

CAÑADA DEL ORO ECOLOGICAL RECONNAISSANCE, 15-19 MAY 2004

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Executive Summary

An ecological reconnaissance was made of the Cañada del Oro from Steam Pump Ranch (Oro Valley) to Rancho Solano (Pinal County). The county-owned parcels in the reach in Catalina (the Lago del Oro Parkway reach) were surveyed for conservation values, opportunities, and problems. Following heavy flood damage after the Aspen Fire in the Catalina Mountains, Pima County acquired many parcels of land on the floodplain.

Cañada del Oro supports relatively intact meso-riparian to xeroriparian vegetation and bird fauna, with regionally important (or key) populations of two Priority Vulnerable Species, Bell's Vireo and Abert's Towhee. Several other riparian birds that are faring poorly in Pima County also maintain strong and/or important populations along this major drainage. Although the Catalina reach is more xeric (xeroriparian) than two other major adjoining areas within the Cañada, it maintains high bird and plant diversity, including outstanding populations of Desert Willow and Catclaw Acacia.

This area is semi-urban – within the town of Catalina – and much of it has recently been vacated by owners who have sold to Pima County rather than face further flood risk. These two factors offer unique opportunities and constraints. First, people have left behind important “legacy plants”, especially large cottonwood, willow, sycamore, and walnut trees, and legacy ponds suitable for native aquatic vertebrates, all of which might usefully be maintained as part of a conserved and managed landscape. Second, such conservation and management could usefully emphasize biodiversity and recreation within the town setting of Catalina.

The following recommendations are among those offered: (1) maintain legacy plants and ponds, notably including immediate action to prevent their loss; (2) erect fencing to eliminate cattle trespass and head off ORV damage; (3) develop popular, low-impact recreational uses of the site, including hiking, bird-watching, education, and horseback riding; (4) consider development of a Nature Center and native plant nursery; and (5) acquire a firm knowledge of the groundwater issues impinging on the Cañada del Oro.

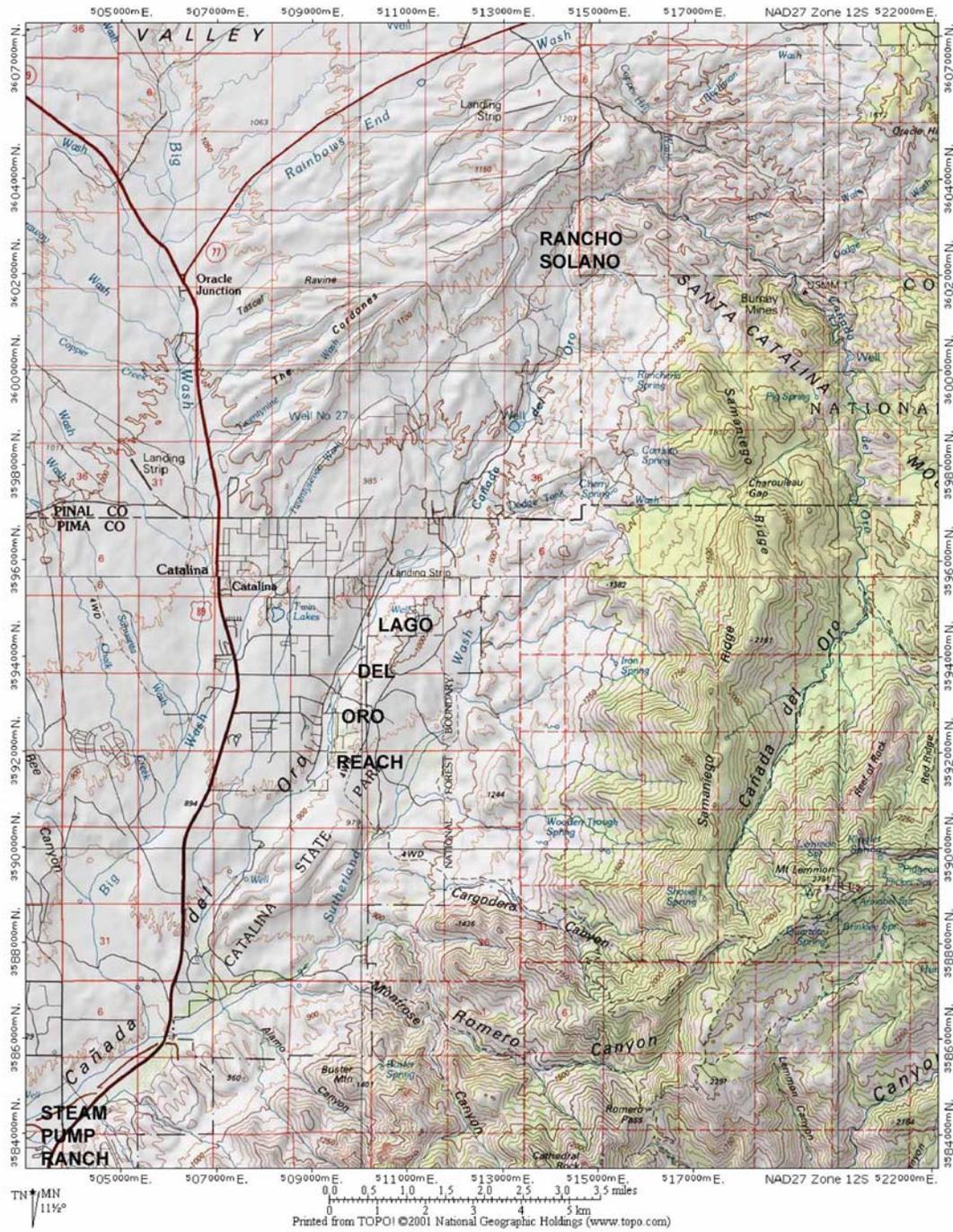


Figure 1. The reconnaissance area for Canada del Oro, 15-19 May 2004.

