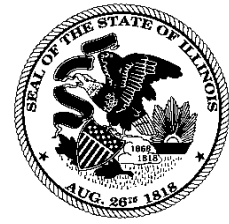


State of Illinois
Pat Quinn, Governor

Department of Natural Resources
Marc Miller, Director



ILLINOIS STATEWIDE FOREST RESOURCE ASSESSMENTS AND STRATEGIES

As Prescribed by the Food, Conservation, and
Energy Act of 2008 (2008 Farm Bill)



**Checklist for Statewide Forest Resource Assessments and Strategies
Requirements of the 2008 Farm Bill**

The State Assessment and Strategy must be submitted to the USDA Forest Service, with this check list signed by the State Forester, by June 18, 2010. Federal review will focus on the requirements as outlined in the Food, Conservation, and Energy Act of 2008 (2008 Farm Bill).

State: Illinois

Approved by the State Forester:


Name

5/27/10
Date

Statewide Forest Resource Assessment Includes:

- The conditions and trends of forest resources in the state Yes No
- The threats to forest lands and resources in the state consistent with national priorities..... Yes No
- Areas or regions of the state that are a priority Yes No
- Any multi-state areas that are a regional priority..... Yes No

Statewide Forest Resource Strategy Includes:

- Long-term strategies to address threats to forest resources in the state* Yes No
- Description of resources necessary for state forester to address state-wide strategy*..... Yes No

**Can be presented in a strategies matrix with columns for (a) programs that contribute, (b) resources required, (c) national objective it supports, and (d) performance measure(s) that will be used for each strategy.*

Stakeholder Groups Coordinated with for the Statewide Assessment and Strategy:

Note: this could be identified in the body of the documents or as an appendix.

- State Forest Stewardship Coordinating Committee (required) Yes No
- State Wildlife Agency (required)..... Yes No
- State Technical Committee (required)..... Yes No
- Lead agency for the Forest Legacy Program (if not the state forestry agency) (required) Yes No
- Applicable Federal land management agencies (required) Yes No

Other Plans Incorporated in Statewide Assessment and Strategy:

- Community wildfire protection plans (required) Yes No
- State wildlife action plans (required)..... Yes No
- Other Yes No

Forest Legacy Assessment of Need (check the one box below that applies)

Previously approved AON remains unchanged and is incorporated by reference

OR

Required AON components are included in the Assessment and Strategy (Note: AON elements will be evaluated outside the assessment and strategy certification process)

Deemed to be sufficient (all requirements met)

Comments:

Not deemed to be sufficient* (missing one or more requirements)

*Indicate Corrective Action(s) Necessary to Meet Sufficiency Requirement:

Certified by Regional Forester/NA Director:

_____ Name

_____ Date

DECISION BY THE DEPUTY CHIEF FOR STATE & PRIVATE FORESTRY

Approve _____
Disapprove _____

Date _____

Table of Contents

SECTION	PAGE
ACKNOWLEDGMENTS	ii
CURRENT CONDITIONS AND TRENDS OF FOREST RESOURCES	1
THREATS TO FOREST LANDS AND RESOURCES	20
PRIORITY AREAS WITHIN ILLINOIS	26
PRIORITY AREAS WITHIN MIDWEST REGION.....	30
STATEWIDE FOREST RESOURCE STRATEGY	32
APPENDICES	38
REFERENCES	42

Acknowledgments

We would like to acknowledge the following organizations for their assistance in the assembly of this plan:

- Illinois Forestry Development Council, for their comments and revisions of this plan. The Council consists of 23 members representing the Illinois General Assembly, the Governor's Office, state agencies, associations that have an interest in Illinois forests, forest products, and urban forestry, Forestry-related Departments at the University of Illinois and Southern Illinois University, and private landowners who are timber producers, farmers, or have an environmental interest. Representatives of the Shawnee National Forest and the Natural Resources Conservation Service serve as ex-officio members. The Council met on April 30, 2010 to review, provide input, and approve this document.
- Illinois Department of Natural Resources, Division of Forest Resources for their assistance and coordination of stakeholder groups to review this plan, including the IL Forestry Development Council, IL DNR Division of Wildlife Resources, IL Technical Committee, IL Forest Legacy Program, USDA Forest Service – Shawnee National Forest, and USDA NRCS.
- Illinois has concluded that the Forest Legacy Program (FLP) will be implemented according to the current Assessment of Need (AON) approved on November 29, 1994, which is hereby incorporated into this document by reference. A copy of the State Lead Agency designation letter, the AON, and the AON approval letter can be found at the IDNR headquarters in Springfield, IL.
- Significant portions of the following plans were either directly incorporated or referred to in the making of this plan including:
 - Crocker, SJ, Brand, GJ, Butler, BJ, Haugen, DE, Little, DC, Meneguzzo, DM, Perry, CH, Piva, RJ, Wilson, BT, Woodall, CW. 2009. Illinois' Forests 2005. Resource Bulletin NRS-29. Newtown Square, PA: USDA Forest Service, Northern Research Station. 114 p.
 - Guyon LJ and Edgington J. Illinois Report on Sustainable Forest Management: Criteria and Indicators. Illinois Forestry Development Council. 59 p.
 - Illinois Division of Wildlife Resources. 2005. The Illinois Comprehensive Wildlife Conservation Plan and Strategy. Illinois Division of Wildlife Resources. 353 p.
 - Illinois Forestry Association. 2007. Urgent need for additional professional and technical staff within the Division of Forestry in the Illinois Department of Natural Resources. Illinois Forestry Association. 4 p.
 - Illinois Forestry Development Council. 1999. Realizing the Forests' Full Potential: Assessment and Long-Range Action Plan for Forest Resources in Illinois. Illinois Forestry Development Council. 60 p.
 - Illinois Forestry Development Council. Critical Issues Facing Illinois Forests and Forestry. 2005. Illinois Forestry Development Council. 16 p.
 - Illinois Forestry Development Council. Forestry Impact on Illinois Economy. Illinois Forestry Development Council. 6 p.

- Illinois Forest Legacy Program. 1994. Assessment of Need. 65 p.
- Nowak, DJ and Greenfield EJ. 2010. Urban and Community Forests of the North Central East Region. General Technical Report . NRS-54USDA Forest Service, Northern Research Station. 54 p.
- Ruffner CM. 2009. Makanda Township Wildfire Protection Plan. Southern Illinois University.
- USDA Forest Service. 2008. Northeastern Area State And Private Forestry Strategic Plan Update for Fiscal Years 2008-2012. United States Department of Agriculture, Forest Service, Northeastern Area, State and Private Forestry. 55 p.

Eric Holzmueller
John Groninger

Carbondale, IL
5/20/10

Current conditions and trends of forest resources

Ecological Provinces of Illinois

Illinois spans three ecological provinces: the Eastern Broadleaf Forest, the Prairie Parkland, and the Lower Mississippi Riverine Forest (Figure 1).

The rolling hills and flat expanses of the Eastern Broadleaf Forest Province are dominated by a diverse mixture of broadleaf deciduous species. Relatively low precipitation in the area favors the drought resistance of the oak/hickory forest-type group (Bailey 1995). Major species include: white oak, red oak, black oak, shagbark hickory, and bitternut hickory. Maple, beech, and basswood increase in dominance in the northern portions of the province. In this area, sugar maple and American basswood dominate the maple/basswood forest type (Bailey 1995).

The Prairie Parkland Province is characterized by an alternating pattern of prairie and deciduous forest. Forested portions of the province consist of uplands dominated by oak and hickory, and moist slopes and floodplains where eastern cottonwood and American elm are common species. Grasses are the predominant vegetation in prairies (Bailey 1995).

Broad floodplains and low terraces typify the land form of the Lower Mississippi Riverine Forest Province (Bailey 1995). Vegetation is classified as bottomland deciduous forest and the primary forest-type groups are oak/gum/cypress and oak/hickory. Major species include Nuttall oak, water oak, cherrybark oak, cottonwood, sycamore, and baldcypress in the oak/gum/cypress group, and post oak, bur oak, and northern red oak in the oak/hickory group. Pecan, green ash, sweetgum and water tupelo are also present (Bailey 1995; McNab and Avers 1996).

The greatest percentage of Illinois' forest land is in southern Illinois, most of which is in the Shawnee National Forest (Figure 2). There is also significant forest area in the western portion of the State along the borders of the Illinois and Mississippi Rivers.

Distribution of Forest Land by Forest Type and Stand Size

Occupying 65 percent of forest land, oak/hickory is the predominant forest-type group in Illinois (Figure 2). Though oak/hickory is found throughout the State, this forest-type group is highly concentrated in west-central and southern Illinois. Elm/ash/cottonwood, which makes up 23 percent of forest land, is the second largest forest-type group.

Forest land in Illinois consists largely of stands with sawtimber-size trees. Sawtimber occupies 3.3 million acres, or 72 percent of forest land. Twenty percent of forest land is made up of poletimber and 8 percent contains sapling/seedlings. Mature oak/hickory stands are the most prominent feature on Illinois forest land.

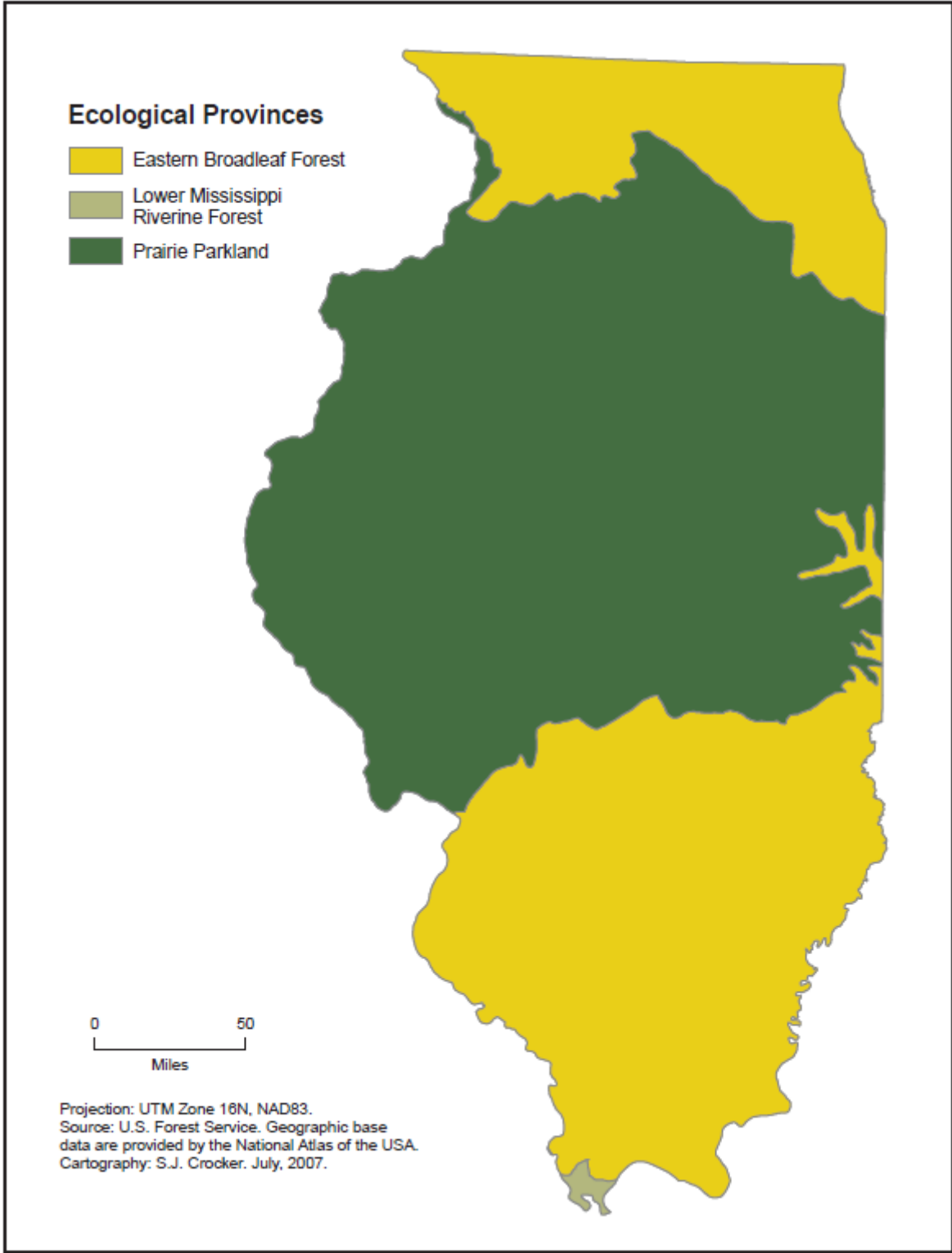


Figure 1.—Ecological provinces of Illinois (Bailey 1995).

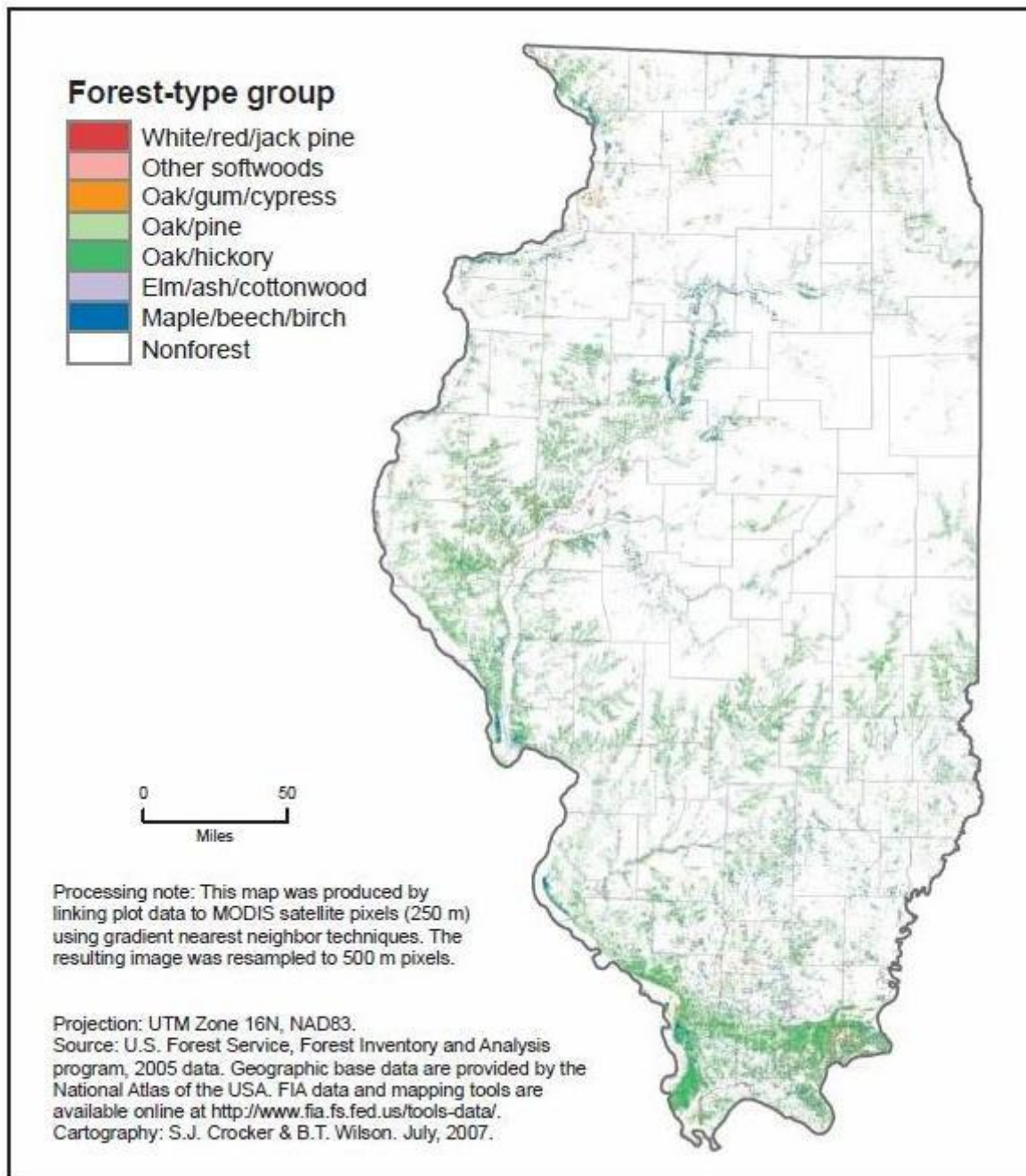


Figure 2.—Distribution of forest land by forest-type group, Illinois, 2005.

