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Living Snow Fence Site Assessment

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Site Assessment

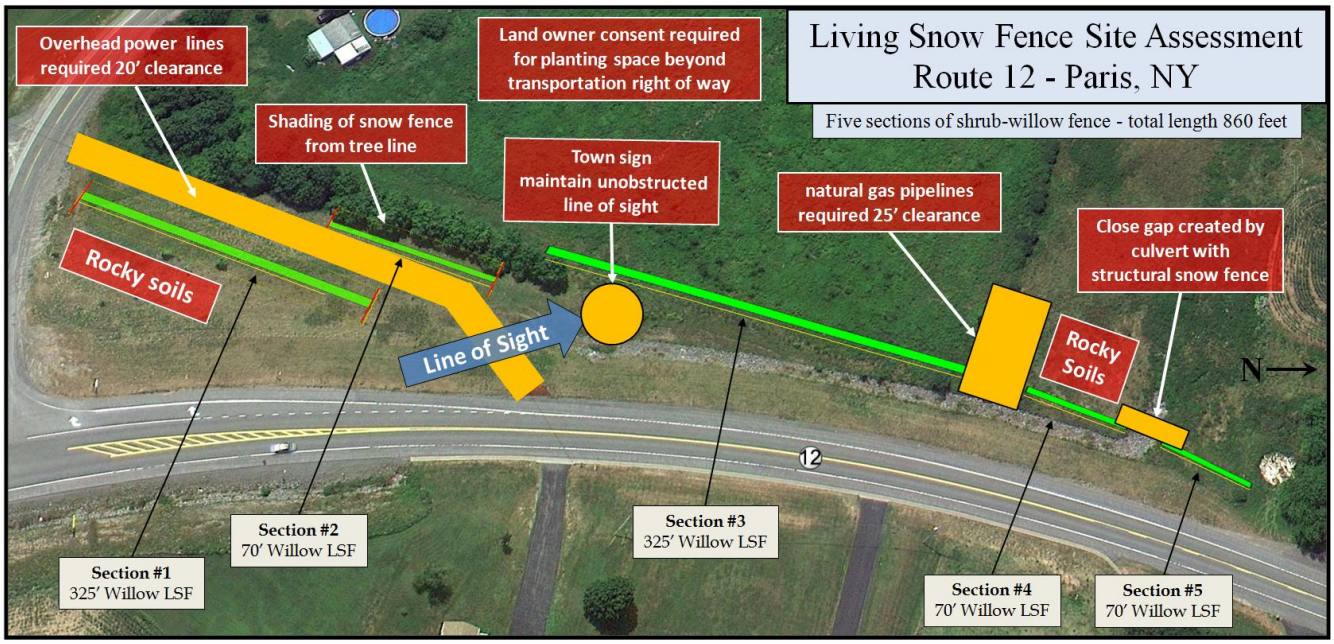
Site assessment is an important step in the establishment and long-term success of living snow fences. Once an area has been selected for a living snow fence installation, site assessment informs the design and planting phases. Multiple site visits may be necessary throughout the design process. The following checklist offers a general methodology for living snow fence site assessment that can be modified as needed by the design team based on the specifics of the site and design goals.

- Identify the problem by determining the source of blowing snow and the potential solutions using living snow fences. Refer to Tabler (2003) chapter 4 for more specific information on blowing snow problem identification.

- Collect accounts of winter road conditions and drifting patterns. In collecting accounts, ensure that information is gathered from workers who plow or maintain a given highway segment. Such people are often the most familiar with the snow problem at a site. If possible, the design team should observe winter road and drifting conditions firsthand.

- Make at least one site visit in the company of as many stakeholders as possible (DOT staff, contractors, landowners, etc). Discuss any site-specific challenges and opportunities while in the field with all stakeholders.

- Examine aerial photos and use mapping software to measure site characteristics, such as fetch distance, and to visualize potential designs and site challenges. An example is depicted below. The proposed sections of living snow fences are shown in green, and site challenges identified in the site assessment phase are identified by the red caption boxes.