Introduction

I reconnoitered the Cañada del Oro (CDO) from Steam Pump Ranch to Rancho Solano (Figure 1) to observe the hydrology, landscape, and ecology. I used this reconnaissance to frame a survey of conservation and ecological restoration opportunities for the Cañada del Oro floodplain in the reach within and near Catalina, Pima County Arizona. This reach (here termed the Lago del Oro, or LDO reach) is, in part, being purchased by Pima County to help get people out of the floodplain where their homes and property are at risk from flooding. A flood in 2003, with high intensity following from ground denudation during the massive Aspen Fire in the Santa Catalina Mountains, affected many property owners on this floodplain, and convinced others that future floods might damage their property.

My list consisted of at least 45 properties in the hands of Pima County at the time of this study, including a majority of the parcels between the approximate alignment of Hawser Road (about ½ mile to the north of Golder Ranch Road) to the approximate alignment where Bowman Road contacts the CDO on the south, about 1.3 miles south of Golder Ranch Road. The northernmost address was 15620 and the southernmost was 14010, both of these being N. Lago del Oro Parkway addresses.

Objectives were to identify conservation significance, opportunities, and potential obstacles for this reach as a public resource, particularly in context of the Sonoran Desert Conservation Plan (SDCP) Conservation Lands System and its Priority Vulnerable Species (PVS). In addition, objectives include identifying recreational uses suitable for the area and difficulties that might arise in implementing future plans.

Methods

Following consultation of maps, aerial photography, and a museum records database, I reconnoitered the reach from Steam Pump (Oro Valley) to Rancho Solano, Pinal County, north of Saddlebrooke) to gain an understanding of the setting and regional significance of the LDO reach. I met with Dr. Richard Felger, an ecologist who lives in the general area, who offered advice on issues and ecology in the area, and, with my assistance, created a plant list for a small portion of the LDO reach. I then proceeded to visit each currently unoccupied (vacated) property indicated on maps provided by Pima County Flood Control District (FCD) or visibly signed and vacant. I drove into each area and walked in the wash and xeroriparian environments, making observations of physical landscape, vegetation, reptiles, birds, and human evidence. I also drove and climbed various hilly canyon walls to obtain various perspectives on the landscape, human presence, and dominant vegetation. Finally, I re-toured the area with Elissa Ostergaard, Urban Wildlife Specialist in the Tucson Office of Arizona Game and Fish Department.

Physical Setting

This reach totals about 2 miles in length, extending south from about 1 mile south of Miraval spa to a northern corner of Catalina State Park. To the north, rich xero- and

meso-riparian environments extend up to Saddlebrooke development, where extensive damage to the wash environs is occurring. Further north is the Rancho Solano reach, with perennial surface water and a hydro-riparian gallery forest. To the south, the floodplain broadens and again becomes less xeric (more meso-riparian) than in the LDO reach, within the Catalina State Park. Within the state park it is joined by Sutherland Wash, which brings more subsurface water and a biota more closely tied to the Santa Catalina mountain base.

Thus CDO changes from a hydriparian oasis at Rancho Solano, to an anthropogenic desert at Saddlebrooke, followed by meso-xeriparian woodland in the Miraval reach, followed by a relatively more xeriparian, and more narrow floodplain aspect in the LDO reach. It is again meso-xeriparian in the northern portion of Catalina State Park, but as CDO exits the state park, it has an increasingly broad, flat, somewhat open xeriparian aspect, changing into a more Cañada-bound, open xeriparian woodland as it enters the urban Tucson margin in Oro Valley.

Vegetation (see Figure 2)

The hydro-riparian reach has cottonwood, willow, and other deciduous trees, with thornscrub and desert grassland elements abundantly included.

The xeriparian reaches have a rich mixture of large-stature catclaw acacia, mesquite, and desert willow (*Chilopsis*, not a true willow), with a significant scattering of netleaf (or “canyon”) hackberry and occasional individual trees of walnut. Although this xeriparian woodland presents local thickets along the wash margins and a very open woodland aspect on the surrounding sandy floodplains, it is botanically rich. We assembled a list of 103 plant species (86 native, 17 non-native or possibly non-native; Appendix II.) in less than one hour in a single 300 m reach of no extraordinary character within the LDO survey reach near its northern end. Moving down into Oro Valley, the vegetation becomes more typically desert-associated, with mesquite and blue paloverde playing increasingly dominant roles.

The meso-xeriparian reaches have denser woodlands, and often larger and healthier trees, as well as many more individual netleaf hackberries and walnuts.

In general, the vegetation of CDO, except at Saddlebrooke and in Tucson, retains a strongly natural character and probably resembles early historical conditions in many essential ways. The perennial waters are largely in or abutting the Santa Catalinas, at Rancho Solano, and in the major tributary canyons to Sutherland Wash and CDO (Cargodera, Baby Jesus, Distillery, Romero, Montrose, Alamo). This natural (un-landscaped and un-bladed) character for most of the Cañada del Oro makes it relatively unique in eastern Pima County, where a similarly natural riparian corridor can only be found at Cienega Creek (from its spring source to the Vail area).

Rancho Solano



Figure 2A. Riparian environment along CDO.