Forest Area

In the early 1800s, prior to European settlement, tall grass prairie and eastern deciduous forests were the dominant features on the Illinois landscape (Illinois State Nat. Surv. Div. 1960). Forests during this period spanned an estimated 13.8 million acres, approximately 40 percent of the total land area. For nearly 120 years (from 1800 to the 1920s), forest area declined and in 1924 reached its lowest point with only 3 million acres of forest land (Telford 1926). A survey of Illinois' forest resources in 1948 revealed an increase to 4 million acres. Since 1948, forest land has steadily risen and is currently an estimated 4.5 million acres (Figure 3).

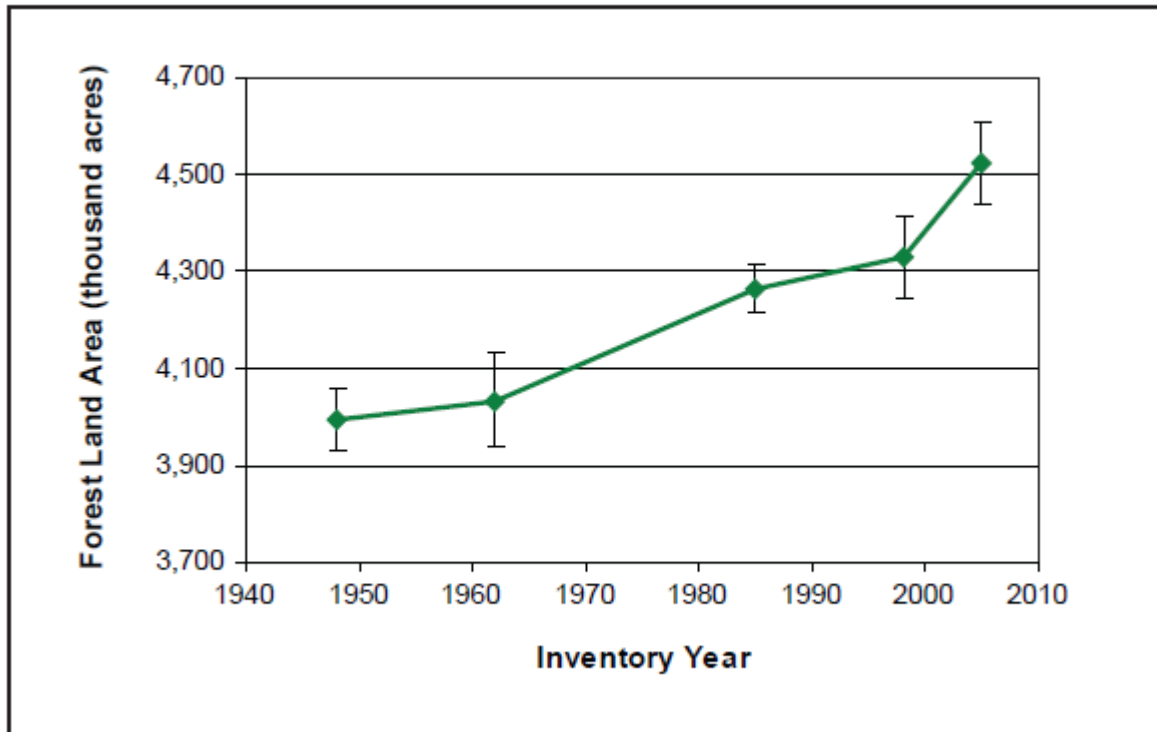


Figure 3.—Area of forest land by inventory year, Illinois, 2005 (error bars represent a 66-percent confidence interval).

Illinois' forest land began to increase in the 1960s and 1970s as a result of a declining farm economy. The reduced need for agricultural land fueled a reversion of pastures and marginal agricultural lands to forest land. A second increase in forest area occurred during the latter half of the 1980s. This was due in large part to the success of state and national programs designed to promote well managed forests and forest regeneration. Since the Illinois Forestry Development Act of 1983, which granted cost-share assistance and favorable tax treatment for timber-producing forested lands with a forest management plan, the annual rate of increase in forest area has nearly doubled from 0.2 percent between 1948 and 1985 to 0.3 percent between 1985 and 2005. The greatest increase occurred between 1998 and 2005, when the annual rate of increase was 0.6 percent.

Nonforest land with trees accounts for 2 percent of Illinois' total land base (Figure 4). The greatest percentages of nonforest land with trees are within the northern and southern tiers of the State. There are several classes of nonforest land that contain trees. In Illinois, the urban and other with trees class has the largest area of nonforest land with trees. However, a substantial portion is also found in pasture and rangeland with trees, and in narrow wooded strips lacking interior forest values. Nonforest land with trees adds an additional 858,900 acres of land to the total area of land with tree cover, or the area of treed land. Thus, nonforest land with trees and forest land form a combined total 5.3 million acres of treed land, which is equivalent to 15 percent of the total land area in the State. Even with the addition of nonforest land with trees, the southern tier remains the most heavily treed portion of Illinois.

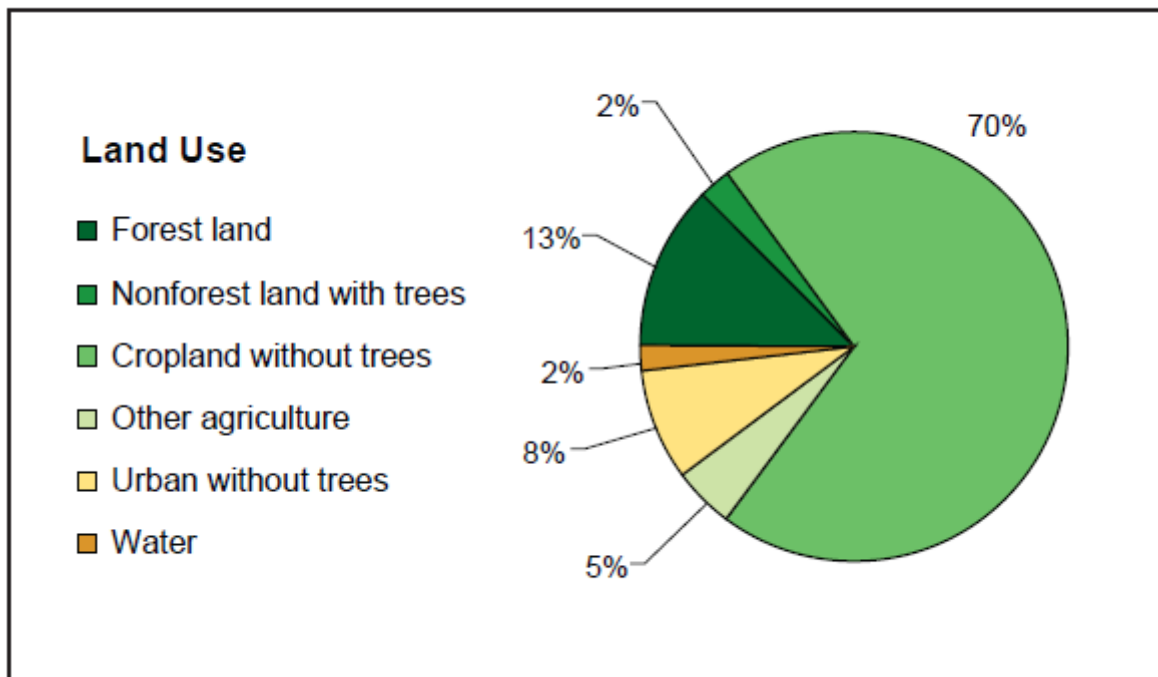


Figure 4.—Distribution of total land area by land use, Illinois, 2005.

Biomass

Illinois biomass has been increasing since 1985 (Figure 5). Currently estimated at 210.6 million dry tons, an average of 48 dry tons per acre, the distribution of biomass is similar to that of forest area. The majority of biomass is found in the southern tier of the State, primarily within or near the purchase areas of the Shawnee National Forest. Biomass on private forest land is currently about five times greater than biomass on public forest land; however, public forest land contains more biomass per acre (Figure 5). Growing-stock trees contain 84 percent of biomass; 11 percent is in nongrowing-stock trees, and 5 percent is in saplings.

Illinois' forests sequester 343 million tons of carbon. Live trees, which sequester 44 percent of total carbon, are the State's largest source of forest carbon. Soil is another substantial carbon pool (33 percent). Additional carbon pools include live trees, below ground (8 percent); the forest floor (7 percent); down and dead wood (4 percent); standing dead trees (3 percent); and understory vegetation (1 percent).

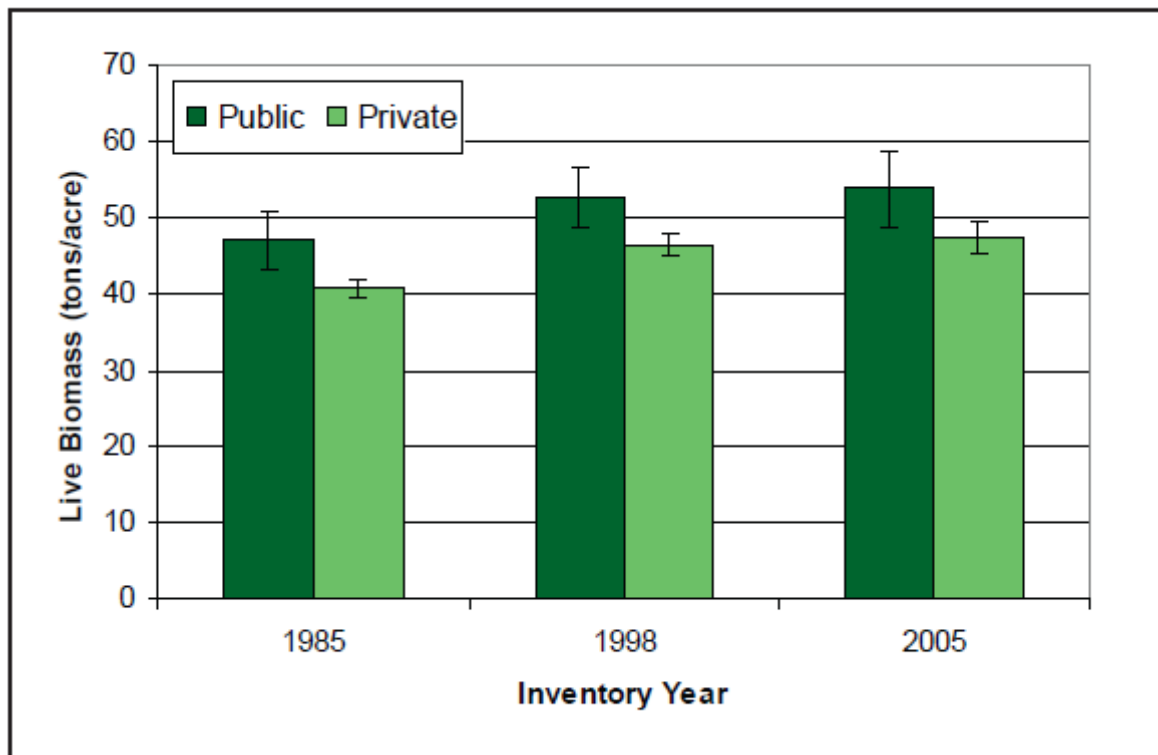


Figure 5.—Live biomass per acre of forest land by ownership and inventory year, Illinois, 1985 - 2005 (error bars represent a 66-percent confidence interval).

Species Composition

Illinois' forest land contains just over 2 billion trees (greater than 1 inch in d.b.h.) from nearly 100 different species. This number represents a 25 percent decrease in the number of trees between 1998 and 2005, consistent with a maturing forest resource, equivalent to a reduction of about a half billion trees. American elm, sugar maple, and black cherry are the most abundant species by number (Figure 6).

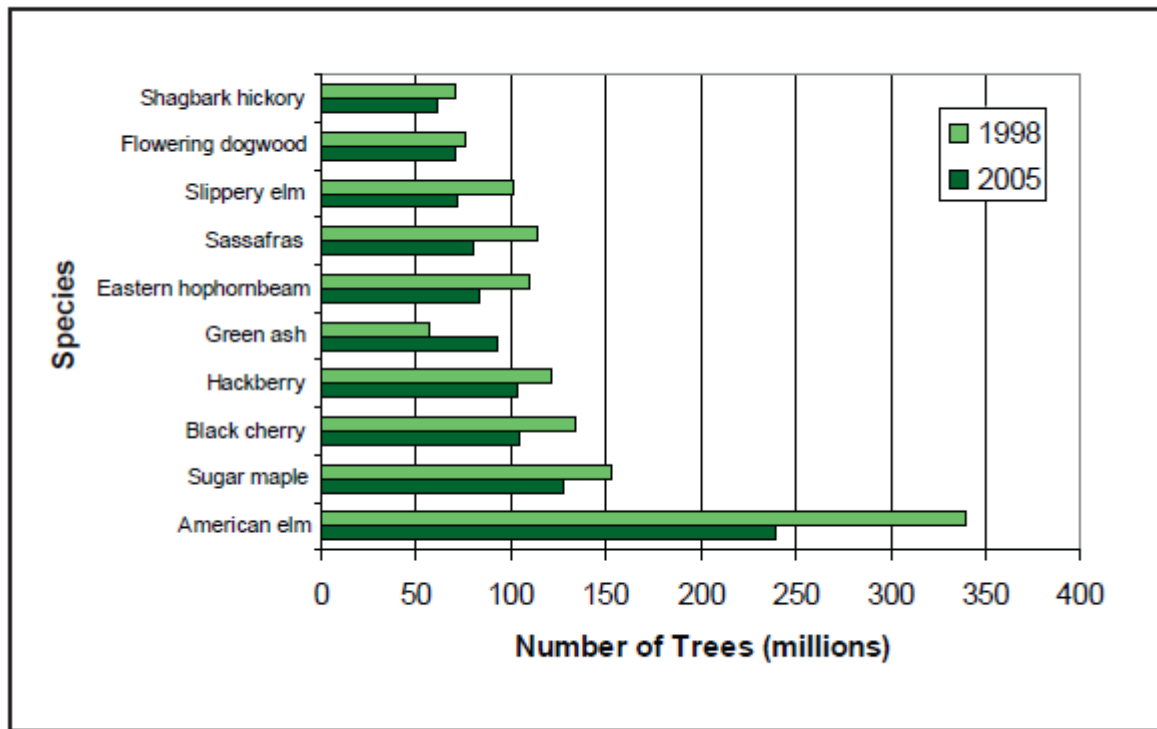


Figure 6.—Top 10 species on forest land by number of live trees, Illinois, 1998-2005.

