Estimating Percent Vegetative Cover on Streambanks for the Proper Functioning Condition Assessment for Lotic Areas Item 11

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Checklist Item 11 – "Adequate riparian-wetland vegetative cover is present to protect banks and dissipate energy during high flows?"

Questions have arisen about available methodologies that may be used in the field to provide the best possible estimate for the amount of vegetation needed to evaluate checklist item 11 in *A Users Guide to Assessing Proper Functioning Condition (PFC) and the Supporting Science for Lotic Areas* TR 1737-15 1998 (USDI Bureau of Land management 1998). Winward (2000) *Monitoring the Vegetation Resources in Riparian Areas* provides two approaches for measuring and interpreting this attribute (1. Ecological Status and 2. Streambank Stability). Training and experience using these approaches can help interdisciplinary teams (ID) formulate a more reliable estimate while walking a stream doing a Proper Functioning Condition Assessment (PFC). Using either of these methods to formulate an estimate as described in this paper does not replace the need to establish long term monitoring studies or collection of quantifiable data. Nor does it lessen the need for ID teams to have members with strong plant identification and riparian ecology skills. However, it does provide opportunities to compare PFC assessment ratings with measured monitoring data, where both processes are done on the same area, and increase confidence of the assessment rating when making management decisions.

Both the measuring and estimating approaches require knowledge of potential vegetation for the riparian area and stream type being surveyed. This includes a background in stabilizer and colonizer species, as well as the successional relationships of community types and the relative stability ratings for each. If this information is lacking for an area, the ID team will need to develop it before beginning an assessment.

The following two approaches are based on information and training in Winward, 2000 – Appendix A. page 34; Appendix B pages 35-39 and Appendix C, page 40. Relationships between Ecological Status and PFC are shown in Table 1 of this document.

A. GREENLINE ECOLOGICAL STATUS APPROACH USING VISUAL ESTIMATES

Step 1. – Determine the capability group of the stream and record the corresponding minimum percent of stream banks that need to be covered by late seral community types or anchored rocks/logs for that group to classify as Potential Natural Vegetation, (see values in parentheses for each group – Appendix A, page 34. These values are based on substrate and stream gradient characteristics).

Step 2. – Walk the section of stream being evaluated and estimate the percent of the greenline vegetation (both sides of the stream) that is made up of stabilizing, late seral community types (see Appendix B pages 35-39). A. community type is named after the 1-3 species most dominant in that type (e.g. Booth willow/Nebraska sedge).

Example: Assume a PFC assessment is being run on a stream with a gradient of 1.5 percent and has a non-consolidated silty-clay substrate. This stream would fit group IV in Appendix A, page 34, which indicates that it should have 85+ percent late seral community type composition for that stream to be in a minimum Potential Natural Community status. Assume you have estimated that the greenline vegetation consists of 40% late seral community types (see step 2) above. By dividing 40 by 85, this stream is at 47 percent of its potential which would place it in the "Mid Ecological Status" rating (page 40).

Step 3. - There is a general consensus that most streams require at least 70% of their potential late seral types to be minimally functional. Therefore, this particular stream section is 23 points below being minimally functional and question 11 on the PFC form would be answered "no".

Additional Examples:

Value Estimated by Group	% of Potential	Score	Answer
Group III Streams (90+%)			
60	(60÷90) = 66	4 pts below	liner
80	(80÷90) = 88	18 pts above	yes
Group VI Streams (80+%)			
40	(40÷80) = 50	20 pts below	no
65	(65÷80) = 81	11 pts above	yes
Group II Streams (90+%)			
40	(40÷90) = 44	24 pts below	no
65	(65÷90) = 72	2 pts above	yes

Step 4. – Since there may be other circumstances that influence amount of late seral vegetation needed for functionality of some streams in addition to those covered by stream gradient and substrate characteristics (step 1), it may be necessary to fine-tune the tallied score using examples in Section C.

B. GREENLINE STABILITY RATING APPROACH USING VISUAL ESTIMATES

Step 1.

Determine the capability group of the stream (see values in parentheses for each group – Appendix A, page 34. These values are based on substrate and stream gradient characteristics) and record the corresponding minimum percent of stream banks that need to be covered by late seral community types or anchored rocks/logs for that group to classify as Potential Natural Vegetation.

Step 2.

Walk the section of stream being evaluated and estimate the percent of the greenline vegetation (both sides of the stream) that is made up of stabilizing, late seral community types (see Appendix B pages 35-39). A. community type is named after the 1-3 species most dominant in that type (e.g. Booth willow/Nebraska sedge).

Appendix B lists a "stability class" rating for community type identified through year 2000. This ten-point rating is based on those types with a rating scale from "1" (those with the lowest ability to buffer the forces of water) to "10" (those with the greatest ability to buffer water forces).

Step 3.

For each stream determine amount of vegetation needed for physical function and then estimate presence or absence of vegetation species and other non-vegetation features that influence erosional processes. If the ID team does not feel comfortable making this determination they can refer to Appendix A, Capability Groups page 34.

Step 4.

Estimate the percent of greenline vegetation that rates a 7 or greater stability class rating (App. B – pages 35-39 and App. C, page 40).

Step 5.

Assume the ID team determines the stream being assessed requires that 80% (step 3) of the banks be covered with community types/species that rate 7 or higher. Stability estimates are fine tuned then averaged and ratings scored as follows:

Mean Stability Class Rating	Percent of Banks	Answer
1-6	80	no
7	80	yes to liner
8-10	80	yes

Step 6. – Adjust rating and answer based on special features the ID Team listed in Step 3 and in Section C.