Cat St Park (N end)

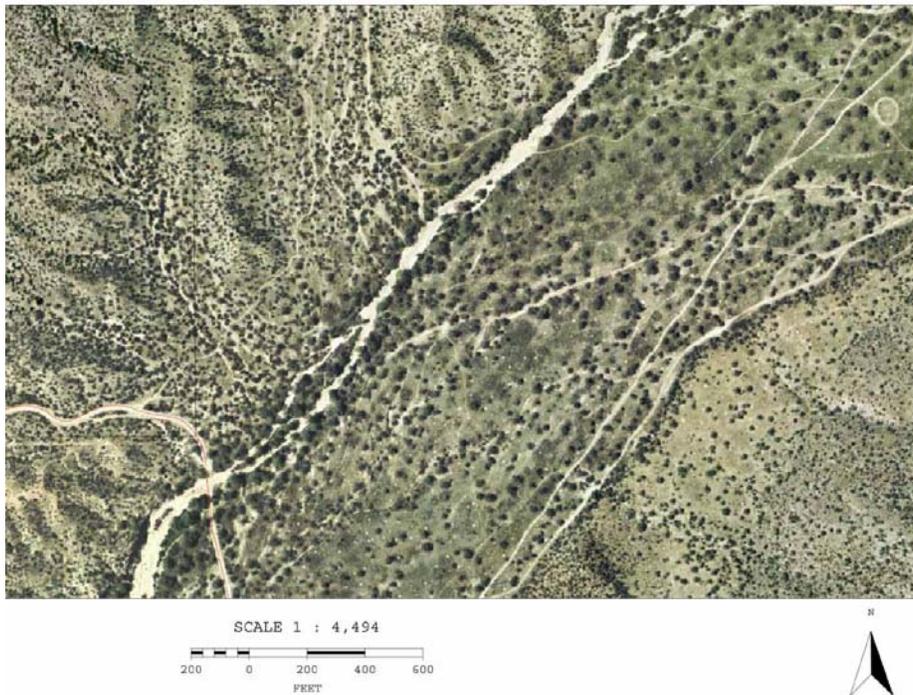


Figure 2A. Meso-riparian area along CDO.

N-Cent (Golder Ranch Rd), Lago del Oro reach



Figure 2C. Open xeroriparian area on CDO.

South end, Lago del Oro reach

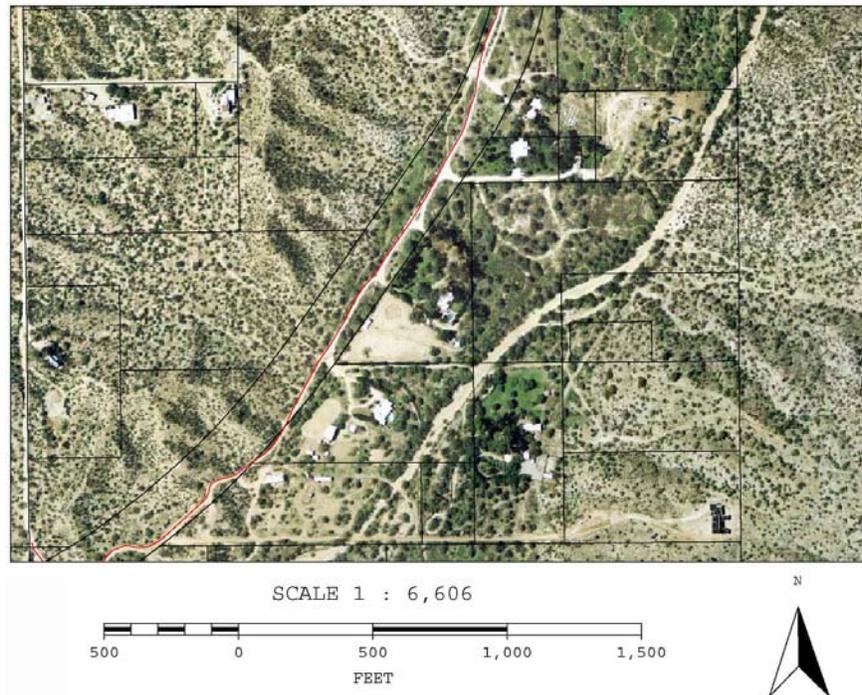


Figure 2D. Dense xeroriparian along CDO, 2002 color aerial photos, Pima County MapGuide site.

However, it is obvious that urban development is encroaching upon most of the CDO reach described here, occupying both the uplands, often as massive, planned communities with total destruction of the natural ecology, and, on the bottomlands, with more scattered, older, and more “organic” development within the natural matrix. This latter condition is what is found throughout the LDO reach being purchased by Pima County.

Animals. I. Birds

Birds are represented by a rich and varied assemblage throughout the CDO, although it seems that the richness (and human interest) increase from xero- to meso- to hydro-riparian environments. For example, at Rancho Solano, Black Hawks and Yellow Warblers were apparent. In meso-riparian reaches, Bell’s Vireos and especially Lucy’s Warblers were typically very apparent and abundant. Nonetheless, xero-riparian reaches in the LDO area supported a rich bird assemblage (see Appendix III.) including a casually accumulated list of 28 species. Lucy’s Warblers were widespread in the LDO reach, and Bell’s Vireos were present where hackberries and walnuts appeared. It was noteworthy that a Green-tailed Towhee was seen on 15 May; a pair of Bullock’s Orioles on 19 May; and Abert’s Towhees were seen several times. Gambel’s Quail were seen in exceptional abundance. In general the avifauna of the LDO appears to markedly exceed that of a typical xeroriparian system in the Tucson region.

The reconnoitered part of CDO, as a whole, would appear to be a key site for two PVS, Bell's Vireo and Abert's Towhee, in eastern Pima County. Other birds for which this appeared possibly an essential environment for eastern Pima County include Pyrrhuloxia and Lucy's Warbler; other primarily non-core-desert birds such as Phainopepla, Vermillion Flycatcher, and Least Goldfinch were obviously prominent members of the assemblage at LDO reach. An important resident species reported by birdwatchers and ornithologists at Catalina State Park, but not seen during this survey, is the Crissal Thrasher, which appears to be much less common and widespread in the Tucson region than in reports by early ornithologists.

Animals. II. Reptiles, Amphibians, Fishes, and Mammals.

