

**RECOMMENDATIONS FOR COMMUNICATING
SUSTAINABLE LANDSCAPING INITIATIVES**

by

Rebecca Sawyer Pineo

A thesis submitted to the Faculty of the University of Delaware in partial fulfillment
of the requirements for the degree of Master of Science in Public Horticulture

Spring 2011

Copyright 2011 Rebecca Sawyer Pineo
All Rights Reserved

**RECOMMENDATIONS FOR COMMUNICATING
SUSTAINABLE LANDSCAPING INITIATIVES**

by
Rebecca Sawyer Pineo

Approved: _____
Robert E. Lyons, Ph.D.
Professor in charge of thesis on behalf of the Advisory Committee

Approved: _____
Blake C. Meyers, Ph.D.
Chair of the Department of Plant and Soil Sciences

Approved: _____
Robin W. Morgan, Ph.D.
Dean of the College of Agriculture and Natural Resources

Approved: _____
Charles G. Riordan, Ph.D.
Vice Provost for Graduate and Professional Education

ACKNOWLEDGMENTS

This thesis would not have been possible without the generosity and support of a number of people. Firstly, I would like to thank my Thesis Committee—Dr. Robert Lyons, Dr. Susan Barton, and Ms. Marnie Conley—for providing insight and guidance throughout the program. Thanks also to the many professionals who gave their time and expertise as research participants.

I greatly appreciate the many professional development opportunities provided by the Longwood Graduate Program. Thank you to Longwood Gardens and University of Delaware for supporting my studies.

My family and friends have also offered continued encouragement. Thanks especially to my husband Isaac Pineo for his loving support, and to my classmate/housemate Dongah Shin for the delicious meals that sustained me during long hours at the computer. Thanks to all of my classmates, Kate Baltzell, Zoe Panchen, Dongah Shin, and Laura Vogel, whose friendship helped carry me through.

TABLE OF CONTENTS

LIST OF TABLES	viii
LIST OF FIGURES	xv
ABSTRACT	xvii
Chapter	
1 INTRODUCTION	1
2 LITERATURE REVIEW	5
Characteristics of Conventional Landscaping	5
Characteristics of Sustainable Landscaping	6
Potential Conflict of Sustainable Landscaping with Landscape Preferences	10
Strategies for Overcoming Conflicts between Sustainable Landscaping and Landscape Preferences	11
Using Knowledge Interventions to Change Attitudes	13
Using Knowledge Interventions to Change Behavior and Social Norms	15
Specific Knowledge Intervention Strategies	18
Interpretation as a Knowledge Intervention Strategy	18
Green Marketing as a Knowledge Intervention Strategy	26
3 METHODS	32
Research Approach	32
Data Collection Methods	32
Survey of Green Industry Professionals in the Mid-Atlantic Region	32
Interviews with Landscape Managers in the Mid-Atlantic Region	37
Case Study of Organization Planning to Implement Sustainable Landscaping Practices	40
Interviews with Experts in the Field of Sustainable Landscaping, Interpretation, and Green Industry Marketing	42

	Data Analysis Methods.....	43
	Quantitative Data	43
	Qualitative Data	43
	Human Subjects in Research Considerations	44
	The Role of the Researcher	44
4	RESULTS.....	46
	Respondent Characteristics	46
	Survey	46
	Organization Interviews.....	49
	Case Study	51
	Expert Interviews	54
	Sustainable Landscaping Practices.....	55
	Definitions of Sustainable Landscaping Practices	55
	Sources of and Motivations for Sustainable Landscaping Initiatives	56
	Challenges to Using or Promoting Sustainable Landscaping Practices....	61
	Factors Affecting Communication to Stakeholders about Sustainable Landscaping Initiatives.....	65
	Management-based Factors.....	65
	Market-based Factors.....	75
	Mechanics-based Factors	77
	Message-based Factors	78
	Current Communication Strategies	80
	Survey	80
	Organization Interviews.....	82
	Case Study	84
	Potential Communication Strategies Identified by Respondents	85
	Organization Interviews.....	85
	Case Study	87

Expert Commentary.....	89
Expert 1: Sustainable Landscaping and Interpretation	89
Expert 2: Green Industry Marketing	90
Sources of Error.....	91
Survey	91
Qualitative Research	93
5 DISCUSSION.....	94
Definitions, Motivations, and Challenges of Sustainable Landscaping	94
Factors Affecting Communication about Sustainable Landscaping Initiatives ..	96
Management-based Factors.....	96
Market-based Factors.....	101
Mechanics-based Factors	105
Message-based Factors	106
Communication Strategies.....	108
Conclusion	112
6 RECOMMENDATIONS	114
Guidelines for Communicating Sustainable Landscaping Initiatives	114
A Role for Public Horticulture Institutions	118
Avenues for Further Research	119
Appendix	
A Survey Instrument	121
B Professional Associations Solicited for Survey Participation	133
C Survey Invitation	134
D Survey Reminder	135
E Interview and Case Study Organization Descriptions.....	136
F Interview and Casey Study Respondent Quotes.....	138
G Sample Consent Form	175
H Interview Guides	176
I Case Study Information Needs Checklist.....	179
J Focus Group Questions	184
K Focus Group Presentation.....	185

L	Expert Biographies	191
M	Breakdown of Survey Responses Selected and Not Selected for Analysis.....	192
N	Human Subjects in Research (HSRB) Documentation	193
O	Survey Results by Category of Organization	197
P	Types of Sustainable Practices Used and Promoted.....	204
Q	Distribution of Survey Invitees, Rate of Response, and Number of Analyzed Responses by Professional Association	211
R	Sustainable Landscaping-Related Certification Programs, Awards Programs, and Other Communication Resources for the Mid-Atlantic Region	213
REFERENCES		215

LIST OF TABLES

Table 3.1	Survey administration details for green industry professional association members.	35
Table 3.2	Name, summary information, sustainable landscaping status, and communication initiatives of interviewee organizations.....	38
Table 3.3	Name, position, organization, and relevant expertise of expert interviewees	42
Table 4.1	List of interviewee organizations and primary interviewee names, positions, and responsibilities	50
Table 4.2	List of case study interviewee names, position, and responsibilities	54
Table 4.3	Motivations for using sustainable landscaping practices reported by organization interview respondents and survey respondents	58
Table 4.4	Sources of sustainable landscaping initiatives reported by organization interview respondents and survey respondents.....	59
Table 4.5	Internal challenges to implementing sustainable landscaping as reported by organization interview respondents and survey respondents.....	63
Table 4.6	External challenges to implementing sustainable landscaping initiatives as reported by organization interview respondents and survey respondents	64
Table 4.7	Desire and need to communicate to stakeholders about sustainable landscaping practices as reported by organization interview respondents	66
Table 4.8	Goals for communication about sustainable landscaping initiatives as reported by organization interview respondents	67

Table 4.9	Mission, vision, and/or values themes of interviewee organizations, with supporting statements and quotes from organizational websites, publications, and/or interviewees	68
Table 4.10	Internal resources for communication about sustainable landscaping initiatives as reported by organization interview respondents.....	71
Table 4.11	External resources for communication about sustainable landscaping initiatives as reported by organization interview respondents.....	71
Table 4.12	Organizational support for communication about sustainable landscaping initiatives as reported by organization interview respondents.....	73
Table 4.13	Current management challenges to communication about sustainable landscaping initiatives as reported by organization interview respondents	75
Table 4.14	Market-based factors affecting communication about sustainable landscaping initiatives as reported by organization interview respondents	76
Table 4.15	Mechanics-based factors affecting communication about sustainable landscaping initiatives as reported by organization interview respondents	78
Table 4.16	Desired message content for communication about sustainable landscaping initiatives as reported by organization interview respondents.....	79
Table 4.17	Open-text responses describing media used for explaining sustainable landscaping initiatives to landscape users or viewers by survey respondent organizations	82
Table 4.18	Current media for communication with landscape users/viewers or the larger community at interviewee organizations.....	83
Table 4.19	Current media for communication with landscaping staff or upper-level management at interviewee organizations	84
Table 4.20	Current strategies for communication with landscape users/ viewers or the larger community at interviewee organizations	84

Table 4.21	Potential media for communication with landscape users/ viewers or the larger community as reported by organization interview respondents	86
Table 4.22	Potential media for communication with landscaping staff or upper-level management as reported by organization interview respondents	87
Table 4.23	Potential strategies for communication with landscape users/ viewers or the larger community as reported by organization interview respondents	87
Table 4.24	Observations and recommendations related to communication about sustainable landscaping, from Janet Marinelli of Blue Crocus Consulting	90
Table 4.25	Observations and recommendations related to green industry marketing of sustainable products and practices, from Steve Bogash of the Pennsylvania State University Cooperative Extension, Franklin County	91
Table 6.1	Proposed guidelines for organizations developing communications about sustainable landscaping initiatives.....	115
Table AF.1	List of interviewee organizations, primary interviewees, and quote identification codes (ID)	138
Table AF.2	List of case study interviewee names, position, and quote identification code (ID).....	139
Table AF.3	Quotes describing motivations for using sustainable landscaping practices, from organization interview respondents and survey respondents	139
Table AF.4	Quotes describing sources of sustainable landscaping initiatives, from organization interview respondents and survey respondents.....	140
Table AF.5	Quotes describing motivations for planned implementation of sustainable landscaping practices at Dow Electronic Materials	141
Table AF.6	Quotes describing internal challenges to implementing sustainable landscaping, from organization interview respondents and survey respondents	142

Table AF.7	Quotes describing external challenges to implementing sustainable landscaping, from organization interview respondents and survey respondents.	144
Table AF.8	Quotes describing challenges to implementing sustainable landscaping at Dow Electronic Materials	145
Table AF.9	Quotes describing desire and need to communicate to stakeholders about sustainable landscaping practices, from organization interview respondents	146
Table AF.10	Quotes describing desire and need to communicate to stakeholders about sustainable landscaping practices at Dow Electronic Materials	146
Table AF.11	Quotes describing goals for communication about sustainable landscaping initiatives, from organization interview respondents.....	147
Table AF.12	Quotes describing goals for communication about sustainable landscaping initiatives at Dow Electronic Materials.....	147
Table AF.13	Mission, vision, and/or values themes of interviewee organizations, with supporting statements and quotes from organizational websites, publications, and/or interviewees	148
Table AF.14	Statements describing mission, vision, and/or values of Dow Chemical, from organizational website and publications	150
Table AF.15	Quotes describing internal resources for communication about sustainable landscaping initiatives, from organization interview respondents.....	150
Table AF.16	Quotes describing external resources for communication about sustainable landscaping initiatives, from organization interview respondents.....	152
Table AF.17	Quotes describing resources for communication about sustainable landscaping initiatives at Dow Electronic Materials.....	152
Table AF.18	Quotes describing organizational support for communication about sustainable landscaping initiatives, from organization interview respondents	153