Live volume on forest land is an estimated 8 billion cubic feet. Most of this volume is found in the large-diameter size classes (Figure 7). White oak remains the most dominant species (Figure 8). Between 1998 and 2005, there were significant volume increases in silver maple, green ash, and American elm and a significant decrease in black oak volume.

Illinois' forests are composed of a diverse array of tree species. White oak, black oak, northern red oak, and silver maple are the most voluminous species in the State. The most abundant species, in terms of total number, are American elm and sugar maple, along with a host of predominantly understory species. While this is a reflection of variation in ecological roles, where species such as hackberry, eastern hophornbeam, and flowering dogwood are typically understory species and oaks and maples are dominant overstory species, it is also a sign of changing understory dynamics. Disturbance, particularly from harvesting and fire management, promotes oak regeneration. The absence of such disturbances has allowed shade-tolerant species

to out-compete understory oaks. Thus, although oaks are fewer in number, their dominance in volume is due to high numbers of mature trees in the overstory. As these oaks continue to senesce, oak mortality will create gaps in the overstory that will likely be filled by maples and elms that now represent the majority of understory species. In the absence of wide-scale intervention, non-oaks will replace oaks as the dominant species within Illinois forests.

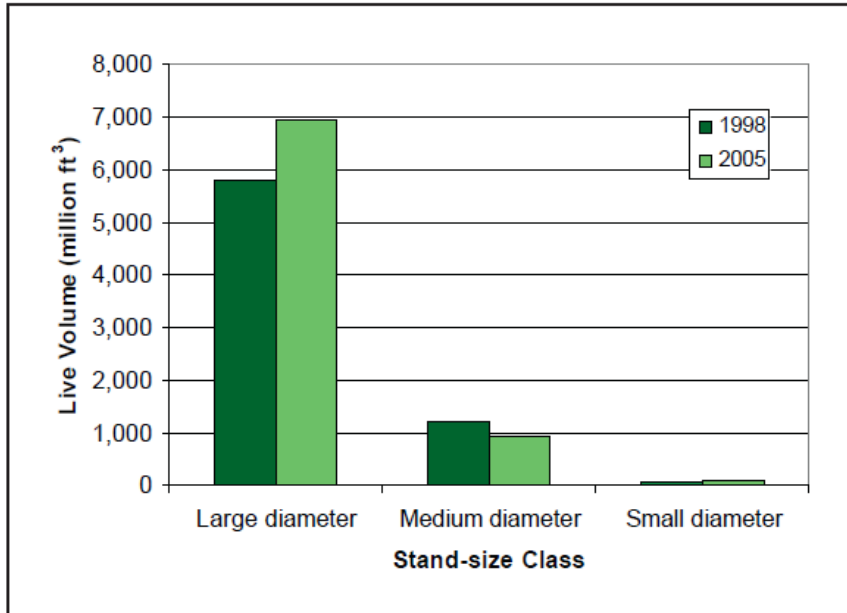


Figure 7.—Live volume on forest land by stand-size class and inventory year, Illinois, 1998-2005.

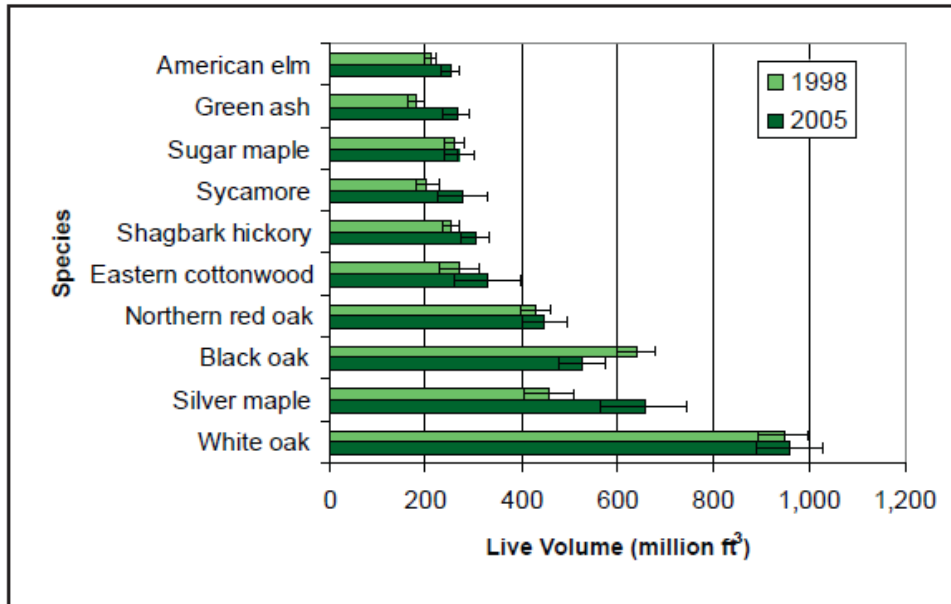


Figure 8.—Live volume on forest land for the 10 most voluminous species, Illinois, 1998-2005 (error bars represent a 66-percent confidence interval).

Forest Density

An average acre of Illinois forest land contains 459 trees. Live volume per acre of forest land has steadily increased since 1985 and now totals an estimated 1,751 cubic feet per acre (Figure 9). Most of Illinois forest land is fully (40 percent) or moderately stocked (44 percent). Overstocked stands, which represent 3 percent of forest land, contain too many trees to support adequate tree growth and development. Poorly stocked stands that do not contain enough trees to fully utilize a site represent 12 percent of forest land area.

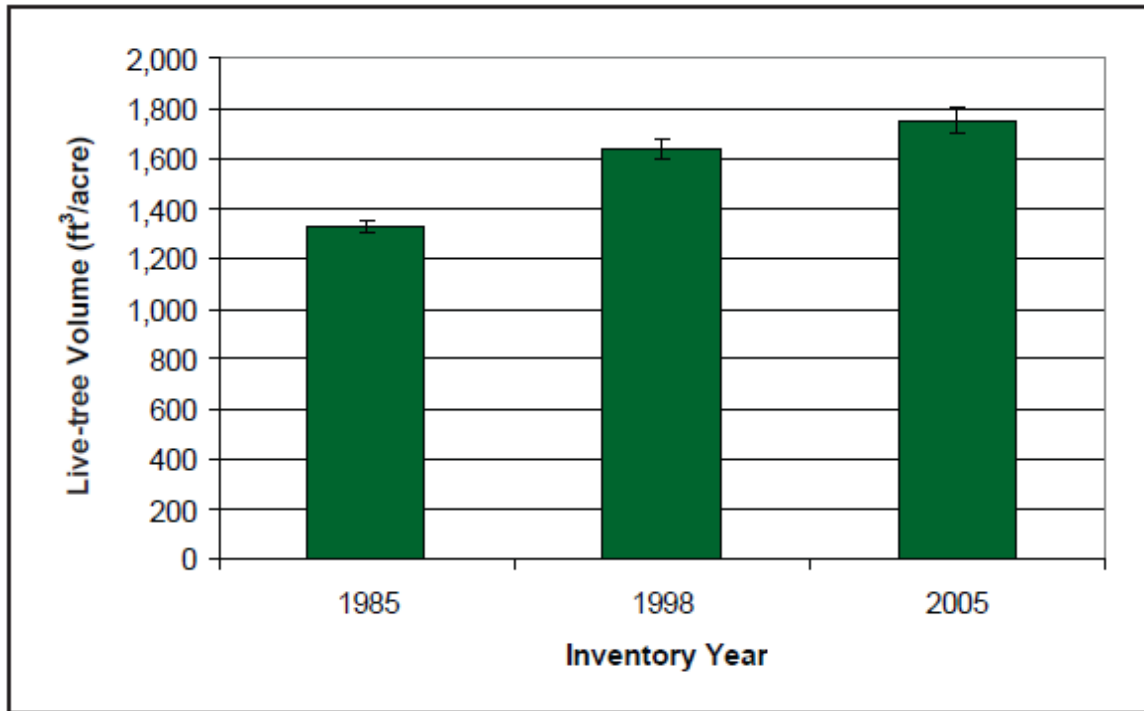


Figure 9.—Live volume per acre of forest land by inventory year, Illinois, 1985-2005 (error bars represent a 66-percent confidence interval).

Table 1A.—Sawtimber density, expressed as number of live trees per acre on forest land, by inventory year, Illinois, 1985-2005 (Sampling errors [SE] represent a 66-percent confidence interval. Sawtimber density estimates for a given species are not significantly different from one another if followed by the same letter).

Species	Sawtimber density [†]					
	1985		1998		2005	
	estimate	SE	estimate	SE	estimate	SE
Boxelder	0.5 a	± 0.08	0.6 ab	± 0.10	0.9 b	± 0.14
Red maple	0.4 a	± 0.07	0.7 b	± 0.11	0.5 b	± 0.12
Silver maple	1.4 a	± 0.16	2.2 b	± 0.24	3.0 c	± 0.39
Sugar maple	0.9 a	± 0.09	1.2 b	± 0.11	1.2 ab	± 0.15
Pignut hickory	0.8 a	± 0.07	1.1 b	± 0.10	1.3 b	± 0.14
Shagbark hickory	1.0 a	± 0.08	1.3 b	± 0.10	1.6 c	± 0.16
Mockernut hickory	0.6 a	± 0.06	0.8 b	± 0.08	0.4 c	± 0.08
Hackberry	0.5 a	± 0.07	0.8 b	± 0.09	1.2 c	± 0.13
White ash	0.9 a	± 0.08	1.1 b	± 0.10	0.8 a	± 0.12
Green ash	0.6 a	± 0.08	1.0 b	± 0.10	1.5 c	± 0.17
E. hophornbeam	0.0 a	n/a	0.0 a	n/a	0.0 a	n/a
Black cherry	0.5 a	± 0.05	0.8 b	± 0.08	1.0 c	± 0.12
White oak	4.1 a	± 0.22	5.0 b	± 0.27	4.8 b	± 0.36
Shingle oak	0.4 a	± 0.05	0.8 b	± 0.08	0.9 b	± 0.12
Bur oak	0.6 a	± 0.08	0.7 a	± 0.10	0.8 b	± 0.14
Northern red oak	1.6 a	± 0.11	2.1 b	± 0.15	1.9 b	± 0.19
Black oak	3.0 a	± 0.19	3.5 b	± 0.22	2.9 a	± 0.25
Sassafras	0.1 a	± 0.03	0.2 ab	± 0.04	0.3 b	± 0.06
American elm	0.7 a	± 0.06	1.0 b	± 0.08	1.2 c	± 0.13
Slippery elm	0.4 a	± 0.04	0.4 a	± 0.05	0.5 a	± 0.08
All other species	9.4 a	± 0.38	12.2 b	± 0.49	13.6 c	± 0.71
Total	29.5 a	± 0.53	37.5 b	± 0.63	40.1 c	± 0.87

[†]Sawtimber trees must be greater than 9 inches d.b.h. for softwoods and greater than 11 inches d.b.h. for hardwoods.

Table 1B.—Sapling/poletimber density, expressed as number of live trees per acre on forest land, by inventory year, Illinois, 1985-2005 (Sampling errors [SE] represent a 66-percent confidence interval. Sapling/poletimber density estimates for a given species are not significantly different from one another if followed by the same letter).

Species	Sapling/poletimber density [†]					
	1985		1998		2005	
	estimate	SE	estimate	SE	estimate	SE
Boxelder	13.5 a	± 1.30	18.0 b	± 2.84	12.1 a	± 2.30
Red maple	7.9 a	± 1.30	10.2 a	± 3.40	4.6 b	± 0.96
Silver maple	12.8 a	± 1.41	7.9 b	± 1.52	7.3 b	± 1.28
Sugar maple	28.0 a	± 2.13	32.0 a	± 4.20	26.6 a	± 3.00
Pignut hickory	15.1 a	± 1.05	12.0 ab	± 2.92	9.5 b	± 1.13
Shagbark hickory	8.5 a	± 0.93	15.7 b	± 1.98	12.1 c	± 1.28
Mockernut hickory	11.0 a	± 1.07	8.2 b	± 1.70	3.8 c	± 0.68
Hackberry	15.6 a	± 1.18	28.6 b	± 3.49	22.3 c	± 2.22
White ash	15.2 a	± 1.14	16.9 a	± 2.19	7.7 b	± 1.15
Green ash	11.0 a	± 1.21	12.0 a	± 1.95	18.6 b	± 2.18
E. hophornbeam	18.1 a	± 1.58	25.0 b	± 3.53	19.0 ab	± 2.60
Black cherry	16.0 a	± 1.34	29.4 b	± 3.30	22.1 c	± 2.02
White oak	12.4 a	± 0.92	9.1 b	± 1.07	7.1 b	± 0.84
Shingle oak	7.1 a	± 0.72	15.7 b	± 3.90	8.1 a	± 1.36
Bur oak	1.1 a	± 0.22	1.6 ab	± 0.86	1.8 b	± 0.46
Northern red oak	4.1 a	± 0.47	3.6 a	± 0.81	3.2 a	± 0.50
Black oak	12.4 a	± 1.01	15.1 a	± 2.19	7.7 b	± 1.07
Sassafras	22.4 a	± 1.62	26.9 a	± 3.73	17.7 b	± 1.91
American elm	50.0 a	± 2.38	78.5 b	± 6.23	51.3 a	± 3.59
Slippery elm	28.0 a	± 1.55	23.5 a	± 2.94	15.3 b	± 1.69
All other species	140.3 a	± 4.28	159.3 b	± 9.46	129.5 c	± 6.36
Total	450.3 a	± 6.93	549.4 b	± 20.99	407.4 c	± 10.71

[†]Sapling/poletimber trees range from 1.0 to 8.9 inches d.b.h. for softwoods and from 1.0 to 10.9 inches d.b.h. for hardwoods.

