

**NAFO Survey Report:
Perceptions of Research Needs**

**Pat Stephens Williams, Ph.D.
Ray Darville, Ph.D.
Stephen F. Austin State University**

**Damian Adams, Ph.D.
University of Florida**

**Janean Creighton, Ph.D.
Oregon State University**

**Steve Grado, Ph.D.
Mississippi State University**

**Jim Johnson, Ph.D.
Oregon State University**

Final Report

February 2014

Table of Contents

EXECUTIVE SUMMARY	4
INTRODUCTION.....	7
METHODOLOGY.....	8
RESULTS	11
Demographics and Descriptors.....	11
Job Title	11
Region.....	12
State	12
Geographic Extent and Type of Business.....	13
Top Products.....	14
Acres Managed.....	15
Business View of Research.....	15
NAFO Research Needs.....	16
Amount of Contracting of Research	16
Top Sources of Research Information	17
Level of Concern about Specific Issues	18
Research Needs Satisfaction.....	21
Specific Issues Recently Affecting Businesses.....	23
Research Priorities.....	24
CONCLUSION.....	30
LITERATURE CITED.....	31

List of Tables

Table 1. Job Title.....	11
Table 2. Region of Work Zip Code.....	12
Table 3. State of Respondent.....	13
Table 4. Geographic Extent of Business.....	14
Table 5. Type of Business.....	14
Table 6. Top Products Frequencies.....	15
Table 7. Business View of Importance of Research.....	16
Table 8. One or More Researchers on Staff.....	16
Table 9. Amount of Contract for Research.....	17
Table 10. Sources Frequencies.....	18
Table 11. Descriptive Statistics for Level of Concern for Specific Issues.....	19
Table 12. Descriptive Statistics for Research Needs Satisfaction.....	22
Table 13. Descriptive Statistics for Issues Recently Affecting Business.....	24
Table 14. Research Priorities for Region - Short-term: Frequencies.....	25
Table 15. Research Priorities for Region - Long-term: Frequencies.....	26
Table 16. Research Priorities for United States - Short-term: Frequencies.....	27
Table 17. Research Priorities for United States - Long-term: Frequencies.....	28
Table 18. Summary Table of Priorities.....	29

EXECUTIVE SUMMARY

NAFO Survey Report: Perceptions of Research Needs

The National Alliance of Forest Owners (NAFO), formed in 2008, is an organization of 73 private forest owners who own or manage nearly 80 million acres in 47 states. NAFO's membership is comprised of a blend of corporations, family companies, Timber Investment Management Organizations (TIMOs), Real Estate Investment Trusts (REITs), associations, and two universities. Following a 2012 meeting between David Tenny, President and CEO of NAFO, and the Executive Board of the National Association of University Forest Resources Programs (NAUFRP), a decision was reached for NAUFRP to conduct a survey of NAFO membership to determine NAFO's perceptions of and need for forestry and natural resources-related research.

In 2013 a team of six researchers from Stephen F. Austin State University, University of Florida, Mississippi State University, and Oregon State University developed and delivered a web-based survey to 30 pre-selected members of NAFO who own and/or manage forest land. Following a two month response, 21 usable responses resulted, for a response rate of 70%. Nearly all of the respondents classified themselves as President, Vice-President, or Manager, with respondents evenly split between the eastern U.S. and the western U.S., with nine states represented. About half of the respondents were TIMOs or REITS, and the other half were either corporations or family companies. Collectively, the respondents own or manage 4.8 million acres of forest land, with the median being 730,000 acres. Sawtimber, sawlogs, and pulpwood were the primary products sold. Research was deemed to be somewhat

to very important to all of the respondents, though less than 30% of respondents employed research personnel directly. Two thirds of the respondents contract out for 25% or more of their research needs.

Most respondents rely on others for their information and research needs. Nine respondents (43%) relied on research cooperatives, while 16 (76%) made use of university research. Eight respondents (38%) made use of the National Council for Air & Stream Improvement (NCASI), and seven (33%) made use of U.S. Forest Service research.

