



DRAFT

MEMORANDUM

Date: October 20, 2000

To: The Honorable Chair and Members
Pima County Board of Supervisors

From: C.H. Huckelberry
County Administrator 

Re: Improving the Riparian Habitat Mitigation Ordinance and Floodplain Regulations

I. Overview

This memorandum describes (1) the potential applicability to Pima County of a national initiative to institute reforms in floodplain management based on the general failure of the National Flood Insurance Program and federal flood assistance to improve annual rates of flood damage; and (2) an assessment of the effectiveness of Pima County's Riparian Habitat Mitigation Ordinance (attachment). Recommendations offered by the Association of State Floodplain Managers and by County staff are included in this memorandum. Finally, in this memorandum I am instructing staff, consistent with the Board's direction on September 26, 2000, to form an inter-departmental team and formulate specific proposals for the Board's consideration as part of the Riparian Protection Element of the Sonoran Desert Conservation Plan, and the major plan amendment to the comprehensive plan.

II. Pima County's Floodplain Regulations in Light of the National "Good Neighbor" Policy

A. Background and Findings -- Despite 30 years of the National Flood Insurance Program and 75 years of federal flood control assistance, annual flood damage in the nation continues to worsen. The Association of State Floodplain Managers, a national organization for floodplain professionals, believes that this trend is the unnecessary result of spending too much time debating issues of individual standards while not stepping back and evaluating the collective impact of approaches. The Association is proposing a new policy that is based on the premise of allowing no adverse impact by landowners on adjacent properties. In other words, a *no adverse impact floodplain is one in which the actions of one property owner do not have a negative impact on the flood risk to other properties*, as measured by flood peaks, flood stage, flood velocity, overbank storage, erosion and sedimentation. The new "good neighbor" floodplain policies that the Association recommends are:

- Individual actions that create adverse impacts will be allowed only in communities that have developed and adopted a comprehensive river plan, and only if the adverse impacts are confined to the planning area and mitigated within it. Such a comprehensive plan would specify acceptable levels of impact, combined with appropriate mitigation measures, and a plan for implementation. This puts local communities in charge of their own development.

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- The no adverse impact standard would virtually ensure that future development activities in the floodplain are part of a locally adopted plan. This removes the mentality that floodplain management standards are something imposed by the federal government, and will encourage localities to develop comprehensive strategies that can incorporate various community needs through a range of programs and approaches.
- With the no adverse impact standard, and the accompanying federal recognition of the local comprehensive plan as the acceptable standard in the communities that do have plans, federal resources could be spent on mitigation and other long-term strategies instead of on interpreting standards.
- Because of its flexibility and emphasis on local planning, the no adverse impact floodplain sets the stage for providing incentives that will recognize and reward communities that take strong mitigation actions.

The ongoing development of the Sonoran Desert Conservation Plan, which includes all major federal stakeholder agencies, and the upcoming major plan amendment of the comprehensive plan provide the opportunity to consider including the principles of this national initiative in Pima County planning.

B. Pima County's Current Floodplain Regulations – The Pima County Code (Title 16) states:

- *Natural flood-prone areas, stream, washes, arroyos, river and drainage courses, whenever possible be preserved in their natural riverine condition and that any land use proposal which utilizes this approach be considered superior to all others.*
- *Any human habitation or structural developments which limit natural processes within floodprone or erosion hazard areas be discouraged and limited to the extent allowable by law.*

Because the current county Code is tiered to the standards of the National Flood Insurance Program, however, which allows the floodplain to be filled until flood elevations increase by up to one foot, the Flood Control District approves plans and carries out projects that can have the effect of increasing flood peaks, flood stage and velocities, decreasing overbank storage, and altering erosion and sedimentation.

The National Flood Insurance Program generally imposes no consideration for effects such as velocity, overbank storage and sediment transport.

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C. Effect of Amending the County's Floodplain Regulations – Amending the County Code by adopting a no adverse impact floodplain standard, similar to that proposed by the Association, would stem the loss of natural hydrologic and hydraulic functions. The Sonoran Desert Conservation Plan's riparian element has identified the loss of these natural functions as one factor causing losses to riparian and aquatic ecosystem. Amending the Code to reduce this loss would benefit certain wildlife species that use these ecosystems and contribute to the Section 10 Implementation Agreement with the United States Fish and Wildlife Service.