Table AF.19	Quotes describing organizational support for communication about sustainable landscaping initiatives at Dow Electronic Materials	154
Table AF.20	Quotes describing current management challenges to communication about sustainable landscaping initiatives, from organization interview respondents	154
Table AF.21	Quotes describing market-based factors affecting communication about sustainable landscaping initiatives, from organization interview respondents	156
Table AF.22	Quotes describing market-based factors affecting communication about sustainable landscaping initiatives at Dow Electronic Materials	158
Table AF.23	Quotes describing mechanics-based factors affecting communication about sustainable landscaping initiatives, from organization interview respondents	158
Table AF.24	Quotes describing mechanics-based factors affecting communication about sustainable landscaping initiatives at Dow Electronic Materials	159
Table AF.25	Quotes describing desired message content for communication about sustainable landscaping initiatives, from organization interview respondents	160
Table AF.26	Quotes describing desired message content for communication about sustainable landscaping initiatives at Dow Electronic Materials	161
Table AF.27	Quotes describing current media for communication with landscape users/viewers or the larger community at interviewee organizations	161
Table AF.28	Quotes describing current media for communication with landscaping staff or upper-level management at interviewee organizations	163
Table AF.29	Quotes describing current strategies for communication with landscape users/viewers or the larger community at interviewee organizations	164

Table AF.30	Quotes describing current media and strategies for communication with stakeholders at Dow Electronic Materials	165
Table AF.31	Quotes describing potential media for communication with landscape users/viewers or the larger community at interviewee organizations	165
Table AF.32	Quotes describing potential media for communication with landscaping staff or upper-level management at interviewee organizations	166
Table AF.33	Quotes describing potential strategies for communication with landscape users/viewers or the larger community at interviewee organizations	167
Table AF.34	Quotes describing potential media and strategies for communication with stakeholders at Dow Electronic Materials	168
Table AF.35	Observations and recommendations related to communication about sustainable landscaping, from Janet Marinelli of Blue Crocus Consulting	169
Table AF.36	Observations and recommendations related to green industry marketing of sustainable products and practices, from Steve Bogash of the Pennsylvania State University Cooperative Extension, Franklin County	171
Table AI.1	Information needs checklist for case study at Dow Electronic Materials.....	179
Table AO.1	Sources of or motivations for using/promoting sustainable landscaping practices judged to be “Very Important” by 50% or more survey respondents (n=161), by organization category.....	199
Table AO.2	Sources of or motivations for using/promoting sustainable landscaping practices judged to be “Not Important” by 25% or more survey respondents (n=161), by organization category.....	200
Table AO.3	Factors judged to be “A Significant Challenge” by 10% or more of survey respondents (n=161), by organization category.....	200
Table AO.4	Factors judged to be “Not a Challenge” by less than 50% of survey respondents (n=161), by organization category	201

Table AP.1	Open-text responses describing sustainable practices and elements used/promoted by survey respondent organizations	206
Table AP.2	Sustainable landscaping practices used by interviewee organizations, as reported by interview respondents	209

LIST OF FIGURES

Fig. 4.1	Mailing list distribution of invitation recipients (n=~4800), overall survey respondents (n=367), and study respondents (n=143).....	47
Fig. 4.2	Distribution of respondent organizations by category (n=161)	49
Fig. 4.3	Distribution of exempt and non-exempt employees at Dow Electronic Materials, as of December 2010 (n=551)	52
Fig. 4.4	Distribution of male and female employees at Dow Electronic Materials, as of December 2010 (n=551)	52
Fig. 4.5	Importance of sources of or motivations for using/promoting sustainable landscaping practices, as reported by survey respondents (n=161).....	57
Fig. 4.6	Significance of challenges to using/promoting sustainable landscaping practices, as reported by survey respondents (n=161)	62
Fig. 4.7	Designated staff and budget resources for educating people about sustainable landscaping initiatives at survey respondent organizations (n=161)	69
Fig. 4.8	Survey respondent opinions of how well their organization's sustainable landscaping initiatives have been explained to landscape users or viewers (n=161)	81
Fig. 4.9	Media used for explaining sustainable landscaping initiatives to landscape users or viewers by survey respondent organizations (n=138).....	81
Fig. AM.1	Percentage of survey respondents selected or not selected for analysis (n=392).....	192
Fig. AM.2	Survey respondents not selected for analysis, broken down by criteria (n=231)	192
Fig. AO.1	Distribution of Educational Institutions by type of institution (n=29)	197

Fig. AO.2	Distribution of Government Agencies by jurisdiction (n=18).....	197
Fig. AO.3	Distribution of Private or Non-Profit Organizations by type of institution (n=16)	198
Fig. AO.4	Distribution of Landscape Service Providers by type of landscapes served (n=26).....	198
Fig. AO.5	Distribution of Landscape Product Providers by type of company (n=13)	198
Fig. AO.6	Survey respondent opinions of how well their organization's sustainable landscaping initiatives have been explained to landscape users or viewers, by organization category (n=161)	202
Fig. AO.7	Media used for explaining sustainable landscaping initiatives to landscape users or viewers, by organization category (n=138)	203
Fig. AO.8	Designated staff and budget resources for educating people about sustainable landscaping initiatives at survey respondent organizations (n=161), by organization category	203
Fig. AP.1	Types of sustainable landscaping practices and elements used by survey respondent organizations (n=116), by organization category	205
Fig. AP.2	Mean, mode, and median number of sustainable practices used/promoted by survey respondent organizations, by organization category	208
Fig. AQ.1	Distribution of survey invitees by professional association mailing list (n=4800)	211
Fig. AQ.2	Rate of response by professional association (# respondents=320; # responses=373).....	212
Fig. AQ.3	Number of analyzed survey responses per professional association (# respondents=161; # responses=178).....	212

ABSTRACT

Sustainable landscaping practices are increasingly being implemented on publicly viewed landscapes. However, visible attributes of sustainable landscaping practices may conflict with preferences and expectations of stakeholders, and environmental benefits may not be inherently recognizable. Making benefits explicit through communication can help garner acceptance of and support for sustainable landscaping initiatives, and this thesis presents strategies to do so in the Mid-Atlantic region. Supportive data was collected through a targeted survey of green industry professionals, selective interviews, and a corporate campus case study. Two expert interviews were also conducted, one in sustainable landscaping and interpretation, and one in green industry marketing.

The findings illuminated a range of considerations when planning communication initiatives, including management, market, and mechanics factors; desired messages; and potential communication strategies. For each organization, the considerations combine to create communication opportunities reflective of desired outcomes, operational capacity, and target audiences. When resources are limited, both internal and external collaborations can enhance capacity for communications. Translating the implicit desire for communications into an explicit plan of action is needed to prioritize communication efforts, and to recognize their role as an essential component of sustainable landscaping itself.

A set of recommendations for green industry professionals was developed based on present research and related literature. Potential opportunities for public horticulture institutions are also highlighted.

Chapter 1

INTRODUCTION

The United Nations World Commission on Environment and Development defines sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (UNWCED, 1987). In recent decades, there has been increased interest in applying the tenets of sustainable development to landscape design, installment, and maintenance (Campbell and Ogden, 1999). The phrase “sustainable landscaping” has emerged to refer to landscape design, installation and management practices that conserve resources, minimize negative environmental impacts, and maximize ecological function while meeting functional and aesthetic goals (SSI, 2010c; University of Minnesota, 2006; Welker and Green, 2003).

Landscape industry professionals have been increasingly encouraged to utilize sustainable landscaping practices. Professional organizations that offer education, advocacy, and public relations services to the green industry have promoted sustainable landscaping through conferences, workshops, print publications, websites, partnerships, and award programs (ANLA, 2009; ASLA, 2010; GCSAA, 2010; PGMS, 2010a, 2010b; PLANET, 2010). The Sustainable Sites Initiative™ (SSI), a partnership between the American Society of Landscape Architects, Lady Bird Johnson Wildflower Center, and the United States Botanic Garden, has been developing “voluntary national guidelines and performance benchmarks for sustainable landscape design, construction and maintenance practices” as a tool for

landscape decision-makers and managers (SSI, 2010a, 2010b). At the time of this writing, the SSI is testing its guidelines on more than 150 pilot projects across the United States (SSI, 2010d), one testament to the growing interest in sustainable landscaping.

Although sustainable landscaping practices are increasingly being implemented, they represent a departure from the way landscapes are traditionally designed and maintained, and thus can differ significantly in appearance from conventional landscapes. Moreover, the ecosystem services provided by sustainable landscaping practices may not be inherently recognizable to users, viewers, and other stakeholders of the landscape (Nassauer, 1995). Making these and other benefits explicit through interpretation may be required to gain acceptance of and support for sustainable landscaping practices (Thayer, 1989). The SSI recognizes education itself as an element of sustainable landscapes, indicating that interpretive efforts could in fact serve to bolster overall site sustainability (SSI, 2009a). Marketing their landscape as “green” could not only raise awareness of an institution’s commitment to sustainability, but could also raise awareness of how a landscape in general can contribute to goals of sustainability.

However, outside of public horticulture institutions, communicating educational information about landscaping is not a traditional function of landscape managers. While some landscape managers have expressed interest in promoting their institutions’ sustainable landscaping practices to landscape users, maintenance staff, and upper-level management (J. Lawson, personal communication; G. Schwetz, personal communication; T. Taylor, personal communication), lack of

communications experience, expertise, and resources may present significant barriers to doing so.

This thesis presents research-based potential strategies for managers of institutional landscapes in the Mid-Atlantic region to communicate information about sustainable landscaping practices to stakeholders. The purpose of such communications would be primarily to garner acceptance of and support for these practices, and secondarily to publicize the institution's environmental stewardship. The primary research objectives were to 1) determine factors that affect how information about sustainable landscaping practices are communicated to stakeholders of institutional landscapes in the Mid-Atlantic region, and 2) identify potential strategies for communication. Secondary research objectives that guided exploration of the primary research objectives included ascertaining motivations for and challenges to implementing sustainable landscaping practices, determining the need and desire for communicating about sustainable landscaping practices, investigating current communication challenges and strategies, and identifying potential communication resources. The research also considered how interpretation and marketing strategies could serve as a framework for developing communication strategies.

The research focused specifically on landscape managers who are typically not involved in landscape interpretation efforts, thus excluding public horticulture institutions. The research also excluded residential landscapes, focusing instead on institutional landscapes that serve a wider number of users; institutions were any type of public, for-profit, or non-profit organization. For the purpose of the research, the Mid-Atlantic region included New York, Pennsylvania, New Jersey,

Delaware, Maryland, Virginia, and Washington, D.C. The term “stakeholders” refers primarily to landscape users, and secondarily to upper-level management and landscape management personnel. “Landscape manager” refers both to in-house and contracted professionals responsible for landscape design, installation, and/or maintenance.

This thesis research intends to fill a perceived void and build knowledge capacity for communication by managers of institutional landscapes not classified as public horticulture institutions. Such communication efforts may not only improve understanding of sustainable landscaping practices (Lohr and Bummer, 1992), but can also serve as an opportunity to highlight an institution’s commitment to sustainability (Ottman, 1998). Though not occurring within a conventional public garden, the institutional landscapes investigated in this research may be considered public horticulture venues in a broad sense, according to the Center for Public Horticulture’s definition of public horticulture as the “art and science of cultivating plants for public enjoyment and enrichment” (CPH, 2007). The results of this research will benefit not only managers of institutional landscapes, but also the field of public horticulture by promulgating knowledge and awareness of horticulture’s role in sustainability. Public gardens are increasingly practicing environmental advocacy and implementing sustainable landscaping practices (Hoversten & Jones, 2002; Sifton, 2009). The research intends to expand the influence of public horticulture by facilitating engagement and education of stakeholders that may not represent the current public garden audience, as well as illuminating potential opportunities for public garden outreach and education efforts.

