

## CONDUCTING A STREAM WALK



Conducting a visual survey and basic information such as conductivity and temperature are important in collecting information about our streams and creeks. From this survey, we will gain supportive documentation for the Town of Chapel Hill's annual biological assessments and other scientific monitoring and research. Your reports will also provide important information and data for emergency intervention to stop pollution, and for making future decisions to improve the quality of our waterways.

You and your friends and family will also benefit by learning how your segment of waterway changes through time. You will be able to protect it from degradation, and you will get to know your watershed, your neighbors, and all of the "players" that impact the stream or creek.

The Stream Walk Worksheet will be completed each time you monitor your reach, whether monthly or quarterly. Please complete at least one report each season.

### BEFORE YOU BEGIN

**(Stormwater staff will help mark 200' - 300' stream reaches)**

- 1) First, do you have permission to enter from property owners if the survey area is on private property? The Town will hold the original signed copy; both the volunteer and property owners will receive copies with contact information.
- 2) Print out a baseline aerial map and contour map of your area. Put a date on them and file them in your notebook so that you can compare as online maps are updated.
- 3) Flag/mark the start and end of your stream reach, and flag or remember the same location for taking temperature and conductivity readings each time.
- 4) Schedule to pick up thermometer, electrical conductivity meter and other supplies from the Stormwater Office before your stream walk. Please try to complete your stream walk and return reports and equipment within 10 days. Phone: 919-969-RAIN (7246)
- 5) Think safety. Do not go out if you are feeling poorly or have balance problems. While taking readings within the riffle, lower your center of balance, even finding a rock to sit upon while taking the readings. Put your belongings on the ground nearby before entering the riffle. This helps in simplifying your ability to balance, and in the event that you slip or fall into the water, your cell phone will still work and belongings will stay dry.



## Tips for Completing the Stream Walk Worksheet

### Items to Take With You

- Shoes or boots that can get wet if you enter the stream
- Clipboard with Stream Walk Form & Tips Sheet
- Charged cell phone and/or another person with a cell phone
- Camera
- Thermometer
- A calibrated conductivity meter
- Clear plastic cup for taking temperature of the water
- Pencil or pen (use pencil if the weather is misty or rainy)
- Small first aid kit
- Trash bag for litter
- Identification guidebooks as wanted (plants, animal tracks, etc.) A good online site is [enature.com](http://enature.com). Sounds are included!

### Before you begin, please check the following conditions at your site:

- There are no unusual odors.
- The water appearance seems normal.
- The depth and velocity of the water allow safe access.

**1. Weather:** Complete past 24 hours information before you head out. Check rainfall amount online for 3-day history: <http://w1.weather.gov/data/obhistory/KIGX.html>

**Air Temperature:** Take at the same spot that you take water temperature. Hold thermometer in the air for 2 minutes. Do this before taking the water temperature. Try to be consistent with the time of day you monitor the stream.

### Temperature Conversion Chart

Fahrenheit	33	34	35	36	37	38	39	40	41	42	43	44	45	46
Celsius	.6	1.1	1.7	2.2	2.8	3.3	3.9	4.4	5	5.6	6.1	6.7	7.2	7.8
Fahrenheit	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Celsius	8.3	8.9	9.4	10	10.6	11.1	11.7	12.2	12.8	13.3	13.9	14.4	15	15.6
Fahrenheit	61	62	63	64	65	66	67	68	69	70	71	72	73	74
Celsius	16.1	16.7	17.2	17.8	18.3	18.9	19.4	20	20.6	21.1	21.7	22.2	22.8	23.3
Fahrenheit	75	76	77	78	79	80	81	82	83	84	85	86	87	88
Celsius	23.9	24.4	25	25.6	26.1	26.7	27.2	27.8	28.3	28.9	29.4	30	30.6	31.1

**2. Water Appearance:** Most of the checklist items are self-explanatory. Here are some tips:

**Water Temperature: Make sure you return to the same spot for taking the water temperature.** Record the time taken. Test from a riffle, not in pools or backwater areas. Immerse the thermometer for approximately 2 minutes or until the temperature stabilizes. Immerse a clear plastic cup below the thermometer, collecting water and lifting the cup and thermometer out of the water. Raise it to eye level to read the temperature. Record in Celsius, then convert to Fahrenheit using the table above.

