of that environment

Objective 1.1 – Increase Public Awareness (Increase public awareness of the importance of desert conservation)

Program	Lead agency	Support agency	Timeframe – Years					Budget/ Resources	Leverage other Funds?	Outputs
			1	2	3	4	5			
Establish a Desert Conservation Commission	Mayor & City Council	City Staff	♦	•	•	•	•	Staff & Volunteer time	Y	Commission Established
Create Fund for Desert Conservation Education	Mayor & City Council	City Staff	♦	•	•	•	•	$15,000 per Year	Y	Fund Created and Funds Dispersed
Annual Conference: State of the Desert Overview; Awards; Sharing ideas, concerns, etc.	City of Peoria; Desert Conservation Commission	Private Sector Sponsorship; City Staff	♦	•	•	•	•	Corporate Sponsorships & Volunteer Time	Y	Conference Conducted; Awards Presented; Ideas Exchanged; etc.
Create New Staff Position Desert Conservation Planner	Mayor & City Council	City Staff	♦	•	•	•	•	$45,000 per Year	N/A	Staff Position Created; Grants applied for; etc.

Notes:

- ♦ Implementation/Start-Up of Program
- • Administration/Continuation of Program

City of Peoria Desert Lands Conservation Master Plan – Implementation Program (Continued)

Objective 1.2 – Coordination (Coordinate desert conservation goals, objectives, policies, and programs with other land use codes, jurisdictions, agencies, and private interest groups)

Program	Lead agency	Support agency	Timeframe – Years					Budget/ Resources	Leverage other Funds?	Outputs
			1	2	3	4	5			
Adopt Desert Conservation Plan as an Area Plan to the Peoria General Plan	Mayor & City Council	City Staff & the Planning & Zoning Commission	♦					Staff Time	N/A	Desert Conservation Area Plan Adopted
Add Desert Conservation Elements to the General Plan (As Part of Open Space Element)	Mayor & City Council	City Staff & the Planning & Zoning Commission	♦	♦				Staff Time	N/A	General Plan Amended & in Conformance with ARS
Prepare and Adopt Annual Budget to Implement the Objectives of the Desert Conservation Plan	Mayor & City Council	City Staff	♦	•	•	•	•	Staff Time $$$$$$$$	N/A	Budget Provides Funding to Implement the Desert Conservation Plan
Prepare and adopt annual Capital Improvements Program in conformance with the Desert Conservation Plan	Mayor & City Council	Staff Departments	♦	•	•	•	•	Staff Time	N/A	Annual CIP Adopted in Support to Desert Conservation Goal and Objectives
Revise Zoning Ordinance to Conform to the Plan	Mayor & City Council	City Staff; Planning & Zoning Commission	♦	♦	•	•	•	Staff Time	N/A	Zoning Ordinance Updated
Revise the Subdivision Ordinance to Conform to the Plan	Mayor & City Council	City Staff; Planning & Zoning Commission	♦	♦	•	•	•	Staff Time	N/A	Subdivision Ordinance Updated

Objective 1.3 – Promote Large Areas (Promote the establishment of large, intact areas of native vegetation by preventing fragmentation of those areas by development)										
Program	**Lead Agency**	**Support Agency**	**Timeframe – Years**					**Budget/ Resources**	**Leverage Other Funds?**	**Outputs**
			1	**2**	**3**	**4**	**5**			
Designate Land for Arizona Preserve Initiative	Mayor & City Council	Arizona State Land Department; City Staff	♦					Staff Time	Y	Application Filed with ASLD
Work with Maricopa County on the RPP Act	Maricopa County & the Bureau of Land Management	City Staff	♦					Staff Time	N/A	Lease Acquired for Maricopa County
Explore Establishing a Dedicated Funding Source	Mayor & City Council; Desert Conservation Commission	Planning and Zoning Commission & City Staff	♦	♦				Volunteer & Staff Time	N/A	Recommendations to Mayor and Council
Create a Transfer or Purchase of Development Rights Program	Planning & Zoning Commission	City Staff	♦	♦				Staff Time	N/A	Zoning Ordinance Amended
Provide Cluster Development Incentives in the Zoning Ordinance	Planning & Zoning Commission	City Staff	♦	♦				Staff Time	N/A	Zoning Ordinance Amended
Objective 1.4 – Integration with Existing and Future Open Space (Create a meaningful open space network throughout the Study Area which is connected to existing and future open space)										
Revise the Zoning Ordinance to Provide Incentives/Mandates to Connect with Existing Open Space	Planning & Zoning Commission	City Staff	♦	♦	•	•	•	Staff Time	N/A	Subdivision Ordinance Revised
Amend the Trails Plan to Link Existing and Proposed Open Space	Planning & Zoning Commission; Parks Department	City Staff; Community Hiking/Biking Clubs	♦	•	•	•	•	Staff Time	N/A	Trails Plan Prepared
Enhanced Review: IGA requiring mutual review of developments adjacent to open space areas on the Desert Conservation Land Use Map	Mayors & City Councils of Adjacent Jurisdictions	City Staffs	♦	•	•	•	•	Staff Time	N/A	Joint Review of Critical Projects in Sensitive Areas

City of Peoria Desert Lands Conservation Master Plan – Implementation Program

Program	Lead agency	Support agency	Timeframe – Years					Budget/ Resources	Leverage other Funds	Outputs
			1	2	3	4	5			
Objective 1.5 – Buffers (Maintain appropriate or sufficient buffers between areas dominated by human activities and environmentally sensitive areas. Open space corridors or buffers must be at least 25 feet wide.)										
Acquire Environmentally Sensitive Lands (ESLs)	Mayor & City Council	Citizens; Public & Private Agencies (Grants); Private Citizen Donations & Dedications	♦	•	•	•	•	Staff Time $$$$$$$	Y	Environmentally Sensitive Lands Acquired
Create Overlay Zoning District for ESLs (with Enhanced Buffer Requirements)	Planning Commission	City Staff and the Planning and Zoning Commission	♦	♦	•	•	•	Staff Time	N/A	Overlay District Created; Buffers Established
Require Provision of Natural Area Open Space Areas (NAOS)	Mayor and City Council	City Staff and the Planning and Zoning Commission	♦	♦	•	•	•	Staff Time	N/A	NAOS Areas Established
Add Desert Conservation Elements to the Zoning Ordinance	Mayor and City Council	City Staff and the Planning and Zoning Commission	♦	♦	•	•	•	Staff Time	N/A	Ordinance Amended; Buffers Established
Objective 1.6 – Preserve Natural Features (Preserve features of the natural local landscape in developed areas)										
Require Development Envelopes to Reduce Damage to Vegetation	Planning Commission	City Staff	♦	•	•	•	•	Staff Time	N/A	Subdivision Ordinance Amended
Require Sensitive Construction Techniques (Fences) to Reduce Damage	Planning Commission	City Staff	♦	•	•	•	•	Staff Time	N/A	Subdivision Ordinance Amended
Maintain Washes in a Natural State, Even when Used for Flood Protection	Planning Commission	City Staff; Maricopa County Flood Control District	♦	•	•	•	•	Staff Time	N/A	Washes Maintained as Natural as Possible
Adopt Native Plant Ordinance	Planning Commission	City Staff	♦	•	•	•	•	Staff Time	N/A	Zoning Ordinance Amended