D. Instruction to Staff to Carry Out the Board's Direction of September 26, 2000 – By copy of this memorandum to staff in Development Services, Transportation, Wastewater Management, and the Flood Control District, my office will assemble and lead a team that considers how Pima County's conservation and comprehensive plans can reduce the cumulative impacts to natural floodplain hydrology and hydraulics. Since large, landscape-level decisions are made in the comprehensive land use plan, it will not be sufficient to simply amend the County Code. Rather, the first consideration to the cumulative hydrologic and hydraulic effects of developments should begin in the land use planning stage, before individual development and infrastructure plans are prepared. I am instructing staff to come up with recommendations about proceeding with the Association's "good neighbor" floodplain standards so such can be forwarded to the Board within the next 90 days. My office will coordinate this effort with federal agencies too, to ensure consistency with the Sonoran Desert Conservation Plan.

III. Pima County's Habitat Mitigation Ordinance – Effectiveness Review

A. Background and Findings -- During the last 45 days, members of staff have performed a review of the effectiveness of the 1994 Watercourse and Riparian Habitat Protection and Mitigation Requirements Ordinance. The attached report details the results of this investigation. In general, the study finds that:

- The Ordinance is working as intended to encourage avoidance of hydro-mesori-riparian habitat (with the exception cited below), however, the original mapping omitted areas of xerori-riparian habitat. The mid-1990s mapping has been greatly improved by the riparian mapping of the Sonoran Desert Conservation Plan, and such improvements can be reflected in an update of the Ordinance.
- The Ordinance is not effective in preventing fragmentation of hydro-mesori-riparian habitat within broad riparian corridors and additional measures are needed to protect and restore these areas.
- Natural hydrologic functions are not protected by the Habitat Mitigation Ordinance and other methods, such as the national proposal discussed in the section above, are necessary adjuncts to the habitat mitigation ordinance.

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B. Effectiveness Review -- The study reviewed data since 1998 (the revision date of the Ordinance) and made site visits to formulate an assessment of the effectiveness of the Ordinance. Findings include:

- Since 1998, 33 mitigation plans have been submitted and all have been approved. Of the 33 plans, 27 have been for single family residences built in hydro-mesoriparian habitat. Habitat disturbance for each of these projects has been less than one half acre. Of the 33 plans, 6 development plans or plats have been subject to mitigation under the ordinance, and all are within xeroriparian habitat.
- Site visits to all mitigation plan projects shows that there is full compliance among completed projects with one exception. Despite the lack of an enforcement program, the mitigation plans to date are generally implemented by the landowner.
- The Ordinance establishes a preference for avoidance, and then onsite mitigation when avoidance is not possible, and then off site mitigation or banking as a last resort. Most of the mitigation has been onsite. The Ordinance does not, but should, require that the least damaging alternative be pursued.
- Avoidance is easier for large development projects that have a land base within which to site impacts than it is for single family projects working with a small land base, or commercial projects, which traditionally impact a larger percent of the project site. The Ordinance is not triggered in xero-riparian areas until 1/3 of the acre is impacted. In hydro-mesoriparian areas, which is considered to be of higher resource value, any amount of disturbance triggers the protection of the Ordinance.
- The average mitigation on a single family residence plan is 12 to 20 trees and a corresponding amount of shrubs and seeding.
- Mitigation banking has been an aspect of two private projects and another proposal is in process. County departments have mitigated impacts in compliance with the Ordinance, including Transportation, Parks and the Flood Control District.
- One of the major weaknesses of the existing Ordinance is that important xeroriparian areas are not included. Areas with total vegetation volume of a certain level were specifically not included. With improved mapping we can see the magnitude of the resource base that exists in drier areas but is not protected. From a practical perspective, compliance with federal endangered species law would probably be easier today, if during the last decade a multi-jurisdictional effort had protected the washes at the level delineated on the Harris Riparian Mapping found after page 7 of the attached report.
- Other weaknesses include that (1) hydrologic functions are not protected; (2) the Ordinance extends to structures, but not activities such as mining, agriculture, ranching, construction of transmission lines, or school district activity; (3) exotic species issues are not addressed; and (4) mitigation techniques need to be combined at times to create broader coverage.

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C. Instruction to Staff to Carry Out the Board's Direction of September 26, 2000 – County staff, working in the assigned interdepartmental team and with federal agency staff through my office, will consider how the conservation and comprehensive plans might encompass the recommendations found on pages 9 and 10 of the attached report, which generally state:

- Consider the requirement that the least environmentally damaging alternative be selected for actions involving land that is designated critical habitat.
- Consider updating the Ordinance based on the improved riparian mapping that has been created through the Sonoran Desert Conservation Plan.
- Work with the federal agencies to align Section 402 and 404 permit standards under the Clean Water Act with county standards, in order to improve efficiency in the government permitting process and ensure consistency in protection of the resource base.
- Emphasize use of Floodprone Land Acquisition Program and bond monies to acquire riparian areas.
- Keep future development related infrastructure out of the riparian corridors.
- Tailor standards of protection to the priority of the watershed as defined by the Sonoran Desert Conservation Plan.
- Establish a meaningful monitoring and adaptive management program for riparian areas.