Respondents were asked to rate their level of concern with 25 contemporary issues, as determined by NAFO, U.S. Forest Service regional Forest Futures projects, and the National Woodland Owners Association. Twenty of the 25 issues were listed as “of concern”, with the following top five: (1) water quality, (2) management standards and practices, (3) biomass, (4) property rights, and (5) invasive insects. Most of the issues were of concern to both eastern and western respondents equally. There were a few differences based on ownership size, for example, larger owners (over one million acres) rated biodiversity, fragmentation and parcelization, and private property rights higher than smaller owners (less than one million acres). Respondents also were queried about their level of satisfaction with the current intensity of research around the 25 key issues. Sixteen of the 25 were perceived as needing additional research, with the top five neediest as follows: (1) water quality, (2) management standards and practices, (3) invasive diseases, (4) water quantity, and (5) wildfire. Respondents were also asked to list up to four forest resource or technology issues that need priority research *in their region* over the next five years and long term. This generated a lengthy

list of responses, but the top five for both near and long term were as follows: (1) water quality, (2) markets, (3) management standards and practices, (4) insects and diseases, and (5) wildlife habitat. When asked this same question regarding priority research needs across the country over the next five years and long term, biomass emerged as a key near term need.

This survey of NAFO membership reveals that forest and natural resource-related research is very important to NAFO members, and many already rely on NAUFRP institutions to provide it, more than any other source. However, there is room for further growth and development of relationships with both organizations having much to learn from each other and much to offer each other.

INTRODUCTION

The National Alliance of Forest Owners (NAFO) is an organization devoted to advocacy of private forest owners and includes many of the largest forest landowners in the country (www.nafoalliance.org). The approximately 70 members include publicly-traded companies, family businesses, partnerships, investment organizations, and associations. These members work on policies and policy solutions in a wide area of forestry-related issues including sustainability, bioenergy, national forests, taxes, clean water and air, and other policies “to help working forests keep working.” Moreover, NAFO “has developed a sophisticated, bipartisan and solutions-oriented advocacy approach to advance federal environmental, energy, conservation, economic and tax policy benefiting private working forests and those who own and manage them.”

The Executive Committee of NAUFRP believes that there is much work to do with NAFO to communicate the relevance of university-based research in forestry and related fields, and to build a better relationship with this important group of constituents. Since the overall change in forest land ownership from forest industry to TIMOs/REITs in recent decades, much of the institutional memory and equity that existed for many years has been lost. Current leaders with TIMOs/REITs do not necessarily understand or see the high degree of relevance of university-based research in forestry and related fields. In 2012 a two-page proposal was sent to Dave Tenny with NAFO by NAUFRP, offering to conduct a survey to determine NAFO's research priorities. Results of this survey will be used to do a better job of communicating findings relating to key topics of interest to their members as well as identifying needs for new and continued faculty funded research. The ultimate goal of the project was to determine NAFO priorities and

to work on communication between the two forestry-based organizations so that each benefits from the other.

METHODOLOGY

In 2012, a proposal was sent by NAUFRP to NAFO, offering to conduct a survey to determine NAFO's research priorities. Upon acceptance of the proposal in spring 2013, NAUFRP created a research team charged with designing a survey instrument, conducting the survey, and providing results to NAUFRP and NAFO for use in discussion and recommendations of possible research directions. The research team consisted of the following members:

- Dr. Pat Stephens Williams, Associate Professor of Human Dimensions and Natural Resources, Stephen F. Austin State University, Nacogdoches, TX
- Dr. Ray Darville, Professor of Sociology, Department of Social and Cultural Analysis, Stephen F. Austin State University, Nacogdoches, TX
- Dr. Damian Adams, Assistant Professor of Natural Resource Economics and Policy, University of Florida, Gainesville, FL
- Dr. Steve Grado, George L. Switzer, Professor of Forestry, Mississippi State University, Mississippi State, MS
- Dr. Janean Creighton, Extension Specialist, Oregon State University, Corvallis, OR
- Dr. Jim Johnson, Associate Dean for Outreach and Engagement, Oregon State University, Corvallis, OR.

