United States Department of Agriculture

655 – NH Forest Trails and Landings Guidance Document (5 year lifespan)

Purpose of this document: Describe areas where it is appropriate for NRCS to provide financial assistance to landowners to help implement the Forest Trails and Landings (CPA 655) practice.

Definition: Forest trails and landings are routes, travelways, or cleared areas within a forest to provide access on a periodic basis. Forest trails are often steeper than permanent access roads and access may be limited or eliminated upon completion of logging or other use. Where forest trails intersect with streams, a temporary stream crossing is needed to minimize impact. Landings are used for temporary storage of forest products until they are removed from the site. Recommended construction, maintenance, and close-out of these features can significantly minimize erosion and maintain water quality.

Photo Wendy Ward

Forest (skid) trails are the pathways where trees or forest products are transported to a log landing. Water bars, seeding, and mulching are all good strategies to prevent erosion and stabilize the site.

Criteria: Forest trails and landings usually require structural measures to manage runoff and vegetative treatment to reduce soil erosion and sedimentation. Water flows must be controlled using techniques such as outsloping, rolling (broad-based) dips, water bars, and rock plunge pools. Culverts, poled fords, and timber bridges may be used for stream crossings. Cut and fill slopes and the travel surface must be stabilized with appropriate vegetation or material. Woody material can be placed in trails using different techniques to limit erosion. Trails that do not concentrate water and have adequate cover usually do not require treatment.

Photo Todd Caron

Landings are the hub of operations for a timber harvest. Creation of a landing usually requires clearing and stumping an area that can be as large as a few acres. At the end of the harvest, a landing is smoothed and graded and allowed to revegetate. Erosion control measures such as water bars are often necessary. Seeding and mulching is sometimes necessary as well - these are different NRCS practices that can be also included in a contract.

Operation and Maintenance: Upon completion of logging, temporary measures should be replaced with permanent water bars, trails should be properly graded and outsloped as needed, and the entire disturbed area stabilized using recommendations outlined in *NH Best Management Practices for Erosion Control (2016)*. Trails should be inspected to ensure that drainage systems and structures for water control are properly functioning and the site is stable.

This practice can be implemented in the following ways:

- creation and stabilization of forest trails, or stabilization of existing forest trails
- installation and removal of temporary stream crossings
- creation and stabilization of log landings, or stabilization of existing log landings
- improvement of truck roads in situations where the Access Road (CPS 560) practice is not appropriate

FOREST TRAILS GUIDANCE

Planning Guidance: Forest (skid) trails are placed in locations that allow cut forest products to be moved to the log landing by a skidder or forwarder. At the landing, forest products are loaded onto trucks and driven on a truck road from the landing to the town's public road system. Good forest trail layout minimizes impacts to sensitive feature such as streams, wetlands, sensitive soils, and cultural features. The 655 practice can help fund (1) the creation and stabilization of forest trails, (2) the stabilization or repair of existing forest trails, or (3) improving truck roads in situations where Access Road (CPS 560) is not appropriate. Forestry or access for forest management activities must be the primary use for these trails; NRCS does not fund creation or rehabilitation of recreational trails.

It is not appropriate to plan this practice on every foot of forest trail used in a harvest. Instead, plan the practice on the primary and secondary forest trails that are most heavily used and impacted. See diagram below. If more than 75' of forest trail is being planned per acre being harvested, check with the NRCS State Forester to see if the request is reasonable.

