

## Standard Operating Procedure (SOP)-4.2.1.3

### California Stream and Shore Walk Visual Assessment

(CARCD 2001, Written by TAC Visual Assessments work group)

#### Introduction:

The Stream and Shore Walk Visual Assessment protocol and data sheets are intended to provide a template for volunteer monitoring groups throughout California to collect baseline data for gross problem identification within a watershed. The protocol is designed for use by volunteers with limited equipment and training. Two to three volunteers should be able to survey a reach of stream or shore within 2-3 hours, depending on terrain and accessibility.

Survey reach lengths should be approximately ¼ to ½ mile in length, depending on the terrain and accessibility.

Frequency of Survey: Frequency of the survey should be based on the monitoring goals. Two types of goals are provided below:

- 1) Gross problem identification. In this situation, it is assumed that, based on the results of an initial Stream or Shore Walk, a more in-depth monitoring program will be designed to evaluate specific non-point or point source pollution problems.
- 2) Baseline monitoring. For baseline monitoring, it is recommended that volunteers survey the same reach 2-3 times per year, specifically during early spring (before trees or shrubs are in full leaf and water levels are generally high), late summer (when water levels are low), or late fall (US EPA 1997).

#### Equipment:

##### Required

- Data sheets and clipboard
- Pencil/pen
- Topographic Map
- Road map
- Camera and Film
- Ruler (for scale)
- Waterproof boots or waders

##### Optional

- Plant communities guide for your region
- Additional water testing equipment
- Transparent cup for evaluating the color of the water
- GPS unit

### **Monitoring Team:**

For safety and logistical purposes there should always be a minimum of two people performing the survey. The duties of the team are as follows:

- Note-taker
- Observer
- Observer/Photographer

### **Safety Concerns:**

Stream and shore walk volunteers should ALWAYS put safety first. For safety reasons, always have at least 2 volunteers for the survey. Make sure that the area(s) you are surveying either are accessible to the public or that you have obtained permission from the landowner prior to the survey.

Some safety concerns that may be encountered during the survey include, but are not limited to:

- inclement weather
- flood conditions, fast flowing water, or very cold water
- poisonous plants (e.g.: poison oak)
- dangerous insects and animals (e.g.: bees, rattlesnakes, range animals such as cattle, etc.)
- harmful or hazardous trash (e.g.: broken glass, hypodermic needles, human feces)

We recommend that the volunteer coordinator or leader discuss the potential hazards with all volunteers prior to any fieldwork.

### **Instructions for completing the California Stream and Shore Walk Visual Assessment Form:**

**Body of Water:** Write in the name of the stream or tributary you are surveying. If you are surveying a lake, reservoir, estuarine or coastal environment write in the name of that lake or water body.

**Watershed Name:** Write in the name of the watershed you are surveying in. The watershed and stream name will often be the same name. If you are surveying a tributary to a bigger watershed, the watershed name will be different. For instance, if your survey reach is on Deer Creek which flows into the Sacramento River, the Stream Name

will be “Deer Creek” but the Watershed Name will be “Sacramento River.” In coastal environments the watershed will be that of the river or creek flowing into the bay nearest your position. For example, if you are surveying Surfrider Beach on Santa Monica Bay (the waterbody) in the vicinity of the mouth of Malibu Creek, then the watershed would be “Malibu Creek.”

- County:** Please write the name of the County your survey reach is located in.
- Volunteers:** List the names of all volunteers present during the survey
- Date:** Write the date when the survey was actually conducted.
- Reach Length:** Indicate the distance of stream or shore surveyed. The protocol recommends surveying  $\frac{1}{4}$  to  $\frac{1}{2}$  mile. If a different survey length was surveyed please explain why in the notes section. To determine the length of the reach use your maps or the odometer of your car. There may be cases when physical landmarks such as bridges, roads, or tributaries will bracket the reach. In such cases these starting and ending landmarks may dictate the length of the reach.
- Start Time:** Include the start time of the survey (when you began to collect information). Be sure to include “a.m.” or “p.m.”
- End Time:** The time you finished collecting information. Be sure to include “a.m.” or “p.m.”
- Weather in past 24 hours:**  
Record any applicable weather codes using the codes provided on the right side of the datasheet. Of special importance is any precipitation information (see below).
- Precipitation in past 24 hours:**  
If any rainfall has occurred within the last 24 hours, circle “yes.” If no rain has occurred during the last 24 hours, circle “no.” If you know how much precipitation occurred during the last 24 hours, please record the amount in inches. If you record the inches of precipitation, reference your source for that information (e.g., newspaper, rain gauge, weather service website, television, etc.) here or in the comments section.
- Current weather conditions:**

Record all applicable weather codes at the start of the survey. For instance, if the weather is sunny and windy, record a “0” and a “2” in the box.

**Starting point:** Where possible, begin your survey at a prominent landmark (e.g. a bridge, or some other feature that will be easy to find again on subsequent surveys). If no prominent landmark is present, describe the starting point in detail. In some cases, you can use surveyor’s flagging, stakes or some other type of reference mark for subsequent visits. Provide enough details and instructions so that someone who had never been to the site could locate it. On streams, if possible, try to plan your observations so that the starting point is downstream of the ending point (i.e., you then proceed upstream.)