NAUFRP, NAFO and team members worked together to design an appropriate process and instrument for data collection. Leading reports and agency sites (such as Northern Forest Futures Project 2011; Southern Forest Futures Project 2012; NAFO Annual Report 2012; and National Woodlands, Winter 2013) were used to identify a comprehensive list of issues for inclusion in the survey. A draft of the survey was reviewed by the committee and selected professionals for appropriateness of content and format. The final survey was created in Survey Monkey, a leading electronic survey delivery program (www.surveymonkey.com).

Emails containing an introduction letter and survey link were sent from NAFO to approximately 30 selected individuals on September 30, 2013. The letter consisted of a brief statement of the importance and purpose of the survey, instructions for completing the survey, and contact information. After about two weeks, individuals were provided a reminder to complete the survey in Survey Monkey. Another reminder was sent about a month after the initial survey invitation. The survey was closed November 2, 2013 with 21 total number of respondents, yielding an overall survey response rate of 70 percent. No non-response analysis was performed.

Data were downloaded from Survey Monkey into Excel. Then, an SPSS data file was created following standard procedures. Most of the responses were in numeric form and directly imported into the SPSS file. Some of the responses were of an open-ended (text) form; these were converted into numeric codes for analysis purposes. Standard data cleaning was performed with no major data problems noted.

Data analysis was performed using SPSS, version 21, the leading statistical software in social sciences and business. Univariate analysis forms much of the

analysis; this analysis simply provides information on the distribution, central tendency and variability inherent in variables. Because of the relatively low number of cases, analysis was limited somewhat. However, multiple response analysis was performed when appropriate; for example, on questions 13-17, respondents could have identified up to and including four unique answers to their research priorities. To take advantage of this question approach, the questions were treated as a multiple response question. This allows the determination of the number cases identifying each priority, the percent of responses a particular response represents, and the percent of cases giving a particular answer. Lastly, a principal components analysis (also known as factor analysis) was performed on selected variables.

RESULTS

Demographics and Descriptors

Twenty-one individuals completed the online survey, which ended on November 2, 2013. The results below are drawn exclusively from the information and answers provided by these individuals. Most individuals answered all survey questions. But, in a few instances, a participant did not answer each and every question; however, this non-response does not affect in any substantial way the survey results or conclusions.

Job Title

The plurality (n=11) of respondents were classified as managers, but seven were vice-presidents and four were presidents of their respective businesses.

Table 1. Job Title

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	President	4	19.0	20.0
	Vice-President	7	33.3	55.0
	Manager	9	42.9	100.0
	Total	20	95.2	100.0
Missing	System	1	4.8	
Total		21	100.0	

Region

Participants were asked to indicate the geographic location of their business and available markets. From this information, respondents were classified as to whether they were from east of the Mississippi River or west of the river. There were an even division of 10 respondents from each side of the river.

Table 2. Region of Work Zip Code

		Frequency	Percent	Valid Percent	Cumulative Percent
	East	10	47.6	50.0	50.0
Valid	West	10	47.6	50.0	100.0
	Total	20	95.2	100.0	
Missing	System	1	4.8		
Total		21	100.0		

State

Based on zip code, respondents were identified by state. Nine states were identified as shown in table 3 below. Four respondents were from Washington and Georgia with three from Oregon. No more than two respondents were from any other state.

Table 3. State of Respondent

	Frequency	Percent	Valid Percent	Cumulative Percent	
Valid	Mississippi	2	9.5	10.0	10.0
	Washington	4	19.0	20.0	30.0
	Georgia	4	19.0	20.0	50.0
	California	2	9.5	10.0	60.0
	Maine	1	4.8	5.0	65.0
	New Hampshire	1	4.8	5.0	70.0
	Massachusetts	2	9.5	10.0	80.0
	Oregon	3	14.3	15.0	95.0
	Idaho	1	4.8	5.0	100.0
	Total	20	95.2	100.0	
Missing	System	1	4.8		
Total		21	100.0		

Geographic Extent and Type of Business

Eight of the 20 (40%) respondents indicated that their business were international in scope while another quarter said their business was a national business (see Table 4). Four different business types were identified: TIMO, REIT, corporation, and family business (see Table 5). Seven respondents self-reported that they were in a family business while six indicated a REIT and another four said they were in a TIMO.