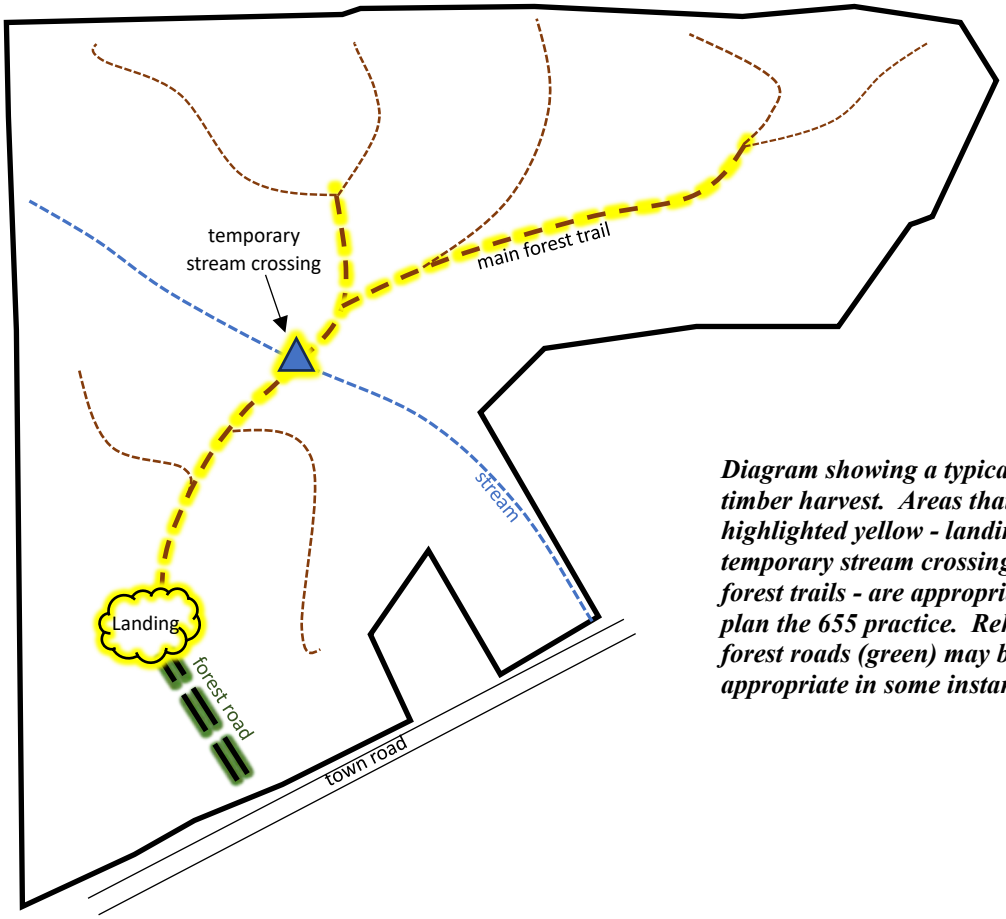

Diagram showing a typical layout of a timber harvest. Areas that are highlighted yellow - landing, temporary stream crossing, and main forest trails - are appropriate places to plan the 655 practice. Rehabilitating forest roads (green) may be appropriate in some instances.

Implementation Guidance: Careful layout of forest trails is important. Minimizing stream crossings, crossing at the best (least impactful) locations, and crossing perpendicular to the stream are best management practices. After the harvest is complete, close-out activities should include grading and shaping forest trails to smooth ruts, and installing water bars and broad-based dips as needed to minimize erosion. Follow guidance in *NH Best Management Practices for Erosion Control (2016)*, and see this helpful resource for more detail than can be described here. Steeper slopes require more water bars or dips. Placing slash (leftover tree tops, branches, and other woody debris) in forest trails during the harvest and leaving it in place after completion is another good technique to stabilize the site and prevent erosion. A stabilized, properly closed out forest trail does not need to be drivable by vehicles to meet NRCS practice standards.

FOREST TRAILS GUIDANCE, continued

Water Bars can be used on trails up to 25 percent grade and should be installed at a downslope angle of 30 degrees or less depending on the grade of the trail. Steeper trail grades require less downslope angle. The outlet of the water break should be open to prevent water from accumulating, and be protected by a buffer or filter zone of undisturbed forest floor to clean the sediment out of the water and prevent erosion. When the site does not provide adequate outlet protection, additional practices such as plunge pools will need to be considered. Recommended distances between water bars based on road/trail grade are shown in the table below.

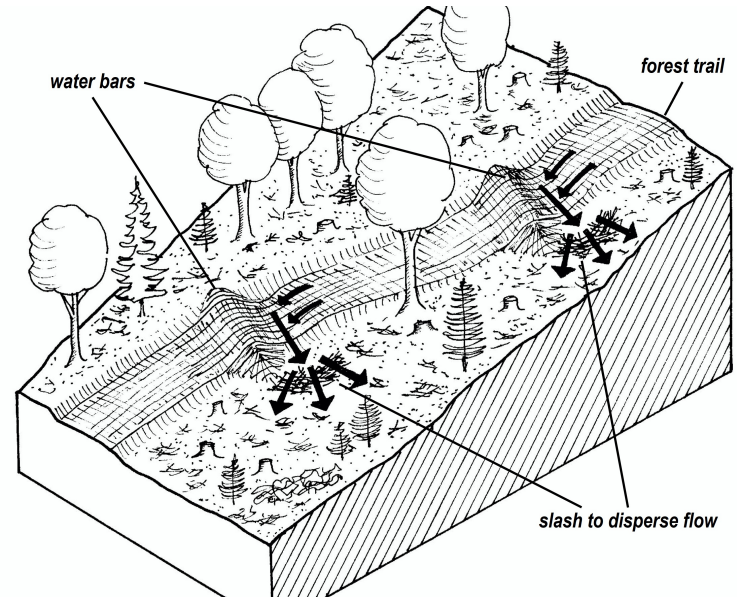

Diagram from Maine Forest Service BMP Guide

Road Grade (percent)	Distance between water bars, approx (feet)
1-2	250
3-4	200-150
5	135
6-10	100-80
11-15	80-60
16-20	60-45
21+	40

Rolling (Broad-based) Dips are shallow, wide diversions usually constructed on roads having a gradient of 10 percent or less. The bottom of the dip should be outsloped at least 4 degrees and extend the full width of the roadway. The dip and reverse grade section may require bedding with 3 inch crushed stone in some soils for stability to prevent rutting, and on slopes greater than 8%. Broad-based dips are more commonly used on trucks roads than forest trails.

