

Vegetation Consistency Clarification  
Proper Functioning Condition Assessment  
Lotic (Perennial and Intermittent)

*A User Guide to Assessing Proper Functioning Condition and Supporting Science for Lotic Areas* TR 1737-15 provides instructions and information for conducting Proper Functioning Condition (PFC) assessments. The technical reference includes descriptions of the purpose and examples of applications of the items for the riparian-wetland area being assessed with the intent of ensuring consistency between users. However, both PFC instructors and users have raised questions concerning consistency in the application of certain vegetation items. Individuals, depending on training, experience and background, have interpreted some of these descriptions and examples differently. This paper will provide clarification on the following lotic checklist items:

Checklist Item 7: “There is diverse composition of riparian-wetland vegetation (for maintenance/recovery).”

Checklist Item 9: “Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events.”

Checklist Item 11: “Adequate riparian-wetland vegetative cover is present to protect banks and dissipate energy during high flows.”

The following questions are addressed in this paper.

1. How do Items 7 and 9 relate to question 11 TR1737-15 (Lotic)?
2. Are Items 7 and 9 in TR 1737-15 (Lotic) redundant?
3. Is Item 9 in TR 1737-15 (Lotic) a “presence or absence” question or does it have some quantity associated with it?

It is important to note that the intent of this paper is not to change the original intent of the subject checklist items.

**Question 1: How do Items 7 and 9 relate to question 11 (TR1737-15 Lotic)?**

A continuum exists in plant density and plant community development, from the absence of stabilizing vegetation species, to the presence of such species, to the development of plant community complexes throughout a riparian area approximating ecological potential. Checklist Items 7, 9, and 11 assess and describe this progression of vegetation development from riparian-wetland plants to recognizable plant groupings or community types and finally to documenting whether there is adequate riparian-wetland vegetation to protect streambanks.

Each of the three items requires that the potential vegetation for the site be identified. Potential vegetation of the riparian area and streambank is based on the hydrologic features of each riparian complex and needs to be considered when assessing plants (Item 7), plant groupings and community types (Item 9), and adequate vegetation (Item 11). The plant species, characterizing species of groupings or community types, and those providing for adequate cover are all the same kinds of riparian plants or group of plants on perennial systems. “Most plants that are OBL and FACW have root masses capable of withstanding high-flow events, while most plants that are FACU and UPL do not (Prichard et al 1998).” These usually include hydrophytic perennial stabilizer stoloniferous or rhizomatous species but there are some that are cespitose (bunchlike) on perennial systems.

Perennial riparian systems generally require at least a high stability rating (7 or above) as described by Winward (2000). Item 11 specifically documents if the streambanks and riparian-wetland areas have enough (i.e., amount) vegetation to protect the streambanks and riparian-wetland areas from high flow events. See Elmore and Winward (2007) at <http://www.blm.gov/or/programs/nrst/index.php> for more information on estimating percent vegetation cover on streambanks.

Examples of relative rooting strength of various riparian community types in the Intermountain West may be found in *Monitoring Vegetation Resources in Riparian Areas* (Winward 2000 – in particular the vegetative stability rankings for those community types). For example, the *Carex aquatilis* community type has a stability rating of 9. Stability classes of 7 or higher are usually considered adequate to protect streambanks and other high-energy riparian areas. *Monitoring Streambanks and Riparian Vegetation—Multiple Indicators* (Burton et al 2007) contains additional plants and community type ratings. Vegetation stabilizing requirements for intermittent systems may not be as high.

Locations that do not have stability ratings for plant species or plant community groups will need to rely on professional judgment and compare their species [and sites] with locations that have stability ratings (e.g. Padgett et al 1989).

### Intermittent

Intermittent systems must be judged based on the potential type of vegetation possible for that system and knowledge of an experienced interdisciplinary team. It should be determined if you are truly dealing with an intermittent stream rather than an ephemeral channel, e.g., are flows greater than 30 days, are channel characteristics present or absent. This is of critical importance as the vegetation that could occur is dependent upon the timing and persistence of stream flows. The potential of the type of vegetation (facultative rather than a facultative-wet) may be affected if the majority of stream flow occurs outside the growing season, or if stream flows are too short in duration.

