Toronto and Region Conservation for The Living City

TRCA Field Staking Protocol
December 2017

This Protocol describes TRCA staff's current practice for field staking the physical top of bank, the physical toe of slope, and the limit of existing natural features or areas. It also includes administrative procedures to be undertaken by the proponent and TRCA staff prior to and after the staking exercise.

Typically, staking takes place as part of the planning process (under the *Planning Act*) or the section 28 *Conservation Authorities Act* permitting process (TRCA's Ontario Regulation 166/06). This technical guideline supports the Natural System policies of The Living City Policies for Planning and Development in the Watersheds of the Toronto and Region Conservation Authority (LCP), and supports TRCA's partner municipalities in defining their natural heritage systems.

Defined terms in this Protocol are italicized.

Where there are overriding provincial technical guidelines for delineating boundaries of natural heritage features, such as on the Oak Ridges Moraine (e.g., stake from tree trunk), these shall take precedent over TRCA protocols for the same.

As a matter of safety and practicality, field staking may not be possible or advisable at times due to excessive cold, heat, wind, thunderstorms, snow accumulation or icy conditions.

Staking is One Step in Defining the Natural System
It is important to note that **field staking is only part of the process for establishing the boundaries of the Natural System** and that the top of bank or features staked may not be the greatest constraint applicable to a site. The Natural System is comprised of water resources, natural features and areas, natural hazards and potential natural cover and/or buffers (LCP, section 7.3.1). Not all of these components of the Natural System have boundaries that are staked through an on-site field exercise.

Elements of the Natural System that are typically **not staked** include:

- watercourses
- headwater drainage features
- fish habitat
- wildlife habitat
- habitat of endangered and threatened species
- species of concern
- potential natural cover/enhancement or restoration areas
- buffers/vegetation protection zones
- long term stable top of bank
- stable toe of slope
- regulatory flood plain
- meander belt

Rather, these features, areas and hazard limits are identified and delineated through technical studies.

Elements of the Natural System that typically **are staked** include:

- physical top of bank of a *valley corridor*;
- physical toe of slope of a *valley corridor*;
- *wetlands*;
- *woodlands*; and
- *contiguous vegetation* that intersects with, a *wetland*, *woodland* or *valley corridor* or *stream corridor*, such as a shrub thicket.

Staking for each of these elements is described in turn below.

Physical Top-of-Bank of a Valley Corridor
The physical top-of-bank is that point where there is a break in slope or grade which distinguishes the *valley corridor* landform from its surrounding landscape. The staking of this feature is the responsibility of TRCA planning staff, who may consult with TRCA technical staff as desired. The physical top of bank is based on TRCA staff's professional judgment and can generally be described as the first main point of inflection or start of downward valley slope as observed from the adjacent tableland and does not include plateaus within the *valley corridor* with secondary points of inflection. *Delineation of the physical top of bank is based on existing conditions at the time of staking.

Staking takes place from the top of the valley slope looking down, rather than from on the valley slope looking up. The top of valley bank to be staked should be consistent with the elevation trend of the valley, both upstream and downstream of the subject site. A trending elevation may be visible while standing on site; staff may also use digital elevation modeling tools (e.g., LIDAR) to help confirm the elevation trend for a corridor and the location of the top of bank on the subject property.

For rolling hills-type of topography, such as is common to the Oak Ridges Moraine, again, the top of bank is delineated based on the elevation trend of the valley on site and up and downstream of the site. There may be small knolls on the tableland adjacent to top of bank, which should not be included.

Ideally, the greater extent of the physical top of bank and the *dripline* of *contiguous vegetation* is staked as one line that defines the entire feature. However, for some sites, other staking options may be appropriate. For example:

- staking of two separate lines to delineate physical top of bank and the *dripline* of *contiguous vegetation* independently; or
- staking of a single combination line that identifies the key defining element (the greater of) along the staked line (i.e., with each stake labeled as either physical top of bank or *dripline*)

The preferred option will be determined based on location, scale, municipal planning policies and protocols etc., and should be established prior to scheduling the site staking. For large sites, a single line will be preferred. Where the *dripline* of *contiguous vegetation* is located well beyond the top of bank, staking of the top of bank is not appropriate. Similarly, where the *dripline* is located below the top of bank, *dripline* staking is typically considered unnecessary.