"Extreme" BMPs are strategies that can be used to prepare an active harvest for extreme weather events, such as heavy rainstorms. One example is the pre-emptive placement of logs perpendicular to its direction in the main parts of a forest trail (sometimes known as "armoring"), which can prevent ruts and soil impacts during wet conditions. "Stashing slash" is another strategy, where brush is placed near areas of forest trails that may turn muddy, so that it can quickly be used to protect soils when weather conditions worsen.

Photo Scott Rolfe

"Armoring" a forest trail can prevent rutting and impacts to the soil when conditions worsen unexpectedly. Here, logs are placed perpendicular to the trail to provide a stable surface for machinery.

LANDINGS GUIDANCE

Planning Guidance: Landings are the hub of operations for a timber harvest, where products are brought from the woods, processed and sorted, and then loaded onto trucks. Careful selection of a landing site and proper close-out procedures are critical to minimizing erosion and protecting any sensitive nearby resources. The 655 practice can help fund either (1) the creation and stabilization of a new landing site, (2) the enlargement and stabilization or an existing landing site that is too small for the current harvest, or (3) the stabilization of an existing landing site after the harvest is completed.

Implementation Guidance: An ideal landing site is flat, dry, and centrally located in relation to the wood products being cut during the harvest. It should also be located out of wetland and riparian areas and if possible at least 100 feet from waterbodies. To create a landing, trees and stumps are removed from the smallest area necessary to allow for machinery and trucks to maneuver. Placement of wood chips, stone, aggregate, timber mats, or geotextile fabric on some portions of the landing is sometimes helpful to help stabilize the surface and shed water.

Photo Kaitlyn Delehanty

At close-out, a log landing should be smoothed and graded, with terrain shaped to be resistant to erosion. It can take a year or two for these areas to regrow and revegetate, and the site should be prepared for heavy rain events.

After a harvest is complete, a landing should be smoothed, with stumps and leftover butt logs piled or otherwise neatly dealt with. A closed-out landing should drain into areas of undisturbed forest, or to road drainage systems that can handle the flow. Drainage ditches, water bars, or berms are often necessary to accomplish this and reduce erosion. Seeding and mulching (separate NRCS practices) should be added in cases where there is a significant chance of erosion, and in some cases silt fencing may be recommended during landing construction or after closeout. Landings are generally under an acre (sometimes up to two acres) in size, and should be the minimum size that's necessary for the equipment being used and the areas being harvested. Follow guidance in *NH Best Management Practices for Erosion Control (2016)*.

Photo Scott Rolfe

After a few years, a landing should "green up", with vegetation to hold the soil in place and provide wildlife habitat.

Cost-share calculation: Currently, NRCS-NH calculates the payment rate for landings in *linear feet*. To calculate the cost-share payment rate of a landing in linear feet, multiple the number of acres by 2,420. For example, a 0.5 acre landing would be equivalent to 0.5 * 2420 = 1,210 linear feet of cost-share payment. This ratio is consistent with nearby states, and is calculated by determining the length of 18'-wide forest trail that a landing would occupy.

TEMPORARY STREAM CROSSINGS GUIDANCE

Planning Guidance: Forest (skid) trails often need to cross streams, and proper use of Best Management Practices in these areas is critical to protecting water quality and minimizing soil erosion. An effective temporary stream crossing keeps harvest machinery and soil out of the stream, and minimizes the chances of erosion and sedimentation.

Implementation Guidance: Temporary stream crossings should be installed during the timber harvest, and removed after the areas they provide access do have been completed. TSP foresters should take photos of the installed crossings and send them to NRCS staff. When the crossing has been removed and the site stabilized, NRCS staff can visit and inspect to insure that the stream is running clear, without any of the structure impacting or altering its hydrology. Follow guidance in *NH Best Management Practices for Erosion Control (2016)*.

Photo Steve Roberge

Grapple skidder driving over a temporary skidder bridge.