Chapter 2

LITERATURE REVIEW

Literature about sustainable landscaping highlights the potential conflicts between aesthetic preferences and ecological quality in landscape management, and how design and knowledge interventions can alleviate this conflict by fostering attitude and behavior change. Two types of knowledge interventions, interpretation and green marketing, are reviewed in this section.

Characteristics of Conventional Landscaping

Historically, landscaping has focused on aesthetic preferences and functional land use with little regard for environmental impact (Campbell and Ogden, 1999; Gobster et al., 2007; Thayer, 1989). Many landscape perception studies highlight Westerners' high preference for the "English Landscape style parkland," dominated by a low, uniform groundcover, scattered groups of woody plants, and open vistas (Freeman Associates, 2008; Jorgensen, 2004; Kaplan and Kaplan, 1989; Orians and Heerwagen, 1992; Parsons, 1995; Ulrich, 1986). The combination of this biologically-shaped preference with a number of historical and socio-economic factors has led to the dominant landscape paradigm of the United States, called the "urban savannah" by Jorgensen (Balling and Falk, 1982; Byrne and Grewal, 2008; Jorgensen, 2004; Thayer, 1994). The "urban savannah" is characterized by mowed turf grass lawns accompanied by plantings of relatively few species of ornamental trees, shrubs, and herbaceous plants (Jorgensen, 2004; Lindsay, 2005; Tallamy, 2007). This

landscape paradigm has been applied indiscriminately to large-scale and small-scale landscapes across the country (Byrne and Grewal, 2008). It typically represents the replacement of native plant assemblages that contribute to the provision of ecosystem services (Byrne and Grewal, 2008; Tallamy, 2007).

Many resources can be required for maintenance of conventional landscapes. Routine mowing requires fossil fuels, causes pollution, and entails human labor; irrigation is required to keep lawns green in many areas of the United States; and pesticides and fertilizers are common inputs that can generate negative environmental impacts (Wasowski & Wasowski, 2000). Polluted runoff and flash flooding arise from pervasive use of impervious surfaces in developed areas; close-cropped lawns inefficiently allow for storm water percolation (Bormann et al., 2001). The limited variety of plant materials used in traditional landscaping, many of them exotic species, arguably cannot support regional wildlife (Tallamy, 2007).

Characteristics of Sustainable Landscaping

Environmental concerns related to traditional landscaping techniques have prompted professional landscapers, public gardens, and home gardeners to identify and utilize more environmentally sound practices. The past decade has seen a decided rise in applied literature regarding sustainable landscaping practices (Sifton, 2009), which can be implemented throughout all stages of landscape development, from design and construction to operations and maintenance (SSI, 2009a).

The literature presents no single definition for “sustainable landscaping,” though the concept generally encompasses both ecological and cultural elements. The Sustainable Sites Initiative (SSI) focuses on the concept of conserving and maintaining ecosystem services while promoting human well-being (SSI, 2009a). Thayer defines a

sustainable landscape as “a physical place where human communities, resource uses, and the carrying capacities of surrounding ecosystems can all be perpetually maintained” (Thayer, 1994). Byrne and Grewal (2008) propose a social-ecological framework for sustainable landscaping that recognizes social and cultural factors in addition to ecological function.

In the United States, third-party certification for sustainable landscaping practices is a growing trend. At the time of writing, the most comprehensive effort to develop a certification system is being undertaken by the SSI, which is currently piloting the United States’ first voluntary rating system for design, construction, and maintenance of sustainable landscapes (SSI, 2009b). Practices promoted by the SSI are divided into nine categories, based on the environmental, social, and economic benefits of sustainable landscaping practices (SSI, 2009a):

- Site Selection
- Pre-Design Assessment and Planning
- Site Design – Water
- Site Design – Soil and Vegetation
- Site Design – Materials Selection
- Site Design – Human Health and Well-Being
- Construction
- Operations and Maintenance
- Monitoring and Innovation

Sixty-six measurable prerequisites and credits for sustainable sites are identified by the SSI’s Performance Benchmarks and Guidelines 2009, which operates

on a 250-point scale and offers recognition for achieving 40, 50, 60, and 80 percent of available points. Currently, over 150 pilot projects are being evaluated using the 2009 draft document (SSI, 2010d). Advocated practices include selecting sites to maximize wildlife habitat preservation, managing stormwater on site, minimizing soil disturbance during site construction, preserving and restoring native plant communities, utilizing recycled materials, and promoting human well-being through creation of livable outdoor spaces (SSI, 2009a).

Another significant third-party certifier of sustainable landscaping practices is the Audubon Cooperative Sanctuary Program, an “education and certification program that helps organizations and businesses protect our environment while enhancing their bottom line” (Audubon International, 2010a). The program has certified hundreds of landscapes across the United States. The vast majority of current participants are golf courses, though the program also targets “cemeteries, corporate parks, community colleges, churches, resorts, manufacturing facilities, municipal and state parks, and retail stores” (Audubon International, 2010b; 2009). The program requires an environmental management plan in five key areas:

- Site assessment and environmental planning
- Wildlife and habitat management
- Water
- Resource management
- Outreach and education

Landscapes receive the designation of a Certified Audubon Cooperative Sanctuary when they achieve prerequisites and a set number of standards in each area.

Practices promoted by the program include conserving and creating wildlife habitat, protection of surface and ground water quality, conserving energy, integrated pest management, waste management, and educating patrons and employees about environmental stewardship practices (Audubon International, 2009).

To summarize definitions in the literature as well as those outlined by certification programs, sustainable landscaping refers to landscape design, installation and management practices that conserve resources, minimize negative environmental impacts, and maximize ecological function while meeting functional and aesthetic goals (Bryne and Grewal, 2008; SSI, 2010c; University of Minnesota, 2006; Welker and Green, 2003). This aligns well with the definition of “sustainable development” as “meeting the needs of the present without compromising the ability of future generations to meet their own needs” (UNWCED, 1987).

The phrase “sustainable landscaping” is not universal. Terms that convey analogous concepts include sustainable gardening (NWF, 2009), ecoscaping (Lathan & Cone, 2005), conservation landscaping (Slattery et al., 2003), ecological design (Cadenasso & Pickett, 2008), eco-friendly landscaping (USDA, 2008), greenscaping (USEPA, 2008), beneficial landscaping, green landscaping, and environmentally friendly landscaping (USEPA, 2009). For consistency, the phrase “sustainable landscaping” is utilized throughout this study.

Both certification programs and common usage in literature recognize that the concept of sustainable landscaping does not require sustainability in the strictest sense, i.e. being capable of being sustained indefinitely. Landscapes must merely “tend towards sustainability” by utilizing practices that support ecological processes in balance with human use (Thayer, 1989). For instance, landscapes that use irrigation

only for plant establishment can be considered sustainable when compared to landscapes that require daily irrigation (Thayer, 1989).

Potential Conflict of Sustainable Landscaping with Landscape Preferences

In many cases, the visible attributes of sustainable landscaping practices may conflict with the aesthetic preferences and expectations of landscape viewers (Parsons, 1995). Literature about natural lands management, especially forestry, describes conflicts that arise when managing both for scenic beauty and environmental quality. Parsons (1995) highlights how environmental preferences for savannah-like natural settings do not align well with the appearance of woodland edge habitats supportive of diverse wildlife. In Colorado wilderness areas, Baumgartner (1982) showed that areas judged to be ecologically stable and visually valuable were sometimes disparate; Steinitz (1990) found similar results in Acadia National Park in Maine. Furthermore, certain ecosystem-based management practices for timber harvesting can significantly conflict with visual preferences for managed woodlands (Gobster, 1999; Sheppard, 2001).

Findings for landscapes in developed areas are similar, confirming that sustainable landscaping practices do not always align well with aesthetic preferences. Current socio-cultural landscaping norms that define “proper” landscaping practices present a significant barrier to implementation of sustainable landscaping (Byrne and Grewal, 2008). While the public is increasingly receptive to environmental stewardship, social conventions overrule scientific assertions when it comes to landscaping; that is, “people do not know how to see ecological quality directly” (Nassauer, 1995). Thus, landscapes with high ecological quality can be considered “messy” according to cultural standards of landscape design and aesthetics (Nassauer,

1995). In terms of roadside vegetation management, people judge the landscapes based on visual features rather than ecological processes (Schutt, 1999), a finding that has been corroborated by news media characterizing reduced mowing programs as resulting in a “shaggy” appearance, despite assertions that such management practices have important environmental benefits (Dishneau, 2009). The result of judging landscapes by aesthetics means that those perceived as attractive are more likely to be appreciated and preserved than those perceived as unattractive, regardless of ecological quality (Gobster et al., 2007).

Strategies for Overcoming Conflicts between Sustainable Landscaping and Landscape Preferences

When creating sustainable landscapes, landscape managers must satisfy user groups in order for them to persist. Thus, when implementing sustainable landscaping, the landscape manager must consider how to meet—or change—user expectations that are driven by landscape preferences (Gobster et al., 2007; Kaplan and Kaplan, 1989).

One way is to create high-quality ecosystems within a framework of accepted design standards (Nassauer, 1995). Specifically, the landscape must demonstrate “cues to care,” cultural conventions that show the landscape is being managed intentionally and not being abandoned to natural forces (Hands and Brown, 2002; Nassauer, 1995). Gobster et al. advocates using “design interventions” that deliver “positive aesthetic experiences consistent with public aesthetic expectations” (Gobster et al., 2007).

The literature cites several examples of how intentional design cues have enhanced landscape users’ acceptance of sustainable landscaping. Restored wetland

research found that structures, signs, and strategically located turf areas helped landscape users better understand the stewardship intention and developing beauty of the wetland (Nassauer, 2004); roadside meadow plantings with neatly mowed edges are considered more desirable than meadow treatments containing no mowed edge (Barton, 2005); and the appearance of maintenance and the inclusion of color increase acceptance by roadside users (Lucey, 2010), which supports the view that in order for naturalistic plantings to be accepted in urban areas, they must be “visually dramatic” (Hitchmough, 2008).

However, several authors point out that judgments about landscapes are based not only on how the landscape looks, but also its context. Implied meaning or significance of a landscape can affect judgments of the landscape’s attractiveness (Hodgson and Thayer, 1980), and perceived beauty is derived from prior knowledge of planned change (Van den Berg and Vlek, 1998). The siting of sustainable landscaping can violate the context of standard land use norms; for instance, Thayer asserts, “people don’t expect to see wildlife habitat and drought-tolerant vegetation in downtown parks” (Thayer, 1989).

In addition to context and prior knowledge, the literature recognizes a range of other factors that affect landscape perception, including gender, education, income, cultural upbringing, and familiarity with a place (Gobster et al., 2007; Jorgensen, 2005; Kaplan and Kaplan, 1989). Though there is disagreement about whether these factors should be considered part of or separate from the aesthetic experience, they undeniably influence how landscapes are perceived and judged (Gobster et al., 2007).

