APPENDIX C—Greenline Location

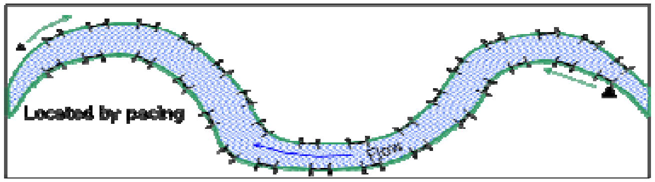

Figure 1—placement of the monitoring frame along the greenline. Note that frame placement is not necessarily perpendicular to the placement on the opposite bank due to differences in greenline length.

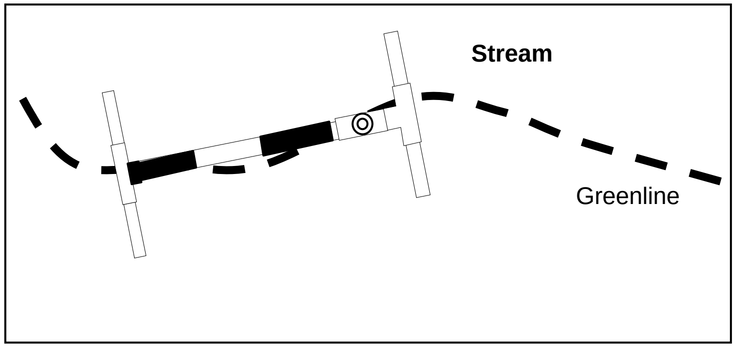

Figure 2—place the monitoring frame with the center of the frame along the greenline.

APPENDIX C—Greenline Location

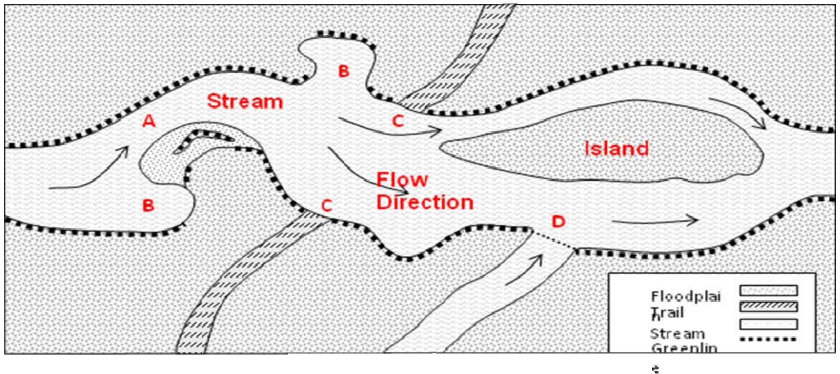

Figure 3—the point bar (A) shows an interrupted greenline with vegetation growing the bar not connected to the vegetation along the stream. The greenline runs more-or-less parallel to the flow of the stream. The areas shown by the letter "B" constitute an interrupted greenline as the vegetation exceeds 75 degrees toward perpendicular to the stream flow. The greenline continues when the line of vegetation begins to parallel the stream. Roads, trails (C), and tributary streams (D) are not considered part of the greenline. They may be recorded as information, but not included in greenline calculations. These include livestock and wildlife trail.

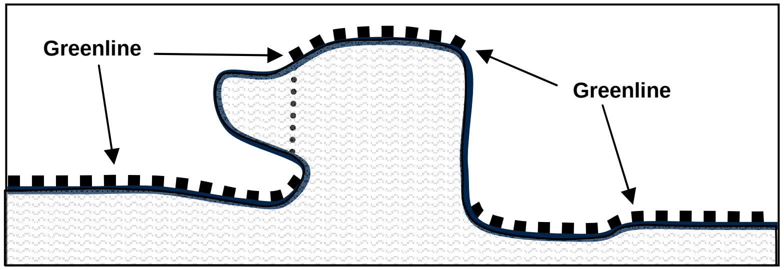

Figure 4—the greenline is on the streambank approximately parallel to the water flow. Streambanks perpendicular (over 75-degree angle) to the stream flow are not considered greenline.

