

NOTE: This is a summary document developed by the University of Minnesota's Boreal Forest and Community Resilience Project to inform an update to the Minnesota Forest Resources Council's Northeast Landscape Plan.

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Document Title	Source	Date	URL or Address
St. Louis Moraines, Tamarack Lowlands, Nashwauk Uplands, and Littlefork-Vermilion Uplands Subsections Forest Resources Management Plan Final	Minnesota Department of Natural Resources	2010	http://www.dnr.state.mn.us/forestry/subsection/index.html

VISION(S)

None identified.

Draft issues, goals, and strategies

(Retrieved from 3-x. General Direction Statements (GDSs) and Strategies section of North Shore SFRMP.)

ISSUES (Issues)

1. Biological diversity, forest composition, and spatial distribution
2. Age-class distribution
3. Within-stand composition and structure
4. Wildlife habitat
5. Riparian and aquatic areas
6. Timber productivity
7. Forest pests, pathogens, and exotic species
8. Visual quality
9. Harvest levels
10. Access to state land
11. Cultural resources
12. Natural disturbance events

GOALS (General Direction Statements) (# links to issue)

1. Old forest in these subsections is distributed across the landscape to account for timber products, wildlife habitat, and ecological diversity (1).
2. Species of Greatest Conservation Need and Key Habitats are maintained or enhanced in these subsections (1).
3. Forest cover-type composition on state lands moves closer to the range of cover-type composition that historically occurred within the ecosystems found in these subsections (1).

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4. Patch management in these subsections maintains existing large patches and increases the average patch size on state lands over time, with consideration of natural spatial patterns (1).
5. Managers of state lands in MCBS sites of statewide biodiversity significance implement measures to sustain or minimize the loss to the biodiversity significance factors on which these MCBS sites were ranked (1).
6. Rare plants and animals and their habitats are protected, maintained, or enhanced in these subsections (1).
7. Rare native plant communities are protected, maintained, or enhanced in these subsections (1).
8. Even-aged managed cover types will be managed to move toward a balanced age-class structure (2).
9. ERF stands in even-aged managed cover types will be managed to achieve a declining age-class structure from the normal rotation age to the maximum rotation age (2).
10. State lands will include representation of each of the Native Plant Community (NPC) growth stages that historically occurred in these subsections (2).
11. Young, early-successional forest is distributed across the landscape over time (2).
12. Species, age, and structural diversity within some stands will be maintained or increased (3).
13. Some stands on state lands will be managed to reflect the composition, structure, and function of native plant communities (3).
14. Adequate habitat and habitat components exist, simultaneously at multiple scales, to provide for nongame species found in these subsections (4).
15. Adequate habitat and habitat elements exist, simultaneously at multiple scales, to provide for game species found in these subsections (4).
16. Riparian areas are managed to provide critical habitat for fish, wildlife, and plant species (5).
17. Forest management on state lands adequately protects wetlands and seasonal ponds (5).
18. Timber productivity and quality on state timber lands is increased (6).
19. Limit damage to forests from insects, disease, and exotic species to acceptable levels where feasible (7).
20. Reduce the negative impacts caused by wildlife species on forest vegetation on state forest lands (7).
21. Forest management on state lands attempts to mitigate global climate change effects on forest lands. Management is based on our current knowledge and will be adjusted based on future research findings (7).
22. Minimize forest management impacts on visual quality in sensitive areas (8).
23. The SFRMP treatment level for each cover type moves toward the desired age-class structure of even-age managed cover types (both normal and extended rotation forest), and improves the age structure and timber quality of uneven-age managed cover types (9).

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24. Forest access routes are well planned and there is a high level of collaboration with federal, private, and local units of government to share access and minimize new construction (10).
25. Cultural resources will be protected on state-administered lands (11).
26. Natural disturbance events that occur on state land within these subsections are promptly evaluated to determine the appropriate forest management need to their impacts (12).

STRATEGIES (General Direction Statement Strategies) (# links to goal)