Due to the role that context and other factors play in mediating opinions about landscapes, using standard design conventions may not be sufficient to gain support for sustainable landscaping practices. People who “comprehend how and why a sustainable landscape functions will respond differently to that landscape than those who are uninformed or unable to ‘read’ the landscape”; people who cannot recognize the landscape as sustainable often do not enjoy a positive experience (Thayer, 1989). The literature suggests that explicit communication about sustainable landscaping is a critical element of sustainable landscapes, both to gain acceptance of and support for the sustainable practices and to encourage sustainable behavior (Byrne and Grewal, 2008; Gobster, 1999; Thayer, 1994; Thayer, 1989; SSI, 2009a). For the purposes of this study, the phrase “knowledge intervention” will be used to characterize this type of communication, defined by Gobster et al. (2007) as “an attempt to change the perceptual, affective, or cognitive processes that mediate landscape aesthetic experience.”

Using Knowledge Interventions to Change Attitudes

Knowledge interventions have successfully garnered acceptance of and support for sustainable management practices and programs employed in natural areas (di Mauro and Dietz, 2001; Gallagher, 1997; Marynowski and Jacobson, 1999; Powell and Ham, 2008; Wiles and Hall, 2005). Pre- and post-education surveys that examined attitudes about residential water-conserving landscapes found that education did generate more positive attitudes about these landscapes (Lohr and Bummer, 1992), and very recent research indicated an increased acceptance of sustainable landscaping practices along Delaware roadsides in concert with education about associated benefits (Lucey, 2010).

Research on attitude change and persuasion illuminates certain factors that can contribute to the ability of knowledge interventions to effect attitude change. Attitudes not central to an individual's belief system are more susceptible to being changed (Fishbein, 1967), and attitudes about the environment change more readily when the message recipient has weaker prior attitudes and lower prior knowledge (Falk and Adelman, 2003; Wiles and Hall, 2005).

The literature posits several models of persuasion that affect how attitudes are changed through knowledge interventions. One of the most widely cited is the Elaboration Likelihood Model (ELM), which divides knowledge interventions by context and importance to the individual—high elaboration and low elaboration. Under high elaboration circumstances, recipients of the knowledge intervention are highly motivated and able to think critically about the message. The recipients will then follow the “central route” to persuasion, meaning they will base their attitudes on the information presented. Conversely, under low elaboration circumstances, when both ability and motivation to process the message is low, recipients will follow the “peripheral route” to persuasion, considering factors other than message content on which to base their attitude. These factors, termed “peripheral cues,” may include judgments about the communication device as well as the recipient's current mood. (Petty and Cacioppo, 1986). The ELM predicts—and has been verified by research—that in terms of effecting attitude change, the quality of the information is most important under high elaboration circumstances, while peripheral cues are of greater importance under low elaboration circumstances (Johnson et al., 2005; Petty and Cacioppo, 1986). The Heuristic-Systematic Model is similar to ELM, in which people either process information with systematic cognitive processes, or use “heuristic”

shortcuts such as emotions and intuition to reach quicker conclusions (Chaiken et al., 1989).

These and other persuasion models suggest that attitude change is influenced not only by the quality of information presented and how the information is presented, but internal factors such as an individual's prior knowledge and attitudes, and his/her motivations to interact with the knowledge intervention (Briñol and Petty, 2005; Brunson and Reiter, 1996; Johnson et al., 2005). Knowledge interventions developed to effect attitude change therefore should address both information quality as well as peripheral cues (Petty et al., 1983); audience analysis is a key step to achieving this (Briñol and Petty, 2005; Jacobson and Marynowski, 1998). To successfully change attitudes, knowledge interventions must capture the attention of the target audiences and present information that is personally relevant to their emotions and beliefs (Brunson and Reiter, 1996; Falk and Adelman, 2003; Ham, 2007; McKenzie-Mohr and Smith, 1999; Pooley and O'Connor, 2000).

Using Knowledge Interventions to Change Behavior and Social Norms

The present study focuses on using knowledge interventions to foster attitude change, i.e. to garner acceptance for sustainable landscaping on publicly viewed landscapes. However, sustainable landscaping literature promotes a longer-term goal of contributing to widespread societal change in landscaping practices (Byrne and Grewal, 2008; Thayer, 1994). SSI offers credits for “promoting sustainability awareness and education,” with the intent to “positively influence user behavior on site and beyond” (SSI, 2009a); the Audubon Cooperative Sanctuary Program certification requires an “Education and Outreach” plan to “educat[e] and involv[e] employees and patrons in good stewardship practices” (Audubon

International, 2008). Considering how the research may contribute to a landscape paradigm shift, a brief review of literature on fostering behavior change follows.

Society-wide behavior change is notoriously hard to study, and more research is needed on how both design and knowledge interventions can influence behavior towards the environment (Ardoin, 2009; Byrne and Grewal, 2008; Cadenasso and Pickett, 2008; Gobster et al., 2007; Knapp, 2009). Lack of knowledge and unsupportive attitudes are only two of many barriers to behavior change; for instance, convincing people to commute by bicycle involves a complex set of barriers such as concerns about time, safety, and weather (McKenzie-Mohr and Smith, 1999). Self-efficacy, referring to a person's belief that they can achieve the prescribed behavior, is also a strong moderator of behavior change (Bandura, 1982; Bandura and Adams, 1977). However, the literature supports the idea that some types of knowledge interventions can play a significant role in changing individual behavior, leading to large-scale changes in social norms (Byrne and Grewal, 2008; McKenzie-Mohr and Smith, 1999).

To contribute most effectively to behavior change, knowledge interventions must accomplish more than providing general information—they must connect to specific needs and belief systems of specific audiences (McKenzie-Mohr and Smith, 1999; Ham and Krumpe, 1996). The literature offers several approaches and strategies for achieving this requisite. For example, McKenzie-Mohr and Smith recommend a hybrid between psychology and social marketing (termed “community-based social marketing”) to foster sustainable behavior. Community-based social marketing follows a pragmatic approach that targets specific behaviors in an attempt to change them (McKenzie-Mohr, 2000). The approach involves:

...Identifying barriers and benefits to a sustainable behavior, designing a strategy that utilizes behavior change tools, piloting the strategy with a small segment of a community, and finally, evaluating the impact of the program once it has been implemented across a community. (McKenzie-Mohr and Smith, 1999)

Modeling desired behaviors can foster behavior change in individuals and lead to transformation of social norms (McKenzie-Mohr and Smith, 1999).

Approaching behavior change at a community—rather than an individual—scale may be essential for changing social norms within a community (Jorgensen, 2005; Nassauer et al., 2009). Citizen science programs, in particular, have been successful in fostering sustainable behaviors (Cooper et al., 2007; Stepath, 2000). Ham and Krumpe recommend thematic, targeted interpretation, based on Theories of Reasoned Action and Planned Behavior put forth by Fishbein and Ajzen (1975), Ajzen (1991), and Fishbein and Manfredo (1992):

Interpretive interventions that convincingly advocate behavioral, normative, and control beliefs conducive to replacing, altering, or maintaining a behavior will be more effective in achieving desired behavioral outcomes than those that merely present arbitrary facts about a topic of presumed interest to a general audience...Although other factors must be taken into account in the design of a persuasive communication appeal, the need to focus communication content on the primary beliefs salient to the target behavior(s) is of paramount importance. (Ham and Krumpe, 1996)

No matter the specific strategies used, the literature suggests that knowledge interventions will be required for a paradigm shift to sustainable landscaping. The theory on the diffusion of innovations posits that innovations only diffuse when they are observable, and are resistant to diffusion when they are complex or difficult to comprehend (Rogers and Shoemaker, 1971). Because sustainable landscapes support a complex array of ecosystem services and humans cannot see

environmental quality directly, sustainable landscape practices are resistant to diffusion (Thayer, 1989). Thus, to support widespread adoption of sustainable landscaping practices, the environmental benefits of such practices need to be made explicit and observable through “conspicuous expression and visible interpretation” (Thayer, 1989). Byrne and Grewal (2008) suggest that “widespread, sustained outreach efforts about the practices and value of ecological landscaping are essential to bring about large-scale changes in social landscaping norms.”

Specific Knowledge Intervention Strategies

This section details two knowledge intervention strategies that provide a framework for the current thesis research: interpretation and green marketing. Interpretation can enhance visitor awareness of and attitude towards resource sites by emphasizing basic environmental concepts, promoting environmental stewardship, and enhancing understanding of management practices (Curthoys and Cuthbertson, 2002; Knapp, 2006); the SSI asserts that landscape users “develop understanding and support for resources and their values primarily through interpretive events or contacts” (SSI, 2009a). Green marketing has emerged as a way for companies to raise awareness of their environmentally friendly offerings as well as the environmental benefits these offerings provide (Ottman, 1998).

Interpretation as a Knowledge Intervention Strategy

Defining Interpretation. Though many definitions of interpretation have been articulated in the literature, one of the most enduring is that offered in 1957 by Freeman Tilden in *Interpreting Our Heritage*, the landmark publication that first outlined principles and guidelines for the interpretative profession (Brochu and

Merriman, 2002; Tilden, 2008). Though Tilden encouraged interpreters to make a life-long study of the meaning of interpretation, he defined interpretation for “dictionary purposes” as “an educational activity, which aims to reveal meanings and relationships through the use of original objects, by firsthand experience, and by illustrative media, rather than simply to communicate factual information” (Tilden, 2008). Many others have since modified and expanded his definition and principles of interpretation (see Alderson and Low, 1985; Brochu and Merriman, 2002; Cable and Beck, 2002; Ham, 1992; Knudson, Cable and Beck, 1995; and Lewis, 1980). However, Brochu and Merriman cite that these authors generally agree that interpretation “delivers messages that connect with the interests of the audiences and reveal meanings,...is more than information but involves information,...[and] is a communication process rather than a product” (Brochu and Merriman, 2002). The National Association of Interpretation (NAI), the professional organization for interpreters of heritage resources, summarizes the art and science of interpretation as “a mission-based communication process that forges emotional and intellectual connections between the interests of the audience and meanings inherent in the resource” (NAI, 2009b).

Interpretation is utilized by a wide-variety of free-choice learning institutions including museums, parks, historic sites, zoos, aquariums, nature centers and botanic gardens (NAI, 2009a). Interpretive methods can range from personal interpretation—communication from the interpreter directly to the audience—to non-personal interpretation, which includes signage, brochures, exhibits, websites, social media, and audiovisual materials (Brochu and Merriman, 2002). One of the tenets of the NAI’s interpretive training is that interpretation also may be the way the resource

is utilized or displayed; in essence, “everything is the message” (T. Merriman, personal communication).

Although “interpretation” and “education” are sometimes used interchangeably, they are not equivalent terms (Cable and Cadden, 2006). Education involves communication; interpretation is the process of communication itself (Knapp, 2006). Generally speaking, education is “part of a larger system with an established curriculum, educational goals, and specific learning objectives” (Brochu and Merriman, 2002). Conversely, interpretation is usually a short-term, stand alone, voluntary experience (Knapp, 2009). Both can be used to address environmental issues, although environmental education tends to have a universal focus on global challenges, while interpretation focuses more specifically on the mission of the sponsoring organization (Merriman and Brochu, 2009).