Illinois' overstory is currently dominated by oak, maple, hickory, and ash sawtimber (Table 1A). As a group, oaks make up the largest percentage of sawtimber density (28 percent), but represent only 7 percent of sapling/poletimber density. In comparison, maple species make up a smaller percentage of sawtimber density (14 percent) and a larger portion of sapling/poletimber density (12 percent). Overall, there is much higher density in the smaller sapling and poletimber trees. American elm, sugar maple, black cherry, hackberry, and green ash have the highest sapling/poletimber densities.

For the past 20 years, oaks have made up a large portion of the overstory. Presently, the density of American elm, silver maple, shagbark hickory, and green ash sawtimber is increasing, while the density of oak sawtimber is decreasing (Table 1A). Individually, the density of most oak saplings and poletimber has remained fairly constant. Black oak, whose sapling/poletimber density dramatically fell between 1998 and 2005, is a major exception (Table 1B). As a group, the density of oak saplings and poletimber has slightly decreased over time.

The decrease in the number of trees per acre and the increase in live volume per acre are indicative of mature stands with adequate spacing and good growth. This is a result of the increased availability of growing space following a reduction in the overall number of trees. The stems that remain then face less competition for growing space and are able to grow more quickly. The existence of quality growth conditions is mirrored in the current levels of stocking, which show that the growing space available for tree development is fully utilized on the majority of forest acreage.

Evidence of possible transition to maple forest types is reflected in the changes in forest density among Illinois' saplings, poletimber, and sawtimber trees. The density of oak sawtimber appears to be leveling off and it does not appear that oak will replace itself in the overstory. A lack of increasing oak density in the sapling/poletimber size classes coupled with decreasing oak sawtimber density and high maple sapling/poletimber density is an indication that future stands may include fewer oaks and more maples.

Ownership

Illinois' forest land is predominantly held by private landowners. An estimated 206,000 families and individuals own a total of 3.5 million acres, or 77 percent of forest land. An additional 265,000 acres are owned by other private groups (e.g., corporations, associations, etc.). Collectively, private owners hold 82 percent of the State's forests. Family forest owners generally own less than 10 acres of forest land (Figure 10). However, family forest owners with landholdings greater than 10 acres own more than 55 percent of private forest land. The most common reasons for owning forest land are related to beauty and scenery, forest land as part of a farm, privacy, and as a family asset or legacy to pass on to heirs. Timber has been harvested on 11 percent of privately owned forest land in the past 5 years. Four percent of family forest owners reported having a written forest management plan and 15 percent have sought management advice. Trespassing was rated as a significant concern by 46 percent of family forest owners. Other prevalent concerns were related to vandalism, dumping, property taxes, and

owners' abilities to keep their land intact for heirs. One in 10 acres of forest land is owned by someone who plans to transfer or sell it within the next 5 years. This is related, in part, to owner age; 49 percent of family forest land is owned by people 65 or older.

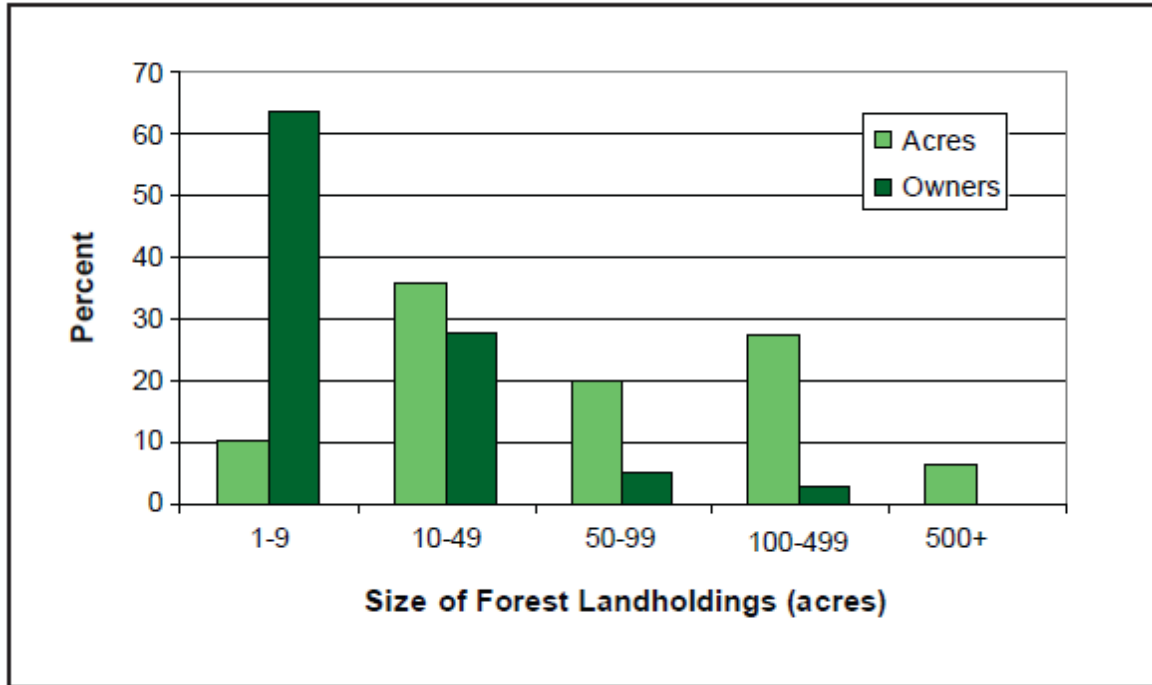


Figure 10.—Area of family owned forests and number of family forest owners by size of landholdings, Illinois, 2002-2004.

Riparian Forests

Riparian forests total an estimated 992,500 acres and account for 22 percent of Illinois' forest land. A mapped distribution of riparian forests using U.S. Fish and Wildlife Service's National Wetlands Inventory data shows that much of these forests are concentrated along rivers and streams in the southern tier of Illinois. FIA data indicates that 74 percent of riparian forest land is in narrow floodplains and bottomlands that are less than a quarter mile wide.

Illinois' riparian forests currently contain an estimated 352.3 million live trees, an average of 355 trees per acre of riparian forest land. Nearly 70 tree species were identified; the most commonly observed species were American elm, green ash, silver maple, hackberry, and boxelder (Figure 11). These five species account for half of the total number of trees on riparian forest land. Estimates of volume show that riparian forests contain 2.1 billion cubic feet, or 26 percent of the State's total live volume on forest land. Silver maple (29 percent of total riparian volume), eastern cottonwood (9 percent), green ash (7 percent), hackberry and sycamore (5 percent each) have the greatest percentage of volume in riparian forests.

Thirty-eight percent of total mortality of growing stock on forest land occurred in riparian forests. Species with considerable mortality include: red maple (6.3 million cubic feet), silver maple (3.6 million cubic feet), American elm (3.3 million cubic feet), hackberry (2 million cubic feet), green ash (1.3 million cubic feet), and pin oak (474,500 cubic feet).

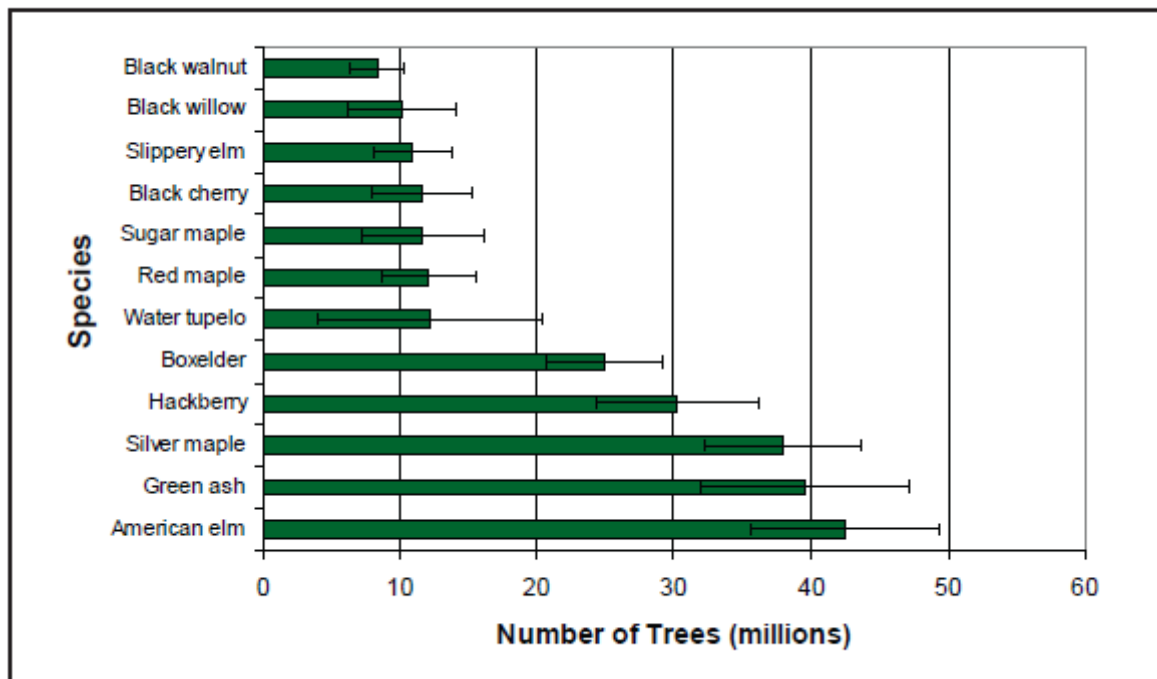


Figure 11.—Top 12 species, by number of trees, in riparian physiographic classes on forest land, Illinois, 2005 (error bars represent a 66-percent confidence interval).

Average Annual Growth

Since 1962, average annual net growth of growing stock has been on the rise. Net growth averaged 327 million cubic feet per year between 1998 and 2005. Nearly all of that growth (98 percent) was in hardwoods. Silver maple had the highest growth rate, followed by eastern cottonwood, white oak, and northern red oak (Figure 12). Collectively, Illinois' major oak species (white, northern red, bur, and black oak) account for 23 percent of total growth. The bulk of growth occurred in large-diameter stands. Ninety-four percent of net growth in white, northern red, bur and black oaks was in large-diameter stands.

Illinois' forests are growing at their highest rates since 1962. The preponderance of this growth is occurring within large-diameter stands, which indicates that mature trees are continuing to increase in volume. While sustained growth of large-diameter oak increases its availability for commercial wood products, growth of other species in a variety of size classes suggests that in the future oak may not be as dominant as it is today.

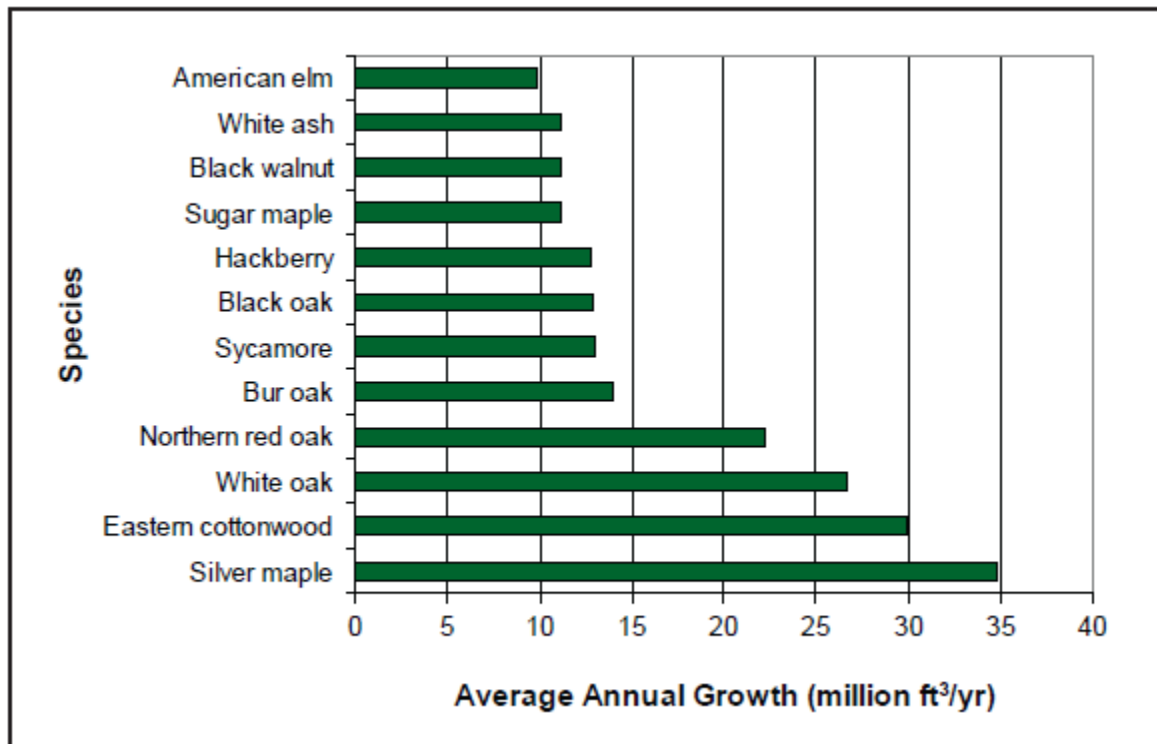


Figure 12.—Average annual net growth of growing stock on forest land for the top 12 species, Illinois, 1998 to 2005.

Average Annual Removals

Growing-stock removal rates began a rapid climb during the 1960s, reaching a peak in the early 1980s (Figure 13). Since 1985, the rate at which growing stock was removed from forest land has decreased. Currently, growing stock is removed at an average of 60.6 million cubic feet per year. Eighty-seven percent of growing-stock removals occurred on private land. Hardwoods account for virtually all of total removals; softwood removals total 43,000 cubic feet per year and represent less than 0.1 percent of total removals. White oak and eastern cottonwood had the highest annual removals, each averaging 8.9 million cubic feet per year. Oak species account for 36 percent of annual removals.

Wood products represent an important industry in Illinois. Changing market demands and market values can influence the rate of tree removals and the species being removed. Black oak was the only species to show a significant change (decrease) in removals between inventory cycles. Perhaps the most important trend is an apparent change in which species are being removed. Illinois' forest products market seems to indicate declining utilization of oak while demand for cottonwood is increasing.

