Obligation to Conduct Assessments

1-1  (1) A person to whom this standard applies shall conduct:
   (a) an establishment assessment; and
   (b) a free-to-grow assessment.

   (2) An establishment assessment shall be conducted over the survey area:
       (a) within four to seven operating years after the end of the year in which harvesting was
           conducted; and
       (b) at least 12 months after regeneration activities have been completed on the survey area.

   (3) A free-to-grow assessment shall be conducted:
       (a) between 8 and 14 operating years after the end of the year in which harvesting was
           conducted; and
       (b) at least 24 months after the completion of stand tending treatment.

Purpose of Assessment

1-2 The assessments required by section 1-1 shall determine:
   (a) the regeneration status of the survey area; and
   (b) without restricting the generality of (a), those polygons within the survey area that are
       not sufficiently regenerated and that are greater than or equal to four hectares.

Ground Survey Methodology

1-3  (1) If the assessments required by section 1-1 are conducted by way of a ground survey, the field
      layout of the establishment and free-to-grow assessments shall be conducted in accordance
      with the following rules:
      (a) line and survey plot numbers shall be:
          (i) used to identify each plot centre;
          (ii) numbered sequentially;
      (b) survey and control lines shall be established as follows:
          (i) select a random start point for the survey and establish the survey grid based on a
              survey plot being located on that start point;
          (ii) if it is necessary to maintain accurate positioning of survey lines:
              (A) superimpose a control line on the survey grid, perpendicular to the survey
                  lines so that survey plot centres are located on it; and
              (B) reference the control line to the harvest block boundary to enable accurate
                  mapping of survey plot locations;
          (iii) attach two sections of flagging tape to the survey line locations where the lines
               intersect with the control line, if established, and clearly write the line and survey
               plot number on the flagging tape;
          (iv) all measured distances shall use horizontal distance;
      (c) subclauses 1-3(1)(b)(ii) to 1-3(1)(b)(iv) do not apply when conducting assessments
          with a global positioning system device;
      (d) survey plot establishment shall be as follows:
          (i) the survey plot is a circle:
              (A) with a 1.78 metres radius, the equivalent of 1/1000 hectare or 10 square
                  metres; and
              (B) the centre of the circle and the plot centre is a common point;
          (ii) locate individual plots by compass and a distance measuring device or a global
               positioning system device;
          (iii) clearly mark each plot centre;
(e) survey plot deletion shall be as follows:
   (i) plots falling on areas described in clause 1-3(1)(f) that were not known to exist prior to the survey shall be:
       (A) deleted from the harvest block area for survey purposes;
       (B) identified during the survey and recorded as a deleted plot with a “D” in the plot label field on the regeneration survey tally sheet;
   (ii) when a plot is deleted, the next plot:
       (A) is established at the regular inter-plot distance; and
       (B) if the plot still lands on the area that qualifies for plot deletion, continue to move to the next potential plot at the regular plot interval distance, until a valid plot can be established;

(f) survey plot movement shall be as follows:
   (i) plots within a harvest block that would be situated in unharvested retention patches or riparian management areas greater than or equal to 0.04 hectares (20 metres by 20 metres) and less than 2.0 hectares shall be moved until they fall on a harvested area;
   (ii) plots identified in subclause 1-3(1)(f)(i):
       (A) are considered part of the area to be regenerated;
       (B) are to be included in the survey block area; and
       (C) do not require that plots are established within them;
   (iii) where a plot is to be moved pursuant to clause 1-3(1)(f)(i):
       (A) move the plot half the inter-plot distance towards the next plot to obtain the required number of plots, rather than adding plots later;
       (B) if the plot still lands on the area that qualifies for plot movement, continue to move the plot at one-half the plot interval distance until a valid plot can be established; and
       (C) the next plot following a moved plot remains at its normal grid location;
   (iv) plots landing on temporarily flooded ground, slash piles, landings, in-block roads, and borrow and gravel pits outside road rights-of-way without an approved disposition are not to be deleted or moved;

(g) non-productive plots:
   (A) are valid plots;
   (B) shall be tallied as a non-productive plot; and
   (C) are included in the regenerating block but not included in the total plots for use in determining the survey block regeneration status.

