The Economics of Large-Scale Conservation

A Framework for Assessment in Pima County

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Executive Summary

A number of significant positive and negative economic impacts could result from Pima County's Sonoran Desert Conservation Plan (SDCP) and related programs, according to an analysis of existing research on large-scale conservation planning undertaken to provide a framework for community decision-making.

On the positive side, the literature documents that such programs can provide a number of potential economic benefits. Foremost among these, the SDCP, a pending multispecies habitat conservation plan (HCP) and Pima County's 2001 Comprehensive Plan Update could:

- Raise the value of some real estate

- Facilitate more efficient Endangered Species Act (ESA) compliance for developers

- Boost economic development by providing "amenity" benefits

- Provide fiscal benefits to local governments

- Foster resource-based industries like ranching

- Provide "quality of life" gains to the community

At the same time, Pima County could experience several potentially negative economic impacts should it implement its plans. The package of programs could, in this regard:

- Reduce some property values

- Require substantial local outlays for implementation and management of the conservation reserve

- Increase the region's cost-structure in economic development

- Reduce housing affordability

How exactly these diverse potential impacts will play out as a "net" economic impact in Pima County, will depend on the final details of the programs and their implementation over time. More detailed forecasting must also wait on program descriptions and data sets that were unavailable at this writing.

Nevertheless, several lessons emerge from this research. These lessons offer specific counsel to policy-makers who want to maximize the benefits of any possible large-scale conservation program in Pima County and minimize its negatives.

- First, the complex, multidimensional nature of programs like those proposed in Pima County requires that any future economic impact assessment account for both specific positive and negative impacts, as well as their net overall effect, in a comprehensive approach.

- Second, a Section 10(a) HCP permit offers the possibility of substantial economic benefits to the community — *but only* if it actually streamlines and expedites permitting for large numbers of developers. Only if an HCP actually cuts permit processing time, mitigation costs and construction delays will it deliver important economic benefits to the region.

- Third, the community can reduce the likely inflationary effect on housing prices that can result from conservation programs. This can be done by diligently offsetting plan-associated reductions in development capacity in habitat areas with increased housing supplies elsewhere in the region. In short, the community can mute plan-driven housing price increases if it delivers higher densities in more central areas and puts in place significant inclusionary or mixed income subdivision programs and programs to provide affordable housing for low-income families. Prudent public policies, in short, can offset the important housing affordability issue.

This report offers no final verdict on the net economic impact of Pima County's current, ambitious initiatives in habitat conservation and growth management. However, it does provide a framework for future assessment and decision-making.

Introduction

In February of 1998, the Pima County Board of Supervisors launched what has evolved into the Sonoran Desert Conservation Plan (SDCP) — a comprehensive effort to protect the Sonoran Desert, guide growth and rationalize land development in the metropolitan Tucson region.

Proponents of this planning process maintained that the project would reconcile conflicts between human activities and conservation, providing benefits for both wildlife and economic development. Critics, however, have increasingly alleged that implementing such an initiative will adversely affect land and housing markets, increase taxes and create problems of housing affordability. Over time a pressing need has consequently grown for objective information about the possible fiscal and economic impacts of the conservation programs being assembled by Pima County.

This report addresses that need. It is a tool in the form of an impartial framework for assessment that government officials, environmentalists, business people and the general public can use for debate and decision-making.

Originally intended to stage the central issues of a larger economic impact study, the report is now designed as a "stand alone" document. Within these pages are gathered much data and original analyses derived from the best research available on the actual experience that other regions have had with large-scale conservation efforts. This research has here been drawn together for the benefit of Pima County's current planning effort.

In compiling this research, it has been assumed that implementation of the full SDCP could clearly have significant impacts on the economy since the plan and its associated programs will likely influence local land-use and development patterns, the region's quality of life and ecosystem health in the county.

After all, the SDCP vision is far-reaching. As summarized for the Pima County Board of Supervisors,

> "…the Sonoran Desert Conservation Plan (SDCP) is a comprehensive, local planning initiative to conserve the county's most valued natural and cultural resources, while accommodating the inevitable population growth and economic expansion of the community" (Huckelberry, 2001)

What is more, SDCP policies have also informed two related large-scale planning and conservation initiatives — the 2001 Pima County Comprehensive Plan Update (adopted in December 2001) and a multispecies habitat conservation plan (HCP), currently under development. The Comprehensive Plan Update undertakes to guide the future development of the county while conserving its natural resources in keeping with SDCP concepts. The HCP, meanwhile, is intended to enable the county to obtain a region-wide permit under Section 10(a) of the Endangered Species Act (ESA) allowing the "incidental take" of covered species in keeping with appropriate continued development and the species' long-term conservation.

Taken together, these separate but related and interdependent habitat planning and growth management programs represent a significant alteration of "business-as-usual" in Pima County with significant potential implications for the economy.

In keeping with that, this report seeks to identify the most important economic issues that might be raised by the SDCP and associated undertakings. More than 150 major articles, reports and other publications were analyzed as the basis for this report. These publications addressed such diverse issues as the impacts on land values of land-use regulations, the impacts of growth management on housing affordability, the "amenity" benefits of open space and the fiscal implications for local governments of alternative forms of development. As to its provenance, most of the material evaluated consisted of evidence and discussion presented in the refereed journals and scholarly books that contain the primary discourse of such fields as economics, economic development, real estate analysis and planning.

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The academic literature on the economics of habitat conservation is sprawling, diverse and involved. Nevertheless, it is clear that conservation programs can reorient development patterns in complicated ways, and so alter fundamental economic arrangements in a community.

Changes in regional conservation development policies may have direct and indirect economic impacts on *private sector* property values and employment. They may have fiscal implications for the *public sector*. And they may prompt other impacts, both quantifiable and non-quantifiable, on a broad array of *community* characteristics, ranging from housing affordability and transportation efficiency to social equity, aesthetics, quality of life factors, ecosystem "services" and ecosystem health (Hollis, 2001).

The interrelatedness of the possible effects of conservation-oriented land-use programs adds to the intricacy of economic effects. First, impacts typically overlap and interact — for example, many quality of life community factors are also private-sector factors. Second, different types of impact or value are measured by different methodologies and expressed in different units (Fausold & Lilieholm, 1996). What is more, some impacts — such as the protection of open space — will always possess intangible values over and above any calculation of monetary values.

In view of all this, selecting and organizing relevant research from the large body of sophisticated economic analyses of conservation and growth management initiatives that now exist poses a challenge.

On the matter of selection, the method of this review has been to take a broad-ranging but commonsense approach. In brief, that means the objective has been to consider the full run of potential impacts, positive and negative, of programs somewhat like Pima County's, but to focus only on impacts that seem the most important in the literature and the best documented. Priority, in this regard, was given to monetizable, quantifiable impacts in a few widely studied areas where consensus exists. In addition, more qualitative (yet equally real) benefits and costs were included if they had won wide acceptance. For all impacts included, a judgment was made that at least "much" if not "general" agreement existed. On this basis, the survey offers no discussion of the impact of transportation and traffic because little consensus could be found, and much research of amenity benefits and housing affordability, about which a consensus exists. Likewise, the focus was kept on impacts resulting from programs resembling Pima County's in some way. One problem here, however, is that very little economic impact analysis has been previously conducted on the scores of HCPs in existence or under development. In view of this, much material was considered that touched not on the impacts of Sec. 10(a) programs per se, but on programs resembling aspects of Pima County's interconnected package of related initiatives.

Under these terms, then, the literature search identified 14 key positive economic impacts of programs like the county's and nine negatives. These impacts are listed in Table 1.

Table 1: Potential Economic Benefits and Costs of the SDCP

	Possible Benefits of a Plan	Possible Costs of a Plan
Private Sector	• Enhanced property values • More cost-effective ESA compliance • Increased economic development • Protection of land-based industries • Amenity gains for economic development	• Loss of developable land and negative real estate effects • Costs of plan implementation • Negative impacts on economic development
Public Sector	• Enhanced property values • More cost-effective ESA compliance • Fiscal benefits of sprawl reduction and open space	• Reduced public property value • Costs of plan implementation • Higher public service costs

Community	• Urban redevelopment
	• Public goods gains
	  • scenic vistas
	  • enhanced access to recreation
	  • enhanced community character
	• Ecosystem goods
	  • ecosystem "services"
	  • preservation values
		• Reductions in housing affordability
		• Interference with consumer preferences
		• Increased exurban sprawl

Source: Morrison Institute for Public Policy.

In brief, the possible benefits of plans like Pima County's include property value increases associated with the protection of nearby open space, a more cost-effective method of complying with the ESA for developers, more efficient infrastructure provision and improvements of the region's quality of life. On the other hand, the costs to the community of establishing a multispecies habitat program could include the loss of private and public land value associated with land-use controls, the costs of protecting and managing reserves and reductions in housing affordability.

For purposes of this report the literature was organized to follow Table 1. Potential impacts were divided into economic positives and negatives. These impacts were then classified into three major categories: *impacts on the private sector, impacts on the public sector,* and *impacts on the community*. Thus, the first section of this report presents potentially "positive" economic impacts of programs like Pima County's on the private sector, the public sector and the community. The second section then considers potentially negative influences on each segment of the economy. Specific examples of relevant empirical research accompany each sub-discussion.

Possible Benefits of a Plan

The possible economic benefits of a large-scale multispecies habitat conservation program to the community include the enhancement of some property values, more cost-effective compliance with the Endangered Species Act for developers, various "amenity" benefits to businesses and the stabilization of certain resource-based industries such as ranching and eco-tourism. A program may also lower capital and operating costs to local government and provide "quality of life" gains to the community.

The following sections and subsections discuss these impacts and others. All are grouped with reference to whether they primarily benefit the private sector, the public sector or the community.

Possible benefits to the private sector

According to the literature, an initiative like Pima County's habitat planning could well produce substantial economic benefit for the region's private sector. These gains would likely come in the form of some increased property values and the creation of a more predictable regulatory environment for developers. Businesses could also benefit from the programs, which could help attract and retain skilled workers who appreciate such "amenities" as abundant open space, healthy ecosystems and managed growth.

Enhanced property values
One of the most direct economic benefits of a conservation program like Pima County's SDCP (and related initiatives) would likely be a modest to substantial creation of new real estate value, reflected in increased property values for some or many who own property.

