

■ PRIORITY FOREST RESOURCES RESEARCH NEEDS

The Minnesota Forest Resources Council (MFRC) is statutorily required to conduct an assessment of forest resources research in Minnesota. Through a vigorous and inclusive process, the MFRC and its Research Advisory Committee have developed two tiers of priority research topics and priority research questions.

By widely vetting these topics, it is envisioned that this document should be used to encourage the direction of, and investments in, priority forest resources related research in Minnesota.

TIER ONE: PRIORITY RESEARCH ISSUES

PRIORITY ISSUE: FOREST HEALTH THREATS.

1. How do we manage forests in relation to disturbances (e.g., forest insect and disease outbreaks), or lack thereof (e.g., wildfire), and what stand-level and landscape-level management prescriptions most effectively maintain or enhance forest health and which might be barriers?
2. How do we sustain native plant and animal communities and maintain ecological functions and diversity in the face of new invasives, native pests and climate change? For example:
 - How will forests respond to EAB and the loss of ash, and
 - How do we maintain the health of the state's aspen resource?
3. What are the people's perceptions and interpretations of "forest health"?

PRIORITY ISSUE: IMPLICATIONS AND MITIGATION OF CLIMATE CHANGE.

1. How will climate change, in conjunction with land use change (parcelization, development, etc.) and forest management, affect:
 - Ecosystem structure, function and biodiversity (composition, carbon sequestration and storage)
 - Hydrologic response and watershed management, and
 - Forest-dependent human communities and economies?
2. What strategies and forest attributes will promote mitigation, resilience and enhance adaptation of Minnesota's forests, dependent communities and related economies to a changing climate?

Note: Need to focus on direct and indirect consequences of climate change (temperature, moisture, means and variability, seasonality, severe disturbances) and near- and long-term effects at local to regional scales.

PRIORITY ISSUE: FOREST FRAGMENTATION, PARCELIZATION AND DEVELOPMENT.

1. What are the impacts of parcelization and fragmentation on forests in regards to:
 - Availability of timber and non-timber forest resources (e.g., wildlife habitat, water quantity and quality, recreational opportunities, other ecosystem services),
 - Forest management opportunities,
 - Forest-based industry development and expansion, and
 - Forest disturbance (e.g., impacts on wildfire, spread and management of invasive species, efforts to mitigate global climate change)?

2. What are the efficiencies and quality of the contributions made by various owners and parcel sizes to forest ecosystem attributes and production of other forest products?
3. What are the effective policy responses to mitigate the negative impacts of parcelization and fragmentation?

PRIORITY ISSUE: CHANGES AND LOSSES IN BIODIVERSITY AND WILDLIFE HABITAT.

1. To what extent are ecosystems (terrestrial, aquatic and wetland) at risk of loss of biodiversity and wildlife habitat from climate change, harvest, forest health decline and parcelization?
2. What are the stand-to-landscape management strategies that either mitigate negative changes or promote adaptation and resiliency?
3. What are the major policy needs/impediments that arise from answers to questions 1 and 2 (e.g., state-level goals/targets for biodiversity and the cost of sustaining versus losing biodiversity)?

PRIORITY ISSUE: WOODY BIOMASS HARVESTING AND ENERGY.

1. What are the short- and long-term environmental impacts of woody biomass harvesting?
Note: This will require a synthesis of existing information and targeted large-scale, long-term study.
2. What is the physical, economic, technical and ecological supply of biomass?
 - What management techniques and policy (e.g., state environmental review and federal incentive programs) will increase the utilization/supply of woody biomass, and what are potential cross-sector impacts?
 - What are the issues with respect to scale, economics, community role and sustainability?
3. What developments will facilitate the use of woody biomass for energy and other products in Minnesota, including:
 - What technologies/equipment/logistics should be developed for woody biomass harvesting in Minnesota (e.g., handling of bundles or chips), and
 - Which conversion technologies and transportation technologies are appropriate, and what are the issues of scale, economics, location, community role and sustainability with respect to these technologies?

TIER TWO: PRIORITY RESEARCH ISSUES

These second tier research priorities are significant as identified by the Research Advisory Committee and were elevated as top priorities as a result of public forum comments.

METHODS OF FORESTLAND MANAGEMENT/SILVICULTURE

WATER QUALITY AND FORESTS

HEALTH OF THE FOREST PRODUCTS INDUSTRY

FOREST PRODUCTIVITY CONCERNS AND IMPLICATIONS

LONG-TERM ECOLOGICAL IMPACTS OF TIMBER HARVESTING