Benefits of Interpretation. In terms of fostering attitude and behavior change, a benefit of interpretation is that the end goal is not provision of information, but to facilitate understanding of a greater theme (Ham, 1992). As Tilden states, “the chief aim of interpretation is not instruction, but provocation” (Tilden, 2008). Pierssené notes that interpretation should seek to “encourage a special quality of understanding, not the superficial kind that knows the answers but not their significance” (Pierssené, 1999). Presenting relevant themes provokes thought about beliefs, offering a pathway for influencing attitudes and behaviors, and interpretation can play a significant role in creation of new attitudes by sharing ideas that target audiences have never before encountered (Ham, 2007). In general, interpretation’s emphasis on audience relevancy and facilitating emotional connections aligns well with the research on attitude and behavior change.

Though interpretation is most well known for its use at free-choice learning institutions, it is adaptable for any situation in which forging emotional and intellectual connections is an end goal (Ham, 1992; Merriman and Brochu, 2006; Pierssené, 1999). Despite its broad definition and use as a communication process, a strength of interpretation is the existence of a professional framework that identifies guiding principles and research-based strategies (Merriman and Brochu, 2006). The NAI serves 5,000 members around the world with the mission to “to inspire leadership and excellence to advance heritage interpretation as a profession” (NAI, 2009a). In addition to providing professional certification and training, NAI publishes the peer-reviewed *Journal of Interpretation Research* (NAI, 2011).

Challenges of Interpretation. A significant challenge of interpretation is its reliance on non-captive audiences for a short participation time (Ham, 2007; Hammit, 1984). The brevity and oftentimes singularity of interpretive encounters means that changing existing attitudes and long-term behaviors can be extremely difficult (Ham, 2007; Knapp, 1996). Reinforcing existing attitudes, creating new attitudes, and fostering change of short-term, on-site behaviors are the more plausible outcomes of interpretation (Ham, 2007).

The literature suggests that only strongly thematic, relevant, and provocative interpretation will be successful at contributing to longer-term attitude and behavior change (Ham, 2007). However, in many instances, interpretation focuses too narrowly on resources and message without adequate research of visitor motivation. This mismatching of messages and audiences is a significant barrier to fostering change in attitudes and behaviors (Atkinson and Mullins, 1998; Ham and Krumpe, 1996).

An ethical consideration concerning the use of interpretation is to ensure it is not used as a propaganda instrument (Knapp, 2009). Knowledge interventions in general can have ethical implications when they attempt to alter perceptions and behavior (Gobster et al., 2007). In his “Applied Interpretation” blog, Knapp cautions interpreters to “handle environmental issues with care,” interpreting them as necessary with “the utmost scientific backing and not through personal speculation” (Knapp, 2009). Although ecological science is sometimes a subject of controversy, it is constantly improving, and “the precautionary principle would lead us to act in defense of ecological goals as we understand them” (Gobster et al., 2007). Interpretation should not, by principle, shy away from persuasive communication for fear of offending certain sectors of the audiences, but should use a passionate approach, firmly based in the reasons for the resource protection or creation (Novey, 2008).

Strategies for Interpretation. Interpretation Principles and Standards.

Basic interpretive strategies and principles have been outlined by the literature, most notably by Tilden (2008) and Cable and Beck (2002). The TORE™ model of thematic interpretation, based on cognitive research literature, indicates that successful interpretation must be “enjoyable to the audience, relevant to what they already know and care about, organized for easy processing, and it must make a compelling point (communicate a relevant theme)” (Ham, 2007). The NAI uses the acronym “POETRY” to remind interpretive professionals of key ideas about interpretation (NAI, 2010):

Purposeful: Aligns with the mission [of the institution] and accomplishes measureable objectives

Organized: Uses introduction, body, and conclusion to convey theme and subthemes

Enjoyable: Employs multiple learning styles in a friendly manner

Thematic: Provokes further thought or action by delivering a message

Relevant: Makes emotional and intellectual connections

You: Creates flexibility to design appropriate experiences for specific audiences

The NAI has produced “Standards and Practices for Interpretive Methods,” which includes “a variety of benchmarks that can be used by any interpretive organization to determine areas in which they excel or might improve in their provision of interpretive products, programs, and services” (NAI, 2009c). The Standards offer a list of “good,” “better,” and “best practices” in 12 categories: Audience Involvement, Civic Engagement, Cultural Competency, Ethics, Evaluation, Interpretive Principles, Management Objectives, Operational Commitment, Sustainable Business Practices, Terminology, Theme, and Visitor Experience (NAI, 2009c).

Applying Social Marketing Strategies to Interpretation. Foundational audience research is critical to interpretive planning; although in practice, as noted above, interpretation sometimes focuses too narrowly on resources and message. As a remedy, incorporating social marketing techniques to divide audiences into market segments and ascertain their motivations is recommended. This allows the product (the interpretive message) and the promotional materials to be tailored for effective communication (Atkinson and Mullins, 1998).

Applying social marketing strategies to interpretation aligns well with the findings of Jacobson and Marynowski, who developed, implemented, and evaluated a variety of interpretive media for the natural lands management areas at Elgin Air

Force Base. Their study concluded that the most effective interpretive programs are based on knowledge and understanding of audience rather than on specific site characteristics. They advocate for “social monitoring” to continually evaluate how interpretive offerings affect knowledge, attitudes, and satisfaction levels of the target audience (Jacobson and Marynowski, 1998). Interpretive Planning: The 5-M Model for Successful Planning Projects also emphasizes the need for thorough audience research during the interpretive planning process (Brochu, 2003; see below).

Interpretive Planning. Developing an interpretive plan is key to guiding interpretation at a site. It is “the decision-making process that blends management needs and resource considerations with visitor desire and ability to pay (with time, interest, and/or dollars) to determine the most effective way to communicate the message to target markets” (Brochu, 2003). Brochu endorses a “5-M” framework for interpretive planning, in which a set of five variables is considered when developing interpretation (Brochu, 2003):

Management: The “nuts and bolts” associated with running the interpretive operation. Includes mission, goals, policies, issues, and operational resources such as budget, staffing, and maintenance.

Message: The ideas that will be communicated to the visiting public. Includes theme, subtheme, and storylines based on resource, audience, and management conditions.

Market: The users and supporters, both current and those who might have an interest in the subject or site in the future; and the implications of targeted market segments, and market position.

Mechanics: The large- and small-scale physical properties that have some effect or influence on what is being planned.

Media: The most effective method(s), given the mechanics of the situation, for communicating messages to targeted market segments in support of management objectives.

In light of the NAI's definition of interpretation as a mission-based communication process, the 5-M framework seeks to develop interpretation to further an institution's mission (Brochu, 2003). Formative and summative evaluation is recommended to assess the impact of various types of interpretive media and how well they achieve an institution's mission.

A similar approach to planning with the goals of 1) providing interpretation and not just information; 2) accomplishing effective communication of relevant messages in an organized fashion; and 3) achieving an institution's mission and goals has also been outlined (Veverka, 2005). Planning begins with identifying managerial realities (staffing, political support, mission and policies), and then moves into identifying learning, emotional, and behavior objectives; conducting an inventory of site resources and a market analysis, developing an interpretive theme, and deciding on the best media to convey this theme (Veverka, 2005). Like Brochu, Veverka emphasizes the importance of evaluation to assess achievement of stated objectives (Veverka, 2005).

A somewhat different planning framework for the distinct purpose of improving ecological literacy is cited by Curthoys and Cuthbertson (2002). Their "landscape approach" to interpretive planning "brings together both folk knowledge and scientific understanding of a place, thereby integrating socially constructed meanings and ecological realities." The guiding principles of this approach include explicit protection of ecological integrity, collaborative planning to understand and celebrate the sense of place, and recognizing the need for time and flexibility to

complete the planning process. The end goal of ecological literacy and the dynamic, expressive nature of the landscape take precedence over agency mission; interpretation serves to complement an institution's goals rather than achieve them directly (Curthoys and Cuthbertson, 2002).

Green Marketing as a Knowledge Intervention Strategy

Defining Green Marketing. Green marketing generally refers to developing and marketing products that are beneficial to the environment or have lower environmental impact than conventional products (AMA, 2011; Ottman, 1998; Polonosky, 1994). Synonymous terms include “ecological marketing, greener marketing, environmental marketing, enviropreneurial marketing, and sustainable marketing” (Chamorro et al., 2007). The objectives of green marketing are (Ottman, 1998):

- to develop products that balance consumers' needs for quality, performance, affordable pricing, and convenience with environmental compatibility, that is, minimal impact on the environment
- to project an image of high quality, including environmental sensitivity, relating to both a product's attributes and its manufacturer's track record for environmental achievement

Although the field of green marketing encompasses product innovation and corporate decision-making as well as advertising and public relations (Polonosky, 1994, Ottman, 1998), this literature review will focus specifically on how information about green products and services is promoted to customers.

Benefits of Green Marketing. Green marketing can help foster attitude and behavior change towards green products by increasing awareness of environmentally friendly options, facilitating understanding of environmental benefits, and promoting green lifestyles (Grant, 2007; Pickett-Baker and Ozaki, 2008). While many consumers express a desire to buy environmentally preferable products, they may not be aware of green product options, benefits provided by green products over conventional products, and how to determine whether a product is environmentally friendly (Manget et al., 2009; Pickett-Baker and Ozaki, 2008). Companies offering green products reportedly lose as much as 20 percent of potential purchases when consumers do not know about their green offerings (Manget et al., 2009). Thus, failing to engage in marketing can actually present a business risk, as competition will increasingly favor companies who make environmental options explicit (Ottman, 1998).

Promoting the environmental benefits of a product can provide “powerful and emotional end-benefits and imagery that increase impact [of the advertisement] and add perceived value [to the product]” (Ottman, 1998). The literature is not consistent in terms of whether consumers will pay a premium for products and services marketed as environmentally preferable. Although some studies show that consumers may be willing to pay more for some categories of products branded as environmentally friendly (Collart et al., 2010; Manget et al., 2009; Mintel Oxygen Reports, 2010), economic realities may sometimes conflict with environmental goodwill (Esty and Winston, 2009; Vermillion and Peart, 2010).

Green marketing also offers an opportunity to communicate a company’s good environmental intentions to stakeholders. Given increased public concern over

environmental issues, green marketing can help companies cater to consumers who increasingly base purchasing decisions on the manufacturer's environmental stewardship (Environmental Leader, 2009; PGAV Destination Consulting et al., 2008; Ottman, 2011; Ottman, 1998). Green marketing thus provides a way to both satisfy consumer desires and achieve the double-bottom line of profit and corporate social responsibility (Polonosky, 1994).

Challenges of Green Marketing. Effective communication about a product's environmental benefits is a key challenge of green marketing, given that such benefits are often "indirect, intangible, or insignificant to the consumer" (Ottman, 1998). Educating consumers, establishing new environmentally friendly brands, and substantiating environmental claims can be costly endeavors (Ottman, 1998). Without education, customers who are generally supportive of the environment may not understand specifically how purchasing a green product increases environmental stewardship (Esty and Winston, 2009; Pickett-Baker and Ozaki, 2008).