In general, microeconomic theory anticipates two positive potential influences on property values.

First, to the extent a conservation program constrains the supply of land in parts of a region, the law of supply and demand predicts it will increase raw land prices and property values across the region (Alonso, 1964; Muth, 1969; Katz & Rosen, 1987). Such appreciation may result from "true" scarcities of buildable land associated with the creation from new conservation reserves, or it may result from the "artificial" regulation of new construction by government, whether through zoning limits, mitigation fees or other regulatory constraints (Glaeser & Gyourko, 2002; Nelson et al., 2002). Either way, a conservation plan could be good for property values across the region.

At the same time, current models of urban rent notice that open space and other conservation or growth management programs create important "positive externalities," or amenities. These amenities create a windfall for property owners when they are capitalized into land and housing values (Correll, Lillydahl and Singell, 1978; Nelson et al., 2002).

Among these "amenity" effects, the literature identifies two related sources of "enhancement value" (Correll et al., 1978; Nelson & Duncan, 1995; Nelson et al., 2002).

First, the creation of habitat preserves, natural corridors, greenbelts or smarter growth creates a public good that benefits everybody's property values in the region. Such *regional* amenity gains range from the "soft" benefits of a less cluttered viewscape and increased recreational options to the intangible "sense of place" that comes with a more compact urban form — but they are undeniably real and quantifiable.

More familiar is a second amenity benefit: the *localized* gains realized in the property values by those living near to open space protected by a conservation plan. Informal evidence for this boon to the real estate market appears every Sunday in the nature photography of newspaper real estate ads. But beyond that, researchers have succeeded in isolating and quantifying the positive effects on property value of proximity to various kinds of open space.

Here are samples of the empirical work:

Increased property values across the region
Substantial research suggests the potential for conservation and growth management programs to increase property values across the region, whether by creating scarcities of property or making the region a more desirable place. The extent of the impact, however, depends on the type and details of the programs.

- Segal and Srinivasan (1985) interviewed regional planners in 51 metropolitan areas to estimate the fraction of buildable land withdrawn from development due to conservation or growth management. Using a regression model of single-family house prices they found that land protections correlated with higher appreciation rates overall. As a class, protection-oriented regions, with an average of 12 percent of available land set aside, experienced appreciation rates 17 percent higher than those that did not protect land — for a rate of 12.5 percent instead of 10.8 percent annually. Cities reporting more than 20 percent of outlying land preserved added more than 6 percent to their annual property price inflation rates.

- Lillydahl and Singell (1987) reviewed dozens of studies to survey the effects of land protection and growth management on property values and found prices on average 10 to 20 percent higher in regulated communities than unregulated communities.

Enhancement of adjacent property values
Additional gains would be realized by owners of property adjacent or near new preserves. Again the scale of the impact would depend on the specific layout of the conservation lands system.

- An early analysis by Hammer et al. (1974) isolated a statistically significant rise in property prices near 1,294-acre Pennypack Park in Philadelphia, while controlling for other factors. In this analysis the park accounted for 33 percent (or $11,500 per acre) of a parcel's value at 40 feet, 9 percent at 1,000 feet, and 4.2 percent (or $1,000 per acre) at 2,500 feet. All told the study found that each acre of open space generated an enhancement value of $2,600 in the community. That implied the creation of some $3,391,000 in net real estate value.

- Correll et al. (1978) found that Boulder, Colorado's city-owned greenbelts significantly increased adjacent property values. While controlling for other variables, they found properties adjacent to greenbelts were worth an average of 32 percent more than those 3,200 walking feet away. According to the author's regression analysis, every foot away from the greenbelt decreased the price of residential property by $4.20. In one of the neighborhoods studied the aggregate property value for the neighborhood was about $5.4 million greater than it would have been absent the greenbelt.

- Nelson (1986) extended such analysis to greenbelts created on private land — in his case, through the agricultural zoning employed by Salem, Oregon's urban containment program. Greenbelts in the form of preserved agricultural land substantially increased property values there. Specifically, Nelson determined that urban land at greenbelt's edge commanded about 10 percent more per acre than urban land 1,000 feet away from the boundary, all other things being equal. Moreover, the amenity influence of the greenbelt land on urban land value extended about 5,000 feet inward from the agricultural zone.

Taken together, research of this sort suggests implementation of a large-scale conservation plan in eastern Pima County could generate sizable property values gains for many current property owners.

<u>More cost-effective ESA compliance</u>
A second potential economic benefit for the private sector of a habitat conservation plan such as Pima County proposes could be a more cost-effective, predictable system for developers to comply with the ESA.

This benefit would result from the county obtaining a regional Sec. 10(a) permit to allow the "incidental take" of threatened species in the course of appropriate development.

Beatley (1994), for example, concludes on the basis of case studies and stakeholder interviews that the habitat conservation process offers local economies "a far less costly approach than attempting to satisfy federal and state endangered species requirements on a case-by-case or project-by-project basis [by obtaining individual project 10(a) permits]."

The reason is clear: Absent a regional Sec. 10(a) program, landowners still must contend with the often exacting requirements of the ESA. Specifically, if they have habitat for endangered species on their land, property owners can face an especially burdensome campaign when they attempt to develop their holdings. That campaign can be unpredictable and time-consuming; more specifically, costs can spiral as the developer absorbs the direct expenses of: 1) permit processing and plan preparation, 2) mitigation and 3) construction delays.

Currently under the ESA, developers operating within pygmy-owl critical habitat in the Tucson region, for example, must pay for two years of biological surveys and complete a formal or informal consultation with the United States Fish and Wildlife Service before breaking ground. Then they must negotiate a mitigation plan to offset any destruction of habitat. Yet even then, uncertainties and costs remain. At any time the discovery of a new threatened or endangered species of plant or animal on the development site can still stop the project. Meanwhile, throughout all of the processing period, construction will have been delayed so developers' carrying costs will have mounted. All told such delays can consume years and entail substantial costs in interest payments, property tax and other overhead.

By contrast, under a regional solution, developers still incur species-related costs in the form of fees, tax assessments or other levies required to fund an HCP. But these expenses will likely be containable. Permitting may be simpler and quicker. A per-acre mitigation fee may replace complex mitigation planning. Predictability and economies of scale may be realized through a regionalized mitigation system that taps more sources than just new development.

In these ways, then, the *absence* of a regional ESA permit imposes real costs on both the development community and the broader economy that must be compared to those of organizing a regional solution. Moreover, in places where the comparison has been made, as in Austin and San Diego, analysis has tended to find a regional program of ESA compliance more cost-effective than individual compliance outside an HCP.

In this regard, a nascent literature on the costs and benefits of Sec. 10(a) programs points to potential cost savings for regional economies. These analyses suggest that the economies of scale associated with a regional plan can save the private sector money by reducing the total costs of ESA compliance beneath the expected total costs of individual compliance. For example:

- Gau and Jarrett (1992) assessed Austin, Texas' total private ESA compliance costs over 20 years with and without the Balcones Canyonlands Conservation Plan (BCCP), a proposed Sec. 10(a) habitat conservation plan covering 10 sensitive species and 300,000 acres of Travis County. Their analysis estimated that private compliance expenditures over the 20 years would reach $148.9 million to $410.6 million in 1992 dollars without the program, and $86.7 million to $87.7 with it. A key finding was the study's use of four case studies to estimate that the average compliance cost for private landowners in the region ran to $9,000 per acre of development for projects with sensitive habitat. By contrast, the program's proposed mitigation fee was projected at just $600 to $1,300 per gross acre. Gau and Jarrett concluded that the BCCP "is a more cost effective method of complying with the Endangered Species Act than individual compliance by Travis County landowners with habitat."

- A similar economic analysis of San Diego's Multiple Species Conservation Program (MSCP) conducted by Cox et al. (1995) projected even larger savings from plan implementation. This assessment compared the direct impacts on developers' construction costs of a "No Preserve" scenario, a minimal "Coastal Sage Scrub"(CSS) alternative and an ambitious "Multiple Habitats"(MH) plan, as reflected in mitigation costs, construction delays and planning. This time "no action" was projected to cost the development community a total of $401.1 million, the minimalist alternative $355.2 million and the full multispecies approach just $146.6 million (see Table 2). These results prompted the study authors to remark that, although costs were associated with the full multispecies plan, those costs were lower than with lesser alternatives and so could be said to "insure the region against large and persistent development disruptions."

Table 2: Summary of Costs, Three Habitat Preserve Scenarios, San Diego Multiple Species Conservation Program

	NP Scenario ($ million)	CSS Scenario ($ million)	MH Scenario ($ million)
In-kind mitigation costs and mitigation fees	$218.3	$232.4	$146.1
Construction delays	$181.3	$121.4	$145.0
Privately funded habitat planning	$181.5	$181.4	$180.5
Subtotal of direct impacts on construction costs	$401.1	$355.2	$146.6

Sources: Onaka Planning & Economics, Douglas Ford & Associates; Compiled by SourcePoint, 1995.

Increased economic development

A related benefit for the private sector of rationalized ESA compliance through the county's programs could be increased economic development across the economy.

Such gains could result from the fact that a resolution of species issues would improve the region's attractiveness to firms and households that are considering a relocation. These gains would probably not be sizable enough to significantly change the region's overall competitiveness, which depends above all on issues such as housing price, university presence and climate. However, with a plan in place, firms or households weighing equivalent location options on all other factors might well choose Pima County over locations with unresolved problems. What is more, the resulting gains in employment and population could grow thanks to the "multiplier effect" by which expenditures resulting from additional jobs in primary sectors create additional employment in secondary "downstream" sectors.

Two economic development analyses are relevant:

- In Austin, Gau and Jarrett's assessment of the Balcones HCP estimated that the region could anticipate obtaining between 9,800 and 39,000 additional high-tech jobs, and greater population growth of 30,000 to 62,000 residents, if the region crafted a plan to reduce ESA compliance costs and uncertainties. The job gains represented a 2.2 percent to 8.7 percent boon. Crucial to the analysis was the assumption that regulatory confusion would negate some of the region's relocation advantages and cost the region jobs over the 1992 to 2011 period if there were no plan. This assumption led Gau and Jarrett to project that the lack of a plan would cost the region between 2,500 and 10,000 high-tech research and development jobs, or between 16 percent and 65 percent of projected R&D job growth, over the forecast period.

