

8.0 Priority Forest Landscapes

Identifying and prioritizing forest areas that are important to the people of Iowa is a challenge. Forest areas have been prioritized using the following assumptions:

1. the data that is important for deciding which areas are important is available at a scale that is useful;
2. the important issues that can't be displayed geospatially are not included in this evaluation;
3. deciding at what scale the data will be displayed to show where priority forested areas are in the State.

Even though not all forested areas are listed as a priority, that does not mean those forests are not important to the owners of those forests or to the DNR Forestry Bureau. However, with limited and shrinking financial resources and a decreased State general fund investment in forestry, the Forestry Bureau must focus its limited resources in targeted areas. In effect the Bureau must prioritize to where it can get the biggest return on investment of federal and state dollars.

8.1 Rural Forest Priority Areas

Portions of the state that were excluded from the analysis were urban community areas and open water. Public lands were included.

The way the rural forest priority areas were determined was by looking at 15 different factors for which there was data available. The forest stewardship committee weighted the importance of each factor to allow a GIS specialist to create a composite map that displays where forested areas had the most factors in common.

For each factor the most recent, highest resolution data available was used. Higher resolution data allowed for far more precise areas to be defined within the analysis area.

The 15 factors included in the analysis were developed from issues described earlier in this assessment. The factors are listed with the figure they relate to and were discussed earlier in the assessment.

Weighting applied to the 2009 Forest Priority Map

Criterion	Weight (%)	Figure
Forest Soils	18	4.9
Forest Wildlife	18	1.56
Existing Forest	13	1.3
Forest Patch Size	13	1.42
Proximity to Public Land	13	1.16
Priority Watersheds	7	4.6
Topography (Slope)	4	4.11
Development Risk	3.15	1.25
Riparian Corridor	3	4.3
Pest/Disease (Morality)	2.1	3.15
Forested Wetlands	2	4.2
Oak Regeneration	1.4	1.32
Forested Landscapes	1	1.44
Historical Forest	1	1.2
Wildfire Risk	0.35	3.24

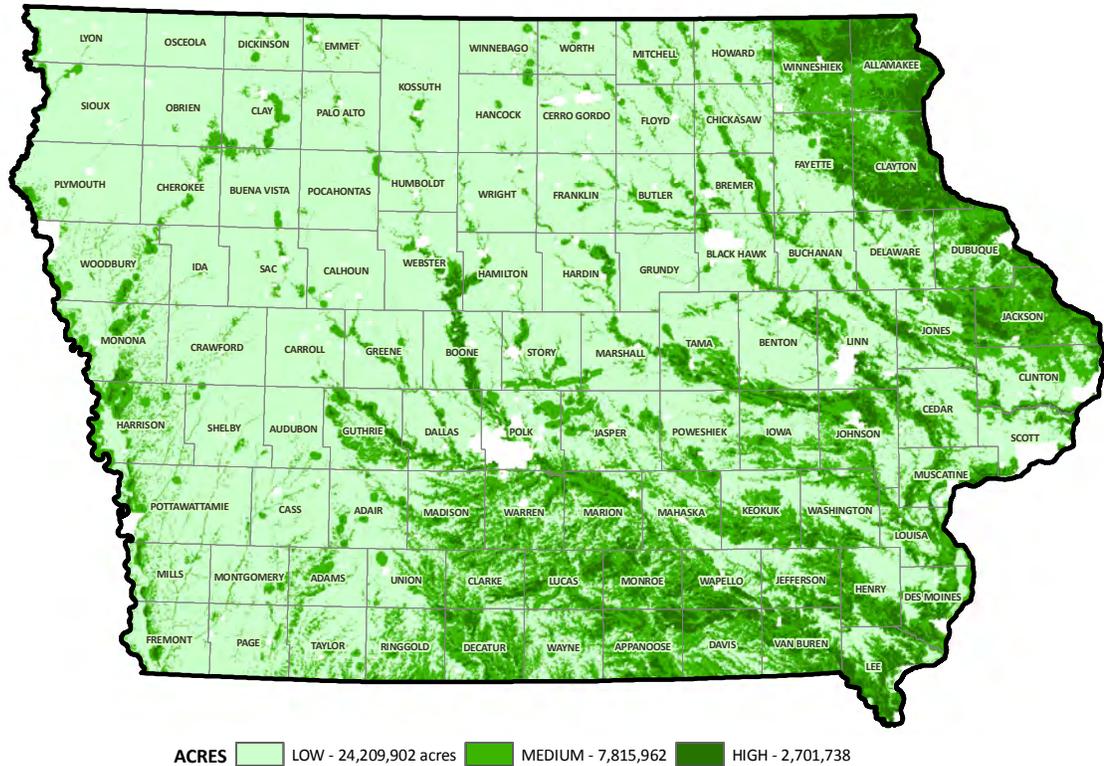
When ranking the factors, one was considered the most important and 15 the least important. A mean response value was calculated for each factor which was then subtracted from the highest possible rank (15). The inverse response values generated were then weighted by dividing each by the sum of the inverse response values.

All analysis components were converted to 15 meter pixel ESRI GRIDS for the same spatial extent (used Iowa land cover 2002 clipped to the Iowa border as a spatial reference). The 2009 GIS computation used the final GRID having a low (0-0.14), medium (0.15-0.41) and high rank (0.42-0.98).

Composite Rural Priority Map

Combining all of the 15 maps described above into one overall priority map for determining forest areas of the state with the most issues in common results in the rural priority map.

RURAL FOREST PRIORITY



Source: Kathryn Clark.

This composite map shows there are 2,701,738 acres in Iowa with high potential for forest stewardship based on 15 attributes for where forest cover would not only thrive, but would be the preferred vegetation cover. Within the high potential growing area there is already 1,889,489 (63.1%) acres of forest growing on those acres. Within the areas forested in the high potential area there are 76,983 (2.8% of the area) acres that have Stewardship Plans written to guide these landowners on how to manage these resources.

There are 7,815,962 acres with medium potential for forest stewardship. Within the medium potential growing area there is 34,948 (7.7%) acres that are currently forested. Within the acres that are forested in the medium area there are 50,384 (0.6%) acres that have a Stewardship Plan.

In the low priority area there are 24,209,902 acres that are less suited for forest stewardship, although these areas could still grow high quality trees. Within that area there is 7,342 (0.03%) acres that are currently forested. Within the acres that are forested in the poor area there are Stewardship plans written for all of the acres.

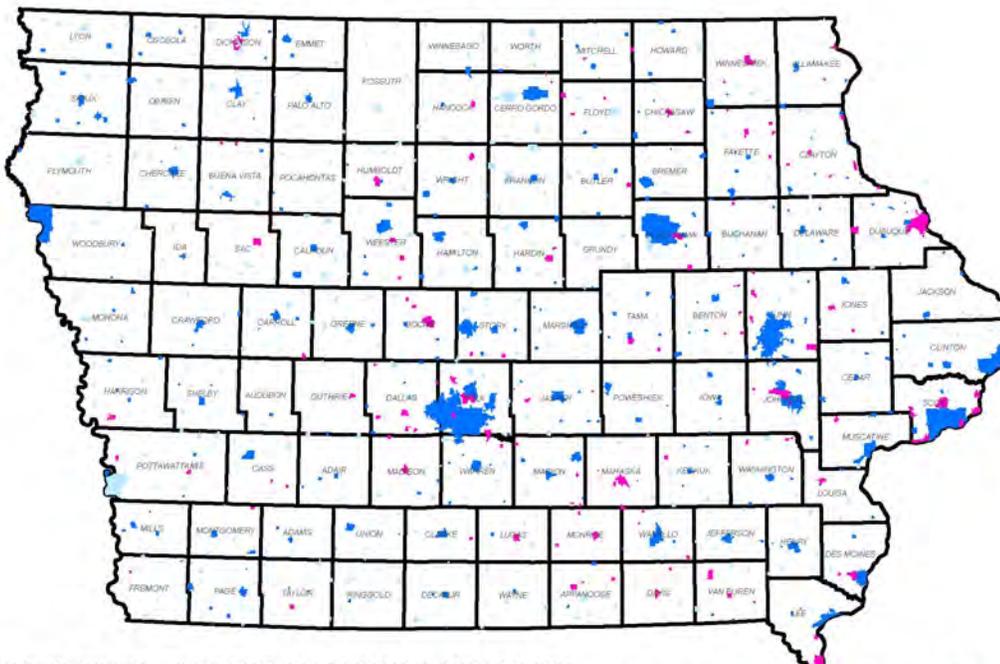
8.2 Urban Priority Areas

Prioritizing communities for assistance is a moving target. Community leaders, budgets, threats to the trees and advocates within a community can change from one year to the next making opportunities come and go depending on the situation for that community.

The Urban Forest Priority map uses figures that were developed around urban issues as described in Chapter 1. The map was developed by equally weighting the data from communities participating in Tree City USA (Figure 1.19), urban tree canopy using the Maryland method (Figure 1.26), towns ranked by percent forest canopy (Figure 1.27), community populations (Figure 1.20), surface water sources that communities depend on for drinking water supplies (Figure 1.24) and community growth into existing forest (Figure 1.22).

The communities on the composite map are designated to receive priority assistance for tree inventories, management plans, focused residential tree planting and planning. The goal is to work with community leaders to effectively create policies that improve the condition of the tree resource for the community. They are also areas where limited resources will be focused in an effort to make the largest impact with the limited amount of personnel and money available to service communities. This map does not mean other communities will not receive assistance when requested, rather it means attention will be focused on the issues in the communities in Figure 1.28 and the map will continue to be refined as conditions change. The criteria that went into developing this map emphasize working with communities already existing forest resource, to allow better management for the many benefits those trees are already providing those communities. The 140 high ranking communities are listed in Appendix D.