(2) The number and type of sample plots required shall be determined in accordance with the requirements set out in Table 1.

<table>
<thead>
<tr>
<th>Block Size</th>
<th>Sample intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 2.0 hectares to &lt; 5.0 hectares</td>
<td>6 sample plots per hectare</td>
</tr>
<tr>
<td>≥ 5.0 hectares to &lt; 10.0 hectares</td>
<td>30 sample plots per block</td>
</tr>
<tr>
<td>≥ 10.0 hectares to &lt; 25.0 hectares</td>
<td>2.77 plots per hectare with alternating sample and stocked plots with a minimum of 30 plots</td>
</tr>
<tr>
<td>≥ 25.0 hectares</td>
<td>2.77 plots per hectare with a sample plot every third plot (and all other plots being stocked plots)</td>
</tr>
</tbody>
</table>
(3) Not sufficiently regenerated areas greater than or equal to 4.0 hectares shall be identified on a map for both the establishment and free-to-grow assessments unless the entire block is declared not sufficiently regenerated.

(4) The following field records shall be created when conducting an assessment by way of a ground survey:

(a) for each harvest block to be surveyed:
   (i) the license area descriptor for the forest license where the block is located;
   (ii) the Universal Transverse Mercator coordinates of the approximate centre of the harvest block;
   (iii) the name of the surveyor(s) performing the assessment;
   (iv) the operating year in which the harvest ended;
   (v) the type of assessment being performed;
   (vi) the licensee’s harvest block area in hectares;
   (vii) the survey block area;
   (viii) the survey grid of line and plot spacing as determined by the sample intensity;
   (ix) the sampling intensity as per Table 1;
   (x) the total area of contiguous not sufficiently regenerated patches greater than 4.0 hectares;
   (xi) the unique harvest block identifier comprised of the forest area, management unit, operating area, and block numbers combined shall be generated if:
      (A) unique harvest block identifier does not exist;
      (B) as it applies to persons holding forest management agreement or area based term supply licenses: after two successive years of harvesting in a planned block, any uncut portion of that block that is still planned for harvest shall be assigned a new block number;
      (C) as it applies to persons holding volume based term supply licenses or forest product permits: after five successive years of harvesting in a planned block, any uncut portion of that block that is still planned for harvest shall be assigned a new block number;
   (xii) the survey date of the assessment;

(b) for valid productive sample plots, tally sheets that disclose:
   (i) the species symbol for each acceptable tree species present in a plot as determined by ecoregion in accordance with Table 3;
   (ii) the species symbol in the residual tree field if the tree measured for height is a residual tree;
   (iii) the height of the tallest tree for each species in the plot measured vertically from the base of the seedling/sapling, at the average ground level, to the highest living branch or terminal bud of the tree;
   (iv) the number of all acceptable trees in the plot, by species:
      (A) up to twenty trees in a plot, after which counts can be to the nearest 5 trees;
      or
      (B) if the total number of stems for a given species exceeds 40, the total trees for that species in the plot can be recorded as 40;
   (v) the occurrence of plots falling on in-block roads and landings to assess regeneration success on these sites compared to the remainder of the harvest block;
   (vi) general survey comments that indicate the reason(s) for:
      (A) non-productive areas;
      (B) the presence of advanced growth;
      (C) not sufficiently regenerated area;
      (D) mapping issues; or
other comments that might be relevant to the survey polygon;

**Aerial Survey Methodology**

1-4 (1) If the assessments required by section 1-1 are conducted by way of an aerial survey, the field layout of the establishment and free-to-grow assessments shall be conducted in accordance with the following rules:

(a) the surveying shall be conducted with rotary wing aircraft;
(b) licensees shall require surveyors to land in survey blocks at least once per day to calibrate for species, density, height, and average leader growth;
(c) survey blocks shall be stratified and mapped into the following polygons from the air:
   (i) areas greater than or equal to 4.0 hectares of not sufficiently regenerated;
   (ii) areas greater than or equal to 2.0 hectares of softwood or softwood/hardwood within a hardwood polygon;
   (iii) areas greater than or equal to 2.0 hectares of hardwood or hardwood/softwood within a softwood polygon; and
   (iv) areas greater than or equal to 2.0 hectares which are non-productive;
(d) data shall be recorded on the regeneration field survey map as the surveyor progresses through the survey block. All regeneration field survey maps shall have the following information included on the map:
   (i) licence area;
   (ii) licensee;
   (iii) Universal Transverse Mercator coordinates;
   (iv) unique harvest block identifier;
   (v) harvest date;
   (vi) survey type (establishment or free-to-grow assessment);
   (vii) survey date;
   (viii) harvest block area;
   (ix) survey block area;
   (x) map scale;
   (xi) north arrow;
   (xii) harvest block and survey block boundaries;
   (xiii) location and boundaries of deletions;
   (xiv) location of roads and landings; and
   (xv) polygon stratifications with labels indicating regeneration status, species association and species composition.

(2) The following information shall be recorded on a tally sheet when conducting an assessment by way of an aerial survey:

(a) for each harvest block surveyed:
   (i) the licence area descriptor for the forest license where the block is located;
   (ii) the Universal Transverse Mercator coordinates of the approximate centre of the harvest block;
   (iii) the name of the surveyor(s) performing the assessment;
   (iv) the operating year in which the harvest ended;
   (v) the type of assessment being performed;
   (vi) the licensee’s harvest block area in hectares;
   (vii) the survey block area;
   (viii) the total area of contiguous not sufficiently regenerated patches greater than 4.0 hectares;
   (ix) the unique harvest block identifier comprised of the forest area, management unit, operating area, and block numbers combined. A unique harvest block identifier shall be generated if:
(A) a unique harvest block identifier does not exists;
(B) as it applies to persons holding forest management agreement or area based term supply licenses, after two successive years of harvesting in a planned block, any uncut portion of that block that is still planned for harvest shall be assigned a new block number;
(C) as it applies to persons holding volume based term supply licenses or forest product permits, after five successive years of harvesting in a planned block, any uncut portion of that block that is still planned for harvest shall be assigned a new block number;

(x) the survey date of the assessment;

(b) for each polygon surveyed:
(i) using the acceptable tree species listed in Appendix 1, the tree species composition based on per cent representation by crown closure to nearest 10 per cent;
(ii) the average height of the trees for each species shall be:
(A) measured to the nearest decimetre for all trees less than or equal to 2.0 metres; and
(B) estimated to the nearest half-metre up to a 10.0 metre maximum for trees greater than 2.0 metres;
(iii) the density per hectare of each tree species as follows:
(A) to the nearest 50 trees for densities up to 1,000 per hectare;
(B) to the nearest 100 trees for densities up to 2,000 per hectare;
(C) to the nearest 1,000 trees for densities up to 10,000 per hectare; or
(D) to the nearest 10,000 trees beyond 10,000 per hectare;
(iv) separate polygons may be generated for in-block roads to identify:
(A) differing regeneration strata;
(B) the status of the regeneration; and
(C) whether the roads have been reclaimed;
(v) general survey comments that indicate the reason(s) for:
(A) non-productive areas;
(B) the presence of advanced growth;
(C) not sufficiently regenerated area;
(D) mapping issues; or
(E) other comments that might be relevant to the survey polygon;

(c) for each harvest block or polygon surveyed, the presence of forest health concerns as described in Table 2.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Symbol</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presence of Forest Health Concerns (Information only, not used to determine Regeneration Status)</td>
<td>M</td>
<td>Mistletoe</td>
</tr>
<tr>
<td></td>
<td>I</td>
<td>Insect</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>Diseased</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>Animal</td>
</tr>
<tr>
<td></td>
<td>O</td>
<td>Other (specify e.g. frost, blowdown)</td>
</tr>
</tbody>
</table>
Determination of Renewal Status

1-5 (1) The renewal status of a harvest block or polygon shall be determined in accordance with the following:

(a) respecting ground survey methodology:
   (i) the block shall meet all the requirements for the type of assessment conducted as described in Appendix 1 to be considered sufficiently regenerated;
   (ii) a block that does not meet the requirement of (i) shall be designated not sufficiently regenerated;
   (iii) not sufficiently regenerated areas greater than or equal to 4.0 hectares shall be identified unless the entire block is designated as not sufficiently regenerated;

(b) respecting aerial survey methodology:
   (i) blocks or polygons with greater than or equal to 80 per cent of the area stocked with acceptable trees and having a density of greater than or equal to 800 acceptable trees per hectare shall be designated sufficiently regenerated;
   (ii) blocks or polygons with less than 80 per cent of the area stocked with acceptable trees and having a density of less than 800 acceptable trees per hectare shall be designated not sufficiently regenerated unless such areas are non-productive as set out in clause 1-4(1)(c)(iv).

