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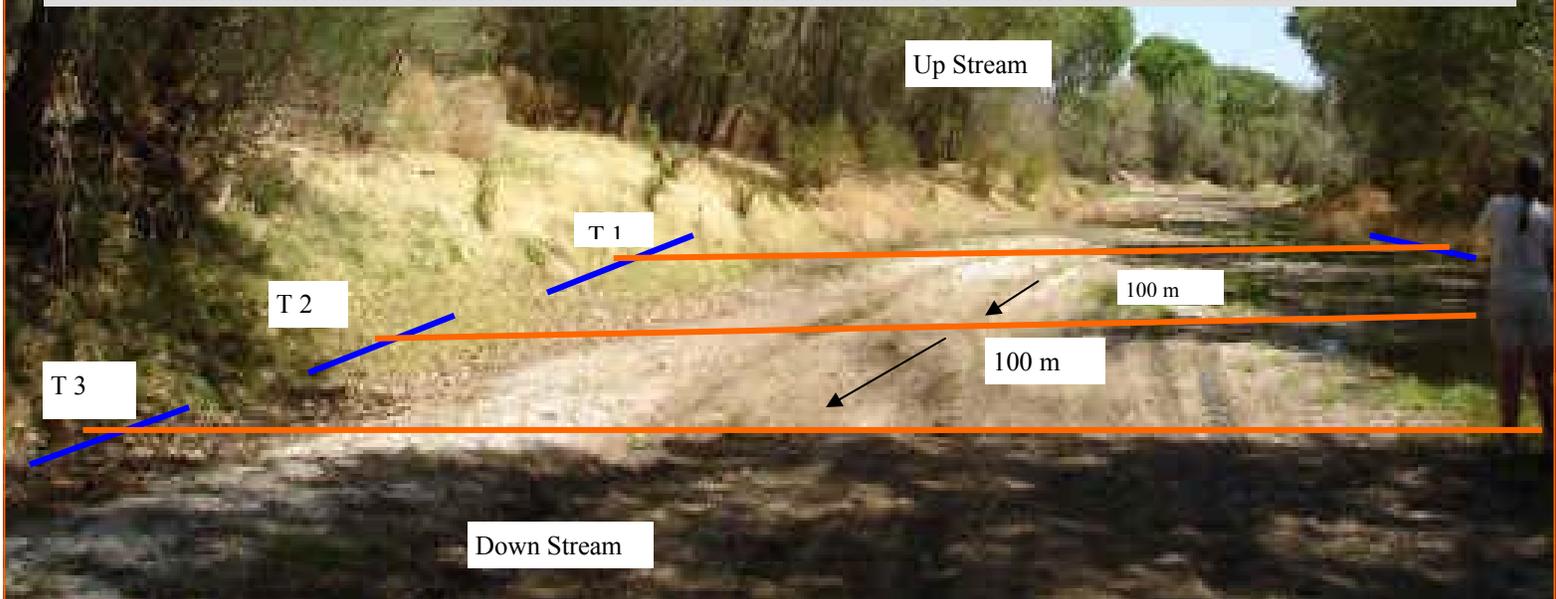
## PHOTO JOURNAL

# COMMUNITY RIPARIAN MONITORING NETWORK IN THE MIDDLE SAN PEDRO SUBWATERSHED

### Process used in establishing monitoring system for riparian bioindicators.

Each of four sites to include:

- Three transects ( red lines, T1-T3) perpendicular to high -flow channel that span the width of the floodplain (the extent of the cottonwood, willow, and tamarisk/mesquite bosque forest zone)—no sampling on the high terraces. Lines truncated for diagram.
- Longitudinal transects along streambanks( 20 m blue lines ) for streamside vegetation sampling, perpendicular to transects.
- Randomly located (5m x 20) monitoring plots for woody plant DBH and density – one in each patch type identified on both sides of the channel along T 1 and T 2. These are centered longitudinally on transect line.
- Eighteen one square meter quadrats randomly placed along streamside transects (blue lines) on both sides of the active channel to measure % of cover by species, of all species in the plots. Six plots total per transect, three plots on each side of the river for each of the three ( red ) transects.
- When possible, shallow aquifer piezometers are installed to monitor groundwater levels near transects.



Photos from field sessions Spring of 2006. Partners include:  
CWA, ASU, U of A, NEMO, ARS, USGS, TNC, Cochise County, Apache  
Nitrogen, and local land owners.



**Figure 1:**

**ESTABLISHING LOCATION OF TRANSECT:** Drive Stake #1 on bank. Sight bearing (using True North.) to place Stake #2 on far side of channel, perpendicular to river channel. Place end of 100m tape on Stake #2 and proceed to end of flood plain using same bearing. Drive stake #3 at end of transect and attach loose end of 100m tape. Repeat for the opposite side of the transect across the river. Take GPS readings for both ends and stream channel points of each transect.

**Figure 2:**

**Other transect features of interest:**  
 Channel width from base of bank  
 Width of wetted area  
 Max depth of water  
 Streamside edge to edge of floodplain (defined by geomorphic and vegetative variables).



**Figure 3:**

**PATCH TYPE DATA SHEET:** Once patch types (as indicated by dominant species) are identified along the transect, one 5m x 20m sampling plot is randomly located along the transect within each patch. Perimeter boundary of rectangle is marked by 100 meter tape wrapped around 4 rebar corners placed so that the long (20 meter) sides of rectangle are bisected and perpendicular to transect line.



**Figure 4:**

Within each patch, DBH tapes are used to measure diameter of the two largest trees per patch—measurements taken 1 caliper height from ground level.

**Figure 5:**

**TREE DBH AND DENSITY DATA SHEET:** Within each sampling plot, DBH tapes and calipers are used to measure the diameter of stems (trunks) of all cottonwoods, willows, and tamarisk. DBH is recorded by species and size classes: 0-1 cm, 1-2 cm, over 2 cm. The number of stems of each species per size class is recorded.





**Figure 6:**

**Determination of what stems that are appropriate to include may be confusing. For example:**

**The original trunk on this tamarisk was damaged, and now lies dead on the ground, with several distinct resprouts emerging separately out of the ground near by that are alive. Count the main trunk as dead, as well as the separate live stems that have now become established, since they are emerging from the ground surface separately.**

**Figure 7:**

**To count or not to count! Use these tips:**

**This is obviously a relatively large trunk that has been damaged, but was actually still alive, although no longer vertical. Count only the main trunk, since it is still alive. The resprouts are not emerging from the ground independently of the main trunk, and should not be counted in this case.**





**Figure 8:**

**Here, although the resprout is positioned lower on the trunk, it is still visibly emerging from the main trunk, and should not be counted separately.**



**Figure 9:**

**STREAMSIDE VEGETATION SAMPLING DATA SHEET: A 20 meter tape is positioned perpendicular to the transect stake and centered on it, at the edge of the stream banks. Three randomly located, one square meter sampling quadrats are positioned along the tape.**

**A total of six plots are established in the streamside zone at each of the three transects, 3 on each side of the stream (for a total of 18 plots per site).**

**Within each plot, the percent cover of all species is recorded by cover classes: 1-5%, 5-25%, 25-50%, 50-75%, 75-100%.**