Physical Toe-of-Slope of a Valley Corridor
Staking the toe-of-slope is not a common occurrence given that new development is not permitted within *valley corridors*. However, in special circumstances, such as historically urbanized *valley corridors*, staking toe-of-slope may be necessary.

The physical toe-of-slope is defined as that point where there is a break in slope or grade which distinguishes the bottom of the *valley corridor* slope from the valley floor. The staking of this feature is the responsibility of TRCA planning staff, who may consult with TRCA technical staff as desired. The physical toe of slope is based on TRCA staff's professional judgment and can generally be described as the first main point of inflection or start of the upward valley slope as observed from the adjacent valley floor. *Delineation of the physical toe of slope is based on existing conditions at the time of staking. Staking takes place from the toe of the valley slope looking up, rather than from on the valley slope looking down.

Ideally, the greater extent of the physical toe of slope and the *dripline* of *contiguous vegetation* is staked as one line that defines the entire feature. However, for some sites other staking options may be appropriate. For example:

- staking of two separate lines to delineate physical toe of slope and the *dripline* of *contiguous vegetation* independently; or

* In the case of unauthorized filling or grade alteration having occurred, altering the original top of bank or toe of slope, TRCA staff may require confirmation of the pre-disturbance topography as part of the geotechnical study for determining the location of the stable top of bank or stable toe of slope.

- staking of a single combination line that identifies the key defining element (the greater of) along the staked line (i.e., with each stake labeled as either physical toe of slope or *dripline)*

The preferred option will be determined based on location, scale, municipal planning policies and protocols etc., and should be established prior to scheduling the site staking. For large sites, a single line will be preferred. Where the *dripline* is located well beyond the toe of slope, staking of the toe of slope is not appropriate. Similarly, where the dripline is located above the toe of slope, *dripline* staking is typically considered unnecessary.

Wetlands, Woodlands and Contiguous Vegetation within Stream Corridors
Stream corridors do not have a physical top of bank and so their limits are typically defined from the greater of the following: regulatory flood plain, the meander belt, and any natural features or areas adjacent to the watercourse. While flood plains and meander belts cannot be staked, the natural features or areas associated with a *stream corridor* can be. Features such as *woodlands* and *wetlands* are considered contiguous to the *stream corridor* if the boundary of the vegetation units intersects with the meander belt or flood plain based on integrated mapping of these elements. The field staking exercise should be completed once the limits of the regulatory flood plain and/or meander belt have been established and preliminary assessment (via photos, site reconnaissance) identifies the presence of *contiguous vegetation*.

Where a *stream corridor* has no regulatory flood plain or meander belt, but does contain a watercourse, the *dripline* of any *woodland* or *wetland* vegetation or the *dripline* of any *contiguous vegetation* that is coincident with the edge of the watercourse could be staked.

Transitional Corridors (Valley to Stream or Stream to Valley Corridor landforms)
Often found within the headwaters of TRCA watersheds, some corridors transition from *valley corridor* with a definable top of bank, into *stream corridors* with no definable top of bank. Such corridors may transition in this way more than once and back again. Where the corridor is a valley with a definable top of bank, the procedures under the above section on physical top-of-bank of *valley corridors* are used. For those sections of the corridor containing no definable top of bank, features such as *wetlands*, *woodlands* and *contiguous vegetation* may be staked (see above). In this way, a single corridor may be staked in some sections as a *valley corridor* and in other sections treated as a *stream corridor*.

