1 August 2012

Jeannie Wagner-Greven,
Lead Planner,
U.S. Fish and Wildlife Service,
P.O. Box 1306,
Albuquerque NM 87102

TUCSON AUDUBON SOCIETY

Leaders in conservation and education since 1949

Main Office
300 E. University Blvd., #120
Tucson AZ 85705
TEL 520.629.0510
FAX 520.623.3476

Tucson Audubon's Mason Center
3835 W Hardy Road
Tucson AZ 85742

Dr Paul Green
Executive Director
TEL 520.209.1801

pgreen@tucsonaudubon.org

Dear Ms Wagner-Greven

Tucson Audubon comments on proposed Lower San Pedro National Wildlife Refuge

The Tucson Audubon Society (TAS) is a 501(c)(3) non-profit NGO established in 1949 and representing approximately 5000 households scattered throughout the southeastern Arizona region, primarily in Pima County. Our mission is to protect and promote the stewardship of the biodiversity of southeast Arizona by connecting people to their natural world through the study and enjoyment of birds. TAS has partnerships with private and governmental entities and works to conserve and protect habitats where wildlife is at risk to the many factors that threaten their existence — habitat fragmentation, roads, development, exotic invasive species, fire, and watershed degradation. http://www.tucsonaudubon.org/

TAS appreciates the opportunity to comment on the proposed Lower San Pedro River Collaborative Conservation Initiative and National Wildlife Refuge. TAS supports this effort as the best possible partnership to steward the unique and irreplaceable resources of the lower San Pedro River Valley. Due to the high number of candidate, threatened, and endangered species associated with this river system, and the considerable investments in conservation easements and land use planning processes that have already occurred, the US Fish & Wildlife Service is the ideal lead agency to work with all the other stakeholders to conserve this most critically rare and important habitat type, and the ways of life and working landscapes that have historically sustained it, for current and future generations.

Conservation and Multiple Uses

The southwest is now the fastest growing area in the United States and Arizona is growing faster than most states. In order to maintain the resilience and flexibility of the ecosystem our human health depends upon we must seek a balance between uses that will enable certain scientifically identified lands to be preserved in perpetuity. There is certainly precedence for this approach. Not all public lands have a "multiple use ethic." Some are established in order to protect specific values, including natural hydro-geologic processes and wildlife. Wilderness areas, wildlife refuges, national parks, and national monuments are just a few of those areas, which have a more protective higher mandate than "multiple use."

The **Arizona Game and Fish Department's** Strategic Plan for the Years 2007–2012, ***Wildlife 2012***, states that the goals of its wildlife program are "to conserve and preserve wildlife populations and habitat; to provide compatible public uses, while avoiding adverse impacts to populations and habitat; to promote public health and safety; and to increase public awareness and understanding of wildlife resources."

The **National Park Service** mission is to "preserve unimpaired the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations."

The mission of the **BLM's National Landscape Conservation System**, which includes the Upper San Pedro River Riparian National Conservation Area (the Nation's first) and the Las Cienegas National Conservation Area, is "to conserve, protect, and restore these nationally significant landscapes that have outstanding cultural, ecological, and scientific values for the benefit of current and future generations." Again, the protection of these attributes is prioritized over other activities.

The entire region enjoys the various diverse habitats within the **Coronado National Forest**'s multiple units, much of which is designated multiple use. Yet even the very definition of "multiple use" in the Multiple-Use Sustained Yield Act of 1960 recognizes "that some land will be used for less than all of the resources; and harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of the land, with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output."

The **National Wildlife Refuge System Administration Act of l966** mandates the standard of compatibility, i.e.: uses of refuge lands must be determined to be compatible with the purposes for which individual refuges were established. This standard was later clarified in the National Wildlife Refuge System Improvement Act of 1997: Conservation is the priority, then various compatible uses.

We call your attention to the significant investment to conserve the cultural, historic, and biologic resources of the lower San Pedro River valley by private parties, non-profit organizations, and state and federal agencies. TNC's Spring 2010 map indicates 733,589 acres of public and private restoration and conservation sites encumbered by easements along the San Pedro River. It does not include all current conservation or archaeological easements. The lower San Pedro portion of TNC's easement legend is listed below.

1. San Pedro River Preserve: TNC is restoring this 6,900-acre property—formerly a catfish and pecan farm—and re-seeding it with native grass. Water is being restored to the river and the plant community is rebounding. Partner: Bureau of Reclamation.

2. Aravaipa Canyon: Flanked at either end by a TNC preserve, this 58,900-acre wilderness is noted for its majestic cliffs, bighorn sheep and a creek which supports a thriving population of native fish. Partners: Bureau of Land Management, Arizona Game and Fish Department.

3. H & E Land & Cattle: TNC is restoring the natural washes and native grasses on this 570-acre property, thereby improving the floodplain and returning water to the river. Partner: Arizona Department of Water Resources.

4. 7B Ranch: TNC is managing this 3,100-acre property to eliminate invasive species and restore its wetlands and the largest mesquite bosque remaining in the Southwest. Partners: Resolution Copper Company, US Fish & Wildlife Service, BLM.

5. Mercer Ranch Rancher: Mike Mercer has planted native grass along the river's floodplain and is using significantly less water than on previous crops. Partners: US Fish & Wildlife Service, Mercer family.

6. Buehman Canyon: From lands high up in the Santa Catalina Mountains, water flows down this canyon—a critical wildlife corridor—to feed the San Pedro. It is now in county ownership. Partners: Pima County, Forest Service.

7. Bingham Cienega: This restored spring-fed marsh sits on 285 acres with cattails, native grass, mesquite, cottonwood and willow. It is now in county ownership. Partner: Pima County.

8. A-7 Ranch: TNC originally purchased this 6,828-acre property to conserve the wildlife corridor extending from the forests of the Catalina Mountains to the river. It is now in county ownership. Partner: Pima County.

9. Hot Springs Canyon: Five landowners and TNC signed conservation agreements covering 1,700 acres of this critical wildlife corridor that connects the Muleshoe Ranch to the San Pedro River. Partners: Cascabel Hermitage Association, Saguaro-Juniper Association, BLM, private landowners.

10. Muleshoe Ranch Cooperative Management Area: TNC manages this 57,500-acre property in the Galiuro Mountains to restore native grasslands and streamside areas, creating excellent habitat for rare native fish. Partners: BLM, Forest Service, Arizona Game and Fish Department.

11. 3 Links Farm: TNC purchased and placed conservation easements on 2,209 acres, restricting future development and restoring water to the river. Now this once-dry, six-mile stretch of river is permanently flowing, and the beavers have returned. Partners: Bureau of Reclamation, Salt River Project, private landowners.

There is significant existing research documenting the economic importance of protected private and public land resources and the economic role of these lands, river valleys, playas and open spaces in supporting local economic health. Income from tourism is a sustainable source of income, assuming that the resource is managed and protected.

Ecosystem Services, Economics and Climate Change

The term **"Ecological values"** refers to clean air, clean and abundant water, fish and wildlife habitat and other values that are generally considered public goods. "**Ecosystem services**" include all the functions and natural processes performed by nature that provide biological diversity and benefit humans. Basic services include climate regulation, waste treatment, water supply, carbon sequestration, nutrient cycling, habitat provision and many others that all help modulate and regulate climate, weather and

various resources needed for human comfort, security and well-being. Wetlands, forests, grasslands, river systems, lakes, etc. all provide different levels of a myriad of environmental services.