Objective 1.7 – Protect Environmentally Sensitive Lands

Program	Lead agency	Support agency	Timeframe – Years					Budget/ Resources	Leverage other Funds	Outputs
			1	2	3	4	5			
Identify Important Environmental Features & Place on the Desert Conservation Land Map	Planning Commission	City Staff	♦					Staff Time	Y	Critical Areas Identified
Acquire and Maintain Unique Features	Mayor & City Council	City Staff; Land Trusts; Heritage Funds; Citizens		•	•	•	•	$$$$$; Staff Time	N/A	Critical Areas Acquired & Protected
Acquire and Maintain Spring Areas	Mayor & City Council	City Staff; Land Trusts; Heritage Funds; Citizens		•	•	•	•	$$$$$; Staff Time	N/A	Critical Areas Acquired & Protected
Use Development Ordinances to Discourage Development in these Areas	Planning Commission	City Staff; Homeowners Associations	♦	•	•	•	•	Staff Time	N/A	Subdivision Ordinance Amended
Require Habitat Assessments for Developments in ESLs	Planning Commission	Staff Time	♦	•	•	•	•	Staff Time	N/A	Habitat Assessment Standard Adopted
Require Landscape Assessment & Plan for ESLs	Planning Commission	Staff Time	♦	•	•	•	•	Staff Time	N/A	Landscape Standard Adopted
Obtain Conservation Easements	Planning Commission	City Staff; Developers	♦	•	•	•	•	Staff Time	N/A	Conservation Easements Obtained

City of Peoria Desert Lands Conservation Master Plan – Implementation Program

Program	Lead agency	Support agency	Timeframe – Years					Budget/ Resources	Leverage other Funds	Outputs
			1	2	3	4	5			
Objective 1.8 – Maintain Connections (Maintain connections among wildlife habitats by identifying and protecting corridors for movement)										
Identify Key Linkages & Put on Desert Conservation Land Map	Planning Commission	City Staff	♦					Staff Time	N/A	Map Prepared and Adopted as Part of Desert Conservation Plan/General Plan
Acquire Key Linkages When Development Occurs	Mayor & City Council	Staff Time; Developers; Parks Department	♦	•	•	•	•	Staff Time	$$$$$	Critical Linkages Acquired
Obtain Access Easements	Planning Commission	Staff Time	♦	•	•	•	•	Staff Time $$$$$$$$	N/A	Access Easements Acquired
Require Dedications for PUDs	Planning Commission	Staff Time	♦	•	•	•	•	Staff Time	N/A	Key Linkages Dedicated to City
Objective 1.9 – Balance Recreational and Habitat Needs (Balance the opportunity for recreation by the public with the habitat needs of wildlife)										
Establish Wilderness/Habitat Areas	Planning Commission	Staff Time; Parks Department	♦	•	•	•	•	Staff Time $$$$$$$	N/A	Wilderness Areas Established
Education/People Management	Parks Department	City Staff	♦	•	•	•	•	Staff Time	N/A	Natural Areas Protected
Develop Guidelines for Mutual Use	Parks Department	City Staff	♦	•	•	•	•	Staff Time	N/A	Natural Areas Protected
Obtain Conservation Easements	Planning Commission	Staff Time	♦	•	•	•	•	Staff Time	N/A	Conservation Easements Obtained

City of Peoria Desert Lands Conservation Master Plan – Implementation Program (Continued)

Objective 1.10 – Maintain Visually Prominent Qualities (Maintain the natural aesthetic qualities of the areas which are visually prominent or offer unique settings)

Program	Lead agency	Support agency	Timeframe – Years					Budget/ Resources	Leverage other Funds	Outputs
			1	2	3	4	5			
Identify Key Visually Prominent Features	Planning and Zoning Commission	City Staff	♦					Staff Time	N/A	Key Vistas & Viewsheds Identified
Amend Hillside Ordinance to Better Protect Hillsides & Ridgelines	Mayor and City Council	City Staff and the Planning and Zoning Commission	♦	•	•	•	•	Staff Time	N/A	Key Hillsides & Ridgelines Protected
Obtain Conservation Easements	Mayor and City Council	City Staff and the Planning and Zoning Commission	♦	•	•	•	•	Staff Time;	N/A	Key Vistas & Viewsheds Protected

Section Thirteen - Resource Organizations for Desert Conservation Programs

The following is a list of private, state, and federal resource organizations which provide a wide variety of educational and funding services for land conservation throughout the U.S. The list is not exhaustive of all organizations that provide assistance, but is provided as a helpful starting point.

Private Organizations

The Trust for Public Land
Founded in 1972, the Trust for Public Land is a national nonprofit working exclusively to protect land for human enjoyment and well-being. TPL helps conserve land for recreation and spiritual nourishment and to improve the health and quality of life of American communities.
116 New Montgomery Street, 4th Floor
San Francisco, CA 94105
Phone: (415) 495-4014
Fax: (415) 495-4103
Web Site: http://www.tpl.org

National Wildlife Federation
The mission of the National Wildlife Federation is to educate, inspire and assist individuals and organizations of diverse cultures to conserve wildlife and other natural resources and to protect the Earth's environment in order to achieve a peaceful, equitable and sustainable future.
8925 Leesburg Pike
Vienna, VA 22184
Phone: (703) 790-4000
Web Site: http://www.nwf.org/nwf/index.html

The Nature Conservancy
The mission of the Nature Conservancy is to preserve plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive.
4245 North Fairfax Drive, Suite 100
Arlington, VA 22203-1606
Phone: (703) 841-5300
Web Site: http://www.tnc.org

The Sierra Club
The mission of the Sierra Club is to explore, enjoy, and protect the wild places of the earth; practice and promote the responsible use of the earth's ecosystems and resources; educate and enlist humanity to protect and restore the quality of the natural and human environment; and use all lawful means to carry out these objectives.
85 Second Street, Second Floor,
San Francisco CA, 94105-3441
Phone 415-977-5500; Fax 415-977-5799.
Web Site: http://www.sierraclub.org

The Land Trust Alliance

The Land Trust Alliance promotes voluntary land conservation and strengthens the land trust movement by providing the leadership, information, skills and resources land trusts need to conserve land for the benefit of communities and natural systems.

1319 F Street NW, Suite 501
Washington, DC 20004-1106
Phone: (202) 638-4725
Web Site: http://www.lta.org

The Wildlife Habitat Council

The Wildlife Habitat Council is a nonprofit group of corporations, conservation organizations, and individuals dedicated to protecting and enhancing wildlife habitat. Created in 1988, WHC helps large landowners, particularly corporations, manage their unused lands in an ecologically sensitive manner for the benefit of wildlife. More than 550,000 acres in 43 states, Puerto Rico, and eight other countries are managed for wildlife through WHC-assisted projects.

1010 Wayne Avenue, Suite 920
Silver Spring, MD 20910
Phone: (301) 588-8994
Fax: (301) 588-4629
Web Site: http://wildlifehc.org

State of Arizona

Arizona Game and Fish Department

The mission of the Arizona Game and Fish Department is to conserve, enhance, and restore Arizona's diverse wildlife resources and habitats through aggressive protection and management programs, and to provide wildlife resources and safe watercraft and off-highway vehicle recreation for the enjoyment, appreciation, and use by present and future generations.