**Conductivity:** Take the conductivity reading at the same place as water and air temperatures.

**Water Flow:** Throw a small stick into the middle of the creek and see how relatively fast it goes downstream.

**Water clarity and color:** See Habitat Assessment fact sheet in your notebook and other inserts in the notebook explaining water characteristics.

**3. Water Odors:** Do not enter the water if it smells. Report to Stormwater Management.

**4. Observations to Report:** These items may indicate illicit discharges or a need for immediate maintenance to prevent flooding or severe stream erosion. If storm drains or drainage pipes enter the stream, do your best to follow the pipes to find their inlet, but stay on property for which you have permission. Report unknown outfalls to Stormwater Management for further investigation. DO take pictures with GPS readings if possible.

**5. Conditions:** Face **upstream** to report left and right bank conditions. Score as:

**N for None (0);**

**R for Rare (<25%);**

**C for Common (25%-75%);**

**A for Abundant (75%-95%) or**

**T for Total (95%-100%)**

- *Active bank erosion* - Note whether banks or parts of banks have collapsed and fallen into the channel, are wearing away or undercutting.
- *Sand bars and/or sedimentation* – Sand bars and sedimentation may be natural depositions inside meanders (point bars), which help to maintain channel shape, or may indicate excessive scouring and aggradation within the stream channel. Look for changes in accumulation of excessive sediment and note where it is located within the channel.
- *Vegetation Overhanging Water* - Stream shading is a measurement of the extent to which the stream itself is overhung and shaded by vegetation. This shade (or overhead canopy) provides several important functions in the stream habitat. The canopy cools the water; offers habitat, protection, and refuge for aquatic organisms; and provides a direct source of beneficial organic matter and insects to the stream.
- *Wrack lines* – Look for elevated litter, leaf packs and branches wedged into tall vegetation or crotches of trees or along sewer lines. Wrack lines occur after flooding.
- *Embeddedness in Riffles* – Check for embeddedness ONLY in the riffle area where water is not above your ankles. As embeddedness increases, habitat is lost.

## 6. Human Impacts: Score as N, R, C, A, or T as under Conditions.

- *Evidence of mowing to edge* – Is there mowing less than 15' from the stream bank?
- *Crossings* – Are there new bridges, boards across the stream, stepping stones that may be large enough to obstruct/redirect flow, vehicle tracks going across the creek?
- *Trails/pathways to creek* - Note whether streamside vegetation is trampled or missing or has been replaced by landscaping, cultivation, or pavement. (These conditions could lead to erosion.)
- *Litter* – Some litter may have washed into the waterway from upstream; some may have accumulated from nearby land; and some will be directly placed. Describe the types of litter you find, which will help us identify possible sources of litter and solutions to the problem.

7. **Wildlife:** Sightings, tracks, dens, nests, sounds all count. Leave if any mammals are acting strangely, and report their behavior by calling 911.

8. **Algae** include some photosynthetic bacteria and aquatic plants. Algae may grow on rocks, twigs, or other submerged materials, be suspended in the water, or float on the surface of the water. Algae naturally occur in green and brown colors. Excessive algal growth may indicate excessive nutrients (organic matter or a pollutant such as fertilizer) in the stream. Check the type you see.

9. **Plants** growing IN the water should be described. Note if they are rooted or floating.

## 10. The Sketch

You can create a baseline sketch using your downloaded contour map. Modify it to “ground truth” it. Make copies of this to use during your more frequent stream walk monitoring. Bridges, paths, crossings, shape of the channel, sand and sediment bars and vegetation may change over time. Aerial orthophotos found online are updated every five years, so may or may not illustrate current conditions. It is easiest to measure and sketch in 25' increments.

Photos taken at beginning and end points of the reach, and photos to document changing conditions along the reach are helpful to determine change over time. Make sure to clearly title the photos with date and location description.

See page below for an example sketch.

**Example of stream sketch**

Volunteers should include current land use, and note important stream features on their sketch including riffles and pools, and an arrow placed to indicate direction of flow. EPA Steam Walk Survey