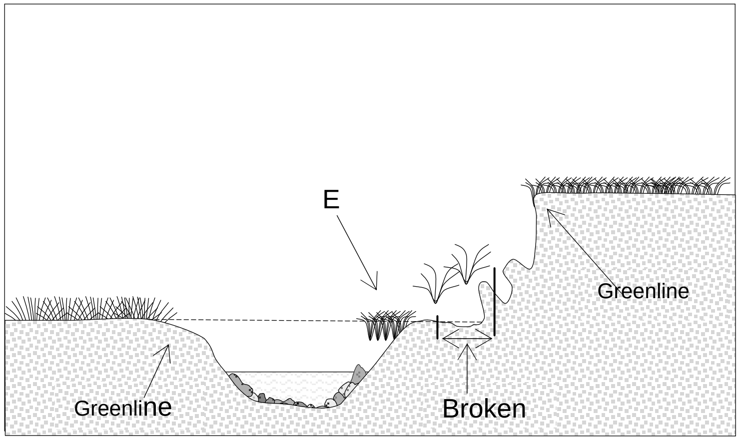

Figure 5—the diagram shows the location of the greenline in a situation with a broken bank. The field horsetail (E) is shown on an area that is an island during above bankfull flows, and therefore the greenline is on the edge of the higher bank (terrace). The greenline on the left-hand bank is typical of vegetation at or slightly above the bankfull flow line.

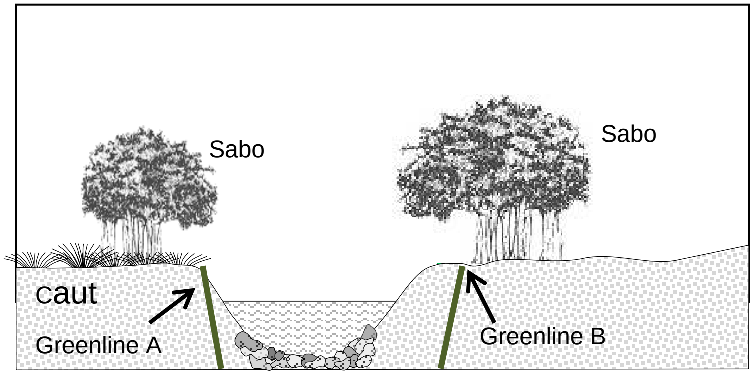

Figure 6—greenline A is an example of a Booth's willow (Sabo) overstory with beaked sedge (Caut) as an understory. The type name would be Sabo/Caut. Greenline B is an example of the location of the greenline when there is a shrub overstory and no vegetation understory; the greenline is at the base of the shrub or tree.

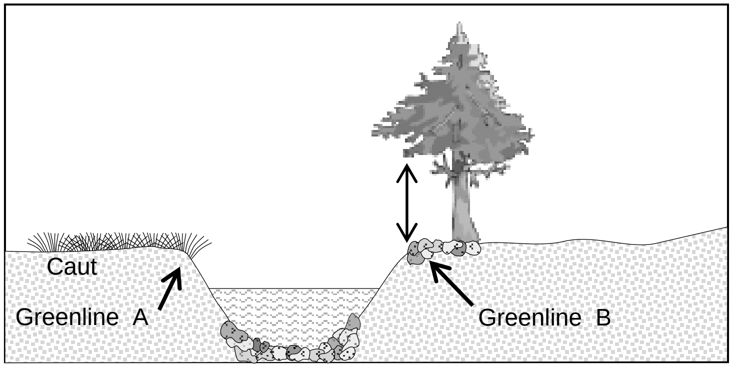

Figure 7—greenline A is an example of a single species, beaked sedge (Caut). Greenline B is an example of the location of the greenline when there is a conifer tree overstory with anchored rock in the streambank. Conifer and anchored rock are both recorded as dominant.

APPENDIX D—Modified Daubenmire Monitoring Frame

Monitoring frames may be constructed of ½-inch schedule 40 PVC pipe or metal. Schedule 40 PVC is rigid and does not warp as much as the lighter PVC pipe. PVC material is inexpensive, light, and easy to use. Carefully measure each of the pieces before they are glued together since fittings may not be uniform between manufacturers. If handles or other components are constructed with slip fittings, they should be glued together. Threaded fittings glued onto the pieces work well if the frame needs to be disassembled for transport. Electrical tape wrapped around the pipe is a good material for marking the frame and handle segments. Tape is more durable than paint.

Metal frequency plot frames (typically 40 by 40 cm) may also be used by extending the tines to 50 cm in length and marking the four incremental segments with lines or alternating colors.