- In San Diego, Cox's simulations found the economy would fare "marginally better" under the minimalist Sec. 10(a) program than with no action, and "much better" under the full "multispecies, multihabitats" plan. Under the minimalist CSS program the region gained an additional 1,000 jobs after 20 years, and a $21 million personal income boost, good for an additional $10.4 million in taxable retail sales. Under the comprehensive MH permit, the gains increased to 4,400 jobs (40 percent in the construction sector), a $107 million growth in personal income and $52 million in added retail sales. In both "plan" scenarios the economic stimulus resulted from the plans' reduction of ESA compliance costs, and their provision of state and federal grant support for implementation (see Table 3).

Table 3: 2010 Economic Impact Comparison, Three Preservation Scenarios, San Diego Multiple Species Conservation Program

	NP Scenario	CSS Scenario	MH Scenario
Total Population	3,427,000	3,427,500	3,429,100
Housing Stock	1,302,900	1,303,000	1,303,400
Home Prices	$239,500	$239,600	$239,800
Total Employment	1,365,900	1,366,900	1,370,300
Personal Income ($ million)	$61,100.80	$61,122.30	$61,208.70
Per Capita Income	$17,829	$17,833	$17,850
Taxable Retail Sales ($ million)	$28,503.00	$28,513.40	$28,555
Local Government Expenditure ($ million)	$4,084.40	$4,088.40	$4,092.60
Property Tax Revenue ($ million)	$994.20	$994.30	$994.40
Sales Tax Revenue ($ million)	$352.70	$352.80	$353.30

Note: Money values are in 1992 dollars.

Source: SourcePoint, 1995.

Protection of land-based industries

A fourth direct benefit to the private sector of a regional conservation plan could be the protection of lands and landscapes vital to land-based Pima County industries, such as ranching, agriculture and nature-based tourism.

Much of the "open space" being considered for "reserve" status in Pima County, as it happens, remains far from idle. Crops are grown there, cattle are grazed and, in some cases, visitors enjoy bed-and-breakfasts, eco-oriented guided recreation and resort-stays that depend on the unbroken integrity of local scenery. Open spaces in these ways frequently turn out to be working landscapes vital to the production of goods and services that create value in the regional marketplace (Fausold & Lilieholm, 1996).

At the same time, though, these open spaces and their productivity are threatened. As in many regions, population growth and the demand for low-density housing have led to rising land values and urban sprawl. Ranchers especially are tempted to sell or subdivide their deeded private lands for development (Nelson 1986, 1992).

In this context, the literature suggests a conservation program like Pima County's could support productive activities on rural open lands by reducing the burdens of ranchers' ESA compliance, purchasing development rights from willing sellers and enforcing the limits to rural development embedded in the 2001 Comprehensive Plan Update.

Several studies document how program-packages not unlike Pima County's conservation plan can stem the loss of rural open lands lands and the jobs and income they support:

- Robert Burchell (Burchell,1992; Burchell et al., 1998) has demonstrated that significant savings of agricultural land can be afforded by "compact, or more managed" development. In a series of studies Burchell's group employed detailed land consumption models to compare the 20-year future impacts of "trend" (sprawl-like) and "planned" growth studies in New Jersey, South Carolina, Michigan and Lexington, Kentucky. The results consistently identified large savings of agricultural land with the planned alternative, ranging from around 20 percent in South Carolina, Michigan and Lexington to 40 percent in New Jersey. In New Jersey those savings amounted to some 42,000 acres of croplands and grazing pasture (see Table 4).

Table 4: Findings on Savings of Compact Growth Versus Current or Trend Development: Burchell, 1992-1997

Area of Impact	Lexington, KY and Delaware Estuary	Michigan	South Carolina	New Jersey
Public-Private Capital & Operating Costs				
Infrastructure Roads (local)	14.8 - 19.7%	12.4%	12.0%	26.0%
Utilities (water/sewer)	6.7 - 8.2%	13.7%	13.0%	8.0%
Housing Costs	2.5 - 8.4%	6.8%	7.0%	6.0%
Cost-Revenue Impacts	6.9%	3.5%	5.0%	2.0%
Land/Natural Habitat Preservation				
Developable Land	20.5 -24.2%	15.5%	15.0%	6.0%
Agricultural Land	18.0 - 29.0%	17.4%	18.0%	39.0%
Frail Land	20.0 - 27.0%	20.9%	22.0%	17.0%

Source: Burchell et al., 1998.

- Nelson's work in Oregon (1986, 1992), meanwhile, connects land-use policy to economic outcomes, and demonstrates that a package of policies aimed at limiting exurban development and fostering agriculture can stabilize commodity enterprises. Nelson's approach was to compare the 1982 to 1987 change in a number of indices of farm vitality for the United States, Washington and Oregon, the last being a state that has endeavored to preserve farmland open space and reduce speculation with urban growth boundaries, restrictions on exurban development and exclusive agricultural districts. His conclusion: Oregon's growth management and farm preservation policies stabilized Oregon's agricultural economy, both statewide and in the urbanizing Willamette Valley. In the valley, commercial farm acreage rose nearly 18 percent from 1982 to 1987 after the implementation of conservation programs, despite large earlier declines and national losses. Statewide, land in farms also rose slightly. By contrast, acreages declined 2 percent in unregulated Washington and 5 percent across the U.S. Over the same period, total farm sales in Oregon rose 20 percent, while those of Washington and the nation rose just 11 percent. In short, growth management and land conservation programs appear to have boosted the regional agricultural economy.

Amenity gains for economic development

A final, less-direct potential benefit for the private economy flows from the economic development value of a plan's provision of new public goods — such as open space — that contribute to the region's "quality of place."

This potential benefit may be especially important in view of the growth of the so-called "knowledge economy" of highly skilled, highly educated workers and entrepreneurs.

According to recent literature, economic growth increasingly comes to those places that attract and retain the largest stores of talented workers (Florida, 2000), or "human capital" (Romer, 1990). At the same time, surveys, regression models and other studies of workers' location choices confirm that environmental quality and natural amenities rank among the most important of location factors. This research demonstrates that workers often incorporate locally-specific amenities into their migration decisions (Blomquist et al., 1988; Cushing, 1987; Liu, 1975; Roback, 1982) and that park, wilderness and open space assets count heavily in those decisions (Rudzitis, 1991, 1998; Rudzitis and Johansen, 1991; Florida, 2000). Modeling and other analyses further confirm that workers frequently accept a lower wage in order to locate in what they consider more attractive regions (Rosen, 1979; Roback, 1982; Blomquist et al., 1988; Berger & Blomquist, 1992).

Taken together, these dynamics suggest that a conservation program and HCP that protected large amounts of open space could boost the local private sector by attracting talent, spurring corporate relocations and generating economic growth (Florida, 2000).

The following selections from the literature suggest how a county MSCP could benefit economic development by attracting both people and businesses:

Attraction of people

- Blomquist et al. (1988) demonstrated not only that "quality of life" issues strongly influence location decisions, but that environmental and other amenities have dollar values that can both lower the wages companies must pay and elevate the rents charged in a locality. They found substantial amenity-value differentials between regions in a regression analysis of 1980 census and amenity data for 253 U.S. counties. For top-ranked Pueblo, Colorado, the team's index suggested households would accept $3,288 (1980 dollars) in lower wages or higher rent to live in the county. By contrast, their numbers concluded St. Louis, Missouri. workers require a premium of $1,857 in wages or rent — some $5,146 more per household per year because the quality of life was perceived lower there.

- Rudzitis and Streatfeild (1994) have also indicated the special importance in location decisions of environmental and open space amenities. Their random survey of 398 people in San Juan County, Washington found that environmental attributes (such as "landscape/scenery," "environmental quality" and "outdoor recreation") accounted for four of the five top reasons migrants moved to the island county. In a similar survey (Rudzitis & Johansen, 1991) 60 percent of movers to 12 "wilderness" counties cited the presence of nearby wilderness as an important reason for their move.

- Shumway and Otterstrom (2001) extended the analysis recently by showing that environment-friendly, amenity-rich "New West" counties grew faster than other counties in the Mountain West in the 1990s. This work used IRS and census data to isolate growth rates for five different sorts of Inland West counties: "New West" counties, "government" counties, "diversified counties," "mining-manufacturing" counties and "farming" counties. In the analysis, New West counties had the most population; gained about six times the amount of in-migration as the next most popular class of regions; and had the highest income levels. New West counties' lavish environmental assets also appeared to selectively draw individuals with relatively higher income. According to Shumway and Otterstrom, in-migrants to New West counties enjoyed per capita incomes 40 percent higher than migrants to the next best-off areas, and 3 percent higher than New West residents.

- Richard Florida (2000) adds evidence that "knowledge workers" have a particular affinity for environmental quality, as reflected by air quality, water quality and "smart growth." He reveals a correlation between regions' overall environmental quality and the locales' incidence of knowledge workers (as derived from County Business Patterns SIC-code data) (see Figure 2). Writes Florida: "Quality of place — the amenities, lifestyle offerings and environmental quality of a region — plays a key role in the ability to attract talent and develop high technology industries."