IV. Conclusion

As we carry out the Board's direction of September 26, 2000, each of the County ordinances and state and federal laws that effect the Sonoran Desert Conservation Plan and the major plan amendment to the comprehensive plan will be reviewed as the Riparian Mitigation Ordinance has in order to determine past effectiveness and future recommended adjustments in light of County planning efforts. These reports will be forthcoming to the Board on a regular basis.

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Pima County's Riparian Habitat Mitigation Ordinance: Effectiveness Review

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Pima County's Riparian Habitat Mitigation Ordinance

Effectiveness Review

Introduction

On July 19, 1994 the Pima County Board of Supervisors (Board) adopted the *Watercourse and Riparian Habitat Protection and Mitigation Requirements Ordinance 1994-FC2* (Ordinance). The purposes of the Ordinance are:

To enhance wildlife and recreation values where appropriate by preserving riparian vegetation along watercourses and floodplains and:

- A. *Protect the valuable, limited and endangered natural riparian habitat resources of Pima County;*
- B. *Provide an ecologically sound transition between riparian habitat communities and developed areas;*
- C. *Assure the continuation of existing or natural functions, values and benefits provided by riparian habitat resources;*
- D. *Promote an economic benefit to Pima County by providing the aesthetic, recreation and wildlife values of riparian habitat for the enjoyment of residents and visitors;*
- E. *Promote natural erosion control; and*
- F. *Promote continuity of xeroriparian habitat. (Ord. 1994-FC2 (part), 1994: Ord. 1998-FC2 Art. 10 (A), 1988.)*

The Ordinance was structured to encourage avoidance of riparian areas; it does not prohibit development within those areas. If a developer or property owner demonstrates avoidance of riparian habitat is not possible, then mitigation of disturbed habitat areas is required. Onsite mitigation to provide continuity of habitat is preferred, but offsite mitigation and mitigation banking options are available as alternative approaches to habitat conservation.

In 1998, four years after adoption of the riparian protection regulations, the community and the Board called for stronger all-around environmental regulations within Pima County. As part of that effort, the Ordinance was amended on July 14, 1998 so that the mitigation requirements now apply to all properties within unincorporated Pima County, not just those entering the rezoning or subdivision process. Other changes in the Ordinance text included: 1) any disturbance to hydro/mesoriparian habitat requires a mitigation plan approved by the Board, and 2) the mitigation trigger for the xeroriparian classes was to require a mitigation plan for disturbance of 1/3 acre or more.

Again, in 2000, as part of the Sonoran Desert Conservation Plan, ways to strengthen riparian habitat protection are being explored. This analysis finds that the current Ordinance is working as intended, to encourage avoidance of habitat by development. This is apparent by the small number of mitigation plans submitted. However, many

areas of xeroriparian habitat were overlooked by the original mapping, and hence have no regulatory protection. In addition, this report finds that the Ordinance is not effective at preventing fragmentation of hydro/mesoriparian habitat within broad riparian corridors. Additional measures will be needed to protect and restore these areas. Finally, other methods are needed to work in concert with this Ordinance to assure the continuation of natural hydrologic functions throughout Pima County.

History and Background of Ordinance Development

On July 16, 1991 the Board of Supervisors (Board) directed staff to begin preparation of a wash protection ordinance. This effort was driven by a desire of the community (mainly residents of the Catalina foothills) to preserve open space and vegetation along the washes. The Board asked staff to focus on regulations that would encourage developers, in particular, to protect riparian habitat. The resulting regulations, as recommended by the County Administrator's office were to "require specific mitigation for the removal of riparian vegetation within any defined floodplain of a wash having a discharge greater than 2,000 cfs when the aggregate area of disturbance within the floodplain exceeds one acre". The 2,000 cfs criteria was later dropped in favor of a habitat classification system.

Staff returned to the Board on April 7, 1992 with a draft of an Ordinance whose intent was to protect riparian habitat and to establish mitigation requirements for occurrences of unavoidable disturbances to riparian habitat. A definition was proposed for riparian habitat found in Pima County. Characteristics that typically identify riparian habitat in arid/semi-arid environments are: increased vegetation size and/or density along watercourses (areas with increased soil moisture compared to upland areas), or a change in plant species composition. The definition included three categories: hydroriparian, mesoriparian, and xeroriparian.