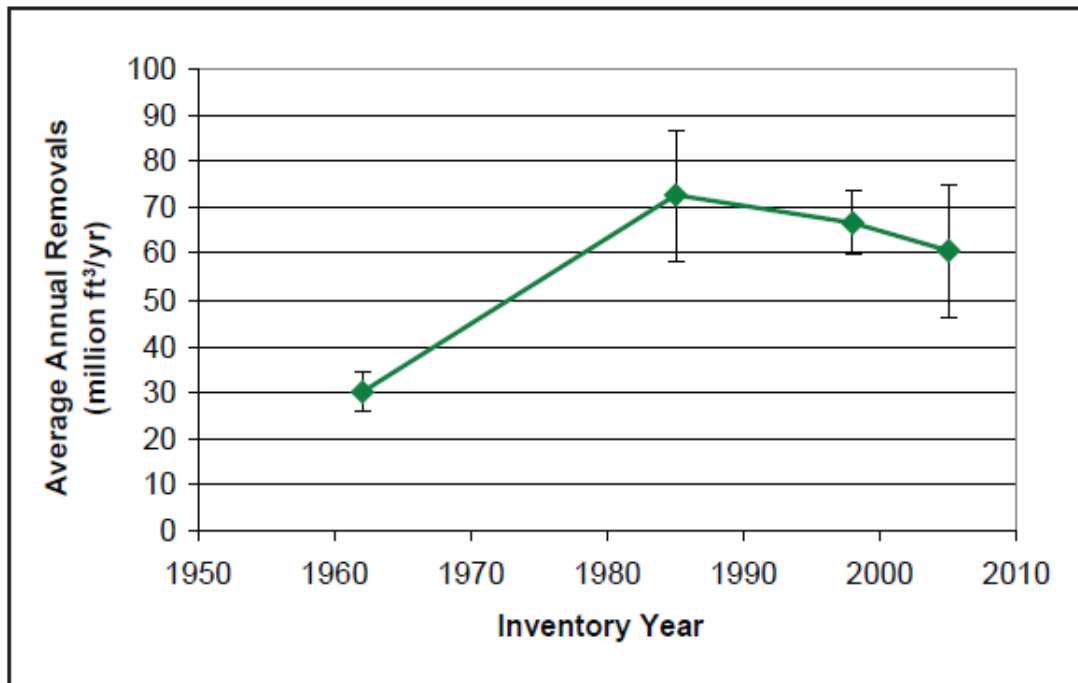


Figure 13.—Average annual removals of growing stock on forest land by inventory year, Illinois, 1962 to 2005 (error bars represent a 66-percent confidence interval).

Average Annual Mortality

Since the 1960s, the rate of growing-stock mortality has continued to grow with each inventory (Figure 14). Average annual mortality of growing stock on forest land is currently an estimated 86.7 million cubic feet per year, roughly 1.3 percent of total growing stock volume. American elm, black oak, and red maple have the highest rates of mortality; all three species experienced significant increases in mortality since 1998 (Fig 15). A closer look at elm mortality shows that 27 percent of elms were infected with disease; 72 percent of elm damage agents were unknown/other.

Increasing mortality reflects the growing maturity of Illinois' forests. As the bulk of the State's forests are made up of large-diameter stands, much of the mortality may be the result of senescence. However, elm mortality is largely due to the continued spread of Dutch Elm Disease (DED). Black oak mortality is related to oak wilt and old age. As oak is a major overstory component and does not appear to be replacing itself in the overstory, oak mortality has implications for the future composition of Illinois' forests. As American elm and maples now occupy the majority of the poletimber density, high elm mortality makes maples likely candidates to replace oaks in the overstory.

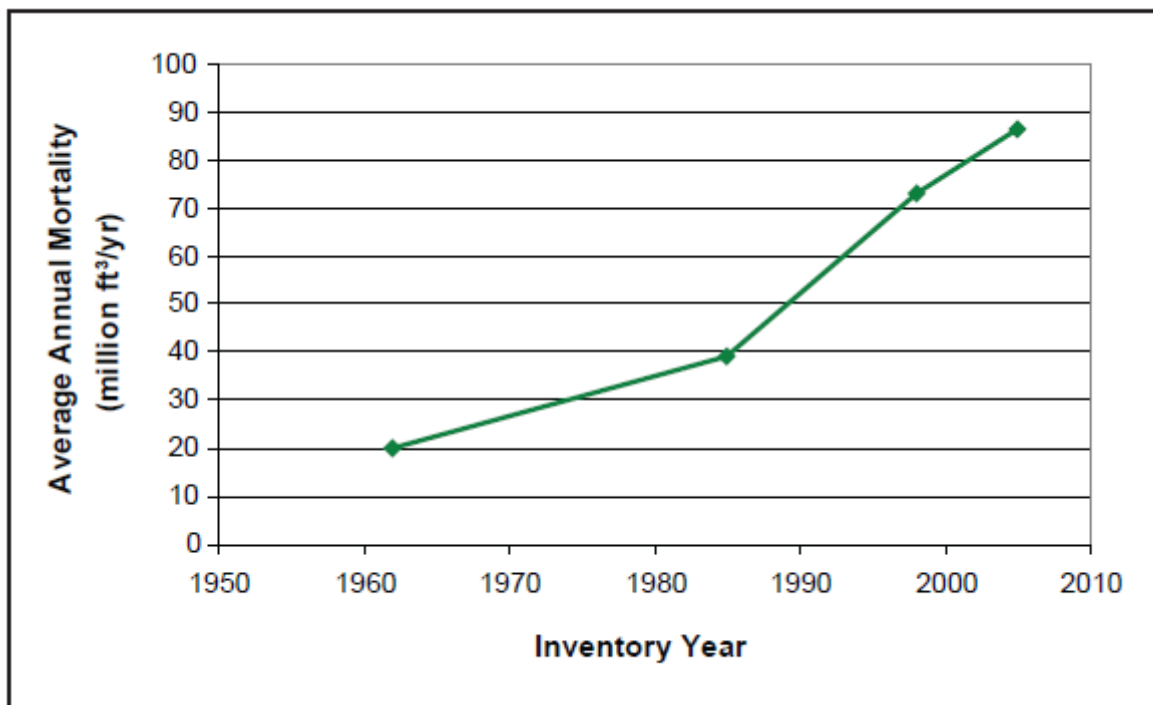


Figure 14.—Average annual mortality of growing stock on forest land by inventory year, Illinois, 1962 to 2005.

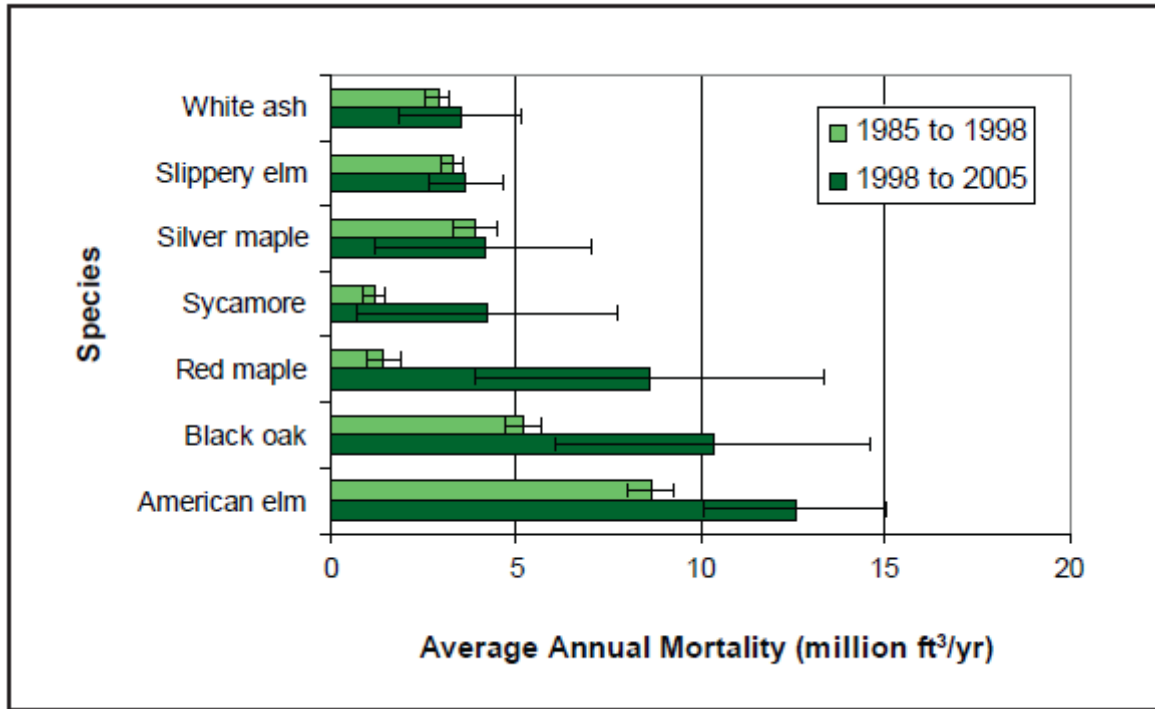


Figure 15.—Average annual mortality of growing stock on forest land for the top seven species by inventory year, Illinois, 1985 to 2005 (error bars represent a 66-percent confidence interval).

Status of Urban Forests

Urban or community land in Illinois comprises about 8.7 percent of the state land area in 2000, an increase from 7.5 percent in 1990. Statewide tree canopy cover averages 12.1 percent and tree cover in urban or community areas is about 13.0 percent, with 25.9 percent impervious surface cover and 17.5 percent of the total green space covered by tree canopy cover. Statewide, urban or community land in Illinois has an estimated 77 million trees, which store about 14.7 million metric tons of carbon (\$335.2 million), and annually remove about 484,000 metric tons of carbon (\$11.0 million) and 13,560 metric tons of air pollution (\$107.9 million).

Statewide, 188 communities are recognized as Tree City USA through the National Arbor Day Foundation in recognition of their investment in managing their urban forest resource for the benefit of their citizens. As of March 2010, these designated communities spend a total of \$83 million annually on tree planting and tree care. Tree City USA program participants designate a city official or volunteer to have authority over the management and care of its urban forest. A community tree ordinance identifies urban forest management and tree care standards and enforcing authorities. Participating communities must expend \$2 per resident for its urban forestry program and must conduct an annual Arbor Day tree planting ceremony.

Illinois municipalities are recognized nationally as leaders in urban and community forest management. These efforts are supported at the state level through the IDNR Urban and

Community Forestry Programs. An expanding threat to the urban tree resource is the growing impact Emerald Ash Borer moving southward and westward throughout the state

Chicago Wilderness serves as a link between urban populations and the forest resource as a means of improving lives in the state's largest metropolitan area. This organization consists of a broad coalition of public and private entities and can serve as a model for similar efforts providing a wide range of natural resource amenities to urban residents. Similar community-based organizations, such as Green Earth in Carbondale, follow a similar model in municipalities throughout the state.

Threats to forest lands and resources

Several factors have been identified as particularly large in their impact on the Illinois forest resource through stakeholder activities sponsored by the Illinois Forestry Development Council (IFDC). In addition, the Illinois Comprehensive Wildlife Conservation Plan & Strategy identified a number of the same challenges (Appendix A). The following list represents a composite of these two exercises as a starting point to the development of a more comprehensive natural resources strategy.

Decline of Oak Dominance

Oak/hickory forests are the predominant forest type on the Illinois landscape. The broad range of tree species and the structural variation within these forests contributes to their importance as a reservoir for biological diversity. Home to a number of mast-producing trees, many wildlife species are dependent on oak/hickory forests for the food and habitat they provide.

With an average of fewer than 45 seedlings per acre of forest land, oaks represent a small component (7 percent) of the understory (Figure 16A). Of all oak species, white and black oak seedlings are the most abundant, occurring over three times more often than red oak seedlings. Elm, ash, and maple have substantially more seedlings per acre than oaks. Similarly, oak saplings (which average fewer than seven saplings per acre of forest land) are far less abundant than other hardwood species (Figure 16B). Regeneration of oak within oak forests is poor (Figure 17A, B). On average, the ratio of oak to non-oak species is 1 to 13 for both seedlings and saplings.

Illinois' oak resource is characterized by numerous large, mature trees and a comparatively small sapling/seedling component. Decreases in the frequency of beneficial disturbances including timber management and prescribed fire have contributed to suppression of oak seedlings and an increase in the abundance of non-oak seedlings and saplings. With an understory dominated by non-oak species such as sugar maple and with relatively few oak saplings available to move into the medium-diameter classes, it is likely that there will be a successional change in species dominance. Oak stands may eventually be dominated by more shade-tolerant species such as maples. With a largely mature oak resource, the future of oak in Illinois is uncertain. Maintaining a healthy oak resource will be dependent on successful seedling regeneration and sapling development, processes presently not functioning adequately across most forest acreage.

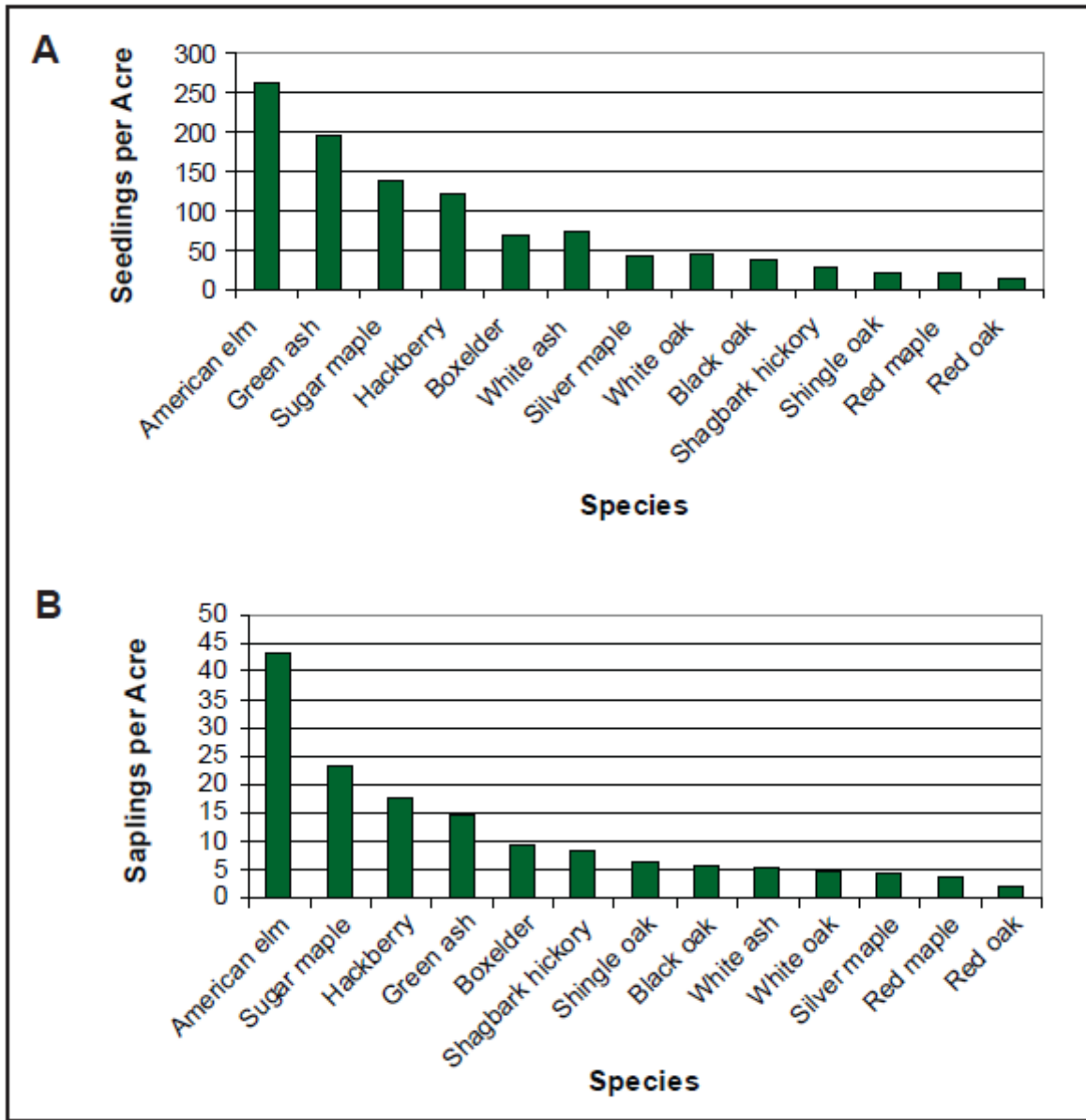


Figure 16.—Number of seedlings (A) and saplings (B) per acre of forest land for selected species, Illinois, 2005.