2221 W. Greenway Road
Phoenix, AZ 85023-4399
Phone: (602) 942-3000
Web Site: http://www.fg.state.az.us

Arizona State Land Department

The mission of the State Land Department is to manage state trust lands and resources to enhance value and optimize economic return for the Trust beneficiaries, consistent with sound stewardship, conservation and business management principles supporting socio-economic goals for citizens here today and generations yet to come. To manage and provide support for resource conservation programs for the well-being of the public and the state's natural environment.

1616 W. Adams Street
Phoenix, AZ 85007
Phone: (602) 542-4621
Web Site: http://www.land.state.az.us

Arizona Advisory Council on Environmental Education
State Land Department
1616 West Adams Street
Phoenix, Arizona 85007
Phone: (602) 542-2854
Fax: (602) 542-4668
Web Site: http://www.land.state.az.us

The AACEE provides three categories of grants:

Regular Grants: Grants of up to $10,000 to support curriculum development, training for educators, developments of balanced materials, field trips, and school based-site or facilities.

Fast Track Grants: Grants of up to $1,000 to support smaller projects, primarily, but not exclusively, field trips.

Class Environmental Research Contest: This competition allows high schools and middle schools to work in teams to select a topic from six environmental issues for 1998-99. These teams then write a balanced environmental research paper. Entries will be judged and the winning entries will receive a field trip/education experience grant of up to $10,000 for Gold awards, $5,000 for Silver awards and $2,500 for Copper awards.

Arizona State Parks Department
The mission statement of the State Parks Department is to manage and conserve Arizona's natural, cultural and recreational resources for the benefit of the people both in our parks and through our partners.
1300 W. Washington Street
Phoenix, AZ 85007
Phone: (602) 542-4174
Fax: (602) 542-4188
Web Site: http://www.pr.state.az.us

Federal Agencies

U.S. Department of the Interior
U.S. Fish and Wildlife Service
The mission of the Fish and Wildlife Service is, working with others, to conserve, protect, and enhance fish and wildlife and their habitats for the continuing benefit of the American people.
Phone: (602) 640-2720
Web Site: http://www.fws.gov

U.S. Department of the Interior
Bureau of Land Management
It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.
Office of Public Affairs
1849 C Street, Room 406-LS
Washington, DC 20240
Phone: (202) 452-5125
Fax: (202) 452-5124
Web Site: http://www.blm.gov

Natural Resource Conservation Service (NRCS)
U.S. Department of Agriculture
The mission of the NRCS is to provide leadership in a partnership effort to help people conserve, improve, and sustain the natural resources and environment.
PO Box 2890
Washington, DC 20013
Phone: (202) 720-2847
Web Site: http://www.nrcs.usda.gov

U.S. Department of the Interior
Bureau of Reclamation
The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.
Phoenix Office
10888 N. 19th Avenue
Phoenix, AZ 85029
Phone: (602) 216-3801
Fax: (602) 216-4003
Web Site: http://usbr.gov/main/index.html

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APPENDICES

APPENDIX A

The Enhancement Value of Open Space Conservation

1.0 Introduction

The conservation ethic is strong and growing in the intermountain west. Clearly, government at all levels recognizes the value of open space conservation, as attested to by the case studies described in Section 2.0 of this report. The financial commitments made by government at all levels clearly underscore the belief that the economic or enhancement value of open space is dramatic. Quality of life and real estate values are enhanced and tax bases strengthened when environmentally sensitive lands are conserved; thus helping to optimize the revenue stream available for the provision of needed public goods and services and the profitability of real estate development.

This Element of Peoria's *Desert Lands Conservation Master Plan* has been prepared by BRW Team member ***Sunregion Associates, Inc.*** with the goal in mind of analyzing the overall impact of open space conservation on real estate values in new development.

The City of Peoria believes intuitively that "....the incorporation of natural area open spaces within new developments provides not only benefits in the form of environmental preservation, habitat protection and recreational and visual benefits to residents but also enhances the type of product to be developed and creates a product which is highly valued by consumers and therefore generates a higher revenue potential to the developer. By establishing rough economic benefit figures highlighting the economic benefit resulting from enhanced protection of the environment, the City is better able to work with the development community to preserve open spaces." (4/7/99 Memorandum from the Community Development Department's Planning Division).

Sunregion has moved to test this hypothesis by preparing the present report. We have approached this objective by addressing the following subjects:

- A brief narrative discussion of public sector case studies relating to conservation initiatives and open space issues;
- A review of the literature on the subject of "enhancement" or location value that attends the conservation of open space; and,
- An extensive north Valley subdivision analysis that focuses on the subject of lot or location premiums that are added to residential real estate transactions, primarily due to the adjacency of open space.

2.0 Public Sector Case Studies

In the material that follows Sunregion has endeavored to briefly summarize some selected examples of open space conservation initiatives and actions that have been instituted by cities and counties in the Phoenix metroplex as well as elsewhere in the intermountain west.

2.1 City of Boulder, Colorado

Boulder's Open Space program was initiated in the late nineteenth century when, in 1898, the City purchased Chautauqua Park at the foot of Flagstaff Mountain. Over 25,000 acres of land have been preserved and protected since 1967.

At that time Boulder became the first city in the country to enact a sales tax (.40%) for the acquisition and management of open space lands. In 1989 an additional .33% was approved by voters. Through sales tax revenues, bond issues, private donations and development dedications, nearly $100 million dollars have been spent on the acquisition of open space.

Section 176 of the City's Open Space Charter deals specifically with open-space purposes/open-space land and provides that open space land shall be acquired, maintained, preserved, retained, and used only for the following purposes:

- Preservation or restoration of natural areas characterized by or including terrain, geologic formations, flora, or fauna that is unusual, spectacular, historically important, scientifically valuable, or unique, or that represent outstanding or rare examples of native species;

- Preservation of water resources in their natural or traditional state, scenic areas or vistas, wildlife habitats, or fragile ecosystems;

- Preservation of land for passive recreation use, such as hiking, photography or nature studies, and if specifically designated, bicycling, horseback riding, or fishing;

- Preservation of agricultural uses and land suitable for agricultural production;

- Utilization of land for shaping the development of the city, limiting urban sprawl and disciplining growth;

- Utilization of non-urban land for spatial definition of urban areas;

- Utilization of land to prevent encroachment on floodplains; and,

- Preservation of land for its aesthetic or passive recreational value and its contribution to the quality of life of the community.

Boulder's open space forms a buffer around the City and a framework within which development occurs in the Boulder Valley. More information is available from the City's Open Space Department, from whom this summary information was received.

2.2 Fort Collins/Larimer County, Colorado

The Fossil Creek Reservoir area of the county is in the path of development as Fort Collins spreads southeast toward I-25. Pressure to develop near the reservoir is beginning to build, and both city and county officials are developing a *new* program using transferable development rights (TDRs) aimed at trying to move development out of growth sensitive areas such as the foothills and the Fort Collins/Loveland corridor into areas such as north Fossil Creek, where higher density development is envisioned.

These TDRs will potentially keep growth out of sensitive environmental areas and buffer zones such as the Loveland/Fort Collins corridor. These public agencies should be able to offer keen, current insights into the structuring of one of these TDR programs; this includes the selection of "sending" and "receiving" areas, and the structuring of the incentives.

2.3 Washoe County, Nevada

This western Nevada county (Reno area) developed a Regional Open Space Plan which may receive funding for open space acquisition via legislation enacted in 1991 by the Nevada Legislature.

