Colorado River Watch Network

# Stream Survey

The purpose of the Stream Survey[1] is to identify water quality concerns, learn about stream ecosystems, and document changes over time. The information will provide a more complete picture of the water quality at your monitoring site and within your watershed. Fill in as much as you can, but if you don't know the answer to a question, just leave it blank.

## Before You Begin

***Prepare:*** Read this document so you'll know what you'll be looking for when you go to your site.

***Review:*** Go over the safety guidelines outlined in the Colorado River Watch Network's manual. Remember that you should never cross private property without the landowner's permission.

***When*:** Monitors should complete this survey once a year at a consistent time of year, preferably during winter when vegetation cover is minimal.

***Where*:** Stream survey boundaries are a 1/4 mile radius of your site (1/4 mile is about 450 yards).

***Gather materials for the field:***

- Stream Survey (a hard copy of this document)
- clipboard
- pencil
- shoes for walking in wet areas
- timer or watch
- tape measure
- camera

## After You Finish

- After you fill out this survey in the field, take it back to your home or office.
- Go to http://www.surveymonkey.com/s/CRWNstreamsurvey.
- Record the answers from the hard copy in the electronic version of the survey and submit it by **March 18, 2011**.
- If you have photos that you would like to include with your survey, please email them, along with explanatory notes, to Jacob Daniel Apodaca at Jacob.Apodaca@lcra.org.

## Background Information

Site Name: _____

Participants: _____

Have weather conditions been stable over the past week? Yes_____ No_____ If no, please describe conditions:

| |
|---|
| |

[1] This survey is modeled on the following sources:

Texas Commission on Environmental Quality, *Conducting a Watershed Survey*, GI-232
http://www.tceq.texas.gov/publications/gi/gi-232.html

United States Environmental Protection Agency, *Volunteer Stream Monitoring: A Methods Manual*, EPA 841-B-97-003
http://water.epa.gov/type/rsl/monitoring/stream_index.cfm

## Stream Survey Part 1: Observations of Land Use and Land Activities

### 1. How is the land within 1/4 mile radius of your site used? (check all that apply)

**Residential**
- Single-family housing _____
- Apartment building _____
- Playground _____
- Parking Lot _____

**Commercial/Industrial**
- Commercial development *(malls, restaurants, etc.)* _____
- Auto repair/gas station _____
- Factory/power plant _____
- Sewage treatment facility _____
- Water treatment facility _____
- Institutional (school, offices) _____
- Landfill or junkyard _____
- Detention or water quality ponds _____

**Forest/Parkland** _____

**Recreational park**
- Woods/greenbelt _____
- Undeveloped land _____
- Wetland _____

**Agricultural/Rural**
- Cropland _____
- Grazing land _____

**Other** _____

If "Other," please describe.

| |
|---|
| |

**2. Indicate the approximate percentage of the stream survey area devoted to the main land use categories shown above. Does not have to add up to 100%.**

**Residential** _____% **Forest/Parkland** _____%

**Commercial/Industrial** _____% **Agricultural/Rural** _____%

### 3. What activities occur on the land within 1/4 mile radius of your site? (check all that apply)

**Construction**
- Building construction _____
- Roadway or bridge construction _____

**Recreation**
- Biking/off-road trails _____
- Boating _____
- Campground _____
- Fishing area _____
- Golf course _____
- Horseback trail _____
- Jogging/hiking trail _____
- Swimming area _____

**Other** _____

If "Other," please describe.

| |
|---|
| |

**4. Indicate the approximate percentage of the major activities occurring within the stream survey boundaries.** Does not have to add up to 100%.

**Construction** _____% **Recreation** _____%

If you have any comments on **Land Use** and/or **Land Activities** at your site, please write them here:

## Stream Survey Part 2: Stream Reach Characteristics

This section covers a smaller area, approximately 50 feet upstream and 50 feet downstream of your monitoring location.