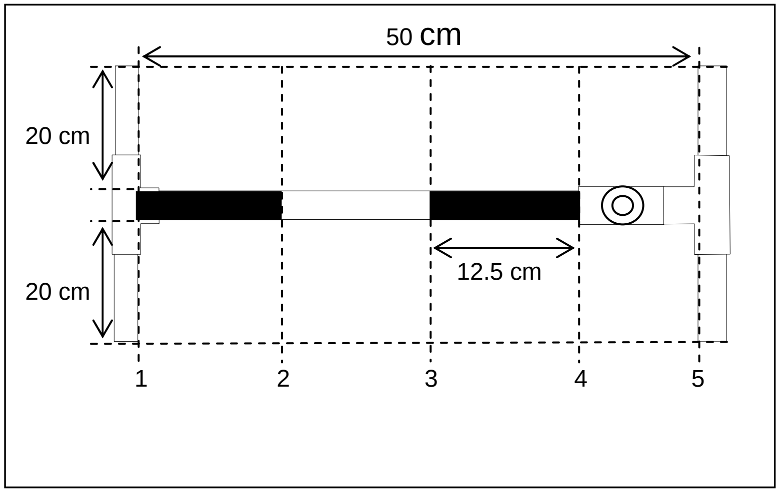

Figure 1—standard multiple indicator monitoring quadrat frame. Based on field experience, this is the preferred quadrat configuration. It is light, easy to carry, and easy to manipulate in shrub-type vegetation. Observers must be careful to extend the lines to complete the quadrat. Mark one-inch increments on the handle to with electrical tape to facilitate stubble height measurements.

APPENDIX D—Modified Daubenmire Monitoring Frame

Figure 1—Material list for standard quadrat frame.

Item	Number	Length	
		Inches	Centimeters
½-inch Tee	3	-	-
PVC pipe	4	7.75	19.7
PVC pipe	1	16.9	43
PVC pipe	1	1.25	3.2
PVC pipe (handle)	1	39	100

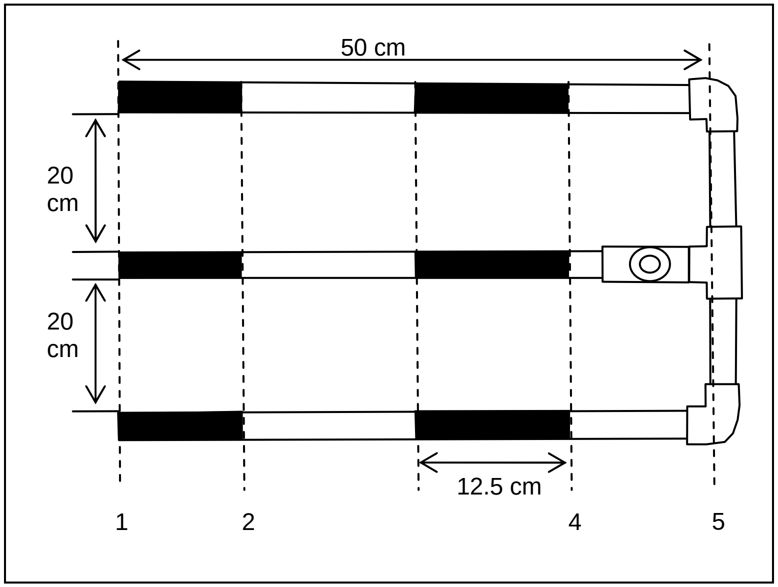

Figure 2—alternate design for multiple indicator monitoring quadrat frame. This configuration more succinctly defines each of the two plots and can be easily used on streams lacking shrubs. The frame consists of two 20-cm by 50-cm Daubenmire monitoring quadrats set side-by-side.

APPENDIX D—Modified Daubenmire Monitoring Frame

Figure 2—Material list for alternate design quadrat frame.

Item	Number	Length	
		Inches	Centimeters
½-inch tee	2	-	-
½-inch elbow	2	-	-
PVC pipe	3	19.6	49.7
PVC pipe	2	7.6	19.4
PVC pipe	1	1.5	3.8
PVC pipe (handle)	1	39	100

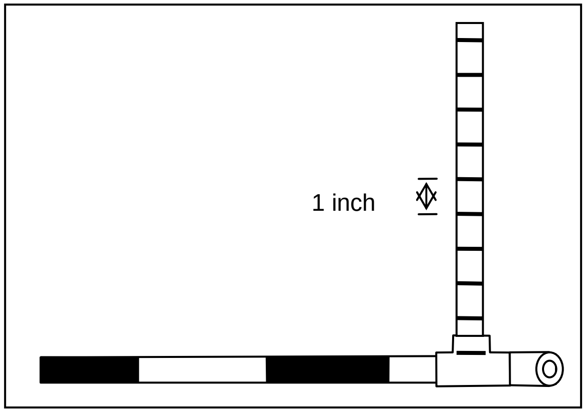

Figure 3—for either frame design, mark the handle in one-inch increments to facilitate measuring stubble height.