The legislation enables Washoe County to solicit voter approval of tax increases to help fund the acquisition and maintenance of open space land. Several options for taxation on the local level were authorized. Before any of these tax increases may be imposed, the Regional Open Space Plan had to be adopted, and citizens must approve any increase during a general or special election. The three authorized types of increases are:

- A sales tax increase of up to ¼ of 1 percent for land acquisition and maintenance. (This type of funding is preferred because it not only provides the resources to acquire the land, but also to maintain it);

- A real estate transfer tax increase of up to 0.1% to be used for land acquisition only; and,

- A real property tax increase of up to one cent on each $100 of assessed valuation to be used for maintenance of open space only.

As a final note, monies raised from these taxes cannot be used for neighborhood or community park facilities, but can be used for undeveloped portions of regional parks.

2.4 Scottsdale

Under the 3-year-old Arizona Preserve Initiative, which provides for the purchase of state land for conservation, the City of Scottsdale is asking for state and federal funds to help pay the estimated $400-$600 million dollar cost of assembling the

16,460-acre McDowell Sonoran Preserve Area (as seen in map on the preceding page, provided by the McDowell Sonoran Land Trust) for open space preservation.

Whether or not the Arizona State Land Department will reclassify some or all of this state trust land for conservation purposes is unknown at this time. However, it is useful to point out that other cities are in line for this funding ahead of Scottsdale. This includes Phoenix' proposed 15,000-acre Sonoran Desert Preserve Area (a triangular area roughly bounded by the CAP Canal, Cave Creek Road, and Carefree Highway on the north), and another 1,600-acre site near Prescott.

Last year, Scottsdale voters agreed to an extension of a 0.2% sales tax, originally slated to buy lands in the McDowell Mountains, to help acquire acreage north of Dixileta Drive. Scottsdale's McDowell Mountain Preserve Commission is preparing a range of funding ideas for preservation measures that will be sent along to the City Council for review.

As part of the City's CityShape 2020 planning process, the City has defined eight "character" areas, three of which are taking shape in the northern most regions of Scottsdale. For example, the Desert Foothills Character Area includes a eight-square-mile region between Lone Mountain and Happy Valley Roads, from the City's western boundary to 96th Street.

2.5 Phoenix

Mayor Rimsza has recently proposed a 0.1% sales tax increase with which to implement major desert preserve and recreation projects (including new regional parks) citywide, the largest of which is the $250 million dollar, 15,000-acre Sonoran Desert Preserve area in the north. The tax would generate an estimated $20 million dollars a year for a decade. It will be voted on in September if approved by the City Council.

Specifically, in September of last year the City of Phoenix submitted an Arizona Preserve Initiative (API) to the Arizona State Land Department. The City's intent is to acquire 14,886 acres of State trust lands in North Phoenix. The land's location, described earlier, also includes some property north of the Carefree Highway.

The API allows the State Land Commissioner, after certain findings are made, to withdraw some or all of the land from sale or lease for three to five years, while financing and management plans are prepared and put into place by the City of Phoenix.

2.5.1 Enhancement Value Study - Still related to open space conservation issues, The City of Phoenix also commissioned a study in 1998, and completed in 1999 that contains interesting findings:

The study, by Ward Brady, Subhrajit Gulhathakurta, Gary Whysong, Jack Gillcrest et. al., was titled "*The Effect of Mountain Preserves on Residential Property Values*," and was prepared for the City of Phoenix Parks, Recreation and Library Department by the School of Planning and Landscape Architecture, College of Architecture and Environmental Design, Arizona State University, March, 1999.

The goal of ASU's study was to determine if a positive correlation could be identified between residential property values and adjacency to open space (mountain parks and preserves). Lands adjacent to South Mountain and the Phoenix Mountains were the focus of this study. The first step was to identify the developed lands adjacent to each preserve with the use of aerial photos. At least one neighborhood adjacent to each preserve was selected for the analysis. The final selection of neighborhoods was based on several criteria, including neighborhood size (the larger the better), uniformity of land use (single family residential vs. mixed uses), and subdivision pattern (parcel size, density, and street configuration).

The study intended to include enough properties so as to develop a statistically valid analysis, and to control as much as possible the variety of factors that affect residential land values.

A multiple regression model was used in the analysis. South Mountain Preserve, the Phoenix Mountain Preserve, and Lookout Mountain formed the study area. The study found that the most important factors affecting property values were the size of the home, age of the home and size of the parcel. In the case of the South Mountain Preserve and Phoenix Mountain Preserve, *values were significantly increased by location close to the preserve*. However, specific dollar values were not provided in the study.

It was determined that there was no positive relationship between residential land values and location close to the Lookout Mountain Preserve. It was noted that further investigation was required to clarify this issue. Sunregion believes the study's findings validate our conclusions based on our data and our subdivision analysis presented in this report.

2.5.2 Stetson Hills PCD - Of particular interest to the City of Peoria may be a recent example of Phoenix' open space conservation efforts highlighted by its zoning negotiations that began in late 1996 with Coventry Development Company. The specific project was Coventry's master plan for the 2,415-acre Stetson Hills PCD on State Trust Land just ½-mile east of Peoria from 35th to 63rd Avenues, Happy Valley to Jomax Roads.

Selected stipulations that relate to open space conservation include:

1./ PCD zoning was to vest in phases to coincide with the State land Department's land disposition auction and completion of required plan elements for each of three phases.

3./ That all land above 15 percent slope contour line (approximately 861 acres) be dedicated to the City of Phoenix at the time of adjacent site plan or subdivision approval. Ludden Mountain shall be dedicated as one parcel at the time of the State Land Department's land disposition auction for Phase III.

4./ That the developer improve the scenic parkway loop through the Deem Hills Recreation Area to the City of Phoenix minimum specifications standards.

3./ That prior to issuance of any building permits for individual buildings within the project, a Master Pedestrian/Bike Circulation Plan shall be submitted and approved by the City's Parks, Recreation and Library Department and Planning Department.

2.6 Tucson

Last year the Tucson City Council approved a proposal to spend $2.5 million dollars to help the Nature Conservancy purchase 71 square miles of land and grazing leases within *Bellota Ranch* for $4.5 million. The ranch is located about 7 miles east of the Tucson city limits.

The acquisition preserves Bellota Ranch as open space and prevents further development in the area. One of the few open-space areas still available for preservation close to Tucson, it links two mountain ranges (the Rincons and the Catalinas) with a natural wildlife corridor. This wildlife corridor stretches from Tucson to the San Pedro River, and 3½ miles of it is within Bellota Ranch.

The Nature Conservancy approached Tucson and the owners of the Tanque Verde Guest Ranch near the western border of Bellota Ranch with a proposal. Subsequent negotiations produced a two-way transaction between Riley West, Inc. (the owner of Bellota Ranch) and the guest ranch, and a three-way purchase involving Riley West, the city and the Nature Conservancy.

Specifically, Riley West agreed to sell 40 acres of land along with Forest Service grazing rights to another 37,000 acres to the Tanque Verde Guest Ranch for $450,000.

The Nature Conservancy then agreed to acquire 10,300 acres of land plus 34,000+ acres in grazing leases from the BLM and the State of Arizona for $4.5 million. The $2.5 million share from the city transfers ownership of 6,828 acres to the city, as well as rights to the federal and state grazing leases.

2.7 Chandler

The City of Chandler is presently preparing an area plan for a 15-square mile area along its far southeast border with the Gila River Indian Community and the Town of Gilbert. The plan, to be completed this summer, stresses low density development and open space conservation.

