

Horizontal Cover

Guidance for Assessing Horizontal Cover in the Understory Within Lynx Habitat on the Southern Rockies National Forests¹

Background

This paper provides preliminary guidance for National Forests in the Southern Rockies to use in the early stages of implementing the Southern Rockies Lynx Amendment (SRLA). It provides guidance to personnel for conducting an initial qualitative assessment of habitat in a project area and determining whether more rigorous quantitative assessment in the field is needed during project development. If more systematic evaluation is needed to support project planning and section 7 consultation, this paper provides a methodology that has been used in the Northern Rockies for measuring horizontal cover that can be compared to cover levels that the agencies can agree equates to good snowshoe hare habitat. This may or may not be the same as that identified in the Northern Rockies.

Dense horizontal cover is an important determinant of snowshoe hare presence and abundance within lynx habitat. This cover may occur in both young structure and multi-storied stands, with the latter more important to lynx during the winter period. Assessment of horizontal cover at the project level is important in determining whether these areas are likely to provide important foraging habitat for lynx. The objective is to determine whether multi-storied stands provide winter snowshoe hare cover above a threshold value (discussed below). If the threshold value is met or exceeded, the stands are subject to the provisions of Standard VEG S6 in the SRLA Record of Decision (USFS, October 28, 2008).

Determining need for quantitative field monitoring at the project level

In many situations, a simple qualitative ocular evaluation of horizontal cover in the project area will clarify whether there is obviously little horizontal cover, much horizontal cover, or whether a quantitative measurement is needed.

In the first example where the horizontal cover is clearly low, the Forest is unlikely to need any further quantitative evaluation of horizontal cover from the field. Ideally, Forest Service and Fish and Wildlife Service personnel can visit the project site together to confirm this. If that is not possible, the Forest Service biologist should collect appropriate information including photographs to support the biological evaluation and assessment, as needed.

In the second example where understory cover is obviously high, no further field quantitative sampling is needed either. Appropriate information including photographs should again be collected and documented.

In the third example where the understory is in some 'in-between' condition and it is not clearly apparent what the cover level is, this scenario would likely require field quantitative sampling to determine where the different cover levels are distributed in the project area.

¹ This paper was originally developed by Tim Bertram and Jim Claar (USFS Region 1) as interim guidance for use on the National Forests in the Northern Rockies. Portions of it were substantially modified here by the Implementation Guide team for application to National Forests in the Southern Rockies. The team accepts responsibility for the content of this revised paper.

Methods could include cover board measurements or evaluation of stem density or other data. The appropriate method and sampling protocol should be determined by FS personnel including biologists, silviculturists, and/or vegetation ecologists in coordination with FWS as needed.

Assessing habitat suitability and functionality based on field monitoring

The agencies continue to explore the quantitative connection between horizontal cover in the understory and snowshoe hare presence and abundance on the National Forests in the Southern Rockies. Based on approach and information from John Squires' work in the Northern Rockies (see attachment), these are considerations for project-level field sampling of horizontal cover:

1. Delineate stands within mapped lynx habitat to be evaluated for horizontal cover.
2. Measure and assess horizontal cover and habitat functionality:

Below 35% of measured horizontal cover, a Forest should evaluate whether habitat functionality continues to be maintained. At this point in time, there is no scientific certainty about quantitatively what constitutes "functional" understory cover for snowshoe hares in the Southern Rockies. The intent here is to begin establishing some 'trigger' for more in-depth evaluation and discussion of potential changes in habitat functionality relative to current condition and changes in vegetation brought about by natural or project-related factors. The procedure for measuring horizontal cover in the field is discussed later.

This value corresponds to the lower "hinge" horizontal cover values reported by John Squires for a variety of lynx activity areas in Montana. Further, recent unpublished graduate research (Nate Burg pers. comm. May 2009 with Kurt Broderdorp) suggests strong correlation between high hare density and similar horizontal cover levels as Squires found for lynx use areas and previously reported (i.e. Wolfe et al. in 1982). Burg's data on hares and horizontal cover were collected by Mr. Burg during the summer months and conditions thought to more closely represent those in the Southern portion of the species' range (i.e. Wyoming and Colorado). While not representing a firm threshold, this cover level provides a basis for Forests to further evaluate potential changes in habitat function and for validation over time of its relation to snowshoe hare occupation and abundance.

