

Forest Edge Management Plans are requested when tree clearing involves an existing forest edge. The plans are intended to help mitigate negative impacts to the existing forest community. Typically, impacts to the remaining forest community may include, but are not limited to:

- Direct loss of floral and faunal habitat;
- Trees along the 'new' edge may be susceptible to windthrow;
- Reduced species richness and abundance;
- Decreased biodiversity;
- Reduced stability of landforms composed of unconsolidated material;
- Regrading/fill placement along forest edges can impact root systems of retained trees, resulting in root stress/tree decline;
- Loss of canopy cover/shade, resulting in an increase in sunlight penetration;
- Some trees with thinner bark (e.g. Beech) can be susceptible to sunscald and frost cracking due to changes in light penetration. This can weaken the tree's defenses, particularly to pathogens.
- Changes in microclimates (increased temperatures, decreased soil moisture) resulting in desiccation;
- Site may be more susceptible to invasion by non-native species, pathogens, etc.; and,
- Soil compaction resulting from unrestricted vehicle and machinery operations
- Loss of native seed bank.

These impacts can be substantially reduced by adhering to the objectives set out in the TRCA Terrestrial Natural Heritage Program, including locating infrastructure and development away from natural heritage features, avoiding larger contiguous blocks of habitat, minimizing the amount of new edge, and providing appropriate buffers. The requirements for edge management become substantially reduced or altogether negated with these considerations. However, some projects may still require encroachment on natural features. In these cases, the following standard mitigation measures will be expected where applicable:

1. Draft Plans, a report outlining the existing terrestrial resources will be required. Prior to tree removals, a Tree Preservation Plan should be submitted which includes an inventory of all affected existing trees (location, species, size, condition), an assessment of the direct and indirect effects (see above), the extent of the anticipated removals, and proposed measures that will minimize or eliminate these impacts. Plans depicting the location of trees in relation to the proposed works and mitigation measures should be provided. Reports should be completed by (or with guidance from) qualified professionals. Where permits are issued, the recommendations in these reports need to be translated to approved plans (e.g. notes on stamped drawings).
2. Minimize disturbance widths wherever possible by reducing temporary working easements, limiting equipment storage areas and vehicle turning points to open areas dominated by exotic species, and reducing ROW footprints.
3. In areas with less disturbance, supplemental planting within the existing forest community may help to mitigate potential impacts (i.e. increase canopy cover in areas adjacent to disturbance).
4. Tree protection fencing should be installed beyond the forest edge dripline to be retained. The location of the protection fence should be illustrated on the plans and typical details are also required. Herb and shrub layers should be left intact wherever possible.

5. If feasible, stumps within 5 m of the new edge should not be grubbed to allow groundcover regeneration from the undisturbed seedbank.
6. If a large amount of woody material is removed and chipped, some of the chips can be used as mulch for individual restoration plantings. However, avoid covering an area with a layer of mulch as this can inhibit growth and regeneration.
7. Replant trees and shrubs along the disturbed forest edge to provide a protective 'buffer'. Planting plans should include a diversity of species that are compatible to the existing forest and of sufficient density (e.g. trees planted at 3 m on centre) and height to afford some immediate level of protection. Fast-growing edge species that are adapted to the harsher conditions found along new edges/disturbed areas are recommended. Plantings should emulate a natural forest edge with smaller sized plant material at the front, and larger sized plant material along the existing forest.
8. Ensure that species are tolerant of the stresses imposed by urbanism (e.g. salt, pollution, disturbance, soil compaction, etc.). For instance, use of salt tolerant species may be appropriate along the new edge if there are concerns that roadway operations may induce salt spray impacts to the remaining stand. Native species are preferred, and some species that could be appropriate include green ash, cottonwood, white spruce, basswood, grey dogwood, sumac, and choke cherry, but the full range of site conditions need to be assessed. Non-invasive exotics may also be appropriate in some limited cases.
9. Grading should be designed to meet existing grades a minimum of 3 m away from the tree dripline in order to prevent suffocation of tree roots. All efforts to maintain pre-construction soils and seed bank should be employed, except in areas with heavy invasion by exotic species.
10. Drainage patterns adjacent to the new edge should be maintained to avoid a change in soil moisture resulting from the concentration/redirection of flows. Hydrological changes can seriously damage or kill vegetation. It is particularly important to maintain swamp water tables.
11. Shallow rooted trees susceptible to windthrow may have to be pruned such that they can be retained. This may include cutting the tops of trees, so they are less susceptible to wind effects. Tree topping should be accomplished in consultation with TRCA staff, however please be advised that the owner of the property containing hazard trees is responsible for these trees.
12. Should hazard tree removals be required on lands that will be conveyed into public ownership, TRCA staff must approve the appropriateness and quantity of all removals. Hazard trees must be structurally-unsound with the potential to cause damage to life or property. If a structurally-unsound tree does not pose a risk of damage or injury (i.e. in forest away from any paths or buildings), then the tree should be retained for wildlife benefits (i.e. logs should be left on forest floor and snags should be retained for habitat wherever possible).
13. A monitoring plan should be developed to ensure that the newly planted material survives and fulfills the intended function. Watering of planted stock should occur for 2 years during dry periods, and weed mats or brush blankets should be installed where there is abundant herbaceous competition expected. Monitoring should include a 2 year inspection, whereby the plantings are inspected once upon completion of the installation, once following the first growing season and winter, and again at the end of the second year. Monitoring should include the invasion of exotic species. Targets for planting success will be developed on a site-by-site basis.

14. In areas heavily impacted by invasive exotics, invasive species removal prior to construction disturbances should be incorporated into the plans in order to limit their ability to colonize the site following restoration activities.

Note: *This document is dated **July 2004** and is consistent with current policies adopted by the TRCA at this time. These guidelines are not meant to be exhaustive but present the typical requirements of the TRCA and are subject to change.*