

**USDA Forest Service Sponsored:**

**Outlook Forest Research Dialog**

*“Developing Research Options to Address  
Future Decision Makers’ Needs”*

**Survey Report:**

**Decision Makers’ Future Needs**

**8/30/05**

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**Please Note:** This report summarizes solely the opinions expressed by survey participants. There are potential gaps and duplications from surveying 50 experts. We have not added to or subtracted from the survey results. Therefore, this is not necessarily a comprehensive assessment of all trends in U.S. forestry. An interactive workshop, including 25 of the survey participants, will be held September 27-29, 2005 to refine these results.



NCSE is conducting this project for the USDA Forest Service.  
The Council is a non-profit and non-advocacy organization.

## Introduction

This survey is part of a project that the National Council for Science and the Environment (NCSE) is conducting for the USDA Forest Service entitled “**Developing Research Options to Address Future Decision Maker’s Needs**” In order to anticipate the information needs of policymakers, managers and practitioners over the next 20 years, we are using a *Research Futures Process*.

The goal of the futures process is to examine a *range* of possible futures to serve as the basis for anticipating the needs of decision makers in the future. These needs for data, information and tools will be the basis for developing a long term research agenda. The Research Futures Process engages participants from industry, NGO’s, academia and governments, to establish wide input, broad credibility and buy-in from diverse stakeholders.

One of the key aspects of the process is first to have information “users” (decision makers at the policy, management and practice levels) define their anticipated needs, and then secondly to involve the information “producers” (researchers) in determining what research is best suited to meet those needs. This report on the survey is part of the first step in that process. The summary herein represents the results of a survey of 50 decision makers in forestry and natural resources. The survey articulates what these diverse stakeholders think are the most significant trends affecting U.S. forests over the next 20 years, what is driving these trends, what their consequences will be, and options for addressing them.

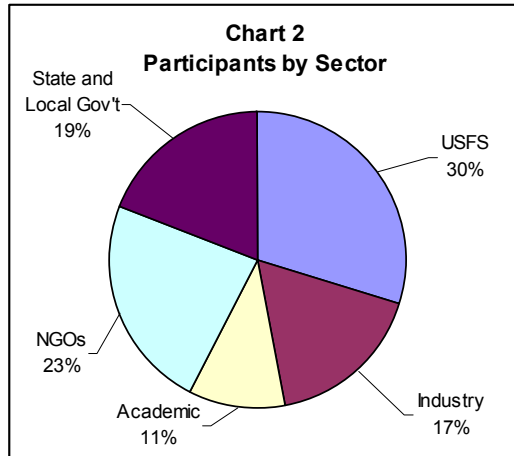
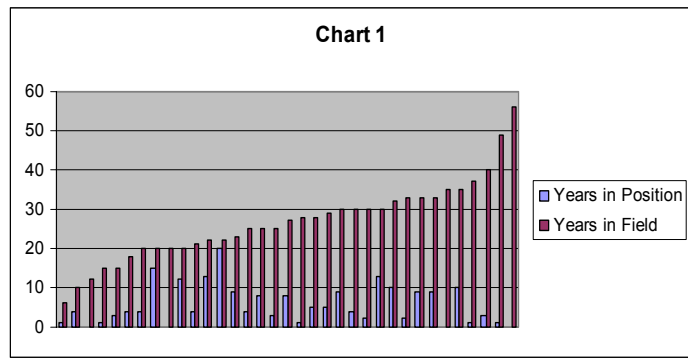
The results of the survey, as summarized in this report, will serve as a starting point for the “Decision Makers’ Future Needs Workshop,” to be held September 27-29, 2005, where a group of forestry decision makers will develop a range of possible futures and the information needed to address them. We use a *range* of futures because in a world of increasing uncertainty no one “best guess” future is likely to become reality. These multiple possible futures will serve as the basis for identifying a research agenda that has the highest probability of meeting the actual future needs of users.