1. Determine the desired level of effective extended rotation (ERF) for even-aged cover types (1).
2. Utilize Remsoft model to prescribe ERF stands in even-age managed cover types so that when a balanced age-class distribution is achieved the desired amount of effective ERF will be provided (1).
3. The Remsoft harvesting-scheduling model selected ERF, using the criteria provided by the North 4 Core Team (see 3.10 for list of criteria) (1).
4. Manage riparian management zones primarily to reflect old forest conditions (1).
5. Allow some stands to naturally succeed to long-lived cover types with, or without the use of harvest (1).
6. Manage designated old-growth stands and old forest management complexes according to DNR policy (1).
7. Designate ecologically important lowland conifers according to department direction (1).
8. Follow the MFRC *Voluntary Site-Level Forest Management Guidelines (Site-Level Guidelines)* to retain components of old forest in even-age managed cover types (1).
9. Use silvicultural treatments that retain old forest components in some stands (1).
10. Consider the status of old forest within subsections when making decisions to add and offer unplanned wood for harvest (1).
11. Provide current Species of Greatest Conservation Need (SGCN) and Key Habitat data to DNR staff upon request (2).
12. Incorporate new SGCN and Key Habitat locations and data as they are collected in these subsections (2).
13. Select some ERF, OFMC, EILC, and Patch stands based on their association with SGCNs and Key Habitats (2).
14. Stand-level management accounts for SGCN and Key Habitats (2).
15. Increase the acreage of jack pine, red pine, white pine, northern hardwoods, oak, white, spruce/balsam fir and white cedar (3).
16. Increase mixed-forest conditions in some stands in all cover types (3).
17. Forest composition goals and objectives are consistent with the MFRC Landscape plans (3).
18. Maintain or increase average harvest block size across the landscape (4).

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19. During assignment of fiscal years to 10-year stand exam list, group harvests within patches in close temporal proximity (4).
20. At the area level, using the *Coordination Framework*, initiate processes for each of the designated patches within the patch (4).
21. For the long term (50+ years), manage designated patches to include characteristics of older NPC growth stages (4).
22. In the short term (10 years), apply management strategies that contribute to the long-term goal stated in (d) above (4).
23. For stands outside of the 53 designated patches, incorporate the initial patch assessment in stand-level decisions (4).
24. When possible, cooperate with other landowners in patch management to maintain existing large patches and increase the average patch size across forest land of multiple ownerships (4).
25. Determine which MCBS sites are of greatest concern or importance for SFRMP over the ten-year planning period (5).
26. Consider the broader context and significance of the MCB site as a whole when assigning management objectives and designing silvicultural prescriptions (5).
27. Determine location and composition of stand conversions based on NPCs (5).
28. Allow some stands to succeed to the next native plant community growth stage, with or without harvest (5).
29. Emulate the within-stand composition, structure, and function of NPC growth stages when managing stands in MCBS sites (5).
30. Apply variable density thinning during harvest or reforestation (5).
31. Apply variable retention harvest techniques during harvest (5).
32. Designate some stands as ERF to provide old forest conditions (5).
33. Increase the use of prescribed fire as a silvicultural technique in managing fire-dependent NPCs (5).
34. Locate roads to minimize fragmentation of a Minnesota County Biological Survey (MCBS) site (5).
35. Emulate natural disturbance conditions in large patch management (5).
36. Apply special management recommendations for known rare features, Species of Greatest Conservation Concern (Need??), and Key Habitats (5).
37. Defer management of some stands that have been identified as having high conservation value for further assessment (e.g., EILC and nominated natural areas, and rare representative ecosystems) (5).
38. Consider timber productivity, trust responsibilities, and other forest management priorities when managing stands in these MCBS sites (5).
39. Forestry, Wildlife, and Ecological Resources personnel will communicate with other landowners, as opportunities arise, to inform them of the significance of these MCBS sites and management options that could be implemented to address the biodiversity objectives of these MCBS sites (5).

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40. Provide current rare features database (Natural Heritage Information System) to DNR staff through the DNR Quick Themes in ArcView (6).
41. Incorporate new rare features inventory information as the Minnesota County Biological Survey is completed in these subsections (6).
42. Select some ERF, OFMC, and EILC stands based on their association with rare features (6).
43. During the development of the 10-year stand examination list and annual stand examination lists, land managers check the rare features database and flag those stands proposed for treatment that include a rare feature for follow-up consultation (6).
44. Harvest prescriptions, access plans, and other management proposals identify and implement measures that protect rare features (6).
45. Complete the Minnesota County Biological Survey and document known locations of NPCs with a state rank of critically imperiled (S1) or imperiled (S2), and those NPCs with S-Ranks of S3 to S5 that are rare or otherwise unique in these subsections (7).
46. Manage known locations of critically imperiled (S1) or imperiled (S2) NPCs and those NPCs that are rare statewide or with limited occurrences in these subsections to maintain their ecological integrity (7).
47. Ecological Resource staff identified stands that are high quality examples of rare native plant communities. Those stands were removed from consideration for placement on the 10-year stand exam list (7).
48. Target the selection of stand treatment acres to the appropriate age classes (8).
49. Prescribe ERF stands within even-age managed cover types so that each age class will be represented to produce a sustainable amount of old forest over time (9).
50. Target ERF treatment acres to the appropriate age classes to move toward the declining age-class structure after normal rotation age (9).
51. Determine growth stages stands selected for treatment in these Subsections (10, 13).
52. Strive to emulate the within-stand composition, structure, and function of NPC growth stages when managing stands (10, 13).
53. Consider the distribution of non-timber land cover types (e.g., stagnant conifer types), inoperable stands, and reserved areas (e.g., old growth, SNAs, state parks) in providing representations of growth stages (10, 13).
54. Designated representative ecosystems and High Conservation Value Forests per forthcoming DNR direction (10, 113).
55. Apply ECS Silvicultural Interpretations to management decisions (10, 13).
56. Move aspen, balsam poplar, paper birch, and jack pine cover types toward a balanced age-class structure (11).
57. Increase the treatment level for the paper birch cover type (11).
58. Regenerate most paper birch harvest sites to well-stocked, younger paper birch stands (11).
59. Maintain young, early successional forest in a variety of patch sizes to provide habitat for the associated species (11).