Wetlands and ANSIs
Where a site includes or is immediately adjacent to an area designated as a Provincially Significant Wetland (PSW) or an Area of Natural and Scientific Interest – Life Science (ANSI), staking of the *wetland* or feature boundary must be completed by Ministry of Natural Resources and Forestry (MNRF) staff. Staking of *wetlands*, other than identified PSWs, may be undertaken by TRCA staff with or without consultation with MNRF, however, TRCA staff may defer any or all *wetland* staking exercises to MNRF.

Delineation of *wetland* boundaries is based on the criteria and procedures outlined in the MNRF Manual for Wetland Evaluation – Southern Edition. *Wetland* boundaries are usually areas of gradual ecological change (i.e., transition areas). A *wetland* boundary is established where 50 percent of the plant community consists of upland plant species. This is based on the percentage of area cover by upland plant species, not to the number of different upland plant species. Topography and soil data may also be used to identify where the *wetland* boundary will be established.

For sites with unevaluated *wetlands*, especially where multiple *wetland* units are present on and off site, consultation with MNRF may be recommended or required to confirm or delineate individual *wetland* units that may form part of a larger *wetland* complex.

Wetlands can be staked whether or not they are located within other features to be staked, such as below top of bank or within a *woodland*. The *dripline* of any *contiguous vegetation* to the *wetland* is also staked. This may be staked as two lines, one for the *wetland* boundary and one for the *dripline* of *contiguous vegetation*.

Woodlands
The *dripline* of *woody vegetation* is used to stake the limit of a *woodland*. Where a *woodland* forms part of a larger natural feature that includes a *wetland*, the greater limit of the two features is staked, which may include *contiguous vegetation* to the *wetland* or *woodland*. Gaps in *woodland* of more than 20 metres between crown edges signify two separate *woodlands*, whereas gaps of 20 metres or less between crown edges constitutes one contiguous *woodland* (MNRF, 2010).

Ecological Quality
Whether vegetation being staked is native, non-native and/or invasive, the quality of existing natural cover does not inform or otherwise affect the staking exercise in the field. TRCA staking of the physical top of bank and natural features and areas is only one step in defining the Natural System. Additional studies may be required to determine areas of potential natural cover/enhancement/restoration areas or buffers/minimum vegetation protection zones; this includes assessing the need for additional lands or actions to maintain, to restore, or to improve Natural System functions. During these evaluations, issues of ecological function, quality, sensitivity, etc. can be assessed to inform future management options to ensure that a net ecological gain can be achieved.

Feature Removals
Staff will not stake a feature that has been wilfully damaged or destroyed; rather, a violation process under the applicable legislation may be initiated. Further, TRCA staff will rely on the following policy from LCP 7.4.2.1, which states, “It is the policy of TRCA: g) To not support a boundary adjustment to recognize any component of the Natural System that has been altered, damaged, or destroyed by unauthorized activities; such activities will require replacement or rehabilitation of the feature(s) and its functions.”

Disputes
Any disagreement with a staked line on behalf of the proponent may be noted in minutes or in follow up correspondence. Any requests for or changes to the limits as staked must be supported by additional technical studies (i.e., EIS or similar) prepared by qualified professionals and in accordance with the applicable provincial, municipal or TRCA standards.

Administrative Procedures for Field Staking
Prior to a staking being scheduled, the landowner must submit a request for a staking to TRCA, which includes an acknowledgement of the conditions outlined below.

1. The landowner and/or his or her agent, the landowner's Ontario Land Surveyor (OLS), municipal staff (to be invited by the landowner) and TRCA planning and technical staff will meet on site. It is the responsibility of the landowner to arrange for an OLS to be present, with a sufficient number of wood stakes, flagging tape and any other measures necessary for field staking. A topographic map of the subject property and the surrounding area is also helpful but not mandatory.

2. TRCA staff, in consultation with municipal staff, will stake the limits of the natural features or areas and/or physical top-of-bank. TRCA staff may identify locations where additional technical assessments may be required (see Staking Protocol above).