The decision makers’ workshop will be followed by a separate workshop in February for researchers. At this second workshop, a diverse group of scientists will examine the decision makers’ needs for data, information and tools from the first workshop and then develop research options to best address users’ future requirements.

## Methods

From late April through early July 2005, the NCSE project team interviewed over 50 individuals with strong forestry and natural resource backgrounds. Included in this group were people affiliated with of the USDA Forest Service, conservation organizations, industry, federal, state and local government, and academia. Chart 1 below shows a profile of the participant’s experience level in forestry and other natural resource fields.

While knowledge and leadership in the field was a primary consideration in the selection of interviewees, individuals were also chosen to ensure a diverse set of stakeholders and perspectives were included. Chart 2 shows the diversity of interviewees by sector.



Participants were first given a short questionnaire and then were subsequently interviewed to learn about their survey responses in greater detail. The interview results were then compiled and analyzed; the results of this analysis are provided in this report. To ensure participants were able to speak freely during the interview, no individual's opinions will be specifically identified in this report; the report represents an analysis and presentation of the results in summary without attribution.

The report begins by presenting a general view of the major trends and issues facing U.S. forests, major opportunities for improving forest management, and major constraints to forest management, based solely on the survey and interview responses. These sections are followed by a narrative analysis of four major categories of trends, encompassing all the survey responses, and considers the major drivers of these trend categories, their major consequences and finally options for addressing them.

## A. Major Trends

Participants identified the following as the most important trends and issues facing forests in the U.S. The trends are divided into three areas: environmental, economics, and social.

### Environmental

1. Further pressure on rural forest land due to population growth and the first waves of retiring baby boomers moving away from cities, leading to urban sprawl and increasing amounts of urban-wildland interface.
2. The need to improve forest health, especially with regard to fire in the western U.S.
  - a. A limited market for small wood makes fire management difficult.
  - b. Healthy, resilient forests are important for water quality and quantity for both rural and urban areas.
3. Invasive species will continue to play a major role in the health, productivity and biodiversity of U.S. forests
4. Climate change is a long-term trend with consequences for forests and needs to be recognized as such.
5. Increasing pressures on public lands from recreational users as individual private land holdings become smaller and less available for public use.

### **Economic**

6. Major changes in ownership trends of the U.S. forest base, including: industry divestiture of lands leading to land parcelization (division of large parcels of forest land between many owners), increasing urban/wildland interface, and shifting values of land owners reflecting a new ownership class of urbanites/second home owners who do not consider themselves “forestland owners.”
7. U.S. forest industry is becoming less competitive in the face of strong overseas markets and stagnant growth in demand domestically.
  - a. A small segment of interviewees cited increasing demand for forest products and over consumption as a threat to forest area.
8. Emerging markets or the need for markets for ecosystem services provided by forestlands.
9. Potential use of non-timber forest products (NTFPs) as a tool for biodiversity conservation and economic diversification.

### **Social**

10. Greater public involvement in forest management issues
  - a. Greater public scrutiny; people no longer trust forestry professionals contributing to the increasing popularity of certification systems
  - b. Polarization over how forest management should be approached
11. Concern over the “do nothing” approach to management of National Forests and the ability of the Forest Service to effectively manage National Forests in the future.
12. Generally poor forestry practices on both public and private lands.
13. Declining public commitment to forest biodiversity; people do not realize the value of forests or connect the wood products they use to the forests they came from.
14. Shrinking forest research capacity
15. Challenges of regulation faced by landowners—both public and private (e.g. the Endangered Species Act).

## **B. Opportunities**

Participants identified the following as major opportunities for improving forest management and conservation in the U.S. The opportunities are divided into three areas: environmental, economics, and social.

### **Environmental**

1. Embracing the concept of sustainability to improve forest management.
2. Development of conservation easements that allow for working forests.
3. Our scientific knowledge of forest systems is improving; more forestry research can lead to better management practices.
4. Water quality and quantity will become a major issue and provides an opportunity to stimulate collaboration between interests.

