

SECTION 5.3

DEBRUSHING

Overview

Practice 301

Chemical Vegetation Control

Practice 302

Debrushing Using Hand-held Tools

Practice 303

Debrushing Using Heavy Machinery

Practice 304

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SECTION 5.3 **DEBRUSHING**

Debrushing entails controlling and removing living, woody vegetation from the banks and overbanks of streams and man-made ditches. Herbicides, hand-held tools, and heavy machinery, all are useful during debrushing activities. Using a combination of herbicides and mechanical debrushing is usually the most effective approach.

Debrushing using hand-held tools is generally the least damaging to the environment, and may be the best choice for small-scale projects, and in ecologically sensitive areas. However, this approach is labor intensive, and not cost-effective for large-scale projects.

Debrushing using heavy machinery may be the most practical alternative for long stretches of banks and overbanks that require regular maintenance. Since heavy machinery is generally more damaging to the environment than hand-held tools, care must be taken to limit access to areas able to withstand the impact.

Chemical Vegetation Control can either be used alone, or in conjunction with mechanical debrushing. Foliar spray applications, in which an herbicide is sprayed so that it coats the leaves and stems of target species, can be used alone as a way to routinely control vegetation. However, depending on the project, it may be necessary to clear and dispose of the dead vegetation. Applicators also run a high risk of contaminating water, and non-target species during spraying.

Herbicides are very useful when incorporated with mechanical debrushing techniques. Painting fresh-cut stumps of woody plants will reduce or eliminate regrowth, thus reducing long-term maintenance costs. Herbicides may also be used in ecologically sensitive areas where a skilled applicator can be very selective in which plant or plant species is herbicided.

Removing stumps is generally not advised unless absolutely necessary. Stumps and intact root systems help protect banks and overbanks against erosion. Removing stumps necessitates filling in the cavities left after stump removal, regrading, and revegetating the disturbed area.

Vegetation is probably the single most important component of wildlife habitat. Deep-rooted native plants (grasses, shrubs, and trees) are usually the most economical means of bank stabilization and erosion control. Therefore, extensive use of debrushing should be reserved only where such activity is absolutely needed for maintaining access, maintaining the flow capacity and conveyance, or selectively controlling nuisance species.

PRACTICE 301 CHEMICAL VEGETATION CONTROL

- DESCRIPTION**
- Controlling woody vegetation by means of an herbicide.



Exhibit 301a: Chemical Vegetation Control (Source: CBBEL files)

PURPOSE	<ul style="list-style-type: none">● To control growth of woody vegetation.
WHERE APPLICABLE	<ul style="list-style-type: none">● Stream and ditch right-of-ways.● Often used in conjunction with mechanical debrushing techniques (Practice 302 Debrushing Using Hand-held Tools and Practice 303 Debrushing Using Heavy Machinery).● Areas where low impact, selective vegetation control is desirable.
ADVANTAGES	<ul style="list-style-type: none">● Foliar application of herbicides may be more economical than mechanical control of woody vegetation. (However, it should not be used near the water.)● Herbicides used in conjunction with mechanical debrushing techniques can be used to prevent resprouting.● Often used in environmentally sensitive areas to selectively eliminate undesirable species.
CONSTRAINTS	<ul style="list-style-type: none">● Herbicides can be hazardous to humans and the environment if not used properly.● Product label should be strictly adhered to. In some cases label instructions prohibit use adjacent to water, and may prohibit use in certain areas where threatened/endangered species are known to exist.● Applications may be done only by or under the direct supervision of a certified applicator, certified by the Office of Indiana Chemist at Purdue University.● Application of herbicide may be limited by weather and season.● May elicit negative public response.

DESIGN AND CONSTRUCTION GUIDELINES

Materials

- Protective Clothing (minimum): shoes, long-sleeved shirt and long pants, eye protection, hat, rubber gloves.
- Foliar Application: manual or power hydraulic sprayer.
- Basal Bark Treatments: manual sprayer.
- Cut Surface Treatments: manual sprayer and or squirt bottle, tree injector.
- Herbicide.