APPENDIX E—Data Entry and Analysis

A data entry form has been prepared for use with PDAs using the Excel spreadsheet format. The form can be downloaded into Excel on the user's PC, and then converted to Pocket Excel in the PDA through synchronization. This file includes user instructions. Calculations and analyses are limited in this form to avoid time delays caused by the much-reduced processing speed of handheld computers (see Appendix M).

Using Pocket Excel for PDAs & the Data Entry Module

Use Pocket Excel to enter data in the field and determine sample size needed.

The Data Entry Module is designed to be used with Pocket Excel.

Enter data for one pasture in an allotment, on one file. Save the file as the pasture or DMA name.

Entering data

Header

The "Header" worksheet records descriptive info and is required.

You can generate a random number in the "Header" worksheet entering the formula "=RAND()*10," followed by enter.

You should also indicate how many steps you take in a pace, and the length of your step in meters.

Gradient is stream gradient in %. You should also enter the substrate class using the codes in the "Codes" spreadsheet.

The questions concerning woody plants must be answered to obtain a seral status rating.

DMA

Use plant codes from the Codes worksheet

Data entry cells are non-colored.

Codes

This worksheet describes the bank stability and woody regeneration age classes.

Vegetation

Worksheets contain vegetation codes for grasses (including grass-likes), shrubs, trees, and forbs.

Key species are listed in a column on the right side of the DMA spreadsheet.

Substrate

This worksheet allows entering stream substrate data using the Pebble Count method as explained in the bulletin and in the field cards. Data are entered for all 20 cross sections, 10 per section for a total of 200. If more pebbles are desired, for example to meet sample size needs, add them to the rows indicated. Measure pebble counts across the stream channel at every other plot until the desired sample size is achieved.

Comments

Comments may be general or by plot.

Statistics

The "Stats" worksheet describes statistics used to calculate sample size.

Using the Data Analysis Module

The “Data_Analysis_Module 2008 V5” is a file that will import all of the raw data from the “Data_Entry_Module 2008 V5,” and calculate metrics useful for data interpretation. This analysis module will also format the data for export to the MIM database, and the IIT IM Database, which are both in ACCESS format. Data may also be copied directly into this module. Thus, when users record data on hard copy sheets, the data are transferred directly to this file rather than the Data Entry Module, which is used for field entry only.

MACROS: The Macros in this analysis module open your Data Entry file and extract data for analysis, and examine and correct common mistakes in coding plants in the DMA worksheet. There is also a macro for entering new plant codes into the system.

Macros must be enabled to function. Enable Macros in "Tools," "Macro," "Security."

-

The "Data Summary" worksheet can then be opened to examine results.

Analyzing Data collected using Data Entry Module
In the Data_Analysis_Module, run the macro Ctrl "m" by holding down the control key and select the letter "m" to import and analyze the data. Data are brought into the module from the Header, DMA, and Substrate worksheets of the Data Entry Module. Follow the prompts as described above for data prior to 2007.

Correcting plant codes in the DMA worksheet
Use Ctrl "r" for execution. This macro searches for commonly made mistakes in the coding of plants and corrects them. Not all mistakes are likely to be found, so users MUST check the data to assure that all plant codes are correct. The drop-down menus in the plant code fields of the DMA worksheet provide a quick and efficient means of checking the plant code list. When unsure of the code for a particular plant, refer to the "Codes" worksheet for a complete list with their scientific and common names.

Correcting numeric data
Use Ctrl "c" to let the system analyze the numeric values entered by the user. This quality control measure checks to see if decimals are in the right place.

Adding plant codes not currently in the DMA worksheet
Use Ctrl "p" for execution. If a plant is encountered in the field and is not included in the list of plants provided in the "DMA" or the "Codes" worksheets, this macro will insert it. You must first select a plant code from the plant list that you did not use. You will be prompted for that code name. You will then be prompted for the code name you intend to use for the new plant encountered. The system will then replace the unused plant code with the new plant code, which will now be counted in the metric calculations.

