Natural Resources Conservation Service

CONSERVATION PRACTICE STANDARD

CLEARING AND SNAGGING

Code 326

(ft)

DEFINITION

Removal of vegetation along the bank (clearing) and selective removal of snags, drifts, or other obstructions (snagging) from natural or improved channels and streams.

PURPOSE

Reduce risks to agricultural resources or civil infrastructure by removing obstructions that hinder channel flow or sediment transport to—

- Restore flow capacity and direction.
- Prevent excessive bank erosion by eddies or redirection of flow.
- Reduce the undesirable formation of bars.
- Minimize blockages by debris and ice.

CONDITIONS WHERE PRACTICE APPLIES

Any natural or improved channel where the removal of vegetation, trees, brush, and other obstructions is needed to accomplish one or more of the listed purposes.

CRITERIA

Notify landowner and/or contractor of responsibility to locate all buried utilities in the project area, including drainage tile and other structural measures. The landowner is also required to obtain all necessary permits for project installation prior to construction.

The design must address all modified flow conditions caused by clearing and snagging.

Capacity

Determine the capacity of the channel, both before and after modification, using National Engineering Handbook (NEH) Part 654, Stream Restoration Design, Chapter 6, Stream Hydraulics. Select a value of Manning's "n" roughness coefficient to determine channel capacity after modification that reflects the degree of natural changes and maintenance expected to occur in future years.

Location

Include the perimeter and flow area of the channel in the area to be cleared and snagged. Trees on the bank that are leaning over or other objects that may fall into the channel may be included.

Clearing and snagging may also be used for other areas, such as temporary disposal areas or travelways, required for implementation of this practice.

NRCS reviews and periodically updates conservation practice standards. To obtain the current version of this standard, contact your Natural Resources Conservation Service State office or visit the Field Office Technical Guide.
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Stability

Clearing and snagging activities may affect channel stability. The effect on downstream and upstream reaches due to the removal of obstructions must be analyzed using appropriate stream and channel geomorphologic procedures. Avoid or mitigate activities that negatively affect stability.

Debris Disposal

Remove cleared and snagged material from the floodplain or deposit in areas or in a manner that will not significantly affect the flow capacity of the floodplain. Designate locations to dispose of any garbage encountered during clearing and snagging operations, such as construction materials, metal, rubber, glass, and plastic.

Vegetation

Restore all areas denuded and/or disturbed during clearing and snag removal by planting vegetation, unless the disturbance is minimal and conditions are highly conducive for natural regeneration of vegetation. Use native vegetation where practical. Vegetation established as part of this practice should include ecologically suitable species obtained from local sources wherever practical.

Minimize disturbance of wetlands, riparian areas, and fish and wildlife habitat sites and avoid disturbance where possible.

The establishment of vegetation on cleared and snagged areas will be in accordance with the criteria contained within Conservation Practice Standard (CPS) Critical Area Planting (Code 342).

CONSIDERATIONS

Debris in stream systems affects the physical characteristics of the stream as well as the diversity and abundance of its aquatic organisms. Fisheries and/or aquatic biologists can assist in evaluating and incorporating measures to improve aquatic and riparian-wetland habitat:

Incorporate enhancements for fish and wildlife values as needed and practical. Give special attention to landscape aesthetics and to protecting and maintaining key shade, food, and den trees. Use CPS Stream Habitat Improvement and Management (Code 395).

Retain or replace habitat-forming elements that provide cover, food, pools, and water turbulence, to the extent possible.

Root balls of fallen trees that are securely anchored in the channel or naturally formed logjams may provide fish habitat and/or stability. The effects of these items must be included in the channel capacity hydraulic analysis. Existing root structure and stumps firmly within the soil should remain to help stabilize the soil and facilitate resprouting of woody vegetation.

Incorporate existing onsite woody debris into the design to help stabilize banks, modify channel flow, provide anchorage and food for invertebrates, and provide habitat and cover for fish. Note that woody debris should be securely fastened, anchored, or embedded, as dislodged woody debris may be a risk to downstream structures such as bridges, dams, or other civil works. Use NEH Part 654, Stream Restoration Design Technical Supplement 14E, for determining the forces acting on woody debris, and the necessary anchoring.

Erosion rates decline as a percentage of vegetative roots in a streambank increases. Selection of appropriate riparian vegetation will increase the streambank's ability to resist future erosion.

Clearing and snagging activity may resuspend sediments in the flow. Consider treatments that promote beneficial sediment deposition and the filtering of sediment and dissolved substances.

During construction, woody materials may float downstream and cause additional snags and drifts. Incorporate measures and practices, as needed and practical to address this concern.

Schedule in-stream work to avoid environmentally sensitive periods such as spawning and migration.

Incorporate measures and practices, as needed and practical, to address modified flow conditions such as—

- A lowered hydraulic gradient that may drain adjacent flood plains more quickly.
- Decreased groundwater recharge in water-losing streams resulting from reduced residence time in the channel and adjacent floodplains.

Ground-disturbing activities associated with this practice may adversely affect protected plant species and may encourage the establishment of exotic and/or non-native species. Quickly revegetating disturbed areas can minimize the introduction of non-native species.

Temporary erosion and sediment best management practices can be used to minimize the delivery of fine sediment to adjacent and downstream reaches.

Incorporate construction methods that enhance fish and wildlife values as needed and practical to include—

- Use hand-operated equipment, water-based equipment, or small equipment to minimize soil, water, and other resource disturbances.
- Operate heavy machinery from atop adjacent streambanks to the fullest extent possible.
- After the material has been removed from streambank locations, limit machinery access to riparian areas to minimize damage to stream habitat.

PLANS AND SPECIFICATIONS

Prepare plans and specifications for clearing and snagging that describe the requirements for applying the practice to achieve its intended purpose(s).

As a minimum, include, as applicable, the following items in the plans and specifications:

- Map of overall area including limits of clearing and snagging required.
- Location of ingress and egress to the site.
- Description of works of improvement, extent of removal, and manner of disposal.
- Location of disposal areas or location of areas off limits for disposal of debris.
- Requirements for disposal area to address final dressing, stabilization, drainage, and vegetation.
- Location and description of trees or woody vegetation to be left undisturbed.
- Method of debris disposal.
- Manner and sequence of construction operations so that impacts on the environment will be minimized.
- Erosion control measures, as applicable.
- Vegetative requirements for areas denuded and disturbed, as applicable.

Carry out all operations in a safe and skillful manner. Observe all safety and health regulations and use appropriate safety measures.

OPERATION AND MAINTENANCE

Provide an operation and maintenance plan to the landowner/user to maintain channel capacity and vegetative cover. Items to include are—

- Assess the area after each major storm event for downed trees and debris accumulation. Remove

or relocate and anchor downed trees and debris accumulations that are causing bank erosion problems as soon as possible.

- Periodically inspect the area for signs of streambank undermining or instability. Remove any debris accumulations that may contribute to the instability and closely monitor the area.
- Clear any vegetation and/or debris that block side drainage structures and channels.

REFERENCES

USDA-NRCS. 2007. National Engineering Handbook, Part 654, Stream Restoration Design. Washington, D.C.

USDA-NRCS. 2009. National Biology Handbook, Part 614, Stream Visual Assessment Protocol Version 2. Washington, D.C.