

FIELD PROCEDURE: CANOPY CLOSURE (single point)

EQUIPMENT NEEDED:

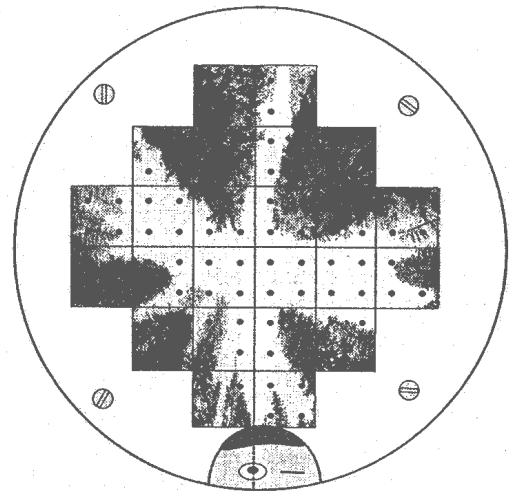
- spherical densiometer (in small wooden box)
- knowledge of cross-section transect for your reach (from reach map, written instructions, or verbal directions)
- data sheet, clipboard, pencil

Perform this procedure in January and August. Comparing the two annual readings will give some idea of the amount of cover that is provided by conifers, since the deciduous trees will lose their leaves by January. **Do not perform this procedure in January if flows are too high for you to be safe.**

1. Generally, you'll take this reading along your cross-section transect (or, if there is no cross section at your site, the site's central monitoring point), in the middle of the bankfull channel (see "Bankfull" chapter). However, you want your reading to be representative of your reach, so if that spot is not representative, move to another spot and note where you moved to on your data sheet. (E.g., if the reach is treeless except for one tree that happens to be directly above your cross-section transect, move at least partially away from that spot.)
2. Your goal is to measure the upper-story tree canopy, not bushy streamside vegetation. If the latter gets in your way of viewing upper-story canopy cover through the densiometer, you may:
 - try to ignore the understory blockages when you take your readings; or
 - cut away a small amount of brush; or
 - move your location by up to six feet, as long as you remain in the wetted channel.

If you ignored brush or moved location, note that on your data sheet.

3. Face downstream & open the densiometer. Hold it about 12" in front of you and at elbow height. Identify a rock in the channel directly below the densiometer. Throughout this entire procedure, the densiometer should remain above this rock! The top of your forehead should be visible in the mirror but not the grid area. Close one eye and get your sighting eye in line with the grid centerline. Make sure the densiometer is level by getting the bubble inside of the circle. You will have a "fish-eye" view of the riparian canopy cover. **Maintain this position while you count.**
4. There are four dots in each square of the grid. Count either the dots that are more than half shaded or less than half shaded, depending on which is easier to count. (See sample diagram.) Count systematically, from top row to bottom



Sample spherical densiometer reading.
The above example shows 48 shaded points.
(From Pleus & Schuett-Hames, 1998)

row, left to right. Anything in the upper canopy that shades the dots counts as shade, including tree stems and branches.

5. Record the number of **shaded** dots on your data sheet in the box marked "Dn". **If you counted unshaded dots, subtract that number from 96.**

6. **Interference factors:**

- a) **Sun glare:** Block the reflection using a finger on your free hand.
 - b) **Wind in the branches:** Try to make your count between gusts. If this is not possible, use your best judgment.
7. Repeat this procedure facing toward the right bank, upstream, and left bank, turning 90° each time, keeping the densiometer in the same spot and rotating your body around it—remember the rock you identified. (“Left bank” and “right bank” are your left and right while facing downstream.) Record the number of **shaded** dots for each direction in the boxes marked “RB”, “Up”, and “LB”.
8. If possible, have someone else or the same person take the canopy closure readings again, and average them on your data sheet.
9. In the “Sampler’s Initials” box to the right of the data boxes, put all the initials of one sampler taking responsibility for the data. If more than one person worked on this data, put the initials of the person with the most experience or knowledge.
10. The database will calculate the % shade, but if you want to calculate it yourself, add the four numbers and multiply by 0.26.