

Location, Location, Location

The effect of riparian areas on property values in Tucson

By Susan McGinley

You can spot Tucson's riparian areas from the air: winding bands of green that follow streams, washes and riverbeds. This network of watercourses attracts wildlife to the shade and shelter of its cottonwoods, mesquites, blue palo verdes, white thorn acacias and other plant species. Not surprisingly, houses border many riparian areas. As an interface between wet and dry areas in the desert, riparian corridors offer shade and shelter for animals and stabilize the soil. They also provide beauty and a sense of peace for homeowners.

This beautiful view translates to dollar values: buyers will pay a premium to live near riparian zones. Now, thanks to research conducted over the past four years at the University of Arizona, that premium can be quantified. The focus is a 100-square-mile area in northeast Tucson that includes 200 miles of riparian corridor, three school districts, and more than 45,000 single family residences. More than 9,000 of those homes were sold during the study period.

"We're looking at the type and amount of vegetation to see if the premium people are willing to pay varies with the vegetation, and it does," says Bonnie Colby, a professor in the Department of Agricultural and Resource Economics in the College of Agriculture and Life Sciences (CALs). "People will pay more for a cottonwood or a natural wash near their home."

Colby, Daniel Osgood (now at Columbia University) and Rosalind Bark, a graduate research associate in



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The type and amount of vegetation in riparian areas, such as the wash in the foreground above, can make a difference in property values.

the CALs Arid Lands Resource Sciences Ph.D. program have worked on a series of studies to characterize and assess the value of riparian areas in Tucson, to find out exactly which attributes of a riparian area command the highest value in a home sale.

"We checked the sale prices on just over nine thousand homes in the remote sensing area," Colby says. The range of values varied, with an average price of around \$200,000. "We were looking at whether one could see a systematic pattern that linked riparian characteristics to property values and if we could

statistically isolate these to estimate the value of this natural amenity."

By showing the benefit of riparian areas to the property values of single family residences, the team hopes to add yet one more reason to preserve these natural areas, which are endangered because of groundwater overdraft and the current drought. The impact of draining too much groundwater affects not only plant and wildlife and the condition of the soil, it also influences property values and quality of life in Tucson.

This research is a continuation and expansion of research initiated by the



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The study showed homeowners had decided that concrete-lined washes weren't an amenity; many put up walls to block the view.

Arizona Water Commission. For the past four years funding has been provided by SAHRA (Sustainability of semi-Arid Hydrology and Riparian Areas), a National Science Foundation, Science and Technology Center on campus.

The researchers used two methods to characterize heterogeneous vegetation in the study area: vegetation indices derived from Landsat remote sensing images and comprehensive site surveys at 51 riparian sites. The surveys determined the diversity of plant species, the presence of trees that require stable groundwater, the vegetation density, and other factors at each of the 51 sites.

To verify the accuracy of the satellite images, a collaborating team of biologists from Arizona State University's School of Life Sciences, under the direction of plant ecologist Juliet Stromberg, conducted ground-truthing. That process involves walking through sample sections of the study area to match the vegetation on the ground with the satellite images. Many of the washes, where the groundwater is shallow and can support vegetation, are endangered because of groundwater pumping, Colby says.

In studying how people's landscape choices were influenced by their proximity to riparian areas, the

researchers found that a home didn't need to be right next to a riparian area. The premium for a riparian amenity appeared to hold for homes located up to a quarter mile away, where people could still walk to a green wash or enjoy the view.

"People do pay a premium to live adjacent to a wash, or even nearby," Bark adds. "And it's not just how close you are, but also, what's the wash like? Is it natural or concrete? People put up back walls where the wash was ugly. They left them out if the wash was beautiful. It shows the homeowners themselves had decided it was not an amenity to live near a concrete wash."

In some cases homeowners actually took care of the wash because they considered it to be valuable.

"We'd see homeowners watering dirt washes because the trees were dying, because the normal flow had been diverted upstream by development," Bark says.

Throughout their research, which involves six years'-worth of data, Bark and Colby have controlled for the size of house, the school zone (Catalina Foothills, Tanque Verde and Tucson Unified), bathroom size, and other factors. All of the homes in the study

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were single-family dwellings, not apartments.

Overall the researchers noticed that people preferred a diversity of vegetation, and seemed to be willing to pay more for a home located near cottonwoods in particular, an advantage that is becoming harder to find.

"If you live near a wash that has cottonwoods, you may be paying a premium of more than eight percent," Colby says. "Native vegetation also commands a price. I've actually shared this information with realtors."

"In the remote sensing study we found people will pay more for a greener lot," Bark says. "There is also evidence that if the wash nearest a home is green, the owner of that home cares less about having a green lot, and vice versa." In the desert, there's a limited supply of natural green landscapes and people are willing to pay a premium for them, just like the golf courses."

Colby and Bark emphasize that premiums for the private benefits of riparian areas are affected by groundwater pumping. Less water in the wash translates into dead, unsightly vegetation.

"That's a case where preventing groundwater overdraft would actually protect private property values," Colby says. "It would be managed at the county level. Pima County is very interested in this work because they manage the flood plains and riparian area. There's a link between how we manage our groundwater and how we manage our natural resources." ❖

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