Some intermittent streams are not able to support vegetation with higher stability ratings and may have a higher proportion of facultative and facultative upland species, which is

all that is needed to hold those systems together. FAC plants provide stability for the intermittent system the same way that obligate plants do for the perennial systems relative to its potential and would have a high rating for that type of system.

**Question 2: Are Items 7 and 9 in TR 1737-15 (Lotic) redundant?**

Checklist Item 7: “There is diverse composition of riparian-wetland vegetation (for maintenance/recovery)” (Prichard et al 1998, p. 38).

Checklist Item 9: “Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events” (Prichard et al 1998, p. 40).

Items 7 and 9 are not redundant. They provide information used to determine at what point the riparian-wetland area or reach is in relation to achieving PFC (i.e. is it at the lower end of the scale in FAR or closer to PFC based on the development of plant groupings or communities). Notes on each of the checklist items provide insight into trend and how close or far the site is from achieving PFC. Checklist responses (and detailed comments) should help the examiners determine where in the continuum of vegetation development a particular reach or riparian-wetland area is at the present time for functional classification when analyzed in context with the other checklist items. It must be remembered that all checklist items are evaluated for physical function and stability based on relatively common channel forming flows (i.e., 1.5-2.5 year recurrence interval), not the less common high flow events (>25 year recurrence interval).

Items 7 and 9 are intended to assess the progression towards riparian-wetland plant or plant community development. Item 7 asks only that the appropriate plant species are present within the **riparian-wetland area**. Item 9 specifically requests information concerning the presence of riparian (obligate and facultative wet or facultative for intermittent systems) plant groupings or communities and is restricted to a specific location, the **streambank**. Item 9 builds on item 7 to assess the likelihood and possible relative timeframe for recovery (i.e., are the sites poised to recover rapidly or will it take more time for recovery to occur under the right conditions). It does this by requiring the ID Team to consider whether the right kinds of plants or plant communities are available in numbers (plants) or extent (plant communities) to provide for persistence and expansion. This begins to bring in quantity for recovery and not in the context of adequacy for stability as does item 11. These are related but different purposes. To use a construction analogy, item 7 represents an inventory of material sources, i.e., are the right kinds of construction materials available. Item 9 documents the accumulation of construction materials on site to determine if there are adequate quantities to allow construction to begin/proceed. Item 11 has all the materials needed to build and protect the structure.

**Question 3: Is Item 9 in TR 1737-15 (Lotic) a “presence or absence” question or does it have some quantity associated with it?**

Checklist Item 9: “Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high stream flow events” (p 40).

Confusion with this item seems to primarily involve those cases where the vegetative community is not at or near potential, i.e. item 11 is clearly a “no”. In these instances the purpose of item 9 is to determine if there is an adequate reservoir of the right kinds of plants or plant communities to support recovery. In this case, adequate would be defined as occurring in great enough numbers (plants) or extent (plant communities) to ensure persistence and expansion given the right conditions. At first glance this would appear to duplicate item 11. The difference is that item 9 assesses the potential for persistence and recovery of plants and plant communities while item 11 assesses the actual level of stability afforded by the existing plant community. To put it another way, item 9 asks “is the stage set for recovery.” Item 11 asks “are we there yet?”

A ‘yes’ response is possible on item 9 when there are patches within the riparian area that contain the right kind of plants/plant communities. In such condition, it is likely that reproduction of the characterizing deep-rooted (or potential) vegetation could occur and eventually fill in the gaps along the streambank. The examples stated on page 40 (TR 1737 15) are only examples and do not represent all potential “yes” or “no” responses on the checklist (i.e., stream reaches do not require a dominance of riparian community types to answer “yes” on item 9).

For example, if the site has predominantly 80% bare ground with 20% Nebraska sedge along the streambank, the answer to item 9 would be “yes.” If a site has 60% Kentucky bluegrass, 20% Nebraska sedge, and 20% bare ground the answer to item 9 would also be “yes.” You are not looking at the upland vegetation or the amount of bare ground when answering this item, but the riparian plants or communities to determine if there is enough to start recovery when the opportunity is provided.