Of particular interest to Peoria should be Sunregion's recent survey research in connection with this project. A census survey of the planning area's 2,000 households and large landowners received an enthusiastic response when better than one in three surveys were returned. This provided response accuracy of ±5% at the 99% confidence level.

In results that bode well for public support in Peoria for open space conservation, Chandler residents responded in the following manner on some of the open space issues raised in the survey:

- More than 85% felt that rural themes, equestrian developments/trails, a mix of larger and smaller lots with buffers, a system of parks and lakes linked by trails, narrow tree-lined streets, open space, mountain views, and similar features are desirable for southeast Chandler's future.

- More than 58% felt that neighborhoods should be linked to other parts of the community through a regional trail system.

- Residents were asked whether they felt that preservation of a rural or agricultural character in southeast Chandler is desirable and what they felt might be done to protect

this rural lifestyle or character. With an opportunity to provide multiple responses, nearly two-thirds (65.6%) of the respondents suggested lower density with larger lots, and 64.4% supported the preservation of continuous open space and trails.

- And finally, residents were asked this question. If a small property tax increase were to be proposed for the purpose of *purchasing the development rights* on some farmland in the southeast Chandler planning area, and as part of this process create a special district that only permitted agricultural uses, would you be in favor of such a proposal to preserve some farmland? Nearly fifty-two percent (51.8%) said yes. When asked how much they would be willing to have their *taxes raised* in order to pay for farmland preservation, 63.7% of the respondents indicated that they would be willing to pay *at least $26 a year* for this purpose.

3.0 The Literature on the Economic or "Enhancement" Value of Open Space

After an extensive search, including the Internet, Sunregion has found that the literature on this subject is somewhat limited, although a number of different studies have been prepared. We have summarized the findings of some of this research below.

1./ A July, 1974 study by Thomas R. Hammer, Robert E. Coughlin, and Edward T. Horn, IV in the Journal of the American Institute of Planning focused on the effect of a large urban park on real estate values nearby. The study: "The Effect of a Large Urban Park on Real Estate Value" analyzed land values surrounding 1,294-acre Pennypack Park in northeast Philadelphia and found a statistically significant increase in land value based on proximity to the park when controlling for other factors. The park accounted for 33 percent of the land value at 40 feet distance from the park, 9 percent at 1,000 feet, and 4 percent at 2,500 feet. The authors concluded that each acre of park land generated $2,600 in "location rent" or enhancement value.

As noted, this article is based on a study conducted in a selected area within 2,500 feet of the 1,294-acre Pennypack Park in Philadelphia. The objective of the study was to determine whether land values increased as proximity to the park increased. A multiple regression model was utilized in the analysis. A total of 336 houses of similar size and character were identified that had been resold at once since they were constructed. New homes were not included in the analysis because the authors believed that the prices of the homes and land would reflect developer administered prices rather than the actual market value of the land. The research showed a statistically significant rise in land value based on closeness to the park; when allowance is made for the effect of type of house, year of sale, and special characteristics such as location on the corner of a block.

As noted above, the study found that location rent accounts for 33% of the value of land within 40 feet of the park, and 4.2% of the value of land at 2,500 feet. Expressed in dollar value per acre, location rent values ranged from $11,500 per acre within 40 feet of the park, to $1,000 per acre within 2,500 feet of the park (a little less than ½-mile away). The average value of location rent per acre added by the park was $2,600. Therefore, the total location rent/ehancement value/land premium added by the park was $3,364,000 ($2,600 X 1,294 acres).

2./ Another study, "An Economic Analysis of Wetland Protection," was authored by Francis R. Thibodeau and Bart D. Ostro, Department of Economics, Tufts University, and appeared in a 1981 issue of Journal of Environmental Management (Volume 12).

This study was conducted in the Boston area to determine how much the value of land is affected by location adjacent to wetlands. Two approaches were taken. The first approach involved a survey of 15 real estate appraisers and Realtors who operated in towns along the Charles River. The survey indicated that wetlands increased the value of land by a mean value of 17.5 percent. The range was 10-25%.

The second approach involved a process of attempting to quantify the value of a wetland acre. Included in the analysis was the value of the land for flood protection, for pollution control, water supply, and recreation. The aggregate value per acre identified ranged from $153,000 to $190,000 per acre. A figure was not provided for the market value per acre. However, the study noted that the market value for construction ranged from $200-$5,000 per acre. The lower figure for residential construction and the higher for industrial construction.

It was apparent that land values adjacent to a wetland are positively impacted as to price, and that land left in open space is quite valuable in terms of what it contributes to the community not only in terms of views, or natural beauty, but also in terms of such things as water supply/conservation, pollution control, and recreation value.

3./ In another recent study, "The Economic Value of Open Space: A Review and Synthesis," by Charles J. Fausold and Robert J. Lilieholm, The Journal of Environmental Management, Volume 23, March, 1999, pp. 307-320, some valuable additional research is reviewed and synthesized.

As the authors point out, *enhancement value* created by open space, something that intuitively seems so clear and is so often extolled in real estate advertising, is also explicitly recognized in our federal income tax statutes. U.S. Treasury regulation Sec. 14(h)(3)(i) requires that the valuation of a conservation easement take into account any resulting *increase* in the value of *other property* owned by the donor of the easement or a related person. Section 14(h)(4) cites as an example a landowner who owns 10 one-acre lots and donates an easement over eight of them. By perpetually limiting development on the eight lots, the owner ensures that the two remaining one-acre lots will always be bordered by open space, thus increasing their market value.

The authors reference a 1978 article in the journal Land Economics (54[2]) by M.R. Correll, J.H. Lillydahl, and L.D. Singell, titled "The effects of greenbelts on residential property values: Some findings on the political economy of open space." It was found that linear open space had a significant impact on adjacent residential property values. "While controlling for other variables, they found properties adjacent to greenbelts in three (Boulder, Colorado) neighborhoods studied to be worth an average of 32% more than those 3,200 walking feet away."

"The relationship was linear: a $4.20 decrease in the price of residential property for each foot away from the greenbelt." The study found that "...In one of the neighborhoods the aggregate property value was approximately $5.4 million greater than it would have been without the greenbelt, resulting in potential additional annual neighborhood property tax revenue of $500,000."

3./ Brown, T. L., and Nancy A. Connelly, "State Parks and Residential Property Values in New York," Ithaca, N.Y., Department of Natural Resources, Cornell University, 1986.

This 1986 study in New York State found that increases in property value depend on the characteristics of the open space. The study concluded property value increases are highest when the greenway emphasizes open space *as opposed to developed recreational areas*.

4.0 Subdivision Data Analysis

Focusing attention on the "enhancement" value of open space, or, the extent to which adjacent open space enhances the value of developed land nearby, Sunregion has prepared a comprehensive analysis of "location" or lot premiums in new developments in the north Phoenix metroplex. The purpose of this analysis has been to objectively quantify the economic importance of open space and the extent to which it enhances the value of residential lots in master-planned developments and their subdivisions. Sunregion has also included a few golf course projects so as to be able to compare their lot premiums to other types of open space premiums for this analysis.

The proprietary database upon which our analysis is based was specially prepared for Sunregion by *The Meyers Group*. The data, the most current available as of May 1, 1999, is 4th Quarter, 1998 information, and is provided *in its entirety* in the Appendix to this report.