Table 4. Geographic Extent of Business

	Frequency	Percent	Valid Percent	Cumulative Percent	
Valid	Local	2	9.5	10.0	10.0
	Regional	5	23.8	25.0	35.0
	National	5	23.8	25.0	60.0
	International	8	38.1	40.0	100.0
	Total	20	95.2	100.0	
Missing	System	1	4.8		
Total		21	100.0		

Table 5. Type of Business

	Frequency	Percent	Valid Percent	Cumulative Percent	
Valid	TIMO	4	19.0	20.0	20.0
	REIT	6	28.6	30.0	50.0
	Corporation	3	14.3	15.0	65.0
	Family Business	7	33.3	35.0	100.0
	Total	20	95.2	100.0	
Missing	System	1	4.8		
Total		21	100.0		

Top Products

In question 3, respondents identified what they considered their three top products in an open-ended question format; thus, this question was treated as a multiple response question. The twenty-one respondents provided 53 responses that were classified into six categories: saw timber, logs, pulpwood, dimension lumber, chip-n-saw, real estate, and other. The results are shown in Table 6 below. The most frequently given response was saw timber (n =13), which represents 62% of cases and 25% of responses. Pulpwood was the second most mentioned top product (57% of

cases and 23% of responses) while logs was the third most mentioned top product (52% of cases and 21%).

Table 6. Top Products Frequencies

	Responses		Percent of Cases
	N	Percent	
Saw timber	13	24.5%	61.9%
Logs	11	20.8%	52.4%
Pulpwood	12	22.6%	57.1%
Dimension lumber	3	5.7%	14.3%
Chip-n-saw	2	3.8%	9.5%
Real estate	4	7.5%	19.0%
Other	8	15.1%	38.1%
Total	53	100.0%	252.4%

Acres Managed

Respondents were asked to identify the number of acres managed by their business. Answers ranged from a minimum of 2,000 to a maximum of 2.3 million acres with a total acreage managed of 4.8 million acres. The median acreage managed was 730,000 acres for these 21 respondents.

Business View of Research

Businesses viewed the importance of research differently. Respondents indicated their level of importance that they attached to research from not important to very important (see Table 7). The modal response was very important (57.1%) and some 95% said it was either very important or important.

Table 7. Business View of Importance of Research

	Frequency	Percent	Valid Percent	Cumulative Percent
Somewhat Important	1	4.8	4.8	4.8
Important	8	38.1	38.1	42.9
Very Important	12	57.1	57.1	100.0
Total	21	100.0	100.0	

Furthermore, we wanted to know if they had one or more full-time researchers on staff in their business. Only six (28.6%) indicated they had such a researcher or researcher on staff (see Table 8).

Table 8. One or More Researchers on Staff

	Frequency	Percent	Valid Percent	Cumulative Percent
No	15	71.4	71.4	71.4
Yes	6	28.6	28.6	100.0
Total	21	100.0	100.0	

NAFO Research Needs

Amount of Contracting of Research

Respondents were asked to identify at what level they contract out their research needs using five categories from none to 76-100%. Nineteen of the 20 answering the question indicated that they contract out at least some of their research. The median answer was 26% to 50%. In addition, seven (35.0%) said they contract out 76% to 100% of their research needs (Table 9).

Table 9. Amount of Contract for Research

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0%	1	4.8	5.0
	1-25%	6	28.6	30.0
	26-49%	3	14.3	50.0
	50-75%	3	14.3	65.0
	76-100%	7	33.3	100.0
	Total	20	95.2	100.0
Missing	System	1	4.8	
Total		21	100.0	

Top Sources of Research Information

In question 8, respondents identified up to five sources of where their business currently obtained most of its research information. Because they could provide up to five separate responses, this question was treated as a multiple response question. These 21 respondents provided 69 total responses, or just over three responses each. Answers were coded into six general categories, not including one “other” category. The results of the frequencies of responses, the percent of total responses and the percent of cases identifying a particular response are displayed in Table 10 below.

