

RIPARIAN COTTONWOOD/ASPEN/WILLOW BROWSE SURVEY METHODS

Objectives

1. Determine the percent of unbrowsed, browsed, or otherwise damaged leaders on riparian area cottonwood, willow and aspen along a portion of a creek.
2. Determine the heights (to nearest foot) of willow, cottonwood and aspen, including willow species that would not be expected to reach above browse height at maturity.
3. Gather data on the ability/prevention of aspen, cottonwood, and willow to exceed browse height for reproduction (i.e., flowering units above browse height) and riparian vegetation structure.
4. Qualitatively relate riparian area conditions to unbrowsed/browsed status of these riparian plants.
5. Compare browse status along creeks open to livestock grazing against creeks browsed only by native ungulates (e.g. elk, deer).
6. Gather some data for what is otherwise a quantitative data gap in the Forest Service's monitoring of livestock utilization and riparian vegetation conditions: riparian area willow, cottonwood and aspen browse.

Methods

1. Use CAW_Data_Sheet[6] for this survey
2. Determine willow species: Key out all willows present; retain plant specimen(s) and take detailed photographs of all willow species for later identification/re-identification See Plant_Sample_Instructions[2] for details on taking plant samples.
3. Delineate survey area/creek transect tape: Lay down a 100' transect tape along edge of creek with beginning of the transect tape at location where willow/cottonwood/aspens is(are) present. The tape should be straight and parallel to the creek. It does not need to follow the meanders of the creek.
4. Determine browse (belt) transect locations: Select a random number between 0-20 and place a 100' browse transect perpendicular to the creek transect at the random number of feet from the beginning, adding 20' for each successive transect (e.g., If 7 is the random number, a browse transect will be placed perpendicular to the creek transect at 7, 27, 47, 67, and 87 feet along the creek transect . Lay the browse transect tape perpendicular to the creek tape, starting at the edge of the creek and extending into the riparian area. .

5. Length of browse (belt) transect: The length of each 6' -wide browse (belt) transect is determined by the distance cottonwood/willow/aspens extend back from the creek, up to 100'. For instance, if cottonwood and/or willow extend 50' back from the creek, the transect will be 50' long. If no willow or cottonwood are present further than 13' back from the creek, the transect will be 13' long. If cottonwood/willow/aspens extend more than 100' from creek, only conduct the browse survey to 100', but note approximate distance to furthest old/young cottonwood/willow/aspens.
6. Record species: Walk along each browse transect, starting at creek and moving away. Record the species name of each individual willow/aspens/cottonwood encountered within 3' on each side of the transect tape (6' wide belt transect). Include only those aspens or cottonwood whose trunk lies $\geq 50\%$ within the belt transect and only those willow whose width lies $\geq 50\%$ within the belt transect.
7. Record height: Place the range pole on the upslope side of the cottonwood/willow/aspens. Indicate which one-foot increment on the range pole within which the tallest leader lies. Do not lift the tallest leader to place it against the range pole; instead note the height of its natural droop or position. The measurement will be 1 foot for all plants between 0' and 1', 2 for plants between 1' and 2', etc.. If the plant is $>6'$, indicate that with a "7".
8. Willows $>6'$ tall: Measure plant width at bottom of plant where stems meet the ground. In a dense willow patch, or with clonal willows such as coyote willow (*Salix exigua*), it is sometimes difficult to determine individual willow plants. A space of at least 6" between plants on the ground is sufficient for recording a second plant.
9. Willows 0'-6' tall: Determine the browse/damage condition of the tallest leader. Place a 12" diameter hoop 6" from top of the tallest leader. Measure the browse/damage of all sub-leaders within the hoop. Do not count branches that are horizontal or growing from leaders.
 - a. Unbrowsed leader (0): No damage, tip of leader intact and leaves from this year are present.
 - b. Browsed leader (1): Stems and or branches lack a terminal bud and end bluntly.
 - c. Frost (4): Terminal bud/leaves on leader turned blackish due to a frost after the leader had leafed out.
 - d. Dead Leader (7): Terminal bud on leader still intact, but leader does not have leaves from this year.
10. Cottonwood/aspens $>6'$ tall: Measure diameter at breast height (DBH)..
11. Cottonwood/aspens 0'-6' tall: Measure browse/damage condition of the tallest leader and all sub-leaders within 6" of tallest leader. Cottonwood and aspens sub-leaders are branches that are primarily growing vertically or adding height to the plant. Do not count branches that are horizontal or growing from leaders.

- a. Unbrowsed leader (0): No damage, tip of leader intact and leaves from this year are present.
- b. Browsed leader (1): Stems and or branches lack a terminal bud and end bluntly.
- c. Frost (4): Terminal bud/leaves on leader turned blackish due to a frost after the leader had leafed out.
- d. Dead Leader (7): Terminal bud on leader still intact, but leader does not have leaves from this year.

12. Whole plant damage: For plants that are dead, or have branches stripped of their leaves, browsing plus branches stripped, insects, disease, stem broken (cottonwood/aspen), multiple stems broken (willow), stem wound, rodents, record the appropriate whole plant damage code.

13. Dead plants: Measure the height but not browse/damage condition.

14. Zone indication: For each cottonwood/willow/aspen record whether it is growing inside or outside of the bankfull area of the creek/stream (“zone”). This would be the normal high water mark for stream flow but not the flood zone. For deeply incised streams the zone includes the steep and incised banks of the stream.

15. Willow age: For each willow record the age.

- a. Mature (M): >10 stems per willow
- b. Young (Y): 3-10 stems per willow
- c. Sprout (S): 1-2 stems per willow

16. Riparian width: Record for each belt transect the distance from the creek of both the furthest young (<7’ tall) cottonwood/willow (not aspen) and the furthest mature willow: >6’ tall and >10 stems/willow and or cottonwood: >6’ tall and ≥ 4 ” DBH).

17. Dominant vegetation: Record the dominant plant species present in the survey area other than cottonwood/willow/aspen. Photograph and take samples of unidentified plants for later identification.

18. Site description: Record a general description of the site, including nearby prominent features (to assist relocating the site) and a qualitative description of the status of the riparian community. Note the presence or sign of any vertebrate animals, especially beaver, livestock and native ungulates.

19. Photos: Photograph the site, including the upstream and downstream ends of the primary transect and representative photos of the survey area.

20. Sketch: Make a brief sketch of the surveyed area, including the stream, the direction of north, the transects and any prominent features.

What can / will be learned using this method?

1. This method will provide a good picture of the presence and condition of various riparian aspen, cottonwood, and willow populations (e.g., big and old; mature; young; sprouts).
2. The method will give a sense of impacts of browsing on the aspen, willow, and cottonwood in various riparian areas. For instance, are willow being suppressed relative to their potential height? Are their reproductive parts being removed? In which creeks or reaches are willow flourishing? What appear to be the circumstances that are allowing for this health?
3. Depending on the site, the method may provide a sense of the width of current riparian vegetation compared to past riparian width, for instance if old trees exist farther away from the creek than any young willows, cottonwood or aspen. (However, if the creek bed has shifted, this would indicate a different location of the creek, not a former and wider riparian area of the current creek bed.)