Each iteration of data import into the Data Analysis Module provides an opportunity to save the raw data and data summary.

> A good convention is to save the file as follows: "allotment_DMAname" (e.g. for the Dry Creek Allotment, Long Creek DMA: "drycreek_longcreek").

Once the file has been saved, close it, then reopen the Data Analysis Module to import and analyze additional DMA data.

Always keep the master copy of the Data Analysis Module in a separate folder.

Make copies of the Module and place them in each data file folder.

APPENDIX E—Data Entry and Analysis
Use these copies to run the Macros and analyze the data—never use the master copy.

Your field-entered vegetation codes must match those in the "Codes" worksheet. If they don't, you will need to replace the field-entered codes with those in this worksheet to run the analysis.

Additional instructions for use of the Module are contained in the "Instructions" worksheet. This includes instructions for using the Export worksheet. Also, there are instructions in the MIM database for transferring data from the Data_Analysis_Module 2008 V5 directly into the database table and for up-loading images.

Worksheets in the Data Analysis Module are protected to prevent inadvertent modification of equations used to calculate the metrics. If the user desires to modify a component, first make a copy to assure that the original is not lost in case of errors; second, select "Tools," "Protection," "Unprotect Sheet," and and press enter. Users are cautioned not to make substantial changes without making sure that such changes affect the outcomes of metric calculation. For example, if a plant code is changed in the "Codes" worksheet, it must also be changed at all locations of occurrence in the "DMA" and "Summary" worksheets for the metrics to be correctly calculated. If there is any doubt, contact the developer first: Tim Burton at: tburton@blm.gov.

APPENDIX F—Riparian Monitoring Data Sheet

Plot No.—Enter the plot number manually for each plot. This allows multiple rows to be used for additional species encountered for the vegetation entries.

Riparian Vegetation

Dominant—Enter the species code for the dominant vegetation. If any part of the quadrat contains a woody species overstory, enter that plant code in the first line of the plot. If there is a co-dominant species, enter it on the next line without a plot number. The first species code of riparian community type may be entered into this column. The second species code in the riparian plant community designation may be entered into the Subdominant Vegetation column.

Subdominant—Enter the species code of the species into this column. If there are two subdominant plant species, enter the code on the next line without a plot number.

Streambank

Altered—Record the number of lines (0 to 5) that intersect streambank disturbance caused by the hooves of livestock and/or wildlife. If more than one animal track is intersected along one of the five lines, only one is recorded.

Stability Class—Record the streambank stability class (cs-covered/stable, cu-covered/unstable, uu-uncovered/unstable, us-uncovered stable, fs-false bank, or un-unclassified).

Stubble Height

Key Species—Enter the code of the key species.

Average Height—Record the average height of the leaves of the key riparian species nearest the handle and within the plot. When there are no key species in the quadrat, leave the cell blank.

Woody Species Regeneration

Species—Enter the code for the woody species encountered within the plot. Leave the cell blank if no plants are encountered.

Seedlings—Record the number of individual woody plants classified as seedlings.

Young—Record the number of individual woody plants classified as young.

APPENDIX F—Riparian Monitoring Data Sheet

Mature—Record the number of individual woody plants classified as mature.

Decadent—Record the number of individual woody plants classified as decadent (over 50 percent of the plant is dead).

Dead—Record the number of individual woody plants classified as dead (no part of the plant is alive).

Unclassified—Use this column for recording the number of woody species stems within the plot that are not classified by age. It may be used for rhizomatous species such as coyote willow (*Salix exigua*).

Greenline-to-Greenline Width (GGW)

Record the non-vegetated distance (meter or English) at each plot location. The measurement is from the greenline at the back of the quadrat across the stream, perpendicular to the water flow direction, to the greenline. When a vegetated island is encountered, subtract the distance of the vegetated island from the total greenline-to-greenline distance.

Woody Use

Species—Record the code of the woody species on which use will be determined.

Percent Use—Enter the midpoint number (none to slight = 5; slight to moderate = 25; moderate = 50; heavy to severe = 75; and extreme = 95) of the use class for each transect.

In-Stream Variables

Thalweg depth—Record the maximum water depth under the greenline-greenline width transect in meters.

Water width—Measure and record the width of water (excludes islands/peninsulas) in meters.

Substrate sizes—Record substrate sizes in mm for each transect on the substrate form.