4.1 Study Area

The study area we defined stretches from the Jackrabbit Trail (195th Avenue) alignment in the far West Valley to Scottsdale Road on the east, and from Beardsley Road on the south to the developed edge of the Phoenix metroplex on the north (this includes new master-planned communities such as Del Webb's Anthem project in New River).

Additionally, we have provided information for McDowell Mountain Ranch in Scottsdale which, while out of the study area described above, was selected for analysis because of its scenic location, wide range of housing product, and highly desirable master-planned features.

4.2 Characteristics of Selected Subdivisions

Sunregion has selected a cross section of twenty-nine (29) subdivisions from our database for detailed analysis. These are identified in Table 1 below. Some of these subdivisions are in master-planned communities and some are not. They spread out all across our study area, and there are more than 3,100 planned or developed residential units in these selected subdivisions.

The prices range from $115,000 up to nearly $350,000, and the location premiums range from zero up to $98,500 (Carefree Highlands). The very highest of these lot premiums are for small, single loaded subdivisions in the far north metro area with 1-acre lots and spectacular adjacent mountain views. Lesser premiums, but still in the range of $50,000 are commanded by what are effectively single-loaded golf fairway lots at three of our sample subdivisions in the Desert Ridge master-planned community in northeast Phoenix. At McDowell Mountain Ranch (not specifically in our study area but evaluated nonetheless because of its uniqueness), some of the lot premiums can range up to a quarter-million dollars for 3-acre lots with spectacular adjacent mountain views, but no golf courses.

Sunregion has endeavored to gather together a cross section of subdivisions in Table 1 that are either brand new, or no older than five years. They have a wide range of sales histories.

The subdivision variables that have been included in Table 1 include:

- the name of the community;
- the name of the masterplan if any;
- the name of the project (subdivision);
- the name of the builder;
- total number of units;
- price range of plans;
- square footage range of plans;
- price per square foot range of plans;
- location premium (if any);
- the map code (the Thomas Guide Directory # and map coordinates); and,
- the buyer profile (market niche).

Table 2 provides additional information for these subdivisions. We have identified the *average lot sizes*, calculated the location premiums per square foot, and also calculated the estimated gross revenue generated by these location premiums.

4.3 Findings

4.3.1 Mc Dowell Mountain Ranch - In the case of McDowell Mountain Ranch, at Thompson Peak Parkway and Bell Road in Scottsdale, there are at least thirty developed or planned subdivisions in this master-planned community of 3,200 acres with 4,474 planned units. It includes single-family, patio homes, condominiums, and even two multifamily projects. Sunregion selected two subdivisions for location premium analysis: The Enclave at Cimarron Hills; and, The Villas at 100 Hills. Both of these projects are being built by Geoffrey Edmunds-Toll Development. These projects were selected because they both are directly adjacent to mountain terrain and slopes that will not be developed.

The 68-unit Villas project has been completely absorbed. These lots average 6,600 sq. feet, the units averaged 2,477 sq. feet in size and the prices averaged $265,000; or, $107.21 per sq. foot. The location premiums in this project ranged from zero up to $49,500. There are single- and double-loaded streets in the subdivision which directly affects location premiums, as well as 26 lots with unobstructed views of the mountains. The prime lots on the southern edge of the subdivision are directly adjacent to the mountain open space and washes and have location premiums that average $26,654. The remaining lots have premiums that average $8,298, or *less than one-third* the location premiums associated with the prime view lots.

The 106-unit Enclave project was 60 percent absorbed at the end of the 4th Quarter, 1998. These lots average 9,000 sq. feet, the units averaged 2,945 sq. feet in size and the prices averaged $329,000; or, $112.25 per sq. foot. The location premiums for this project ranged from zero up to $54,500. The 46 prime view lots in the subdivision have location premiums that average $40,717. The remaining lots have premiums that average $6,183, or *barely more than 15 percent* of the location premiums associated with the prime, open space view lots.

4.3.2 The Sample Subdivisions - Sunregion's summary conclusions, drawn from our analysis of the 29 selected subdivisions identified in Tables 1 and 2 below, can be presented as follows:

- The location premiums grow in size as the sampled subdivisions move from west to east across the study area.

- Some large, single-loaded view lots with upscale homes in master-planned communities, or areas with dramatic mountain views enjoy lot premiums that may approach or even exceed those for golf fairway lots. But, typically, golf course location premiums are higher, since they sit on a single- or double-loaded developed greenbelt that must be carefully maintained.

- The economic value of open space can be clearly seen by making comparisons in a number of our sampled projects. For example, at Arrowhead Lakes two subdivisions by Courtland Homes, Crystal Cove and Valley Isle have water-feature location premiums of $20,000 and $10,000 respectively. Not at all unusual. However, in the same master-planned community is another subdivision, by Regal Homes, The Estates (project #7./ in Table 1), with the same water features, but something else as well; the homes are directly adjacent to the mountains in Thunderbird Park and the views that attend that location. The location premiums in this subdivision are $35,000.

- Another example can be found in several new subdivisions just west of the Stetson Hills PCD in far northwest Phoenix, and just a half-mile east of Peoria. In the Entrada master-planned community, those subdivisions that are ¼ to ½-mile removed from the base of Ludden Mountain (projects 1./ and 3./ in Table 1) have no location premiums. On the other hand, the Ladera and Monarch at Entrada projects (#2./ and #4./ in Table 1) have location premiums of $4,500 and $10,000 respectively. They are directly adjacent to Ludden Mountain, with unimpaired views at the base of the mountain.

- At Del Webb's new Anthem project in New River, we see that the highest location premiums (for those subdivisions that are under development so far) can be found at the Anthem Country Club 1 master plan, in the Expedition project (#8./ in Table 1). This golf course project has the added advantage of being on the northern edge of Anthem, with unobstructed views on single-loaded streets of the natural terrain to the north.

- At Pulte's Horizons project at Scarlet Canyon (#15 in Table 1) located north of Beardsley along the 16th Street alignment, the location premiums ($15,000) are particularly high for the area. As it happens, the project is virtually surrounded by Phoenix' proposed Union Hills Park and its natural mountain features.

- Kaufman & Broad's upscale Carefree Highlands project south of Carefree Highway on the Central Avenue alignment (#29 in Table 1) has location

- premiums of nearly $100,000 due to the dramatic mountain features directly adjacent to the project, and the large single-loaded lots.

- Sunregion has concluded that master-planned communities in the scenic area of far north Peoria can benefit in the same fashion as the selected examples cited above. There are many others. The enhancement (economic) value of open space in this area can

dramatically affect the returns on investment in residential development within properly designed projects that *maximize* the views of the pristine Sonoran desert, its washes, and the mountain terrain features in the area. Sunregion believes that these opportunities clearly call for a major commitment to open space conservation in the area.