Green marketing is also challenged by the pitfall of greenwashing, the "deceptive practice of companies' attempts to make themselves appear more environmentally friendly than they actually are" (Vermillion and Peart, 2010). Consumers, environmentalists, consumer watchdog groups, and government agencies are increasingly wary of companies that promote themselves or their products as environmentally friendly (PGAV Destination Consulting et al., 2008; Ottman, 1998; Vermillion and Peart, 2010). Thøgersen highlights an "issue-attention cycle in environmental concern" that translates to a heightened sensitivity to greenwashing, with negative stories about companies' environmental efforts being considered more newsworthy than positive ones (Thøgersen, 2006). The less environmentally friendly

a company is perceived to be, the higher the risk of it being perceived as green-washing when engaging in green marketing (Esty and Winston, 2009).

Another potential challenge is to avoid emphasizing the product or service's greenness at the expense of customer satisfaction, a hazard termed "green marketing myopia" (Ottman et al., 2006). The first products marketed as environmentally friendly failed to satisfy expectations of quality, which has had a lasting impact on consumer's perceived effectiveness of environmental products (Grant, 2007; Ottman, 1998; Pickett-Baker and Ozaki, 2008). Misunderstanding the market for environmental products and services—and specifically, consumers' desire for values like convenience and performance in addition to environmental integrity—can lead to failed marketing efforts (Esty and Winston, 2009; Ottman, 2006).

Strategies for Green Marketing. Successful green marketing showcases the explicit and tangible environmental benefits of the product (Davis, 1993; Manget et al., 2009; Ottman, 1998; Pickett-Baker and Ozaki 2008). Effective education uses "compelling illustrations and statistics" (Ottman, 1998) and is "antithetical to dumbing down" (Grant, 2007). Most importantly, green marketing must also communicate environmental benefits as personally relevant to consumers and how the product contributes to their individual environmental stewardship (Davis, 1993; Ottman et al., 2006). Products should be positioned as providing a solution for the customer, making the purchase seem like an intuitive way to better both their lives and the environment (Grant, 2007; Ottman, 1998). Appealing to a customer's emotions and environmental beliefs may be a powerful way to influence purchasing decisions (Pickett-Baker and Ozaki, 2008).

Ensuring the credibility of environmental claims is essential for effective green marketing, and in many cases, legally required (Ottman, 1998; Ottman et al., 2006; Polonosky, 1994; see USFTC, 1998). Consumers seek authenticity, so companies should be certain they are acting in an environmental fashion before promoting themselves as such (Crain Communications, 2010; Esty and Winston, 2009). Any claims made must be meaningful and specific (Davis, 1993; USFTC, 1998; Ottman et al., 2006; Polonosky, 1994). One of the best ways to showcase a company's environmental credibility is to seek certifications, endorsements, and partnerships with expert third parties with a respected track record in environmental matters (Ottman, 1998; Ottman et al., 2006). Eco-labeling, or displaying a third party's seal of approval, can be an important measure to prevent claims of greenwashing (TerraChoice, 2010).

Green marketing myopia can be avoided by ensuring that green products or services provide consumer value beyond what is environmentally sound (Crain Communications, 2010; Ottman et al., 2006; Vermillion and Peart, 2010). Before the environmental aspects are communicated, the ability to address consumer needs must be promoted first, with emphasis on how the product/service delivers as well as or better than a conventional product/service (Davis, 1993; Esty and Winston, 2009; Ottman et al., 2006). Market research is essential to understanding target audiences within the context of the current environmental, social, political, and economic climate (Ottman, 1998).

As with conventional marketing, green marketing should target different market segments in different ways (Esty and Winston, 2009). In addition to paid advertising, public relations can be an effective strategy for promoting a company's

environmental stewardship by providing third-party credibility (Ottman, 1998; Ottman et al., 2006). The Internet is very popular for green marketing (Environmental Leader, 2009), and facilitates word-of-mouth communication about green products and companies (Ottman et al., 2006). Ottman et al. advocate use of strategies to create “buzz” about products, by developing “credible messages, stories, and Web sites....that are so compelling, interesting, and/or entertaining that consumers will seek the information out and forward it to their friends and family” (Ottman et al., 2006).

Finally, effective green marketing involves not just selling products and services, but core positioning of a company as environmentally responsible (Crain Communications, 2010; Ottman, 1998). Green marketing messages—and innovations—should illuminate an authentic corporate commitment to environmental excellence (Ottman, 1998). Communications should be external as well as internal; employee “eco-training” can help environmental values become part of organizational culture (Esty and Winston, 2009). Community outreach programs and corporate social marketing efforts are popular ways for companies to partner with non-profits, public agencies, and other companies to further environmental causes (Kotler and Lee, 2005; Manget et al., 2009, Ottman, 1998). Such programs can increase credibility of a company’s environmental efforts while showcasing their environmental stewardship (Manget et al., 2009).

Chapter 3

METHODS

Research Approach

A sequential mixed methods approach was used for gathering data. Specifically, an explanatory sequential approach was used; a quantitative survey was followed by qualitative data collection to provide additional depth and meaning to quantitative results (Creswell, 2009; Patton, 2002).

Data Collection Methods

Survey of Green Industry Professionals in the Mid-Atlantic Region

Content and Development. An internet-based survey of green industry professionals in the Mid-Atlantic region was administered to identify types of sustainable landscaping initiatives being implemented, the motivations for and barriers to their implementation, current strategies for communicating sustainable landscaping initiatives to stakeholders, and perceived effectiveness of these communication strategies.

The survey was developed and administered using Qualtrics™ web-based survey software. The survey contained 25 questions but not all respondents viewed all questions. Built-in logic modified the question terminology, streamlined questioning, and captured specific background information from different subsets of respondents. The survey consisted primarily of multiple-choice questions, some with open-text

response (Dillman, Smyth, and Christian, 2009). A copy of the survey instrument is found in Appendix A.

Population and Sample. The survey population consisted of landscape and nursery professionals in the Mid-Atlantic region, defined in this study as New York, Pennsylvania, New Jersey, Delaware, Maryland, Virginia, and Washington, D.C. The survey sample consisted of three mailing lists representing three categories of professionals responsible for designing, installing, and maintaining landscapes, with a preference for those catering to institutional landscapes:

- Green industry professional association members
- State or federal roadside vegetation managers
- Grounds managers of higher-education institutions committed to environmental sustainability

These mailing lists were not mutually exclusive, meaning that an individual could be present on more than one. Information about recruitment of potential respondents for each of the three groups is included in “Recruitment and Administration,” below.

Review and Testing. The survey was reviewed and tested for usability, reliability, and validity by the Thesis Committee, one landscape management professional, two directors of state nursery and landscaping professional associations, and six Longwood Graduate Program students. The Thesis Committee Chair and staff of the University of Delaware Food and Resource Economics Statistical Lab reviewed the final version.

Recruitment and Administration. Approximately 4871 survey invitations were distributed by email between April 27, 2010, and May 21, 2010. The survey was closed on June 7, 2010. Potential respondents had between 18 and 42 days to complete the survey, depending on when they received the invitation. Sample recruitment and survey administration methods differed among mailing lists; specific details are covered in the following sections.

Mailing List #1: Green Industry Professional Association Members. This mailing list consisted of landscape or nursery professionals in the Mid-Atlantic region who belong to career-related professional associations. To recruit potential respondents, high-level staff or board members at 17 professional associations catering to landscape and nursery professionals were contacted, including both regional and national organizations (Appendix B). Nine permitted survey administration to their membership (Table 3.1).

Table 3.1 Survey administration details for green industry professional association members.

PROFESSIONAL ASSOCIATION	METHOD (VIA STAFF MEMBER)	SEND OUT DATE	SENT TO	# INVITATIONS SENT
Professional Grounds Management Society (PGMS)	Direct email	04/28/10	Mid-Atlantic region members	177
Pennsylvania Landscape and Nursery Association (PLNA)	Included in electronic newsletter	04/30/10	All members	~1200
Maryland Nursery and Landscape Association (MNLA)	Included in electronic newsletter	05/12/10	All members	620
Delaware Nursery and Landscape Association (DNLA)	Direct email	04/27/10	All members	148
Virginia Nursery and Landscape Association (VNLA)	Direct email	05/21/10	All members	~600
New Jersey Nursery and Landscape Association (NJNLA)	Direct email	05/04/10	All members	291
New York State Nursery and Landscape Association (NYSNLA)	Direct email	04/27/10	All members	464
Golf Course Superintendents Association of America (GCSAA)	Direct email	05/17/10	Mid-Atlantic region members	~1300
Total:				~4800

Sponsorship by legitimate authority, in this case, the professional association, was used to improve response rate (Dillman, Smyth, and Christian, 2009). The survey invitation was forwarded to a director or board member at each organization on April 26, 2010, who forwarded it to their membership either directly in an email or indirectly by embedding it in a newsletter. For state-based associations,

the survey invitation was sent to all current members; for national associations, the survey invitation was sent to current members located in the Mid-Atlantic region only. The survey invitations (Appendix C) were sent between April 27, 2010, and May 21, 2010 and reached approximately 4800 potential respondents; no reminders were sent due to the researcher's indirect contact with the invitees. However, the actual number of recipients was likely lower, due to the indirect nature of the recruitment methods and membership overlap between organizations.

Mailing List #2: State or Federal Roadside Vegetation Managers. This mailing list consisted of state and federal highway officials responsible for roadside vegetation management within the Mid-Atlantic region. To recruit potential respondents, contact information was obtained and later verified from the Directory of State Highway Agency and Federal Highway Administration Environmental Officials (TRBCEAT, 2010).

On April 27, 2010, the survey invitation (Appendix C) was emailed to 28 officials whose job title and/or description indicated they were likely involved with roadside vegetation management. A reminder email (Appendix D) was sent on May 5, 2010.

Mailing List #3: Grounds Managers of Higher-Education Institutions Committed to Environmental Sustainability. This mailing list consisted of grounds managers at higher education institutions in the Mid-Atlantic region that signed the Taillores Declaration, a statement indicating commitment to incorporating sustainability and environmental literacy in teaching, research, operations, and outreach (AULSF, 2008; 2010). Contact information for grounds managers of signatory institutions was gleaned from institution websites; if a grounds manager was

not specified, a contact for facilities manager, physical plant manager or similar positions was used, based on the judgment of the researcher that the person was involved with grounds management in some capacity.

The survey invitation was emailed to 43 potential respondents on April 27, 2010 (Appendix C). A reminder email (Appendix D) was sent on May 5, 2010.

Interviews with Landscape Managers in the Mid-Atlantic Region

To supplement the survey data and provide additional detail and depth into the research questions, interviews were conducted with six managers of institutional landscapes in Delaware, Pennsylvania, and Maryland. The organizations were purposefully selected to best provide insight into the research questions (Yin, 2009). The organization itself, not the interviewee, served as the unit of analysis. Four interviewees were in-house landscape managers, and two interviewees were from companies that design and/or manage institutional landscapes.

The main criterion for selection was the organization's implementation, planned implementation, or desire to implement sustainable landscaping practices on an institutional landscape. As a group, the interviewees were selected to represent a range of institutions with different missions and audiences (Table 3.2). See Appendix E for a description of each organization.

