

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD**

**CLEARING AND SNAGGING**

(Ft.)

CODE 326

**DEFINITION**

Removing snags, drifts, or other obstructions from a channel or drainage way.

**PURPOSE**

Reducing significant human and/or natural environmental risks by improving physical characteristics of a channel to:

- Restore flow capacity;
- Prevent bank erosion by eddies;
- Reduce the formation of bars; and/or
- Minimize blockages by debris and ice.

**CONDITIONS WHERE PRACTICE APPLIES**

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

**FEDERAL, STATE and Local Laws**

***Design and construction activities shall comply with all federal, state, and local laws, rules, and regulations governing activities in or along streams, pollution abatement, health, and safety.***

***The owner or operator shall be responsible for securing all required permits or approvals and for performing all planned work in accordance with such laws and regulations. NRCS employees are not to assume responsibility for procuring these permits, rights, or approvals, or for enforcing laws and regulations. NRCS may provide the landowner or operator with***

***technical information needed to obtain the required rights or approvals to construct, operate, and maintain the practice.***

***Permits may be required from the following agencies:***

- 1. U.S. Army Corps of Engineers***
- 2. WV Department of Natural Resources***
- 3. WV Public Lands Corporation***
- 4. US Fish and Wildlife Service***

***All contemplated projects and plans involving changes or alterations in any high quality stream and/or as defined in the current publication of "West Virginia High Quality Streams" shall be submitted to the Division of Natural Resources for review.***

***Work in "Waters of Special Concern" will require individual approval from WVDEP and/or WVDNR. Work in waters where there is a present or possible presence of endangered/threatened species require notification and collaboration with the USFWS.***

**CRITERIA**

Clearing and snagging measures shall be planned, designed, and constructed to comply with all Federal, State, and local laws and regulations.

Clearing and snagging shall not be completed on any channel where significant channel erosion will occur, major impairment to the landscape resource quality is likely, or significant impairment to habitat for fish and wildlife will occur, unless needed restoration

NRCS, NHCP  
November 2002

NRCS, WV  
August, 2006

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service **State Office or visit the electronic Field Office Technical Guide (eFOTG) located on our web site.** Note: **Bold italics is information added or changes made to the National Conservation Standard by WV.**

actions are included with the application of this practice.

**Capacity.** The capacity of the channel, both before and after improvement, shall be determined using Manning's Formula with applicable values of the retardance factor "n" from Supplement B to the National Engineering Handbook, Section 5 – Hydraulics, or similar source. ***The channel capacity shall not be impaired by the clearing and snagging operation.*** The value of "n" used to determine channel capacity after improvement shall reflect the degree of natural changes and maintenance expected to occur in future years.

***When the purpose of the work is to increase the flow capacity of the channel, the "after improvement" capacity shall be adequate to provide the protection required by the project. If the needed capacity cannot be provided by clearing and snagging alone or in combination with other practices, such as floodways, or dikes, then the measure shall be designed as an open channel, waterway, or drainage main, or as appropriate.***

**Location.** The area to be cleared and snagged shall include the perimeter of the channel, the flow area of the urban floodway, or both. Trees on the bank that are leaning over or other objects that may fall into the channel shall also be included. If root balls are still attached to the streambank, cut off the log 6 to 12 inches above the ground and leave the stump and root mass for bank stability.

**Stability.** Clearing and snagging shall only be specified for other areas such as: berms, areas used for temporary disposal sites or travel-ways, or for other planned conservation uses where needed to implement this practice.

Clearing and snagging shall not impair channel stability. The criteria for determining channel stability shall comply with ***West Virginia*** Conservation Practice Standard (582), Open Channel. The effect on downstream and upstream reaches due to the removal of obstructions shall be analyzed using appropriate stream and channel geomorphologic procedures.

If clearing and snagging will result in streambank erosion, criteria within

Conservation Practice Standard (580), Streambank and Shoreline Protection will be used in conjunction with this standard.

**Vegetation.** All areas denuded and disturbed during snag removal shall be restored by planting native vegetation where practical. Disturbance of wetlands, riparian areas, and fish and wildlife habitat sites shall be minimized or avoided where possible. Cleared material shall be removed from the floodplain or deposited in approved areas that will not significantly affect the flow capacity of the stream.

## CONSIDERATIONS

Ground-disturbing activities associated with this practice, including but not limited to areas of equipment/vehicle traffic in the channel and floodway and areas of vegetation removal, have the potential to adversely affect cultural resources.

Insure that threatened and endangered species and their habitat shall not be permanently adversely impacted by the use of this practice.

Effects on water quantity and quality should be considered.

Removal of deadfalls, stumps, and trees from streambanks and channels may increase discharge, velocity and channel capacity that could reduce flood damage from out of bank flow.

Improved flow conditions may lower the hydraulic gradient and drain flood plains more quickly. Rapid drawdown may cause sloughing of saturated, unstable streambanks.

Decreased groundwater recharge in water-losing streams may result from reduced residence time of water in the channel.

Temporary losses of aquatic or wetland habitat may occur with the removal of vegetation.

During implementation of the practice, there may be increased turbidity due to an increased sediment load. Water quality may be further degraded by chemical substances (i.e. organic nitrogen or phosphorus) attached to the sediment particles.

During construction, a heavy organic load may be produced resulting in a decreased availability of dissolved oxygen. Long-term effects may cause a decrease in yields of sediment and sediment-attached substances.