### **Economic**

5. Development of markets for biomass energy, ecosystem services, and recreation to increase the value of forests.

6. High value, engineered wood products are a great opportunity if the U.S. can stay at the forefront of innovation.

### **Social**

7. Using more collaborative and community based approaches to forest management.
8. Increased acceptance of certification systems as a way of setting minimum forestry practices.
9. Educating the public about forest health and management can lead to support for better practices and the budgets required to carry them out.
10. Look to European countries and learn from their efforts to take a long term perspective on management.

## **C. Constraints**

Participants identified the following as important constraints to improving forest management and conservation in the U.S. The constraints are divided into three areas: environmental, economics, and social.

### **Environmental**

1. Land ownership patterns with many different private and public landowners with different priorities making landscape scale management challenging.
2. EPA air quality standards limit the ability of land managers to conduct fuel treatments.
3. Pressure of population growth on forestlands.

### **Economic**

4. Lack of funding and leadership on forestry research.
5. Lack of support for land management agencies to fund social science research.
6. People are reluctant to pay for things they have not had to pay for in the past such as ecosystem services and recreation access.
7. Economics do not always support sustainable practices.

### **Social**

8. Public opinion is still skeptical of land management. Polarization and policy gridlock a major issue.
9. Lack of a conservation behavior ethic among the general public and inadequate funds available to educate them.
10. True collaboration is difficult to achieve and there is limited funding for this work or for education on how to carry it out.
11. Lack of a long-term perspective in planning.

## **Major Themes**

While the interview process yielded a diverse set of trends and issues facing forestlands in the U.S., when the trends are considered in conjunction with their drivers and consequences, relationships between trends emerge. From a careful analysis of the interview results, four major, overarching trends become apparent:

- I. Land Use and Global Markets:** The relationships between shifting global markets and land use changes.
- II. Forest Health:** Long term forest health/management issues including fire, invasive species and climate change.
- III. Ecosystem services:** Forests as a source of ecosystem services.
- IV. Diminishing Trust in Forestry Professionals:** A lack of trust of forestry professionals by the general public resulting from the current problems with forest health.

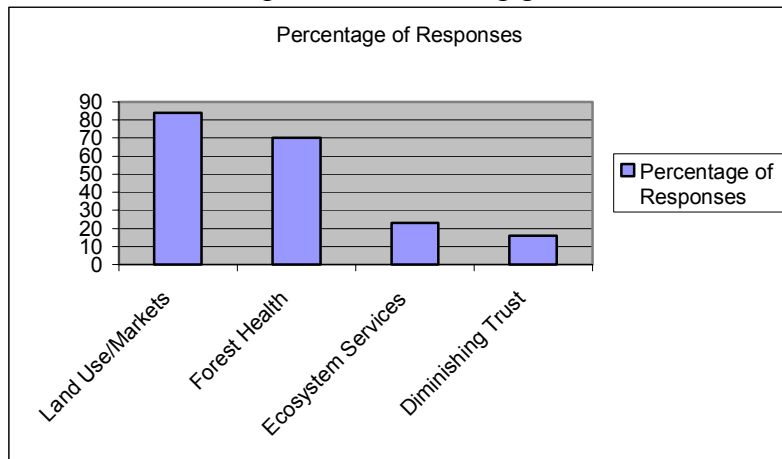


Chart 3 above shows what percentage of interviewees identified each of the four major trends as an important area of concern. Summaries of each of these issue areas, their major drivers, their consequences and options for addressing them, follow below.

### ***I. Land Use and Global Markets***

**Trends:** Issues related to land use change and global markets were a nearly universal concern of the interviewees, with 84% including a trend in this category in their responses. While changes in global markets and land use were often initially thought of as separate issues, they ultimately shared common drivers and consequences.

The primary concerns in this category are:

- The widespread parcelization and fragmentation of private lands
- Diminishing competitiveness of U.S. timber production in a global context and the impact of this on the U.S. forestland base.
- Land conversion out of forest uses caused by urban sprawl
- Shifting economics of rural land values resulting in development offering better returns than traditional forestry practices.
- The growth of the urban/wildland interface
- The growth of investment firms focused on forest ownership (e.g. timber investment management organizations, TIMOs, and real estate investment trusts, REITs) with uncertain investment horizons.