(2) Subject to subsections 1-5(4) and 1-5(5), all harvested land for which a licence obligation for renewal exists shall be sufficiently regenerated in accordance with the requirements of a free-to-grow assessment as described in Appendix 1 by the end of the free-to-grow assessment period.

(3) Harvest blocks or polygons described in subclauses 1-5(1)(a)(ii) or 1-5(1)(b)(ii) shall be identified in an operating plan along with a description of planned renewal activities intended to achieve sufficiently regenerated status for the areas.

(4) Harvest blocks or polygons designated hardwood or softwood not containing white spruce which satisfy the following height requirements and the other requirements of this chapter after an establishment assessment are deemed to be sufficiently regenerated and shall not require a free-to-grow assessment:
   (a) softwood height is greater than or equal to 0.5 metres; and
   (b) hardwood height is greater than or equal to 2.0 metres.

(5) Harvest blocks or polygons which satisfy the height requirements in Table 4 and the other requirements of this chapter after an establishment assessment are deemed to satisfy the requirement of subsection 1-5(2) and shall not require a free-to-grow assessment.

(6) Harvest blocks or polygons which fail to satisfy the requirements for sufficiently regenerated due to circumstances set out in subsection 1-5(7) and that are beyond the control of the person with the obligation for renewal shall be reported to the minister along with evidence of the circumstances which have affected the block or polygon’s renewal success.

(7) Circumstances which may affect the regeneration of a harvest block or polygon may include:
   (a) changes in water regimes due to beaver flooding;
   (b) activities of overlapping licenses such as grazing or oil and gas exploration;
   (c) natural events such as damage due to frost; or
   (d) compaction of soil due to other forest users.
Appendix 1: Regeneration Assessment Requirements

1. When conducting an assessment, only trees that qualify as an acceptable tree shall be included in the assessment.
2. An acceptable tree is a tree that is:
   a. alive;
   b. less than 10 metres tall;
   c. if a softwood tree, has a living crown that covers the top 50 per cent of the tree height;
   d. free of lean in excess of 30 degrees from the vertical; and
   e. approved for use in the ecoregions specified in Table 3.

3. Assessed harvest blocks or polygons with greater than or equal to 80 per cent of the area stocked and having a density of greater than or equal to 800 acceptable trees per hectare shall be designated sufficiently regenerated.
4. Assessed harvest blocks or polygons with less than 80 per cent of the area stocked and having a density of less than 800 acceptable trees per hectare shall be designated not sufficiently regenerated.
5. The density of acceptable trees shall be measured in both types of assessments by species according to the following density categories:
   a. under 1,000 stems per hectare density is to be recorded to the nearest 50 trees;
   b. between 1,000 and 2,000 stems per hectare density is to be recorded to the nearest 100 trees;
   c. between 2,000 and 10,000 stems per hectare density is to be recorded to the nearest 1000 trees; and
   d. over 10,000 stems per hectare density is to be recorded to the nearest 10,000 trees;