1. **Check all the <u>stream habitats</u> that are present (see Figure 1).**

_____ Pool (still or slow flowing, often deep, water)

_____ Riffle (shallow, swiftly flowing water)

_____ Run (swiftly moving, slightly turbulent water, but with a smooth surface)

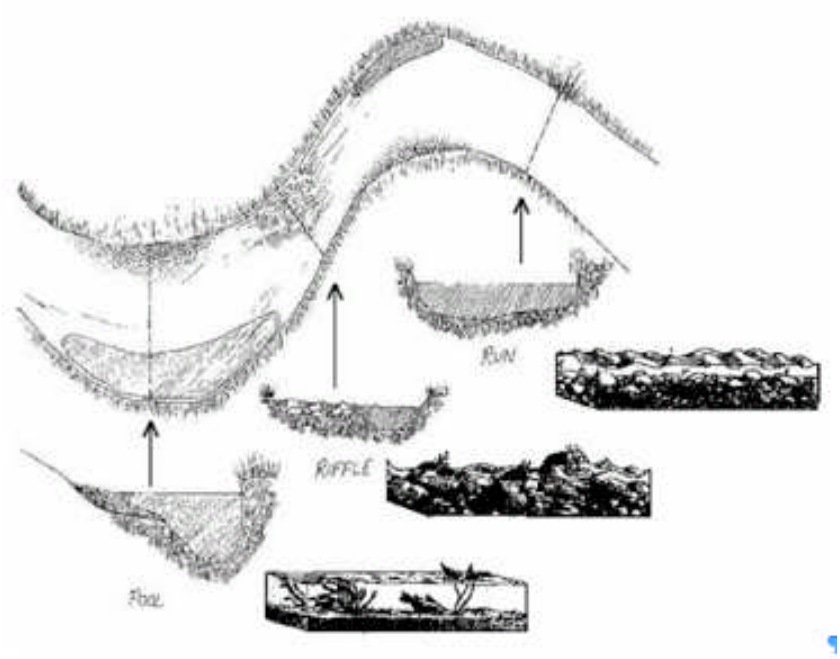


Figure 1. Diagram of a *pool, riffle,* and *run* along a stream section.

2. **Check the one that best approximates the <u>depth of pool(s)</u>:**

_____ Less than 0.5 ft

_____ Between 0.5 and 1 ft

_____ Greater than 1 ft (approximate depth: _____)

3. **Check the one that best approximates the <u>depth of run(s)</u>:**

_____ Less than 0.5 ft

_____ Between 0.5 and 1 ft

_____ Greater than 1 ft (approximate depth: _____)

**4. Approximate <u>width of stream channel</u> at monitoring site:** _____ ft

**5 and 6. Check the description that best fits the <u>shape of the channel</u> at monitoring site.**

***5. Width***

_____ Narrow (less than 6 ft from bank to bank)

_____ Wide (more than 6 ft from bank to bank)

***6. Depth***

_____ Deep (more than 3 ft from substrate to top of bank

_____ Shallow (less than 3 ft from substrate to top of bank)

**7. Average <u>velocity</u> of water channel at monitoring site.**

Mark off a 10-ft section of a *run*. Measure the time it takes a stick to float that distance. Do this three times, then calculate the average time. Estimate average velocity by dividing the distance by the average time.

_____ ft/sec

**8. Estimate the percentage of each <u>substrate</u> type:**

_____% Bedrock (solid slab of rock)

_____% Boulders (rocks greater than 10 inches in diameter)

_____% Cobble (rocks 2-10 inches in diameter)

_____% Gravel (rocks 0.1-2 inches in diameter)

_____% Sand (granular material composed of finely divided rock and mineral particles)

_____% Silt (granular material of a grain size between sand and clay derived from soil or rock)

_____% Mud (semi-liquid mixture of water and some combination of soil, silt, and clay)

_____% Clay (naturally occurring aluminum silicate composed primarily of very fine-grained minerals)

_100_ % Total

**9. Check the one category that best approximates the extent to which boulders, cobble, and gravel on the stream bottom are <u>embedded</u> (buried) into the sand, silt, or mud:**