**Drivers and Consequences:** The drivers and consequences of these trends are difficult to separate. Diminishing competitiveness of U.S. timber markets will impact industrial timber companies' decisions to invest further in the U.S. The resultant loss of mills limits the options for non-industrial private forest owners to sell their wood, causing land owners to look for alternate income streams. At the same time, urban areas are growing rapidly, causing rural land values to rise and make the option of subdividing and selling timberland more attractive and profitable to rural landowners than continued management and production. The new

landowners, more often than not from an urban background, bring with them an urban perspective with a desire for the aesthetics of the rural environment, but the convenience of the urban. They lack the knowledge and desire to manage forests leading to forest health issues (stagnation, overstocking). The combination of parceling the land into 10-15 acre “ranchettes” and the desire for urban amenities drives sprawl further. Many see further loss of forestland as timber investment management organizations (TIMOs) and real estate investment trusts (REITs) begin to subdivide portions of their holdings in pursuit of investment returns. Other consequences include:

- Parcelization and sprawl will lead to the loss of the ecosystem services provided by forests especially water quality and quantity.
- Increase in the area of mid-successional forests of least value to wildlife.
- As urbanization spreads, people will become less connected to forests and the disconnect between forest and wood products will become greater.
- Increase in landowners posting their land against trespass; as less private land becomes available for recreation, the demands and strain on public lands will be greater.

Secondary drivers of this trend are U.S. population growth and the retirement of baby boomers. The consequences of the former are self-evident—a larger population requires larger urban areas. Some of the interviewees felt the latter will become a major issue in the years to come as retirees seek alternatives to urban areas and begin purchasing rural forestland, but do not manage the forest. However, the consequences of this are not completely negative. Large lots of forested land with a human understorey are still forested—it is not the same type of conversion as a strip mall. There is potential to educate new landowners to be stewards.

Diminished U.S. competitiveness, driven by lower production costs overseas and globalization generally, will have consequences beyond driving parcelization and the loss of forests, including:

- Loss of forestry jobs with the heaviest impact on rural communities.
- Loss of land value for timber lands, increasing the potential for poor management practices like high grading to maximize the value of harvests.
- Decreased domestic wood product manufacturing capacity, resulting in even higher imports and continued weakening of U.S. markets and capacity.
- Continued consolidation of the forest products industry and a shift from industrial ownership to TIMOs and REITs (because of their favorable tax structure) where the land will be managed as an asset, shifting the focus from fiber.
- An increase in fee based recreation as both public and private landowners search for alternate sources of income.
- Decreasing monetary support for land management, forestry research, and forest conservation.

While some of the participants noted some regional differences between the east and west due to different land ownership patterns, these problems are seen as nationwide with the only major variation being the approach of different jurisdictions to controlling sprawl.

**Options:** Survey participants most frequently pointed to education as a viable option for addressing the issue of forest parcelization, fragmentation, and urban sprawl. It is strongly felt that people outside the forestry community simply do not realize the value of forests or the role

they play in vital ecosystem services, especially water quality. An education campaign is needed to show people all forests, including those managed for production, provide valuable services to society and not just old growth forests. Efforts need to be made to educate new forest landowners who are unfamiliar with land management about the benefits of management for the health and resiliency of their newly acquired forestland.

It is clear the traditional methods of landowner education are not enough. New owners with an urban background do not see themselves as forest owners, or have a history of trusting traditional extension foresters. The technologies and knowledge to manage the land is available; what is needed are new ways to reach new, broader audiences. More than just landowners need to be educated—urban dwellers are also an important audience because they are disconnected from the forests and do not connect forest products to the forest. Local governments also need to be educated on the benefits forests can provide. This type of effort will require new strategies, increased funding and greater cooperation between government, universities, NGOs and industry.