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60. Use selective harvesting to encourage diversity of species, ages, and stand structures (12).
61. Implement the *Site-Level Guidelines* designed to maintain a diversity of tree species within a stand (12).
62. Use the NPC Field Guide, site index, soils data, and ECS Silvicultural Interpretations to aid in determining the species composition and structure most appropriate for the site (12).
63. Retain tree species, stand structure, and ground layer diversity within stands when prescribing timber stand improvement and thinning activities (12).
64. Reserve seed trees in harvest areas and site preparation areas, where possible (12).
65. Use the least intensive site preparation methods possible to ensure success (12).
66. Use harvest systems or methods that protect advance regeneration. Retain conditions that favor regeneration and understory initiation (12).
67. Identify some stands where succession is allowed to occur to encourage development of within-stand diversity. Movement to the next successional stage may be achieved with or without harvests (12).
68. Increase and/or maintain by reserving from harvest, targeting species including white pine, jack pine, white spruce, upland cedar, oak, yellow birch, and upland tamarack as a component within appropriate cover types. Silvicultural practices that may add or increase the presence of these target species will include planting, interplanting, and artificial or natural seeding (12).
69. Manage planted and seeded stands to represent the array of plant diversity (12).
70. Use ERF in some even-age managed stands to encourage greater structural diversity (12).
71. Encourage fruit and mast-producing species (12).
72. Continue to use the *Field Guide to the Native Plant Communities in Minnesota: The Laurentian Mixed Forest Province* and associated ECS Silvicultural Interpretations to classify stands to NPC and inform silvicultural prescriptions (13).
73. Provide old forest distributed across the landscape (14, 15).
74. Provide young forest distributed across the landscape (14, 15).
75. Provide a variety of patch sizes across the landscape to better reflect patterns produced by natural disturbances, and attempt to maintain existing large patches (14).
76. Manage to retain the integrity of riparian areas and provide protection for seasonal and permanent wetlands (14).
77. Provide for the needs of species that depend on perches, cavity trees, bark foraging sites, and downed-woody debris (14).
78. Provide for the needs of species associated with conifer stands and mixed conifer/hardwood stands (14, 15).
79. Provide for creation and maintenance of within-stand diversity (14, 15).
80. Manage to favor native plant communities and retain elements of biodiversity significance (14).

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81. Consider Natural Heritage Program data and other rare species information during development of both the 10-year and annual stand examination lists (14).
82. Apply the DNR management recommendations for habitats of nongame species (e.g., gray wolves, bald eagles, wood turtles, northern goshawk, 4-toed salamander) as described in DNR guidelines and policies (14).
83. Provide a range of habitats for short-distance and long-distance (neo-tropical) migratory birds (14).
84. Provide a balanced age-class structure in cover types managed with even-aged silvicultural systems (15).
85. Increase the productivity and maintain the health of even-age managed cover-type stands (15).
86. Continue to manage special management areas for the benefit of game species (15).
87. Apply the *Site-Level Guidelines* relating to riparian areas (16).
88. Manage to maintain or increase old forest in riparian areas (16).
89. Use the NPC Field Guide and associated ECS Silvicultural Interpretations, manage for a species appropriate for the site. Emphasize conifers where appropriate and discourage aspen and birch in the RMZ (16).
90. Follow the recommendations in the St. Louis Cloquet Whiteface Corridor Management Plan (16).
91. Follow recommendations in Tomorrow's Habitat for the Wild and Rare (16).
92. Apply the *Site-Level Guidelines* (17).
93. Areas will consider landforms in their work areas (e.g., end moraines) that have seasonal ponds and small open-water wetlands, and address those features in site-specific prescriptions that are developed during the stand examination field visit (17).
94. Move toward harvesting even-aged managed non-ERF stands at their normal rotation age (18).
95. Thin or selectively harvest in some aspen, balsam of gilead, birch, white pine, red pine, balsam fir, white spruce, northern hardwoods, lowland hardwoods, ash, and oak stands to capture mortality and/or increase growth rates (18).
96. Include silvicultural treatments such as site preparation, interplanting, release from competition (e.g., herbicide application or hand release), and timely thinning in plantation management, to increase productivity (18).
97. Apply and supervise the implementation of the *Site-Level Guidelines* on treatment sites (18).
98. Continue to implement, supervise, and enforce current DNR timber sale regulations to protect and minimize damages to sites or residual trees from treatment activities (18).
99. Manage some ERF stands for large diameter, high-quality sawtimber products by retaining adequate stocking and basal area (18).
100. Respond to insect and disease problems, as appropriate (18).
101. Identify and monitor insect, disease, and harmful exotic species populations as part of the Forest Health Monitoring program and document their occurrence on state-managed lands (19).