The observed lizard fauna of the LDO reach included a representation of typical Sonoran Desert species: Tiger Whiptails, Desert Spiny Lizards, Zebra-tailed Lizards, Tree Lizards, Western Banded Geckos, and Regal Horned Lizards. Riparian, non-desert lizards can be found at Rancho Solano, Sutherland Wash, and in the lower canyons of the west face of Santa Catalina Mountains: Giant Spotted Whiptail (PVS), Sonoran Spotted Whiptail, Lesser and Greater Earless Lizards, and likely other riparian reptile species like the Ring-necked Snake, Southwestern Black-headed Snake, Madrean Alligator Lizard, and Great Plains Skink. These species have not recently been reported below Rancho Solano in CDO, although Charles H. Lowe reported (personal communication) that 3 or more decades ago Giant Spotted Whiptails were found at CDO at Oracle Road. Currently, the herpetofauna of Cañada del Oro, outside of the Rancho Solano reach, generally appears to be an unremarkable desert herpetofauna.

No snakes or their tracks were seen in the LDO reach, and, as might be predictable, no amphibians were seen at this season. However, a pond formerly maintained at a house at 14050 N. Lago del Oro Parkway, at the south end of the LDO reach, contained numerous native Sonoran Mud Turtles, one or more introduced Red-eared Sliders, and may have contained some kind of fish. This pond is drying and should be maintained as perennial, at the very least for the time being, to salvage the turtles.

Native longfin dace (a PVS) were present in CDO at Rancho Solano until the flood of 2003, and there are currently only two left, in captivity, and possibly none left in the wild. This population was probably isolated for several hundred to some thousand or more years. These may have been the only native fish in the Catalina Mountains west of Sabino Canyon. A full survey should look for them. If dace are gone from CDO, they might be taken from Buehman Canyon and kept on County property in the LDO area. Dace would consume, and effectively control mosquitoes in the pond setting.

The only mammals observed on this survey were round-tailed ground squirrels and rock squirrels, both at LDO, and domesticated animals.

Specific Sites in the Lago del Oro Parkway Survey Reach

The vegetation density generally increased from upstream to downstream over the two-mile LDO survey reach. However, high plant and bird diversity appeared to exist throughout. Local sites with netleaf hackberries, walnut trees, and dense thickets of mesquite-catclaw acacia supported the most diverse sets of birds, and the highest lizard abundance. These occurred throughout, except in the White Dog Stables site that has an open arena and where the CDO is most deeply entrenched between its banks. In this sense, no site stands out in terms of ecological significance of the naturally occurring vegetation and biota.

The most striking and unique features of individual sites are “legacy plants” – planted and maintained individuals of water-loving species, especially trees, found near recently vacated houses. These are immediately significant because they will be quickly lost if they are not preserved, and significant aesthetic, shade, and bird-watching resources would also be lost. These trees are mostly native Fremont cottonwoods, and they are primarily to be found in the southern 3/8th of the survey reach. In some areas, a number of trees have died in the past year or so, and many other trees show signs of water stress that probably foreshadow impending mortality.

One property stands out in having several large cottonwoods, one being ≥ 2 m dbh, large willows (ca. 1 m dbh), and several other native trees. This address, apparently 14050 S. Lago del Oro Parkway, also is the place with the large, butyl rubber-lined pond that supports turtles. Birds, including Abert’s Towhee and Northern Cardinal were seen to be notably abundant at the site, and there are several other features, such as a tree house on low stilts, a concrete and rock pond (currently dry) and drives lined with desert tree and cactus thickets that make this area particularly rich for biodiversity. Nearby houses (to the north) are also sturdy, attractive structures that could be adapted to future uses.

A second property that also stands out is the White Dog Stables north of Golder Ranch Road. There are several barns, corrals, and an arena that, as clearly known within Pima County government, offer a good start to equestrian-based recreational use of the LDO reach. An additional feature is that several of the corrals are up on slopes that cannot foreseeably be reached by floodwaters.

A third consideration is that the south end of the LDO reach is occupied by a pistol club, marring the silence of the southern 1/4 or so of the survey reach with sudden eruptions of high caliber fire. This will likely restrict the values of peace and serenity that otherwise might be developed in this nicely vegetated area.

Fourth, there are some property owners that have remained uninterested in or unconvinced about the fiscal advantages of selling to Pima County. These owners may potentially become unhappy over what are likely to be necessary restrictions on ORV use and woodcutting.

Fifth, trails might logically start from the White Dog Stables area (north of Golder Ranch Road), and from just below the central part of the reach, in the general area of 14200 N. LDO, or thereabouts, for access to more densely vegetated areas suitable for bird-

watching. The pistol range at the south end of the survey reach makes establishing trail-head access at the south end problematical, as it would be highly disturbing to get out the car and, after a few minutes of serenity, be assailed by what sounds like disturbingly close gunfire. Other than this, trail location within the LDO reach in general may not pose large challenges, as the vegetation is open, and trails could be established wherever they were desired.

South of Rollins Road, there is Arizona State Trust Land that extend to the east margin of CDO in the LDO reach. This property could provide the only upland connection to undeveloped habitats in the reach, and thus provide important habitat connectivity at a larger scale. The State Trust Land includes part of the LDO bottomland near Rollins Road, and this bottomland, especially near some private lands an approximate area of 14300 N. LDO, supports the richest xeroriparian vegetation in the LDO reach.

Finally, the county has obtained at least one property that is well out of the floodway, and has an excellent view of the central part of the survey reach. This is 14745 N. Desert Sage Lane. It might function as a place for a manager or caretaker to live, or for someone who might help keep an eye on the place to prevent extreme violations such as woodcutting, crime, etc. This property also has a small, concrete-lined pond that might be used to keep native fish and frogs.

Connectivity, Groundwater, and Re-vegetation

Some additional insights are available from study of aerial images of the CDO region.