Figure 1: Knowledge Workers Tend to Congregate in Places Known for Environmental Quality
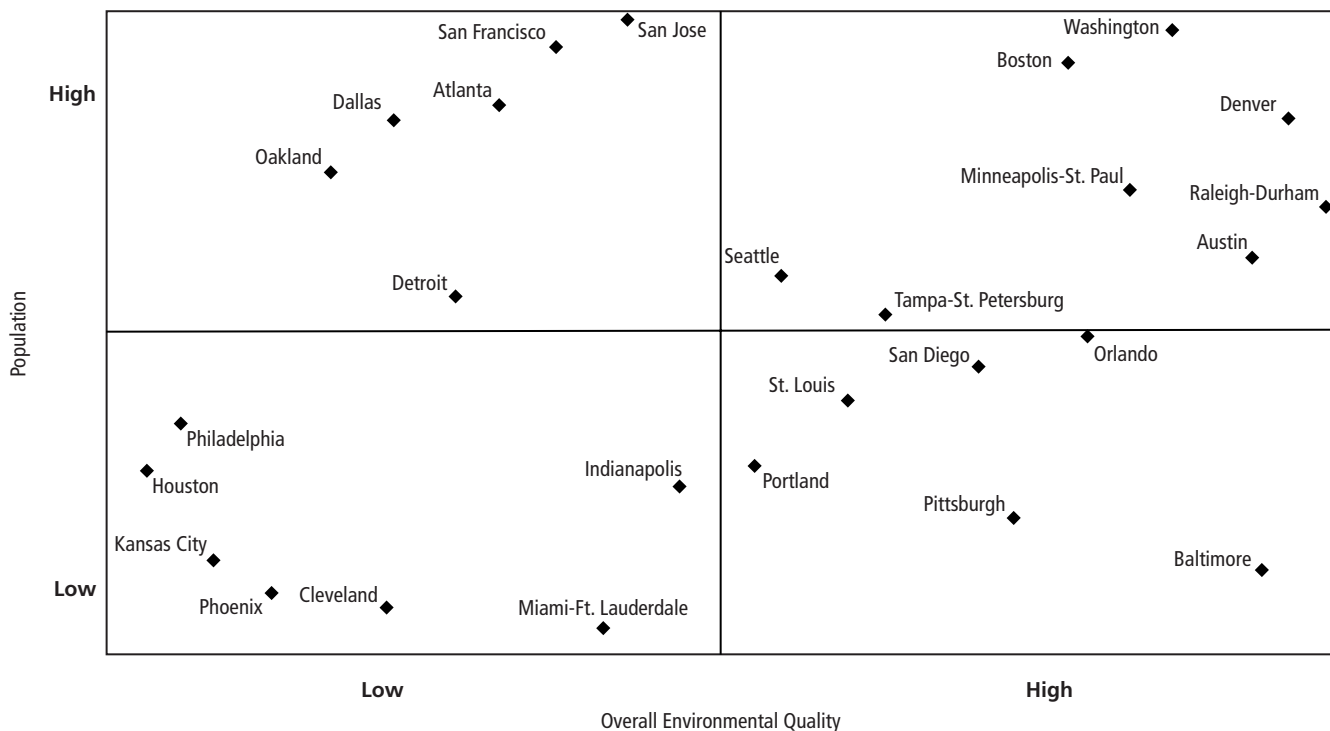
Source: Florida, 2000, based on County Business Patterns, Money Magazine Best Places *and The Sierra Club.*

Attraction of companies

- Open space and other "green" amenities may also attract business leaders. Extensive survey research, reviewed by Gottlieb (1994), strongly links the presence of environmental amenities to firm locations — especially high-tech firm location. Gottlieb aggregated the results of more than a dozen surveys of business executives ranking various amenities as location factors and found that "environmental quality" ranked high for both "all firms" and "high-tech firms." For all firms environmental quality ranked third out of 12 issues in importance to executives. For high-tech companies it topped the list (see Table 5).

Table 5: Amenities as Location Factors Based on a Review of Surveys

ALL FIRMS		HIGH TECHNOLOGY FIRMS	
Amenity	Average Rank	Amenity	Average Rank
Good Schools	2.11	Environmental Quality	3.00
Public Safety	3.89	Cost of Housing	3.25
Environmental Quality	4.22	Cost of Living	3.38
Cultural Amenities	4.56	Good Schools	3.50
Proximity of Housing	4.89	Easy Commute	3.50
Easy Commute	4.89	Recreational Amenities	3.63
Cost of Housing	5.00	Climate	3.75
Recreational Amenities	5.22	Cultural Amenities	4.13
Climate	5.89	Government Services	4.50
Government Services	6.22	CEO Preference	4.50
Cost of Living	6.67	Public Safety	5.25
CEO Preference	6.78	Proximity of Housing	5.25

Source: Paul Gottlieb, "Amenities as an Economic Development Tool: Is There Enough Evidence?"
Economic Development Quarterly, August 1994, p. 276.

- Granger and Blomquist (1999) also concluded that amenities influence business location decisions. Their study used detailed regression models and county-level, urban census data to assess the location of small and medium-sized manufacturing establishments. Their result: Amenities, as measured by a quality of life index, strongly influence manufacturers' location in urban areas, with the effects varying by industry. Especially attracted to high-amenity locations were labor-intensive industries. For these manufacturers the capitalization of strong amenities into lower wages represents a proportionally bigger cost saving.

Possible benefits to the public sector

A conservation program may also produce economic benefits for the region's public sector.

Paralleling potential gains for the private-sector impacts, these taxpayer benefits may include enhancement of the value of government property and more effective ESA compliance for government projects. The literature also indicates that important fiscal gains for government could result if implementation of the conservation program channels future growth away from the urban fringe and into more established areas. These gains could be realized through reductions of the higher infrastructure and operations costs associated with more scattered patterns of development.

Real estate enhancement value
The protection of new biological reserves could in theory increase the value of nearby tracts of publicly owned land, just as the literature shows new open space would enhance some private land values. Most notably, this enhancement effect could increase the value of certain parcels of state school trust land — namely, those with infrastructure availability adjacent to or near but not within future biological preserves. In this scenario, key trust land acreages could command a higher price on the local land market when they are sold to the private sector by the Arizona State Land Department for development in conformity with the department's mandate to generate revenue for the school trust. Such enhanced return would benefit Arizona schools and the taxpayers that fund them.

More cost-effective ESA compliance
Another benefit for the public sector of a regional Sec. 10(a) permit could be a faster, more predictable mechanism for local government compliance with the ESA in carrying out construction projects. Governments that participated in a program that covered their impacts on critical habitat might realize gains analogous to those available to the private sector: simpler and faster permitting, more straightforward mitigation, quicker and more cost-effective project turn-around. The time-delays Pima County itself has experienced with several road-widening projects in pygmy owl critical habitat on Tucson's Northwest Side underscore the potential for savings.

Fiscal benefits of sprawl reduction and open space
A final benefit to the public sector — and taxpayers — of SDCP implementation could result from changes in the county's growth patterns. To the extent implementation of the program (in part through the 2001 Comprehensive Plan Update) protects more open space and fosters more compact development it could lead to cost savings for government.

This potential gain follows from the recognition in recent decades that local population growth and real estate development "do not necessarily provide net fiscal benefits to local governments"(Fausold & Lilieholm, 1996).

Of specific interest here is the literature on "fiscal impact analysis," which has demonstrated that providing services (like public safety, courts and health care) and infrastructure (such as streets, flood control and sewers) to accommodate new development may cost more than the development generates in property tax and other revenues. In this work, the issue is not usually growth *per se*. Rather, the research considers the location and type of growth — and how the public costs and revenues of different development patterns vary (Burchell & Listokin, 1978). These analyses frequently endorse the superior cost-effectiveness of open space and compact — as opposed to sprawling — development.

Research on the *location* of growth, for example, shows that more compact, less sprawling development patterns reduce the capital and operations costs governments incur from new growth. On this front, studies by the Real Estate Research Corporation (RERC) (1974), Duncan (1989), Frank (1989), Burchell (Burchell,1992; Burchell

et al., 1998) and others show that compact development can be as much as 70 percent less costly for governments than equivalent volumes of scattered growth. These savings result mainly from the lower relative cost of providing road systems, utility lines, health care and public safety to new development contiguous to existing areas of growth. And they may accrue also to the private sector in the case of one-time capital improvements, which are increasingly being funded by private-sector developers.

Research on the cost-effectiveness of various *types* of land-uses also ranks open space a winner and low-density residential housing a money loser for governments, notwithstanding the specific local breakdown of responsibility for defraying the costs of new development. Burchell and Listokin (1992), most notably, have developed a general hierarchy of land uses and their public costs. They place research office parks at the top of the list (because they generate a net fiscal surplus) and mobile homes at the bottom (because they often generate a deficit) (see Figure 2). In this hierarchy, open space ranks in the middle, just above the break-even line for municipal budgets. Additional research (RERC, 1974; Downing & Gusteley, 1977; American Farmland Trust, 1985) confirms that the balance-sheet frequently remains unfavorable for low-density residential developments.

Figure 2: Types of Land Uses Ranked by Cost-Effectiveness for Governments

Cost-Effective
- Research office parks
- Office parks
- Industrial development
- High-rise/garden apartments (studio/1 bedroom)
- Age-restricted Housing
- Garden condominiums (1-2 bedroom)
- Open space

Breaks Even
- Retail facilities
- Townhouses (2-3 bedrooms)
- Expensive single-family homes (3-4 bedrooms)

Loses Money
- Townhouses (3-4 bedrooms)
- Inexpensive single-family homes (3-4 bedrooms)
- Garden apartments (3+ bedrooms)
- Mobil homes (unrestricted as to occupancy locally)

Note: Land use must always be viewed in the context of other land uses impacts and within the fiscal parameters of the jurisdiction in which the land use is being developed.

Source: Burchell, Robert W., "Fiscal Impact Analysis: State of the Art and State of the Practice."

Taken together, this literature suggests that the county's proposed program, in conjunction with supporting land use policy as codified in the 2001 Comprehensive Plan Update, could produce significant fiscal benefits for local governments — particularly the county. To the degree the plan fosters more compact growth patterns the program could reduce jurisdictions' outlays for roads, water and various services. And to the degree the plan facilitates the protection of county open space it could produce additional savings.

Here are highlights of the research:

Fiscal benefits of sprawl reduction

- RERC's *The Costs of Sprawl* (1974) broke new ground in fiscal analysis by calculating in precise terms the substantial capital and operating cost savings for government associated with higher-density, planned growth, as opposed to low-density sprawl. RERC's basic study method was to compare detailed estimates of the costs associated with six hypothetical new communities — each containing 10,000 dwelling units. The conclusions: The high-density planned community required a capital investment 44 percent less than the low-density sprawl community, and required 11 percent lower operating costs. Road and utility construction yielded the largest proportionate capital savings.