Consider birds, which contribute irreplaceable ecosystem services: according to the American Bird Conservancy's 2007 report, "Birds play an important role in maintaining the ecosystems on which humans depend to maintain our quality of life and civilization. For example, birds eat billions of insects each year that left unchecked could decimate our crops. Birds also play an important role as pollinators, providing a fundamental service to agricultural production that simply cannot be replaced by other means. According to the Smithsonian Migratory Bird Center, birds eat up to 98 percent of budworms and up to 40 percent of all non-outbreak insect species in eastern forests. The value of this insect control has been estimated to be as much as $5,000 per year per square mile of forest." "Birds are also superb "canaries in the coal mine", or indicators of environmental health and change. Rapid declines in bird numbers have alerted us to the harm being caused to humans and the environment by toxic chemicals. And birds, by virtue of their insect control services, can help prevent the spread of insect-borne diseases such as malaria and dengue fever, both formerly prevalent in the wetlands of the arid southwest. The knowledge we gain from birds directly affects our quality of life and our understanding of how economic development can be made more environmentally sustainable." http://www.abcbirds.org/habitatreport.pdf

Maintaining sustainable rural and urban landscapes is important for the quality of life of all Arizonans. The results from the 2012 Colorado College State of the Rockies Conservation in the West poll find that Arizona voters across the political spectrum — from Tea Party supporters to those who identify with the Occupy Wall Street movement and voters in-between — support upholding and strengthening protections for clean air, clean water, natural areas and wildlife. Voters also view Arizona's parks and public lands as essential to their state's economy and quality of life. Sustainable forestry, agriculture and ranching practices can help to maintain and restore the vitality of our communities while also helping to preserve our culture, natural landscapes and ecosystems. It only makes common sense that it should be our general policy to support the maintenance, enhancement and restoration of ecosystem values and services throughout the state, focusing on the protection of land, water, air, soil and native flora and fauna upon which our human health and safety depend.

We encourage landowners within the lower San Pedro River watershed to explore gaining access to additional sources of revenue such as emerging ecosystem services markets that help landowners diversify their incomes, improve the ecological functions of their lands and pass along their lands and the lands' associated benefits to future generations. The term **"Ecosystem services market"** describes a system in which providers of ecosystem services can access financing to protect, restore and maintain ecological values.

Employment and economic opportunities are important in order to maintain our quality of life while providing assurances that development will occur in suitable locations so that ecological values will be maintained and improve. We must recognize the need for biological connectivity and the overall ecological viability of conservation and restoration efforts at a landscape scale, such as has already occurred along portions of the lower San Pedro River. The conservation and restoration of these rare

ecosystem services will help avoid carbon emissions, help address impacts associated with climate change and help natural resources adapt to these impacts.

It is widely accepted that the Sonoran ecoregion is currently in the throes of a profound drought and that these types of drought have occurred historically in the region. On June 23, 1999, the Arizona Division of Emergency Management declared a statewide drought emergency (PCA99006) which remains in effect as a "current open disaster" at this time. However, new findings appear to indicate that weather changes associated with global climate change may exacerbate the negative impacts of previous climate patterns. University of Arizona climate models document current, and predict future, above average warming trends in the Sonoran desert ecoregion which may exacerbate the extremes of previous precipitation patterns. Jonathan Overpeck, co-director of the University of Arizona's Institute of the Environment, was a lead author on the April 2007, Nobel Prize-winning Intergovernmental Panel on Climate Change's report linking atmospheric greenhouse gas increases to human activity. "The climate in the Southwest is changing faster than anywhere else in the U.S.," he said. "The implications of climate change have already started in Arizona. We'll have to deal with warmer temperatures, less precipitation and more drought . . . " "These temperature changes that are coming are huge, will demand a lot of water and will make the droughts of the past look pale because they will be so much hotter," he testified before the House Science and Technology Committee at a hearing on water supply challenges for the 21st century (AZ Daily Star 5/15/2008).

Published May 2008, the *Synthesis and Assessment Product 4.3 (SAP 4.3): The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity in the United States* (http://www.sap43.ucar.edu/) is the most extensive examination of the impacts of climate change on important U.S. ecosystems undertaken to date. It concludes that, in arid region ecosystems that have not co-evolved with a fire cycle, the probability of loss of iconic, charismatic mega flora such as saguaro cacti and Joshua trees will greatly increase and that:

- Climate change is already affecting U.S. water resources, agriculture, land resources, and biodiversity, and will continue to do so.
- Higher temperatures will negatively affect livestock. Warmer winters will reduce mortality but this will be more than offset by greater mortality in hotter summers. Hotter temperatures will also result in reduced productivity of livestock and dairy animals.
- Forests in the interior West, the Southwest, and Alaska are already being affected by climate change with increases in the size and frequency of forest fires, insect outbreaks and tree mortality. These changes are expected to continue. Much of the United States has experienced higher precipitation and streamflow, with decreased drought severity and duration, over the 20th century. The West and Southwest, however, are notable exceptions, and increased drought conditions have occurred in these regions.
- Weeds grow more rapidly under elevated atmospheric CO_2. Under projections reported in the assessment, weeds migrate northward and are less sensitive to herbicide applications.
- There is a trend toward reduced mountain snowpack and earlier spring snowmelt runoff in the Western United States.
- Invasion by exotic grass species into arid lands will result from climate change, causing an increase fire frequency. Rivers and riparian systems in arid lands will be negatively impacted.

- A continuation of the trend toward increased water use efficiency could help mitigate the impacts of climate change on water resources.
- The growing season has increased by 10 to 14 days over the last 19 years across the temperate latitudes. Species' distributions have also shifted.

Seager *et al*. (2007) examined future subtropical drying by analyzing the time history of precipitation in 19 climate models. Of the total of 49 individual projections conducted with the 19 models, even as early as the 2021–2040 period, only three projections show a shift to a wetter climate. These simulations provided initial conditions for 21st-century climate projections. In the multimodel ensemble mean, there is a transition to a sustained drier climate that begins in the late 20th and early 21st centuries in the southwestern United States and parts of northern Mexico. In general, large regions of the relatively dry subtropics dry further, whereas wetter, higher-latitude regions become wetter still. The American Southwest experiences a severe drying. This pattern of subtropical drying and moistening at higher latitudes is a robust feature of current projections with different models of future climate.

Seager explains the drying of subtropical land areas that, according to the models, is imminent or already under way is unlike any climate state we have seen in the instrumental record. It is also distinct from the multidecadal megadroughts that afflicted the American Southwest during Medieval times. The most severe future droughts will still occur during persistent La Niña events, but they will be worse than any since the Medieval period, because the La Niña conditions will be perturbing a base state that is drier than any state experienced recently (Seager *et al*. 2007, Science, 25 May 2007, Vol. 316, pp. 1181-1184).

Powell, in his 2011 *Pima County Inventory of Conserved Open Space Perennial Water,* found that the county's San Pedro open space lands contained significant springs and tinajas that may contribute to adapting to climate change: Youtcy Spring, where Lowland leopard frogs were found; two tinajas each in Youtcy Canyon and Espiritu Canyon; Grapevine Spring; and tinajas/pools in Buehman and Bullock Canyons, where Lowland leopard frogs and Longfin Dace were found. All of these sources contribute to the surface water availability in the San Pedro watershed. Powell states that the results of the census indicate there is an average of one source of perennial water for every 20,000 acres of county owned open space. He says, "This does not discount the importance of sites with intermittent or ephemeral surface water. These areas can be crucial resources for a wide range of resources. For example, ephemeral surface water, which sometimes remains for only a few weeks, is used almost exclusively by most of the Desert Toads (family Bufonidae). These surface water resources play critical a critical role in a host of ecosystem functions such as dispersal of aquatic animals, nutrient cycling, and sediment movement." Powell goes on to report that regional models predict a 10-20% decrease in annual precipitation less, primarily decreasing winter rains, and more severe summer monsoons resulting in drying of already stressed ecosystems. Water resources are and will increasingly be the single most important feature of southwestern landscapes.