**Station ID:** Give the starting and ending point a unique station identifier for database use. An example for the lower reach of Pescadero Creek would be “PC-LWR-001.”

**Latitude:** Determine latitude from a topographic map, GPS unit, software program, or other means and record it in the box.

**Longitude:** Determine longitude from a topographic map, GPS unit, software program, or other means and record it in the box.

**Starting Point Observations:**

The following eight parameters should be assessed using the codes provided on the right side of the datasheet.

**Odor:** An odor, of natural or human-induced origin, may be present at a specific point of your survey reach that you can detect. If so, record the number of odor type from the “Terms and Descriptions” page. If “other” is chosen, describe the type of smell present.

**Algae:** Any type of algal growth present in the stream or waterway should be classified by the percentages listed on the “Terms and Descriptions” page.

In a stream, or flowing waterbody, excessive algal growth may be an indication of insufficient flow, high water temperatures, lack of riparian cover, excessive nutrients or other factors.

The presence of algae in a lake or bay is important because algae converts inorganic material to organic material; oxygenates the water; provides the base for the food chain; and affects the amount of light penetrating the water column. An imbalance in the

amount of algae in a lake or bay can decrease water clarity and alter the color of the water. Too much algal growth can be a sign of excessive nutrients.

**Foam:** If foam is present at a particular site, assess whether the foam appears as:

- 0) **None**-no sign of foam or bubbles.
- 1) **Separated bubbles**-floating bubbles or groups of small bubbles on the surface of the water that do not form a contiguous layer on the surface; bubbles do not form patches greater than 3 inches in diameter.
- 2) **Moderate foam**- contiguous bubbles (bubbles attached together) forming foam patches with a diameter of more than 3 inches but having a height of less than 1 inch.
- 3) **High foam**-large frothy accumulations of foam, approximately 1 inch or more in height and with a diameter greater than 1 foot.

The presence of foam may be an indication of detergents, excessive nutrients or other unnatural inputs to the waterway. While foam may be an undesirable result of water pollution, it sometimes can result from natural causes (for example, kelp and other natural organic matter whipped into a frothy foam due to wave action along a beach).

**Turbidity:** Turbidity can be described in 3 ways:

- 0) **Clear**-the water is clear and the observer can easily see the bottom.
- 1) **Cloudy**- the water is somewhat cloudy but the observer can see greater than 4 inches below the surface of the water, or the bottom of the waterway can be seen in greater than 4 inches of water.
- 2) **Murky**- the water is very turbid and the observer cannot see any more than 4 inches below the surface of the water, or the observer cannot see the bottom of the waterway in 4 inches or less of water.

If your group has sampled and measured for turbidity at time of your survey, then in addition to the narrative turbidity observation, also give the measured result along with its units (e.g., 5.5 NTU).

Turbidity is most commonly associated with rainfall events but can also be associated with excessive algal growth or point source pollution.

**Flow:** Estimate the amount of water present in the channel, or the flow status. The flow categories for streams are described below:

- 0) **None**- dry (no water is present in the channel.)
- 1) **Low**- water fills 25-50% of the channel.
- 2) **Medium**- water fills 50-75% of the channel.
- 3) **High**- water fills 75-100% of the channel and reaches the base of both lower banks.
- 4) **Flooding**- water level exceeds channel and bankfull.

If you are aware of a measured flow rate (e.g., provided by an agency), or if your group has measured the flow at the time of your survey, then in addition to the narrative flow observation, also give the measured flow rate along with its units (e.g., 10 cubic feet per second). If agency flow data is used give its source (e.g., USGS, DWR, etc.). You may need to use the comment section if this information does not fit in the flow box.

If you are surveying the shoreline of a lake or reservoir then mark the flow box **NA**. If you are surveying a tidally influenced shore, record whether or not the tide is low or high as follows:

- HT **High tide**  
 ET **Ebb tide**, between high and low tide when the tide is falling  
 LT **Low tide**  
 FT **Flood Tide**, between low and high tide when the tide is rising

**Oil:** The visual presence of petroleum or other oily substances can be described in 3 ways:

- 0) **None**- no oily sheen present.
- 1) **Light sheen**-a thin accumulation of oil (<1/8 inch) at the surface of the water with the appearance of rainbow colors or metallic appearing patches.
- 2) **Slick**-a thick accumulation of oil (>1/8 inch) floating at the surface.
- 3) **Tar on banks/bed**-Solid or semi-solid accumulations of oil on the shore (e.g. adhering to the sediment or rocks above the water line).

**Litter:** Include all litter observed within the waterway, along the banks or shore within a 20 meter diameter area (10 meter radius of your position.) Banks or shoreline should be surveyed away from the water for 10 meters.

**Color:** Color can be assessed for both flowing water (e.g. in streams) or in lakes, reservoirs, estuaries or bays. Poor water color (e.g. brown or

yellowish) can indicate turbidity caused by sediment, excessive algal growth and/or a point source pollution problem.