Table 3. Acceptable Tree Species by Ecoregion

<table>
<thead>
<tr>
<th>Acceptable Species</th>
<th>Symbol</th>
<th>Churchill River Upland</th>
<th>Mid-Boreal Upland</th>
<th>Mid-Boreal Lowland</th>
<th>Boreal Transition</th>
<th>Cypress Upland</th>
</tr>
</thead>
<tbody>
<tr>
<td>White Spruce</td>
<td>wS</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Black Spruce</td>
<td>bS</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Jack Pine</td>
<td>jP</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Balsam Fir</td>
<td>bF</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Tamarack</td>
<td>tL</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Trembling Aspen</td>
<td>tA</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Balsam Poplar</td>
<td>bP</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>White Birch</td>
<td>wB</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>White Elm</td>
<td>wE</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green Ash</td>
<td>gA</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bur Oak</td>
<td>bO</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lodgepole Pine</td>
<td>lP</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plains Cottonwood</td>
<td>pC</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: The silvics of the species shall be compatible with the site. Species that do not appear on this table cannot be used unless approved in an Operating Plan.
acceptable trees shall meet minimum height requirements at both establishment assessment and free-to-grow assessment which are defined to be:

(i) at establishment assessment acceptable trees shall be a minimum of 10 centimetres in height if observed in a ground survey or 30 centimetres in height if observed in an aerial survey;

(ii) at free-to-grow assessment the minimum heights of acceptable trees in metres is listed in Table 4; and

(iii) measured in increments of 0.1 metres to a height of 2.0 metres and in increments of 0.5 metres over 2.0 metres in height to a maximum of 10.0 metres.

Table 4. Free-to-grow Height Standards by Species

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Hardwood</th>
<th>Softwood</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>tA</td>
<td>bP</td>
</tr>
<tr>
<td>Minimum Height (m)</td>
<td>2.0</td>
<td>2.0</td>
</tr>
</tbody>
</table>
Glossary of Terms

Acceptable tree
A tree that satisfies the criteria set out in Appendix 1.

Density
A measure of the population of acceptable tree species in a given area.

Establishment assessment
An assessment of forest regeneration which provides assurance early in the regeneration phase of a forest stand that adequate stocking is present on site to contribute to the short-term development of that stand and is conducted in accordance with the timelines set out in subsection 1-1(2).

Free-to-grow assessment
An assessment of forest regeneration which provides assurance that achievement of the desired forest condition is likely and is conducted in accordance with the timelines set out in subsection 1-1(3).

Harvest block
An area of land from which trees were harvested.

Not sufficiently regenerated
The renewal status of a harvest block or polygon that has not met the requirements of an assessment described in section 1-1 within the time frame in which that type of assessment is required to be conducted.

Non-productive plot
A plot where the entire area of the plot does not have the capacity to grow trees.

Not sufficiently regenerated area
The area within a survey area that is calculated by identifying the number of not sufficiently regenerated plots that are adjacent to at least two other not sufficiently regenerated plots or the block boundary, dividing that number by the number of valid plots, and then multiplying that percentage by the area of the survey area.

Not sufficiently regenerated plot
A valid plot containing no acceptable trees.

Operating year
A period from April 1 to the following March 31.

Polygon
A closed figure that is bounded by curved or straight lines and delineated on a map.

Sample plot
A plot which provides a count of all acceptable trees by species and a measurement of the tallest tree by species that is present in the plot.

Stand tending treatment
A forest management treatment, including spacing, fertilization, pruning, and commercial thinning.
**Stocked area**
The survey area minus the not sufficiently regenerated area.

**Stocked plot**
A plot which determines whether there is an acceptable tree present in the plot.

**Stocking**
A quantitative expression of the adequacy of tree cover on an area, in terms of number of trees.

**Sufficiently regenerated**
A harvest block or polygon that has:

1. greater than or equal to 80 per cent of the area is stocked with acceptable trees;
2. a density of greater than or equal to 800 acceptable trees per hectare as measured in accordance with Appendix 1; and
3. acceptable tree heights in accordance with the type of assessment conducted as described in Appendix 1.

**Survey area**
The area that has been harvested but does not include the following areas:

1. roads that are not required to be reclaimed in an approved operating plan;
2. all unharvested areas greater than 2 hectares;
3. all areas within:
   i. dispositions granted under *The Crown Resource Lands Regulations*;
   ii. research areas including permanent sample plots;
   iii. heritage properties.

**Temporary disturbances**
A disturbance to forest land that is created by an industrial activity and which lasts less than two years.

**Valid plot**
A plot that is located on a licence area for which the licensee has an obligation to renew and that is not:

1. a non-productive plot; or
2. a deleted plot as described in clauses 1-3(1)(e).