The reaches of CDO and Sutherland Wash along Golder Ranch Road retain good habitat qualities, and are important to downstream hydrology. These two areas can be linked with an overland connection via State Trust Land immediately east of CDO starting south of Rollins Road. This is the only undeveloped, upland corridor between the LDO reach and the Santa Catalina Mountains.

Larger, privately owned properties on the CDO floodplain to the north, between the survey reach and Miraval health resort, could provide significant connectivity between the survey reach and rich meso-riparian environments at Miraval, and on Pima County property and undeveloped bottomland (e.g., Triod Partners, etc.) nearby.

The Golder Ranch development section on Sutherland Wash is currently relatively non-damaging for the landscape, and appears not to use a great deal of groundwater. Protecting groundwater in both CDO and Sutherland Wash in the LDO area will likely be essential to maintaining meso-riparian environments in Catalina State Park. Although not emphasized in this report, it must be noted that groundwater pumping that might affect water availability for meso-riparian plants looms as a potential iceberg for conservation in the entire Canada del Oro reach reconnoitered here. An analysis of where the water comes from, how deep it is, and where it is being withdrawn, both in Pima and Pinal counties, should exist as a key guide to conservation and development planning.

Although the environment at LDO is slightly more xeric than in the Miraval and Catalina State Park reaches, this slight difference is, in part, a misapprehension produced by the significant disturbance to the bosque, floodplain, and even wash margins from the development of housing and other activity on the LDO floodplain. A comparative study of 2002 color aerial imagery emphasizes the similarity, rather than difference, among reaches, except that the LDO reach has been patchily de-vegetated. On the ground, there appear to be fewer hackberries and walnuts in the LDO reach, but the aerials show that wash-side and floodplain vegetation density are – in undisturbed areas – quite similar.

This finding indicates that the aesthetic qualities in LDO have suffered significantly by disturbances to the natural continuous organization of the vegetation. This situation will worsen if left to its own devices: with people vacating the LDO floodplain, many exotic trees and shrubs will probably not be maintained (and probably should not be maintained), and will die, further marring the landscape. Preserving the native trees in this legacy will lessen this effect, but dying pines, eucalyptus, oleander, etc., should probably be cut down and left as woodpile habitat or sold as firewood. It is important to recognize, from the wildlife perspective, piles of wood and other non-toxic debris create habitat that is excellent for some species and required by some others.

The problem of de-vegetation will become more apparent when formerly occupied structures are removed from the floodplain, and it will then be clear that large areas of highly disturbed ground exist within the county property. A native plant nursery operation at LDO could function to (1) seed disturbed ground with desirable native grasses and forbs, rather than aggressive Old World invaders, (2) provide woody plants for revegetation of some areas – either in large bladed patches and holes created by local activities, or both, and (3) provide an abundant source of native plants for landscaping in the community of Catalina. The town is nestled within the matrix of native upland habitat, and thus could evolve into either an environment occupied by the native biota or, without careful planning, a “pigeon-sparrow-starling-grackle” environment. As a starting point, county planners should be aware that ground disturbance, as occurs with heavy equipment, typically produces conditions optimal for undesirable Old World weeds.

Human Dimensions

The Cañada del Oro in the Catalina area, and in other local non-planned housing development areas, supports a sizable up-scale blend of horse-lovers and New Age homesteaders, along with the unique Miraval spa. Catalina also appears to support a sizable community of environmentally conscious citizens dispersed throughout the town. These people may be amenable to several aspects of conservation work on the LDO reach. Groups that might be good to work with may include Miraval resort and spa, www.savecatalina.com, and County Line Riders. There is also a sizable contingent of ORV riders for whom preservation may seem a waste and a hindrance; however, many of these people may have young children who will benefit from educational or recreation opportunities in the county-owned portions of LDO.

Catalina's future is complicated by the strong influence that urban development in adjoining Pinal County has had on the area's landscape. Environmentally conscious communities in Catalina and Oracle have suffered great frustrations as a result.

Conclusions and Recommendations

Value of the Lago del Oro Reach for Conservation

The portion of Cañada del Oro in Catalina is not biologically the richest portion of the Cañada. Yet it shares many of the unique features in species occurrence and abundance found in adjoining parts of the system. Birds like Bell's Vireo, Abert's Towhee, Lucy's Warbler, Pyrrhuloxia, and several others occur and abound in this reach. Desert Willow and Catclaw Acacia are represented by fine stands of large mature trees, and there is a great diversity of native plants. The ecological value of the LDO reach would undoubtedly increase dramatically with careful county management.

The value of having people move off the floodplain of Cañada del Oro lies in the future, rather than the present, as current occupancy has only marginally negative effects (increased habitat for undesirable exotic birds like House Sparrows) that might be offset by the rich habitats – such as legacy trees and ponds – created by the former landholders. In the long run, however, a human population on the floodplain would likely lead to bank protection and further build-out, eventually severely compromising the natural environment.

The primary conservation values of this reach may be: (1) sustained connectivity within the Cañada, (2) preservation of legacy trees and culture, (3) opportunities for ecological restoration, and (4) recreational and educational opportunities for Catalina within the context of the Sonoran Desert Conservation Plan.

There may be opportunities for restoration by bringing the level of the wash bed up and allowing sheet flood irrigation as part of the normal enrichment of the xeroriparian bottomland. However, a principal reason for the moderate entrenchment of the wash in the LDO reach is probably the narrowness of the bottomland, concentrating flows and producing erosive downcutting. Thus, I am not strongly recommending active work to bring the streambed up to grade, unless there is good hydrologic analysis to support it. Further, the sheet-flooding approach may raise flood control issues anew, again indicating the need for cautious consideration ahead of time.

With a commitment to maintain some modest amount of supplemental irrigation, a more immediately productive, less controversial, and possibly more pressing, and cheaper approach to biodiversity management would be to capture the legacy of native riparian trees, ponds, and buildings in the area to enhance recreation, conservation, and management opportunities.