- Extending RERC's research, Duncan et al. (1989) conducted detailed case studies of the actual costs and revenues incurred by completed Florida developments and also found that "managed/planned" growth afforded big cost savings to government compared to "trend" (meaning "scattered") growth. Duncan's data show that the total public capital costs for a detached unit built under trend conditions in Florida approached $16,000 in 1990 dollars; under planned development the capital cost was about $11,000 per unit, or roughly 37 percent less (see Table 6). Road-building savings exceeded 60 percent in the more contiguous configurations.

Table 6: Florida Growth Pattern Study (Duncan 1989): Capital Facility Costs Under Sprawl Versus Compact Development (per dwelling unit; 1990 dollars)

Category of Capital Costs	Average of Case Studies under Sprawl Development[1]	Average of Case Studies under Compact Development[2]	Sprawl Versus Compact Development	
			Difference	# / %
Roads	$ 7,014	$2,784	(+) $4,230	60.3
School	6,079	5,625	(+) 454	7.4
Utilities	2,187	1,320	(+) 867	39.6
Other	661	672	(-) 11	1.7
Total	$15,941	$10,401	(+) $5,540	36.7

[1] *Sprawl development as defined here includes the following patterns of "urban form" analyzed by the Florida study: "scattered," "linear," and "satellite." The capital cost figures shown in this table are averages of the Florida case studies characterized by the scattered, linear, and satellite patterns.*

[2] *Compact development as defined here includes the following patterns of "urban form" analyzed by the Florida study: "contiguous" and "compact." The capital cost figures shown in this table are averages of the Florida case studies characterized by the contiguous and compact patterns.*

Source: Burchell et al., 1998.

- Burchell's more recent series of modelings of "trend" versus "planned" growth in New Jersey, South Carolina, Michigan and Lexington, Kentucky (Burchell, 1992; Burchell et al., 1998) also have quantified large capital and operating savings from reducing sprawl (see Table 4). Burchell's projections calculate that a shift away from sprawl to more planned growth could save those paying for new roads 15 to 20 percent of their outlay in Lexington, 12 percent in Michigan and South Carolina and 26 percent in New Jersey. The savings on water/sewer infrastructure run at 7 percent in Lexington, 14 percent in Michigan, 13 percent in South Carolina and 8 percent in New Jersey.

- Another study, by Bollinger et al. (2001), compared the relative costs of government in 10 Kentucky counties, and associated large differences with the counties' different growth patterns. This analysis

revealed that the costs for police, fire and school services were consistently lowest in counties whose growth was most concentrated in established areas, and highest in the counties with the most dispersed growth. In counties with a relatively compact center-city the costs per household of adding 1,000 residents ranged from $-1.08 in Fayette County (which contains Lexington) to $53.89 in Warren County, a smaller non-metro county whose growth was focused on Bowling Green. By contrast, in comparable counties with more scattered growth the costs per household of adding 1,000 new residents ran from $36.82 in Jefferson (home of sprawling Louisville) to $239.93 in Pulaski, a non-metro county without a central town like Bowling Green. The household costs of adding 1,000 residents reached $600 and even $1,200 in 2001 dollars in some highly dispersed fringe counties.

Fiscal benefits of open space protection

- The cost-effectiveness of open space has been suggested in a series of studies sponsored by American Farmland Trust that contend that undeveloped rural land weighs less on governments' budgets than residential development, though it generates lower revenues. Peters (1990), for example, showed that for every dollar of taxes paid, $1.36 was required by an average residential unit for public services across the country, while only 21 cents in services was demanded by the average farm or ranch.

- Freedgood and Wagner (1992), on a more local scale, focused on the "cost of community services" in six rural towns in Connecticut, Massachusetts and New York State and found that residential development lost money on average for the municipalities while agriculture, forest and open space turned a profit. Residential development required $1.13 in municipal services for every $1 of revenue generated. Rural land required 29 cents.

- The numbers for Boulder, Colorado were even more dramatic. There, the National Park Service Rivers, Trails and Conservation Assistance Program (1991) reported that in 1988, developed land cost the city over $2,500 per acre a year to maintain, and up to $3,200 when utilities, flood control, transportation and other government costs were included. In contrast, the public cost for maintaining open space was only $75 an acre, or less than 3 percent that of developed land.

In short, empirical research raises the possibility of significant plan-related cost-efficiencies for governments in Pima County, depending on the land-use details of the adopted alternative.

Possible benefits to the community

A final cluster of economic benefits of a large-scale package of conservation initiatives would flow to the broader community.

These shared benefits could come in the form of "urban livability gains" from urban redevelopment, or from the protection or enhancement of "public goods" such as scenic vistas, added recreational opportunities and the community character embodied in traditional working landscapes. The community could further benefit from the protection of "ecosystem goods" such as the practical benefits of natural flood control, access to wilderness areas and the nearby existence of wildlife living in functioning natural systems. More diffuse and less easily monetized than other economic benefits, these potential conservation gains are nevertheless real — and increasingly calculable.

Urban redevelopment
One community gain of a conservation plan could be improvement in the region's livability through urban revitalization. This benefit would result if the county's conservation program and the 2001 Comprehensive Plan Update succeed in creating a more compact urban form by restricting development at the periphery and channeling it toward the regional core.

Brueckner (2000) argues in this vein that programs that reduce sprawl at the urban fringe often have the desirable side-effect of upgrading and redeveloping decayed central neighborhoods. That is because curbs on fringe development and the spatial growth of cities in general will increase the demand for aging central-city housing, elevate its price and increase the incentive for redevelopment.

To be sure, such redevelopment may not matter intensely to every local resident. Still, much research (Burchell et al., 1998; Ihlanfeldt, 1995) suggests that many consumers do value the presence of a viable center-city that establishes a "sense of place" in a region, conveys a positive image or boasts unique urban or historic amenities.

- Empirical work by Rosenthal and Helsley (1994) confirms that center-city housing is redeveloped as urban sprawl slows and center-city land prices rise. Their analysis of 6,842 single-family home sales in urban neighborhoods in Vancouver, B.C. found overwhelmingly that houses were demolished for redevelopment when the price of vacant land exceeded the price of the property in its initial state.

Public goods gains

A conservation plan that protected new open space in the Tucson region would furnish additional "public goods" to the community. Such shared amenities would benefit all citizens in the region, not just those who own property. And they could include a variety of benefits from cleaner air or protected hydrological flows to the proximity of solitude.

Most quantifiable in the context of Pima County's SDCP are the public benefits of protected scenic vistas, enhancing access to recreation and fostering the community character embodied in traditional working landscapes.

Scenic vistas

Communities that possess outstanding scenic backdrops profit from enhanced tourism and economic development, but they also gain a valuable quality of life amenity for their residents.

- Niemann and Chenoweth (cited in Propst and Schmid, 1993) established that the value of visual resources within natural areas can be quantified, and merits consideration. Their work in 1985 led the U.S. Forest Service to pay landowners $25 million rather than an earlier offer of $13 million, based mainly on timber value, for 24,400 acres of land for the Alpine Lakes Wilderness Area in Washington State. A broader impact of the assessment was to provide a basis for incorporating scenic beauty into economic assessments of conservation projects.

Enhanced access to recreation

A conservation plan could also enhance the availability of outdoor recreational opportunities in the community.

Plan implementation in Pima County would commit much of the designated biological reserve to open space or low-density residential development. Portions of that open space will likely represent new additions to the wilderness and park facilities of the county. To that extent, and to the extent restrictions on the use of reserve lands do not bar recreation entirely, assembly of a habitat system in Pima County will also provide new open spaces for the use of picnickers, hikers, horseback riders and climbers.

Such recreation possesses value for communities. What is more, such value has increasingly been estimated and quantified through "willingness to pay" survey research and related methodologies. Over time, scores of these estimates have accumulated in the literature, and become widely recognized by government agencies, such as the U.S. Fish and Wildlife Service, as useful valuations.

These estimates, together with more conventional calculations, have made the once-"soft" value of recreation visible in assessments of the benefit and cost of conservation scenarios. Here are two sample calculations:

- Rosenberger and Loomis (2000) compiled 760 region-specific studies of recreation use values into a comprehensive reference for American regions. For the relevant U.S. Forest Service region, some 277 studies yielded the following mean per person recreation day values: camping, $25.87; picnicking, $22.95; hiking, $31.85; biking, $58.95; wildlife viewing, 36.10; rock climbing, $42.04 (see Table 7).

Table 7: Selected Recreation Activity Day Values in the Region on U.S. Forest Service Lands

Activity	Number of Studies	Mean	Median
Camping	18	$25.87	$24.09
Picnicking	4	22.95	24.09
Sightseeing	10	13.22	12.23
Hiking	5	31.85	29.66
Biking	2	58.89	58.89
Wildlife Viewing	39	36.11	32.22
Rock Climbing	3	42.04	45.34
General Recreation	11	42.09	14.04
Wilderness Recreation	8	49.24	35.23

Source: Rosenberger and Loomis, 2000.

- Working from similar per household estimates, Walsh et al. (1984) estimated Coloradans' aggregate "willingness to pay" for a full range of wilderness values associated with four different land protection plans, and located substantial recreation value. Colorado households proved willing to pay about $14.00 a visitor per day for even the smallest wilderness designation of 1.2 million acres, a finding that equated to $13.2 million a year in total recreation use value across all households.

In light of these analyses a projection of likely incremental recreation value to be created by implementation of a conservation plan could be estimated by multiplying a relevant recreational-use "willingness-to-pay" price by anticipated visitation increases or the acreage of new, publicly-accessible set-asides. Of course, such estimates will depend heavily on specifics of Pima County's final plan, including the ultimate mix of new recreation lands and the details of reserve management.

Enhanced community character associated with protecting land-based industry
A related public good of plan implementation could be the community benefit of protecting ranches, agriculture and nature-based tourism in the region, all of which depend on the protection of the county's open lands and landscapes.

Non-ranch dwellers and those uninvolved in eco-tourism receive myriad benefits from those activities. These gains include the enjoyment of scenic viewsheds, wildlife habitat and protection from the negative costs of suburban sprawl. There is the cachet of being a tourist destination. Moreover, urbanites in an area that has historically been agricultural may value knowing that this important piece of local heritage still exists, and that ranchers can hand down their chosen profession and their land to the next generation. In view of that, implementation of the SDCP could yield another "soft" (but quantifiable) benefit to the community through any ranch protection it achieves. The following study suggests the dimensions of this benefit:

- Rosenberger and Walsh (1997), working in Routt County, Colorado, demonstrated that non-ranch people *do* place a dollar value on the presence of nearby ranches. Employing survey-based valuation techniques, their calculations estimated that Routt County residents would pay on average $107, $181, $231 and $256 to protect 25 percent, 50 percent, 75 percent or 100 percent, respectively, of the ranchland remaining in their county. The bottom line: Ranch preservation can indeed generate positive value to the community.