The most common response (n=16) was a college or university (23.2% of responses and 76.2% of cases). The second most common response was “other.” Included here was a variety of sources including the ERA, FOIC, AFRC, and “wandering the Internet.” Eleven times consultants were mentioned (15.9% of responses and 52.4% of cases). Internal research was mentioned only four times (5.8% of response and 19.0% of cases).

Table 10. Sources Frequencies

	Responses		Percent of Cases
	N	Percent	
Co-op	9	13.0%	42.9%
University	16	23.2%	76.2%
NCASI	8	11.6%	38.1%
Internal	4	5.8%	19.0%
USFS/USDA	7	10.1%	33.3%
Consultants/Experts	11	15.9%	52.4%
Other	14	20.3%	66.7%
Total	69	100.0%	328.6%

Level of Concern about Specific Issues

Question 10 asked about the level of concern among the respondents about 25 specific issues, in other words, level of importance. Respondents selected the answers based on five categories ranging from “very unimportant to very important.” Results showing the issues, mean and standard deviation for each issue are shown in Table 11 below. Issues are ordered in descending order of means; the larger the mean, the more important to the respondents. *Any item with a mean of less than 3.0 indicates that the issue was on the unimportant side of their perception and any mean of greater than 3.0 indicates that the issue was on the important side of spectrum. And, a mean of exactly 3.0 indicates that the group was neutral (neither important nor unimportant).*

Table 11. Descriptive Statistics for Level of Concern for Specific Issues

	N	Mean	Std. Deviation
Water Quality	21	4.48	.680
Management Standards and Practices	21	4.29	.561
Biomass	21	4.24	.831
Property Rights	20	4.20	.834
Invasives-Insects	21	4.10	.700
Wildlife Habitat	21	4.05	.669
Changing Timber Market	21	4.00	.894
Invasives-Diseases	21	4.00	.632
Wildfire	21	3.90	.995
Invasives-Plants	21	3.90	.700
Water Quantity	21	3.81	1.030
Tax Credits	21	3.76	.831
Inheritance and Property Taxes	21	3.52	.928
Native Diseases	21	3.52	.928
Biodiversity	21	3.38	1.117
Climate Change	20	3.35	.933
Native Insects	21	3.29	1.007
Water Access	21	3.24	1.261
Fragmentation and Parcelization	21	3.10	.944
Landscape Diversity	21	3.05	1.117
Outreach	21	2.95	1.024
Recreation	20	2.95	.826
Urban Expansion	21	2.90	.995
Human Interaction	21	2.90	.831
Forest Composition and Characteristics	21	2.67	.856

Only eight issues had a mean of 4.00 or greater: water quality (M =4.48), management standards and practices (M = 4.29), biomass (M = 4.24), property rights (M = 4.20), invasives-insects (M = 4.10), wildlife habitat (M = 4.05), changing timber market (M = 4.00), and invasives-disease (M = 4.00); these results indicate they were considered important to very important. Only five issues had means less than 3.0:

outreach (M = 2.95), recreation (M = 2.95), urban expansion (M = 2.90), human interaction (M = 2.90), and forest composition and characteristics (M = 2.67). The remaining issues had item means between 3 and 4, indicating at least some importance was being attached to them.

To determine if region affected perceptions of the level of impact of each issue, one-way ANOVAs were performed using region as the predictor variable. Of the 25 selected issues, only one showed a significant mean difference (invasives-insects (F = 8.576, p. = .009) with the East respondents (M = 2.60) having a significantly higher mean than the West respondents (M = 1.70). For 11 of the issues, East respondents had a higher (but not significantly higher) mean while for 9 of the issues West respondents had a higher (but not significantly higher) mean.

