

**RIPARIAN PROTECTION
TECHNICAL PAPER FOLLOW UP**

Follow-up Items

1. Provide definitions of hydro-riparian, meso-riparian and shallow groundwater.

Response:

Hydro-riparian habitat is generally associated with perennial watercourses, where plant species such as cottonwood and willow are present. This is the rarest type of riparian habitat in Pima County and is vital to wildlife species who utilize the habitat for critical life cycle stages.

Meso-riparian habitats are associated with areas with shallow ground water and/or intermittent stream flow. Mesquite bosques are characteristic of this habitat type.

Shallow Groundwater - Several definitions of shallow groundwater have been discussed. PAG (2008) classified them in Pima County as areas having a depth to water of 50 feet or less. In areas with a lack of water level data, Shallow groundwater areas in Pima County were demarcated by indicator plants that thrive on shallow groundwater, including cottonwood, willow and thickets of large mesquite.

2. Could satellite imagery be used as an educational tool to help people see the impacts of groundwater pumping?

Response:

Yes. Satellite Infrared (IR) imagery was used to delineate riparian areas with field confirmation for Pima County MapGuide overlays for 1990 data and updated in 2002. Satellite methods include Landsat Thematic Mapper (TM) data that has been pioneered by the USGS to delineate vegetation using normalized difference vegetation Indices (NDVI). With the use of nearby monitor wells, many of the shallow groundwater areas in Eastern Pima County are monitored to evaluate potential riparian loss. The IR imagery is a tool to show changes over time as water levels decline. The Satellite imagery too may be more cost effective in areas where monitor wells and aerial photography are scarcer to show changes over time using NDVI. NDVI is also a good tool to show differences in plant vigor as water tables drop.

Comments/Recommendations/Themes

1. The number of exempt wells is so significant that we would need a way to limit existing exempt wells at the local level to really protect riparian areas. Wheeling renewable supplies to areas with exempt wells is an option but whether the community would be willing to subsidize this is a question.
2. Planned communities are much better than "wildcat" developments, from a riparian protection perspective. We need to make sure we are not encouraging "wildcatting" by heaping too many regulations on subdivisions.

Issues for Regional or State-level Discussion

1. State level legislative issues are key to this issue of controlling exempt wells.