3. TRCA staff will issue a "staking letter" to the landowner and/or his or her agent, confirming the staking. The letter outlines the following:

- The staking is valid for 5 years;
- The proponent must submit a stamped survey of the staked feature(s) and/or top-of-bank, provided by the accredited OLS, to TRCA within 6 months of the staking;
- Should substantial differences be identified between the location of feature(s) and/or top-of-bank on the survey and the feature(s) and/or top-of-bank on the ground, or should the survey appear to be inconsistent with the illustrated locations, a new staking will be required;
- Additional study requirements to be completed to assist in the determination of development limits.

4. The proponent will submit the survey (on base topographic mapping) to TRCA, which must include the following information:

- staked natural heritage feature(s) and/or physical top-of-bank (location of stakes to be identified);
- date of staking;
- names of TRCA staff who participated in staking;
- OLS stamp.

Note: *Both a hard copy and a digital version (as a PDF, not CAD) of the survey are requested.*

5. The proponent will submit additional technical studies prepared and stamped by qualified professionals, if required (e.g. geotechnical study, flood study, ecological evaluation).

6. The proponent will submit one drawing illustrating all natural hazard and/or natural heritage components, as applicable:

- staked physical top-of-bank;
- staked physical toe-of-slope;
- long-term stable slope, as determined through study;
- long-term stable toe, as determined through study;
- regulatory flood plain limit, as determined through study;
- staked limit of natural features or areas, as determined on site;
- Requisite areas of potential natural cover and/or buffers (from the greatest extent of all hazards and features) as determined by applicable policy.

The above should be overlaid on a recent colour air photo.

Definitions

- **Dripline** – the furthest lateral extent of branches or leaves of woody plants.

- **Wetland** – the identification and boundary determination of a *wetland* will be established following criteria and procedures outlined in the MNR Manual for Wetland Evaluation – Southern Edition. Also see *Planning Act* and *Conservation Authorities Act* definitions in The Living City Policies.

- **Woody vegetation (trees and shrubs)** - perennial plants differing from perennial herbs in their presentation of persistent and woody stem(s)
    - **Trees** – woody plants (stems) of species that are able to reach unassisted a height of 4.5 metres (ORMCP Technical Paper)
    - **Shrubs** – a shrub is a perennial plant differing from a perennial herb in its persistent and woody stem(s), and less definitely from a tree in its lower stature and the general absence of a well-defined main stem (Natural Resources Canada). Shrubs rarely achieve a height greater than 10 metres (Farrar, 1995).

- **Woodland** – treed areas that provide environmental and economic benefits to both the private landowner and the general public, such as erosion prevention, hydrological and nutrient cycling, provision of clean air and the long-term storage of carbon, provision of wildlife habitat, outdoor recreational opportunities, and the sustainable harvest of a wide range of woodland products. Woodlands include treed areas, woodlots or forested areas and vary in their level of significance at the local, regional, and provincial levels. (Provincial Policy Statement, 2014)

- **Contiguous Vegetation** – refers to when the *dripline* of *woody vegetation* intersects with a *wetland*, a *woodland* or a *valley corridor* or *stream corridor*.

- **Valley Corridor** – see definition for River or Stream Valleys (confined/apparent) in The Living City Policies.

- **Stream Corridor** – see definition for River or Stream Valleys (unconfined/non-apparent) in The Living City Policies.

References

Farrar, J.L. 1995. Trees in Canada. Fitzhenry & Whiteside Limited and the Canadian Forest Service, Natural Resources Canada. 502 pp.

Natural Resources Canada. Glossary of Forest Resources. http://cfs.nrcan.gc.ca/terms. Accessed February 2015

Oak Ridges Moraine Conservation Plan Technical Paper 7 – Identification and Protection of Significant Woodlands

Ontario Ministry of Natural Resources. March 2010. Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement. Second Edition. Toronto: Queen's Printer for Ontario. 248 pp.

The Living City Policies for Planning and Development in the Watersheds of the Toronto and Region Conservation Authority, November 2014