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Subpart D—Reporting Procedures for Conservation Practice Standards

Part 641 Guidance for Effective Implementation and Reporting of Conservation Practice Standard 395, Stream Habitat Improvement and Management

(190–VI–NBH, Amend. 2, October 2007)

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Part 641 Guidance for Effective Implementation and Reporting of Conservation Practice Standard 395, Stream Habitat Improvement and Management

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Subpart D

Reporting Procedures for Conservation Practices

Part 641

Guidance for Effective Implementation and Reporting of Conservation Practice Standard 395, Stream Habitat Improvement and Management

641.00 Introduction

The Stream Habitat Improvement and Management Conservation Practice Standard (CPS) 395 was revised in August 2006. This standard provides guidance for implementing stream and riparian conservation actions and the aquatic species that are affected by them, as defined in CPS 395: *Maintain, improve or restore physical, chemical and biological functions of a stream, and its associated riparian zone, necessary for meeting the life history requirements of desired aquatic species.*

Revisions made to the CPS 395 include:

- expanding the *Purpose* to provide suitable habitat for riparian and aquatic species, including but not limited to, endangered and threatened species and species of concern and their communities
- broadening the *Conditions* for the practice to include additional physical features of stream habitats such as backwaters, flood plains and riparian corridors where habitat deficiencies limit survival, growth, reproduction, and/or diversity of aquatic species of concern in relation to the potential of the stream
- expanding the *Considerations* to include fish barriers, fish screens, and geomorphic features of streams

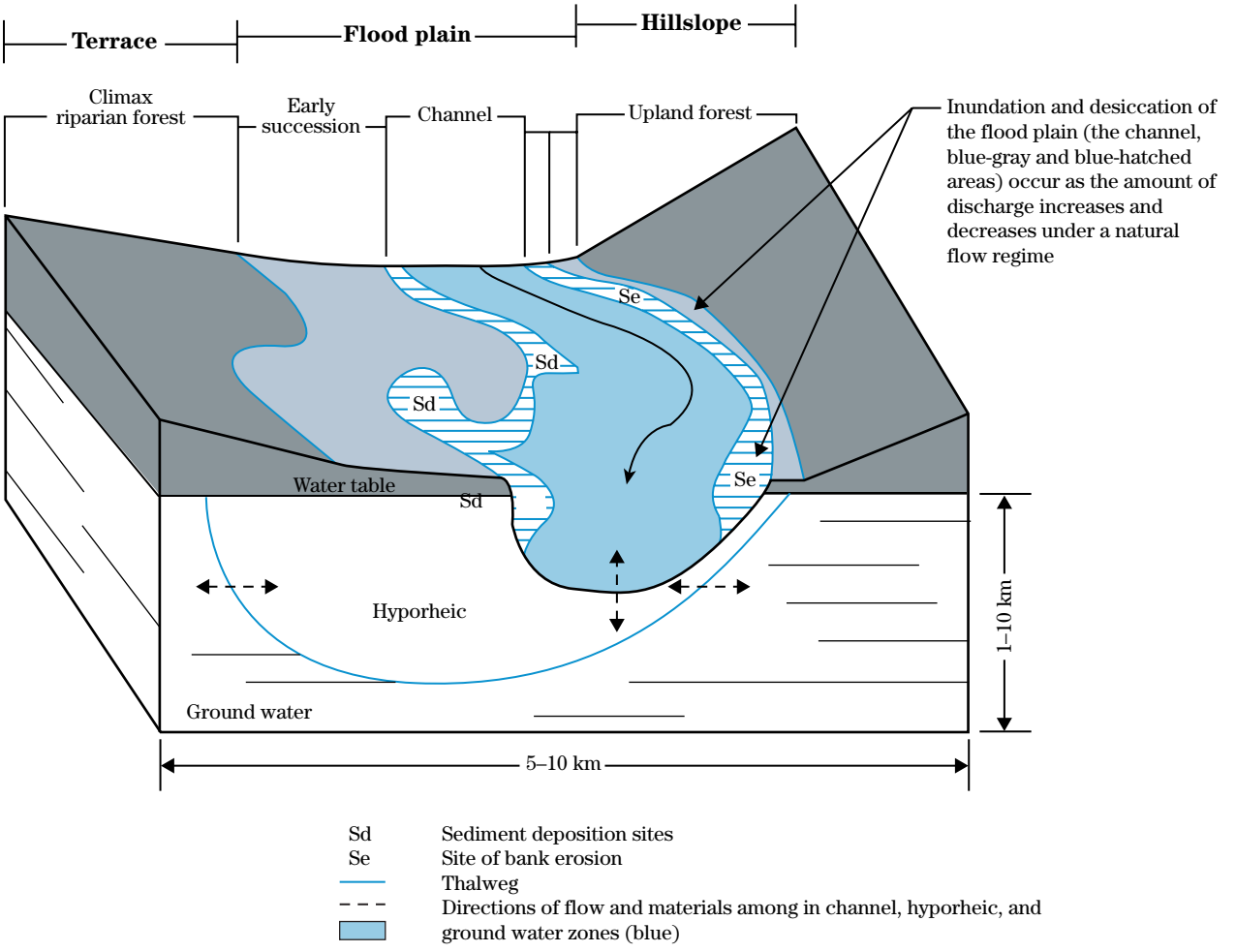
This subpart of the National Biology Handbook (NBH) provides information for implementation and reporting of actions completed under CPS 395. Guidance is provided for computing the number of acres improved and/or managed to meet the purposes of the practice, which are to provide suitable habitat for desired aquatic species and provide stream channel and associated riparian conditions that maintain ecological processes and connections of diverse stream habitat types important to aquatic species.