Our natural resources provide food and shelter, flood control, water filtration, clean air, fish and wildlife habitat, recreational opportunities, aesthetic benefits, jobs, and a higher quality of life for all. Science has demonstrated the importance of these natural resources to our daily lives. The adverse impacts of climate change may stress some natural resources and systems to the point that they may struggle to

adapt and provide ecosystem services. It is necessary to conserve and manage to improve the overall health of our natural resources in order to maintain these resources for the health, welfare, and enjoyment of present and future generations.

Watchable Wildlife Economics

One of the Arizona Game and Fish Department's recreation strategies is to "Identify, assess, develop and promote watchable wildlife recreational opportunities." Audubon Society members enjoy wildlife viewing and think it is critically important to protect wildlife habitat and ensure sustainable populations of the full spectrum of native wildlife species.

You might be surprised to learn that birding leads ALL other recreational activities in promoting the economic growth of ecotourism in Arizona.

In a 2006 study, the Outdoor Industry Foundation reported that all outdoor wildlife-related recreational activities generated $730 billion annually for the United States economy, and of that, watchable wildlife generated $43 billion annually. They reported 66 million Americans participated in wildlife viewing, which supported 466,000 jobs. Estimated economic returns included retail sales averaging $8.8 billion, trip related expenditures of $8.5 billion, and state and federal tax receipts of $2.7 billion. The report is available at http://www.outdoorindustryfoundation.org./ Although much of this economic impact is due to outdoor recreation, other visitors may come to these areas for sight-seeing, for family gatherings, for educational benefits and for many other values not captured by the category of outdoor recreation.

Outdoor recreation, natural resources conservation and historic preservation in the United States all have measurable economic impacts. According to a 2011 study by the National Fish and Wildlife Foundation, http://www.nfwf.org/Content/ContentFolders/NationalFishandWildlifeFoundation/HomePage/ConservationSpotlights/TheEconomicValueofOutdoorRecreation.pdf, a minimum estimate of the combined value of outdoor recreation, nature conservation and historic preservation shows that over 9.4 million jobs were created while $107 billion was generated by local, state and federal tax revenues resulting in a minimum total economic impact nationally of $1.6 trillion! Outdoor recreation sales (gear and trips combined) of $325 billion per year are greater than annual returns from pharmaceutical and medicine manufacturing ($162 billion), legal services ($253 billion), and power generation and supply ($283 billion).

For example, the total value of ecosystem services provided by the acreage of natural habitats in National Wildlife Refuges in the United States totaled $32.3 billion/year, or $2,900 thousand/acre/year (Ingraham and Foster, 2008). The U.S. Fish and Wildlife Service contributed about $4.2 billion in economic activity and supported over 32,000 jobs through their management of 553 National Wildlife Refuges and thousands of smaller natural areas in the United States. In fact, the total amount of ecosystem services provided by these categories of natural land amount to about $1.6 trillion, which is more than 10% of the GDP in 2009 when land in the contiguous United States is tallied. One detailed study of visitation to National Wildlife Refuges (Caudill and Henderson, 2005) looked further into the impacts on the local communities around these reserves in 2004. In 2004, there were 36.7 million

visitors who generated $1.64 billion of economic activity in regional economies. Caudill and Henderson went further into their analysis and showed that about two-thirds of the total expenditures were generated by non-consumptive activities and not fishing (27%) or hunting (5%), which illustrates the value these natural areas have for passive enjoyment of nature. The authors also conducted willingness-to-pay studies to determine the value of these refuges beyond what it actually cost them to visit. They found that visitors showed a consumer surplus of more than $1.3 billion, with $816 million of this amount attributed to non-consumptive visitation.

The most recent economic analysis using US Fish and Wildlife Service data calculated by Arizona county states that ecotourism is worth over $1.5 billion dollars to Arizona each year — over $300 million in Pima County, over $95 million in Pinal County, and over $25 million in Cochise County each year. http://tucsonaudubon.org/images/stories/conservation/AZ_County_Impacts_-_Southwick.pdf. This analysis revealed that Arizona created 15,058 full and part-time jobs and accounted for salaries and wages of $429,391,051, or nearly $430 million in total household income. Arizona engendered over $57 million in state taxes (state sales taxes of $46,756,837 and state income taxes of $10,821,828) and federal income taxes of $75,544,307. Home owners near parks and protected areas are repeatedly seen to have property values more than 20% higher than similar properties elsewhere.

Habitat Fragmentation

Unfragmented landscapes are key indicators developed by biologists in assessing the conservation value of regions and sites and the imminence of the threats they face (Baker, 2010). Large blocks of habitat have the potential to sustain viable species populations and they permit a broader range of species and ecosystem dynamics to persist, such as natural and proscribed fire regimes. Studies have shown that even specialized species such as neo-tropical migrants are using the entire watershed, not just the "green ribbon" created by the lower San Pedro River valley (LSPRWA, 2006).

Harvard's Richard Forman pioneered studies showing that roadway and infrastructure construction and maintenance fragments habitat and can adversely impact flora and fauna by interruption of wildlife movement and migration, clearing of native vegetation, increased human and vehicular traffic in the area of impact, introduction of invasive species, light and sound impacts, and negative edge effects.

Some of the best available scientific information is being incorporated by the 2008 Western Governors Association Wildlife Corridors and Crucial Habitat Initiative (http://www.westgov.org/index.php?option=com_content&view=article&id=123&Itemid=68) and the national award winning Arizona Wildlife Linkages program (http://www.azdot.gov/Highways/OES/AZ_WildLife_Linkages/map.asp), spearheaded by the Arizona Department of Transportation (ADOT) and the Arizona Game & Fish Department (AGFD).

TNC's 2012 map illustrating the cumulative impacts of levels of fragmentation of habitat in New Mexico and Arizona tells a tale. The habitat block bordering the eastern aspect of the lower San Pedro watershed is the second least fragmented area in the combined states of Arizona and New Mexico. Only the habitat block surrounding the Grand Canyon is larger less fragmented by roads and transmission lines.

Riparian Habitat

TAS is engaged in wildlife and conservation issues and focus on research, education, advocacy, recreation, and conservation through habitat protection and restoration, with specific emphasis on the importance of riparian systems to migratory species, especially birds, in the arid southwest. Southwestern riparian habitats, the lush ribbons of vegetation running along our streams and rivers, contain the highest density and diversity of bird species outside tropical rain forests.

The Arizona Department of Environmental Quality (ADEQ), pursuant to A.C.C. R18-11-112, has designated "unique waters" or "Outstanding Arizona waters" as having exceptional recreational or ecological significance and/or providing habitat for threatened or endangered species. Designations include Aravaipa Creek from its confluence with Stowe Gulch to the downstream boundary of Aravaipa Canyon Wilderness Area (Aravaipa Canyon and Lower San Pedro basins) and Buehman Canyon Creek from its headwaters to approximately 9.8 miles downstream (Lower San Pedro Basin).