Beyond education, the following options for mitigating the trend of fragmentation and sprawl were noted by survey participants:

- Improved land-use planning laws.
- Research on what policies currently in place around the country are effectively controlling growth so these policies can be duplicated elsewhere.
- More funding for urban renewal efforts to make cities more attractive and slow the flight of people to rural areas.
- Greater cooperation between jurisdictions to ensure there are consistent land-use planning measures in place across landscapes.

Participants also offered a number of mitigation options that integrated the issue of sprawl/fragmentation and the challenge of weak U.S. timber markets:

- Adjust the tax structure for forestlands to make U.S. industry more competitive and to encourage long-term sustainable management of forestland.
- Implement universal forest practice acts so resources are used efficiently and sustainably and so there is a consistent, predictable set of regulations for industry to follow everywhere.
- Encourage community-based forestry so rural communities can see the value of their forestlands; integrate regional companies into local economies rather than importing wood products.
- Aggressive development of new products and markets through cooperation of industry, academic, and government researchers.
- Greater cooperation between industry, NGOs and government to overcome ideological boundaries and face the reality of dynamic relationship between industry competitiveness and forest conservation.

## ***II. Forest Health and Management***

**Trends:** Forest health and land management issues including fire, invasive species, and climate change were noted as major trends by 70% of the survey participants. Specific concerns were:

- Increasing problems with forest health with no clear way forward for forest restoration.
- Fire has become a much more important factor than in the past; how do we restore forest to a more natural state without losing them to catastrophic fire?
- The increasing threat of invasive species.
- The long-term problem and uncertain implications of climate change and its impact on forests.
- Poor forest management on both public and private lands.

**Drivers and Consequences:** Each of the trends in this category can be seen as issues in their own right as well as dynamically interrelated with one another. The most commonly identified trend was declining forest health in general, with interactions between fire, invasive pests and diseases, forest management and climate change all playing a role in driving the overall decline. Invasive species and fire are seen to drive one another, with large pest outbreaks contributing to catastrophic fire and vice-versa. Both of these issues are overshadowed by a larger issue—poor forest management. The legacy of fire suppression is driving many current forest health problems. Many participants do not see land management improving on public lands and point to a “do nothing” approach—sometimes attributed to budget or regulatory constraints—that continues to leave forests overstocked and at risk for large fires and invasive species infestations. This, “do nothing” management is also attributed to the increasing politicization of forest management from all sides resulting in policy gridlock and declining forest health. The lack of active management and resultant lack of timber production from National Forests is resulting in budget shortfalls: with the forests producing less income, there is little money to manage them.

The spread of invasive species on both public and private lands and the decline in health of private forestland is also being driven by the globalization of timber markets and decreasing U.S. competitiveness as discussed in the previous section. As the U.S. becomes less competitive and non-industrial landowners and industrial landowners alike sell their land into smaller parcels that are not being actively managed, these forestlands become more vulnerable to invasive species. The problem is exacerbated by new invasives arriving in the U.S. along with the increasing amount of imported wood. The problem is made worse still by the lack of a nationwide strategy for addressing new invasive species before they become an entrenched problem.

The drivers of climate change are the continued buildup of greenhouse gases. While the effects of climate change may not be felt immediately, it has the potential to contribute to ecosystem changes, species migrations, change in fire regimes and other significant impacts, with major consequences for forest health.

The consequences of the trends are clear from the drivers. Without intervention, the current trends indicate a continued decline in forest health and a consequent loss of biodiversity. On public lands, the current efforts are seen as too little too late; the lack of income from forests is hurting the Forest Service’s ability to manage leading to even more overstocking and greater threats from invasive species and fire. Markets will continue to play a role in the ability to

manage private land. Landowners will continue to sell land to development because they cannot get enough value from their timber. This will continue the trend of poor management and increase vulnerability to invasives and fire. Poor overall management will lead to loss of ecosystem services resulting in declines in water and air quality and less forest resources for future generations.