Because the majority of habitat found in Pima County is xeroriparian, this type of habitat was further subdivided into four classifications based on vegetation volume. Mitigation requirements were based on type of habitat being disturbed, with hydro/mesoriparian habitat considered the most rare and valuable, thus having the most stringent mitigation requirements. Since the classification system of habitat was based on total vegetation volume, the goal of the mitigation requirements is to replace the total vegetation volume of the disturbed habitat within five years.

Issues of application of the Ordinance were developed over the course of the next few months, with help of committees. A committee comprised of scientists was called upon for help in refining the definition and classification system for riparian habitat specific to Pima County, and development of mitigation requirements. Later, a broad-based committee representing all factions of the community was formed to help develop final Ordinance language. At the same time, regional habitat inventory maps were being developed. The "Pima County Watercourse and Riparian Habitat Protection and Mitigation Ordinance #1994-FC2" and the companion Zoning Code Text Amendment # 1994-113 "Modification of Development Standards in Riparian Areas" were adopted by the Board on

July 19, 1994. Following adoption of the riparian regulations, work on detailed riparian habitat maps commenced.

Due to private property rights advocate's and ranching concerns 1994-FC2 applied only to properties undergoing the subdivision or rezoning process. The riparian regulations did not apply to individual lots and building permits. However, the regulations at that time applied (and still do apply) to Pima County property and any projects undertaken by the county. The regulations also apply to State land, but federal land and preserves were not included because they already enjoy a higher level of resource protection than this Ordinance affords. The politicians responded to the private property rights advocate's concerns by allowing development to take place if mitigation was performed. By adopting an Ordinance that was not prohibitive, the issue of "takings" on private land was avoided. The Ordinance provides, through modification of the Zoning Code, incentives or options of developing property in a manner that allows preservation of habitat.

Examples of these options include increased development density outside the habitat area (cluster development), decrease in the required amount of parking, relaxation of height/setback requirements, etc. in exchange for avoidance of riparian habitat. The current version of the Ordinance adopted in July 1998 applies to all properties within unincorporated Pima County.

Effectiveness Review

Mitigation Plan Statistics

Since the 1998 revision of the Ordinance, only 33 mitigation plans have been submitted and approved. None have been denied. Twenty-seven mitigation plans are for single family residences being built within hydro/mesoriparian habitats. All of the single family residence plans involved habitat disturbance of one-half acre or less. Six development plans or plats have been processed, all being built within xeroriparian habitats.

The Ordinance lists an order of preference for mitigation; the first choice is to encourage avoidance of habitat. If avoidance is not possible then onsite mitigation is the next choice. If onsite mitigation is not feasible, offsite mitigation or the mitigation banking option can be utilized.

Most of the mitigation has been performed onsite. Three of the single family plans involved trading mitigation between 3 adjacent lots. The lots are under the same ownership and plant densities were "traded" between the three in order to meet mitigation requirements for the overall area. One residential plan transferred mitigation to another lot located downstream. Transferring mitigation to nearby areas helps to prevent fragmentation of the habitat corridor.

The Board must review and approve hydro/mesoriparian mitigation plans before a construction permit can be issued. The reason this requirement was included in the Ordinance was to draw public attention to the amount of hydro/mesoriparian habitat being

disturbed. To date, the Board has approved all mitigation plans that have been submitted for their approval. Xeroriparian mitigation plans are reviewed and approved at the staff level.

Compliance Review

As part of assessing the effectiveness of the Ordinance in protecting habitat, field visits were made during August 2000 to each property having an approved mitigation plan. All but one of the projects that have been completed are in compliance with the plans. Many of the projects are still under construction. A statement included in the Floodplain Use Permit gives applicants until the first growing season following completion of construction to comply with the mitigation regulations.

Over the next few years as the mitigation plantings mature, the success of completed mitigation should be evaluated. The Ordinance classification system of habitat was based upon total vegetation volume (tvv) and natural water availability. The mitigation standards were developed with the goal of replacing the tvv of the disturbed habitat within five years of planting. Plant lists were developed for both hydro/mesoriparian and xeroriparian habitat that contain a range of the types of plants found within the different habitat classifications. The mitigation standards suggest use of a mixture of plant species that reflect the habitat that is being disturbed.

The mitigation requirements have been in place since mid-1995 following adoption of the habitat maps and mitigation standards by the Board. The five year establishment period for the first mitigation plans submitted under the Ordinance will conclude during the fall/winter season of 2000. During the next year a plan for evaluating the health and effectiveness of the mitigation should be developed.

Mitigation Plan Effectiveness

The Ordinance is accomplishing the goals set by the Board and the community at time of adoption. It is working the way it was intended - encouraging avoidance of the denser and moister riparian environments that have been mapped. This is particularly evident by the small number of mitigation plans being submitted. The Ordinance is successful in keeping most owners from "mass" grading their lots, and encourages more environmentally sensitive site planning.