Level of concern for the 25 selected issues was also examined using number of acres that their business manages. For this analysis, number of acres was dichotomized with the smaller businesses managing less than 1 million acres in the first category (n = 11; M = 218,636 acres) while the larger businesses managing 1 or more million acres in the second category (n = 10, M = 4.6 million acres). One-Way ANOVA was performed for each of the 25 selected issues with four significant mean differences emerging from the analysis:

- Biodiversity (F = 5.634, p. = .028)—higher mean for larger category of acres
- Fragmentation and Parcelization (F = 5.233, p. = .034)—higher mean for larger category of acres
- Management standards and practices (F = 6.419, p. = .020)—larger mean for smaller category of acres
- Private property rights (F = 6.220, p. = .022)—larger mean for larger category of acres

Research Needs Satisfaction

Building upon the previous question where respondents indicated the level of importance of specific issues, the following question asked them to rate their level of satisfaction that the associated research needs for those issues were being met. Possible answers were (1) “not enough focus,” which represents dissatisfaction; (2) adequate focus, “which represents satisfaction;” and (3) “too much focus.” Thus, the lower the mean, the less satisfaction there is with research needs being met on a particular issue. Results are shown in Table 12 with issues listed in ascending order of means.

Sixteen of the items had an item mean of less than 2.00, indicating respondents were somewhat dissatisfied with their research needs being met. Water quality had the lowest mean ($M = 1.52$); thus, they were the most dissatisfied with research needs being met for this issue.

Table 12. Descriptive Statistics for Research Needs Satisfaction

	N	Mean	Std. Deviation
Water Quality	21	1.52	.512
Management Standards and Practices	20	1.55	.510
Invasives-Diseases	21	1.62	.498
Water Quantity	21	1.62	.498
Wildfire	21	1.62	.498
Invasives-Insects	21	1.67	.483
Private Property Rights	21	1.67	.483
Changing Timber Market	21	1.71	.463
Tax Credits	21	1.76	.436
Biomass	21	1.76	.436
Wildlife Habitat	21	1.76	.539
Invasives-Plants	21	1.76	.436
Inheritance and Property Taxes	21	1.90	.436
Water Access	21	1.90	.436
Native Insects	21	1.95	.218
Native Diseases	21	1.95	.218
Forest Composition and Characteristics	21	2.05	.218
Landscape Diversity	21	2.05	.384
Outreach	21	2.05	.590
Biodiversity	21	2.10	.436
Fragmentation and Parcelization	21	2.10	.436
Climate Change	21	2.14	.573
Recreation	21	2.19	.402
Human Interaction	21	2.19	.402
Urban Expansion	20	2.20	.410
Valid N (listwise)	19		

Specific Issues Recently Affecting Businesses

To help determine the breadth and distribution of recent specific issue impact, Question 12 asked respondents to rate the level of the impact the same selected issues (n = 25) have had on their business during the past five years prior to the survey (Table 13).

Rating categories were: (1) “not affected,” (2) “slightly affected,” (3) “moderately affected,” and (4) “extremely affected.” Results are displayed with items listed in descending order of means. Thus, the issues perceived as creating the greatest impact are at the top of the table and issues, perceived as having the least impact are at the bottom of the table.

Two items have item means of greater than three: changing timber market (M = 3.52) and management standards and practices (M = 3.10); respondents believed these issues had moderately to severely impacted their business. Thirteen issues are in the 2.00 to 2.95 range of means suggesting a slight to moderate impact. And, ten issues had a mean between 1.95 and 1.48 indicating no impact to a slight impact.

Table 13. Descriptive Statistics for Issues Recently Affecting Business

	N	Mean	Std. Deviation
Changing Timber Market	21	3.52	.750
Management Standards and Practices	21	3.10	.768
Biomass	21	2.95	1.024
Water Quality	21	2.90	.889
Wildlife Habitat	21	2.57	.926
Wildfire	21	2.57	.926
Private Property Rights	21	2.52	1.030
Inheritance and Property Taxes	21	2.48	1.123
Tax Credits	21	2.43	.926
Invasives-Plants	21	2.43	.978
Water Quantity	21	2.29	1.056
Biodiversity	21	2.24	.944
Invasives-Insects	21	2.19	.814
Recreation	20	2.10	.718
Invasives-Diseases	21	2.00	.837
Native Diseases	21	1.95	.669
Native Insects	21	1.95	.669
Urban Expansion	21	1.90	.768
Fragmentation and Parcelization	21	1.90	.831
Human Interaction	21	1.86	.910
Composition and Characteristics	21	1.71	.717
Water Access	21	1.67	.913
Landscape Diversity	21	1.67	.730
Climate Change	21	1.62	.669
Outreach	21	1.48	.680
Valid N (listwise)	20		

Research Priorities

Questions 13 through 16 asked respondents to list up to four forestry resource or technology research priorities for their region over the next five years. These were open-ended questions so that respondents could provide any answer, but were asked to focus on the issues from the previous set of questions. These questions were treated

as a multiple response question. Answers were coded into appropriate categories.