A **temporary skidder bridge** can be used for crossing streams or low wet spots. They can be constructed from dimensional lumber or from trees harvested on site. Bridges should be installed at a right angle and at the narrowest point a stream. They should cover the whole width of the machinery, not just the track or tires, to prevent wood and soil from falling into the water. Decking and side rails can prevent soil from falling into the stream. Use brush or other material on the approaches to reduce the opportunity for erosion. When the harvest is complete, this material on the approaches should be pulled back from the installation, and can be used to create a slash waterbar for additional water protection.

A **poled ford** is created by stacking logs within the stream channel to allow equipment to drive over and the stream to flow through. Logs should be parallel to the flow of the stream and loosely packed so the flow of water is not impeded. One or more pipes can be installed at the bottom of the poled ford to allow water to pass through. Brush on the approaches is recommended to stabilize the banks and reduce the opportunity for soil movement and sedimentation.

Photo Todd Caron

Poled ford crossing (highlighted green) on a well brushed-in forest trail.

United States Department of Agriculture

655 – NH Forest Trails and Landings Implementation Requirements (5 year lifespan)

Producer: _____ **Contract/App:** _____

Location: _____ **County:** _____

Forester: _____ **Tract Number:** _____

Forest Management Plan Date: _____

Definition

Forest trails and landings are routes, travelways, or cleared areas within a forest to provide periodic or temporary access for forest management.

Practice Purpose

This practice is used to accomplish one or more of the following purposes (check all that apply):

- ☐ provide routes for temporary or infrequent travel for management activities
- ☐ provide periodic access for removal and collection of forest products

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- ____ feet of new forest trail to be created and stabilized after use
- ____ feet of existing forest trail to be stabilized and/or repaired
- ____ feet of access/truck/woods road to be improved or repaired
- ____ acres of new landing to be created and stabilized after use
- ____ acres of existing landing to be stabilized and/or repaired
- ____ number of temporary stream crossings to be installed and removed after use

How many feet of forest trail to plan?

- NRCS staff should limit cost-share of forest trails to main and secondary skid trails where impact on the land is greatest.
- If more than 75' of new forest trail per harvest acre is requested, check with the NRCS State Forester to see if the request is reasonable.
- Any forest trails created will need to be closed out to NRCS standards.

Are any other practices planned in conjunction with the Forest Trails and Landings scenarios?

- ☐ Forest Stand Improvement (666)
- ☐ Brush Management (314)
- ☐ Mulching (484)
- ☐ Critical Area Planting (342)
- ☐ Access Road (560)
- ☐ Access Control (472)
- ☐ Other - please list _____

Brief project description including any additional BMPs or Timing Considerations:

_____

Plan meets Standards and Specs:

Designer Signature: _____ *Date* _____

Landowner agrees to install practice to specs in plan:

Landowner signature: _____ *Date* _____

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655 – NH Forest Trails and Landings Implementation Requirements (5 year lifespan)

Certification Checklist - Forest Trails

- [ ] feet of new forest trail created and stabilized after use
- [ ] feet of existing forest trail stabilized and/or repaired feet
- [ ] of access/truck/woods road improved or repaired
- [ ] number of water bars installed
  - [ ] Water bars spaced appropriately
  - [ ] Water bars are deep enough and appropriate angle
  - [ ] Water bars extend far enough to bring water off the trail
  - [ ] Trails are smoothed with no ruts deeper than 6 inches
  - [ ] No signs of active erosion

Certification Checklist - Landings

- [ ] acres of new landing created and stabilized after use
- [ ] acres of existing landing stabilized and/or repaired
  - [ ] Landing smoothed and leftover butt logs neatly dealt with
  - [ ] Land shaped to prevent erosion (water bars, dips, berms if needed)
  - [ ] No signs of active erosion

NH Requirements for all Forest Trails and Landings scenarios

- Meets general criteria in Conservation Practice Standard 655.
- Practices must be recommended in current forest management plan.
- No cutting in June or July to protect Northern Long Eared Bats.
- Follow NH Best Management Practices for Erosion Control (2016).
- Reviewed for Threatened and Endangered Species and Cultural Resources.

Certification Checklist - Temporary Stream Crossings

- [ ] number and type of temporary stream crossings installed (ex. 4 skidder bridges, 3 poled fords)
  - [ ] Documentation (photos or observation) that temporary stream crossing was installed
  - [ ] Temporary stream crossing was removed at the end of the operation
  - [ ] Terrain on either side of crossing has brush or water bars or is otherwise unlikely to erode into streambed
  - [ ] No signs of active erosion

Certification Checklist - All Scenarios

- [ ] Practice(s) were implemented to NRCS practice standards
- [ ] Certification Map and Digital Photos Attached
- [ ] GPS Points Collected
- [ ] Before Pictures on File

UNH Extension assisted with:

[ ] Plan [ ] Certify [ ] Both [ ] Neither

Certification Notes

Inspector

Date

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