Since the 1998 revision of the Ordinance (which now applies to all property), it is difficult on some lots to avoid hydro/mesoriparian habitat during development of single family residences (SFR). This is particularly true on Tanque Verde Creek where lot size leaves no option for avoidance within the broad riparian corridor. The trend in this area is to build large residences on relatively small lots, not providing much space for avoidance of habitat or mitigation. Since revision of the regulations, a larger number of hydro/mesoriparian mitigation plans are being submitted. Most mitigation plans are drawn to avoid disturbance of habitat as much as possible and mitigation involves planting small amounts of trees and shrubs. The average amount of mitigation for a SFR is 12-20 trees and a corresponding amount of shrubs and seeding.

Larger developments tend to be located outside of hydro/mesoriparian areas and have more acreage on which to avoid disturbance of habitat. Commercial developments tend to have less flexibility in their site design, and if located in a riparian area, leave little or no space in which to perform mitigation. Commercial developments are most likely to use the mitigation banking approach for project habitat mitigation.

Mitigation Banking

To date, two plans have incorporated mitigation banking, and one more residential plan requesting mitigation banking is currently in process. One commercial plat involved mitigation banking. The developer contributed monies to a restoration project located offsite. This restoration project is being used to meet the USFWS and Army Corps of Engineers 404 Permit mitigation requirements as well as the Ordinance mitigation requirements. The restoration project is being administered by The Tucson Audubon Society.

In this case, mitigation banking was the only option if the project was to be constructed. Commercial projects are the most likely candidates for mitigation banking. The residential lots utilizing mitigation banking are relatively small and heavily wooded. The size of the houses and associated improvements on most of these lots makes onsite mitigation difficult or impossible to accomplish.

Most of the single family residences within hydro/mesoriparian habitat could be eligible for mitigation banking, however it may be more valuable (from a biological viewpoint) to keep the habitat within the same area/watercourse reach. By mitigating onsite or in a nearby area, the habitat will become less fragmented. Continuity of habitat is important for wildlife. The small amount of funds that would be contributed to a mitigation bank by these individual lot owners would take a substantial amount of time to build to a level that could be used for habitat restoration by a public agency. In the meantime if funds are contributed in-lieu of onsite mitigation, habitat along these watercourses is being fragmented, adversely affecting wildlife. Once the habitat is gone, and replacement habitat is not available the animals will be forced to seek other areas for cover and forage (all of which are shrinking).

Mitigation plans for County projects have been implemented for transportation, parks, and flood control projects. No mitigation plans have been received from Pima County Wastewater Management. The requirements apply equally to private and public projects within unincorporated Pima County.

Ordinance Enforcement

A formal enforcement program has not yet been developed and implemented. Permit conditions requiring completion of the mitigation by a certain date, i.e., the next growing or planting season following construction should be a standard part of the permit. A standard FPUP is valid for one year from the date of issuance. The permit expiration date may need to be extended to allow property owners time to comply with the mitigation requirements. A typical residence takes 6-12 months to construct and mitigation should

be completed during the growing season following construction. Regular field inspection of the plans to ensure compliance should be scheduled. Field inspections are currently conducted periodically due to staff work loads.

Strengths and Weaknesses of the Ordinance

Community Acceptability

One strength of the riparian ordinance is that it is not prohibitive, in that it allows for development of private property with restrictions. By structuring the language in a non-prohibitive way, it was acceptable to the community and adopted by the Board of Supervisors (Board). If development were prohibited on private land because of habitat designations, then property owners would believe the Ordinance is "taking" the use of their land.

Mitigation Requirements

Another strength is the mitigation requirements are based on a scientifically sound and defensible vegetation classification system and mapping technique. Total vegetation volume is positively correlated with breeding bird densities. The intent of the mitigation is to replace total vegetation volume and structure through planting trees, shrubs and ground covers.

Classification and Mapping

The delineations of regulated habitats used by Pima County are a weakness. They are largely based on multi-spectral LANDSAT images from the early 1990's. The methodology used to classify the riparian areas fails to protect some of them because of their narrow size relative to the 30-meter LANDSAT pixels. Wide xeroriparian areas which did not meet vegetation volume thresholds were not protected either. Other riparian areas dropped out because the LANDSAT imagery was not rectified to the same base as the orthophotos. A minimum map length of 420 meters prevented some riparian segments from being protected.

For these and other reasons, the Science Technical Advisory Team recommended that the riparian vegetation maps be improved in the Sonoran Desert Conservation Plan. That work is underway, and it is expected that new mapping will be completed in December 2000.