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102. Follow Minnesota DNR Operational Order 113 (Invasive Species) to minimize the spread of invasive exotic species during forest management activities (19).
103. Adhere to the Minnesota DNR 2010 Invasive Species Program Directive (19).
104. Manage existing forest insect and disease problems, as appropriate (19).
105. Manage stands to reduce the potential impacts of insects and diseases (19).
106. In ERF stands, a higher level of impact from native insect and disease infestations may be accepted as long as it does not jeopardize the ability to regenerate the stand to the desired forest cover type or the management goals of the surrounding stands (19).
107. Improve field staff knowledge about the complexity of factors that affect solutions to preventing or reducing damage caused by wildlife. Do this through training and/or field level coordination on sites where problems exist (20).
108. Consider the potential for wildlife impacts to planted or natural regenerating trees before damage occurs. Coordinate on preventative strategies before planting or timber sales begin (20).
109. Focus forest regeneration efforts in areas less likely to be negatively impacted by wildlife species (20).
110. On sites where damage from wildlife species is anticipated, use mitigation techniques to reduce damage when planting susceptible tree species (20).
111. When deciding what to plant, consider species or stock sources (if available) that are less palatable to wildlife (20).
112. Maintain or increase species diversity across the subsections (21).
113. Maintain or increase structural diversity across the subsections (21).
114. Maintain connectivity that permits the migration of plants and animals as climate changes the landscape (21).
115. Evaluate site conditions with respect to climate change when selecting tree species for regeneration (21).
116. Use the concept of carbon sequestration to remove carbon dioxide (the most anthropogenic greenhouse gas) from the atmosphere (21).
117. Maintain or increase conifers adjacent to coldwater streams to moderate the microclimate that provides a cooling effect in warm weather and retains a snowpack longer, slowing discharge in the spring (21).
118. Apply the *Site-Level Guidelines* for tree species at the edge of their range (21).
119. Apply the *Site-Level Guidelines* on visual quality on all vegetative management activities (22).
120. Consider known traditional gathering areas when managing other forest resources (23).
121. Supervise and enforce special product permit regulations to ensure that the site's capacity for future production is not jeopardized (23).
122. Implement Minnesota DNR regional targets for sustainable decorative tree top (black spruce) harvest (23).

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123. Consider the known locations of important wildlife habitats, rare native plant communities or species, and the possible impacts of nontimber forest products harvest practices before issuing special product permits (23).
124. Forest managers should proceed judiciously when issuing special products permits for species where limited knowledge and understanding constrains our ability to know if we are managing these groups of species sustainably (e.g., commercial harvest of mushrooms, *Lycopodium* spp, and native plant seed) (23).
125. Continue to seek cooperation with other forest landowners to retain existing access to state land and to coordinate new road access development and maintenance across mixed ownerships (24).
126. Follow Minnesota statutes and guidelines and DNR policies for state forest lands (24).
127. Apply the department direction regarding access roads across EILC and other areas that have been reserved (or deferred) from treatment during the 10-year plan (24).
128. Follow strategies identified in other General Direction Statements (issues, goals, strategies in this document) that apply to roads throughout the planning, development, and disposition of forest lands (24).
129. Complete a timber access plan (24).
130. Annual Stand Exam lists are reviewed by DNR archeologists; recommendations for mitigation are implemented as part of sale design (25).
131. The subsection planning team will evaluate large-scale (100's to 1000's of acres) disturbance events to determine appropriate action (26).
132. Local land managers will evaluate and determine appropriate actions for small-scale (10s of acres) disturbance events (26).