## Summary

To reiterate, the PFC checklist represents a progression through each checklist item and acts as a check and balance of responses. For example, if the answer to item 9 (streambank vegetation comprised of deep-rooted plants) is “no”, then the answer to item 11 (adequate deep-rooted vegetation exists to protect banks and dissipate energy) should also be “no.” But, item 7 can be “no” and 9 and 11 can be “yes.” We can’t predict the order of how vegetation comes in and what dominates a location. Many woody species occur in very irregular occurrences on riparian areas due to specific requirements for germination to occur. Once all things are in place (new exposed or deposited soils, sunlight, adequate moisture, and temperature) a species may germinate and monopolize that site for some time. The same can occur with one or two herbaceous species such as water or Nebraska sedge.

Lotic site examples are provided below for perennial and intermittent systems in an attempt to further clarify the vegetation checklist items 7, 9, and 11.

### **Perennial Examples:**

In PFC assessments, comments are as important as the “yes” or “no” responses for each of the attribute items. The following examples exhibit how important comments can be in documenting the “answer” as well as determining the relative progress in the continuum of development. Also, remember the assessment is for the stream reach and not one spot.



- 7. No. A few colonizers or low rated stabilizing species (bluegrass, annuals) exist in or at the water’s edge. No stabilizing species observed for recovery of the system.
- 9. No. No stabilizing plants or plant communities exist.
- 11. No. Very low stability rating – mostly barren.

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7. Yes. Baltic rush, swordleaf rush, beaked sedge, Nebraska sedge (not all present in picture), yellow willow, coyote willow, whiplash willow (plus others – This is really the place for full plant list if you can)

9. Yes. Stabilizing plant communities are well developed throughout.

11. Yes. This site is approaching potential. Estimated 90% + stable community types with an overall high to very high stability but woody community component is still developing.



7. Yes on herbaceous species. Occasional Nebraska sedge and Baltic rush, and no on woody species which are needed in this system for recovery.

9. Yes. Sedges and rushes occur in small groupings even though this is predominantly a bluegrass community along the streambank. There is an adequate amount that given the

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opportunity could spread throughout the reach and connect with other patches of riparian-wetland vegetation.

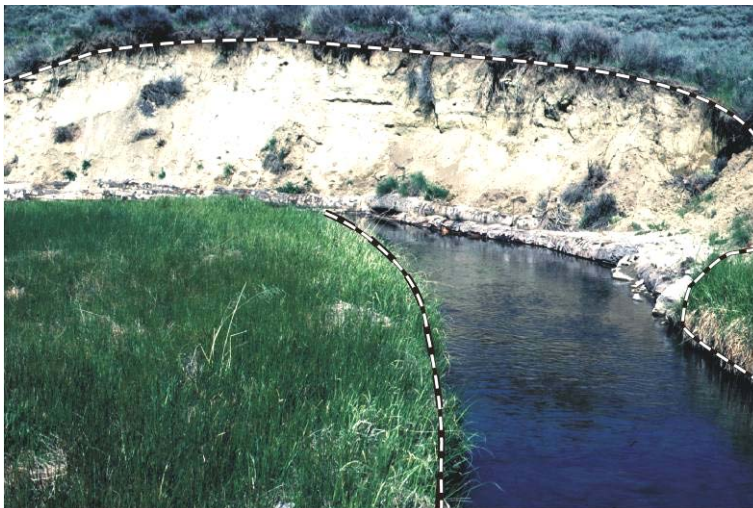
11. No. The absence of stabilizing communities and predominance of barren and bluegrass types gives this reach a low to very low stability.



7. Yes. Coyote willow, whiplash willow and yellow willow are present along with occasional Baltic rush and Nebraska sedge.

9. Yes. Stabilizing communities still persist along the streambank providing the opportunity for reproduction to occur. Even though they are poorly developed and limited in extent patches or groupings occur along the reach.