641.01 Implementing CPS 395

Regardless of their size, natural or minimally altered stream corridors tend to be physically complex. Transport of water, sediment, and wood throughout the stream corridor system creates a complex three-dimensional (longitudinal, lateral, and vertical) arrangement of different stream, riparian, and flood plain habitats with physical features that change through time (Ward 1989). Figure 1 illustrates a cross-sectional view of a generalized stream corridor segment showing the three spatial dimensions in which stream corridor habitats are formed through time. Biota may reside in all dimensions (riparian, in-channel, hyporheic, and/or ground water zone). This complexity of habitats and their dynamic nature contributes to the high level of biological diversity typical of stream corridors. Studies in stream ecology emphasize the importance of linkages between stream channels, riparian areas, and flood plains (Gregory et al. 1991; Stanford and Ward 1992; Brookes, Baker, and Redmond 1996; Huggenberger et al. 1998; Molles et al. 1998; Tockner, Malard, and Ward 2000). Ecological processes occurring among the different elements of stream corridors include energy flow, nutrient cycling, riparian succession, and aquatic and terrestrial species interactions. Intensive land use activities in a stream corridor and its watershed often simplify the physical structure of streams and disrupt linkages important to ecological processes and biological communities (Vondracek et al. 2005). For example, removing riparian vegetation often contributes to bank instability and subsequent bank failure, sedimentation of stream habitat, and changes in stream fauna and flora. Installing dams fragments connectivity between the stream and its flood plain or between downstream and upstream reaches, preventing or limiting ecological processes and interactions important to many species (Allan 2004; Poff et al. 2007).

The purpose of CPS 395 is to manage streams to conserve/protect natural and healthy stream conditions or improve conditions that have deteriorated due to land use actions at the site or in the watershed. For a more thorough description of ecological and physical considerations of stream projects, refer to the National

Figure 1 Cross-sectional view of a generalized stream corridor segment showing the three spatial dimensions in which stream corridor habitats are formed through time (modified from Stanford and Ward 1992)



Engineering Handbook, Part 654 (NEH 654), Stream Restoration Design.