**Flowing water**-To determine water color in flowing streams where little canopy cover is present, determine the color by just looking at the stream.

If it is difficult to determine the water color due to extensive canopy cover, shallow water (substrate visible) or light reflection, use the “cup method:”

- a) Use a transparent plastic cup to collect a sample of water from the stream. Be sure to minimize the bottom sediments in the sample.
- b) Place a piece of white paper behind the cup and with the sun at your back observe the color of the water.

**Lakes, reservoirs, estuaries and bays**- Observe the color at the water surface, and record the narrative results (blue, blue-green, etc.).

The Forel-Ule color scale is traditionally used in estuarine or marine environments. If you have a Secchi Disc and a Forel-Ule color scale, use the following method: With the sun at your back, and the Secchi disc near its extinction depth, determine the best match with the Forel-Ule scale. In cases where wave action, current flow, or boat movement make Secchi observations difficult, raise the disc to the depth which minimizes the interference caused by movement but still allows for adequate color. When recording the Forel-Ule color always label the result starting with FU, then give the Roman Numeral, with the corresponding Arabic number in parentheses. For example, **FU IV (4). Even if you use the Forel-Ule scale also record the narrative color (e.g., blue-green).**

#### **List land uses and activities:**

Based on your observations, record the primary land uses and/or activities occurring within ¼ mile of the waterway you are surveying. You may also be able to obtain a copy of a land use map for the area through your county or city planning department.

#### **Discharges, seeps or leaks:**

If you come across any obvious discharge points during the survey, fill out the “discharges” section with the discharge(s) observed. A discharge point may not necessarily be a pipe or drain but could

also be a dumping location for trash, etc. If no discharge points were observed, write zero or “none” in this section. You may also use the “Notes” section if you need additional room.

Briefly describe the location (you may need to use additional space provided in the “Notes” section).

Using the codes provided on the bottom of the datasheet, list the “discharge point” (e.g., pipe, open concrete storm drains, earthen drains) and the “discharge type” observed (if there are any). Also fill out the information regarding flow, odor, foam, turbidity, color, oil and litter in the same manner described above.

### **Dominant stream- or shore-side vegetation:**

**\*Note: this section is for observers who have some knowledge of the local flora. If you do not know primary plant species or native vs. nonnative plants, put a slash through this section.**

**% Native-** Estimate the percentage of native vegetation present throughout the reach surveyed. Optional: If you can identify the primary species, list them or describe them (common names are acceptable).

**% Non-native-** Estimate the percentage of non-native vegetation present throughout the reach. If you can identify the primary species, list them or describe them (common names are acceptable).

**Natural vegetation zone width-** Estimate the overall width of the natural vegetation on both sides of the stream or along the shoreline. If there is little or no natural vegetation present, please describe what is present (e.g., golf course, cement path, etc.).

### **Ending point:**

Where possible, end your survey at a prominent landmark (e.g. a bridge), something that will be easy to find again on subsequent surveys. If no prominent landmark is present, describe the ending point in detail. In some cases, you can use surveyor’s flagging, stakes or some other type of reference mark for subsequent visits. Provide enough details and instructions so that someone who had never been to the site could locate it. Record the Station ID, Latitude and Longitude in the same manner as described above for the Starting point.

**Ending point observations:**

Fill this section out the same way the “Starting point observations” section was filled out.

**Notes, special problems, comments:**

Use this section to describe any of the above parameters in further detail. This section can also be used to identify any special problems, illegal activities, or interesting observations (e.g. wildlife, fish, etc.).

**Photos taken:**

We strongly recommend that this survey be used in conjunction with photo documentation. Standard Operating Procedure 3.11.3 is the recommended protocol for photo documentation. We encourage that you briefly include photo information on the stream and shore walk form so that any photos taken during the survey can be tracked. When taking photos, complete and attach the photo-log from the photo documentation protocol.

**Draw a map of the reach or shoreline:**

After you have walked the reach, draw a map or sketch of the reach that depicts the key features including: start and stop points; vegetation features; discharges; stream or shoreline modifications; stream diversions; possible fish barriers; erosion, photo point locations, direction of flow, and a “north arrow” (approximate direction of north).

**Possible barriers to fish passage, stream/shore modifications, such as diversions, stream channelization, or armoring (e.g., rip rap):**

If you encounter any of the above problems, use this section to describe each location where a barrier, diversion, modification or channelization was observed. Make sure you include it in your map or site sketch as well. With regard to possible fish barriers, take into consideration flow levels throughout the year, i.e., will an object or structure be a barrier to fish passage at the time of the year in which fish migration occurs.

**Erosion, unstable banks, bed conditions (sedimentation):**

If you encounter any areas of erosion, bank instability or excessive bed sedimentation during the survey, describe each location and, using the codes provided on the Terms sheet, list the code that corresponds to the observed problem.

**Special problems:** Using the codes provided on the Terms sheet, list any special problems observed.

**Comments:** Use this section for any other pertinent comments or information regarding survey observations.