***When possible, measures will be designed such that construction activities can be performed from the bank. Erosion and sediment control measures such as diking, mulching, temporary seeding, etc. will be incorporated in the design.***

Increased surface water temperatures, at low flow, may occur from removal of shade-producing canopy until regrowth occurs. Accelerated flows may reduce the period of time water is exposed for "sun warming," thus reducing water temperature.

In streams carrying dissolved substances, a reduction in ground water recharge may contribute to improved aquifer quality.

The number of pools and riffles forming the channel bottom may be reduced and fish habitat could be adversely affected.

Measures and construction methods that enhance fish and wildlife values should be incorporated as needed and practical. Special attention should be given to landscape aesthetics, to protecting and maintaining key shade, food, and den trees, and to stabilization of disturbed areas.

Consider removal methods and the disposal location of cleared material that will not be used for bioengineering (removal from site, placement in or out of the floodplain, not placed in wetland areas, etc.), and implement according to permit conditions. ***Woody material, excess excavated material and other debris shall be disposed of by methods and in areas such that the material cannot re-enter the stream.***

## PLANS AND SPECIFICATIONS

Plans and specifications for clearing and snagging shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose(s).

Construction operations shall be carried out in a manner and sequence so that impacts on

the environment will be minimized and held within acceptable limits.

All operations shall be carried out in a safe and skillful manner. Safety and health regulations shall be observed and appropriate safety measures used.

## OPERATION AND MAINTENANCE

A maintenance program shall be established by the landowner/user to maintain channel capacity and vegetative cover. Items to consider are:

- Where applicable, control grazing in the construction area during vegetative establishment and when soil conditions are wet.
- Fertilize as needed to maintain a vigorous vegetative cover.
- Promptly repair eroded areas ***bottom or bank instability***.
- Remove major silt and sediment accumulations in the channel cross-section as soon as practical, when the effects are causing significant bank erosion problems.
- Re-establish vegetation cover immediately where scour erosion has removed established seeding.
- Keep inlets to side drainage structures and channels open and armor if necessary.
- Periodically inspect the area for signs of significant streambank undermining or instability.
- ***Annual or approved inspection plan of the channel to assess the need for remedial clearing and snagging.***
- ***Inspection of stumps to check for sprouts and re-growth.***



## WV-NRCS CLEARING AND SNAGGING (326) CONSTRUCTION SPECIFICATIONS

All trees, stumps, and brush to be removed within the perimeter of the channel shall be cut as close to the ground as the cutting tools permit. If other areas are to be cleared, the trees, brush, and other woody vegetation shall be cut within the specified maximum distance above ground level.

Trees shall be felled in such a manner as to avoid damage to other trees and property that are not a part of the clearing and snagging operations. Special attention will be given to protecting and maintaining key shade, food, and den trees when their removal is not necessary.

Down trees, logs, drifts, boulders, debris and other obstructions lying wholly or partly in the channel shall be removed. Piling, piers, headwalls, and sediment bars that obstruct the free flow of water shall be removed if so designated in the drawings.

Construction shall be done in such a way that chemicals, fuels, lubricants, and waste materials will not enter the flow area. If at all possible, construction equipment other than hand-operated equipment should not work in the channel.

Erosion, air pollution, and water pollution will be minimized and federal, state, and local laws and permits shall be followed to the letter of the law.

Selective snagging, where possible, shall be performed primarily with hand-operated equipment, water-based equipment, or small equipment used in a manner that will minimize soil, water, and other resource disturbances.

Trees, logs, and all combustible material resulting from the clearing and snagging operations shall be burned, buried, or piled in designated disposal areas as specified. All burning shall be performed outside the channel and shall conform to regulations in effect in the area.

Burned material shall be disposed of in such a manner that it does not float away or re-enter the channel. Residue from burning and non-combustible material shall be buried outside the channel or placed in designated disposal areas.

All buried material shall have a minimum of 1.0 ft. of earth cover unless specified otherwise on the drawings and disposed of in an approved location as noted on the plans. Excavated material will be placed at the location and in the manner shown on the drawings.

If herbicide treatment is planned, the stumps and brush in the specified area shall be treated at the time of clearing according to the recommendations of the manufacturer of the herbicide specified or being used. Only herbicides designated for use around water sources, by the U.S. Environmental Protection Agency, shall be used.

Measures and construction methods that enhance fish and wildlife values and those for erosion and sediment control shall be incorporated as shown on the drawings.

Upon completion of construction, all disturbed areas shall be graded smooth and blend with the surrounding ground.

A protective cover of vegetation shall be established on all exposed surfaces where soil and climatic conditions permit. Lime and fertilizer shall be spread at the specified rate and shall be disked into the soil to a depth of 4 inches to prepare a seedbed. Seed and mulch shall be applied at the specified rate. In some cases, temporary vegetation may be used for protection until conditions are suitable for establishment of permanent vegetation.

Where soil or climatic conditions do not permit the establishment of vegetation, and protection is needed, non-vegetative means such as mulches or gravel may be used.

Refer to Construction Specification 702-Clearing and Grubbing for additional criteria.

NRCS, NHCP  
November 2002

NRCS, WV  
August, 2006

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service **State Office or visit the electronic Field Office Technical Guide (eFOTG) located on our web site.** Note: **Bold italics is information added or changes made to the National Conservation Standard by WV.**