Figure 1 presents an example of the current regulatory maps for the Tortolita Piedmont area. Most of the riparian zones along small watercourses in this area were not delineated. Riparian zones protected under Pima County's ordinance are shown in yellow on the top of Figure 1. Riparian zones which lie along small, fine-textured drainage networks were not protected under the Ordinance, despite their apparent importance to cactus ferruginous pygmy-owls as well as other animals.

The bottom of Figure 1 shows riparian areas delineated for the Sonoran Desert Conservation Plan (SDCP). These areas were mapped based on 1:24,000 USGS orthophoto quadrangles. The polygons differentiate riparian areas from uplands based on

tonal differences visible at that scale. The riparian areas are classified based on vegetation communities, not vegetation volumes. A previous report, entitled *Pima County Riparian Vegetation Mapping Pilot Study* (May 2000), summarizes the ongoing SDCP mapping effort and provides more information about these maps.

A comparison of the two figures shows that much xeroriparian vegetation is not protected by the current classification. One reason is that xeroriparian areas with a total vegetation volume less than 0.5 m³/m² were deliberately excluded under County ordinance. This threshold value was chosen for Pima County's riparian habitat mitigation ordinance because it represents the upper limits of the vegetation volume of upland Sonoran Desertscrub and Semidesert Grassland biomes. In other words, only the xeroriparian vegetation that was denser than the densest desertscrub or grassland qualified for protection. As a result, few xeroriparian areas in the drier parts of Pima County qualified.

Rectification and Loss of Habitats

In November 1999, Westland Resources under contract with the District, verified the hydro/mesoriparian (H/M) map boundaries along Tanque Verde Creek upstream of Houghton Road. This work was undertaken because during administration, staff found some areas mapped as H/M habitat did not have sufficient vegetation volume to be protected.

Westland mapped H/M habitat using more recent aerial photography (dated October and November 1998) and verified the boundaries in the field. Comparison of the updated field mapping to the original H/M map layer revealed only minor differences. The outermost habitat boundaries on the satellite layer were essentially the same as the field-mapped boundaries. Larger differences were found on parcels where habitat had been altered since 1990 (the date of the satellite imagery used for the original mapping effort).

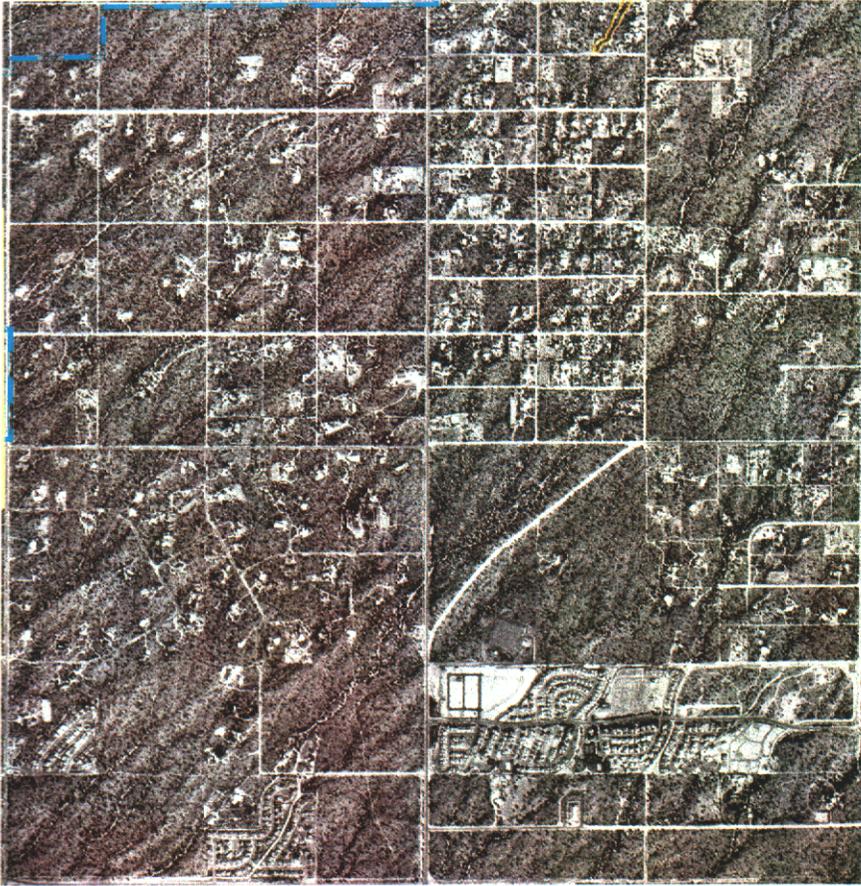
Comparison of the field mapped boundaries to the original boundaries revealed that problems in determining the correct location of the H/M habitat boundaries relative to property lines are due to rectification problems with the parcel base data and the overlaying habitat layer in the GIS system.