The **American Bird Conservancy**'s report on the "***Top Twenty Most Threatened Bird Habitats in the United States***" lists Southwestern Riparian Habitat as the **fifth** most threatened in the nation. This increasingly rare habitat type, epitomized by the Lower San Pedro River watershed, is described as occupying only a tiny fraction of the land area while supporting the largest concentrations of animal and plant life, and the majority of species diversity in the desert southwest, a designated "hotspot" of biological diversity. The report states "The scarcity of water in the Southwest makes rivers and streams particularly important for sustaining the region's communities. This dependence places a severe strain on natural ecosystems. Achieving riparian habitat conservation depends on public agency buy-in to broad-scale land management plans and the successful provision of incentives to private property owners to restore their degraded land. Riparian areas take time to recover… Currently, though, efforts to restore riparian areas are being considerably outpaced by the rate at which they are being lost, making these vibrant ecosystems an ever-rarer feature of the Southwest." http://www.abcbirds.org/newsandreports/habitatreport.pdf.

The **Arizona Partners in Flight (AzPIF)** ***Bird Conservation Plan*** states, "Riparian woodlands comprise a very limited geographical area that is entirely disproportionate to their landscape importance, recreational value, and immense biological interest (Lowe and Brown 1973). It has been estimated that only 1% of the western United States historically constituted this habitat type, and that 95% of the historic total has been altered or destroyed in the past 100 years (Krueper 1993, 1996)… Riparian woodlands are among the most severely threatened habitats within Arizona . . . Maintenance of existing patches of this habitat, and restoration of mature riparian deciduous forests should be among the top conservation priorities in the state".
http://www.azgfd.gov/pdfs/w_c/partners_flight/APIF%20Conservation%20Plan.1999.Final.pdf

Riparian woodlands in the desert southwest are an extremely important resource because they constitute <1% of the desert landscape, yet typically support >50% of the breeding birds. Indeed, the positive effects of even a degraded riparian area in central Arizona extend up to 1 km into the adjacent uplands (Szaro and Jakle 1985). Riparian woodlands also provide shelter and critical food resources for

dozens of species of migratory birds that stop in these woodlands during their spring and fall migrations. From 2006 – 2008, Kirkpatrick *et al* found that riparian areas contained 68% more species and 75% more individual birds compared to adjacent uplands, with this pattern holding true for both the breeding and non-breeding bird communities. They believe:

> "First, should long-term drought conditions persist and/or ground water levels fall to the point where surface water flows are reduced or eliminated, populations of breeding (e.g., Black Phoebe, Common Yellowthroat, Yellow Warbler, Song Sparrow, and Lesser Goldfinch) and migrant (e.g., Yellow-rumped Warbler and Wilson's Warbler) species are likely to decline. Second, should long-term drought conditions persist and/or ground water levels fall to the point that riparian vegetation is negatively affected, populations of breeding species such as Bell's Vireos, Yellow Warblers, and others are likely to decline… Three species that inhabit low-elevation riparian woodland are considered Arizona PIF priority species: Southwestern Willow Flycatcher (*Empidonax traillii extremus*), Western Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*), and Lucy's Warbler (*Vermivora luciae*). The Southwestern Willow Flycatcher and the Western Yellow-billed Cuckoo are considered wildlife of special concern in Arizona . . . and are federally listed as endangered and candidate species, respectively (Federal Register 1996) . . . An additional 8 species that inhabit low-elevation riparian woodland are considered Arizona PIF preliminary priority species: Brown-crested Flycatcher (*Myiarchus tyrannulus*), Northern Beardless-tyrannulet (*Camptostoma imberbe*), Bell's Vireo (*Vireo bellii*), Yellow Warbler (*Dendroica petechia*), Rufous-winged Sparrow (*Aimophila carpalis*), Abert's Towhee (*Pipilo aberti*), and Summer Tanager (*Piranga rubra*)."

Some 80 percent of vertebrate species in the arid southwest region are dependent on riparian areas for at least part of their life cycle; over half of these cannot survive without access to riparian areas (Noss and Peters 1995). Arizona and New Mexico have lost 90 percent of pre-settlement riparian ecosystems (Fig 3e, Noss et al. 1995). The Nature Conservancy lists the Fremont cottonwood-Gooding willow riparian community as highly imperiled. In Arizona and New Mexico, more than 100 federally and state listed species are associated with cottonwood-willow bosques (Noss and Peters 1995).

Among US Federal register notices listing plants and animals as endangered species, water impoundment and diversion are among the most frequently cited threats mentioned. Inundating vegetation in reservoirs behind dams and changes in river flow are among the most severe pressures on threatened plants and nesting birds in the US/Mexico borderlands. The regional decline of 36 of the 82 breeding bird species which formerly used riparian woodlands is a case in point. In combination with water diversion, groundwater pumping has affected nearly all river valleys in Arizona's portion of the Sonoran Desert. In the heart of agricultural areas, groundwater overuse has been most precipitous, leading to ground subsidence, salinization and the demise of riparian forests (Nabhan and Holdsworth 1998, p. 2).

According to Webb, Leake, & Turner (2007, *The Ribbon of Green*, Tucson: University of Arizona Press, p. 223), "Riparian vegetation has generally increased along the [San Pedro] river north of the U.S.-Mexico border . . . [and] closely follows the alternating pattern of perennial-ephemeral flow that characterizes

this watercourse along its greater than 150-mile length in Arizona " Moreover, " . . . the case of riparian vegetation change on the San Pedro River represents one of the largest increases in woody riparian vegetation in the Southwest. Many researchers have noted that this river, once swampy, now sustains a verdant forest."

Key Ecological Attributes of the San Pedro River Valley

The San Pedro River heads in Sonora, Mexico and flows northward for approximately 100 miles to its confluence with the Gila River near the Town of Winkelman, Arizona. It is the last major undammed river in the American Southwest, and exhibits a remarkably intact riparian system including extensive stands of Fremont cottonwood (*Populus fremontii*)/ Goodding's willow (*Salix gooddingii*) gallery forest and large mesquite (*Prosopis velutina*) bosques. Duncan and Slagle (2004) describe the San Pedro River as one of the most significant perennial undammed desert rivers in the United States.

An approximately 40-mile reach of the upper San Pedro River between the International Boundary and St. David is encompassed by the BLM's San Pedro Riparian National Conservation Area (RNCA), the first one of only two RNCAs in the nation. The San Pedro RNCA was designated in order to protect the " . . . unique riparian area and the aquatic, wildlife, archeological, paleontological, scientific, cultural, educational, and recreational resources of the public lands surrounding the San Pedro River."

In special recognition of the San Pedro RNCA's extraordinary avian diversity, it was designated North America's first Globally Important Bird Area by the American Bird Conservancy, in conjunction with the Audubon Society, in 1996. A Monitoring Avian Productivity and Survivorship (MAPS) bird banding and research site has been established on the San Pedro RNCA.

The San Pedro River serves as a corridor between the Sky Islands of the Madrean Archipelago in northern Sonora and southern Arizona in its southernmost reaches and, in the north, Arizona's Central Highlands. The river is not only a major corridor between varied habitat types and ecoregions; it represents a ribbon of water and riparian vegetation in an otherwise arid environment. The river thus exhibits a remarkably high biodiversity, both in resident and migratory species.

Over 100 species of breeding birds and another approximately 250 species of migrant and wintering birds occur in the area, representing roughly half the number of known breeding species in North America. The San Pedro River serves as a migratory corridor for an estimated four million migrating birds each year.