Table 1
Location Premium Analysis, Selected Study Area Subdivisions, 4th Quarter 1998

Community	Masterplan	Project	Total Units	$ (000s)	Sqft	$ Sqft	Location Prem.	Map Code	Buyer Profile
1./ West Phoenix	Entrada	Entrada @ Eagle Ridge (Brown)	155	$120-$141	1,200-2,058	$68.75-$97.49	0	412/E-2	Families
2./ West Phoenix	Entrada	Ladera (Brown)	48	$168-$199	2,034-3,046	$65.49-$82.59	$4,500	412/E-2	Families
3./ West Phoenix	Entrada	La Meseta (Brown)	94	$127-$162	1,467-2,340	$69.44-$86.91	0	412/E-2	Families
4./ West Phoenix	Entrada	Monarch @ Entrada (Hancock)	132	$166-$189	1,906-3,239	$57.65-$78.65	$10,000	412/E-2	Families
5./ West Peoria	Ventana Lakes	Highlands (Lennar)	137	$95-$128	1,000-1,690	$70.62-$95.49	0-$1,500	421/C-2	Age Restricted, EN
6./ West Peoria	Ventana Lakes	Lakeside II (Lennar)	62	$115-$156	1,439-2,230	$69.95-$80.26	0-$2,000	421/C-2	Age Restricted, EN
7./ N.E. Glendale	Arrowhead Lakes	The Estates (Regal)	102	$229-267	2,315-3,551	$75.16-$98.88	$35,000	413/A-6	Families & EN
8./ New River	Anthem C.C. 1	Expedition (Del Webb)	43	$300-$324	3,156-3,738	$86.54-$95.06	$10,000	123/D-6	Empty Nesters
9./ New River	Anthem C.C. 2	Founder (Del Webb)	85	$246-$285	2,542-3,364	$84.57-$96.77	0	123/D-6	Empty Nesters
10./ New River	Anthem Parkside	Heritage (Coventry Homes)	141	$135-$181	1,608-2,653	$68.22-$83.95	$2,000	123/D-6	Families & EN
11./ New River	Anthem Parkside	Jubilation (Coventry Homes)	132	$100-$135	1,218-1,996	$67.63-$87.12	$1,500	123/D-6	Families & EN
12./ New River	Anthem Parkside	Echelon (Coventry Homes)	61	$205-$264	2,548-3,808	$69.33-$80.45	$3,000	123/D-6	Families & EN
13./ N.E. Phoenix	None	Boulder Creek (Courtland)	242	$133-$160	1,414-2,490	$64.25-$94.05	$500	415/B-5	N/A
14./ N.E. Phoenix	Mountaingate N. 2	Bolero (Richmond American)	196	$127-$155	1,057-2,169	$71.46-$123	$2,000	415/B-3	N/A
15./ N.E. Phoenix	Scarlett Canyon	Horizons (Pulte)	103	$174-$211	2,240-3,305	$63.81-$77.63	$15,000	425/A-1	Families & EN
16./ Scottsdale	None	The Preserve (Monterey Homes)	143	$293-$348	2,746-4,256	$81.74-$107	$7,500	406/C-5	N/A
17./ Scottsdale	None	Palos Verdes (Jackson Properties)	65	$279-$338	2,429-3,994	$84.61-$115	$2,500	406/D-5	N/A
18./ N.E. Phoenix	Dynamite Ranch	San Marcos Manor (Maracay)	60	$212-$254	2,160-3,593	$65.29-$99.49	$8,000	406/B-5	Retirees & EN
19./ N.E. Phoenix	Desert Ridge	Mission Greens (Shea Homes)	96	$223-$276	2,392-3,834	$71.98-$93.64	$50,000	416/B-6	Varies
20./ N.E. Phoenix	Desert Ridge	Mesquite Highlands (Shea Hms.)	77	$172-$195	1,518-2,109	$92.60-$113	$45,000	416/B-6	Varies
21./ N.E. Phoenix	Desert Ridge	Glen Eagle (Morrison Homes)	102	$164-$204	1,751-2,749	$74.21-$93.66	0	416/B-5	Retirees & EN
22./ N.E. Phoenix	Desert Ridge	Ironwood Greens (Edmunds-Toll)	55	$288-$323	2,826-3,578	$90.27-$102	$47,500	416/B-5	Varies
23./ N.E. Phoenix	Desert Ridge	Wildflower (Shea Homes)	236	$164-$210	1,804-3,140	$66.93-$90.99	$20,000	416/B-5	Families, MUB, EN
24./ N.E. Phoenix	Tatum Ranch	Tatum Greens (Golden Heritage)	147	$158-$196	1,733-2,563	$74.87-91.71	$30,000	406/B-4	Families, Retirees
25./ N.E. Phoenix	Tatum Ranch	Greystone Manor (Greystone)	113	$122-$146	1,195-1,963	$74.63-$103	$6,000	406/B-4	N/A
26./ N.E. Phoenix	Tatum Ranch	Desert Vistas (Ryland Homes)	255	$136-$191	1,565-2,885	$66.20-$92.01	$10,000	388/A-5	Families, MUB, Ret
27./ N.E. Phoenix	None	Casas del Cielo (United Homes)	60	$226-$290	2,000-3,562	$81.27-$113	$6,000	146/C-6	N/A
28./ N.E. Phoenix	None	Dove Valley Estates (Pulte)	84	$191-$231	2,240-3,305	$69.86-$85.22	$15,000	146/B-6	Empty Nesters
29./ County	Desert Hills	Carefree H. (Kaufman & Broad)	34	$242-$291	2,044-3,018	$96.26-$118	$98,500	1A/E-9	Families & EN

Source: The Meyers Group; and, Sunregion Associates, Inc.

Table 2
Estimated Location Premium Revenue, Selected Study Area Subdivisions, 4th Quarter 1998

Community	Masterplan	Project	Total Units	$ (000s)	Avg. Lot Size	Location Prem.	Location Prem./Sqft	Location Prem. Gross $
1./ West Phoenix	Entrada	Entrada @ Eagle Ridge (Brown)	155	$120-$141	5,500	0	-	-
2./ West Phoenix	Entrada	Ladera (Brown)	48	$168-$199	7,700	$4,500	$0.584	$216,000
3./ West Phoenix	Entrada	La Meseta (Brown)	94	$127-$162	6,600	0	-	-
4./ West Phoenix	Entrada	Monarch @ Entrada (Hancock)	132	$166-$189	8,050	$10,000	$1.242	$1,320,000
5./ West Peoria	Ventana Lakes	Highlands (Lennar)	137	$95-$128	varies	0-$1,500	-	-
6./ West Peoria	Ventana Lakes	Lakeside II (Lennar)	62	$115-$156	varies	0-$2,000	-	-
7./ N.E. Glendale	Arrowhead Lakes	The Estates (Regal)	102	$229-267	9,600	$35,000	$3.646	$3,570,000
8./ New River	Anthem C.C. 1	Expedition (Del Webb)	43	$300-$324	11,400	$10,000	$0.877	$430,000
9./ New River	Anthem C.C. 2	Founder (Del Webb)	85	$246-$285	9,775	0	-	-
10./ New River	Anthem Parkside	Heritage (Coventry Homes)	141	$135-$181	6,900	$2,000	$0.290	$282,000
11./ New River	Anthem Parkside	Jubilation (Coventry Homes)	132	$100-$135	4,950	$1,500	$0.303	$198,000
12./ New River	Anthem Parkside	Echelon (Coventry Homes)	61	$205-$264	9,600	$3,000	$0.313	$183,000
13./ N.E. Phoenix	None	Boulder Creek (Courtland)	242	$133-$160	4,400	$500	$0.114	$121,000
14./ N.E. Phoenix	Mountaingate N. 2	Bolero (Richmond American)	196	$127-$155	5,500	$2,000	$0.364	$392,000
15./ N.E. Phoenix	Scarlett Canyon	Horizons (Pulte)	103	$174-$211	7,700	$15,000	$1.948	$1,545,000
16./ Scottsdale	None	The Preserve (Monterey Homes)	143	$293-$348	21,780	$7,500	$0.344	$1,072,500
17./ Scottsdale	None	Palos Verdes (Jackson Properties)	65	$279-$338	43,560	$2,500	$0.057	$162,500
18./ N.E. Phoenix	Dynamite Ranch	San Marcos Manor (Maracay)	60	$212-$254	9,600	$8,000	$0.833	$480,000
19./ N.E. Phoenix	Desert Ridge	Mission Greens (Shea Homes)	96	$223-$276	9,600	$50,000	$5.208	$4,800,000
20./ N.E. Phoenix	Desert Ridge	Mesquite Highlands (Shea Hms.)	77	$172-$195	6,084	$45,000	$7.396	$3,465,000
21./ N.E. Phoenix	Desert Ridge	Glen Eagle (Morrison Homes)	102	$164-$204	5,500	0	-	-
22./ N.E. Phoenix	Desert Ridge	Ironwood Greens (Edmunds-Toll)	55	$288-$323	11,152	$47,500	$4.259	$2,612,500
23./ N.E. Phoenix	Desert Ridge	Wildflower (Shea Homes)	236	$164-$210	8,400	$20,000	$2.381	$4,720,000
24./ N.E. Phoenix	Tatum Ranch	Tatum Greens (Golden Heritage)	147	$158-$196	6,050	$30,000	$4.959	$4,410,000
25./ N.E. Phoenix	Tatum Ranch	Greystone Manor (Greystone)	113	$122-$146	4,400	$6,000	$1.364	$678,000
26./ N.E. Phoenix	Tatum Ranch	Desert Vistas (Ryland Homes)	255	$136-$191	8,250	$10,000	$1.212	$2,550,000
27./ N.E. Phoenix	None	Casas del Cielo (United Homes)	60	$226-$290	43,560	$6,000	$0.138	$360,000
28./ N.E. Phoenix	None	Dove Valley Estates (Pulte)	84	$191-$231	12,000	$15,000	$1.250	$1,260,000
29./ County	Desert Hills	Carefree H. (Kaufman & Broad)	34	$242-$291	42,750	$98,500	$2.304	$3,349,000