Actions implemented individually or as part of an integrated suite of actions under CPS 395 may be focused in the stream or within the stream corridor. These include:

- riparian conservation practices such as fencing or establishment of riparian buffers, channel bank vegetation, grassed waterways, filter strips, and hedgerows
- flood plain conservation measures such as restoration of emergent wetlands, removal of berms to reconnect isolated channels and sloughs, or reestablishment of connections between the channel and its flood plain
- bank protection practices such as streambank and shoreline protection, grade control, use exclusion, and prescribed grazing
- instream improvements such as water control structure modifications to protect aquatic species (screens), placement of wood and/or boulders, replacement of culverts, dam removal, construction of rock weir complexes, meander restoration, and reestablishing fish passage

Aquatic habitat management or improvement provisions targeted through the use of this practice should benefit as many ecological functions of streams and associated riparian areas, as physically and economically feasible. All actions implemented within the stream channel can be enhanced by protecting or improving the condition of the riparian area. Practices installed under CPS 395 should result in improved conditions over time, as assessed by stream habitat evaluations suitable for the watershed being treated, such as the NRCS Stream Visual Assessment Protocol.

641.02 Reporting acres improved or managed using CPS 395

CPS 395 is a selected conservation practice for the NRCS Performance Reporting System (PRS), specifically Annual Performance Measures 3.1: Grazing and forest land with conservation applied to protect and improve the resource base (acres) and 3.2: Non-Federal land with conservation applied to improve fish and wildlife habitat quality (acres).

Stream habitat improvement actions will influence stream corridors differently, depending on the existing conditions and dynamic responses of the stream and its flood plain. For purposes of reporting, professional judgment of an aquatic biologist, hydraulic engineer, and other qualified specialists should be sought to determine the length of the stream (L) influenced by treatments implemented under this standard. This will assure the most accurate assessment of the effectiveness of the actions implemented. In some cases, L may be difficult to determine because of complex site conditions, multiple project treatments, or disagreements between project personnel. Thus, unless a project includes aquatic organism passage as the primary objective (see #6), or the length of the stream influenced is determined by consensual professional judgment, the maximum length of stream (L) used to calculate acres of improvement will be the total project boundary length (l_1) measured in feet, plus the number of feet equal to 10 average bankfull channel widths (l_2), regardless of treatments, structures, or actions applied. Refer to figure 2 for estimating the bankfull channel width: the stream width (in feet) at the flow that forms and controls the shape and size of the active channel.

l_1 = number of feet in total project boundary, or the number of feet of the linear distance from the point in the channel or bank where a project activity begins to the point where the activity or actions end

l_2 = average bankfull channel width in feet multiplied by 10

Example: The total project boundary length (l_1) is estimated to be 900 feet. The average BFW is estimated to be 20 feet, so l_2 is estimated to be 20 feet multiplied by 10. Thus, the length of stream influenced by treatment (L), is

$$L = (1_1) + (1_2)$$
$$L = [900 \text{ ft} + 10(20)] = 1{,}100 \text{ ft} \qquad \text{(eq. 1)}$$

To determine *acres of stream habitat improved* under CPS 395, use the following general guidelines:

1. Instream structures installed to improve stream habitat (large wood and/or boulder placement, rock weirs, intake pipe screen): length of stream influenced by treatment (L), multiplied by the average bankfull width of stream (BFW), divided by 43,560.

$$\text{Acres improved} = \frac{(L)(BFW)}{43{,}560} \qquad \text{(eq. 2)}$$

2. Bank structures (barbs, groins, and lunkers) to contribute to stream habitat improvement: length of stream influenced by treatment (L) multiplied by average bankfull width (BFW) of stream, divided by 43,560.

$$\text{Acres improved} = \frac{(L)(BFW)}{43{,}560} \qquad \text{(eq. 2)}$$

3. Bank structures plus reestablishment or protection of riparian vegetation on both sides of stream: sum of the average BFW, riparian vegetation width of left bank (RW_l), and riparian vegetation width of right bank (RW_r) multiplied by the length of stream influenced (L), divided by 43,560.

