

ARIZONA RIPARIAN
MAPPING CONVENTIONS

While in Arizona last August and September 1988 for a National Wetlands Inventory field reconnaissance trip, I was introduced to the needs of the Arizona Riparian Council to develop photo-interpretive conventions necessary to produce an accurate inventory (via remote sensing) of Arizona's abundant riparian habitats.

On September 2, 1988 Curtis Carley (Assistant Regional Coordinator U.S.F.W.S.), Donley Kisner (Geonex Martel, Inc.) and myself met with William Bayham (Arizona State Land Department) and Dennis Haywood (Arizona Game and Fish Department) to walk a length of Christopher Creek in Tonto National Forest for a discussion of the goals and possible strategies of the Arizona Riparian Council. The discussion spanned such subjects as:

1. The definitions of riparian and wetland habitats and the overlap between the two systems.
2. The accurate definition of wooded plant species such as
 - a. mixed broadleaved plants (ash, sycamore, walnut) vs. cottonwoods and/or willows
 - b. saltcedar vs. mesquite
3. Mesquite Bosque habitat and subsurface water availability.
4. Saltcedar/Mesquite communities along major floodplains.
5. Non-wetland streamside riparian habitat and ephemeral dry wash situations.
6. The "historic" riparian floodplain.
7. Xeric linears.
8. Problems associated with riparian aspen.
9. Riparian juniper (see separate section on juniper).

Considerations:

In order to map anything, one needs a solid, defendable definition of the data to be gathered. My job of accurately defining wetlands has been made possible by the development of many tools such as color infrared film, the use of U.S.G.S. topographic maps, soil surveys, and most importantly the availability of a tested and reliable classification system. These tools used in combination with one another and guided by the strict definition of the term "wetland" allow me to

differentiate and classify vegetative (and non-vegetative) wetland communities along with their relative periods of inundation. It has been through the use of this wetland classification system that the primary wetland/riparian boundaries have been established. While researching this paper, I have come across many definitions for the criteria necessary to call an area riparian. Some definitions include the following:

1. "Riparian systems are defined as habitats or ecosystems that are associated with bodies of water (streams or lakes) or are dependent on the existence of perennial or ephemeral surface or subsurface water drainage."
(Arizona Riparian Council By Laws)
2. "Riverine riparian ecosystems overlap a great deal with some of the ecosystem types in the wetland classification system of the Fish and Wildlife Service." (Cowardin et al. 1979)
3. "It is possible that the vicinity of headward gully erosion and gully wall collapse may represent the upper limits of floodplains in arid climates. However, riparian vegetation often continues upstream from that point and thus is not restricted to floodplains." (Leopold and Miller 1956)
4. "We include the full continuum from intermittent head water streams with negligible floodplains to broad meandering rivers." (Brisner, Swift, Plantico, and Barclay 1981)

With these thoughts in mind, given the sometimes liberal views concerning riparian criteria, I decided to agressively map riparian habitat whenever it seems to fit into the general definitive scheme. Ultimately, future field reconnaissance trips and draft map reviews will solve any problems that may be encountered during this pilot effort.