Ecosystem goods

The last group of possible gains from the SDCP encompasses the value to the community of protecting the Sonoran Desert ecosystem itself — the functioning natural system that surrounds and supports metro Tucson.

These "ecosystem" benefits come in two forms. On the one hand, they entail the myriad practical "services" protected systems render to the region in the form of such goods as flood control, weather amelioration or aquifer recharge. On the other hand, ecosystem goods include the intellectual, aesthetic, cultural and spiritual value to the public of additional preservation. This may be called "preservation" value. In each case, substantial scientific and economic work has begun to express the benefits in economic terms.

Ecosystem "services"

Fausold and Lilieholm (1996) and Daily (1997) both call attention to the important "services" intact natural systems render for human communities.

In Pima County, these services may include flood control and groundwater recharge; they also embrace habitat provision and soil stabilization among others. At once ubiquitous and underappreciated, the monetary value of such benefits can be calculated by totaling the cost of the damages that would result if the benefits were not provided (Fausold and Lilieholm, 1996). Goulder and Kennedy (in Daily, 1997) add that these benefits can be quantified by assessing the costs various parties avoid thanks to natural processes. Such costs might include, for instance, the price of man-made flood control infrastructure built to stabilize altered natural terrain, or groundwater recharge. Two examples from the literature will suffice to suggest the possible relevance of such calculations for Pima County:

- In Massachusetts, the U.S. Army Corps of Engineers, the Commonwealth of Massachusetts and local governments acquired 8,500 acres of wetlands in the Charles River Basin to provide natural flood control. Kusler and Larson (cited in Fausold and Lilieholm, 1996) report that the cost of acquiring the wetlands was $10 million, while the cost of constructing "hard infrastructure" like dams and levies would have hit $100 million.

- In the same watershed, Thibodeau and Ostro (also cited in Fausold and Lilieholm, 1996) further specified the benefits of natural systems. Along with other quantifiable benefits, they found that each acre of wetland had a present value of $33,370 for flood prevention ($2,000 per year) and $100,000 for water supply (present value discounted at 6 percent, 1978 dollars). Additional benefits resulted from natural pollution reduction.

Preservation values

Less "practical" than the delivery of "ecosystem services" but probably more important to Pima County's assessment of the SDCP are the various types of satisfaction citizens derive from the mere act of preserving nature.

Emotional, aesthetic, even ethical, such valuations might not seem a proper element of economic assessment. However, economists have in recent decades established that the preservation of pristine environments generates important — and quantifiable — "non-use" or "passive use" values.

Loomis (2000), in summarizing this research, notes that only a portion of the economic value of protected open space relates to recreation. In addition, he indicates that the general public receives sizable economic value from just knowing intact natural systems will be available in the future. That such undeveloped environments can only be destroyed, and never created, only sharpens such appreciation. In view of this, Weisbrod (1964) suggested that non-users might well pay an "option" price to maintain the possibility of future use of an ecosystem. And Krutilla (1967) argued that people often value natural resources for their "existence" value, while others may prize their "bequest" value — the value of knowing a species or biome will be protected for the enjoyment of future generations. Starting in the 1980s, economists began to quantify such non-market values of conservation — mostly using survey analysis.

Several well-known studies provide additional perspective to the community as it weighs the economic implications of a conservation plan:

- Walsh et al. (1984) measured the "option," "existence," "bequest" as well as recreation values associated with a large conservation plan in Colorado and found the "passive" uses actually mattered most to Coloradans. According to the research, Colorado households were willing to pay $5.44 a year for maintaining the option of visiting a 1.2 million-acre wilderness set-aside, $6.56 for simply knowing the land was preserved and $6.75 for the satisfaction of bequeathing it to future generations. Those values totaled $18.75 per household per year and exceeded the expressed recreation value. Altogether these non-use benefits represented 54 percent, or $13.8 million of the $28.5 million of Coloradans' annual willingness to pay for the wilderness package.

- Richer (1985) and Pope and Jones (1988) also asserted significant willingness to pay for large-scale conservation plans. Richer's test of a 6.9 million-acre desert protection bill in California yielded a $101 annual willingness-to-pay value for the typical household. That equated to some $313 million a year in state-wide willingness to pay. Pope and Jones's similar assessment of wilderness designation in Utah also revealed a sizable appetite for preservation. There the research found households willing to pay an average of $53, $64, $75 and $92 per year for preserving 5, 10, 15 and 30 percent, respectively, of the state as wilderness. Aggregating those bids over all Utah households placed the annual value of wilderness preservation there at between $10 million and $38 million a year.

- Finally: Hagen et al.(1992) estimated that Pacific Northwest households would spend $86.32 per year per household to preserve northern spotted owls and their old-growth habitat in the region.

In brief, abundant emperical research holds out the possibility of significant economic benefits to the region from its large-scale conservation initiatives.

Possible Costs of a Plan

The possible economic costs of a large-scale conservation plan in Pima County could also become significant.

In the private sector, depending on any plan's final details, some property owners may see the value of their property reduced as new land use policies are capitalized into land values. Elsewhere, increases in land, housing and possibly new taxes or fees associated with the plan could add to business costs, complicate business operations and inhibit worker recruitment. Participant governments, for their part, will likely have to bear some costs of the plan's implementation and operation, as well as restrictions on their own activities. And for the community-at-large the SDCP could reduce housing affordability, cut against consumer preferences for low-density housing and even contribute to a new round of exurban sprawl in adjacent counties.

Much will depend on the program's final details and implementation strategies.

Possible costs to the private sector

The costs of a plan to the private sector would mirror, though not necessarily equal, the plan's benefits for property owners and businesses.

Reserve protection would — almost by definition — reduce the region's stock of developable land, even as it triggered a variety of negative and positive impacts on local property values. Potentially higher tax or fee burdens and real estate costs, as well as negative perceptions, could hinder local economic development, offsetting some of the plans' potential benefits.

Loss of developable land and negative real estate effects
To the extent a conservation program reduces the total acreage of developable land in the region through regulation or other means it may impose an economic cost on the local economy.

Owners of newly regulated land may lose property value, while land users — parties needing to buy land or pay rent — may suffer from higher real estate costs elsewhere around the region.

Together, these negative economic impacts will offset at least some of the positive impacts on property values discussed as benefits above. Ultimately, the net size of these offsets will be determined by the specific details of any enacted programs, which will determine the relative size of the various cross-cutting land-price effects in the region.

Losses for owners of newly regulated land
Much literature confirms that the property values of some landowners with holdings within designated reserve areas could be adversely affected if the SDCP (in concert with the associated HCP and 2001 Comprehensive Plan Update) imposes stringent habitat mitigation ratios, urban service boundaries, limits to upzonings or other land use controls.

This correlation owes to the fact that the value of any piece of raw land flows from the present value of the benefits that could ultimately be derived from the parcel's use, as defined by the type and density of structures to be built there.

In eastern Pima County, sizable swaths of rural and semi-rural land, often operated or recently operated as ranchland, could lose value given the theory of land values. Boal (1970), Rosser (1978) and Nelson (1985, 1986, 1988) explain how. They note that the value of rural land near urban development arises both from its value as agricultural land and from its speculative value as zoned urban land. Limit the land's development potential whether through limits of upzoning, infrastructure boundaries or other means, and some property owners will lose land value. In ranch country, such a loss of value is an inevitable accompaniment to the reduction of ranches' "speculative value." Elsewhere, it is simply a negative impact on property values.

Three empirical studies are of interest:

- Near Montreal, Vaillancourt and Monty (1985) studied the impact of a new "exclusive agriculture" zoning law imposed along the urban fringe. Analyzing a sample of 1,200 sales of land from 1975 (prior to the new rules) up to 1981 (after them), they found that parcels subject to the new restrictions lost between 15 and 30 percent of their value compared to similar unrestricted land.

- Nelson (1986) examined Salem, Oregon's greenbelt zoning and urban growth boundary and also found significant land-value impacts. His analysis showed that, all things being equal, a parcel's location inside the boundary increased its value by nearly $3,900 an acre (1979 dollars) — or more than 30 percent. Parcels subject to greenbelt zoning, by contrast, fell in value about $3,400 an acre — about 33 percent.

- Nelson (1988) located similar impacts in the Portland region. His study of 150 parcel sales just before and just after the establishment of new "exclusive farm use" greenbelts in the metropolitan area demonstrated that greenbelt land did lose value. The mean price per acre of land in the total sample was about $7,300, but greenbelt land sold for about 25 percent, or $1,800, less.

Negative impacts on land users

At the same time, the increases in property values described above as an economic benefit for some owners could play out as negatives for others in the private sector who pay to use land rather than own it (Nelson, 2002).

For example, real estate inflation associated with a plan could entail costs for certain segments of the local private sector even though many would receive important amenities (Lillydahl & Singell, 1978):

- ✓ *Renters and new residents* could face an increase in housing costs without sharing in the capital gains of property appreciation as a result of the county's conservation programs. Higher rents could also delay some home purchases.

- ✓ *Lower-income or minority groups* would be the biggest losers if rents and valuations increased, because they are predominantly renters.

- ✓ *Small or new-entrant homebuilding firms* could find it harder to compete with larger, established firms if higher land, development and carrying costs increased barriers to entry.

Here are two indications from the literature:

- Huszar (1977) found that in San Jose, California upper-income, white suburban households received the largest share of the region's real estate property appreciation between 1960 and 1970. Those gaining the smallest proportional increases in property values were low-income, racially mixed central city residents.