Least Damaging Alternatives

From a biological viewpoint, one weakness of the current Ordinance is that protected habitat can be disturbed, if mitigation is performed. An applicant is required to demonstrate the habitat disturbance cannot be avoided before preparing a mitigation plan. Department enforcement includes negotiation on placement of development relative to the habitat, and most applicants are willing to change their plans to avoid disturbing habitat as much as possible. However, the least environmentally damaging alternative is not required by staff or the Ordinance. Some applicants are inflexible, insisting on a development plan that disturbs habitat in lieu of a more sensitive plan.

Regulation Triggers

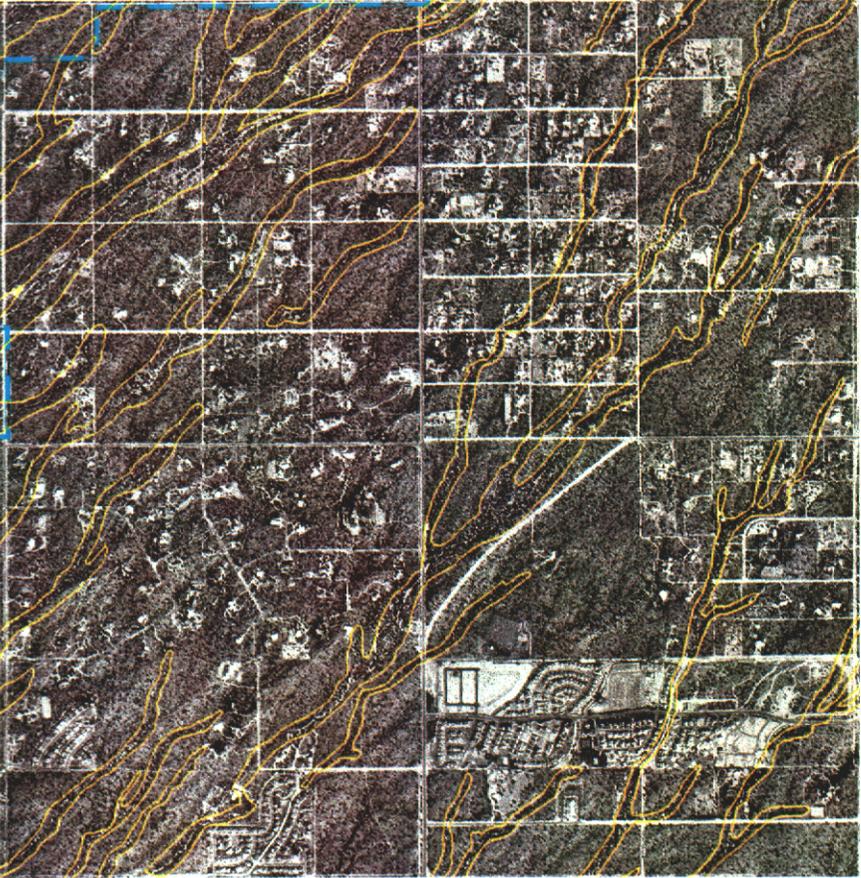
From a legal and property rights advocate viewpoint the mitigation trigger for xero-riparian habitat is a strength. To allow property owners use of their properties, the mitigation



Pima County Riparian Habitat Mapping

Ruelas Canyon Quad

-  Riparian Habitat
-  Administrative Boundaries



Harris Riparian Habitat Mapping

Ruelas Canyon Quad

-  Riparian Habitat
-  Administrative Boundaries

Figure 1

trigger for xeroriparian habitat was set at 1/3 acre. By allowing habitat disturbance up to 1/3 acre before mitigation is required, most site plans can be designed so no habitat or only small areas are disturbed. Hydro/mesoriparian habitat is considered more valuable, thus the zero disturbance trigger.

In some areas of more diverse, biologically valuable xeroriparian habitat this trigger could promote habitat fragmentation by allowing incremental destruction of habitat on adjacent parcels. If disturbance continues at the present rate valuable habitat will be fragmented.

Plant Species Diversity

The mitigation being performed (if successful) will replace the vegetation volume, but may be of a different value from a biological viewpoint. Both habitat fragmentation and the replacement value of the mitigation is a growing concern along Tanque Verde Creek, where much of the county's remaining hydro/mesoriparian habitat is located. Most property owners opt for mitigation plans using mainly mesquite. Although mesquite provides valuable bird habitat, the mitigation areas may become less biologically diverse. Revision of the mitigation plant list requirements should be considered to ensure more diversity for better wildlife habitat.