A positive consequence is conservation groups beginning to recognize this threat and are investing more in conservation easements and other measures to help protect biodiversity and ecosystem services. Some also see the potential to foster long-term planning efforts as a result of the continued decline in forest health.

These trends and their consequences are the same across the country, but their precise nature varies across regions. In the west, where threat of fire and the density of public land is greater, the issues related to overstocking and problems of management of public lands are more pronounced than in the east, where issues are focused on management of private lands.

**Options:** As with land use and markets, participants identified education as a major component of mitigating current forest health trends. People do not understand the consequences of different management actions—or lack thereof—on fire and invasive species. Avenues to education include collaborative decision making. By involving the public in the management process they both learn about forests and forest management and develop an understanding of why certain actions, such as prescribed fire, need to be taken. By letting people be part of the process, a disincentive for gridlock is also created. In the west collaborative efforts and community forestry are already established in many areas; these experiences need to be transferred to the east.

The potential for new markets is also an encouraging trend. Development of a market for biofuel could have a significant impact on forest health, especially where fire and overstocking are major concerns. Similarly, development of a market for ecosystem services and non-timber forest products could create alternate income streams for landowners, public and private, providing them with funds and incentive to actively the health of their forest.

Other options suggested include:

- More research into the mitigation of the impacts of invasive species and climate change.
- Creation of incentives for forest management and certification, which provides a minimum standard for management.

### ***III. Ecosystem Services***

**Trends:** Ecosystem services such as water quality and quantity were raised by 23% of the survey participants as important issues. Specifically, they noted the following trends:

- Ecosystem services are beginning to be acknowledged as an important emerging market in which forests can play a role.
- Water quality and quantity is an important benefit provided by forests to communities, but people are only beginning to realize forest's important role in providing this resource.

- Recreation may become an important, non-consumptive alternate income stream for forest landowners.
- The general public is still reluctant to pay for ecosystem services because they are used to getting them for free.

**Drivers and Consequences:** As seen in the previous section on land management trends, many participants see ecosystem services as an incentive for improving land management. Those who specifically noted ecosystem services as an important trend saw improved land management as an eventual consequence of the development of markets for ecosystem services, but did not see this as a driver. Participants felt the drivers for development of ecosystem service markets are largely the result of necessity. Water quantity and quality are limited resources; with populations around urban areas increasing cities will require reliable supplies—forests can help provide this. Landowners are being driven to seek new markets to replace lost value because of decreasing U.S. competitiveness in the global marketplace. Increasing understanding of the currently non-market values of their land is driving these landowners to find ways to turn these values into income-producing commodities. Despite this, there is concern by many participants that the general public will be very resistant to the creation of ecosystem service markets because they will be unwilling to pay for things they previously received for free.

As a consequence of these drivers, participants see the emergence of a new class of forest landowner entrepreneurs. These people will develop creative ways to sell the services provided by their land, including water benefits and fee-based recreation. Their focus will be on sustainable forest management to maintain the health of their forests and continue to sell the services provided by the land. Water is seen as a potential focal point for markets because of increasing scarcity in respect to both quantity and quality, as a result of increasing forest fragmentation and poor land management as noted in the previous sections. Ultimately, for these markets to succeed, landowners must be able to derive enough value for the ecosystem services to replace the income they would receive from traditional, commodity based forest management or from selling their land for development.

**Options:** In order to stimulate the growth of ecosystem service markets, three things are needed: viable markets for buying and selling these services, incentives for landowners to begin to manage their lands for them, and education of the public about why they are needed and why they should pay for them. In addition, these markets and incentives must be stable so landowners can manage their lands effectively without fear of losing their markets.

#### ***IV. Diminishing Public Support for and Trust in Forestry Professionals***

**Trends:** Participants noted that in general, public concern for forests seemed to be diminishing. For example, environmental issues received minimal attention during the last election. In addition, people are not pursuing careers as frequently as in the past in forestry or forestry-related research. Participants also noted that among those members of the public who were interested in America's forests, there is a growing mistrust of forestry professionals, especially representatives of federal and state resource agencies.