Installation

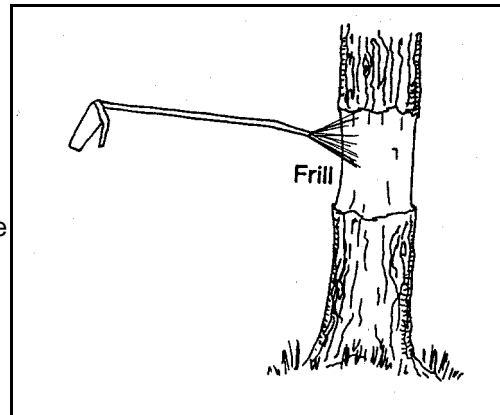
- Foliar Spray Application: Apply to actively growing plants with fully developed foliage. Stems and leaves of target plants should be sprayed to the point of runoff.
- Injection Method: Use either a tool designed specifically for making a cut in a tree and simultaneously injecting the herbicide, or a hatchet and a squirt bottle. In both cases, tree wounds should angle downward through the bark and into the sapwood. Space cuts evenly around the trunk as recommended by the product label.



Exhibit 301b: Herbicide injection application (Source: Illinois Pesticide Manual)

- Girdling("frilling"): Make two cuts approximately 1' apart through the bark and into the sapwood, completely around the tree. Remove the bark in between and apply herbicide as recommended on the product label.

Exhibit 301c: Herbicide applied following girdling
(Source: Illinois Pesticide Manual)



- **Stump Treatment:** Cut stumps should be treated as soon as possible after cutting, preferably less than 2 hours. Stumps should be saturated, especially in the cambial area.

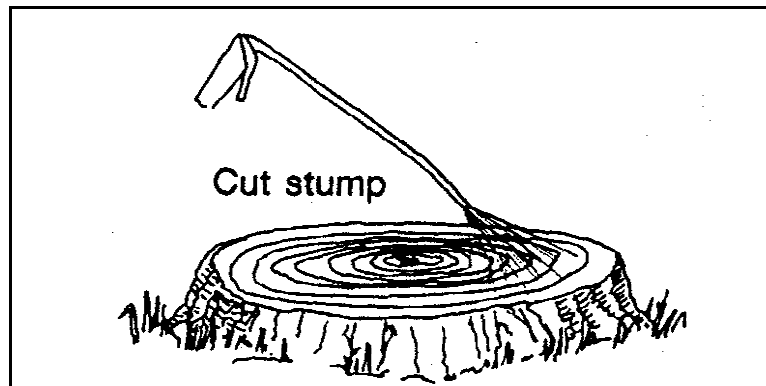


Exhibit 301d: Cut-surface application of herbicide (Source: Illinois Pesticide Manual)

Special Considerations

- Always apply herbicide in accordance with the product label.
- Take extra precautions when applying herbicide around water.
- Careless application may result in damaging non-target plants.
- Adding dyes to herbicide mixtures are useful when treating numerous cut stumps in that the applicator can keep track of stumps that have been treated, and new ones that need to be treated.
- Individual tree control may be accomplished by following methods described in the North Central Forest Experimental Station Notes (see references).

MAINTENANCE

- Repeat applications as necessary.

REFERENCES

Related Practices

- Practice 107, Clearing and Grubbing.
- Practice 302, Debrushing Using Hand-held Tools.
- Practice 303, Debrushing Using Heavy Machinery.
- Practice 304, Stump Removal.

Other Sources of Information

- Illinois Pesticide Manual.
 - Illinois Vegetation Manual.
 - North Central Forest Experimental Station Notes.
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PRACTICE 302
MECHANIZED DEBRUSHING USING HAND-HELD TOOLS

DESCRIPTION ● Removing living woody vegetation by hand-held tools.