Issues that a Mitigation Ordinance Cannot Address

The Ordinance only affects activities which require a floodplain use permit. Destruction of riparian vegetation is not regulated unless a structure is planned. Even if a structure is planned, permits are not required for mining, agriculture, ranching, and construction of electric transmission lines under state statutes. School districts are also exempt. These exemptions allow destruction of habitat without mitigation being performed (provided the project does not fall under federal laws that require habitat mitigation).

Other human uses may detrimentally affect riparian areas. Uses such as mowing or clearing of the understory vegetation for aesthetics or fire control, wood-cutting and grazing of livestock reduce total vegetative cover. The presence of pets (in particular domestic cats which prey on birds, lizards, and insects) and invasion of exotic plant species can affect the habitat quality of preserved or mitigated riparian areas.

In and of itself, hydrologic functions that support riparian systems are not protected. For instance, in the Tortolita piedmont, alteration of distributary flow characteristics can be expected to change sediment transport and peak discharges. Changing these characteristics will likely change the distribution and function of the riparian systems. Loss of over-bank storage along a watercourse, or depletion of sediment by gravel mining alters hydrologic functions. Groundwater pumping can decrease water table levels, another example of how hydrologic functions are not protected. Extension of roads, sewers, and bank stabilization to areas facilitates development at increased densities, with concomitant increases in groundwater pumping.

Separate measures to address hydrologic functions, invasion of exotic species, and habitat

destruction due to statutory exemptions will be needed. The ordinance itself is insufficient to protect ecosystem functions.

Alternative Approaches to Helping Protect Habitat

In rapidly developing urban areas working with the owners to develop site and/or mitigation plans to keep habitat intact and mitigation efforts onsite is important. To quote Bill Weeks, Vice President of The Nature Conservancy, discussing the conservancy's effectiveness, "Our organizational ethic is pragmatic and solution oriented. The long-term conservation of areas depends on the people who live in and around them". Without the cooperation of property owners long-term habitat protection is not possible.

On heavily wooded lots being developed for residential use, hydro/mesoriparian habitat mitigation ratio of 1.5:1 is often impossible to accomplish onsite. To help provide more continuous cover, mitigation techniques could be combined. For example, placing as much mitigation onsite as possible with the remainder being performed on another site within the same habitat corridor will serve to reduce habitat fragmentation. If a suitable offsite area is not available for the remainder of the mitigation requirements, contribution to a mitigation bank would be required. By using a more flexible approach to enforcing the regulations, property owners are more receptive to the Ordinance and less habitat is fragmented. Working with property owners for a mutually acceptable plan ensures future good stewardship of the property.

As outlined in the SDCP, the County can work more proactively with other agencies, environmental organizations, and landowners to find suitable locations for habitat restoration and mitigation. The banks could be administered by public agencies or private organizations. Flexibility in establishing mitigation banks is the key to successful habitat protection and restoration.

Establishment of a network of conservation easements using mitigation banking monies and other funding is a good tool for protection of existing habitat. Mitigation should be second choice to habitat protection, because revegetating riparian areas is challenging, and may not prove to be successful.

Recommendations:

Require the least environmentally damaging alternative be selected for any actions in designated pygmy-owl critical habitat and in high priority watersheds defined in the Sonoran Desert Conservation Plan.

Consider the revised riparian vegetation maps prepared for the Sonoran Desert Conservation Plan for adoption under the Ordinance.

Distribute the revised riparian vegetation maps to other resource agencies and encourage them to avoid these areas in the Section 404 Clean Water Act process.

Use the existing LANDSAT imagery processing as a basis for mitigation target volumes, unless and until better resolution information is available.

Emphasize use of the Floodprone Land Acquisition Program and bond monies to acquire riparian areas, especially hydromesic areas, and to establish conservation easements.

Do not extend roads, sewer easements, and bank stabilization infrastructure along riparian corridors.

Pursue multiple methods to protect all hydromesoriparian areas, such as purchase of property rights, surface/groundwater rights, extension of reclaimed water lines, formation of parks/preserves, development of multi-use corridors, planting of native vegetation on existing disturbed areas, physical barriers to close washes to off-road vehicles, and partnering with local conservation organizations, ranchers, agriculture, state and federal agencies, companies with large land holdings, developers, etc.

Implement an enforcement program to ensure mitigation is completed and maintained.

Provide a deadline for completion of mitigation, which may require extension of the Floodplain Use Permit time frame.

Accept a combination of onsite, offsite, and mitigation banking contributions, where appropriate.

Support stronger floodplain management regulations in high priority watersheds, as defined in the Sonoran Desert Conservation plan.

Evaluate the health and effectiveness of mitigation plantings in replacing lost vegetation volume.