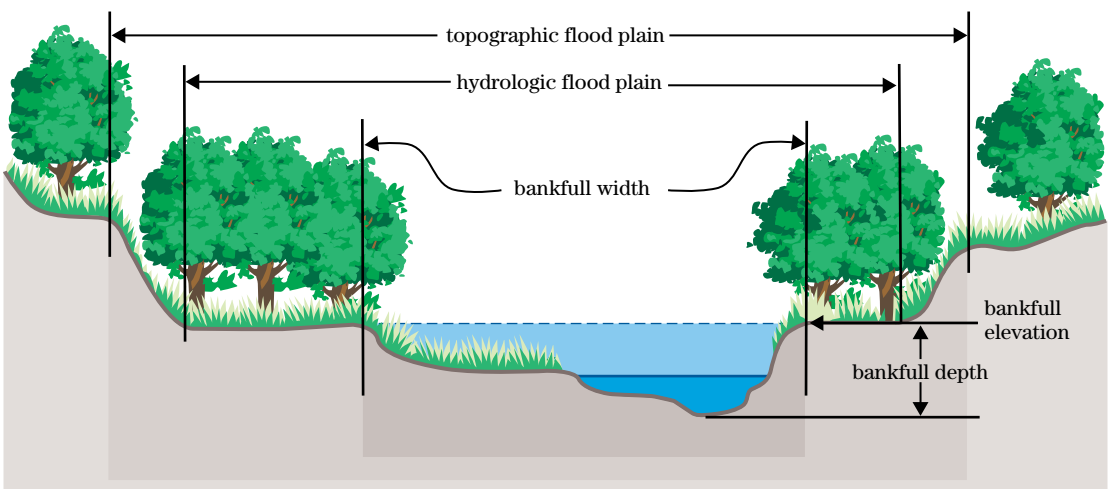
$$\text{Acres improved} = \frac{(BFW + RW_l + RW_r)(L)}{43{,}560} \qquad \text{(eq. 3)}$$

4. Riparian restoration: if restoration is on both sides of the stream, computation is the same as that for treatment 3. If riparian restoration is on one side only, add only the riparian vegetation width for the side treated (RW_t) to the BFW before multiplying by length of stream.

   Acres improved if riparian area is restored on both sides of the stream:

$$\text{Acres improved} = \frac{(BFW + RW_l + RW_r)(L)}{43{,}560} \qquad \text{(eq. 3)}$$

Figure 2 Estimating the bankfull channel width



Acres improved if riparian area is restored on only one side of the stream:

$$\text{Acres improved} = \frac{(\text{BFW} + \text{RW}_t)(\text{L})}{43{,}560} \quad \text{(eq. 4)}$$

5. Improve lateral connectivity: if the objectives of the project are to increase connectivity between the stream channel and flood plain, estimate the total area of the stream channel and its flood plain, including any off-channel habitats (such as emergent wetlands) that are connected at least seasonally by the action (refer to fig. 1). In this case, the width of the area would be the width, in feet, of the entire active flood plain, as measured from hillslope to terrace, or terrace to terrace, depending on the shape of the valley.

$$\text{Acres improved} = \frac{(\text{width of flood plain})(\text{L})}{43{,}560} \quad \text{(eq. 5)}$$

6. Improve longitudinal connectivity: if the objective of the project is to improve connectivity of upstream and downstream habitats for aquatic species, such as improved fish passage, add the area influenced by the fish passage structure, including the total area of stream habitat upstream that is "connected" by the action. Measure upstream mileage according to the NBH, Subpart D, Part 640, Guidance for Assessing and Reporting Stream Miles Affected by Activities Completed Under Conservation Practice Standard 396, Fish Passage, and use guideline 1 to estimate acres improved.

7. For performance measure 3.1, *if stream improvements are accompanied by a grazing management plan that identifies fish and riparian habitat conservation objectives*, report the sum of the total acres associated with the riparian zone, the active flood plain, and the bankfull stream channel within or adjacent to the resource land use area being used for grazing livestock.

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