Recommendations

The following recommendations were offered by the Arizona Game and Fish Department, and I concur with and have added to them as indicated:

1. Maintain the existing cottonwoods and other native riparian trees by supplemental watering, immediately, and then come up with a plan to use or abandon them.

I would add that allowing them to die now, while major issues remain undecided would be most unwise. Bring water to these trees immediately.

2. Utilize the pond or ponds at the south end property (14050 LDO Parkway) for native fish maintenance or propagation under the presumptively impending Safe Harbor Agreement for topminnows.

I would add that the turtles there should also be maintained, or at least saved for other sites, as turtles are not abundant on this side of the Santa Catalina Mountains. Further, consideration should be given toward maintaining native leopard frogs in these ponds. The leopard frogs are likely to face some years of population stress associated with post-fire sedimentation of their habitat in the mountains, and moving to preserve the genetic stock should be considered. Although topminnows, other native fish, and frogs should be able to thrive with the turtles, the immediate problem is to get water to keep the turtles alive.

3. The area should be fenced to stop cattle ingress and encourage recovery of the vegetation; and fencing should also be designed to eliminate ORV use of the riparian zone.

I would add that the county could seek an alternative local outlet for ORV activity. Further, I noted disturbing signs of wood-cutting on recently acquired county land, and I recommend that this be stopped by signage, as well as fencing. Dead wood is essential habitat for many species; and the usual practice of cutting large or dead trees is extremely damaging.

4. Develop passive recreation with small trails, and focus on bird-watching and similar no-impact activities.

To this I would add that moderate to substantial equestrian use of the Lago del Oro reach is likely to be quite popular with a segment of Catalina society, and unlikely to cause significant, untoward ecological impacts. Thus, I would encourage the use of the White Dog Stables area (which is far enough from the shooting gallery) as an equestrian center where special projects may be feasible. One such possibility that I have not previously heard of would be to display and ride legacy breeds of domestic animals, such as Spanish horses, some of which are currently kept in Catalina. Specifics, potentially including plans with some detail, may be found at <http://www.horseweb.com/desertrarebreeds>. Such an approach could combine equestrian recreation and cultural conservation in a unique way.

I want to reiterate that this reach of the CDO is very largely within the *de facto* town limits of Catalina, and, as a conservation area, should be developed for extensive, though compatible, human uses.

I offer the following additional suggestions as recommendations to be considered, without implying in any of this that AGFD does or does not concur:

5. Keep water in the pond at 14050 N LDO Parkway starting now, as it is about to dry up, killing the turtles.
6. Evaluate the more solid houses near this property for use as a Nature Center or similar educational facility.
7. Develop a native plant nursery on-site at one of the more solid existing structures (e.g. 14190 N. LDO), for plants that can be used in the entire CDO area for yards, housing developments, or revegetation. Such a nursery might function in tandem with water being supplied to legacy plants, or in connection with aquatic species conservation in existing ponds. It seems unlikely that a nursery in Tucson could successfully supply the unique needs of the Cañada del Oro, or the community of Catalina. A well-run nursery could produce desirable landscapes directly associated with its operation, assisting with repair to the vegetation in the Laguna del Oro reach.
8. Maintain efforts to complete public ownership of the flood-prone areas. The State Trust Land near Rollins Road east of and including part of CDO, and the LDO bottomland near Rollins Road, support the richest riparian vegetation in the LDO reach, and could be an area where purchase of land and conservation easements would be significant.
9. Evaluate the water budgets and groundwater tables for CDO and Sutherland Wash to determine likely impacts of urban development on water availability for meso-riparian and xeroriparian vegetation. An analysis of where the water comes from, how deep it is, and where it is being withdrawn, both in Pima and Pinal counties, should exist as a key guide to conservation and development planning.

Appendix I. List of parcels and addresses.

Parcel No.	Street Address
22247005A	unk
222390640	unk
22228081A	unk
222310180	unk
22231044B	unk
22235008D	unk
222470210	14010 N. LDO
222470200	14050 N. LDO
222470280	14090 N. LDO
222470190	14150 N. LDO
222470230	14190 N. LDO
222470070	14200 N. LDO
222470060	14232 N. Lago Del Oro
222390520	14402 N. LDO
222380420	14420 N. LDO
222390530	14422 N. LDO
222390560	14500 N. LDO
222390570	14502 N. LDO
222390580	14540 N. LDO
222390590	14560 N. LDO
222390610	14620 N. LDO
222390620	14640 N. LDO
222390650	14722 N. LDO
222380360	14725 N. Desert Sage Ln.
222380370	14745 N. Desert Sage Ln.
222390670	14762 N. LDO
222400370	14802 N. LDO
222400380	14822 N. LDO
222400400	14862 N. LDO
222400410	14910 N. LDO
222400420	14940 N. LDO
222350140	15000 N. LDO
222350600	15100 N. LDO
22235008B	15115 N. Ironwood Tree Road
222350660	15130 N. Red Range Ln.
22231044A	15300 N. LDO
222310280	15360 N. LDO
222310270	15476 N. LDO
222310240	15490 N. LDO
22231023A	15500 N. LDO
22231022A	15510 N. LDO
222280820	15620 N. LDO
22235019A	4301 E. Wilds Road
222380400	4304 E. Wilds Road
222350200	4305 E. Wilds Road

Appendix II. Plant taxa recorded in < 1 hour along Canada del Oro 3/8 – 5/8 mi N of Golder Ranch Road, near Lago del Oro Parkway, Felger and Rosen, May 15, 2004 (103 taxa total: 86 native, 17 non-native). Asterisk (*) denotes a non-native taxon.