Urban Forest Assessment



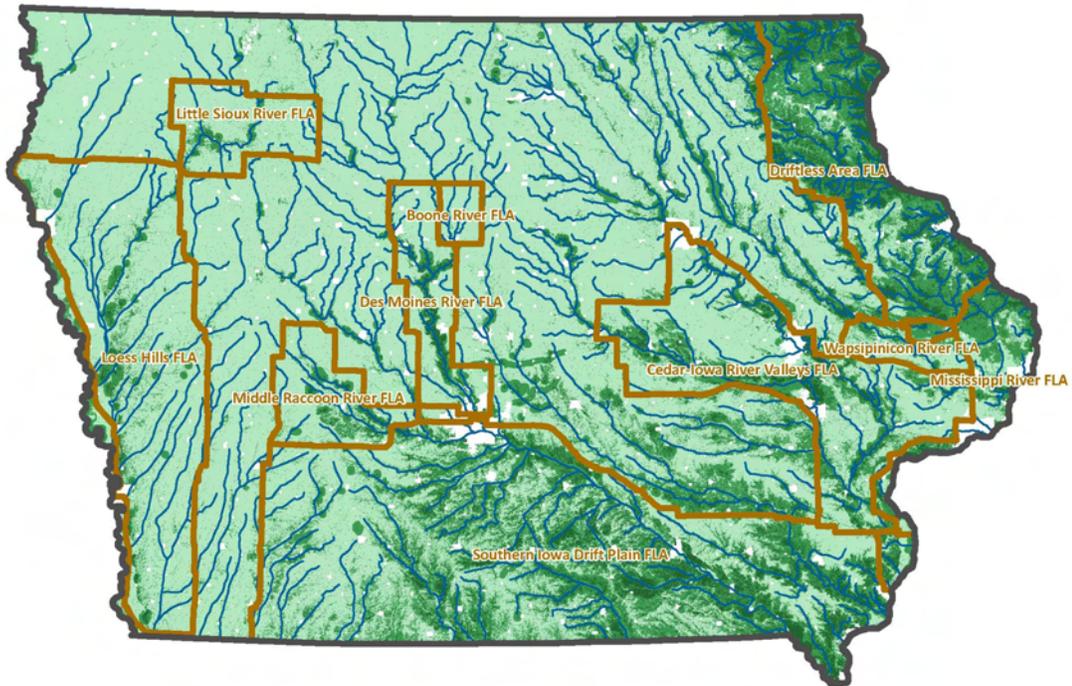
All urban forestry parameters were added together to arrive at a final score for each 15 meter pixel in urban centers. Pixel scores ranged from 0 to 500. Pixels were then associated with their respective towns. Each town was ranked based on the percentage of pixels falling into categories: HIGH towns had greater than 50% of their total pixels at 400 or above; LOW towns had 75% or more of their pixels between 0 and 300; MEDIUM towns had less than 50% of their pixels scoring 400 and less than 75% scoring at 300 or below.

Rank	Number of Towns	Percent of Towns	RANK
HIGH	140	15%	■ HIGH
MED	317	33%	■ LOW
LOW	497	52%	■ MEDIUM

Source: Kathy Clark.

8.3 Forest Legacy Priority Areas

Detailed descriptions for each of the seven Forest Legacy Priority Areas recommended by the Iowa Forest Stewardship Committee are described in Appendix C. The priority areas are shown in the forest legacy priority map below. The seven legacy areas are distributed across Iowa and cover several natural regions of the state.



Source: Kathryn Clark.

8.4 Multi-State Priority Areas and Issues for Iowa

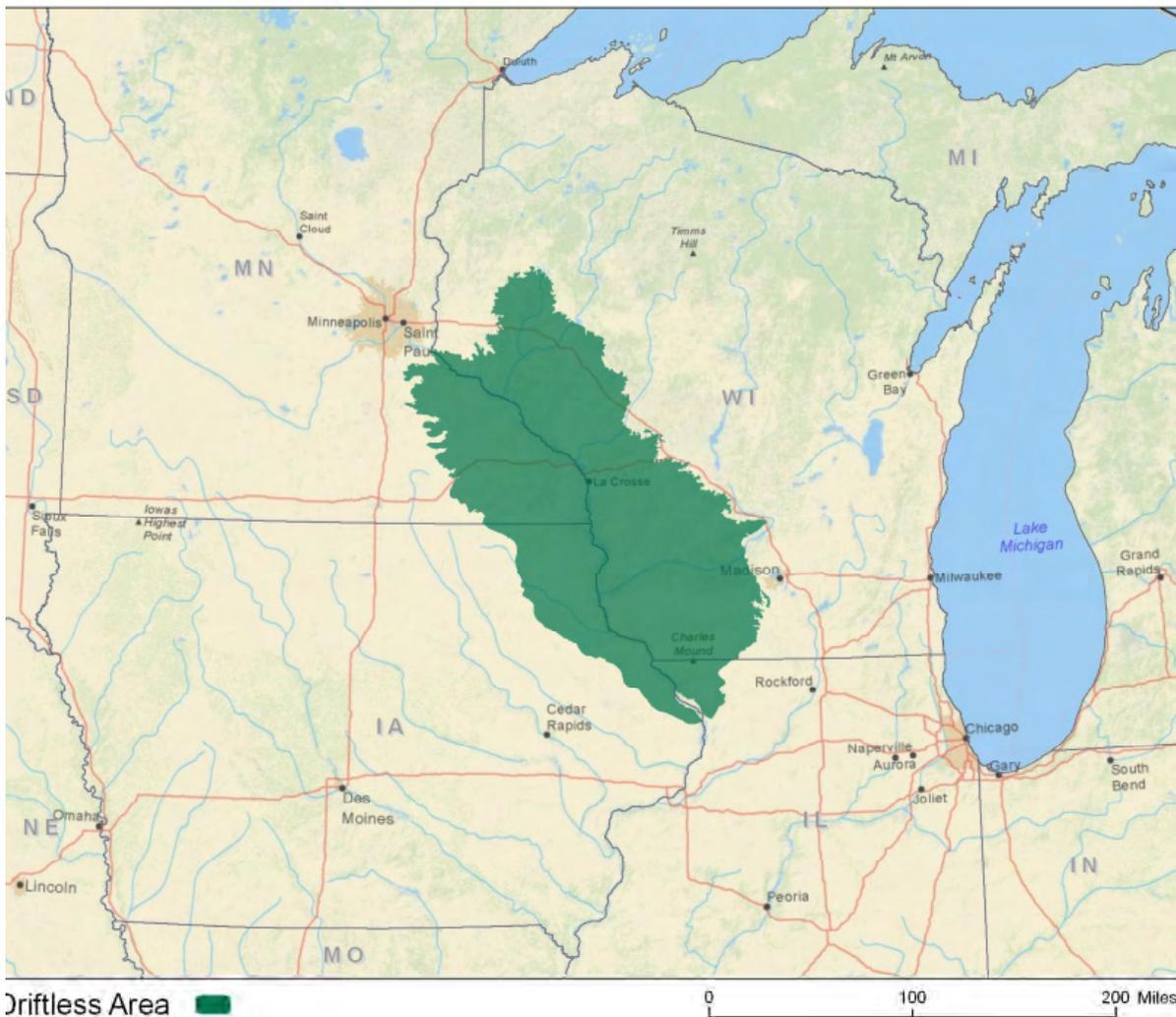
Multi-State Priority Areas and Landscapes

The following areas describe potential conservation areas that Iowa has in common with other states to work on as multi-state projects when policies, stakeholders and funding allow.

The Driftless Area

This is an area that is characterized by a common geologic land form. Steep terrain has allowed much of this area to remain in permanent vegetation.

States: Illinois, Iowa, Minnesota, Wisconsin; see map below for boundary.



Driftless Area ■

Issues Associated with the Area

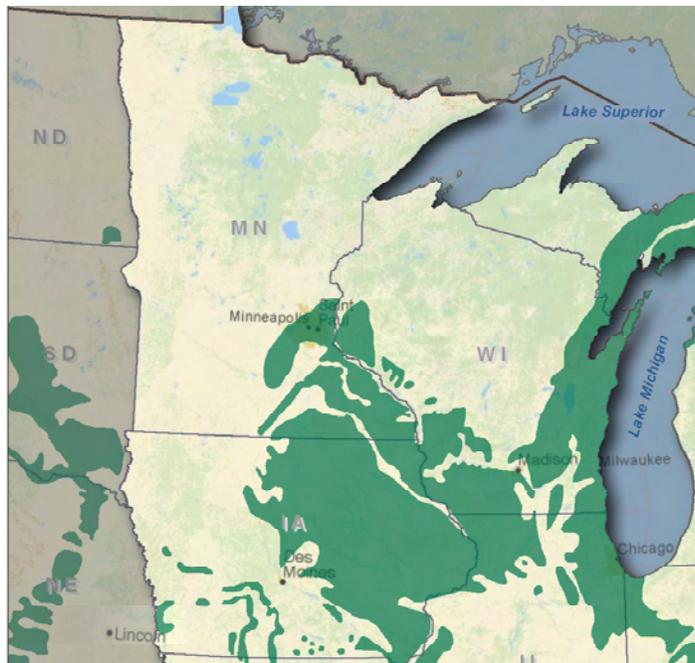
- Cold water, spring fed streams that are sensitive to non-point source pollution due to the karst geology.

- Maintenance of a high value forest resource that attracts tourist to the area each year for a variety of recreational activities.
- Forest fragmentation and parcelization is reducing forest-interior bird habitat.
- Lack of forest management related to limited wood markets.
- Forest invasive plants decreases sunlight to understory plants. As the native plants die, bare soil on steep slopes causes soil erosion

Karst Topography

Area with a geology of limestone or other soluble rock that is characterized by caves, sinkholes, and sinking streams.

States: Illinois, Indiana, Iowa, Missouri, Nebraska, South Dakota; see map below.



Issues Associated with the Area

- The porous landscape prevents adequate filtering of water that usually takes place through soil layers. Therefore, groundwater quality is greatly threatened by the type of land use occurring. The loss of forest land in this area and the lack of forest management have led to water quality problems in this region.
- Karst areas contain a large number of protected or sensitive species, usually associated with caves. Lack of forest management activities is a concern for the forest habitats of this area.

Upper Mississippi Watershed

All of the watersheds that drain into the Mississippi River in the upper Midwest are included as priority areas.

States: Illinois, Indiana, Iowa, Minnesota, Missouri, Wisconsin; see map below for boundary.