- Identify any permit requirements or regulatory agency concerns. For example, determine if the site is in an environmentally sensitive watershed where fertilizer or herbicide use is restricted, or near utility right of ways that must be kept clear of woody vegetation.

- Consider the existing vegetation on site, topography, fences, buildings, open spaces, and any other factors that would affect wind patterns or plant growth. Refer to Tabler (2003) chapter 4 for more specific information about landscape features than can be detrimental or beneficial to living snow fence function.

Site assessment for a living snow fence installation in Hamburg, NY in 2009

Soil Assessment

Soil quality is a critical factor in the survival and vigor of living snow fences. Soils should be thoroughly evaluated in the site assessment phase to determine if the quality of the soil is sufficient to support a living snow fence and optimal growth rates. If soils are determined to be of poor quality, a living snow fence installation may not be possible, or significant efforts to improve the soil may be required. The critical factors in assessing soil quality are: soil depth, drainage, fertility, percentage of rocks by volume, and soil texture.

- Begin the soil assessment by observing the existing vegetation on the site. This will give a rough indication of soil conditions. If the site supports lush woody vegetation or agricultural crops, the soil quality is likely sufficient for a living snow fence. If existing vegetation is sparse or primarily herbaceous (non-woody), this may be an indication of poor or degraded soils. Soils in or near the right of way may be degraded from previous construction activities. Note the presence of wetland indicator species, such as sensitive fern or cattails on the site, as this may indicate saturated soils and the presence of wetlands that may be hinder living snow fence growth and require special permits.

- Consult the Natural Resource Conservation Service (NRCS) soil survey maps (websoilsurvey.nrcs.usda.gov) for site-specific information on soil depth, drainage class, fertility, and texture. Loams and sandy loams are the preferred soil texture of most species. Soils with high clay content may impede drainage. NRCS drainage classification of the soils should be listed as "well

drained" to "moderately well drained". "Poorly drained" and "somewhat poorly drained" soils will cause stunted growth or mortality in most species and will require more precise plant selection or substantial site modifications to improve drainage.

- Take soil samples and have the soil tested by a university lab or environmental engineering firm for: pH, percentage of organic matter, soluble salts, available nitrogen, phosphorus, potassium, calcium, and magnesium. Follow the soil sampling procedures specified by the lab that will do the analysis. For woody plants, sampling the top 6 inches to 10 inches of soil is the most critical. Evaluate the chemical properties of the soil and consider the need for soil amendments in the design, species selection, site preparation, and installation phases.

- Dig a soil pit on the planting strip at several locations across the installation site to expose the soil profile to a depth of 24 inches. Examine the soil profile in each pit to supplement and confirm NRCS data. Observe and evaluate the soil layers, textures, depths, and the percentage of rocks in each layer.

    - If rocks, debris, or large roots make up more than 50 percent of the soil volume, the site is likely unsuitable for a snow fence installation.
    - Determine the depth to root restricting layer (bedrock, clay, water table, etc) and make sure there is sufficient depth for proper root development. Depth to restricting layer should be at least 18 inches.
    - Confirm the NRCS soil drainage classification at each soil pit across the site as indicated by the presence soil mottling. Mottling is indicated by the presence of distinctive orange and grey soil particles, both occurring at the same depth in the soil profile. This indicates the depth to a seasonal water table and probable root restricting layer. High quality sites with adequate drainage will show no signs of mottling at depths of 24" or greater. If mottling is observed at depths 12 inches or less, the site may be too wet and unsuitable for planting. Some tree and shrub species will tolerate wet conditions, but only a limited number species suitable for living snow fences will thrive and grow rapidly in saturated soils.

- Consult your local environmental specialist, extension agent, or NRCS staff if you have questions about any of the steps in the soil assessment process.

Additional Resources

Gullickson, D., Josiah, S.J., Flynn, P., 1999. *Catching snow with living snow fences.* University of Minnesota.

Tabler, R.D. 2003. *Controlling blowing and drifting snow with snow fences and road design.* Tabler and Associates. Niwot, CO.

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