Notably, 36 species of raptors, including the Gray Hawk (*Asturina nititda* = *Buteo nitidus*), Mississippi Kite (*Ictinia mississippiensis*), Common Black Hawk (*Buteogallus anthracinus*), and Zone-tailed Hawk (*Buteo albonotatus*) can be found within the San Pedro River watershed. Regarding the Gray Hawk, the San Pedro RNCA is thought to support 40 percent of the nesting Gray Hawks in the United States. The lower San Pedro River, like the upper reaches, also supports appreciable numbers of nesting Western Yellow-billed Cuckoos (*Coccyzus americanus occidentalis*), currently a candidate for Federal listing as a threatened or endangered species. The abundance of mammals, reptiles, and amphibians is also high; over 80 species of the former and more than 40 species of the latter. Fourteen species of native fish formerly occurred in the San Pedro River; two persist today. The upper reaches of the San Pedro River

and its watershed also support populations of the endangered Huachuca water umbel (*Lilaeopsis schaffneriana* var. *recurva*), a semi-aquatic plant.

Investigations conducted in the 1940s and 1970s documented between 95 and 111 bird species solely within the approximately 3500 acre mesquite bosque currently owned by BHP-Billiton (Arnold 1940, Gavin and Sowls 1975). The lower reaches of the San Pedro River are currently subject to intensive survey efforts, largely conducted by Arizona Game and Fish Department biologists, for the endangered Southwestern Willow Flycatcher (*Empidonax traillii extimus*). Its mission to control insects in riparian areas is an essential function benefiting people as well as plant life.

River and stream impoundments, ground water pumping, and overuse of riparian areas have altered up to 90 percent of the flycatcher's historical habitat. The aforementioned survey effort has shown the reach between Three Links and the Gila River confluence to be densely occupied by Southwestern Willow Flycatchers. Indeed, in 2005, the most-recent year for which complete survey data have been summarized, the reach thus described contained 164 Southwestern Willow Flycatcher territories consisting of 307 adult birds (English *et al*. 2008). These lower reaches thus contain over 99 percent of the Southwestern Willow Flycatcher territories on the entire San Pedro River within the United States. The San Pedro RNCA hosted the remaining < 1 percent of the territories (one) and adults (a single pair). It must be noted that the middle reaches of the river, between St. David and Three Links, are largely unsurveyed due to limited habitat and poor access to private lands. Little to no surveys are conducted in Sonora.

The high importance of the lower San Pedro River for the recovery of the Southwestern Willow Flycatcher contributed to its designation as critical habitat for the species. The current critical habitat includes approximately 60 river miles of the lower San Pedro River between a point approximately 3.5 river miles south of Hot Springs Canyon to the Gila River confluence. In 2011, the US Fish & Wildlife Service proposed to redesignate (and increase the length of) Southwestern Willow Flycatcher critical habitat over a 79-mile reach of the lower San Pedro River.

The Aravaipa area includes over 500 species of plants and birds, 45 mammals, and 67 amphibians and reptiles. Aravaipa Creek is a major tributary to the lower San Pedro River and contains an intact native fish assemblage, including the endangered spikedace (*Meda fulgida*) and loach minnow (*Tiaroga cobitis*). The presence of a robust population of these fishes in Aravaipa Creek, and the largely unregulated hydrology of its waters, led to a 46.1-mile reach of Aravaipa Creek and its upper tributaries — Deer Creek and Turkey Creek — being designated as spikedace critical habitat. Similarly, critical habitat for these species exists within Hot Springs Canyon (5.8 miles plus 3.4 additional miles within Bass Canyon, an upper tributary) and in Redfield Canyon (4.0 miles). Hot Springs and Redfield canyons are tributaries to the lower San Pedro River near Cascabel.

The protection of riparian resources and the desire to provide flood protection and plentiful clean drinking water to the residents of the Phoenix valley and others is what originally prompted the Salt River Project (SRP, a utility) and the Bureau of Reclamation (BOR) to purchase and conserve federally required mitigation lands along the lower San Pedro River. These lands are encumbered by easements and are specifically managed to conserve Southwestern Willow Flycatchers and mitigate for the impacts

of the rising waters associated with the construction of the Roosevelt Dam and flooding territories there. The BLM and the BOR own disjunct parcels within the reach. TNC and the BLM also own and co-manage lands within the Aravaipa Canyon and Muleshoe Ecosystem Management Areas, both located on major tributaries to the lower San Pedro River.

TNC has identified the San Pedro River as "One of the Last Great Places".

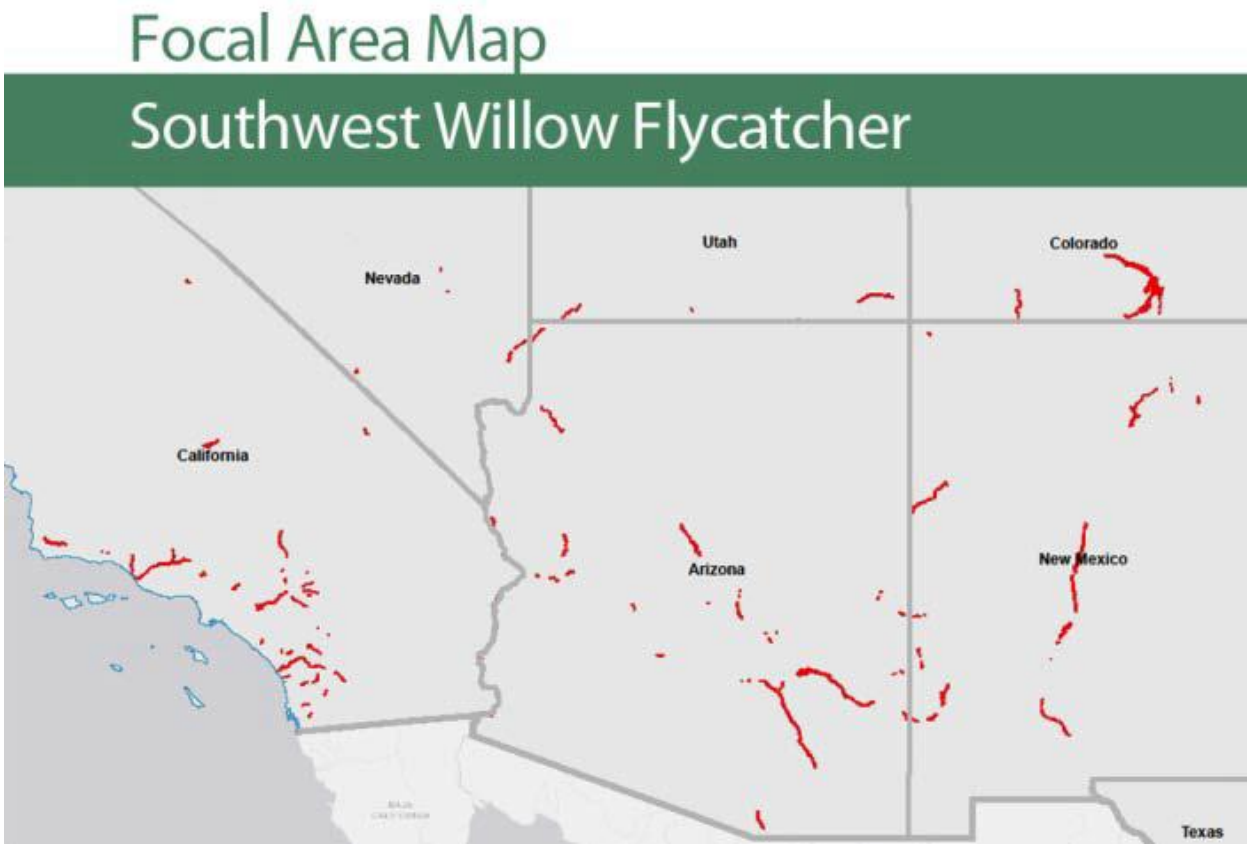
TNC is working with the U.S. Fish and Wildlife Service's Partners for Fish and Wildlife Program to restore an artesian spring-fed Cienega (wetland) and reestablish endangered Gila topminnow (*Poeciliopsis occidentalis occidentalis*) and lowland leopard frog (*Rana yavapaiensis*) on the 7B Ranch.