Issues Associated with the Area

- **Water Pollution--Sediment, nitrogen and phosphorus are the main pollutants in the Upper Mississippi watershed. A significant portion of sediment, nitrogen and phosphorus loads in the Mississippi River comes from human activities: runoff and groundwater from farming, discharges from sewage treatment and industrial wastewater plants, and storm water runoff from city streets. The delivery of high amounts of nitrogen to the Gulf of Mexico causes a hypoxia zone (abnormally low levels of dissolved oxygen in bottom waters) to expand each summer. About 90% of the nitrate load to the Gulf of Mexico comes from nonpoint sources, and over 31% of that load comes from the Upper Mississippi River.**
- **Loss of Migratory Bird Habitat--The north-to-south orientation of the Upper Mississippi River and its contiguous habitat make it critical to the life cycles of many migratory birds. It is a globally important migratory flyway for 40 percent of all North American waterfowl and 60 percent of all the bird species in North America. The loss of more than 50% of historic floodplain and valley hardwood forests creates a problem for many waterfowl, raptors, songbirds, and shorebirds.**
- **Forest Loss and Fragmentation--Forests and prairies are the most beneficial land uses in the Upper Mississippi River Basin in terms of protecting watersheds and water quality. Nearly all of the prairies and about 70 percent of the forest land have been converted to agriculture and urban land uses. The remaining forest land is critical to watershed**

health and clean water. The ability of forests to produce abundant clean water declines as they are broken up (fragmented) and eventually lost. Fragmentation is a process where large, contiguous forest landscapes are broken into smaller, more isolated pieces, often surrounded by human-dominated uses. The loss and continued break up of forest land increasingly impairs water flow and quality, forest health and diversity, and other economic and recreational benefits.

Multi-State Priority Issues

The issues described for the remaining of this section describe potential conservation projects that Iowa has in common with other states to work on when policies, stakeholders and funding allow.

Ecosystem Services

Healthy forest ecosystems are ecological life-support systems. Forests provide a full suite of goods and services that are vital to human health and livelihood, natural assets referred to as ecosystem services.

Many of these goods and services are traditionally viewed as free benefits to society, or “public goods” - wildlife habitat and diversity, watershed services, carbon storage, and scenic landscapes, for example. Lacking a formal market, these natural assets are traditionally absent from society’s balance sheet; their critical contributions are often overlooked in public, corporate, and individual decision-making.

When forests are undervalued they are increasingly susceptible to development pressures and conversion. Recognizing forest ecosystems as natural assets with economic and social value can help promote conservation and more responsible decision-making.

Note: Text and content taken from: <http://www.fs.fed.us/ecosystems-services/>

Issues

- As population, income, and consumption levels increase, people put more and more pressure on the natural environment to deliver these benefits. The 2005 Millennium Ecosystem Assessment, prepared by a group of over 1300 international experts, found that 60 percent of ecosystem services assessed globally are either degraded or being used unsustainably. Seventy percent of the regulating and cultural services evaluated in the assessment are in decline. Millennium Ecosystem Assessment scientists predicted that ecosystem degradation could grow significantly worse in the first half of the 21st century, with important consequences to human well-being.
- Climate change, pollution, over-exploitation, and land-use change are some of the drivers of ecosystem loss, as well as resource challenges associated with globalization and urbanization. Land use change is an immediate issue in the United States. The forests of Iowa are experiencing a loss of open space and a decline in forest health and biodiversity, particularly on private lands. Approximately 87% of all forest land in the Iowa, or 3 million acres, is privately owned. Non-industrial interests – families, organizations, and communities that own the land for the aesthetics and uses that

forests provide or for income generated from the sale of forest products and services - own 85% of private lands. Recent trends in parcelization and divestiture of private lands in the United States suggest that private landowners are commonly under economic pressures to sell their forest holdings. Rising property values, tax burdens, and global market competition are some of the factors that motivate landowners to sell their lands, often for development uses. The loss of healthy forests directly affects forest landowners, rural communities, and the economy. As private lands are developed, society also loses the life-supporting ecosystem services that forests provide.

Forestation-Reforestation

Healthy diverse forests are essential for providing a broad range of goods and services from forested ecosystems. Maintaining a balance of the many forest-types within the landscape is increasingly difficult due to the many and diverging interests of various forest land owners/managers. Further, 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.

Issues

- Invasive plants such as garlic mustard, Japanese knotweed and reed canary grass have literally taken over the understory on many locations out-competing the native vegetation, including tree seedling, reducing or eliminating natural regeneration on these sites.
- Extremely high deer populations reduce natural regeneration or shift species composition by favoring some tree species as browse over another. This has contributed to a trend towards increasing amounts of undesirable tree species in some areas and a complete lack of preferred native vegetation regeneration in other areas.
- The hardwood forest type has been severely impacted by the loss of American elm due to Dutch elm disease. Now the Emerald Ash Borer threatens to eliminate ash species, especially black ash that is another important riparian and urban hardwood species.
- Oak regeneration has proven to be extremely difficult to achieve on many sites that have historically been oak dominated systems.
- Historically, large-scale forest disturbance patterns initiated forest regeneration, these include fire, tornadoes/wind. Fire suppression has virtually eliminated large-scale fire as a disturbance agent. Large scale-wind events are present; however their impact on the landscape is often tempered by forest fragmentation and land-use patterns.
- Climate change is forcing people to re-think the notion of species range. As temperatures rise, many tree species may no longer be able to thrive in locations where they existed historically.
- Forest fragmentation has created many smaller blocks of forest and greatly increased the amount of forest “edge” that has existed historically. Edges tend to favor sun-loving species where shade tolerant species may have once dominated.

- The lack of forest management is allowing species composition to change, which will affect wildlife habitat and the wood products available to the forest industry.
- Many forest tree nurseries in the region have closed or are producing at greatly reduced capacities. Adequate stocks of planting material may be an issue with reduced capacity.

Invasive Species

Non-native invasive species have the potential to reduce forest diversity and cause huge economic and ecological damage to forests. Insect species such as the Emerald Ash Borer, Gypsy Moth, and Asian Long Horned Beetle have already caused major damage in forests and in urban areas in the Midwest. Non-native disease causing organisms, typically fungi that cause mortality such as those that cause White Pine Blister Rust, Butternut Canker, and Dutch Elm Disease are well documented historically. More recent examples include Hickory Mortality, Beech Bark Disease, and Sudden Oak Death. Dozens of invasive plants species spread and flourish in both urban and forested areas. Resource agencies must have evolving and adaptive responses to detect and reduce the potential for the introduction and spread of new invasive species.

Issues

- Prevention of invasive insects and plants is time consuming and costly. Eradication efforts are very expensive. Doing nothing has far-reaching cost consequences
- Invasive species management must be integrated with good land stewardship on millions of acres of privately owned forest.
- Invasive plant populations influence, and are influenced by, environment and co-occurring plant and animal species. An integrated ecosystem-based approach is therefore essential but difficult to achieve.
- Quarantines on timber product movement placed on states in infested areas cause economic hardship as well as difficult utilization and marketing challenges.
- The loss of forest diversity reduces the ecological stability of forests.
- Control techniques and methodologies need to be developed, shared and implemented for new invaders.
- The inability to effectively control plants introduced via the horticultural industry allows many problem plants to continue to be bought and sold in the marketplace.
- The ability to identify and detect new invaders is extremely limited due to lack of knowledge.
- A changing climate may make forests more susceptible to invasive species.

Promoting Sustainable Active Private Forest Management

The Upper Midwest contains some of the highest levels of private forest land ownership in the nation. Unfortunately, the vast majority of these private forestlands are unmanaged, undermanaged, or mismanaged. This represents a huge untapped resource of timber, fiber and associated forest-related employment opportunities. By promoting sustainable active management of these forest lands, the productivity of the regions' forest lands could be enhanced, thereby reducing pressure on existing productive forests and reducing the nations' dependence of outside sources of wood fiber. Active forest management can help to off-set the rising costs of forest ownership, while contributing to the health and resiliency of the regions forests.

Issues

- Most landowners own woodlands for reasons unrelated to forest management. Typically private citizens own forests for hunting, recreation, or other reason unrelated to forest management.
- Landowner turnover rates are increasing due to the aging demographic of current forest owners. This creates opportunities to engage these new landowners who may be more receptive to active forest management.
- Average woodland parcel size is decreasing which leads to increasing the numbers of woodland owners. This creates a capacity issue for those agencies charged with providing landowner assistance.
- Rising land values, and associated property tax rates, are making woodland ownership less appealing to many would-be landowners. Existing landowners may be increasingly tempted to sub-divide large holdings for financial benefit or to reduce their tax burden.
- Many woodland owners are not knowledgeable about forest management and are not aware of programs or cost-share opportunities that might enable them to take an active role in the management of their woodlands.

Sustaining Forest Industry and Markets

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

Issues:

- Competition for forest resources among various industrial users of low quality wood is likely to increase as biomass markets (e.g. pellet production) grow.
- New state and federal energy/climate policies will increasingly stimulate demand for forest resources. For instance, proposed federal Renewable Energy Standards are already catalyzing coal fired power plants to co-fire with wood. Large scale fuel switching could cause an enormous drain on resources.

- Requests for resource information (inventory and timber product outputs) will increase as resource use patterns change.
- Which forest products industries and commercial users of wood create the most jobs per volume of wood utilized will become a frequent area for debate.
- Pulp and paper. Though still a very large part of US demand for wood, pulp production has declined for more than 10 years. US is still the global leader in wood pulp production, although percentage of total continues to decline. Switch from newsprint to electronic media, declining demand for packaging grade papers as US industries continue to move offshore. Growth in demand and production is focused now in Europe and Asia. Losses in paper output range from -54% for newsprint to -10% for containerboard.⁷⁰
- Acute shortage of loggers as boomers retire and industry fails to recruit new entrants.
- Discussion and information needs regarding forest products production and bio-energy application impacts on carbon lifecycles will increase.
- Housing. Softwood lumber demand associated with homebuilding has been off dramatically. As the economy collapsed and home foreclosure rates accelerated resale values of homes plummeted and new starts turned down as well. Predictions are a return to normal housing starts of 1.5-1.7 million starts by 2012.⁷¹ Homeowner improvements and remodeling are expected to begin a gradual rebound in 2010.⁷² Some suggest a trend towards smaller homes with less use of hardwoods for flooring and millwork as homebuyers try to economize on housing costs.
- Hardwood, solid wood products. Recent years outsourcing of furniture, kitchen cabinets, millwork and flooring production to China and other Asian countries has caused many companies to close with a permanent loss of 25-35% of productive capacity nationally. Indexed prices since 2004 show decline in all graded hardwoods with only lumber prices for pallets and railroad ties remaining stable or increasing slightly. 60% of hardwood now used for low priced industrial applications versus. 32% in 1972.⁷³ Growing capacity/ efficiency of remaining mills. Downward pressure on hardwood grade logs probable.⁷⁴
- Green building is experiencing significant interest and is one of the few areas in forest products trending upward. Currently, green building volume as a proportion of the market remains rather low.

