Potential riparian ecosystem monitoring projects for AZ Rivers

1) Develop an identification list for plant/animal species in your riparian ecosystem:
    a) birds
    b) woody / non-woody plant species & flowers
    c) pollinators (insects, bats)
    d) macro invertebrates
    e) vertebrates (mammals, reptiles, amphibians) – animals: tracks & scats

2) Measure different characteristics of the river water over a day, month, or seasons.
    a) Basic water quality: temperature, pH, TDS, turbidity
    b) Kit-based water quality: Alkalinity, Dissolved oxygen, Nitrate
    c) River flow rate and/or volume

3) Estimate abundances and/or diversity of …
    a) key plant &/or animal species in your riparian ecosystem,
    b) macro-invertebrates (use to monitor stream health index)

… record these observations and compare them over months or seasons.

4) Measure physical differences in a transect across a riparian system. You can monitor:
    a) Soil/air temperature
    b) Soil profiles and textures
    c) Soil organic content
    d) Soil chemistry – salinity, NPK
    e) Soil and litter decomposers

5) Use ground, satellite and aircraft images with ground GPS data to develop a detailed or reconnaissance map of your area using GIS software.

6) Study ephemeral wash changes over time

7) Work with other groups to develop an oral history of the river.

8) Rio Salado - contact Heather Watson
    - avian surveys ("pretty much under control", but his means there's probably good data for comparison.
    - vegetation surveys
    - surveys of terrestrial species
        - mammals
        - reptiles
        - amphibians

9) Record where river "starts" and "disappears". Does this vary seasonally?

10) Service at Salado - excellent examples of past and future projects - possibly adopt or adapt these ideas at your own river site. Visit the website to review past projects of school groups: http://caplter.asu.edu/explorers/riosalado/index.htm

11) If you can't get out in the field OR if you want to intrigue students before going out in the field, consider an aquarium project or a "biospheres in a bottle" like the ones Kiki Moore described/showed.

Remember ***BLAH!*** ☺ (**B**iosphere, **L**ithosphere, **A**tmosphere, **H**ydrosphere)

one website for more info:
http://www.microbeworld.org/resources/experiment/experiment_biosphere_in_a_bottle.aspx

Google: "biosphere in a bottle" and "National Association of Biology Teachers"

12) Crayfish projects abound! Contact Eric Proctor of AZ Fish & Game &/or visit their website for soon-to-be-posted protocols contact: eproctor@azgfd.gov
- Don't forget to get a fishing license

13) Contact Brent Cogswell for a tour of Southwestern Academy in Sedona. Schools, families, individuals welcome. They are located right on Wet Beaver Creek - a great site for field trips, sampling, monitoring

For more info contact Brent &/or visit the Southwestern Academy website

http://www.southwesternacademy.edu/arizona.htm

14) Birding project ideas abound! Including:
- project feederwatch: http://www.birds.cornell.edu/pfw/
- project pigeonwatch: http://www.birds.cornell.edu/ppw/

Contact: Tice Supplee "SUPPLEE, Vashti" <tsupplee@audubon.org>

15) Empire Ranch - a great place for field trips - contact Dieter & Netzin Steklis (WildMindsInc@aol.com) &/or visit http://www.empireranchfoundation.org/

Biotic monitoring (invasive/non-native/native)

Animal groups
- Birds – sound surveys, sight surveys
  - Breeding (nesting) – spring/summer
  - Migratory – spring/fall
    - Ducks?
  - Wintering
    - Crane
  - Permanent (year-round)
    - Quail
  - Raptors
    - Hawks
  - Hummingbirds
- Mammals – track surveys, scat surveys

- Bats – capture and/or ultrasound surveys
- Herps – presence surveys
  - Reptiles – sight or capture
    - Lizards & snakes
  - Amphibians – sound surveys (early spring, summer)
    - Crayfish – size and numbers
- Terrestrial Insects – presence surveys – spring/summer/fall
  - Crickets
  - Cicada

- Plant groups
  - Woody
    - Id; Canopy cover & density
  - Herbaceous
    - Id; Under-story density
  - Annuals
    - Grasses
  - Perennials
    - Ex. Penstemon

- Landcover
  - MUC classification

- Soils
  - Profile: Depth, Texture & Color
  - Litter/organics
  - Soil Decomposers

Water monitoring

Animal groups

Herps – presence surveys

Amphibians – sound surveys (early spring, summer)

Crayfish – size and numbers

Aquatic Insects – presence surveys – capture

Macroinvertebrate species diversity

Aquatic vertebrates – capture (permits)

Fish surveys

Plant groups

- Sedges & Cattails
- Duckweed
- Algae

Geomorphology

- Channel geometry
- Flow / no-flow
- Gravel-Grain size analysis
- Flood deposits and erosion

Water chemistry

- Temperature
- PH
- Conductivity
- Transparency
- Alkalinity
- Dissolved oxygen
- Nitrates
- Fecal Bacteria