The Department of Interior's **American Great Outdoors (AGO) Initiative** http://americasgreatoutdoors.gov/ will focus on the three areas in the desert borderlands: the Malpais Borderlands, the Upper San Pedro River, and the Lower San Pedro River. The AGO Initiative operates from the premise that protection of our natural heritage is a non-partisan objective shared by all Americans. It turns to communities for local, grassroots conservation initiatives that also promote recreational opportunities which support sustainable economies based on working landscapes, cultural and historic heritage and ecotourism.

The Department of Agriculture's (USDA) Natural Resource Conservation Districts (NRCDs) and the US Fish & Wildlife Service (Service) have revealed their new **Working Lands for Wildlife Habitat Initiative** www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/financial/whip/?&cid=stelprdb1046975 which, in Arizona, will focus on cooperative efforts to assist ranchers and farmers in preserving their heritage and way of life while strengthening rural economies and conserving the Southwestern Willow Flycatcher (*Empidonax traillii extimus*), a small Neotropical migratory bird that breeds in the arid southwestern United States. Arizona recognizes it as a "species of greatest conservation need." It was listed as Endangered under the Endangered Species Act on February 17th, 1995.

The Endangered Species Act, sec. 3, defines critical habitat as:

1) the specific areas . . . on which are found those physical or biological features
   a) essential to the conservation of the species and
   b) that may require special management consideration or protection, and
2) specific areas outside the geographic area occupied by a species at the time it is listed, upon determination that such areas are essential for the conservation of the species.



The destruction of tropical rain forests where the flycatcher winters makes the conservation of breeding habitats in the southwest United States even more urgent. Interestingly enough, the survival of riparian ecosystems may depend on the flycatcher as well. “Studies have shown that predation on insects by birds actually results in the improved health of trees and forests,” said Bill Howe, nongame migratory bird coordinator for the Fish and Wildlife Service’s Southwest Region. “The Southwestern Willow Flycatcher and other insectivorous birds in riparian woodlands consume huge numbers of insects per day, including mass quantities of mosquitoes.” The San Pedro Watershed's ecosystem services are extraordinary and offer tremendous biodiversity at the confluence of four different ecosystems. The entire river is a "Keystone" Transition Zone. The lower San Pedro River supports appreciable biodiversity, especially avian, and has recently been the subject of a ground-breaking study by the EPA which determined that the lower San Pedro River surpassed even the Middle Rio Grande River in biodiversity.

Led by Dr. William Kepner of the EPA, scientists from the University of New Mexico and elsewhere have modeled the San Pedro River watershed as one of only two test areas in the nation, mapping metrics reflecting ecosystem services and biodiversity features using U.S. Geological Survey Gap Analysis Program data, including land cover, land stewardship, and deductive habitat models for terrestrial vertebrate species. Mapping and quantifying ecosystem services have become strategic national interests for integrating ecology with economics in order to help explain the effects of human policies and the subsequent impacts on both ecosystem function and human welfare.

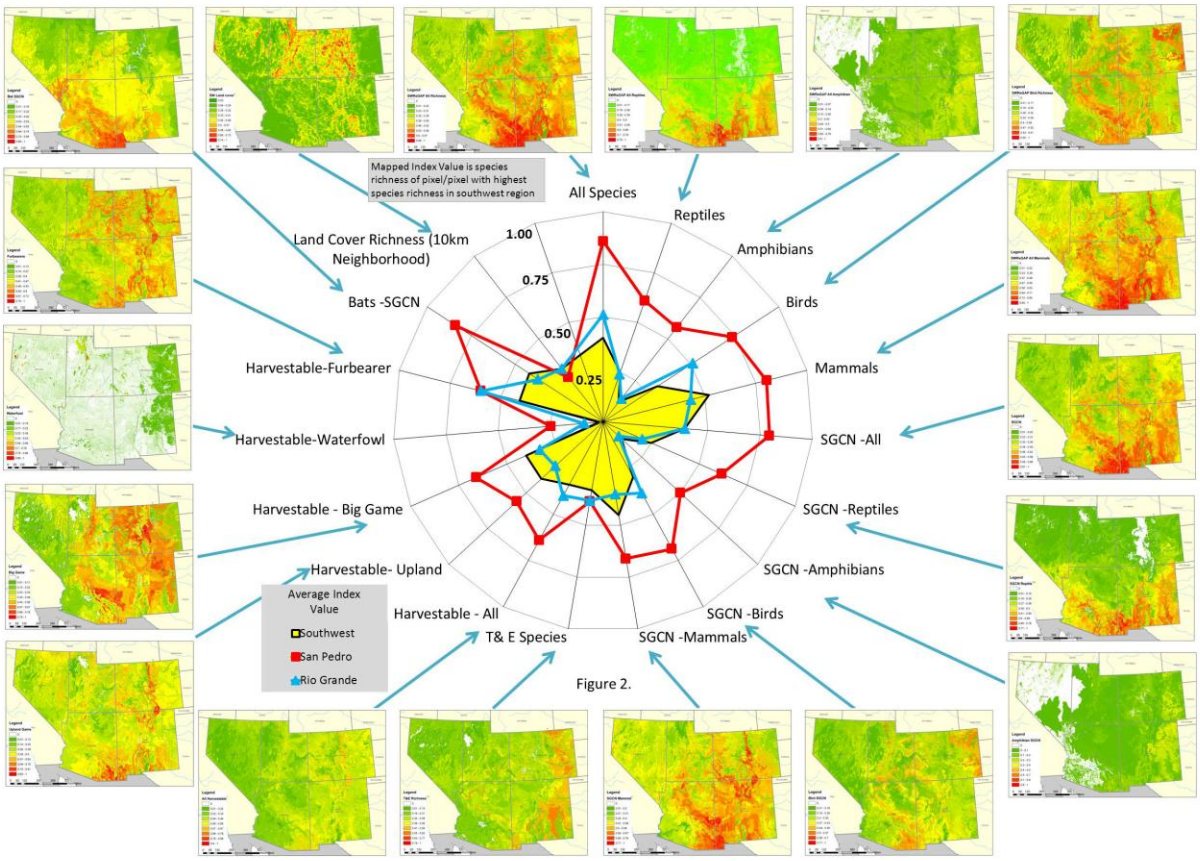


Figure 2.

Biodiversity Metrics for Southwest Region portrayed as a Radar Graph May 2011

Important Bird Area (IBA) Designation

IBA designation is particularly relevant to protecting critical habitat utilized by birds during some part of their life cycle (breeding, feeding, nesting, and migrating) as well as conserving the general biodiversity of wildlife species. Migration and molt are very taxing on birds, and for some species migration is the time of greatest mortality.