⁷⁰Peter Ince. USDA Forest Products Lab. Forests in Transition. New England Society of American Foresters Winter Meeting.

⁷¹National Association of Homebuilders. March 24, 2010. Urs Buehlman, Virginia Tech personal communication

⁷²Harvard Joint Center for Housing Research. Urs Buehlman, Virginia Tech personal communication

⁷³William Luppold. Condition of U.S. Hardwood Markets. Allegheny Society of American Foresters. 11/5/2009

⁷⁴Paul Lyskava. Status and Future of Wood Products Markets. Allegheny Society of American Foresters. 11/5/2009

Urban and Community Forestry

Urban forests are dynamic ecosystems that provide needed environmental services by cleaning air and water helping to control storm water, and conserving energy. They add form, structure, beauty and breathing room to urban design, reduce noise, separate incompatible uses, provide places to recreate, strengthen social cohesion, leverage community revitalization, and add economic value to our communities.

Issues

- **Energy consumption.** Trees reduce energy demands throughout the year. Communities often only account for the expenses associated with tree maintenance, since the savings are not factored into budgets. This has led to the deterioration of both personnel and money dedicated to maintaining or improving the forest resource in city budgets.
- **Air quality.** There are many communities in the region that have reduced air quality because of emissions from a variety of sources. More trees are needed to address air quality concerns, improve aesthetics and sequester carbon from the variety of polluting sources found within communities.
- **Storm water runoff.** Trees slow rainwater, allowing more water to infiltrate the soil, rather than discharging more to a water treatment plant. More economic analysis is needed to compare the costs of preventing storm water runoff to the costs of green infrastructure to give stakeholders, city planners and engineers.
- **Green Space.** Trees provide natural beauty within a community that enhances the experiences of the people in the area.
- **Invasive pests threaten the diversity and longevity of trees susceptible to those pests would otherwise be able to provide to communities.**
- **Work with partners, other programs and councils to better accomplish common goals related to the urban and community forest resource.**

In addition to the areas and issues identified in this section, any issues listed in Chapter 9 that are in common with other states to collaborate are considered multi-state priorities. The strategies that accompany the issues are included in Chapter 9. When opportunities exist to collaborate with other states to resolve an issue using similar strategies, multi-state proposals will be submitted to the Forest Service for funding consideration.

9.0 State Issues and Strategies

This chapter follows the chapter titles from the first seven chapters, to allow for more details about an issue to be referenced. The issues address forest on both public and private land. The short-term and long-term strategies for addressing each issue are listed in bulleted form following each issue. The strategies would be focused but not limited to working within the priority areas developed in Chapter 8. Strategies that address the priority landscape areas and state issues have been provided by stakeholders and DNR foresters.

The resources necessary to address each issue are common across all of the issues and boil down to needing time, money, personnel and sometimes equipment to carryout strategies. Without any one of these items, success will be limited in both scope and persistence. Oftentimes, waiting to address an issue only increases the resources necessary to deal with that issue into the future. With Iowa having already lost half of the forested resource that once existed, opportunities to improve or maintain existing forested resources are fading away.

Federal funding sources will continue to be used to support statewide programs that address issues identified in the first seven chapters and national objectives. Federal and partner financial resources are becoming an increasingly larger portion of the overall Iowa DNR Forestry Bureau budget to deliver forestry programs as described in Figure 6.16 and 6.17.

Information was gathered from a variety of reports, DNR forester experience, and stakeholders. Other natural resource assessments and plans were referenced and incorporated. Coordination with the State Forest Stewardship Committee, State Wildlife Bureau, State Technical Committee, Federal land management agencies, the State Urban and Community Forestry Council, and the Forest Legacy program helped with the development of the strategies to address the issues facing Iowa's forest resource.

Specific DNR Forestry programs are not designated to address each issue; rather a collaborative approach by programs will be used to more effectively implement these strategies. Appropriate evaluation criteria and monitoring results will be applied to strategies and detailed in the grant narrative when applying for funding.

Some strategies provide ways that Iowa's forest resources could become a solution to a variety of environmental problems related to Iowa's natural resources. The strategies developed support National priorities:

- 1.) conserve and manage forest landscapes for multiple values and uses,
- 2.) protecting forests from threat,
- 3.) enhancing public benefits from trees and forests.

Addressing monitoring and revision of the issues will occur as necessary to take into account changes in conditions, values, technologies, and resources through time. Performance measures from the list below will be used to measure outcomes from strategies that are used for the priority issues.

- number of acres of priority forest area harvested
- number of acres of priority forest area FSI completed
- number of forest landowners affected
- number of wood businesses affected
- number of forest management plans written
- number of urban residents assisted
- number of communities inventoried
- number of communities management plans written
- number of residential trees distributed
- number of trees for kids/ teens planted
- number of acres of new forest planted
- number of programs delivered
- number of news releases, articles, radio, TV informational/ educational programs
- number of fire departments assisted
- number of fire fighters trained
- number of insect and disease assists
- number of gypsy moth traps monitored
- number of emerald ash borer traps monitored
- number of acres of oak wilt managed
- number of acres of invasive species managed
- number of acres of forest purchased
- number of acres of conservation easements established for priority forest areas

9.1 Conservation of Biological Diversity

1. Loss of Forest Land

Strategies

- a.) Promote conservation easements and Forest Legacy program easements to sustainably manage biologically diverse forests.
- b.) Discuss easements with forest landowners that have large contiguous forests and are identified as a forest priority.
- c.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on leaving a forest legacy for future generations.
- d.) Produce materials that provide information to forest landowners about why they should manage their forest land.
- e.) Public land acquisition efforts enhanced to sustainably manage priority forest areas.
- f.) Create an advocacy group to persuade political officials to provide sustainable funding for protecting more priority working forest land.
- g.) Encourage the creation of a Department policy for land acquisition that prioritizes acquiring forested areas that are identified in the State Forest Resource Assessment as a priority.
- h.) Encourage and help communities to develop covenants that protect forest resources from development, when land is annexed or new developments are planned.
- i.) Increase one-on-one landowner assistance so more forest landowners know about the benefits their forests provide, explaining and developing a forest land ethic.
- j.) Encourage through information and education and if necessary, provide incentives for landowners with land in areas that have lost forest to plant trees back in those areas.
- k.) Encourage through information and education and if necessary, provide incentives to forest landowners with priority forests to manage those ecosystems in a sustainable manner that maintains those qualities that make that forest ecosystem desirable.
- l.) Support local conservation efforts.
- m.) Reduce the number of acres of priority forest grazed by livestock.
- n.) Inform forest landowners of priority forests about forest reserve program property tax relief for keeping those areas forested.
- o.) Facilitate stakeholder meetings to address loss of forest land by encouraging policies at a local level that protect priority forest areas from land change or offer incentives to manage that property in a sustainable way to protect the qualities of that property

- p.) Create markets or develop incentives that pay landowners for the ecosystem services provided by their trees and forests.

2. *Loss of Forest Productivity*

Strategies

- a.) Encourage through information and education and if necessary, provide incentives for landowners with forests growing less than full stocking levels to better manage the productivity of those areas by scheduling site visits with a DNR forester.
- b.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on the benefits improved forest productivity would have for these landowners and to society in general.
- c.) Produce materials that provide information to forest landowners about why and how they can manage for a productive forest.
- d.) Increase the number of acres of forest stand improvement accomplished within priority forested areas.
- e.) Reduce the number of acres of forest grazed by livestock.
- f.) Increase hazardous fuels management to improve forest productivity.
- g.) Be more aggressive at managing invasive species to prevent productivity losses.
- h.) Plant trees in areas of need to improve stocking levels.
- i.) Monitor tree plantings to assess the amount of weed control and number of conservation seedlings that are necessary to successfully establish a fully stocked tree planting.
- j.) Demonstrate on public lands methods to improve stocking levels.
- k.) Create markets or develop incentives that pay landowners for the ecosystem services provided by their trees and forests.

3. *Changing Ownership*

Strategies

- a.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on leaving a legacy for future generations.
- b.) Produce materials that provide information to forest landowners about how and why they should manage their forest resource.
- c.) Use new technologies to inform and educate landowners, such as webinars, web accessible power points to explain baseline information for forest landowners seeking information.

- d.) Promote conservation easements and Forest Legacy program easements to sustainably manage biologically diverse forests and forest priority areas.
- e.) Work with county recorders office to create a system of tracking so when priority forest land changes ownership, the new landowners are shipped information about how to appreciate/ manage their forest resources.
- f.) Facilitate stakeholder meetings to address loss of forest land caused by changing ownership by encouraging policies at a local level that encourage better management of priority forest resources.
- g.) Provide incentives to forest landowners with priority forests to manage those ecosystems in a sustainable manner that maintains those qualities that make that forest ecosystem desirable.
- h.) Public land acquisition efforts enhanced in priority forest regions.
- i.) Inform forest landowners of priority forests about forest reserve program property tax relief for keeping those areas forested.
- j.) Create markets or develop incentives that pay landowners for the ecosystem services provided by their trees and forests.

4. *Lack of Forest Ecosystem Diversity*

Strategies

- a.) Promote the use of prescribed fire in native landscapes and oak-hickory forest types to selectively favor fire adapted vascular plants and trees.
- b.) Increase hazardous fuels management to improve natural systems functionality.
- c.) Use forest stand improvement activities to select crop trees that maintain a diverse canopy.
- d.) Increase one-on-one landowner assistance so more forest landowners know about how to manage for forest ecosystem diversity, explaining and developing a forest land ethic.
- e.) Be more aggressive at managing invasive species to encourage forest ecosystem diversity.
- f.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on benefits of having diversity within the forest ecosystem.
- g.) Produce materials that inform forest landowners about how and why they should manage for forest ecosystem diversity.
- h.) Reduce the number of acres of forest grazed by livestock.
- i.) Plant more diversity in forests, including species on the edge of their range to accommodate changing climate conditions.

- j.) Research, demonstrate and promote how to plant woodland wildflowers and shrubs in areas where they have been lost due to past land uses.
- k.) Encourage through information and education and if necessary, provide incentives to forest landowners with priority forests to manage those ecosystems in a sustainable manner that maintains those qualities that make that forest ecosystem diverse.