AMARANTHACEAE - AMARANTH FAMILY

Amaranthus palmeri. CARELESS WEED, PIGWEED; BLEDO, QUELITE DE LAS AGUAS

APIACEAE (UMBELLIFERAE) - CARROT FAMILY

Daucus pusillus. WILD CARROT; ZANAHORIA SILVESTRE

ASCLEPIADACEAE - MILKWEED FAMILY

Sarcostemma cynanchoides subsp. **hartwegii.** CLIMBING MILKWEED; GÜIROTE

ASTERACEAE - Daisy Family

Ambrosia confertiflora. SLIMLEAF RAGWEED; ESTAFIATE

Baccharis salicifolia. SEEP WILLOW; BATAMOTE

Baccharis sarothroides. DESERT BROOM; ESCOBA AMARGA, ROMERILLO

Gutierrezia microcephala. SNAKEWEED; HIERBA DE LA VÍBORA

Heterotheca sp.

Hymenoclea monogyra. SLENDER BURRO-BUSH; JÉCOTA

Isocoma tenuisecta. BURRO-BUSH; JÉCOTA

Palafoxia arida var. **arida.** SPANISH NEEDLES

Senecio flaccidus var. **monoensis** [*S. monoensis*] SANDWASH GROUNDSEL; HIERBA CENIZA

***Sonchus oleraceus** L. COMMON SOWTHISTLE; CHINITA

Verbesina encelioides. GOLDEN CROWNBEARD

***Xanthium strumarium.** COCKLEBUR

BIGNONIACEAE - BIGNONIA FAMILY

Chilopsis linearis subsp. **arcuata.** DESERT WILLOW

BORAGINACEAE - BORAGE FAMILY

Amsinckia sp. DEVIL'S LETTUCE, FIDDLENECK

Cryptantha barbiger. BEARDED CRYPTANTHA

Cryptantha micrantha. DWARF CRYPTANTHA

Heliotropium convolvulaceum ? MORNING-GLORY HELIOTROPE

Lappula occidentalis [*Lappula redowskii*]. STICKSEED

Plagiobothrys arizonicus. ARIZONA POPCORN-FLOWER

Plagiobothrys jonesii

BRASSICACEAE (CRUCIFERAE) - MUSTARD FAMILY

Descurainia pinnata. TANSY MUSTARD

***Sisymbrium irio.** LONDON ROCKET; PAMITA

CACTACEAE - CACTUS FAMILY

Cylindropuntia arbuscula [*Opuntia arbuscula*]. PENCIL CHOLLA; SIVIRI

Cylindropuntia versicolor [*Opuntia versicolor*]. STAGHORN CHOLLA

CAPPARACEAE - CAPER FAMILY

Polanisia dodecandra. WESTERN CLAMMYWEED

CAPRIFOLIACEAE - Honeysuckle Family

Sambucus nigra subsp. **cerulea** [*S. cerulea*. *S. mexicana*. *S. neomexicana*]. Blue elderberry; *tápiro*

CARYOPHYLLACEAE - PINK FAMILY

***Herniaria cinerea**. BURST-WORT

Silene antirrhina. SLEEPY CATCHFLY

CHENOPODIACEAE - GOOSEFOOT FAMILY

Atriplex elegans. WHEELSCALE; CHAMIZO CENIZO

Chenopodium sp. GOOSEFOOT

CONVOLVULACEAE - MORNING GLORY FAMILY

Cuscuta sp. DODDER

CUCURBITACEAE - GOURD FAMILY

Apodanthera undulata A. Gray

Cucurbita digitata A. Gray. COYOTE GOURD; CALABACILLA

EUPHORBIACEAE - SPURGE FAMILY

Euphorbia polycarpa. DESERT SPURGE

FABACEAE (LEGUMINOSAE) - LEGUME FAMILY

Acacia greggii. CATCLAW ACACIA

Astragalus arizonicus. ARIZONA MILK-VETCH

Dalea mollis Benth. SILKY DALEA

Dalea sp.

***Melilotus indica**. SOUR-CLOVER; TRÉBOL AGRIO

Prosopis velutina. VELVET MESQUITE; MEZQUITE

Senna leptocarpa. ARIZONA SENNA

GERANIACEAE - GERANIUM FAMILY

***Erodium cicutarium**. FILAREE, STORKSBILL, HERONSBILL; ALFILERILLO

HYDROPHYLLACEAE - WATERLEAF FAMILY

Nama hispidum. BRISTLY NAMA; MORADA

Phacelia arizonica. ARIZONA PHACELIA

JUGLANDACEAE – WALNUT FAMILY

Juglans major. ARIZONA WALLNUT

LAMIACEAE (LABIATAE) - MINT FAMILY**Salvia columbariae.** DESERT CHIA**LOASACEAE - STICK-LEAF FAMILY****Mentzelia multiflora.** BLAZING STAR**MALVACEAE - MALLOW FAMILY****Sphaeralcea coulteri.** COULTER'S GLOBE MALLOW; MAL DE OJO**Sphaeralcea laxa.** CALICHE GLOBE MALLOW**MARTYNIACEAE - DEVIL'S CLAW FAMILY****Proboscidea parviflora** subsp. **parviflora.** DEVIL'S CLAW; GATUÑA, TORITO**NYCTAGINACEAE - FOUR-O'CLOCK FAMILY****Allionia incarnata.** TRAILING FOUR-O'CLOCK***Boerhavia coccinea.** SCARLET SPIDERLING**Boerhavia wrightii.** DESERT SPIDERLING**Commicarpus scandens.** BUSH SPIDERLING**OLEACEAE - OLIVE FAMILY****Menodora scabra.** TWINBERRY**ONAGRACEAE - EVENING PRIMROSE FAMILY****Gaura parviflora.** LIZARD TAIL, VELVET-LEAF GAURA**OROBANCHACEAE - BROOMRAPE FAMILY****Orobanche cooperi.** DESERT BROOMRAPE; FLOR DE TIERRA**PAPAVERACEAE - POPPY FAMILY****Argemone gracilentia.** PRICKLY POPPY, COWBOY'S FRIED EGGS**PLANTAGINACEAE - PLANTAIN FAMILY****Plantago ovata** [*P. insularis* var. *fastigiata*] WOOLLY PLANTAIN, INDIAN WHEAT;
PASTORA**Plantago patagonica** [*P. purshii*] PASTORA**POACEAE (GRAMINEAE) - GRASS FAMILY****Aristida adscensionis.** SIX-WEEKS THREE-AWN; ZACATE TRES BARBAS**Bouteloua aristidoides.** NEEDLE GRAMA; ACEITILLA, NAVAJITA**Bouteloua barbata.** SIX-WEEKS GRAMA; NAVAJITA, ZACATE LIEBRERO**Bromus carinatus** [*B. arizonicus*] CALIFORNIA BROME***Bromus rubens** [*B. madritensis* subsp. *rubens*] FOXTAIL BROME, RED BROME; BROMO
ROJO***Chloris virgata** Sw. FEATHER FINGERGRASS; COLA DE ZORRA, ZACATE LAGUNERO***Cynodon dactylon** var. **dactylon.** BERMUDA GRASS; ZACATE BERMUDA