**Drivers and Consequences:** The drivers of these trends are similar to those of many of the other trends noted by participants, including a lack of public understanding about forests and forest systems, both biological and economic. Apathy over the environment was seen as a driver behind reduced budgets for natural resource agencies and increasing loss of forests to development. The decline of available funding, including the lack of long-term support for public education in the U.S. was noted as an important cause of U.S. research capacity falling behind that of other countries. More worrisome, there is no strong pipeline of young researchers to step in behind those who are nearing retirement age.

The increasing intensity and severity of forest fire damage and the impacts on human communities, especially in the West, were perceived as the basis for lost faith in public land managers. The lack of collaborative action in forest management further compounds concerns, resulting in people turning to non-foresters for leadership on forestry issues.

The effects of these trends will be continued reductions in budget and capacity for resource managers, leading in turn to a decline in forest health. Apathy and lack of research capacity will lead to additional loss of forested acreage and continued decline of U.S. competitiveness with foreign markets.

**Options:** The options for mitigating these trends are also similar to those noted with previous trends. Collaborative approaches to management are essential to overcoming ideological deadlock that contributes to the mistrust of forestry professionals and engaging a disinterested public. Education is also important if people are to understand forests better and become more supportive of the efforts of foresters and the agencies that employ them. Specific to research capacity, more partnerships among universities, the private sector, and federal research agencies are needed to make the most of available funding and engage more young researchers in forest research careers.

## Conclusion

What do these four issues—land use and global markets, forest health and management, ecosystem services, and lack of trust in forestry professionals—tell us about the future of U.S. forests? The table below outlines these major themes, their drivers, and their consequences. Two things are clear from the table: the themes are interrelated and in many ways have a cause and effect relationship, and the status quo for the future is not particularly bright for sustainable forestry in the U.S.

Participants almost universally see a decline in the area of forest in the U.S., a decline in U.S. market competitiveness, and decline in management on the forests that remain, due largely to increasing parcelization and fragmentation and rapidly spreading urbanization. These trends inevitably lead to a decline in the ecosystem services forests provide, including clean water, just as populations are beginning to grow in rural communities and water quality is becoming a bigger issue.

As poor market competitiveness reduces the funds available for land management on both public and private lands, threats by invasive species and fire will increase, exacerbating an already significant problem with forest health. Continued threats from wildfire, water quality issues, and the decline in health of public lands are likely to continue to shake the public’s already fragile confidence in forest professionals and further threaten funds for research and education.

The table below summarizes the major themes to emerge from the survey, as well as the associated drivers and consequences of those trends:

<b>Major Themes</b>	Changing land use, parcelization/ fragmentation, Population growth, less competitive U.S. timber markets	Forest health, invasive species management, climate change	Increasing recognition of Ecosystem services including water quality and quantity as an important benefit of forests.	Lack of trust of forestry professionals and their ability to manage the land
<b>Drivers</b>	More people wanting to live outside of cities; more competitive land values for development than for timber; rapidly expanding urban areas; increasing imports of cheaper wood from overseas	Legacy of poor forest management practices are having consequences of increased fire and invasives today. Continued lack of good fire management on western forests.	Decline in water quality and quantity. A greater understanding of the services forests can provide. Poor markets for traditional commodities.	Poor management and lack of collaboration between managers and local land owners leads to mistrust. Declining investment in forestry education
<b>Consequences</b>	Loss of forest area and wildlife habitat, leading to less biodiversity; declining ecosystem services; continued decline of U.S. timber markets	Continued decline of forest health. Increased risk of catastrophic fire and exotic invasions. Loss of ecosystem services.	Potential for new markets developing, especially as demand for clean water increases and timber competitiveness decreases.	Lack of public support for management of lands, making improvement of forest health difficult. Declining number of qualified foresters.

The material in this report will be discussed and refined by 25 of the interviewees at the “Decision Makers’ Future Needs Workshop” as part of a process to develop a better basis for anticipating the future information requirements for decision making.