C. Examples of Other Special Characteristics That May Need to be Considered When Evaluating the Amount of Stabilizing Vegetation Required on Some Streams

(a) General health and vigor of the stabilizing species. If the vegetation is in early stages of recovery, it may not have developed plants robust enough to adequately buffer water forces.

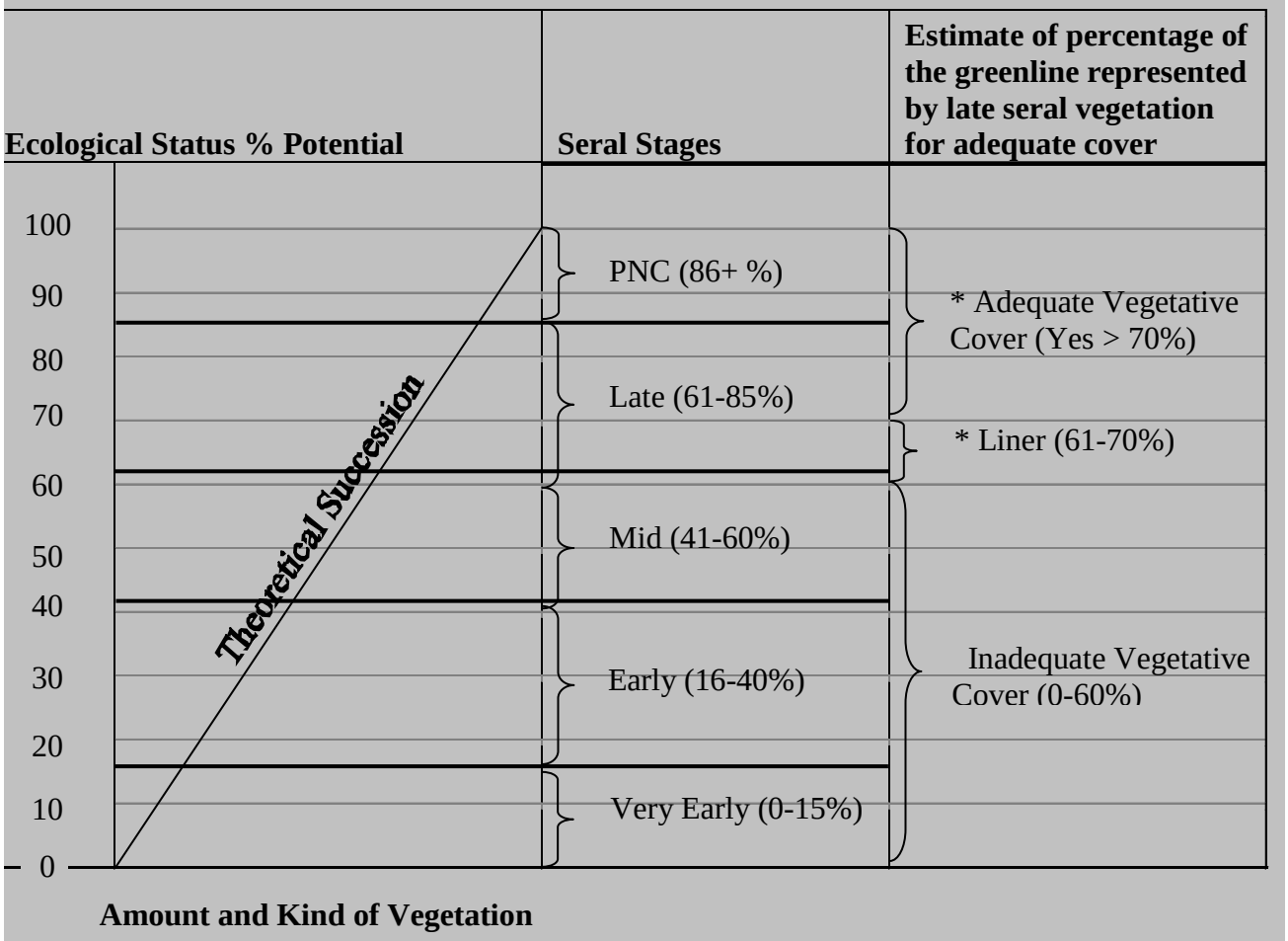
(b) Cohesiveness of the soil. Although the substrate features in step 2 help account for this feature, long-term development of soil structure may or may not be adequate in some settings.

(c) Regularity and size of storm events in the above catchment (watershed). For example, a high percent of catchment acreage covered with cliffs or bedrock results in a flashy release of water through the systems compared to spring fed systems where water flows show little fluctuations seasonally or annually.

(d) Plant communities may be present; however total cover within the community types/complex may currently be inadequate.

See Table 1 next page.

Table 1: General Relationship between Ecological Status and Vegetation for Physical Function



***Most** streams achieve "adequate Vegetation" for PFC in late seral ecological status.

PFC ratings are generally placed on the line between yes and no when the ecological status rating is 60-70%, thus the term "liner."

Spring fed streams with minor flow fluctuations can reach adequate vegetative cover at lower percents of cover than those with flashy watersheds or have a preponderance of impervious areas such as sandstone or basalt outcroppings.

Footnote on Page 34, appendix C (Winward 2000) should read:
"Values in parentheses refer to percent of the greenline that should be represented by the late seral community types or anchored rocks/logs when riparian areas fitting each capability group are at ecological potential."

LITERATURE CITED

USDI, Bureau of Land Management. 1998. Riparian area management: a user guide to assessing proper functioning condition and the supporting science for lotic areas. Technical Reference 1737-15, National Applied Science Center, Denver, CO. 136 p.

Winward, A.H. 2000. Monitoring the vegetation resources in riparian areas. Gen. Tech. Rep. RMRS-GTR-46. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 49 p.