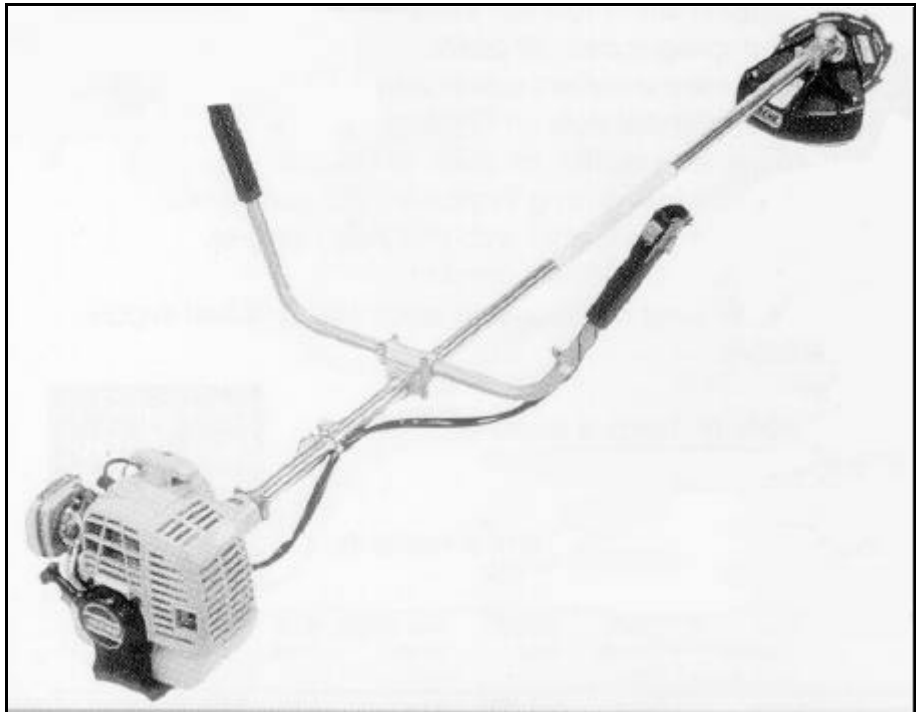


Exhibit 302a: Example of Equipment Used for Mechanized Debrushing Using Hand-held Tools (Source: CBBEL files)

PURPOSE ● To reduce or eliminate woody vegetation along stream or ditch banks and/or overbanks.

WHERE APPLICABLE ● Any drainage improvement project that specifies removing living woody vegetation.

ADVANTAGES

- Hand-held tools generally cause little to no soil displacement of banks and overbank areas.
- May be appropriate in environmentally sensitive areas.
- Lower mobilization cost than that associated with heavy machinery.
- Often requires no special training to operate hand-held tools.
- Opens up the vegetative canopy thus letting more light in for establishment of desirable plants.

CONSTRAINTS

- Time consuming.
- Labor intensive.
- Removing woody vegetation may make a bank or overbank less stable, and more prone to erosion and siltation.
- May require Vegetative Stabilization (See Practice 1102).

DESIGN AND CONSTRUCTION GUIDELINES

Materials

- Hand saws, chain saws, hand-winch, clippers, axes, machete, lopping shears, and/or weed whips.
- Herbicide.

Installation

- Cut woody vegetation above ground with appropriate implement.
- Treat stumps with an appropriate herbicide (see Practice 301 Chemical vegetation control) to prevent resprouting.

Special Considerations

- This practice does not include removing stumps or roots, or any other activity that would displace the soil.
- Cut vegetation may be removed and properly disposed of or left in place.

MAINTENANCE

- Remove resprouts as necessary.

REFERENCES

Related Practices

- Practice 107 Clearing and Grubbing.
- Practice 301 Chemical Vegetation Control.
- Practice 303 Mechanized Debrushing Using Heavy Machinery.
- Practice 304 Stump Removal.
- Practice 1102 Vegetative Stabilization.
- Practice 1301 Debris Disposal.

Other Sources of Information

- Illinois DOT Specifications.