Table 3.2 Name, summary information, sustainable landscaping status, and communication initiatives of interviewee organizations

ORGANIZATION	SUMMARY INFORMATION	SUST. LAND. STATUS	COMMUNICATION INITIATIVES
Bellevue State Park	<u>Location:</u> Wilmington, DE <u>Type:</u> state park <u>Main site users:</u> park visitors	implemented	No formal initiatives for communicating about landscape, but does engage in interpretation and education initiatives for other topics
Larry Weaner Landscape Associates	<u>Location:</u> Glenside, PA <u>Type:</u> landscaping company (focus on design & installation) <u>Main site users:</u> misc	implemented	Markets natural landscaping services; promotes natural landscaping through non-profit organization
Montgomery County Golf	<u>Location:</u> Montgomery County, MD <u>Type:</u> system of municipal golf courses <u>Main site users:</u> golfers	implemented	Member of Audubon Cooperative Sanctuary Program
Ruppert Landscape (PA branch)	<u>Location:</u> Toughkenamon, PA <u>Type:</u> landscaping company (focus on installation & maintenance) <u>Main site users:</u> misc.	desire to implement	Presented an institutional client with plans for implementing sustainable landscaping, but they were not accepted
St. Mary's College of MD	<u>Location:</u> St. Mary's City, MD <u>Type:</u> liberal arts college <u>Main site users:</u> students & staff	implemented	Member of Audubon Cooperative Sanctuary Program
University of Delaware	<u>Location:</u> Newark, DE <u>Type:</u> university <u>Main site users:</u> students & staff	implemented	Interpretation and education initiatives driven by university faculty and students

The institutions were also selected to represent differing methods and levels of success with communicating information about sustainable landscaping initiatives to stakeholders. Two institutions (the golf course and the liberal arts college) were chosen for their exemplary performance under the Audubon Cooperative Sanctuary Program, a third-party certification program for sustainable landscaping that offers resources for planning and promoting their environmental efforts (ACSP, 2010; J. Sluiter, personal communication). The landscaping company with a focus on installation and design was chosen due to its success with promoting natural landscaping both to stakeholders and to green industry professionals through a related non-profit organization. The university was selected due to initiatives by faculty and students to interpret sustainable landscaping. The other organizations had no formal initiatives to communicate information about sustainable landscaping.

Focused interviews were used according to a list of questions prepared in advance to guide the interview systematically, and allow for flexibility according to the interviewee responses. (Patton, 2002; Yin, 2009). Interviews were modified slightly to best reflect the organization type and target audience, as well as the expertise and experience of the interviewee. The content of the interview focused on the same main categories as the survey, although more in-depth responses were sought, specifically in terms of discussing communications with different subsets of stakeholders: landscape users, higher-level management within the organization, and landscape maintenance personnel.

Interviews were solicited via directed email with the interviewee. Before the interview, the interviewee was emailed a consent form (Appendix G) and a copy of the interview guide (Appendix H). All interviews were conducted on-site between

August 25, 2010 and December 9, 2010. Interviews averaged approximately one hour and were recorded using a digital voice recorder for later transcription.

Publicly available or provided documents were also reviewed to complement interview data. At the university and the landscaping company with a focus on design and installation, interviews with additional personnel served to supplement data provided by the main interviewee. Any supplementary data was combined with the main interview for analysis purposes.

Case Study of Organization Planning to Implement Sustainable Landscaping Practices

In addition to organization interviews, a case study was conducted to investigate “contemporary phenomenon in depth and within its real-life context...when the boundaries between phenomenon and context are not clearly evident” (Yin, 2009). The case study took place at The Dow Chemical Company’s Newark, DE plant, Dow Electronic Materials, where sustainable landscaping initiatives were being planned through a partnership with the University of Delaware. Multiple sources of evidence (Yin, 2009) included interviews with internal staff related to the landscaping initiative, as well as a focus group with on-site employees, the primary landscape users. The “contemporary phenomenon” was the decision to implement sustainable landscaping and what organizational considerations would affect how the changes were explained to stakeholders.

A list of case study questions (Appendix I) was developed based on the “Information Needs Checklist” outlined by Brochu (2003), which describes information to consider when developing an interpretation plan. A staff contact at Dow Electronic Materials assisted the researcher with identifying and contacting

employees that could provide the needed information. Interviews were conducted with the Facilities and Building Services/Contract Administration Manager, Site Leader, Employee Engagement Manager, Global Director for Research and Development for Chemical and Mechanical Planarization, Public Affairs Manager for the Northeast Corridor, and the University of Delaware consultant. Prior to each interview, the interviewee was sent a consent form (Appendix G) and an interview guide crafted from the general list of case study questions. The interviews took place between October 27, 2010 and November 23, 2010, and lasted between 20 minutes and one hour 15 minutes. Four interviews were conducted on site at Dow Electronic Materials, one at University of Delaware, and the other by phone. The interviews were digitally recorded and transcribed in full.

A focus group was also conducted to better understand landscape user attitudes about the existing and proposed landscaping practices. The focus group approach was used to efficiently collect data from several people at once, while taking advantage of group dynamics that tend to ensure extreme views are weeded out (Kruger and Casey, 2000; Patton, 2002). The Employee Engagement Manager sent email invitations two weeks in advance to 15 employees randomly selected from a pool of all on-site employees, representing a range of departments and management levels. Participation was voluntary; two complimentary passes to Longwood Gardens were offered as an incentive.

The 1-hour focus group was held on site at Dow Electronic Materials on October, 27, 2010, with four employees attending. A consent form was emailed to participants prior to the session. The researcher served as the focus group facilitator, and the Employee Engagement Manager served as the scribe. During the focus group,

the researcher gave a presentation of proposed landscape changes; employee opinions about both the current landscape and the proposed changes were solicited. The focus group questions and presentation are found in Appendices J and K.

Interviews with Experts in the Field of Sustainable Landscaping, Interpretation, and Green Industry Marketing

To gain additional perspective on the thesis topic, two topic experts were interviewed, one in the field of sustainable landscaping and interpretation, and the other in green industry marketing (Table 3.3; see Appendix L for biographies). The focused interview approach was used, with questions intended to gain perspective on the research questions. Prior to the interview, each interviewee was emailed a consent form (Appendix G) and the interview guide (Appendix H); a research summary was also sent to one interviewee as per request. The interviews, held on September 20, 2010 and December 10, 2010, lasted approximately one hour.

Table 3.3 Name, position, organization, and relevant expertise of expert interviewees

NAME	POSITION	ORGANIZATION	RELEVANT EXPERTISE
Steven Bogash	Cooperative Extension Educator in Horticulture	Pennsylvania State University, Capital Region	Marketing in landscape/nursery industry
Janet Marinelli	Principal	Crocus Consulting	Interpretation, communications, sustainable landscaping

Data Analysis Methods

Quantitative Data

Survey results from all three recruitment groups were combined, imported into Microsoft® Excel, and analyzed using descriptive statistics. Only responses meeting the following criteria were analyzed for this study (see Appendix M):

- Survey has not yet been completed for respondent's organization
- Respondent is an employee or owner of a company in the landscape/nursery industry; or employee responsible for landscape maintenance or management at an organization that is not within the landscape/nursery industry
- Respondent's organization is responsible for institutional landscaping; or is a provider of landscape products
- Respondent's organization utilizes or promotes sustainable landscaping practices
- Respondent completes entire survey (a non-response for some questions is permissible)

Descriptive open-text responses were recoded into existing multiple-choice categories or grouped into new categories. Narrative open-text response results were analyzed as qualitative data.

Qualitative Data

Interview question responses, focus group responses, narrative survey responses, and notations about supplementary documents were entered into Microsoft® Excel spreadsheets, identified by source, and grouped according to research question. The spreadsheets functioned as a case study database, a way of organizing and documenting qualitative data that serves as a springboard to results

reporting and data analysis; the spreadsheets also provided a chain of evidence for increasing study reliability (Yin, 2009).

Within the spreadsheets, each of the responses were coded by category, theme, and sub-theme. Factors affecting communications about sustainable landscaping initiatives were reported and analyzed using the 5-M interpretive planning framework (Brochu, 2003).

Human Subjects in Research Considerations

The researcher followed all procedures required by the University of Delaware's Research Office. The researcher completed Human Subjects Review Board (HSRB) training and submitted all data collection protocols and instruments for review. All aspects of the study were approved for exempt status. Before research participation, survey respondents, interviewees, and focus group participants received notice of their rights as a human subject and consented to participation in the study. All documents pertaining to Human Subjects in Research considerations can be found in Appendix N.

The Role of the Researcher

Disclosing potential researcher bias is important for enhancing the quality and validity of qualitative research (Maxwell, 2005; Creswell, 2009). In this study, the researcher is a student at University of Delaware, one of the study organizations. The research has been directly involved with communication initiatives related to sustainable landscaping at this site; selection of the University of Delaware as an interviewee organization was influenced by this prior affiliation.

The researcher is also a graduate of St. Mary's College of Maryland, another study organization. However, this site was selected based on participation in the Audubon Cooperative Sanctuary Program; prior to the study, the researcher had no knowledge of the college's participation in the program or its sustainable landscaping initiatives, as these efforts commenced after graduation.

Another relevant relationship is the association between several of the study organizations and Dr. Susan Barton, one of the researcher's thesis committee members. Dr. Barton, associate professor and cooperative extension specialist at University of Delaware, has been influential in the design and implementation of sustainable landscaping initiatives on campus, as well as communication initiatives about them. She also provided consulting services to Ruppert Landscape and Dow Electronic Materials in terms of implementing sustainable landscaping practices. She is currently representing the University of Delaware as a paid consultant of Dow Electronic Materials, hired to design and help implement a landscaping plan as well as assist with communication initiatives about the plan; the researcher has also assisted in executing this project. As part of the agreement between Dow Electronic Materials and University of Delaware, the researcher was provided with access to key personnel at the company site for the purpose of conducting the case study.

Chapter 4

RESULTS

Respondent Characteristics

Survey

The survey was sent to approximately 4871 green industry professionals in the Mid-Atlantic region. Three hundred ninety-two respondents initiated the survey, for an overall response rate of approximately 8%. Of these responses, 161 were analyzed based on the criteria described in Chapter 3: Methods, “Data Analysis Methods: Quantitative Data” (see also Appendix M).

The survey was sent to three different mailing lists: green industry professional associations (n=~4800; 98.54%), state or federal roadside vegetation managers (n=28; ~0.57%), and grounds managers of higher-education institutions committed to environmental sustainability (n=43; ~0.88%). Of the 392 overall respondents, 367 were from the professional associations mailing list (93.62%), seven were from the roadside vegetation managers mailing list (1.79%), and 18 were from the grounds managers of higher-education institutions mailing list (4.59%). Of the 161 respondents selected for further analysis, 143 were from the professional associations mailing list (88.82%), three were from the roadside vegetation managers mailing list (1.86%), and 15 were from the grounds managers of higher-education institutions mailing list (9.32%) (see Fig. 4.1). Given the small response number from the roadside vegetation managers mailing list and the grounds managers of higher-

education institutions mailing list, responses from all mailing lists were analyzed together. The subsequent results report considers only the 161 respondents selected for further analysis.