Source: The Meyers Group; and, Sunregion Associates, Inc.

Appendix B

Traditional Public Financing Tools - A Comparative Analysis

In the analysis presented below we have utilized certain key measures of "fiscal burden" in an effort to demonstrate the City of Peoria's capacity to fund the acquisition of environmentally-sensitive desert open space using *traditional* public financing techniques.

This information is presented in comparative terms so that the reader may judge where the City of Peoria stands in relation to nine other sister cities in Arizona.

Population Size

The 1998 population ranking among the cities surveyed is provided in the table below.

City		Population
1./	Phoenix	1,220,710
2./	Tucson	468,520
3./	Mesa	361,895
4./	Glendale	196,820
5./	Scottsdale	195,495
6./	Chandler	160,165
7./	Tempe	158,220
8./	Gilbert	91,290
9./	**Peoria**	**89,930**
10./	Avondale	28,650

Source: Arizona Department of Economic Security, December,1998.

Transaction Privilege Tax

Peoria's sales tax rate is in the middle among the cities surveyed. The cities of Phoenix, Glendale, and Tucson do not tax food sales for home consumption.

City	1998 Sales Tax Rates
1./ Glendale	1.0%
1./ Gilbert	1.0%
2./ City of Phoenix	1.3%
3./ Scottsdale	1.4%
4./ Peoria	**1.5%**
4./ Chandler	1.5%
5./ Tempe	1.7%
6./ Avondale	2.0%
7./ Tucson	2.0%
8./ Mesa	2.0%

Source: Sunregion Associates, Inc.

Property Tax Rates

Peoria's total primary and secondary property tax rates per $100 of assessed valuation is higher than six (6) of the cities we surveyed, and lower than three (3) others. Primary tax assessments are utilized for operation and maintenance activities of government while *secondary tax rate assessments are utilized for servicing voter approved bonded indebtedness and budget overrides*. The property tax rates identified are 1998 rates, and the cities are listed in rank order from lowest rate to highest.

City	Property Tax Rates Primary	Secondary	Total
1./ Mesa	.0000	.0000	= 0.000
2./ Tucson - primary and secondary	.1428	.8173	= .960
3./ Gilbert - secondary		.0000	1.2500 = 1.250
4./ Chandler - primary and secondary	.3468	.9700	= 1.317
5./ Scottsdale - primary and secondary		.5477	.9366 = 1.484
6./ Tempe - primary and secondary	.6363	.8837	= 1.520
7./ Peoria - primary and secondary	**.3249**	**1.3025**	**= 1.627**
8./ Glendale - primary and secondary	.4400	1.3400	= 1.780
8./ Avondale - primary and secondary	.6282	1.1516	= 1.780
9./ Phoenix - primary and secondary	.9104	.9096	= 1.820

Source: Maricopa and Pima Counties.

Secondary Property Valuation

Peoria is the 9th largest city among those surveyed. Therefore, it is not unexpected that the City's assessed secondary property valuation is on the lower end of the list. However, the City's assessed valuation per capita is relatively high for its size as we see in the table below.

City	Valuation	Assessed Valuation Per Capita	
1./ Phoenix	$6,202,274,710	1./ Scottsdale	$10,754
2./ Scottsdale	$2,102,351,943	2./ Tempe	$6,945
3./ Tucson	$1,945,109,495	3./ Chandler	$5,096
4./ Mesa	$1,541,503,375	4./ Phoenix	$5,081
5./ Tempe	$1,098,826,160	5./ Tucson	$4,151
6./ Chandler	$ 816,253,568	6./ Gilbert	$4,454
7./ Glendale	$ 717,390,116	**7./ Peoria**	**$4,277**
8./ Gilbert	$ 406,616,906	8./ Mesa	$4,259
9./ **Peoria**	**$ 384,697,103**	9./ Glendale	$3,645
10./ Avondale	$ 65,158,952	10./ Avondale	$2,274

Source: Maricopa and Pima Counties, and Sunregion Associates, Inc.

Outstanding General Obligation Bonded Indebtedness - July 1, 1998

The table below shows in rank order the total amount of outstanding general obligation bonded indebtedness (Column 2) for the ten selected municipalities as of the end of last fiscal year. Then, in Column 4, as a measure of fiscal burden, we have calculated the amount of this indebtedness per capita. Note that the City of Peoria is ranked *at the bottom* when general obligation bonded indebtedness per capita is calculated (Column 3).

City	Outstanding Bonds	Outstanding Per Capita
1./ Phoenix	$ 1,061,000,078	2./ $ 869.17
4./ Mesa	$ 264,009,537	4./ $ 729.52
2./ Tucson	$ 209,159,070	6./ $ 446.43
3./ Scottsdale	$ 199,026,000	1./ $1,018.06
5./ Tempe	$ 115,623,411	3./ $ 730.78
6./ Chandler	$ 81,850,000	5./ $ 511.04
7./ Glendale	$ 62,575,000	9./ **$** 317.93
8./ Gilbert	$ 39,970,000	7./ $ 437.84
9./ Peoria	**$ 27,690,000**	**10./ $ 307.91**
10./ Avondale	$ 10,136,000	8./ $ 353.79

Source: 1998, Arizona Department of Revenue, and, individual municipalities.