- Landis (1986) considered the different entry and input costs for existing and outside homebuilding firms (entrants) in Sacramento, San Jose and Fresno in the 1970s and showed that growth management efforts favored well-established, larger concerns. In San Jose and Fresno land-use controls and supply limitations functioned to impede the entry of outside firms since they increased land prices and raised the cost of

doing business. Ultimately these barriers reduced competition and increased new-home prices and builders' profits — especially in tightly controlled Fresno. There, stringent growth management conferred near-monopoly power to well-established developers who had been "banking" raw land at the urban fringe for years. Fresno-area profits as a percentage of mean sales prices surged to 28.4 percent in 1980 for single-family homes compared to just 17.7 percent in growth-accommodating, competitive Sacramento.

In sum, losses of developable land represent a potential economic cost of plan implementation, though the relative numbers of "winners" and "losers," as well as the net balance of impacts, remains to be calculated on the basis of more detailed program specifics.

Costs of plan implementation
Another broad cost-impact of the SDCP and its related programs for the private sector would arise in paying for it.

Numerous options exist for assembling and funding the management of a multispecies habitat preserve. These may range from direct mitigation-land exactions imposed on new developments to more widely shared mitigation fees paid by the development community to broad tax or bond levies and/or state, federal and private grants.

No matter how the program is structured in Pima County, however, there will likely be locally borne costs associated with establishing and running it, and these will undoubtedly impact the private sector.

Assembly of the preserve remains the most visible cost, and can impact the local economy in different ways depending on how it is pursued. But additional costs will result from the operation and management of reserve areas. And these costs may be rising, given the increased emphasis being placed under recent incidental take permits on the successful implementation of sophisticated adaptive management programs. Adaptive management calls for protected species and habitats to be carefully monitored, and management techniques to be continuously tested and refined. Such management clearly may increase a conservation plan's costs to the community, no matter whether public agencies or private contributors of open space oversee operations and pay for them.

Cost data relating to species conservation plans comparable to what is being prepared in Pima County provide a sense of the possible burdens, though it should be remembered that projections in Austin and San Diego showed the implementation costs of a plan offsetting the costs of not having one:

Reserve assembly

- Under Austin's BCCP local sources have defrayed the vast majority of the $250 million-worth in property acquisitions needed to protect 30,428 acres of species habitat and additional lands. Funding sources include a $42 million City of Austin bond, passed in 1994, and a schedule of "participation" fees charged by Travis County. The fees range from $55 to $5,500 per acre a year and allow landowners and developers wanting to develop land containing habitat to comply with the ESA. Acquisition of the remaining 4,100 targeted acres will likely require $70 million or so, based on an estimated average land cost of $17,000 an acre.

- The San Diego MSCP makes local jurisdictions responsible for acquiring half of the 27,000 acres to be purchased by state, federal and local governments, for a local outlay of $130 to $180 million. An additional 63,000 acres are supposed to be protected through locally enforced mitigation imposed on new developments. Funding for local acquisition responsibilities remains undefined. But the expansion of a half-cent sales tax for transportation to include habitat conservation is one idea under discussion (Pollack, 2001).

Operation and management expenses

- In Austin operation and management expenses for the BCCP run from $50 per acre per year for remote preserves with limited public access to $800 per acre a year for properties with historic and current public use.

- In San Diego preserve management costs for the habitat reserve are projected to range from $37 to $47 per acre per year (Pollack, 2001). Public agencies there will fund and manage their own land holdings. For private land mitigation set-asides landowners themselves will defray management and monitoring. The plan estimates that local governments will bear management costs of about $4.6 million per year; private landowners will face additional outlays.

- In Las Vegas monitoring and adaptive management make up virtually the entire projected cost of the Clark County (Nevada) Multispecies Habitat Conservation Plan, since virtually all of the land to be conserved and managed there is publicly owned. Altogether, management and associated conservation actions in the Las Vegas-area will entail a $71 million cost (in 2000 dollars) to the community over the term of the incidental take permit. That implies a $6 million- to $8 million-a-cycle two-year budget outlay. The costs will be defrayed through the imposition of a $550 per acre impact fee on all county development starts (Fromer, 2002).

Negative impacts on economic development

A final possible negative for the private sector of a conservation plan follows from its likely implementation costs and possible implications for land and housing prices: Depending on its details, the program could increase Pima County's cost factors, thus complicating its economic development efforts.

Recent economic development literature underscores the continued importance of traditional cost issues in location decisions (Blair & Premus, 1987), notwithstanding the possible ESA compliance savings and amenity benefits detailed above. In this research, surveys of migrants and corporate location professionals as well as econometric analyses confirm that real estate costs and tax or fee levels retain importance in location decisions. At the same time, the increasing emphasis on workforce quality in economic development further highlights these issues, since reasonable housing costs are a vital part of the "quality of life" needed to attract skilled workers (Gottlieb, 1994).

In this regard, several possible cost issues bear consideration:

- ✓ Reductions in the supply of buildable land could impede or increase the cost of industrial expansions or relocations, both absolutely and relative to competitor regions.

- ✓ Localized or general land-cost increases could increase the cost of leasing space for relocating or expanding local businesses.

- ✓ The costs of the plan, whether broadly distributed in new taxes or bonds or borne by developers through impact fees, could also increase the region's cost-of-doing-business.

- ✓ Increased housing costs — whether caused by downplanning, supply constraints and higher land costs or the plan's amenity value — could hinder worker recruitment or place upward pressure on wage demands.

Each of these costs could offset some of the likely benefits to the economy of plan implementation, and undermine potential economic development up-sides. The following research frames these issues:

Individual migration decisions

- Herzog and Schlottmann (cited in Gottlieb, 1994) studied microdata on the migration of high-tech employees and found low housing costs a top deterrent to out-migration.

- Berger and Blomquist (1992) used regression analysis of county-to-county migration data to document that housing prices play almost as large a role as wages in determining where an individual will relocate. They found that while wages dominate the choice of *whether* to move or stay, housing costs have a large bearing on where individuals settle. According to the authors' modeling, an increase of $1,000 in the housing price differential between two destinations lowered the probability of a migrant relocating into one of 25 top counties by 10.7 percent. By contrast, a $1,000 increase in the wage gain raised the probability of settling in one of the cities by just 9.3 percent, while a similar-sized increase in quality of life increased the chances of relocation to a county by 5.38 percent.

Corporate relocation decisions

- Blair and Premus' 1987 review of the economic development literature between 1964 and 1987 named "land availability," "cost of land and construction," housing costs and tax or fee levels as important secondary factors in business development. Their assessment ranked such factors higher in importance than business subsidies and relocation incentives but less critical than such issues as workforce quality and transportation.

- Gottlieb's 1994 aggregation of surveys on the role of amenities in corporate relocation finds housing costs especially important to high-tech firms (see Table 5). For "all firms" "cost of housing" ranked seventh out of 12 issues in importance. For high-tech companies it ranked second.

Possible costs to the public sector

The possible costs of a plan to the public sector would invert, though not necessarily offset, the plan's benefits for governments.

For example, while some publicly owned state land parcels may gain in value as mentioned earlier, others will likely lose value with reserve delineation. Pima County will also need to finance the plan's implementation, or at least arrange it. And some of the potential fiscal savings to government that might flow from a more compact service area might be offset by the potentially higher operating costs associated with increased density.

Reductions of public property value
The SDCP, HCP and 2001 Comprehensive Plan Update will probably reduce the value of some publicly owned land. In particular, certain parcels of state school trust land could lose value if adjacent downplanning or service limits reduce their developability. Such reductions in property value entail a definable cost to state taxpayers, since revenues derived from the sale or lease of such parcels accrue to the state's education trust fund.

Costs of plan implementation
An additional burden for the public sector will be that of financing the conservation program.

Discussed above as a possible cost to the private sector, these costs will likely remain at least in part the responsibility of Pima County taxpayers and participating local governments. Moreover, the county as permittee would likely bear the chief responsibility for funding the important adaptive management portion of any program, even if landowners contribute significant land or funding for reserve assembly. As noted above, such operational costs appear to be running from $4 million to $8 million a year in places like San Diego and Las Vegas.

Higher public service costs
A final cost of a conservation plan to local governments could be higher delivery costs for some services, which could offset some of the potential fiscal savings that might result from more compact development patterns.

Several articles in the literature point out that the operating costs associated with providing some government services increase with higher densities.

Gordon and Richardson (1997), for example, cite the research of Ladd (1992) in arguing that except within very low densities the per capita public service costs for "traffic management, waste collection and disposal, and crime control increase with higher densities." And Black (1996) observes that "as density increases, the level and quality of services need change, often requiring that more be spent on services." Black notes that higher density usually brings more traffic congestion, more crime and more problems with noise, all of which would increase the region's need for traffic supervision, police officers and courts.

- Ladd (1992) investigated the impacts of growth and population density on current account spending and public safety outlays and found that, except in sparsely populated areas, higher density typically increases public sector spending. Her exploration of government expenditures for 247 large counties in 1985 found that higher density reduced costs only in areas with very sparse densities of less than 250 people per square mile. For most places, by contrast, higher density *increased* costs. For example, in Ladd's analysis a county with 1,250 people per square mile was predicted to have costs that exceeded those in the minimum-cost county by some 19 percent.

Possible costs to the community

A few find economic negatives of a potential multispecies plan could fall on the larger community, according to the literature.

Of most concern among these negatives is the potential for adverse impacts on housing affordability in the region. Additional unfavorable outcomes could include interference in the real estate market's production of the low-density product housing consumers seem to prefer and, ironically, increased exurban sprawl.

Reductions in housing affordability
Abundant research suggests an SDCP-type package of conservation regulations could increase housing prices and reduce home affordability in Pima County. This challenge for the community parallels the property values increases discussed earlier, but it has even broader social ramifications since it involves the fundamental relationship between household incomes, housing prices and the accessibility of shelter.

The literature identifies two different ways a package of conservation, planning and growth management policies such as Pima County is weighing may raise the price of housing. First off, classical economics (as noted above) dictates that such programs can and will raise housing prices, either by increasing input costs through new fees or restricting housing supplies relative to demand — whether through open space withdrawals, tightened "zoning" or other regulatory constraints (Alonso, 1964; Glaeser & Gyourko, 2002; Nelson et al., 2002). Yet that's just one inflationary effect: Even if a conservation and growth management program maintains adequate housing supplies it will *still* probably increase prices simply by making the region a better place to live. This follows from the more recently recognized "amenity effect" and other "positive externalities" of such programs (Nelson et al., 2002). In that vein, Nelson's systematic examinations of the issue (Nelson, 1986; Nelson et al., 2002) conclude that an effective conservation or growth management program almost by definition will raise housing prices, one way or the other.