5. *Lack of Well Managed Private or Public Forest Land*

Strategies

- a.) Establish case studies on public and private lands to show how a well managed forest can be profitable for the landowner and provide all the ecosystem services simultaneously.
- b.) Provide technical forestry assistance and develop forest stewardship plans on public and private lands.
- c.) Initiate contact in priority forest areas to encourage forest management plans, offering one-on-one forestry assistance.
- d.) Use recognition programs and local media to reward model landowners who are leaders in conservation to inspire and motivate others to plant trees and be better stewards of their forest resources.
- e.) Increase the number of acres forest landowners with management plans.
- f.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on benefits received from better managing the forest.
- g.) Increase the amount of before and after harvest management activities to improve the establishment of natural regeneration.
- h.) Increase the number of acres of forest stand improvement accomplished.
- i.) Increase hazardous fuels management to improve natural systems functionality.
- j.) Be more aggressive at managing invasive species in forested areas.
- k.) Provide aid and support to fire suppression and protection agencies.
- l.) Reduce the number of acres of forest grazed by livestock.
- m.) Seek sustainable funding for all public lands to get forest stand improvement work done in a timely manner.
- n.) Utilize advanced technology to document more information about the condition of the forest resource while on site.
- o.) Seek sustainable funding to purchase and maintain forest management equipment to accomplish the necessary forest management on public lands.

- p.) Encourage through information and education and if necessary, provide incentives to forest landowners with priority forests to manage those ecosystems in a sustainable manner that maintains those qualities that make that forest ecosystem desirable.
- q.) Produce materials that inform forest landowners about how and why they should manage their forest.
- r.) Create markets or develop incentives that pay landowners for the ecosystem services provided by their trees and forests.
- s.) Establish forest management plans and practice sustainable forest management on all DNR forest lands.

6. *Insufficient Availability of Professional Forestry Technical Assistance*

Strategies

- a.) Seek sustainable funding for more professional foresters to service priority forest areas.
- b.) Recognize private lands and public lands foresters contributions to wildlife habitat for funding additional positions for plan development and forest management through various sources.
- c.) Encourage through information and education a viable private consulting sector.
- d.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on benefits received by managing forest areas and the lost opportunities caused by doing nothing.
- e.) Produce materials that inform forest landowners about who, how and where they can receive professional forestry technical assistance.
- f.) Focus technical forestry assistance within priority forest areas.

7. *Lack of Awareness the Values Trees provide People*

Strategies

- a.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on benefits received by managing forest areas and the lost opportunities caused by doing nothing.
- b.) Produce materials to inform forest landowners about all of the benefits trees provide to society.
- c.) Targeted outreach to forest landowners within priority areas to provide information about how to manage and appreciate their forest resource.
- d.) Participate in public events to raise awareness and provide information about the values trees provide to everyone.

- e.) Create markets or develop incentives that pay landowners for the ecosystem services provided by their trees and forests.

8. *Lack of Community Forest Inventory Data on both Private and Public areas*

Strategies

- a.) Education, outreach and advocacy through Community Stewardship Field Days, mass media about the benefits of managing trees and the risks and costs associated with doing nothing.
- b.) Inventory priority communities along with those seeking assistance.
- c.) Develop management plans to address the needs of a communities forest resource.

9. *Lack of Tree Species Diversity in Communities*

Strategies

- a.) Education, outreach and advocacy through Community Stewardship Field Days, fact sheets, mass media about the benefits of growing a diverse mix of trees within a community.
- b.) Produce materials to inform homeowners about how and why they can increase the diversity of the forest resource in their community.
- c.) Use urban tree canopy assessment tools to help communities.
- d.) Increase tree canopy in new communities with excessive impervious material.
- e.) Facilitate stakeholder meetings to address the lack of diversity and consequences there of, by encouraging policies at a local level that promote additional urban forestry management planning for communities.
- f.) Facilitate creating policies with stakeholders for communities that dedicate funding for tree maintenance and replacement as a part of their management plan.
- g.) Facilitate stakeholder meetings to address the lack of funding allocated within a community and consequences there of, by encouraging policies at a local level that provide dedicated funds for managing the trees in that community.
- h.) Establishing a tree-care industry licensing credential for arborists and tree service companies
- i.) Building and maintaining a healthy and energetic base of volunteers to lead community tree groups and activities.
- j.) Promote the benefits trees provide to homeowners and businesses (energy efficiency, improved air quality, improved water infiltration, stabilize soils, reduce storm water runoff, improved aesthetics, increased property values, noise reduction) to encourage tree

planting in Iowa communities, especially when new developments occur where no trees exist.

- k.) Promote tree planting as a part of every community plan.
- l.) Partner with utility companies and NGOs to inform city planners, developers, and community leaders about the benefits trees provide to community homeowners and businesses.
- m.) Increase hazardous fuels management.
- n.) Be more aggressive at managing invasive species in urban areas.
- o.) Provide aid and support to fire suppression and protection agencies.

10. *Lack of Management within the Urban Community Forest Resource*

Strategies

- a.) Education, outreach and advocacy through Community Stewardship Field Days, news articles, mass media about the benefits of managing trees and the risks and costs associated with doing nothing.
- b.) Develop management plans to address the needs of a communities tree and forest resource.
- c.) Produce materials to inform community homeowners about how, why and where they can get assistance to manage their trees.
- d.) Facilitate stakeholder meetings to establish a tree-care industry licensing credential for arborists and tree service companies to service community and homeowner management needs using appropriate arboricultural techniques.
- e.) Partner with utility companies and NGOs to inform city planners, developers, and community leaders about the benefits community management plans have for community homeowners and businesses.
- f.) Promote planting a diversity of trees as a part of every community plan.
- g.) Increase hazardous fuels management.
- h.) Be more aggressive at managing invasive species in urban areas.
- i.) Provide aid and support to fire suppression and protection agencies.
- j.) Building and maintaining a healthy and energetic base of volunteers to help communities with managing their forest and tree resource.

11. *Lack of Funding for Urban Forestry Programs*

Strategies

- a.) Education, outreach and advocacy through Community Stewardship Field Days, news articles and other mass media outlets- key on the long-term benefits forestry programs provide to communities and the cost to communities of not keeping up with tree planting and tree maintenance programs.
- b.) Facilitate stakeholder meetings to address the lack of funding allocated within a community for tree maintenance and replacement as a part of their management plan.
- c.) Show how services related to urban forestry activities are improving Iowa's community forest resources and discontinue activities that are not funded.
- d.) Provide incentives for communities with excessive impervious area to plant more trees there.
- e.) Compete for grants to allow work to continue on services related to urban forestry programs that serve the mission of the DNR.
- f.) Partner with utility companies and NGOs to inform city planners, developers, and community leaders about the benefits trees provide to community homeowners and businesses.
- g.) Increase hazardous fuels management.
- h.) Be more aggressive at managing invasive species in urban areas.
- i.) Provide aid and support to fire suppression and protection agencies.
- j.) Building and maintaining a healthy and energetic base of volunteers to help communities accomplish needed management of the forest and tree resource.

12. *Lack of Locally Adapted Landscape Nursery Stock*

Strategies

- a.) Improve the quality and consistency of retail nursery stock with special emphasis on the residential tree distribution programs.
- b.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on benefits received by planting locally adapted landscape nursery stock and issues to be faced by using nursery stock supplied by sources from outside of Iowa.
- c.) Produce materials to inform forest landowners about how, why and where they can buy locally adapted landscape nursery stock.
- d.) Create partnership between private nurseries and the State Forest Nursery to grow native liner stock for their landscape trees.

- e.) Work with nurseries and organizations in the state to offer better native grown nursery stock to communities in order to increase the diversity.
- f.) Make native conservation seedlings and landscape nursery stock available to public agencies to demonstrate growing on public lands.

13. *Decline of Oak-hickory Forest Types*

Strategies

- a.) Target forest areas with oak-hickory canopy as places to engage landowners and public entities about methods to ensure a continuing oak-hickory forest.
- b.) Encourage through information and education and if necessary, provide incentives to forest landowners with priority forests that are oak-hickory types, to manage those forests in a way that these areas remain oak-hickory.
- c.) Utilize more prescribed fire to favor fire tolerant tree species like oaks and hickory.
- d.) Encourage tree planting plans to have a large component of oak species.
- e.) Promoting awareness of forest resource issues.
- f.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on benefits received by managing oak-hickory forest areas and the lost opportunities caused by having less oak-hickory forest.
- g.) Increase even-aged management in oak-hickory forest types.
- h.) Increase even-aged management activities to take advantage of existing seed source on site to establish adequate regeneration of desirable species.
- i.) Increase the number of acres of forest stand improvement accomplished.
- j.) Stewardship plans to document current stand conditions and provide prescriptions to establish more mast producing trees.
- k.) Increase hazardous fuels management to improve natural systems functionality.
- l.) Become more aggressive at managing invasive species in oak-hickory forest types.
- m.) Provide aid and support to fire suppression and protection agencies.
- n.) Encourage through information and education and if necessary, provide incentives to forest landowners with priority forests that are oak-hickory types, to plant more oak and hickory trees in areas that have lost forest.
- o.) Produce materials to inform forest landowners about how and why they can reduce the decline of oak-hickory forest on their property.

- p.) Create markets or develop incentives that pay landowners for the ecosystem services provided by their trees and forests.

14. Forest Fragmentation

Strategies

- a.) Facilitate stakeholder meetings to address fragmentation by encouraging policies at a local level that prevent dividing forested property into smaller units or offer incentives to manage that property in a sustainable way to protect the qualities of that property.
- b.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on benefits received from larger contiguous areas of forest and the lost opportunities caused by fragmentation.
- c.) Produce materials to inform forest landowners about how and why they can reduce fragmentation of the forest resource on their property.
- d.) Engage landowners in these areas by scheduling site visits with a DNR forester to offer solutions to reduce fragmentation.
- e.) Encourage tree planting to re-connect forested areas.
- f.) Reduce the number of acres of forest grazed by livestock.
- g.) Host public meetings with forest landowners showing them on a landscape scale where fragmentation could be eliminated.
- h.) Encourage through information and education and if necessary, provide incentives to forest landowners that reduce the amount of fragmentation their forest resource has.
- i.) Encourage through information and education and if necessary, provide incentives to forest landowners with priority forests to manage those ecosystems in a sustainable manner that prevents fragmentation.
- j.) Public land acquisition efforts enhanced to protect the most valuable remaining forests from being fragmented into smaller units.
- k.) Inform forest landowners of priority forests about the forest reserve program property tax relief for keeping those areas forested.
- l.) Create markets or develop incentives that pay landowners for the ecosystem services provided by their trees and forests.