To date, of the 2,500 state level Important Bird Areas identified nationally, only 449 have been prioritized as Global Important Bird Areas. These sites include Important Bird Areas significant for over 65 globally threatened species. Global and Continental Important Bird Areas are determined through a prioritization process, which involves the review of identified State-level Important Bird Areas by the U.S. IBA Technical Committee - they represent high priority sites for conservation actions. See http://aziba.org/?page_id=32 and http://www.audubon.org/bird/iba/prioritizedibas.htm.

Tucson Audubon established and, in partnership with Audubon Arizona, continues to implement the Arizona component of the global Important Bird Areas (IBA) Program, initiated in 1982 by BirdLife International. Arizona IBA Program offices work with diverse partners on issues and specific projects for the conservation of Important Bird Areas in Arizona to promote win-win objectives for people, wildlife, communities, and sustainable economies. The Audubon network within Arizona has thus far established 42 Important Bird Areas in our state (eight of which have Global IBA status) covering 3.38 million acres

of habitat. Each is established using strict standards and scientific data and is peer reviewed by an independent panel of scientists. TAS and Audubon Arizona have partnered with the Arizona Game and Fish Department to gather scientific data to identify and set science-based priorities for habitat conservation and to promote positive action to safeguard and protect significant bird habitats. TAS leads the Avian Science Initiative while maintaining the Arizona IBA Bird Survey Database and website http://aziba.org/.

Lower San Pedro River IBA

Identified as an IBA in January of 2007, the lower San Pedro River was scientifically peer reviewed and subsequently designated as a **Globally Important Bird Area** in January of 2008 http://aziba.org/page_id=461 Western rivers are increasingly imperiled and provide critical resources for migratory pollinators traveling the hemispheric flyways. In the arid southwest, the San Pedro River is unsurpassed in importance.

The Lower San Pedro River IBA's southern boundary begins at 3 Links Farms in Cochise County and follows the San Pedro River downstream, north, through Pima and Pinal counties to Winkelman. Ownership and management of lands along the lower San Pedro River is mixed. Lands along the lower San Pedro, however, are predominately in private ownership. Some of the private lands are essentially wild while others support mining, farming, livestock operations, and/or residences. Only select properties in public ownership or under conservation easement and management are specifically included in the 51.2 square mile, 32,762 acre IBA.

This site is important to numerous special status avian species including the Northern Beardless-Tyrannulet (*Camptostoma imberbe*) and Brewer's Sparrow (*Spizella breweri*). It is comprised of a rare, unique, or exceptional representative habitat/ecological community — a low elevation riparian river. The IBA hosts significant concentrations of breeding birds: Southwestern Willow Flycatchers at >40% Arizona breeding population, Mississippi Kites at >40% Arizona breeding population and Gray Hawks at >30% Arizona breeding population. Land birds occurring in significant numbers/density and/or diversity include Bell's Vireo and Yellow Warblers.

Arizona Wildlife Action Plan Species of Conservation Concern in the Sonoran Desert include: Mississippi Kite (*Ictinia mississippiensis*), Gray Hawk (*Asturina nititda* = *Buteo nitidus*), Common Black Hawk (*Buteogallus anthracinus*), Belted Kingfisher (*Ceryle alcyon*), Tropical Kingbird (*Tyrannus melancholicus*), Thick-billed Kingbird (*Tyrannus crassirostris*), and Desert or Western Purple Martin (*Progne subis*). Other State Species of Concern include Red-naped Sapsucker (*Sphyrapicus nuchalis*), Olive-sided Flycatcher (*Contopus cooperi*), and Zone-tailed Hawk (*Buteo albonotatus*).

Continental Species of Concern include: Elf Owl (*Micrathene whitneyi*) with 40 breeding pairs/120 individuals, Western Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*) with 20 breeding pairs/60

individuals, Southwestern Willow Flycatcher (*Empidonax traillii extimus*) endangered in Arizona with 20 breeding pairs/60 individuals, Lucy's Warbler (*Vermivora luciae*) with 40 breeding pairs/120 individuals, and Abert's Towhee (*Melozone aberti*) with 40 breeding pairs/120 individuals.

Global Species of Concern, for which the IBA was globally recognized: Bell's Vireo (*Vireo bellii*) (IUCN NT and Audubon WatchList Red) with 30 breeding pairs/90 individuals.

Vegetation communities include iconic cottonwood-willow gallery riparian forests and mesquite (*Prosopis juliflora)* bosque woodland terraces along the San Pedro River, mixed broadleaf forests in tributary canyons and washes, Upper Sonoran desert scrub on lower elevation uplands, Sonoran and Chihuahuan semi desert grasslands at intermediate elevations and Madrean oak woodlands in the surrounding mountain ranges. Conifer forests occur at the very highest elevations. This largely unfragmented watershed includes habitats representing the Chihuahuan Desert, Sonoran Desert, Southern Arizona Semi-desert Grassland, and Mexican Oak-Pine Woodland and Oak Savannah, all of which join together in the lower San Pedro River valley.

Saguaro (*Cereus gigantea*), Foothill and Blue Palo Verde (*Cercidium microphyllum* and *C. floridum*), Ocotillo (*Foquieria splendens*), and a variety of cacti and small shrubs cover the Sonoran desert uplands. Mesquite (*Prosopis* spp), Catclaw Acacia (*Acacia greggii*), Burrobush (*Hymenoclea monogyra*), and Desertbroom (*Baccharis sarothroides*) line xeric washes, while Goodding Willow (*Salix gooddingii*), Fremont Cottonwood (*Populus fremontii*), Velvet Ash (*Fraxinus velutina*), and Netleaf Hackberry (*Celtis reticulata*) cluster along wetter drainage ways, interspersed with Sonoran Desert grassland typified by grama grasses (*Boutaloua spp.),* Three-awns (*Aristida spp.)*, and *Mulenberghia spp.*

Cochise County IBA parcels include the **Three Links Farm** consisting of 2,156 acres that lie along the San Pedro River. It was purchased by The Nature Conservancy (TNC) as part of their long-standing program to protect the San Pedro River and its riparian habitat. Here the banks of the San Pedro are lined by an exceptional Fremont cottonwood-Goodding willow forest and mesquite bosque. This River's forest is host to 345 species of birds including 13 species of breeding raptors, and is a major migratory pathway for Neotropical birds such as Gray Hawk and the rare Yellow-billed Cuckoo. It is also the residence for more than 80 species of mammals, 40 species of reptiles and amphibians, 100 species of butterflies and 20 species of bats. Beaver have migrated to the property since the Conservancy's acquisition. Three Links is a retired farm that has had 836.9 acres placed in permanent conservation easements by TNC. The easements encompass six linear miles of the San Pedro River (9.75 kilometers) sub-divided into five parcels sold to conservation owners. Agricultural wells have been dismantled, and the majority of the fields are becoming dominated by mesquite vegetation. The river has been fenced from livestock and is a mix of closed canopy cottonwood/willow gallery forest with an open understory of tamarisk and hackberry, ash and Arizona Walnut and segments of willow stands. The uplands are Chihuahuan Desert Scrub typified by Creosote Bush (*Larrea*), Black Brush and Yucca (*Yucca elata*). Two one kilometer long transect lines following the river channel have been established at this property. TNC is collecting riparian vegetation data at established transects that cross-section the river.

Pima County properties include the county owned **Bingham Cienega** — a small 503 acre parcel with an artesian fed spring, the site has a small marsh habitat and mature gallery cottonwood/willow forest

along the river channel. Pima County is actively restoring riparian and sacaton wetland ecosystems. A fire in 2004 burned the willow and tamarisk vegetation around the marsh that was suitable Southwestern Willow Flycatcher habitat. Pima County also owns and manages the 41,000 acre A-7 Ranch, the 12,000 acre Six Bar Ranch, and the 1000 acre Buehman Canyon, all tributary to the lower San Pedro River.