_____ Not embedded or somewhat embedded

_____ Halfway embedded

_____ Mostly embedded

_____ Completely embedded

**10. Characterize the <u>slope</u> of the stream bank, looking both upstream and downstream from your monitoring site, by estimating the percentage of each type of slope (see Figure 2) comprising the total.**

_____% Undercut slope

_____% Steeply sloping (greater than 30˚)

_____% Gradually sloping or no slope (less than 30˚)

_100_ % Total

**11. Are there any <u>artificial bank modifications</u> where the bank has been covered by rocks, wood, or concrete? If so, approximately what percentage of the bank area has been covered?** (Does not need to total 100%.)

_____% Right bank

_____% Left bank

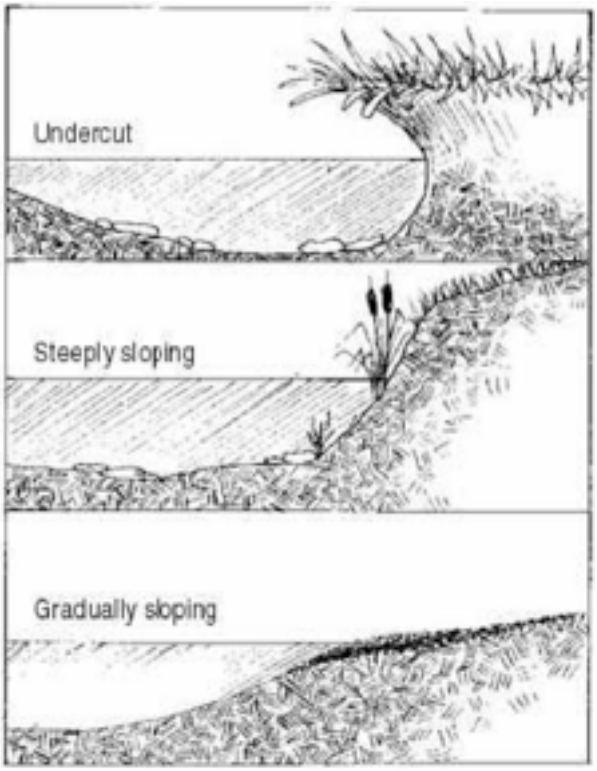


Figure 2. Profiles of various stream bank slopes.

**12. Check the types of <u>streamside cover</u> you see on each bank (looking upstream and downstream from your monitoring site).**

| *Left Bank* | *Type of Cover* | *Right Bank* |
|---|---|---|
| _____ | Trees | _____ |
| _____ | Bushes/Shrubs | _____ |
| _____ | Grasses | _____ |
| _____ | Lawn | _____ |
| _____ | Boulders/Rocks | _____ |
| _____ | Gravel/Sand | _____ |
| _____ | Bare Soil | _____ |
| _____ | Pavement/Structures | _____ |

**13. Check the type of <u>stream bank conditions</u> on either bank (looking upstream and downstream from your monitoring site)? Check all that apply.**

| *Left Bank* | *Stream Bank Conditions* | *Right Bank* |
|---|---|---|
| _____ | Natural plant cover degraded | _____ |
| _____ | Bank collapsed or eroded | _____ |
| _____ | Garbage adjacent to or in the stream | _____ |
| _____ | Mud, silt, or sand in or entering the stream | _____ |
| _____ | Yard waste on bank (e.g., grass clippings) | _____ |
| _____ | Livestock access to stream | _____ |
| _____ | Actively discharging pipe | _____ |
| _____ | Other pipe(s) entering stream | _____ |
| _____ | Ditches entering the stream | _____ |

**14. How much of the stream at your collection site is shaded by trees?** (Does not need to total 100%.)

_____% Right bank _____% Left bank

**15. Do you see evidence of animals or fish in or around the stream now and/or during your regular monitoring visits? Check all that apply.**

_____ Fish (minnows, sunfish, catfish, bass, etc.)
_____ Reptiles (turtles, lizards, snakes, etc.)
_____ Mammals (deer, squirrels, feral pigs, etc.)
_____ Amphibians (toads, frogs, salamanders, etc.)
_____ Waterfowl (ducks, geese, egrets, etc.)
_____ Livestock (cows, goats, sheep, etc.)