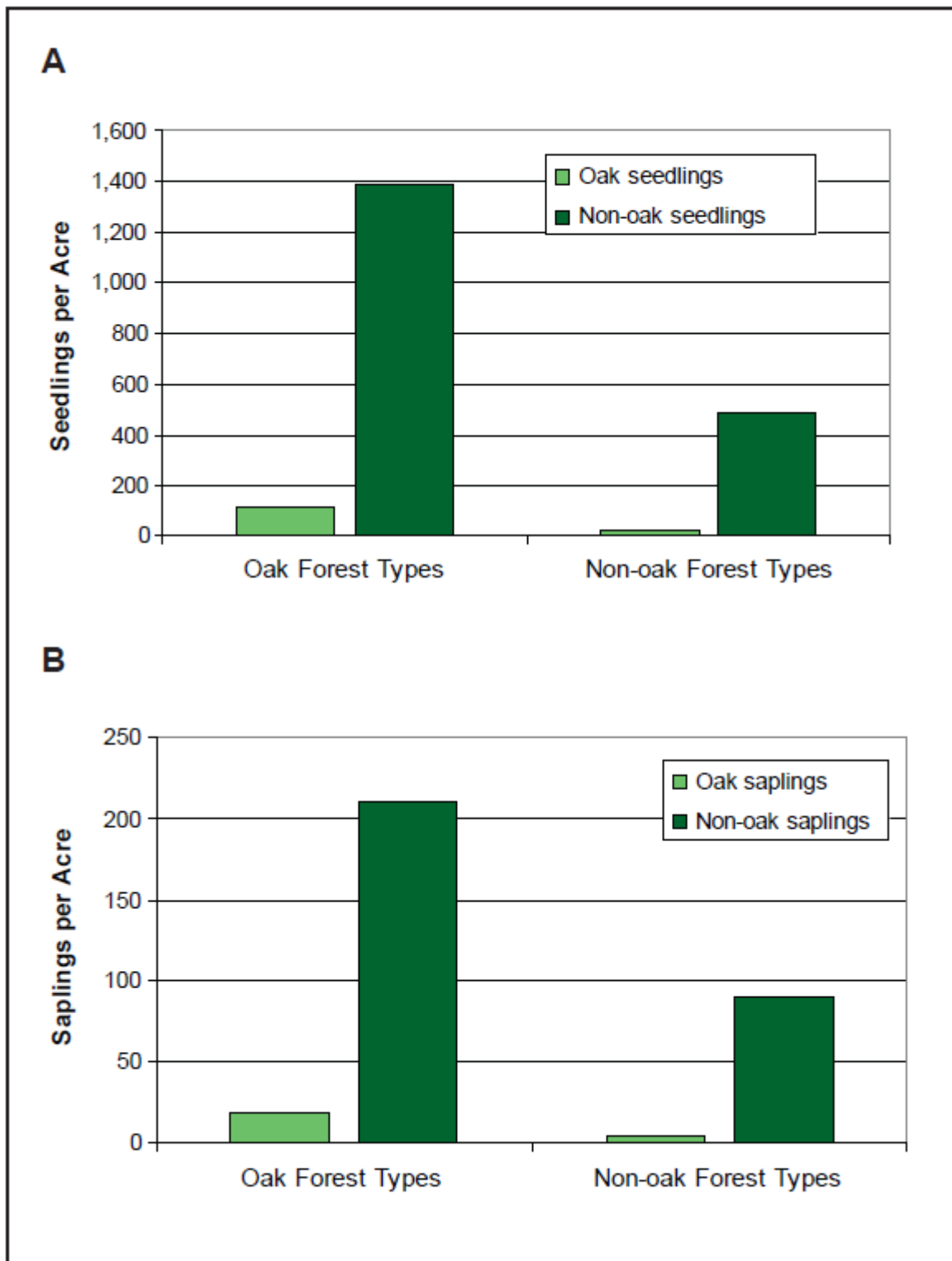


Figure 17.—Number of seedlings (A) and saplings (B) per acre for oak and non-oak species on oak and non-oak forest types, Illinois, 2005.

Changing Forest Landscape

Forman (1995) defines fragmentation as “the breaking up of large habitat or land areas into smaller parcels.” This results in a loss of interior forest and an increase in edge habitat, which has many negative effects on the remaining vegetation and wildlife. Some of the harmful consequences of fragmentation are a loss of biodiversity, increased populations of invasive and nonnative species, and changes in biotic and abiotic conditions (Haynes 2003). Fragmentation occurs naturally from disturbances such as wildfire, wind, and flooding, or as the result of human activities such as conversion to agriculture or urban development/sprawl (Haynes 2003).

Analysis of fragmentation within Illinois classified, 81 percent of area as nonforest, 17 percent as forested, and the remaining 2 percent were identified as “water/barren land” (Figure 49). Further breakdown of forested area shows that 7 percent were classified as interior forest, 7 percent as edge, and 3 percent as patch, implying that forest land in Illinois is heavily fragmented. The majority of interior forest land is concentrated in the southern tip of the State, or in riparian areas along rivers. The remaining landscape contains a high proportion of edge habitat and many small, isolated patches of forest land. This type of fragmented landscape lacks the continuous forest habitat required by many species of plants and wildlife, and can result in loss of biodiversity and even extinction (Forman 1995). While edge habitat may benefit certain species, it also has many negative effects, such as increased predation of bird nests and prey species (Heske et al. 1999), and declines in native plant and wildlife populations (Collinge 1996).

The process of fragmentation is accelerated when more and more people seek to purchase tracts of forested land. Greater numbers of people owning ever smaller tracts of land leads to a condition called parcelization. The average forested land holding covers 21.5 acres; 68.6% of landowners own less than 15 acres. Research shows that owners of smaller parcels are typically less aware of traditional forestry extension programs and less likely to manage their woodlands. While these small woodlots can certainly be attractive to live on, they are often too small to manage effectively and can be too small and too isolated to function as a healthy forest ecosystem.

Decreased Forest Health

Multiple factors affect forest health particularly, exotic invasive plants, insects and pathogens. Exotic invasive plants are a major concern because they alter natural plant communities and processes, threaten biodiversity, and contribute to a decrease in sustainability, productivity, and wildlife habitat. Preliminary data of FIA plots shows that exotic invasive plants are widely distributed across Illinois. Aggressive shrub species such as Autumn olive (*Elaeagnus umbellata*) and thorny Multiflora rose (*Rosa multiflora*) are only two of the most common in Illinois. The familiar woody vine, Japanese honeysuckle (*Lonicera japonica*), while valued as deer browse, replaces native plants in all forest types over a wide range of sites. Exotic insects and pathogens can oftentimes cause greater mortality than native insects and pathogens because plants do not have any natural defense mechanisms to protect themselves from attack.

Three of the biggest potentially harmful exotic insects include gypsy moth, (*Lymantria dispar*), Asian longhorned beetle (*Anoplophora glabripennis*), and Emerald ash borer (EAB) (*Agrilus planipennis*). Currently gypsy moth, which was first reported in Illinois in 1973, has only become established in northeastern counties of Illinois, and there was little discernable defoliation between 2001 and 2005. Asian longhorned beetle, which was reported in 1998, is believed to be eradicated from Illinois in 2008. Emerald ash borer was detected in Illinois in 2006 and was reported in southern Missouri in 2008. Ash trees attacked by EAB show no resistance to the insect and typically die within two years after attack. Ash is an important component of Illinois' forest resource. An abundant species in woodland and riparian forests, ash is also widely planted in urban and suburban areas. The entirety of Illinois' ash resource is at risk for widespread mortality related to EAB.

Diseases caused by exotic pathogens include oak wilt and DED. Oak wilt, caused by the fungus *Ceratocystis fagacearum*, continues to be an important source of oak mortality in Illinois. All species of oak are susceptible to oak wilt, but the disease occurs more frequently and progresses more rapidly in red oak species. The incidence of DED continues to increase each year. Forty-five counties in Illinois reported moderate to heavy elm mortality in 2005. Sudden oak death is caused by the fungal-like pathogen *Phytophthora ramorum*. Susceptible species include a variety of oaks, Douglas-fir, and Rhododendron spp. (O'Brien et al. 2002). Established populations of *P. ramorum* are known to occur only on the West Coast; however, transportation of infected nursery stock has introduced the pathogen to nurseries in a number of eastern and southern states. All Illinois samples collected during the survey period tested negative for *P. ramorum*.

Decline of State Forestry Professionals

Trained forestry professionals and technical staff are responsible for providing information and assistance to private forest landowners, to cities and communities managing urban forests, and for continued tree nursery operations. Lack of access to state forestry professionals ultimately affects Illinois residents who own forested property in the state, those who enjoy and visit Illinois forests and natural areas, and industries that rely on a steady flow of wood as a raw material. The critical issue at hand is that the state of Illinois lacks a sufficient number of qualified personnel to meet the forest management needs of its citizens.

In fiscal year 2006, the Illinois State Appropriation to the IDNR represented a 22% reduction from FY 2004 and a 28% reduction from FY 2002. Staff reductions have been exacerbated by retirements. Early retirements in 2002 and subsequent budget cuts in IDNR over the past several years have reduced the Division's professional, technical, and clerical staff by 39%, 67%, and 86% respectively. Only a very limited number of these now open positions have been filled.

Decline of Forest Industry

Forest product producers and manufacturing firms comprise a small but important part of the State's economy, particularly in rural counties. The U.S. Bureau of Economic Analysis reports

that the relative contribution of paper and wood products manufacturing to the 2003 Illinois Gross State Product has followed national trends in the manufacturing sector and declined to 0.5% (2.5 billion current dollars). The 2004 Illinois Statistical Abstract reports that in 2002, Illinois forestry, logging, wood and paper manufacturing employed over 40,000, agriculture and forestry support activities over 12,000, and furniture and related products manufacturing over 20,000 people. The forestry, logging, wood and paper manufacturing categories combined had a total annual personal income and earnings value of 2.1 billion in 2002.

Nearly all of the wood-processing facilities in Illinois are sawmills processing state-grown saw logs. These mills offer woodland owners an outlet to sell timber and provide jobs in some of the State's rural areas. The demand for wood products is likely to increase, placing a greater demand on the resource. An important consideration for the future of Illinois' primary wood-products industry is its ability to retain and process the industrial roundwood harvested, leading to value-added production in the State. Currently, almost one-third of the industrial roundwood harvested in Illinois is sent to other states for processing, providing less benefit to the Illinois economy. However, there is currently no market for standing small diameter timber, as well as, few economically feasible options to collect this material after it is harvested in thinning operations. The number of sawmills within Illinois has decreased by 72% since 1961. This loss may be partly attributed to high workers compensation rates, utility rates, and taxes compared to neighboring states.

Priority areas within Illinois

Priority areas within Illinois were classified by the IFDC using the USFS S&PF Forest Stewardship Program’s Spatial Analysis Project methodology. The prioritization was based on twelve core data layers using a weighted ranking system for each layer (Figure 18; Table 2). Because of the low amount of forested cover and significant loss of forested cover over the past century in Illinois the Council classified any forested area as a high priority area (Figure 18; Figure 2). While the original prioritization did not include urban areas and public forested areas, the priority areas within this document included public forested areas.

Urban areas were prioritized using an index developed to help identify areas with relatively low tree canopy cover and high population density (high priority tree-planting areas). The index was based on three criteria:

- Population density—The greater the population density, the greater the priority for tree planting
- Canopy green space—The lower the value, the greater the priority for tree planting
- Tree canopy cover per capita—The lower the amount of tree canopy cover per person, the greater the priority for tree planting

In Illinois, priority areas for planting tend to be highest in more urbanized areas due to higher population density (Figure 19).

Overall, Illinois has a relatively low wildfire risk, and this is reflected in the weighted ranking system for priority areas developed by the IFDC. Nevertheless, some communities have begun to assess wildfire risk through the development of community wildfire protection plans (Figure 20). Makanda Township in Jackson County, Illinois is currently the only area with a community wildfire protection plan, but other areas are being considered for plan development in southern Illinois.

Table 2. Layer and corresponding weight used to develop the priority areas within Illinois.