The uplands from Pima County north are Sonoran Desert Scrub and mixed cactus habitats. Saguaro (*Cereus gigantea*), Foothill and Blue Palo Verde (*Cercidium microphyllum* and *C. floridum*), Ocotillo (*Foquieria splendens*), and a variety of cacti and small shrubs cover the uplands. Mesquite (*Prosopis juliflora*), Catclaw Acacia (*Acacia greggii*), Burrobush (*Hymenoclea monogyra*), and Desertbroom (*Baccharis sarothroides*) line xeric washes, while Goodding Willow (*Salix gooddingii*), Fremont Cottonwood (*Populus fremontii*), Velvet Ash (*Fraxinus velutina*), and Netleaf Hackberry (*Celtis reticulata*) cluster along wetter drainage ways interspersed with Sonoran Desert grasslands typified by grama grasses (*Boutaloua spp.),* Three-awns (*Aristida spp.)*, and *Mulenberghia spp.*

Pinal County contains the majority of identified properties within the IBA. **San Manuel Crossing** is a small BLM parcel (160 acres) in Township 9 South and Range 18 East; Southeast Quarter of Section 31 and Township 10 South and Range 18 East, Southwest Quarter of the Northwest Quarter Section 6. One 1 kilometer long transect line following the river channel has been established at this property. A mile further south from this location is a property acquired by Salt River Project (SRP) for Southwestern Willow Flycatcher and Western Yellow-billed Cuckoo mitigation known as **Spirit Hollow** that encompasses approximately one linear kilometer of river located at Township 10 South and Range 18 East; East Half of Section 8 and the North Half of the Southwest Quarter of Section 9. The site is almost entirely cottonwood/willow gallery forest. An additional 50 acres adjacent and south of Spirit Hollow has been acquired by the US BOR for Southwestern Willow Flycatcher mitigation and is being managed by SRP.

7B Ranch is located east of the town of Mammoth. The 3,200 acre property covers seven river miles, is owned by Resolution Copper Company, and is being for conservation purposes as a part of a proposed legislative land exchange with the federal government. Two one-kilometer-long transect lines through the mesquite bosque have been established at this property. The property is contiguous with another 7 miles of river to the south owned by BHP-Billiton mining company. Combined, these two properties represent the largest intact mesquite bosque in Arizona at approximately 7000 acres. The BHP-Billiton land also has cottonwood/willow gallery forest that is contiguous with the San Manuel Crossing properties and has equally high conservation values for birds. The highest numbers of nesting Southwestern Willow Flycatcher on the San Pedro River have been documented at this location.

Aravaipa Crossing (approximately 160 acres**)** has the next highest densities of Southwestern Willow Flycatcher habitat. The properties were privately owned by the mining company ASARCO and will now be managed by the Arizona Game & Fish Department for conservation. SRP also has mitigation land at this location (Stillinger Preserve). One kilometer long avian transect line following the river channel has been established at this property.

Cook's Lake/Cienega Seep - Bureau of Reclamation (BOR) and Salt River Project (**Adobe Preserve)** own mitigation land for Southwestern Willow Flycatcher totaling approximately 320 acres. The ASARCO/Arizona Game & Fish Department parcels to the north and south are noted above. One 1 kilometer long avian transect line following the river channel has been established across these properties.

Dudleyville Crossing and TNC San Pedro River Preserve - A well developed cottonwood/willow gallery forest with a mature tamarisk understory. The properties extend from the Dudleyville Crossing (Schwenesen property) north and total about 1,300 acres. A small 160 acre parcel is just south of the confluence with the Gila River. A nesting colony of Mississippi Kite has been documented at this location. The lands at Dudleyville Crossing are privately owned and in conservation easements with BLM and TNC. A one kilometer long avian transect line following the river channel has been established at this property.

The TNC San Pedro Preserve is a former fish farm with two ponds now being managed for marsh bird habitat. The majority of the property is retired agricultural fields dominated by mesquite. The cottonwood/willow gallery forest experienced a fire in 2004. A one kilometer long avian transect line following the river channel has been established at this property.

Summation

As long ago as 1988, the Arizona Game and Fish Department (AGFD) stated that 90 percent of the Arizona's riparian habitat had been lost in their November 1988 issue of Wildlife Views (AGFD 1988). The San Pedro River valley is a key migratory and breeding corridor for millions of birds, especially riparian dependent species, including some very sensitive species. It supports nearly two-thirds of the avian diversity in the U.S. the reach of the San Pedro River from just north of Benson, Arizona (i.e., "the Narrows") north to the San Pedro-Gila River confluence at Winkelman, Arizona, has been identified as both a State and Global Important Bird Area by our Arizona IBA Science Technical Committee (January 2007) and by a National Audubon IBA Technical Committee (January 2008), respectively. IBA Science Committee members (12) in Arizona are from the Arizona Game & Fish Department, the U.S. Fish & Wildlife Service, as well as representatives from all of the other federal agencies in Arizona. Although Globally Important Bird Area status carries no regulatory authority, it does bring biological information and habitat protection importance awareness to the public's attention, as well as bringing quantitative data and habitat information to the agencies, assisting in agency's land use and land management planning in order to conserve high value wildlife resources at the state, hemispheric and even global levels. We stand in support of the creation of a Lower San Pedro River Collaborative Conservation Initiative and have advocated for the creation of a Lower San Pedro River Valley National Wildlife Refuge since 2005.

Sincerely

Dr Paul Green
Executive Director | Tucson Audubon

Christina McVie
Chair, Conservation Committee

References

Arnold, L.W. 1940. An ecological study of the vertebrate animals of the mesquite forest. University of Arizona. M.S. Thesis.

Caudill, J., Henderson, E., 2005. Banking on Nature 2004: The Economic Benefits to Local Communities of National Wildlife Refuge Visitation. USFWS Division of Economics, Washington, DC.

Ellis, L. A., D. M. Weddle, S. D. Stump, H. C. English, and A. E. Graber. 2008. Southwestern willow flycatcher final survey and monitoring report. Arizona Game and Fish Department, Research Technical Guidance Bulletin #10, Phoenix, Arizona, USA.

Gavin, T.A. and L.K. Sowls. 1975. Avian Fauna of a San Pedro Valley Mesquite Forest. Journal of the Arizona Academy of Science. 10(1): 33-41

Ingraham, M.W. and S.G. Foster, 2008, "The value of ecosystem services provided by the U.S. National Wildlife Refuge System in the contiguous U.S Ecological Economics 67: 608-618.

Kirkpatrick, C., C. J. Conway, and D. LaRoche. 2009. Surface Water Depletion and Riparian Birds. Wildlife Research Report #2009-02, U.S. Geological Survey, Arizona Cooperative Fish and Wildlife Research Unit, Tucson, AZ.

Seager, R., M. F. Ting, I. Held, Y. Kushnir, J. Lu, G. Vecchi, H. P. Huang, N. Harnik, A. Leetmaa, N. C. Lau, C. H. Li, J. Velez, and N. Naik. 2007. Model projections of an imminent transition to a more arid climate in southwestern North America. Science 316:1181-1184.

Southwick Associates, Economic Impact Analysis of non-consumptive wildlife-related recreation in Arizona. 2003. Conducted for the Arizona Game and Fish Department by Southwick Associates in conjunction with the Responsive Management project, Arizona Residents' Attitudes Toward Nongame Wildlife.