ADDENDUM 1—Monitoring Streambanks and Riparian Vegetation

Transect (page 3)

Transect should be about 110 meters (361 feet) on each side of the stream rather than the 100 meters described on page 3. The number of plots needed along the transect, both sides of the stream, is dependent upon the variability of the site. Generally, highly disturbed sites will have high variability and will need more plots. Adjust the intervals between plots, 2, 3, or 4 steps, depending on the site variability. The table below shows the approximate number of plots on 110 meter transect on one side of the stream. Forty to fifty (80 to 100 total) plots on each side of the stream is usually an adequate sample. Individuals should determine the size of the steps they take and adjust the interval to obtain an adequate sample size. This is done by marking a given length, usually 100' and counting the number of steps an individual takes in that distance. Determine the average step length by pacing the distance three or four times to determine the average step length. For example, if an individual takes an average of 66 steps in 100 feet, then the average step length is 18 inches.

Step Interval	Plots per 110 meter Transect		
	18 inch Step	24 inch Step	30 inch Step
2	110	90	70
3	73	60	48
4	55	45	36

Greenline (pages 4-5)

When rock (usually boulders or large cobble) is encountered on the streambank, the greenline will be the first perennial vegetation along the side of the rock away from the stream channel. See Appendix E, Figure 2.

Record overstory when any part of the quadrant has shrub or tree overstory.

The greenline must have at least 25% foliar cover. Move the quadrant away from the water's edge and perpendicular to the streambank until it has at least 25% foliar cover.

Woody Species Regeneration (page 5)

Classify clumped willows (most willows) as follows:

Number of stems at ground surface	**Age class**
1 stem	Sprout/Seeding
2 to 10 stems	Young
>10 stems, >½ stems alive	Mature
>10 stems, <½ stems alive	Decadent
0 stems alive	Dead

(Winwood 2000)

Single stemmed species birch (*Betula* spp.), alder (*Alnus* spp.), and cottonwood or aspen (*Populus* spp.).

Age Class	Cottonwood	Other Broadleaf Species
Sprout	Stem is < 4.5 ft. tall or < 1 in. dbh	Stem is < 3 feet tall and the stem is less than 1 inch dbh
Young	Stem is ≥ 4.5 ft. tall and 1 to < 5 in. dbh or stem is < 4.5 feet tall and is 1 to < 5 inches dbh	Stem is ≥ 3 ft. tall and < 3 in. dbh or < 3 feet tall and the stem is 1 to 3 inches dbh
Mature	≥ 5 in. dbh	Stem is ≥ 6 ft. tall and ≥ 3 inches dbh or < 6 feet tall and ≥ 3 inches dbh
Decadent	≥ 30% dead wood in canopy	≥ 30% dead wood in canopy
Dead	Entire canopy is dead	Entire canopy is dead

Adapted from (Thompson, *et al*, 1998)

It is difficult to age class rhizomatous species such as wolf willow (*Salix wolfii*), planeleaf willow (*S. planifolia*), coyote willow (*S. exigua*), wild rose (*Rosa* spp.), and golden current (*Ribes aureum*) and not recommended to be included in the woody species regeneration. When these species need to be monitored, use the greenline or a line transect.

Woody Species Utilization (Replace the entire woody species utilization section on pages 8 and 9.)

The plot size (see Figure 1) for obtaining woody species use is 2 meters, one meter either side of the greenline, wide and the length is determined by the interval between plots. For example, if the distance between plots is two steps, select the first shrub within one meter of the greenline and two steps forward. If the plot interval is four steps (two paces), select the first shrub that is less than five feet tall within one meter either side of the greenline and within four steps forward.

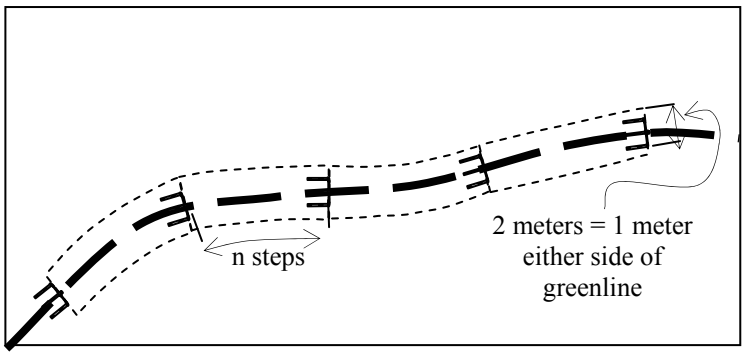

Figure 1—The plot size for selecting woody species is 2 meters wide. The length of the plot is number of steps (n steps) between plots. For example, if the plot interval is 2 steps, the area from which shrubs may be selected is 2 steps long.

Willow, birch, alder, cottonwood, dogwood, and aspen are typically the woody species of concern. Current and rose are not considered key species.

Select only shrubs with at least 50 percent of the active leader growth (current year) at or below five feet. When shrubs have over 50 percent of the active leader growth above five feet, the leaders are not generally available to livestock (except horses) and the plant usually has adequate leaf area for photosynthesis to maintain plant health. If the shrub closest to the back center of the plot is over five feet tall, as described above, proceed to the next shrub that is within the two

meter wide (one meter either side of the greenline) and the length of the interval between plots (see Figure 1). If no shrub is encountered within the plot, leave the space on the field data sheet blank. When active grazing is commonly observed on shrubs over five feet tall, the criteria may be modified and documented on the data sheet.

One method of determining a random location is to use a clock with the direction of travel along the transect being the 6 o'clock to 12 o'clock line. Select a random number from 1 to 12 to determine the location for the sample. For example, if the selected number is 9, the 9 o'clock position is the location of the selecting the branch or branches necessary to look at 10 twigs. A random number table or generator may be used to determine the number. Another simple method is to use a second hand on an analog clock or the seconds on a digital clock. For example, 20 seconds represents 4 o'clock. When using a digital clock, round seconds to the nearest five second interval shown below.

0 = 12 o'clock	10 = 2	20 = 4	30 = 6	40 = 8	50 = 10
5 = 1	15 = 3	25 = 5	35 = 7	45 = 9	55 = 11

Once the side of the shrub to be sampled is determined, divide the height of the shrub by three, the bottom one-third is number one, the middle is number two, and the top third is three. Randomly select a number, one to three. Select the first ten leaders from upper most portion of the height selected. For example, the side of the shrub selected is at the 10 o'clock position and the random number is two, the selected area is in the middle part of the shrub and the twigs selected is the first 10 twigs on the upper part of the middle one third.

Since some shrub plants have less than ten leaders, record the percent of leaders browsed, e.g., a shrub plant has only six leaders of current year's growth and 2 have been browsed, record 33 percent used.

Recording information on hedging is optional. It may provide some additional information that may be useful for evaluating livestock and wildlife grazing.

Bibliography

Thompson, W.H., R.C. Ehrhart, P.L. Hansen, T.G. Parker, and W.C. Haglan. 1998. Assessing health of a riparian site. On line proceedings, Specialty Conference on Rangeland Management and Water Resources, American Water Resources Association. Reno, NV.

Appendix H

The attached the Riparian Monitoring Data Sheet. This will replace all forms in Appendix H.