11. No. Estimate less than 5% of the streambank is occupied by stabilizing communities. Approximately 80% of this stream type needs stabilizing community types (Winward 2000). Floodplain and overflow channels are poorly vegetated.



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7. Yes on herbaceous species. Water sedge, beaked sedge, Baltic rush. No on woody species observed because this system should have them for recovery and maintenance.

9. Yes. Herbaceous riparian communities are developed enough for reproduction to occur. The opposite bank greenline is comprised of upland plants and will maintain upland plants until the greenline establishes at the toe of the streambank.

11. No. Channel evolution still limits the extent of stabilizing communities. There are still too many vertical banks and limited flood plain for plant establishment in places. The stream is still actively building its floodplain and deposition is occurring although not evident in this photo. Estimate approximately 50% stabilizing communities out of 80% needed for this stream (Winward 2000).



7. Yes on herbaceous species. Water sedge, beaked sedge, Baltic rush. No on woody species observed because this system should have them for recovery and maintenance. Other reaches in this stream with the same site characteristics have a woody component.

9. Yes. Herbaceous communities are well developed where they can occur.

11. No. Channel evolution still limits the extent of stabilizing communities. There are still too many vertical banks and limited flood plain for plant establishment in places along this stream. Estimate approximately 50-60% stabilizing communities out of 80% needed for this stream (Winward 2000).

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- 7. Yes. Nebraska sedge and willows in the riparian area.
- 9. Yes. Nebraska sedge and willow community types on the streambank.
- 11. No. Nebraska sedge and willow communities not fully developed on the greenline to protect against high water flow.

**Intermittent Examples:**



- 7. No. The only species present is red willow. This makes the site susceptible to disease or pest infestation removing the only stabilizing species within the reach.
- 9. Yes. Stabilizing plant communities, in this case willow community, is present within the area they have the potential to establish.
- 11. Yes. These willows are well established in the limited space in which it has the potential. The riparian band-width is greater than one tree width. A note should be made

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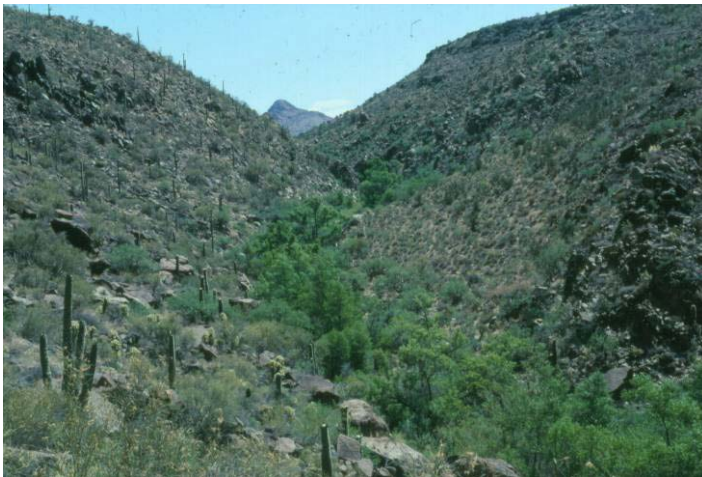
of the excessive browsing and how that may affect root strength and maintenance in the future.



7. Yes. Gooddings willow, Fremont cottonwood, and Arizona sycamore are present

9. Yes. Stabilizing riparian woody plant community is present.

11. No. The large cobble in the streambed indicates this is a high energy reach (intermittent B3 channel). The established woody riparian plants may not yet be large enough to withstand typical flood events that occur here.



7. Yes. Species present include Fremont cottonwood, Gooddings willow, velvet ash, and Arizona sycamore.

9. Yes. Stabilized riparian woody plant is present

11. Yes. The reach has achieved potential and has adequate stabilizing plant communities. This riparian are is located at the “headwaters” of Kaiser Canyon in a relatively small watershed. Large peak flows would not occur to affect this area.

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7. Yes. Red and Gooddings willow, seepwillow, Baltic rush and American bulrush are present at this site

9. Yes. Established willow and herbaceous plant community types are present.

11. Yes. Adequate cover is present along the streambank and floodplain in this reach.

## Literature Cited

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