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PRACTICE 303
MECHANIZED DEBRUSHING USING HEAVY MACHINERY

DESCRIPTION ● Removing living woody vegetation by means of heavy machinery.



Exhibit 303a: Mechanized Debrushing Using Heavy Machinery (Source: Allen County Surveyor's Office Files)

PURPOSE ● To reduce or eliminate woody vegetation along stream or ditch banks and/or overbanks.

WHERE APPLICABLE ● Any large drainage improvement project which requires removing living woody vegetation.

ADVANTAGES ● Use of heavy machinery may be more time efficient than hand-held tools.
 ● Opens up the vegetation canopy.

CONSTRAINTS ● May be more expensive than debrushing with hand-held tools (See Practice 302 Debrushing Using Hand-held Tools).
 ● Generally causes greater environmental impact than debrushing with hand-held tools.
 ● Generally less discriminating than hand-held tools making it more difficult to preserve select areas as necessary.
 ● Removing woody vegetation may make a bank or overbank less stable, and more prone to erosion and siltation.
 ● Generally believed to cause soil displacement.

DESIGN AND CONSTRUCTION GUIDELINES **Materials**
 ● Bush hogs, bulldozers equipped with shear blades, rakes, or discs, backhoes, etc.
 ● Herbicide.

Installation

- Cut woody vegetation above ground with appropriate implement.
- Treat stumps with an appropriate herbicide (see Practice 301 Chemical Vegetation Control) to prevent resprouting.

Special Considerations

- This practice does not include removing stumps or roots.
 - Cut vegetation may be removed by or left in place.
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MAINTENANCE

- Remove resprouts as necessary.
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REFERENCES

Related Practices

- Practice 107 Clearing and Grubbing.
- Practice 301 Chemical Vegetation Control.
- Practice 302 Mechanized Debrushing Using Hand-held Equipment.
- Practice 304 Stump Removal
- Practice 1102 Vegetation Sterilization
- Practice 1301 Debris Disposal

Other Sources of Information

- Illinois DOT Specifications.
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PRACTICE 304 STUMP REMOVAL

DESCRIPTION ● Removing stumps from natural streams and man-made ditches.



Exhibit 304a: Example of Equipment Used for Stump Removal (Source: C&S Equipment Sales, Inc.)

PURPOSE	● Prepare bank and/or channel for drainage improvement activity.
WHERE APPLICABLE	● Any drainage improvement project that requires the removal of tree stumps.
ADVANTAGES	<ul style="list-style-type: none"> ● May improve access to construction site. ● Allows undisturbed compaction of soil, when required. ● Eliminates regrowth of cut trees, where appropriate. ● May facilitate implementation of stream stabilization practices.
CONSTRAINTS	<ul style="list-style-type: none"> ● Causes soil displacement. ● May require heavy machinery. ● Cavity where stump removed should be filled to grade. ● Site may be prone to erosion during stump-removal activities. ● Usually requires restabilization (See Activity 5.11 Revegetation and Site Stabilization).

**DESIGN AND
CONSTRUCTION
GUIDELINES**

Materials

- Back hoe, bush hog, bulldozers, etc.
- Clean fill.
- Vegetative Restabilization (See Practice 1102).

Installation

- Cut woody vegetation above ground with appropriate implement.
- Remove stumps with appropriate implement.

Special Considerations

- Employ appropriate siltation and erosion control practices during construction.
 - Stumps should be disposed of properly (See Practice 1302 Debris Disposal).
 - It is often advisable to leave stumps in place to secure the banks.
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MAINTENANCE

- Periodically inspect the site for signs of erosion.
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REFERENCES

Related Practices

- Practice 107 Clearing and Grubbing.
- Practice 301 Chemical Vegetation Control.
- Practice 302 Mechanized Debrushing Using Hand-held Equipment.
- Practice 303 Mechanized Debrushing Using Heavy Machinery.
- Practice 1301 Debris Disposal.

Other Sources of Information

- Illinois DOT Specifications.
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