15. Forest Parcelization

Strategies

- a.) Facilitate stakeholder meetings to address parcelization by encouraging policies at a local level that prevent dividing forested property into smaller units or offer incentives to

manage that property in a sustainable way to protect the qualities of that property.

- b.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on benefits received by keeping forested areas intact and the lost opportunities caused by parcelization.
- c.) Produce materials to inform forest landowners about how and why they can reduce parcelization of the forest resource on their property.
- d.) Engage landowners in these areas by scheduling site visits with a DNR forester to offer solutions to reduce parcelization.
- e.) Promote conservation easements and Forest Legacy program easements to sustainably manage biologically diverse forests and forest priority areas from parcelization.
- f.) Develop forest management options for forests less than 20 acres in size.
- g.) Provide incentives to forest landowners with priority forests to manage those ecosystems in a sustainable manner that prevents parcelization.
- h.) Encourage through information and education and if necessary, provide incentives to forest landowners with priority forests to manage those ecosystems in a sustainable manner that prevents parcelization.
- i.) Public land acquisition efforts enhanced to prevent the most valuable remaining forests from being parcelized.
- j.) Inform forest landowners of priority forests about the forest reserve program property tax relief for maintaining those areas as forests.
- k.) Create markets or develop incentives that pay landowners for the ecosystem services provided by their trees and forests.

16. Consistency and Transparency in the Development of Landowner Incentive Programs

Strategies

- a.) Better communication between agencies to better promote and simplify landowner conservation incentive programs.
- b.) Promote the long-term benefits trees provide in conservation programs as a rate of return from taxpayer investment in that conservation practice.
- c.) Require re-payment of all economic incentives, if the conservation practices are removed, even if ownership changes.

17. *Lack of Forest Habitat for Species of Greatest Conservation Need*

Strategies

- a.) Encourage through information and education and if necessary, provide incentives to forest landowners with priority forests to manage those ecosystems in a sustainable manner that benefits specific habitat preferences for species of greatest conservation need (SGCN).
- b.) Work with Federal and State partners to improve conservation programs that fund conservation practices that improve forest habitat for SGCN.
- c.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on benefits received by managing forest areas for SGCN and the lost opportunities caused by allowing populations of SGCN to decline.
- d.) Produce materials to inform forest landowners about how, why and where to manage for SGCN.
- e.) Reduce the number of acres of forest grazed by livestock.
- f.) Inventory which wildlife species are benefiting from forestry practices.
- g.) Provide incentives to forest landowners with priority forests to manage those ecosystems in a sustainable manner that benefit SGCN.
- h.) Public land acquisition efforts enhanced to protect the most valuable remaining forests that are providing habitat for SGCN.

18. *Changing Landowner Demographics*

Strategies

- a.) Encourage through information and education and if necessary, provide incentives to forest landowners with priority forests to manage those ecosystems in a sustainable manner.
- b.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on benefits received by managing forest areas and the lost opportunities caused by doing nothing.
- c.) Produce materials to inform forest landowners about how important the forest resource is for all of society.
- d.) Explore using new technologies to inform landowners, such as webinars, web accessible power points to explain baseline information for forest landowners seeking information.
- e.) Inform forest landowners of priority forests about forest reserve program property tax relief for maintaining those areas as forests.

- f.) Create markets or develop incentives that pay landowners with priority forests to manage those ecosystems in a sustainable manner that continues to provide the ecosystem services the trees and forests on their land provide.

19. *Economic Viability of Private and Public Sector Nurseries*

Strategies

- a.) Create partnerships that benefit both private and public sector nurseries.
- b.) Promote reforestation and tree planting; key on planting trees as a way of getting and staying in touch with their property and leaving a legacy for future generations.
- c.) Encourage through information and education and if necessary, provide incentives for landowners with land in areas that have lost forest to plant trees back in those areas.
- d.) Promote tree planting conservation programs with native seedlings to all landowners that have suitable areas for growing trees through partners and organizations.
- e.) Study and improve the quality of nursery conservation seedlings to improve transplanting survival rates and increase customer satisfaction.
- f.) Produce only the profitable varieties of trees and shrubs needed.
- g.) Seek alternative funding sources to support nurseries growing a diversity of native seedlings that would be desirable for growing in conservation plantings but are not profitable to grow.
- h.) Evaluate customer needs, satisfaction and develop a marketing strategy that promotes native seed source plant material as being the absolute best source of planting stock for conservation related tree plantings.
- i.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on benefits received by planting native conservation seedlings and the problems with planting non-native conservation seedlings.
- j.) Produce materials to inform forest landowners about how, why and where to obtain native conservation seedlings.

20. *Maintaining a Supply of Native Low Cost Conservation Seedlings*

Strategies

- a.) Establish seed orchards using native trees with desirable genetics to supply seed for growing conservation seedlings.
- b.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on benefits received by having access to low-cost native conservation seedlings and the lost opportunities caused by more expensive seedlings.

- c.) Seek alternative funding sources that support nurseries growing native conservation seedlings.

21. *Maintain a Population of Threatened Native Tree Species on Public Land*

Strategies

- a.) Encourage through information and education and, if necessary, provide incentives to private and public landowners to maintain forest stands that have trees or forest associated plant species threatened with extinction.
- b.) Establish seed orchards using native trees to preserve Iowa genetics.
- c.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on benefits received by managing native trees and the repercussions of losing native genetics.
- d.) Produce materials to inform forest landowners about how, why and where to manage for forest associated plants or trees threatened with extinction.
- e.) Promote the benefits of native seedlings for use in any private lands project that is federal, state, county or private (i.e. National Turkey Federation) cost-shared and/or any landowner that contacts the state (forester or private lands biologist) for assistance.
- f.) Develop and maintain a database to record locations of trees that are rare.
- g.) Propagate rare species to increase their populations.
- h.) Write stewardship plans that perpetuate the presence of rare species and perform forest stand improvement around mature populations to promote healthy trees, increase seed production and increase germination on site.

22. *Loss of Early Successional Forest Habitat*

Strategies

- a.) Harvest over-mature or poorly stocked stands of timber to encourage regeneration of desirable tree species.
- b.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on the benefits received by managing forest areas for early successional forest habitat and the lost benefits caused by not having this forest habitat.
- c.) Produce materials to inform forest landowners about how, why and where to manage for early successional forest habitat.
- d.) Increase hazardous fuels management to improve natural systems functionality.
- e.) Be more aggressive at managing invasive species, so adequate regeneration of desirable forest habitat can be achieved.

- f.) Provide incentives to forest landowners with priority forests to manage those ecosystems in a sustainable manner that promotes early successional forest habitat at some point in time in the management of that property.
- g.) Encourage tree planting where landowners are willing to convert land-use.

9.2 Productive Capacity of Forest Ecosystems

1. Decline in the Number of Loggers, Timber Buyers, Sawmills and Secondary Wood Processors

Strategies

- a.) Develop policies that offer price support structure similar to agricultural food crops to stabilize timber markets.
- b.) Develop markets for small diameter trees and low quality hardwoods in sufficient number that most priority forests have access.
- c.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on benefits received from using locally grown trees for products and the lost benefits caused by not having a wood products industry available for forest landowners.
- d.) Produce materials to inform forest landowners about who they can sell their timber to.
- e.) Encourage through information and education and, if necessary, provide incentives to forest landowners to better manage stocking levels to help meet the species and volume demands of area sawmills and secondary wood processors.
- f.) Invest in technology to allow ethanol plants or other industries to incorporate hardwood or small diameter, low quality wood into the production of fuel stock.
- g.) Reduce the number of acres of forest grazed by livestock.
- h.) Engage local business leaders to develop a better business environment for wood related businesses applicable to their area.

2. Lack of Understanding about the Economic Importance of the Forest Resource

Strategies

- a.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on benefits received from forests and the lost benefits caused by not having a managed forest resource.
- b.) Produce materials to inform homeowners and forest landowners about how the economic importance benefits all citizens.

- c.) Better describe the variety of businesses in Iowa that rely on trees for making wood products and the economic impact those trees and businesses have on Iowa's economy.
- d.) Increase one-on-one landowner assistance so more forest landowners know about the benefits their forests provide, explaining and developing a forest land ethic.
- e.) Better describe the number of people in Iowa that rely on wood products for income.
- f.) Reduce the number of acres of forest grazed by livestock.
- g.) Increase hazardous fuels management.
- h.) Become more aggressive at managing invasive species in forested areas.

3. Lack of Awareness about Forests

Strategies

- a.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on benefits received from forests and the lost benefits caused by not having managed forest resource.
- b.) Produce materials to inform homeowners and forest landowners about the benefits rural forests provide to all of society.
- c.) Create economic incentives to people who own high quality forest ecosystems to manage those forests in a sustainable manner that maintains those qualities that make that forest ecosystem desirable.
- d.) Reduce the number of acres of forest grazed by livestock.
- e.) Increase hazardous fuels management to improve natural systems functionality.
- f.) Increase awareness of invasive species in rural forests.
- g.) Create markets or develop incentives that pay landowners for the ecosystem services provided by their trees and forests.
- h.) Incorporate forestry curriculum into educational materials developed for schools.

4. Development of Woody Biomass Markets

Strategies

- a.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on benefits received from forests producing woody biomass and the lost benefits caused by not having these markets available.
- b.) Determine the benefits and problems of harvesting forest systems for woody biomass.

- c.) Utilize wood residue from timber management for biomass to create new businesses.
- d.) Determine where these markets would be feasible.

9.3 Forest Ecosystem Health and Vitality

1. Forest Health

Strategies

- a.) Promote forest diversity and sustainability.
- b.) Promote silvicultural techniques that help trees resist forest health threats.
- c.) Determine effective monitoring, control and regulatory needs for pests that affect Iowa's forest resource.
- d.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on benefits received from forests and the lost benefits caused by not having a healthy forest resource.
- e.) Produce materials to inform homeowners and forest landowners about EAB.
- f.) Increase hazardous fuels management to improve natural systems functionality.
- g.) Become more aggressive at managing invasive species in forested areas.