***Echinochloa colonum**. JUNGLEGRASS, JUNGLERICE, LEOPARD GRASS; ZACATE RAYADO, ZACATE PINTO, ZACATE TIGRE

***Eragrostis lehmanniana**. LEHMANN LOVEGRASS; ZACATE AFRICANO

Festuca octoflora [*Vulpia octoflora*] SIXWEEKS FESCUE, EIGHT-FLOWERED FESCUE

***Hordeum murinum** subsp. **glaucum**. WILD BARLEY; CEBADILLA SILVESTRE

Hordeum pusillum. LITTLE BARLEY

Leptochloa dubia. GREEN SPRANGLETOP; ZACATE GIGANTE

Leptochloa panicea subsp. **brachiata** [*L. filiformis*] RED SPRANGLETOP; ZACATE SALADO, DESPARRAMO ROJO

Muhlenbergia microsperma. LITTLESEED MUHLY; LIENDRILLA CHICA

Muhlenbergia porteri. BUSH MUHLY; ZACATE APAREJO

Muhlenbergia sp.

Poa bigelovii. BIGELOW BLUEGRASS; ZACATE AZUL NATIVO

***Polypogon monspeliensis**. RABBITFOOT GRASS; COLA DE ZORRA

***Schismus barbatus**. MEDITERRANEAN GRASS

Setaria macrostachya [*S. leucopila*] WHITE-HAIRED BRISTLEGRASS; ZACATE TEMPRANO

Sporobolus cryptandrus. SAND DROPSEED; ZACATE DE ARENA

POLEMONIACEAE - PHLOX FAMILY

Eriastrum eremicum

Gilia sp.

POLYGONACEAE - BUCKWHEAT FAMILY

Eriogonum abertianum

Rumex cf. **hymenosepalus**. DOCK; CAÑAIGRE

PORTULACACEAE - PORTULACA FAMILY

RANUNCULACEAE - RANUNCULUS FAMILY

Clematis drummondii. TEXAS VIRGIN-BOWER

RHAMNACEAE - BUCKTHORN FAMILY

Ziziphus obtusifolia var. **canescens** [*Condalia lycioides*] WHITE CRUCILLO; *ABROJO* GRAYTHORN; *ABROJO*

SCROPHULARIACEAE - SNAPDRAGON FAMILY

Maurandya antirrhiniflora subsp. **antirrhiniflora**. SNAPDRAGON VINE

Mimulus guttatus. MONKEY FLOWER

Veronica peregrina subsp. **xalapensis**. PURSLANE SPEEDWELL, NECKLACE-WEED

SOLANACEAE - NIGHTSHADE FAMILY

Datura discolor. POISONOUS NIGHTSHADE, DESERT THORN-APPLE; TOLOACHE;

Lycium andersonii var. **andersonii**. DESERT WOLFBERRY; SALICIESO

Nicotiana obtusifolia [*N. trigonophylla*] COYOTE TOBACCO, DESERT TOBACCO; TABAQUILLO DE COYOTE

***Solanum elaeagnifolium**. SILVER-LEAF NIGHTSHADE

ULMACEAE - ELM FAMILY

Celtis pallida subsp. ***pallida***. DESERT HACKBERRY; GARAMBULLO

Celtis reticulata. CANYON HACKBERRY; CUMARO

VISCACEAE - MISTLETOE FAMILY

Phoradendron californicum. DESERT MISTLETOE; TOJI

ZYGOPHYLLACEAE - CALTROP FAMILY

****Tribulus terrestris***. PUNCTURE VINE, GOATHEAD; TORITO, TOBOSO

Appendix III. Bird species observed 15-20 May 2004
at CDO near Hawser St., Golder Ranch Rd., and Wilds
Rd., south to north boundary of Catalina State Park.

Species	Observed PCR
<i>Species Total = 29</i>	28
Abert's Towhee	X
Ash-throated Flycatcher	X
Bell's Vireo	X
Black-chinned Hummingbird	X
Bullock's Oriole	X
Cactus Wren	X
Curve-billed Thrasher	X
Common Raven	X
Gambel's Quail	X
Gila Woodpecker	X
Great-tailed Grackle	X
Green-tailed Towhee	X
House Finch	X
House Sparrow	X
Inca Dove	X
Lesser Goldfinch	X
Lucy's Warbler	X
Mourning Dove	X
Northern Cardinal	X
Northern Mockingbird	X
Phainopepla	X
Pyrrhuloxia	X
Red-tailed Hawk	X
Turkey Vulture	X
Verdin	X
Vermilion Flycatcher	X
Western Tanager	X
White-winged Dove	X