Methodology for Riparian Delineations

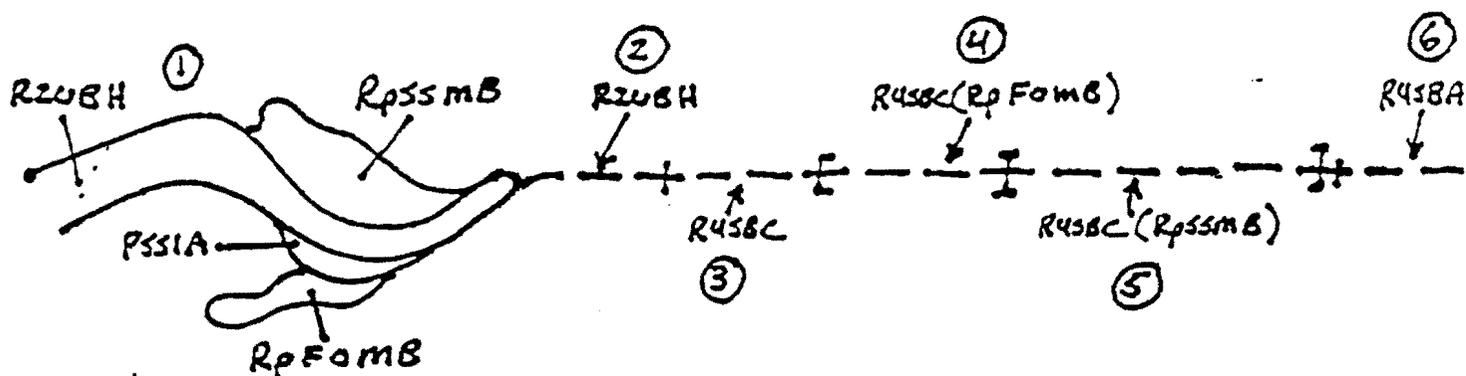
The fundamental goal agreed upon was to map wooded riparian vegetation with respect to five representative plant categories: Mixed broadleaf species, cottonwood/willow associations, saltcedar, mesquite, and juniper. All delineated riparian habitat has been labelled beginning with the symbol Rp: short for riparian. The next determination in labelling is in the "class" of the vegetation as either a scrub-shrub (SS) vegetative community averaging less than 20' in height, or forested (FO) communities greater than 20'. The determination of SS and FO will be restricted to mixed broadleaved (MB) and cottonwood/willow (CW) associations with the given assumption that all saltcedar, mesquite, and juniper communities are to be labelled scrub-shrub (SS)* Thus the following categories have been selected to represent various riparian ecosystems in this project:

* Saltcedar, mesquite and juniper communities were limited to the scrub-shrub designation on the ten 1:100,000 scale maps of the Mogollon Rim in Arizona. In other areas they may be designated (FO) forested if greater than 20 feet tall. C.J.C.

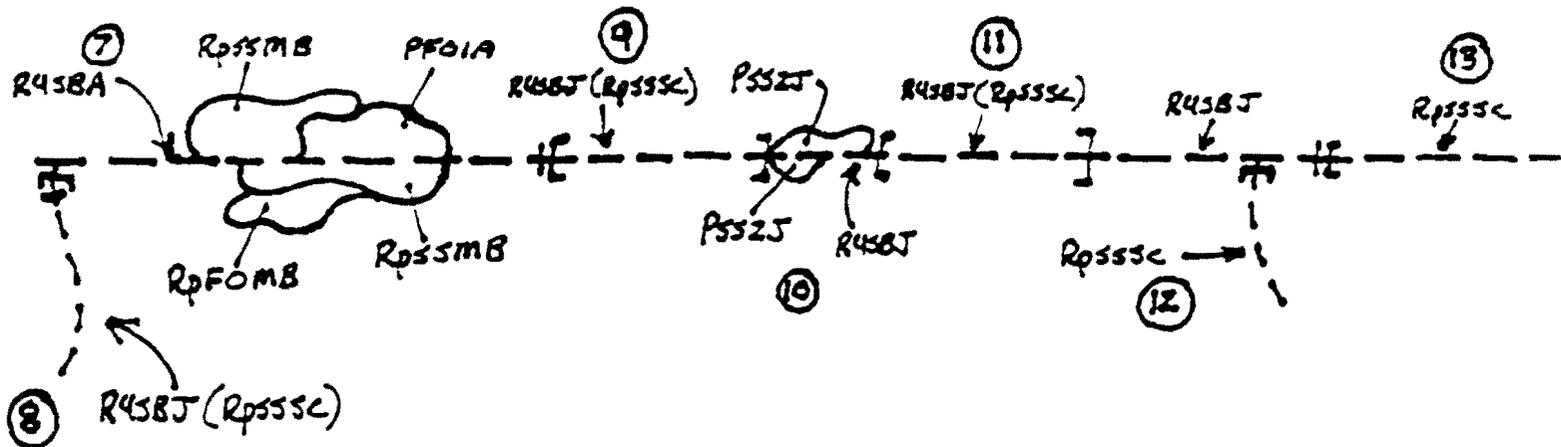
1. RpSSMB and RpFOMB - riparian habitat consisting of a mixed shrub or forested community of ash, sycamore, walnut, cottonwood, and willow.
2. RpSSCW and RpFOCW - riparian habitat consisting of exclusively cottonwood/willow shrub and forested communities.
3. RpSSSC - saltcedar riparian habitat.
4. RpSSMQ - mesquite riparian habitat
5. RpSSJU - juniper riparian habitat