2. Impact of EAB on Urban Trees and Rural Forests

Strategies

- a.) Stakeholders working together on a readiness plan to develop a plan of action.
- b.) Inventory trees in communities to help with preparation of a management plan.
- c.) Survey and monitor ash trees for symptoms of EAB.
- d.) Facilitate stakeholder meetings to address the impact EAB will have on the urban and forest resource by encouraging policies at a local level that prepare communities and forest landowners for EAB.
- e.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on benefits received from ash trees and the lost benefits caused by not having ash trees.
- f.) Produce appropriate materials to inform homeowners and forest landowners about EAB.
- g.) Promote diversity and alternatives for replacing ash.
- h.) Increase hazardous fuels management to improve natural systems functionality.

- i.) Become more aggressive at managing invasive species in urban areas.

3. Ozone Monitoring

Strategies

- a.) Survey, monitor and document findings.
- b.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on benefits received from forests and the damaging affects of increased ozone in the atmosphere on forests.

4. Invasive Species

Strategies

- a.) Survey, record and create a database where invasive species are located.
- b.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on benefits received from native plants and the lost benefits caused by increasing populations of invasive species.
- c.) Produce materials to inform forest landowners about how and why they should prevent invasive species from becoming established in their forest.
- d.) Stakeholders working together on a readiness plan to develop a plan of action.
- e.) Use more prescribed fire to manage invasive plants at the appropriate time.
- f.) Use mechanical or chemical control options where fire is not an option.
- g.) Develop management plans for treatment options by species.
- h.) Increase hazardous fuels management to improve natural systems functionality.
- i.) Become more aggressive at managing invasive species in forested areas.
- j.) Encourage through information and education, if necessary, provide incentives to forest landowners with priority forests to manage those ecosystems in a sustainable manner that prevents establishment of invasive species.

5. Forest Regeneration Challenges where Localized Heavy Deer Populations Exist

Strategies

- a.) Work with DNR Wildlife Bureau to increase hunting permits where there is not enough habitat to support the local deer population.
- b.) Use tree shelters, fencing or another deer exclusion method in areas where desirable tree species are unable to become established due to deer populations in the area.

- c.) Provide financial assistance to forest landowners where heavy deer populations are preventing the establishment of adequate forest regeneration.
- d.) Survey, monitor, study the effects of heavy deer populations on regeneration and tree planting establishment.
- e.) Evaluate the timber quality of trees grown where heavy deer population conditions exist and compare to timber quality where populations are not at detrimental levels.
- f.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on the lost benefits caused by having too many deer inhabiting an area and solutions for addressing heavy deer populations.
- g.) Produce materials to inform forest landowners about why and how they can reduce deer populations on their property.
- h.) Create a stakeholder group that looks at the forest resource capacity before making recommendations for deer population levels for that area.
- i.) Develop policies that allow private forest landowners more hunting options to control depredation of their trees.
- j.) Become more engaged with the decision makers of deer populations so consideration of the capacity of the forest resource to support deer populations in an area is a primary consideration.

6. Lack of Trained Fire Personnel

Strategies

- a.) Provide fire personnel with training and skills development opportunities, specifically in wildland fire incident command, suppression and tactics.
- b.) Assist VFD with wildland fire related equipment needs.
- c.) Provide prescribed fire training.
- d.) Provide better compensation to fire personnel to attract more interest in these types of jobs.

7. Building Homes in the Wildland Urban Interface

Strategies

- a.) Increase hazardous fuels management to improve natural systems functionality.
- b.) Become more aggressive at managing invasive species in the wildland-urban interface.
- c.) Develop CWPP and encourage use of Firewise tactics.

- d.) Provide aid and support to fire suppression and protection agencies.
- e.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on risks associated with building within WUI and provide alternative solutions for people seeking these types of living areas.
- f.) Produce materials to inform forest landowners about how to prevent or reduce their homes exposure to fire.

8. Better Oak Management within Fire Dependent Ecosystems

Strategies

- a.) Increase the number of acres of prescribed fire in oak-hickory forests.
- b.) Increase prescribed fire training for natural resource professionals and forest landowners.
- c.) Train more people to use prescribed fire.
- d.) Survey, monitor, and study the effects of fire on oak regeneration and effects on other species populations
- e.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on benefits received from forests managed with fire and the lost benefits caused by not using fire as a management tool.
- f.) Produce materials to inform forest landowners about how, why and where they should manage oak using fire.
- g.) Increase hazardous fuels management to improve natural systems functionality.
- h.) Be more aggressive at managing invasive species within fire dependent ecosystems.

9. Lack of Prescribed Fire Knowledge

Strategies

- a.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on benefits received from prescribed fire training and the risk of not being trained or using prescribed fire as a management tool when managing a forest resource.
- b.) Produce materials to inform forest landowners about why and how they can use prescribed fire to manage their forest resource.
- c.) Deliver prescribed fire training.
- d.) Make FEPP available to fire departments.
- e.) Facilitate more partnering with volunteer fire departments and counties to assist each other when doing safe fire practices and prescribed burns in their counties or regions.

- f.) Provide aid and support to fire suppression, protection and natural resource management agencies.

9.4 Conservation and Maintenance of Soil and Water Resources

1. Availability of Cost-share Programs for Forestry Practices

Strategies

- a.) Provide incentives to forest landowners with priority forests to manage those ecosystems in a sustainable manner that promote good forest conservation practices.
- b.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on the long-term benefits forests provide for water and soil resources and the increased costs society pays in other ways for not sustainably managing these resources.
- c.) Produce materials to inform forest landowners about what cost-share programs are available to help with forestry related activities.
- d.) Make suitable native conservation seedlings available at a low cost, to keep tree planting from being a cost prohibitive activity.
- e.) Encourage conservation cost-share programs to include forestry practices that allow all willing landowners to participate in tree planting and forest management activities.
- f.) Reduce the number of acres of forest grazed by livestock by providing cost-share to encourage protecting forest areas from grazing.
- g.) Provide cost-share programs that allow management of forest systems with fire.
- h.) Provide cost-share programs that allow management of invasive species in forested areas.
- i.) Inform forest landowners of priority forests about forest reserve program property tax relief for maintaining those forested areas.

2. Recognition About the Role that Forest Cover has for Maintaining/Improving Water Quality

Strategies

- a.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on the long-term benefits forests provide for water resources and the lost benefits of not taking care of water quality.
- b.) Produce materials to inform forest landowners about how and why they can improve water quality using trees.

- c.) Facilitate stakeholder meetings to address how trees improve water quality by encouraging policies at a local level that better manage water resources.
- d.) Monitoring efforts to show the difference forest cover has on water quality and aquatic life compared to areas that do not have forest cover adjacent to them.
- e.) Provide adequate landowner incentives to encourage better forest conservation along rivers, lakes and wetlands.
- f.) Promote the establishment of more riparian buffers and bottomland forests adjacent to rivers, lakes and wetlands.
- g.) Restore flood plain forests to mitigate flooding problems in communities downstream.
- h.) Reduce the number of acres of forest grazed by livestock that have a water source within them.
- i.) Increase hazardous fuels management to improve natural systems functionality .
- j.) Be more aggressive at managing invasive species that are found along water sources.
- k.) Provide aid and support to fire suppression, protection and natural resource management agencies.
- l.) Public land acquisition efforts enhanced to protect the most valuable remaining forests along important lakes and rivers.
- m.) Create markets or develop incentives that pay landowners for the ecosystem services provided by their trees and forests.
- n.) Increase forest cover in watersheds that supply surface drinking water to communities.
- o.) Increase forest cover in watersheds that have impaired waterways according to standards associated with the Clean Water Act.

3. Community Storm Water Runoff

Strategies

- a.) Identify communities causing the most pollution from their storm water.
- b.) Work with planners/ developers to use natural systems to filter storm water before it is discharged into natural areas, rivers and lakes.
- c.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on the long-term benefits green infrastructure provides for water resources and the hidden costs paid in other ways for not using natural systems as solutions.

- d.) Produce materials to inform community leaders about how, where and why communities can utilize trees within a green infrastructure to manage their storm water runoff.
- e.) Provide incentives to priority communities to use green infrastructure to manage storm water runoff.

4. Soil Erosion

Strategies

- a.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on the long-term benefits forests provide for soil resources and the hidden costs for correcting soil erosion later.
- b.) Produce materials to inform forest landowners about how, where and why they can reduce soil erosion on their property.
- c.) Encourage through information, education and if necessary provide incentives to landowners that follow best management practices when performing forestry silvicultural practices.
- d.) Work with partners to shape conservation program so policies are in place that encourage planting native conservation seedlings as long-term solutions for maintaining soil on highly erodible ground.
- e.) Show the economic benefits of using taxpayer money to establish trees for conservation practices and their long-term economic payback compared to other types of land uses (reimbursing for flooding when farms, businesses or homes are flooded, grass being easily reverted to agriculture).
- f.) Reduce the number of acres of highly erodible land grazed by livestock.
- g.) Reduce the number of acres of highly erodible land cultivated for row crops.
- h.) Increase hazardous fuels management to improve natural systems functionality.
- i.) Become more aggressive at managing invasive species where soil erosion is a concern.
- j.) Provide aid and support to fire suppression, protection and natural resource management agencies to improve natural systems functionality.
- k.) Provide incentives to forest landowners with highly erodible soils to establish trees to stabilize those soils.
- l.) Public land acquisition efforts enhanced to acquire the most valuable remaining forests that are growing on highly erodible land.
- m.) Create markets or develop incentives that pay landowners for the ecosystem services provided by their trees and forests.

5. Deriving Annual Forest Income from Property

Strategies

- a.) Provide incentives to forest landowners for growing trees that are providing ecosystem services
- b.) Create markets or develop incentives that pay landowners for the ecosystem services provided by their trees and forests.
- c.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on the long-term benefits forests provide and the lost benefits of not sustainably managing these resources.
- d.) Produce materials to inform forest landowners about how they can responsibly derive income from the forest resource on their property.
- e.) Partner with Iowa Department of Economic Development to provide assistance to rural forest landowners to develop products/ markets from Iowa trees and forests.
- f.) Inform forest landowners of priority forests about forest reserve program property tax relief for maintaining those forested areas.
- g.) Create markets or develop incentives that pay landowners for the ecosystem services provided by their trees and forests.

9.5 Forest Contributions to Global Carbon Cycles

1. Carbon Sequestration

Strategies

- a.) Improve stocking levels of existing forests.
- b.) Improve markets for wood-based products.
- c.) Promote tree planting as a part of every community and stewardship plan.
- d.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on the long-term benefits forests provide for the environment and the lost benefits of not improving Iowa's forest resources.
- e.) Produce materials that inform forest landowners about how they can sequester more carbon by using trees.
- f.) Provide incentives to landowners that sequester carbon by using trees.
- g.) Create markets or develop incentives that pay landowners for the ecosystem services provided by their trees and forests.