At the same time, not all conservation or growth management programs are alike. Seidel (1978), Landis (1986) and Lowry and Ferguson (1992) all provide evidence that different policy packages affect housing markets differently.

In reviewing this and other scholarship, Nelson et al. distinguish between "managed" and "controlled" land markets.

In their view, softer "managed" approaches mute price inflation by offsetting development restrictions with new housing supplies. Such programs — epitomized by those of Portland, Oregon — complement development limits with upzoning, expedited land-use processing, incentives for in-fill, affordable housing elements and other means to ensure the supply of housing for sale and rent meets normal projected demand.

By contrast, more "controlled" regimes drive prices higher by constraining the growth of housing supplies without developing offsetting new capacity. These regimes may impose large-scale conservation withdrawals or downzoning without trying to accommodate projected growth; some of them enact hard building moratoria or permit caps. Either way they tend to touch off rampant cost increases that price poor residents out of the market or force them to overcrowd. This, according to Nelson's review, has been the unhappy experience of many California cities.

In light of these alternatives, the literature makes clear the criteria by which Pima County's SDCP, HCP and the allied 2001 Comprehensive Plan Update should be assessed, when it comes to their potential to erode housing affordability in the region:

- ✓ If the program offsets land-use controls and downplanning in habitat areas with sufficient density gains, expedited development and inclusionary housing elsewhere it will likely mitigate potentially adverse price effects on lower-income households.

- ✓ By contrast, if the programs fail to deliver offsetting supply or density gains they will likely increase housing prices sharply and reduce poor residents' access to housing.

Case studies from the literature illustrate the prospects:

Portland-style supply "management"
Several studies show programs that maintain adequate supplies of developable land and facilitate inclusionary housing tend to mute price increases.

- Knapp and Nelson (1992) found that the inflationary effects of Oregon's urban growth boundaries (UGB), adopted in 1973, had been tempered in the Portland area by policymakers' focus on ensuring that urban containment did not constrain development capacity. Most important, the authors argued that substantial upzoning, multifamily housing supply targets and streamlined permitting processes all reduced the potentially negative price effects associated with growth management and conservation. Overall, their analysis of price and production data concluded that housing supplies actually met rising demand in the 1980s at a relatively *lower* price than in the 1970s.

- More recently, Phillips and Goodstein (2000) compared Portland housing price trends with all other western U.S. metropolitan areas from 1991 to 1996 and found no statistically significant impact of the UGB once they controlled for income changes, unemployment, climate and other factors. All told, Phillips and Goodstein calculate that Portland's programs probably increased median housing prices by less than $10,000 during a period when Portland's median home averaged $144,000. That amounts to a 7 percent impact. Such results leads them to conclude that the bulk of Portland's price appreciation owes to rapid job and wage growth rather than to regulatory impacts, which have been offset by density increases.

- Downs (2002) also absolves Portland's combination of rural conservation, growth containment and supply maintenance for price inflation. He used National Association of Realtors and Freddie Mac data to show that the only time since 1980 when Portland's housing prices rose substantially faster than the national average was 1990 to 1994. During that period, though, wages and employment also surged as Oregon emerged from a locally exacerbated recession — a factor Downs believes accounts for most of the housing price spurt.

California-style "control"

By contrast, much research documents the severe price impacts that can result from rigidly constraining development without creating adequate new housing supplies — a frequent stance of California municipalities.

- Two classic studies by Schwartz, Hansen and Green (1981, 1984) examined the consequences of Petaluma's rigid 1972 building permit cap and concluded that it effectively "eliminated the production of lower priced housing in that city." Schwartz's team compared housing trends in Petaluma and nearby Santa Rosa, which had not adopted growth controls. In their first story they found that five years into the program standard-unit housing prices had risen 8 percent above those of Santa Rosa from similar starting points. A follow-up study documented worse trouble: The production of small, lower-priced new houses virtually ceased under Petaluma's growth controls as costly design points offered by the city's rationing program overwhelmed the few points developers got for moderate-income housing. All told, the percentage of houses that sold for less than $25,000 (1970 dollars) fell from around 50 percent before growth control to 15.2 percent in 1974 and 3 percent in 1976.

- Similar price inflation appeared in the broader sample of Katz and Rosen (1987), who studied the whole San Francisco Bay Area. They looked at 1,600 single-family home sales in 64 different communities. They found that houses selling in towns with building permit moratoria or binding rationing systems were 17 percent to 38 percent more expensive than those in other communities, all other things being equal.

Interference with consumer preferences

An additional community cost of a plan could be the frustration of some consumers' preference for low-density residential living, should the plan constrain fringe development and boost central-area densities.

Both the stated and revealed preferences of a majority of housing consumers underscore that a key part of the "American (and Sun Belt) dream" is ownership of a detached, single-family home on a decent-sized lot. Numerous consumer preference assessments document the enduring popularity of low-density living. Meanwhile, actual behavior highlights consumer desires even more clearly. Research by Fulton et al. (2001), for example, shows that the metropolitan density of the United States declined substantially from 1982 to 1997 as low-density suburbanization accelerated. Fulton's group found that in that period density declined from 5.00 persons per urbanized acre to 4.22 persons per urban acre, reflecting homebuyers' spreading embrace of dispersed living.

In view of evidence like this, Sheppard (1988), Gordon and Richardson (1997), Brueckner (2000) and others argue that many land-use controls on population dispersal harm societal welfare by interfering in the market's response to public preferences. Such analysts assume that decentralization reflects firms' and households' maximization of their welfare in a free market, and argue that constraining choices about where homes and businesses should be located will erode the overall welfare.

- Recent surveys by Fannie Mae (1996, 1997) report that homeownership is a top priority of Americans and that the ideal remains a single-family detached house with a yard. In 1997, 71 percent of respondents described the single-family home as ideal; only 28 percent deemed it less than ideal.

Increased exurban sprawl

An ironic final economic cost to the community of the SDCP's policies could be increased development just beyond the county boundaries, with many of the private-sector, public and community negatives more local sprawl generates.

Such a result could follow from the impacts of urban containment and "greenbelt" policies on regional land markets as theorized and observed by Nelson (1986, 1988).

Much of Nelson's work (described earlier) explains how zoning and other land-use rules associated with conservation planning tend to segment the regional land market into distinctly operating urban and greenbelt land markets, each with their particular land-price structure. But Nelson's analyses also demonstrate that another submarket for *exurban* development will be sharpened after conservation policies delineate a conservation reserve or greenbelt around an urban area.

According to Nelson (1988), interest in this unregulated exurban market will rise as some demand for development that can't be accommodated within the reserves shifts outward, rather than inward. What is more, the desirability of some of these exurban parcels will increase even more because of their proximity to the outer edge of the reserve belt with its "amenity" advantages of pleasant views and privacy.

Such dynamics heighten the potential for accelerated exurban development on private lands just beyond Pima County's projected biological reserve but within commuting range of Tucson. Since county lines bound the reserve-planning effort, plan implementation would make new subdivision development more likely in southern Pinal, northern Santa Cruz and western Cochise counties just beyond the outer reserve and county edge. Such development could stimulate new sprawl and restage many of its negative impacts on a larger regional scale.

The following "empirical note" confirms that conservation belts can stimulate exurban land markets:

- Nelson (1988) found that exurban land in Washington County, near Portland, Oregon, did indeed sell at a premium. He found that private parcels beyond the conservation zone there sold for $8,400 an acre on average between 1983 and 1986, compared to $5,500 an acre within the regulated conservation area. That differential confirmed the emergence of a specific new segment of the regional real estate market.

Conclusion

In summary, a number of general observations emerge from existing research on the economic impacts of large-scale conservation programs such as those being weighed by Pima County.

On the positive side, the literature documents that such programs can provide a number of potential economic benefits. Foremost among these, the SDCP, HCP and Pima County's 2001 Comprehensive Plan Update could:

- Raise the value of some real estate

- Facilitate more efficient ESA compliance for developers

- Boost economic development by providing "amenity" benefits

- Provide fiscal benefits to local governments

- Foster resource-based industries like ranching

- Provide "quality of life" gains to the community

At the same time, Pima County could experience several potentially negative economic impacts should it implement its plans. The package of programs could, in this regard:

- Reduce some property values

- Require substantial local outlays for implementation and management of the conservation reserve

- Increase the region's cost-structure in economic development

- Reduce housing affordability

How exactly these diverse potential impacts will play out as a "net" economic impact in Pima County, will depend on the final details of the programs and their implementation over time. More detailed forecasting must also wait on program descriptions and data sets that were unavailable at this writing.

Nevertheless, several lessons emerge from this research. These lessons offer specific counsel to policy-makers who want to maximize the benefits of any possible large-scale conservation program in Pima County and minimize its negatives.

- First, the complex, multidimensional nature of programs like those proposed in Pima County requires that any future economic impact assessment account for both specific positive and negative impacts, as well as the net overall effect, in a comprehensive approach.

- Second, a Section 10(a) HCP permit offers the possibility of substantial economic benefits to the community — *but only* if it actually streamlines and expedites permitting for large numbers of developers. Only if an HCP actually cuts permit processing time, mitigation costs and construction delays will it deliver important economic benefits to the region.

- Third, the community can reduce the likely inflationary effect on housing prices that can result from conservation programs. This can be done by diligently offsetting plan-associated reductions in development capacity in habitat areas with increased housing supplies elsewhere in the region. In short, the community can mute plan-driven housing price increases if it delivers higher densities in more central areas and puts in place significant inclusionary or mixed income subdivision programs and programs to provide affordable housing for low-income families. Prudent public policies, in short, can mitigate the important "affordability issue."

This report offers no final verdict on the net economic impact of Pima County's ambitious initiatives in habitat conservation and growth management. However, it does provide a framework for future assessment and decision-making.

In short, should Pima County's final package of programs streamline ESA compliance and expand housing opportunities available to lower income households it will likely yield net economic benefits.

By contrast, if the plans fail either to speed permitting or maintain adequate supplies of affordable housing the impact could be negative.

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