Station Briefing Papers

Science-Based Solutions for Four Threats to the Health of the Nation's Forests and Grasslands

North Central Research Station

USDA Forest Service

Research and Development

NC Contact: Rob Doudrick (rdoudrick@fs.fed.us)
R&D Contact: Dave Cleaves (703) 605-4195
OC Contact: Lennie Eav (202) 205-3818

Website: http://www.ncrs.fs.fed.us/

FIRE AND FUELS

Current Emphasis

- ✓ Mapping areas overstocked with vegetation using the FIA database. This information is being cross-referenced with information on proximity to labor pools, fire history, condition classes, drought, and wildland-urban areas to assess fire risk and opportunities for fire mitigation.
- ✓ Studying communities to determine what factors contribute to successful community wildfire preparedness.
- ✓ Surveying homeowners about their understanding of the wildfire problem and fuel reduction methods.
- ✓ Advancing the ability to forecast fire weather conditions.
- ✓ Identify current wildland-urban interface areas and predicting their future growth.
- ✓ Simulating the impact of alternative land management decisions on future fire risks.

Research Results

- ✓ Identified 29 million acres in California, Oregon, Washington, and Idaho that are overstocked, at high risk of wildfire, and needing fuel reduction treatments.
- ✓ Of homeowners who are aware of the wildfire problem, 75 percent support thinning and prescribed burning as fuel management tools.
- ✓ Fuel treatments activities are more favorably received if they are communicated in the broader context of forest and wildlife habitat health.

- ✓ Insights into fire-atmosphere interactions have improved the ability of the Forest Service to predict extreme fire weather conditions and set fire fighting preparedness levels.
- ✓ Detailed information about the size and extent of the wildland-urban interface and its growth from 1940 to 2030 will be useful in fire hazard mitigation and planning efforts.
- ✓ A new model called LANDIS can predict long term effects of fuel reduction treatments on forest structure. This is helpful to managers in selecting management alternatives.

INVASIVE SPECIES

Current Emphasis

- ✓ Defining the habits and characteristics of the emerald ash borer, a new exotic invasive pest.
- ✓ Assessing the potential impact of sudden oak death on the Midwest's hardwood forests.
- ✓ Understanding the intensification of oak wilt in urban areas.
- ✓ Identifying and testing disease-resistant strains of butternut and related native tree species endangered by an exotic canker pathogen.

Research Results

Knowledge of the invasive species' life cycle and spread in developing an effective management and control techniques of invasive species. Prime examples are the work of North Central conducted on the Asian longhorned beetle, butternut canker, pine shoot beetle, and gypsy moth.

Further Research

- ✓ Develop more effective and efficient control methods for existing invasive species.
- ✓ New strategies for rapid detection and prevention.
- ✓ Understand the ecological underpinnings of the spread of invasive species across landscapes.
- ✓ Investigate new pests as they arrive.
- ✓ Reestablish disease-resistant strains of native species.

LOSS OF OPEN SPACE

Current Emphasis

- ✓ Developing new methods to reconstruct past patterns of residential housing density and project these patterns into the future. This will help

show to what extent forests and other open lands are becoming fragmented.

- ✓ Tracking population trends to observe differences in population growth between non-metropolitan areas with recreational attributes—such as national forests—and non-metropolitan areas without such amenities.
- ✓ Mapping key aspects of change in land cover, forest characteristics, plant and animal populations, and human demographics across the North Central region.

Research Results

- ✓ Housing density patterns is impacting urban, suburban, and rural areas in the North Central region. While housing units more than doubled from 1940-2000, urban centers grew little while suburban areas grew throughout the period. Low-density development became widespread during the 1970s. By 2000 more than two-thirds of all Midwest forests were adversely affected.
- ✓ Recreational non-metropolitan areas – places where natural resources attract new residents - grew twice as fast as non-metropolitan areas between 1990 and 2000.
- ✓ In-migration, not natural increases, fueled most of the growth in housing density.
- ✓ Continued attention to *size* and demographic *structure* of populations can help managers understand social change and anticipate which areas need particular care in planning and management.
- ✓ Consolidated, spatially explicit information on trends in land cover, forest characteristics, plant and animal populations, and human demographics is an excellent tool for monitoring and predicting change. These predictions are useful in developing strategies to minimize negative effects of development.

Further Research

- ✓ Exploit satellite imagery and housing density data more fully to understand urban expansion in finer detail. Fine-grained studies should be expanded across important dimensions such as ecological regions.
- ✓ Modeling and prediction of outcomes of policy alternatives by local, regional, and state governments aimed at protecting resource values and guiding growth.

UNMANAGED RECREATION

Current Emphasis

Assessing public attitudes toward National Forest roads and the recreation fee demonstration program.

Research Results

Understanding the factors affecting user preferences can help guide recreation planning and management.

Further Research

Better methods to educate and involve urban populations, especially those with growing ethnic diversity, on resource management and responsible use on both local and National Forest System lands.