Layer	Weight (%)
Private Forest	15.32
Riparian Corridors	12.73
Forest Patches	11.31
Wetlands	9.60
Priority Watersheds	9.09
Developmental Pressure	8.59
T & E Species	6.97
Drinking Water Supply	6.87
Proximity to Public Land	6.67
Forest Health	6.46
Topographic Slope	5.45
Fire Risk	0.91

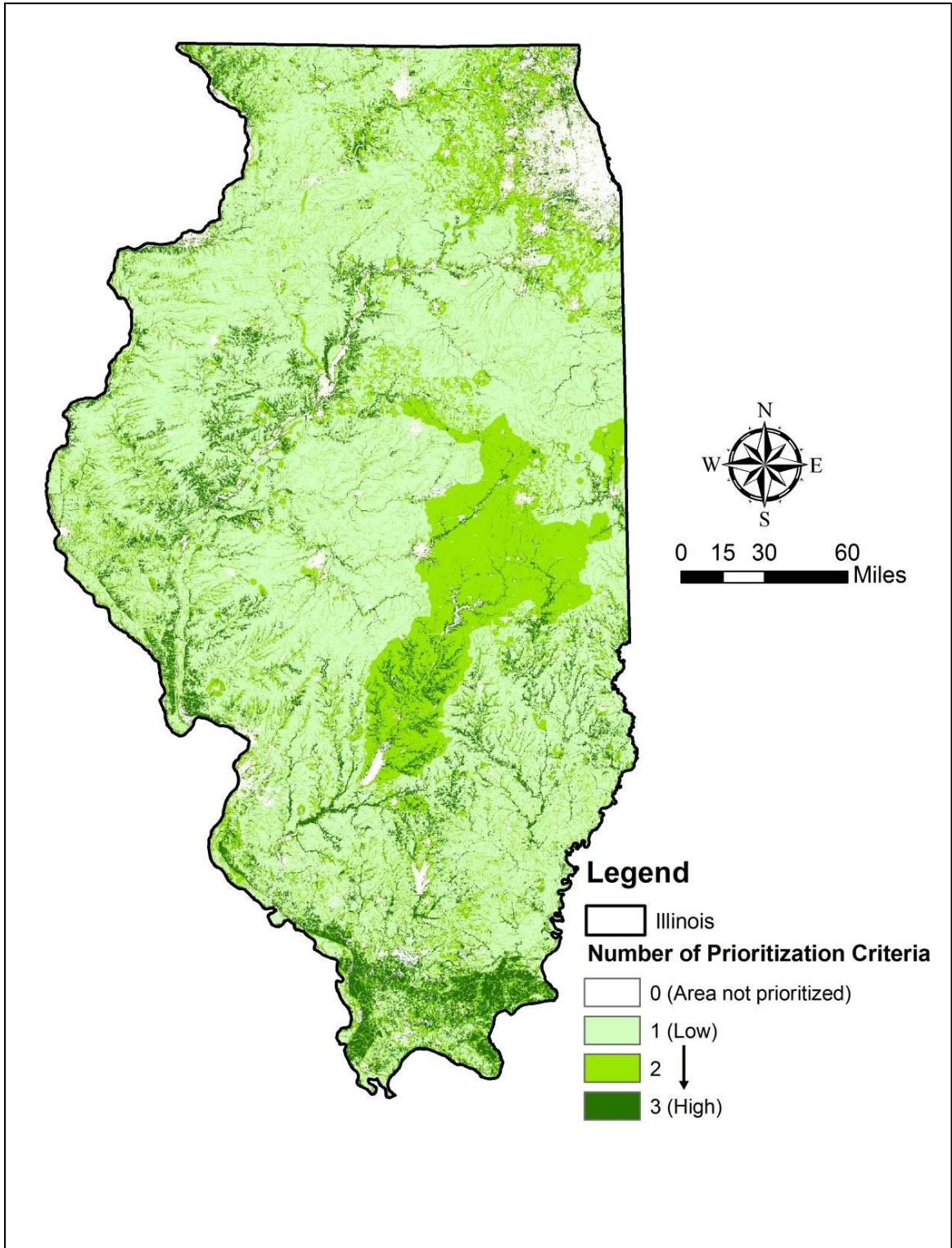


Figure 18. Priority areas within Illinois as determined by the Illinois Forestry Development Council. The darker the color the greater the priority.

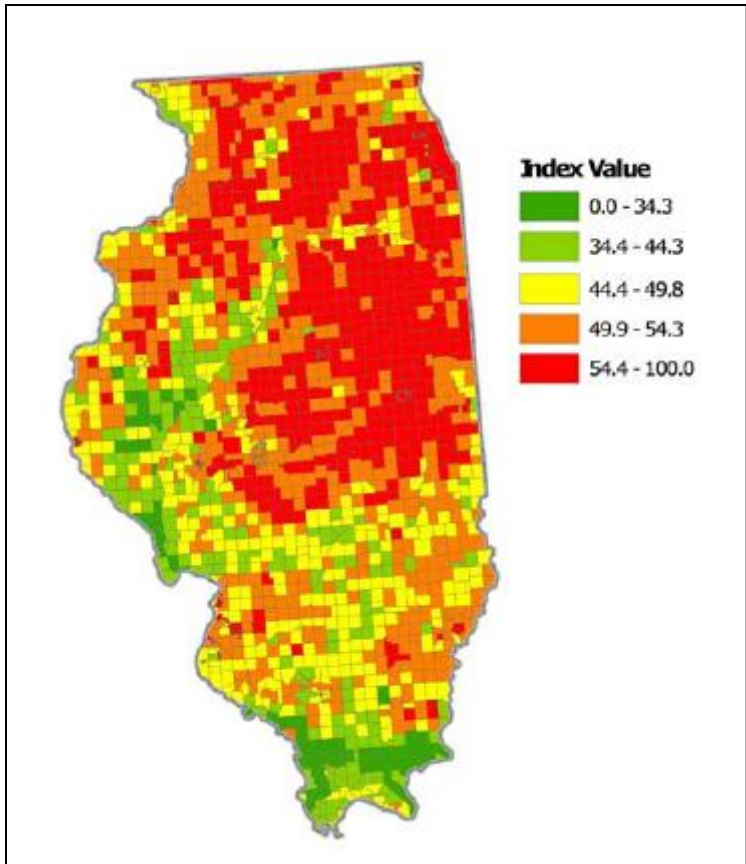


Figure 19. Planting priority index for county subdivisions. The higher the index value, the greater priority for planting.

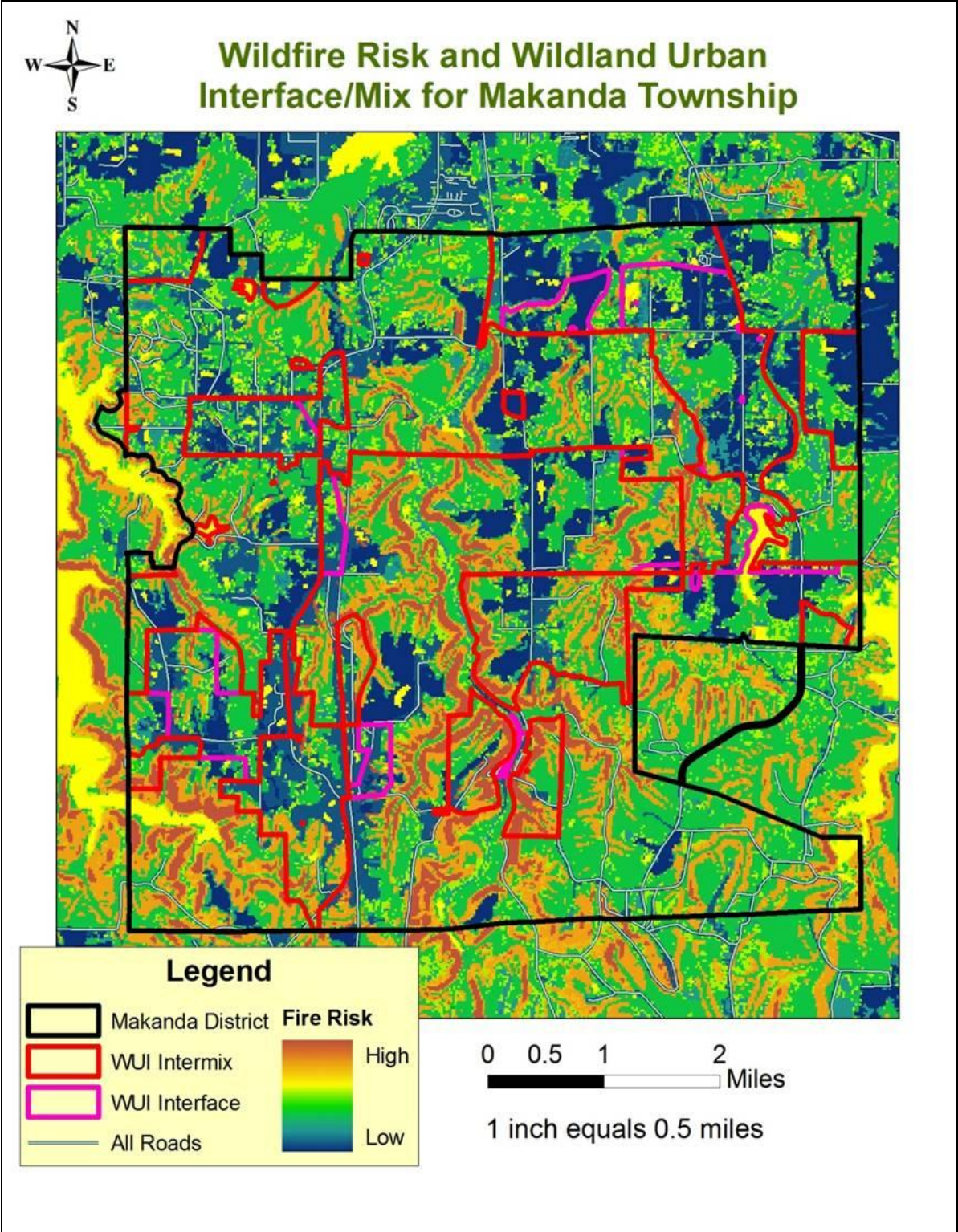


Figure 20. Map of Makanda Township Wildfire Protection Plan. The color red represents areas with the greatest fire risk.

Priority areas within Midwest region

Illinois is a part of several other regional priority areas and issues in the Midwest region identified by state planners during a series of webinars held in spring of 2010 (Table 3). For example, within the Upper Mississippi Watershed of the Midwest region, several subwatersheds have been classified as high priority by the Upper Mississippi River Partnership and the USFS Northeastern Area S&PF. These watersheds were selected because they showcase forest stewardship practices that improve water quality and wildlife habitat. In Illinois, the Cache and Lower Illinois-Lake Chautauqua watersheds were ranked at the highest priority level, while the Apple Plum and Cahokia-Joachim were ranked at the second highest priority level (Figure 20).

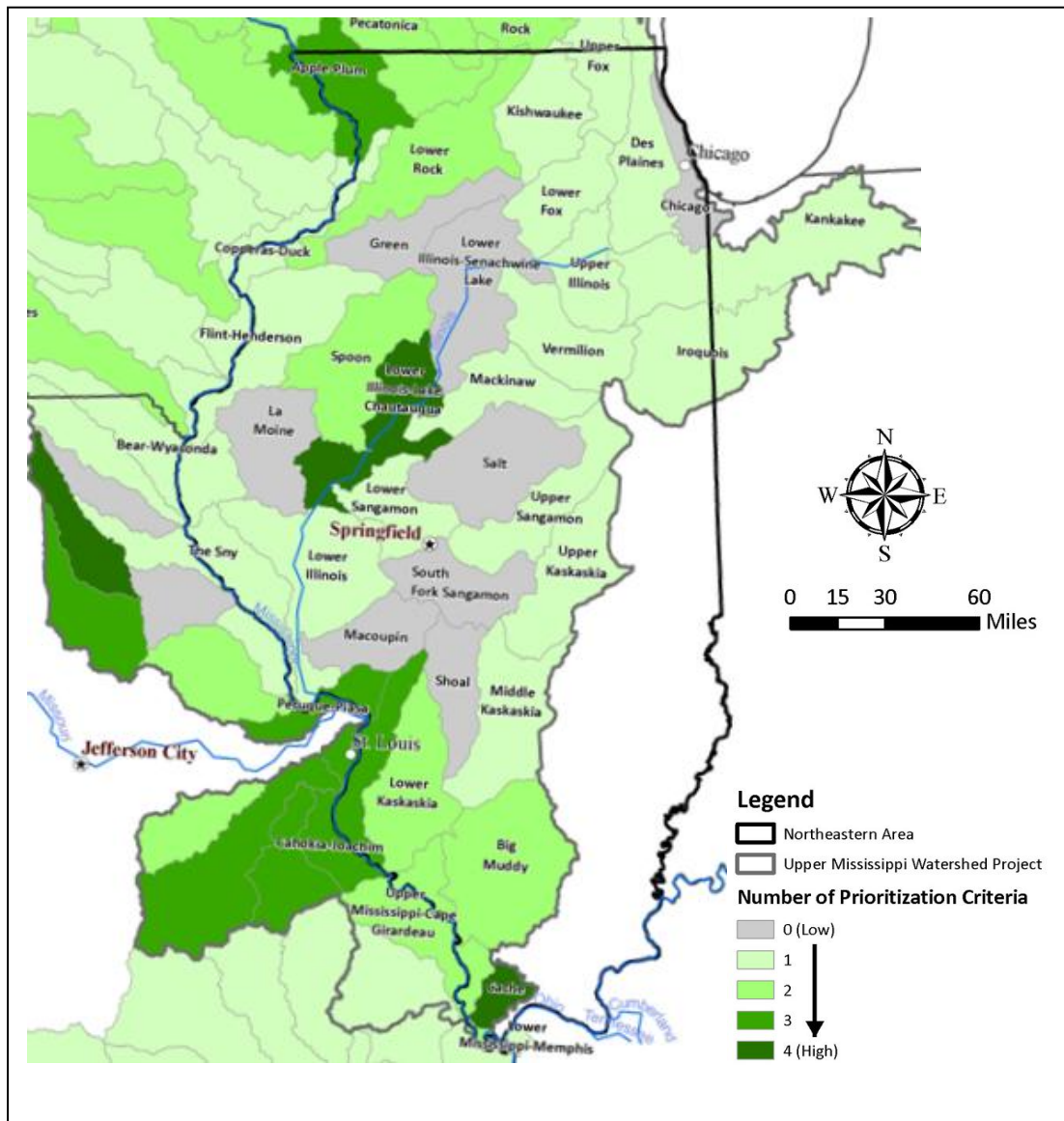


Figure 21. Priority areas within the Upper Mississippi Watershed as determined by the Upper Mississippi River Partnership and the USFS Northeastern Area S&PF.

Table 3. Regional priority areas and issues associated with Illinois identified by state planners during a series of webinars held in spring of 2010

Name	States	Issue/Description
Climate change	IL, IN, IA, MI, MN, MO, WI	How will potential changes in climate affect forests resources in the future.
Driftless area	IL, IA, MN, WI	Unique ecology & forest resource - heavy development pressure.
Ecosystem services	IL, IN, IA, MI, MN, MO, WI	Ecosystem services often lack a formal market and these natural assets are traditionally absent from society's balance sheet; their critical contributions are often overlooked in public, corporate, and individual decision-making.
Wildfire risk	IL, IN, IA, MI, MN, MO, WI	Where wildfire risk is identified as a critical issue, planning and management are needed to reduce a relatively high risk of wildfire.
Forestation- Reforestation	IL, IN, IA, MI, MN, MO, WI	Many forest-types are becoming increasingly harder to maintain and/or regenerate due to a variety of factors including climate, disease, insect activity, deer herbivory, and invasive plants to name a few.
Invasive species	IL, IN, IA, MI, MN, MO, WI	Non-native invasive species have the potential to reduce forest diversity and cause huge economic and ecological damage to forests.
Great Lakes Regional Collaborative	IL, IN, IA, MI, MN, MO, NY, OH, PA, WI	GLRC was assembled as a collective group of stakeholders to develop a strategic plan for the restoration, protection and sustainable use of the Great Lakes.
Karst Topography	IL, IA, IN, MO, KY	Porous landscape can lead to poor water quality.
Upper Mississippi	IL, IN, IA, MN, MO, WI	Water pollution, loss of migratory bird habitat, forest loss and fragmentation.
Major watersheds that cross state boundaries	IL, IN, IA, MI, MN, MO, WI	All units of governments-federal to local-ultimately implement programs at a state or local level, so addressing resource concerns that cross state boundaries is challenging.
Promoting sustainable active private forest management	IL, IN, IA, MI, MN, MO, WI	The vast majority of private forestlands are unmanaged, undermanaged, or mismanaged representing a untapped resource of timber, fiber and associated forest-related employment opportunities.
Sustaining forest industry and markets	IL, IN, IA, MI, MN, MO, WI	The loss of forest products industries and markets constrains opportunities to manage forests and diminishes options for the production and enhancement of an array of ecosystem services.