Horizontal cover is best measured and evaluated in winter during average mid-winter snow depth conditions. If winter sampling is not possible, summer measurements of horizontal cover should be taken from ground level up to 4 meters above the ground.

3. Stratify stands to be sampled – Stands that clearly (a) fall below the threshold value and (b) those that are clearly above the threshold value do not need to be sampled. Photo documentation of stands that fall into either category (a) or (b) is advisable. (See photo documentation under No. 8.) If there is a question as to whether a stand meets the threshold criteria or not then that stand should be sampled. The attached

series of 6 photos provide examples to use as a guide in making this determination. Click on the hyperlink to view the photos:

4. Sampling methodology – Use the methodology developed by John Squires of the Rocky Mountain Research Station in Missoula, Montana. The attached document provides details of that methodology. Record and summarize data as described in this methodology. Click on the hyperlink to view the methodology:
5. Randomize plot locations. Plots need to be randomly located to minimize as much bias as possible.
6. Plot sampling intensity – It is difficult to provide a specific formula for determining an adequate number of horizontal cover plots in a given stand within lynx habitat. Plot number will vary depending upon the uniformity of each stand. An 80% confidence level is desirable to provide a fairly high certainty that the recorded cover values are truly representative of the stand. However, sampling at this level may require a large number of plots and because funding, personnel and time are limiting it may not be possible to sample at this level. The following is an objective, unbiased method that can be used:
 - a) After initial stratification, sample horizontal cover on 20% of the acres to be assessed at the rate of one plot per 10 acres.

Example: The project area has 5,000 acres of mapped lynx habitat that are classified as multi-storied. Screening of these acres indicates that 4,000 acres either clearly meet or do not meet the 35% horizontal cover threshold value and therefore horizontal cover measurements are deemed not necessary on those acres. The remaining 1,000 acres of multistoried stands need to be assessed, therefore:

$$1,000 \text{ ac.} \times 0.20/10 = 20 \text{ horizontal cover plot measurements needed}$$
 - b) Each plot needs to be randomly located. Use GPS units to locate these plot centers in the field.
 - c) Each stand sampled should have at least two plots
 - d) The number of plots should be increased if the stand is highly variable.
7. Record digital photographs at each plot. Take photos according to the following methodology:
 - a) Use a digital camera set at the widest focal length and record this value. (Note: Most point and shoot digital cameras have a wide angle setting of 35-38 mm although some may be as wide as 28 mm. The widest setting is preferred.)
 - b) Record photos from the plot center in each of the same four cardinal directions where horizontal cover is estimated from the cover boards. Check the photos after each exposure to ensure the photos are properly exposed.
 - c) Record all pertinent data for each photo including:
 - i. Project name
 - ii. Recorder(s)
 - iii. Date
 - iv. Location

- v. Elevation
 - vi. Cardinal direction of photograph
 - vii. Other (Weather condition that may affect the photograph)
- d) Download and back-up copies of photos upon return to the office. These photos will provide supportive documentation for the evaluation of horizontal cover in the project record. Other knowledgeable people can also review them if there is any uncertainty about whether the photos are representative of dense horizontal cover.
8. Record and summarize data for each plot and collectively for all plots taken within each stand sampled and record information for these plots as described under section 8.c) above. Include photos taken for each respective plot and provide a copy of all the information and summaries in the project file.

This is a field-tested approach that provides a systematic procedure to measure horizontal cover in multi-storied or regenerating stands where it is unclear whether hares use the habitat. While a horizontal cover ‘threshold’ of suitability for snowshoe hares in the Southern Rockies is unclear as yet, the approach in this paper provides a reasonable starting point for quantifying habitat and beginning to better assess habitat conditions relative to hare presence and abundance. This may also be a useful approach to determine when management standards under the SRLA apply. The procedure will also be applicable to addressing the monitoring requirement under the Management Standard VEG S5 exception to evaluate experimental precommercial thinning treatments. The best procedure for determining hare population response is still under consideration and development for the Southern Rockies systems. Nonetheless, hare presence/absence information from the field while conducting horizontal cover surveys will contribute to our growing understanding of selected and preferred habitat conditions. This should continue to be ongoing work between the agencies in building this understanding.