Results are shown in Table 14 with the number of times an issue was identified, the percent of all responses and the percent of cases mentioning the issue.

A total of 13 issues were indicated through 68 answers. Three issues were identified at least 10 times combining for about half of all responses. Management was mentioned 13 times (19.1% of responses and 68.4% of cases), the most of any issue. Markets was mentioned the second most (n = 11, 16.2% of responses and 57.9% of responses. And, water quality was mentioned 10 times (14.7% of responses and 52.6% of cases).

Table 14. Research Priorities for Region - Short-term: Frequencies

	Responses		Percent of Cases
	N	Percent	
Water Quality	10	14.7%	52.6%
Markets	11	16.2%	57.9%
Management	13	19.1%	68.4%
Insects and Disease	4	5.9%	21.1%
Wildlife Habitat	5	7.4%	26.3%
Biomass	9	13.2%	47.4%
Water Quantity	3	4.4%	15.8%
Forest Composition and Characteristics	3	4.4%	15.8%
Taxes	2	2.9%	10.5%
Private Property Rights	2	2.9%	10.5%
Wildfire	4	5.9%	21.1%
Climate Change	1	1.5%	5.3%
Invasives	1	1.5%	5.3%
Total	68	100.0%	357.9%

The next question simply asked respondents to identify priorities over the long term of more than five years. Results (Table 15) were quite similar to question 13 on the

short-term priorities. For this question, a total of 59 responses were provided. Once again, the top three priorities identified were: (1) markets (n = 12, 20.3% of responses, and 66.7% of cases), (2) management (n = 10, 16.9% of responses, 55.6% of cases), and (3) water quality (n = 9, 15.3% of response, and 50.0% of cases). No other issue was mentioned six times or more often.

Table 15. Research Priorities for Region - Long-term: Frequencies

	Responses		Percent of Cases
	N	Percent	
Water Quality	9	15.3%	50.0%
Markets	12	20.3%	66.7%
Management	10	16.9%	55.6%
Insects and Disease	2	3.4%	11.1%
Wildlife Habitat	2	3.4%	11.1%
Biomass	2	3.4%	11.1%
Forest Composition and Characteristics	1	1.7%	5.6%
Taxes	2	3.4%	11.1%
Private Property Rights	3	5.1%	16.7%
Wildfire	3	5.1%	16.7%
Climate Change	5	8.5%	27.8%
Invasives	2	3.4%	11.1%
Biodiversity	2	3.4%	11.1%
Urban Expansion	1	1.7%	5.6%
Landscape Diversity	1	1.7%	5.6%
Fragmentation	2	3.4%	11.1%
Total	59	100.0%	327.8%

Question 15 asked respondents to identify their perception of research priorities for the United States over the short term of five years or less (Table 16). A total of 50 responses were provided with no issue receiving 10 or more responses. The top three change somewhat from questions 13 and 14. Tied for the most mentions are water

quality and markets (n = 9, 18.0% of responses, and 69.2% of cases). But, instead of management in the top three, biomass received seven mentions (14.0% of responses, and 53.8% of cases).

Table 16. Research Priorities for United States - Short-term: Frequencies

	Responses		Percent of Cases
	N	Percent	
Water Quality	9	18.0%	69.2%
Markets	9	18.0%	69.2%
Management	6	12.0%	46.2%
Insects and Disease	1	2.0%	7.7%
Biomass	7	14.0%	53.8%
Water Quantity	1	2.0%	7.7%
Forest Composition and Characteristics	1	2.0%	7.7%
Taxes	3	6.0%	23.1%
Private Property Rights	2	4.0%	15.4%
Wildfire	4	8.0%	30.8%
Climate Change	2	4.0%	15.4%
Invasives	1	2.0%	7.7%
Biodiversity	2	4.0%	15.4%
Urban Expansion	1	2.0%	7.7%
Human Interaction	1	2.0%	7.7%
Total	50	100.0%	384.6%

The last question pertaining to research priorities asked respondents about priorities in the United States over the long term of over five years. Results are shown in Table 17 below. Respondents provided a total of 47 responses. Markets received the most mentions (n = 9, 19.1% of responses and 75.0% of cases).