Statewide Forest Resource Strategy

Detailed description of statewide forest resource strategies are listed below. In addition, a strategies matrix is also presented (Table 4) that summarizes in following information. Similar to the ‘Threats to forest lands and resources’ section of this document, the Illinois Comprehensive Wildlife Conservation Plan & Strategy also identified a number of the same strategies (goals) to improve forest resources in Illinois (Appendix B).

Decline of Oak Dominance

One of the most promising ways identified to increase forest biological diversity, not only of tree species but also of ground-cover vegetation, is to intensify canopy disturbances, midstory control and re-introduce fire into the system. Many of the oak dominated forest types are presently in decline due to a legacy of management that emphasized little disturbance and no or highly selective removal of valuable timber. Reintroduction of fire into Illinois forests is increasingly gaining recognition as a key component of maintaining desired ecosystems. However, additional disturbances are also necessary under many circumstances. Any meaningful statewide strategies geared toward addressing declining tree species diversity must put implementation of canopy, subcanopy and understory disturbances front and center.

Research in Illinois and elsewhere suggests no cutting or partial cutting without timber stand improvement (TSI) practices, with or without fire, results in an impoverished oak component. Particularly impacted oak species include black oak, scarlet oak, southern red oak. Limited deployment of TSI is furthering the transformation of oak-dominated forests to those of mesic species composition, even on lands where active management is underway. Decline of bottomland oak species, particularly pin oak similarly suggests a loss of conditions associated with development of these highly disturbance dependent species. Simulation of large-scale canopy and soil disturbances associated with maintenance of these species are dependent on a good understanding of specific site conditions that may have changed from the development of presently declining stands. These may include changes in flooding, presence of interfering vegetation, grazing influence, and past fire.

Declines of additional tree species have also been noted, including shortleaf pine, sassafras, dogwood, persimmon, cottonwood, and aspen. These species and their associates are typically short-lived and disturbance dependent. Maintenance of these species would benefit from Cutting regimes that are more aggressive than are now typically used.

Full funding of incentive programs is needed to encourage private landowners to undertake, TSI, burning, and other beneficial stewardship activities. Funds collected from the state timber sales tax must be made fully available to interested landowners.

The Southeastern Illinois Prescribed Burn Association is a pioneering cooperative effort between non-industrial private forest landowners and state agencies that is showing promise in reversing plant biodiversity declines. Similar efforts should be encouraged throughout forested lands in

Illinois under leadership of state district foresters. Expansion of incentives for landowners to develop and implement forest management plans incorporating TSI and fire or fire surrogates on upland sites would create a mosaic of light conditions in forest understories to maintain diversity and, in some cases, reverse the diversity losses that have already occurred.

Coordination with game management interests is necessary to pursue tree species biodiversity maintenance. Most species in decline have considerable value from game and non-game wildlife. This linkage needs to be emphasized to policy makers, managers and landowners to demonstrate how management to enhance tree biodiversity is good wildlife habitat management.

Disturbance dependent species require more intensive forest operations than are now typical. Strengthened markets for small, poorly formed, or decadent trees that interfere with regeneration are key to getting more light to forest understories and more necessary disturbance of forest soils. Expanded utilization options would encourage more acres to be treated with greater intensity and create conditions needed for early successional species to assume a more appropriate balance of the total forest cover. Heavier utilization of these materials would allow forests to contribute more of their potential value to the economic well-being of the state and its constituent communities. The State of Illinois, through IDNR, could serve as a statewide leader by demonstrating stewardship practices that enhance biodiversity on state forest lands and appropriate areas of rural parks. Educational programs on the essential role of disturbance, including fire, in Illinois forest ecosystems targeted for private forest landowners need to be developed emphasizing the importance of disturbance in the maintenance and restoration of desired forest traits. Incorporating a full appreciation for the legacy of human activities on forest ecosystem function and composition should be incorporated into education curricula at all levels.

Changing Forest Landscape Dynamics

Shrinking ownership size and shortened land tenure is a concern throughout the forested United States. This phenomenon impacts landowner ability to sustain forest benefits and decreases the likelihood of undertaking active forest management. Where this is occurring, programs geared toward encouraging voluntary coordinated management across ownerships could increase the positive impacts of forest management. Property tax and zoning policies that encourage good forest stewardship need to be developed and propagated to encourage sound utilization and stewardship practices. Property tax relief and incentives should be pursued in critical areas to keep more forest in 'forest.' Within urbanizing areas, amenity values of forests can be preserved and enhanced through regional land-use planning that encourages conservation of greenways, riparian areas and, where appropriate, wildlife travel corridors. The importance of a viable forest products industry to maintaining forestry as a preferred land use and reducing fragment size cannot be overstressed. Outreach program that respond to the evolving interests and priorities of the land ownership base must be expanded.

Decreased Forest Health

Invasive species management is a concern among Natural Heritage, Wildlife and Forestry interests. Cooperative weed management programs, such as is being enacted through the River

to River Cooperative Weed Management Area should be replicated through the state. On many sites, invasive plant species management will go hand in hand with other management practices. Preventing further invasions will require continued early detection and intervention efforts including information dissemination to public employees, private enterprises and the public. Research, educational materials, and volunteer coordination by Illinois Natural History Survey scientists play critical roles in this effort. Adequate funding and staffing must continue for the interdisciplinary IDNR Invasive Species Working Group. An integrated approach to exotic species control tailored to local conditions is warranted. Just as support for TSI comes from funds generated by the timber tax, landowners who harvest timber should be able to recoup severance tax payments to support invasive species management practices in situations where both exotic and native invasives threaten the long-term sustainability of timber production

Decline of State Forestry Professionals

As awareness of forest stewardship and incentive programs grow, the demand for a professional state support system will be greater than ever. Eligibility requirements for landowner assistance programs often specify approved forest management plans. The need for more educational programs that explain the mechanics of oak regeneration, prescribed burning, habitat fragmentation amelioration, water quality improvement, and incentive program enrollment cannot be met without the personnel to teach them.

The IFDC continues to highlight the essential role of state professional foresters in Illinois and to raise awareness of forestry in urban and rural communities across the state. Without adequate levels of staffing, forest resource conservation in our state will suffer serious setbacks. Increasing the number of forestry professionals and technical personnel must be the first step in reestablishing a win-win relationship that ensures the vitality and productivity of Illinois forests.

The IFDC and Illinois Forest Landowners Association have advocated for full staffing of IDNR district forestry personnel, increased support for forestry extension, and improved collaboration between state, local, and federal natural resources management agencies and organizations. Initiatives to encourage partnerships among agencies and organizations within the forestry community will be necessary to address this need and prevent duplication of effort. State support for university-based outreach and extension efforts, such as the Illinois Virtual Forest, must be maintained. Educated citizens become land stewards. By educating Illinois citizens about forest health and sound management practices, we protect both market and non-market values of Illinois forests for citizens, communities, and the state today and in the future. Illinois forest landowners would benefit from an expanded pool of knowledgeable individuals to provide forest management services needed to effectively undertake active stewardship and its attendant economic benefits.

Efforts to establish regional landowner associations to support more effective information dissemination need to be pursued. Illinois' increasing number of private forest landowners has also created a situation in which many landowners are unaware of the value of their timber and how, with a professionally prepared management plan, it can be harvested in an environmentally responsible manner. Expanded use of state and other public lands and public-private cooperation

to demonstrate good land stewardship practices would be a key resource for private landowners seeking to undertake similar measures on their own land. Further, integration of forest stewardship and deepening the understanding of human-forest interactions through school curricula and interpretive efforts to all ages and audiences would strengthen public support for beneficial management activities. Cooperation with other land management agencies and interests and promotion of education programs such as the American Forest Foundation's Project Learning Tree should be pursued to broaden public understanding of forest management.

Decline of Forest Industry

Illinois is forfeiting most of its forest generated wealth to adjacent states by discouraging the development of a vibrant wood products sector. Funding of tree species diversity and forest wildlife habitat enhancement as well as invasive species management programs should naturally come at least in part from the valuable products that may be derived from Illinois forests. Legal and institutional supports are needed in order to develop an industry that matches the quality of the resource.

The number of primary wood-using firms in Illinois has sharply declined due to comparatively high workers' compensation and unemployment insurance rates, as well as energy and transportation costs. This unfavorable business climate for wood products harvesting and utilization must be addressed. Illinois timber to leave the state to be processed. Institutional technological and marketing support for the forest products industry is at an all time low with the failure to replace retired wood products faculty in the forestry programs at University of Illinois and Southern Illinois University.

Some chronic problems that could support an industry within the Illinois forest sector first need to be addressed. Many Illinois secondary wood-using firms remain unaware that quality Illinois hardwoods are available. No central market exists to bring buyer and seller together. Participation in voluntary certification programs such as the Sustainable Forestry Initiative Program of the American Forest & Paper Association should be explored.

State and county economic development programs should increase support for forest-based industries. Assistance to increase marketing capacity, improve access to financing and capital, and revise taxation formulas will be necessary to stimulate entrepreneurial business development in the Illinois forest products industry.

To add value to material once regarded as waste, Illinois will need to investigate new technologies and new markets for waste wood. An innovative California initiative partnering public agencies, private enterprises, and university researchers is demonstrating the potential of portable band sawmills and dehumidification dry kilns to produce high grade lumber from trees removed from urban forests across the state. The Wisconsin Division of Energy is evaluating alternative programs for estimating the potential of urban wood waste as commercial/institutional heating fuel. Wisconsin recommends state-level incentives to attract potential demonstration projects and targeted marketing to specific types of businesses within range of available resources.

Public-private partnerships and state or regional integrated waste management programs will be needed to increase the rate of waste wood recovery and bring it to market in Illinois. As interest in managing urban and community forests grows in Illinois, it will be important to view urban trees as versatile assets.

Table 4. Strategic matrix of Illinois Forest Resources

Threat to forest resources	Strategies to mitigate threats to resources	Contributing programs¹	Resources required	Supporting National objective²
Decline of oak dominance	Increase TSI efforts (with and without fire) Link oak dominance to wildlife habitat Expanded utilization of harvested material	FDA, EQUIP, SIPBA	Federal funding through USFS & NRCS State funding through IDNR and collection timber harvest tax	Objective 1.1 Objective 1.2 Objective 2.1 Objective 3.5
Changing Forest Landscapes	Property tax relief for forest landowners Encourage greenspace in urban areas Encourage development and maintenance of riparian zones	FDA,CRP, CREP, FLP	Federal funding through USFS & NRCS State funding through IDNR and collection timber harvest tax	Objective 1.1 Objective 3.1 Objective 3.5
Forest Health Decline	Development of cooperative weed management programs Monitor for presence of exotic insects and disease	CWMA, APHIS	Federal funding through USFS, NRCS, & APHIS State funding through IDNR and collection timber harvest tax State funding for IDNR	Objective 2.2 Objective 3.6
Loss of State Forestry Professionals Decline of Forest Industry	Seek to restore IDNR –Division of Forestry Funding Lower tax rates & workman compensation Increase product research development		Change of IL legislation	Objective 3.4

¹List of contributing programs acronyms listed in Appendix C

²List of national priorities and objectives listed in Appendix D

Appendix A.

Challenges of the Illinois Department of Natural Resources according to the 2005 Illinois Comprehensive Wildlife Conservation Plan & Strategy - Version 1.0.

1. Increase the percentage of Illinois' lands which are not plowed, paved, drained, or landscaped.
2. Increase the quality of Illinois' natural lands as measured by their ability to support robust (abundance and richness) communities of native plants and animals.
3. Improve the capacities of Illinois' agricultural and urban lands to support populations of native fish and wildlife. Increase access to Illinois' lands and waters for outdoor recreation purposes.
4. Meet or exceed recreational and commercial demands upon Illinois' plant and animal populations.
5. Restore populations of plant and animal species that have become rare or are declining.
6. Eradicate, control, and prevent the introduction of invasive exotic species.

Appendix B.

Goals for improving forest habitat according to the 2005 Illinois Comprehensive Wildlife Conservation Plan & Strategy - Version 1.0.

1. Implement sustainable forestry practices, including timber stand improvement, prescribed fire, timber harvesting and invasive species control to enhance oak-dominance and maintain understory diversity on 1 million acres of forest.
2. Increase statewide forest acreage by 350,000 acres, emphasizing restoration of floodplains and riparian corridors, increasing ecological connectivity among forests and other habitat patches, and reducing fragmentation of forests 500 acres and larger.
3. High-quality examples of all forest communities, including all Grade A and B Illinois Natural Areas Inventory sites, are restored and managed within all natural divisions within which they occur.
4. Urban forests are healthy and well-maintained.

Appendix C.

Contributing programs and acronyms used in Table 4.

Program	Acronym
Animal and Plant Health Inspection Service	APHIS
Conservation Reserve Program	CRP
Conservation Reserve Enhancement Program	CREP
Environmental Quality Incentives Program	EQIP
Forestry Development Act	FDA
Forest Legacy Program	FLP
River to River Cooperative Weed Management Area	CWMA
Southeastern Illinois Prescribed Burn Association	SIPBA

Appendix D.

State and Private Forestry National Priorities and Objectives*

1. Conserve Working Forest Landscapes

- 1.1. Identify and conserve high priority forest ecosystems and landscapes
- 1.2. Actively and sustainably manage forests

2. Protect Forests from Harm

- 2.1. Restore fire-adapted lands and reduce risk of wildfire impacts
- 2.2. Identify, manage, and reduce threats to forest and ecosystem health

3. Enhance Public Benefits from Trees and Forests

- 3.1. Protect and enhance water quality and quantity
- 3.2. Improve air quality and conserve energy
- 3.3. Assist communities in planning for and reducing wildfire risks
- 3.4. Maintain and enhance the economic benefits and values of trees and forests
- 3.5. Protect, conserve, and enhance wildlife and fish habitat
- 3.6. Connect people to trees and forests, and engage them in environmental stewardship activities
- 3.7. Manage and restore trees and forests to mitigate and adapt to global climate change

* These national objectives were approved by the S&PF Redesign Implementation Council and by NASF, Sept. 2008

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