9.6 Forest Enhancement of Long-term Multiple Socioeconomic Benefits to Meet the Needs of Society

1. Lack of Financial Return for Forest Stand Improvement Activities

Strategies

- a.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on the long-term benefits forests provide and the lost benefits of not managing these resources.
- b.) Produce materials to inform forest landowners about how and why they should perform forest stand improvement.
- c.) Improve markets that can utilize the smaller diameter products that are being removed in forest stand improvement activities.
- d.) Create markets or develop incentives that pay landowners for the ecosystem services provided by their trees and forests.
- e.) Increase one-on-one landowner assistance so more forest landowners know about the benefits their forests provide, explaining and developing a forest land ethic.

2. Lack of Public Forest Land

Strategies

- a.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on the long-term benefits forests provide to various user groups and the lost opportunities to these user groups of not managing or having enough forest resources.
- b.) Produce materials that inform forest landowners about what the DNR Forestry Bureau is doing with public forest land and what they can learn from the management activities occurring on these lands.
- c.) Facilitate stakeholder meetings to address the lack of public forest land by encouraging policies at a local level that provide sustainable funding for buying more priority forest land.

3. Lack of Funding for Forest Management on Public Land

Strategies

- a.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on the long-term benefits forests provide to various user groups and the lost benefits to these user groups of not managing the forest resource.

- b.) Facilitate stakeholder meetings to address the lack of management on public forest land by encouraging policies at a local level that provide sustainable funding for managing more priority forest land.
- c.) Decrease high cost activities like trail maintenance by decreasing the number of trails.
- d.) Change policies to allow public forest land to be eligible for forestry conservation cost-share programs.
- e.) Establish demonstration areas showing beneficial forest management.
- f.) Increase hazardous fuels management to improve natural systems functionality.
- g.) Become more aggressive at managing invasive species.
- h.) Provide aid and support to fire suppression/protection and natural resource management agencies.
- i.) Construct and maintain necessary infrastructure to accomplish forest management.

4. Lack of Applied Research for Silvicultural Methods within Iowa

Strategies

- a.) Dedicated personnel to follow research projects through that look at different silvicultural methods for managing the forest resource.
- b.) Research and develop how to manage for declining tree species populations to improve their ability to regenerate naturally.
- c.) Research and develop management options for invasive species.
- d.) Research the viability of developing specialty forest markets.

5. Lack of Funding for Forestry Programs

Strategies

- a.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on the long-term benefits forestry programs provide to various user groups and the lost opportunities to these user groups when those programs are no longer available.
- b.) Facilitate stakeholder meetings to address the lack of management of forest land in Iowa by encouraging policies that provide sustainable funding for Forestry programs.
- c.) Show how services related to forestry activities are improving Iowa's forest resources and discontinue activities that are not funded.
- d.) Compete for grants to allow work to continue on services that serve the mission of the DNR.

- e.) Re-assign employee work duties based on grants awarded.

6. Declining Involvement with Universities

Strategies

- a.) Collaborate on mutually beneficial programs in areas that are common.
- b.) Use new technologies to inform and exchange information, such as webinars, web accessible power points to communicate.
- c.) Include field studies and analysis with projects to secure better information that can be learned from and built upon in the future.

7. Lack of Forestry Education in Schools

Strategies

- a.) Increase the presence of trees on school property that also serve as outdoor classrooms.
- b.) Facilitate workshops and produce educational materials working with teachers to develop curriculum about forestry that meet national science standards.
- c.) Improve communication between the DNR and schools about services available.
- d.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on the long-term benefits forests provide to society and the lost benefits to society of not managing forest resources
- e.) Produce materials to inform teachers and students about how and why the forest resource is important to society.
- f.) Obtain representation on the Iowa Conservation Education Coalition council and other relevant councils to offer input on forestry curriculum.

8. Lack of Stewardship Plans Written in Relation to the Amount of Forest

Strategies

- a.) Increase the number of foresters available to work with forest landowners on developing stewardship plans.
- b.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on the long-term benefits forests provide and the lost benefits of not managing these resources.
- c.) Produce materials to inform forest landowners about the services offered by the Forestry Bureau.
- d.) Prioritize stewardship plans to be written within priority forest areas.

- e.) Develop incentives that encourage forest landowners to use their stewardship plans.
- f.) Create markets or develop incentives that pay landowners for the ecosystem services provided by their trees and forests.

9.7 Issues of Forest Related Planning, Policy and Law

1. Lack of Policies or Laws to Encourage Better Management of Forest land

Strategies

- a.) Work with stakeholders to create policies that require forest landowners to have and follow a forest stewardship plan to be eligible for forest reserve.
- b.) Work with stakeholders to create policies that encourage best management practices to be followed for all timber harvesting.
- c.) Work with stakeholders to explore policies that would encourage forest stewardship plans for timber sales.
- d.) Work with stakeholders to explore policies that would encourage forest stewardship plans for all forests.
- e.) Work with stakeholders to develop local ordinances to sustainably manage forest areas.
- f.) Education, outreach and advocacy through Forestry Field Days, news articles and other mass media outlets- key on the long-term benefits forests provide and the lost benefits of not managing these resources.
- g.) Work with county offices to create a system of tracking forest land ownership so the new landowners are shipped information about forest benefits and how to sustainably manage their forest.
- h.) Work with conservation agencies to more closely monitor compliance of forestry practices that are cost-shared to ensure success.
- i.) Work with other public agencies that own forest land to develop strategies and policies that ensure sustainable management of the forest resource is accomplished on all public forest land.
- j.) Utilize the Iowa Forest Resource Assessment and Strategies document in conjunction with the Wildlife Action Plan to prioritize forest land acquisition.
- k.) Provide sustainable funding for public agencies that is dedicated to sustainably care for the forest resource.
- l.) Work with stakeholders to encourage policy that increase forest cover within watersheds and rivers that are drinking sources for communities to encourage land use in those watersheds that will improve the water quality and reduce costs of water treatment.

- m.) Create markets or develop incentives that pay landowners for the ecosystem services provided by their trees and forests.

2. Continuing Education for Foresters, Loggers and Consultants

Strategies

- a.) Provide training and educational opportunities specifically for foresters, loggers and consultants.
- b.) Improve the exchange of information among foresters within Iowa.
- c.) Maintain a database of current forestry information that is available for people to keep up-to date on knowledge.
- d.) Produce materials that provide continuing education opportunities.
- e.) Use new technologies to inform and educate, such as webinars, You-tube, web accessible power points to explain information.

3. Improve Communication among Forestry Stakeholders

Strategies

- a.) Use new technologies to inform and educate, such as webinars, You-tube, web accessible power points to communicate.
- b.) Host field days to share information between stakeholders.
- c.) Creation of a web-based Iowa forestry connection to offer education, classifieds, discussion forums, employment opportunities, research, project updates, grant opportunities, publications, wood industry info, ask a forester blog, etc.
- d.) Development of online feedback on DNR Forestry webpage (for general questions and feedback on field days)
- e.) Find common issues among stakeholders to get their constituents to embrace forestry issues.
- f.) Maintain a database of current forestry information that is available for people to keep up-to-date on.

4. Green Certification

Strategies

- a.) Develop economic incentive for participation.
- b.) Train field staff to be able to certify forests.
- c.) Explore green certification of public and private forest land.

5. Assist Communities with Forest Resource Management to Minimize the Effects on Trees Caused by Natural Disaster

Strategies

- a.) Work with communities and stakeholders to develop a designated fund for assisting communities that manage their tree and forest resources.
- b.) Develop natural resource disaster plans of recovery.
- c.) Assist communities to develop urban management plans, maintenance plans, and budgets to prepare their trees to be better able to withstand natural disasters.
- d.) Encourage tree planting to replace lost resources.
- e.) Produce materials to inform communities about how to manage their trees after a natural disaster.

Conclusion

Iowans enjoy many attributes of their trees and forests. This enjoyment is shown by the increasing number of acres of forest cover over the past two decades across the state, an increasing housing market on acreages (land with trees or grass), and by the number of people visiting local conservation areas for recreation as they turn to local options for vacationing. This document has shown a variety of examples of how forests down to a single tree provide multiple benefits wherever they are planted. They help purify the air by absorbing pollutants and producing oxygen. They provide the wood that is used in the construction and furnishing of almost every home. They can provide firewood as a heating source for a home or a campfire. Shade trees increase property values for homeowners which increases the tax base in communities. Trees improve visual curbside appeal for homes and business districts, cool those areas by providing shade to buildings and other surfaces that absorb heat. It has been estimated that trees can save an average household up to \$250 annually in energy costs. Trees provide habitat for birds and other wildlife within urban or rural areas. Trees armor streambanks by holding soil in place and slowing water flowing over the soil causing pollutants and sediment to be deposited before reaching a stream. Where forested watersheds remain, water treatment costs for those citizens are lower.

Demands on forest resources have varied in the past and will continue to change in the future based on societies needs. A growing population, changing land-use decisions with changing forest ownership, invasive species and other influences make long-term planning a challenge for forests in Iowa that are 87% privately owned.



Above: Photo by Iowa Dept. of Natural Resources.

Improving air, soil and water quality is dependent on the land-use decisions of the approximately 150,000 private forest landowners across the state. If markets could be developed for ecosystem services, forestry as a land use would become more competitive when compared to other land uses. Ideas of leasing forest land for hunting, carbon sequestration, improving water quality to reduce the need for water treatment plants downstream, urban trees removing pollution are all ecosystem services that are valued in the billions of dollars per year.⁷⁵

Having information about the condition of Iowa's forest resource both past and present, allows for review about how these resources are changing. This data driven document provides insight about the condition of Iowa's forest resources. Strategies developed for the issues related to Iowa's forest resource were given in Chapter 9. Chapter 9 lays the groundwork for stakeholders to use as a reference for addressing the issues that are most relevant to their constituents.

This assessment of Iowa's forest resource is meant to serve as a working document that will continue to evolve and change in tune with the attitudes stakeholders and partners perceive the important forest issues and areas to be throughout the state. It is the intent of this document to provide initial direction about where to begin resolving some of the issues affecting Iowa's forest resource.

⁷⁵Interim Update of the 2000 RPA Assessment, p41.