For this project, riparian habitat was delineated after the wetland boundaries had been established and linework double checked. Riparian habitat was delineated in polygon form if the vegetative community was wider than the line width of a 4x0 rapidograph pen on 1:58,000 scale photography. If the riparian (and wetland) habitat could be approximately covered by the width of the linework (about 30') the resulting delineation will be in linear form. Differentiating between wetland and riparian polygons will not be difficult given the presence of boundary linework and labelling. The intersection of riparian/wetland linears and the inclusion of narrow (less than pen width) riparian habitat along streams and intermittent washes has necessitated the addition of riparian "breaks" within the linework symbology. Please refer to Table A for possible linear configurations.

WETLAND/RIPARIAN LINEAR CONVENTIONS
TABLE A



1. R2UBH wetland polygon with polygon of wetland vegetation (PSS1A) and polygons of riparian habitat (RpSSMB, RpFOMB).
2. R2UBH wetland linear (pen width) with no bordering wetland or riparian vegetation.
3. Wetland change from perennial flow to intermittent seasonal flow. (Notice single wetland dash "break")
4. Intermittent seasonally flowing system bordered by narrow boundary (less than pen width) of forested riparian vegetation.
5. No wetland change, however, forested riparian vegetation has now changed to a scrub-shrub community (Notice, "I", the riparian "change break"; denotes riparian type change in both directions).
6. Disappearance of riparian vegetation and wetland change indicated by riparian "end bracket" and wetland dash break.



7. Temporarily flooded intermittent riverine streambed with polygon of temporarily flooded palustrine forest (PFO1A) and polygons of mixed broadleaf riparian shrubs (RpSSMB) and mixed broadleaf riparian trees (RpFOMB).
8. Intersection of intermittently flooded stream with riparian saltcedar fringe (R4SBJ)(RpSSSC) with a temporarily flooded riverine system.
9. Wetland riverine change from temporarily flooded streambed to intermittently flooded streambed with non-wetland saltcedar fringe.
10. Continued intermittently flooded streambed (R4SBJ), now with intermittently flooded saltcedar community (PSS2J). Notice at no time will a riparian bordered stream have polygons of wetland vegetation touching it.
11. Back to intermittently flooded streambed with narrow band of riparian vegetation.
12. Non wetland riparian linear (RpSSC) intersecting with non-vegetated wetland linear (notice riparian break).
13. The end point of the intermittently flooded streambed (set by wetland mapping conventions) and beginning of non-wetland riparian vegetated drainage. (Notice both wetland end break and riparian break)

It was not until December of 1988, while at the Riparian Council Meeting attended by Donley Kisner and Curtis Carley, that juniper was more fully discussed, and ultimately included in the riparian inventory. **I agree that juniper is a valid riparian representative species in some instances, however as the definition for riparian boundaries are more liberally interpreted there appears to be countless situations where one does find juniper in riparian settings.

However, the persistence and unchanged appearance of juniper out of the riparian zone seems to counter the species' dependency upon a riparian setting to create a rich and diverse assemblage of plant species in comparison to adjacent upland areas. Only in a very few areas, strictly controlled by elevation, did I observe juniper seemingly dependent upon its proximity to a stream or drainage. Nonetheless, with all the pro's and con's taken into account, juniper is, after all, an example of woody vegetation and was mapped aggressively whenever it appeared to fall within defensible riparian situations.



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** An additional category (UD) for undetermined was also created for use in instances where the photo signature (MQ, CW, SC, MB, JU) was not clear.

C.J.C.