Table 17. Research Priorities for United States - Long-term: Frequencies

	Responses		Percent of Cases
	N	Percent	
Water Quality	7	14.9%	58.3%
Markets	9	19.1%	75.0%
Management	5	10.6%	41.7%
Insects and Disease	1	2.1%	8.3%
Wildlife Habitat	2	4.3%	16.7%
Biomass	2	4.3%	16.7%
Water Quantity	2	4.3%	16.7%
Taxes	2	4.3%	16.7%
Private Property Rights	3	6.4%	25.0%
Wildfire	2	4.3%	16.7%
Climate Change	4	8.5%	33.3%
Invasives	1	2.1%	8.3%
Biodiversity	1	2.1%	8.3%
Urban Expansion	2	4.3%	16.7%
Landscape Diversity	1	2.1%	8.3%
Fragmentation	2	4.3%	16.7%
Human Interaction	1	2.1%	8.3%
Total	47	100.0%	391.7%

Shown in the following table (Table 18) are the counts of the priorities in order of descending count for questions 13 through 16 for each of the time periods (short and long) and areas (region and United States). Combined there were 224 answers provided by the respondents. Changing timber markets were identified 41 times (18.3%). Water quality was mentioned 35 times (15.6%). Management standards and practices was identified 34 times (15.2%). None of the other priorities were identified more than 20 times or more than 10% of the time.

Table 18. Summary Table of Priorities

Priority	Region	Region	U.S.	U.S.	Total	Percent
	Short	Long	Short	Long		
Changing Timber Market	11	12	9	9	41	18.3
Water Quality	10	9	9	7	35	15.6
Management Standards and Practices	13	10	6	5	34	15.2
Biomass	9	2	7	2	20	8.9
Wildfire	4	3	4	2	13	5.8
Climate Change	1	5	2	4	12	5.4
Private Property Rights	2	3	2	3	10	4.5
Wildlife Habitat	5	2		2	9	4.0
Invasives-Insects	4	2	1	1	8	3.6
Water Quantity	3		1	2	6	2.7
Tax Credits		2	3		5	2.2
Biodiversity		2	2	1	5	2.2
Composition and Characteristics	3	1	1		5	2.2
Inheritance and Property Taxes	2			2	4	1.8
Urban Expansion		1	1	2	4	1.8
Fragmentation and Parcelization		2		2	4	1.8
Invasives-Diseases	1		1	1	3	1.3
Invasives-Plants		2			2	0.9
Human Interaction			1	1	2	0.9
Landscape Diversity		1		1	2	0.9
Recreation					0	0.0
Native Diseases					0	0.0
Native Insects					0	0.0
Water Access					0	0.0
Outreach					0	0.0
Total	68	59	50	47	224	

CONCLUSION

As indicated in the introductory portion of this report, NAUFRP considers NAFO members as key players in the role of identifying necessary research needs for the forest industry future. The participation of NAFO in the review, participation, distribution, and collection process of this study was integral to its success and greatly appreciated. The results listed in this report will be used for internal discussions to determine how to better serve NAFO and the forest industry through increased communication and needed research.

LITERATURE CITED

Dietzman, D., K. LaJeunesse, and S. Wormstead (Editors). 2011. Northern Forest Futures Project: Version 3.0. USDA Forest Service, Northern Research Station and Northeastern Area Association of State Foresters, Newtown Square, PA, 41p.

NWOA. 2013. The top ten family forestry issues for 2013. *National Woodlands*, 36:1. Vienna, VA, 8-10p

Wear, D.N., and J.G. Greis (Editors). 2013. The Southern Forest Futures Project: Technical Report. Gen. Tech. Rep. SRS-178, USDA Forest Service, Southern Research Station, Asheville, NC, 542p.