**16. If there are fish in the stream now, how many?**

_____ None
_____ Few
_____ Plentiful

**17. Are there aquatic plants in the stream now?**

_____ None
_____ Few
_____ Plentiful

**18. If there are aquatic plants, where are they? Check all that apply.**

_____ Attached to substrate
_____ Free-floating
_____ Stream margin
_____ In pools
_____ Near riffle

**19 and 20. Is there algae on the submerged stones, twigs, or other material in the stream? If so:**

***19. How much?*** *(Check one)*

_____ None
_____ Rare
_____ Common
_____ Abundant
_____ Dominant

***20. What color?*** *(Check all that apply)*

_____ Brown
_____ Green
_____ Red
_____ Orange

**21 and 22. Are string-like or detached clumps or mats of algae floating on the water's surface? If so:**

***21. How much?*** *(Check one)*

_____ None
_____ Few
_____ Plentiful

***22. What color?*** *(Check all that apply)*

_____ Brownish
_____ Greenish

**23. Do you see structures that alter the natural flow of the stream? If so, how many? (Count a bridge only if it alters the streamflow—i.e., has supports in the stream channel.)**

| *Type of Structure* | *Number* |
|---|---|
| Auto or railroad bridge | _____ |
| Beaver dam | _____ |
| Human-made dam | _____ |
| Log jam | _____ |
| Low water crossing | _____ |
| Tributary | _____ |
| Waterfall | _____ |

Now that you have finished, please remember to take this hard copy from the field to your computer and record your answers in the electronic version of the survey located at http://www.surveymonkey.com/s/CRWNstreamsurvey and submit it by **March 18, 2011**.

The CRWN team would like to thank you very much for taking the time to provide this valuable information about your monitoring site.

## Glossary of Terms Used by Water Monitors

***Channel*.** Zone of the stream cross section that is usually submerged and totally aquatic.

***Dam*.** A barrier or structure that impounds water.

***Ditch*.** A human-made trench used for drainage that typically runs along the sides of a road.

***Downstream*.** Downriver; away from the source or with the current.

***Gradual slope*.** Stream bank that slopes up from the stream channel at an angle less than 30 degrees.

***Habitat*.** Area and conditions in which an organism lives.

***Outfall*.** The pipe through which industrial facilities and wastewater treatment plants discharge their effluent (wastewater) into a body of water.

***Pool*.** Deeper portion of a stream where water flows slower than in neighboring, shallower portions.

***Riffle*.** Shallow area where water flows swiftly over gravel and rock.

***Riparian zone*.** The area of ecological transition between the aquatic zone and the upland zone; pertaining to or located on the bank of the stream.

***Riprap*.** Rocks used on an embankment to protect against bank erosion.

***Run*.** Section of a stream with relatively high velocity and little or no turbulence on the surface of the water; somewhat smoothly flowing segment of stream.

***Slope*.** Used to describe shape of the stream bank.

***Steeply sloping*.** Stream bank that slopes up from the stream channel at an angle greater than 30 degrees.

***Stream bank*.** Defined by the top-most level of the current active channel down to the water's edge.

***Substrate*.** Material that makes up streambed.

***Topography*.** Physical attributes of a land surface, including mountains, valleys, plains, bodies of water, and human-made constructs.

***Tributary*.** Stream that merges into another, thereby creating a larger stream.

***Upstream*.** Upriver; toward the source or against the current.

***Vertical/undercut*.** A bank that rises vertically or overhangs the stream.

***Wetland*.** An area of land whose soil is saturated with moisture (includes saltwater, freshwater, or brackish water), either permanently or seasonally.