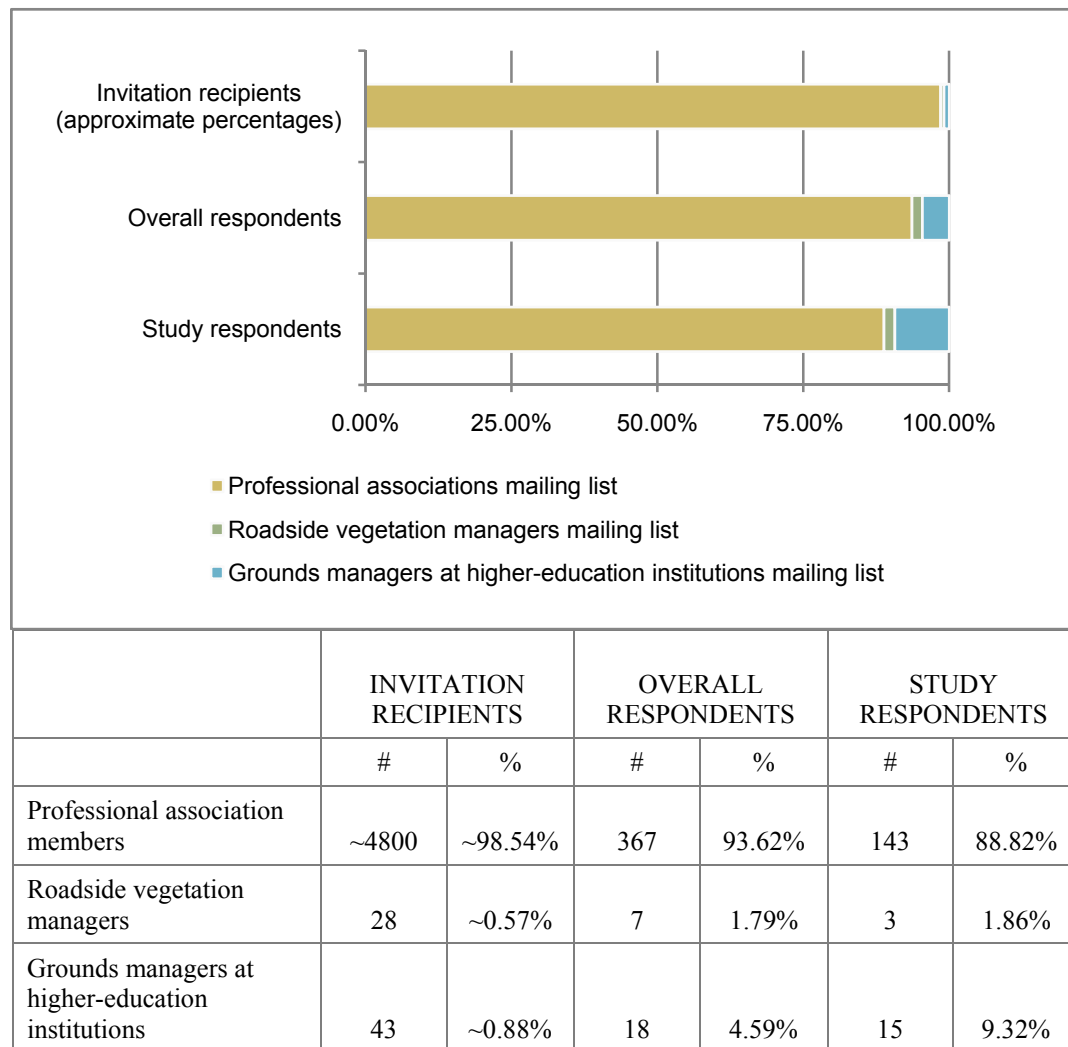


Fig. 4.1 Mailing list distribution of invitation recipients (n=~4800), overall survey respondents (n=367), and study respondents (n=143)

Respondents represent six categories of organizations: Educational Institution (or school system) (18.01%), Golf Course (36.65%), Government Agency (non-golf course) (11.18%), Private or Non-profit Organization (non-golf course) (9.94%), Landscape Services Provider that caters to institutional landscapes (16.15%), and Landscape Products Provider (8.07%) (Fig. 4.2). The majority of institutions in the Educational Institution category represented colleges or universities (89.66%); the others in this category were either preschool or grade schools (up to grade 12) (6.90%), or not specified (3.45%). Over half of those in the category of Government Agency were classified as state agencies (55.56%); others were municipal agencies (11.11%), county agencies (16.67%), and national agencies (5.56%). The category of Private Company or Non-profit Organization was represented by a majority of non-profit organizations or cultural institutions (68.75%), and a minority of private businesses or corporations (31.25%). Landscape Services Providers served either primarily institutional landscapes (38.46%), or served approximately half residential and half institutional landscapes (61.54%). Landscape Products Providers included wholesale nurseries (69.23%), retail nurseries/garden centers (23.08%), and providers of landscape enhancement products (7.69%). Results reported below reflect all respondents; see Appendix O for results by organization category and further details about respondent makeup.

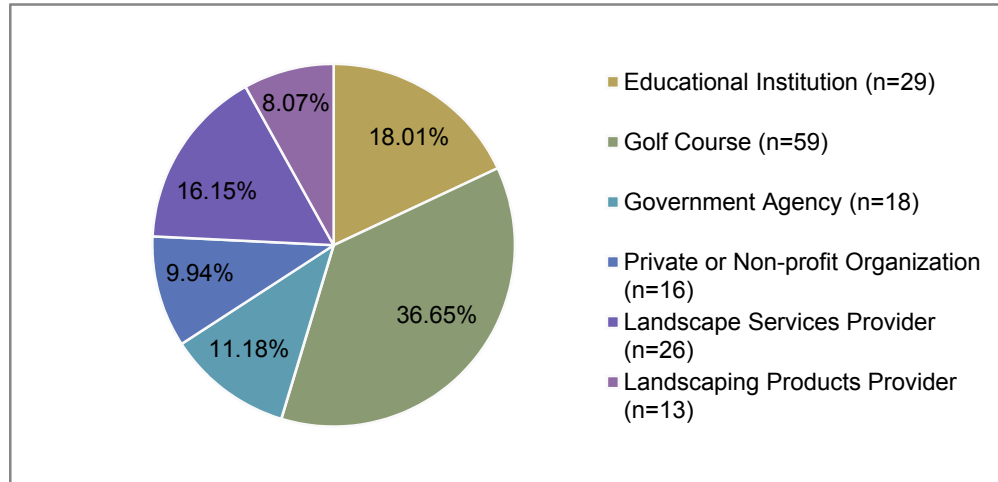


Fig. 4.2 Distribution of respondent organizations by category (n=161)

Organization Interviews

Interviewee organizations included a state park, a system of municipal golf courses, a university, a liberal arts college, a landscape maintenance company, and a landscape design firm (Table 4.1). General characteristics about interviewee organizations can be found in Chapter 3: Methods, “Data Collection Methods: Interviews with Green Industry Professionals in the Mid-Atlantic Region.” A more detailed description of each organization can be found in Appendix E. Interview and case study respondent quotes exemplifying themes described throughout this chapter are available in Appendix F.

Table 4.1 List of interviewee organizations and primary interviewee names, positions, and responsibilities

ORGANIZATION	PRIMARY INTERVIEWEE	POSITION / DEPARTMENT (IF APPLICABLE)	JOB RESPONSIBILITIES
Bellevue State Park	Andrew Driscoll	Assistant Park Superintendent/ Acting Park Superintendent	Park administration, landscape management
Montgomery County Golf	Jon Lobenstine	Director of Agronomy, Montgomery County Revenue Authority; Superintendent, Falls Road Golf Course	Overseeing superintendents and maintenance staff at nine golf courses; landscape/grounds management
University of Delaware	Tom Taylor	Landscape Engineer, Facilities Planning and Construction	Design, installation and construction of landscaping on campus
St. Mary's College of MD	Kevin Mercer	Superintendent of Grounds	Installation and maintenance of campus grounds; waste management
Ruppert Landscape (PA branch)	Garth Jorgensen	Business Development Manager	Current and potential client communications
Larry Weaner Landscape Associates	Larry Weaner	Founder	Landscape design, client communications, public outreach, business administration

Although results tables throughout this chapter indicate how many organizations reported each theme, the true number of organizations involved with each theme may be underrepresented due to the flexible nature of the interview sessions. Thus, it should be noted that the results show which themes arose as significant without regard to prevalence.

Case Study

The Dow Chemical Company owns a global network of “specialty chemical, advanced materials, agrosiences and plastics businesses” that deliver “a broad range of technology-based products and solutions to customers in approximately 160 countries and in high growth sectors such as electronics, water, energy, coatings and agriculture” (Dow Chemical Company, 2011b). Its Newark, DE facility, Dow Electronic Materials, “develops and manufactures products used for chemical mechanical polishing (CMP) and are used in the fabrication of almost every type of electronic chip made today” (Dow Chemical Company, 2011b). Dow Electronic Materials has been a wholly owned subsidiary of the Dow Chemical Company since early 2009. Although to some degree the plant still uses its prior name, “Rohm and Haas Electronic Materials,” the company will henceforth be referred to as “Dow Electronic Materials.”

The plant is located adjacent to Interstate 95 in the Diamond State Industrial Park, which is shared by several other companies. Dow Electronic Materials supports over 500 on-site employees, including both salaried and hourly staff (Fig. 4.3). Employees average 44 years of age; males outnumber females by more than 4:1 (Fig. 4.4). Others audiences who have established relationships with Dow Electronic Materials and who use or view the site include current and potential clients, employees and visitors of other companies in the industrial park, community members, and residents of adjacent neighborhoods. The site is also visible from Interstate 95, and, according to one interview respondent, 290,000 cars pass by daily, representing the most well traveled portion of the highway within Delaware.

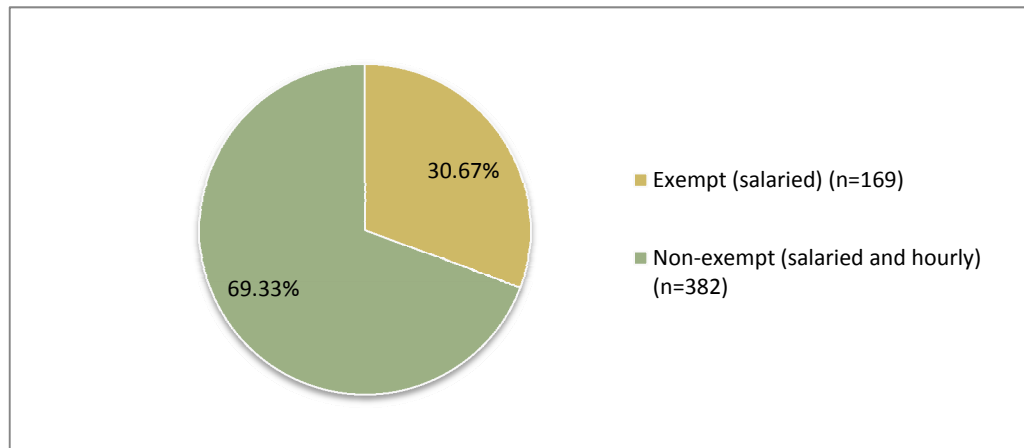


Fig. 4.3 **Distribution of exempt and non-exempt employees at Dow Electronic Materials, as of December 2010 (n=551) (Source: Dow Electronic Materials)**

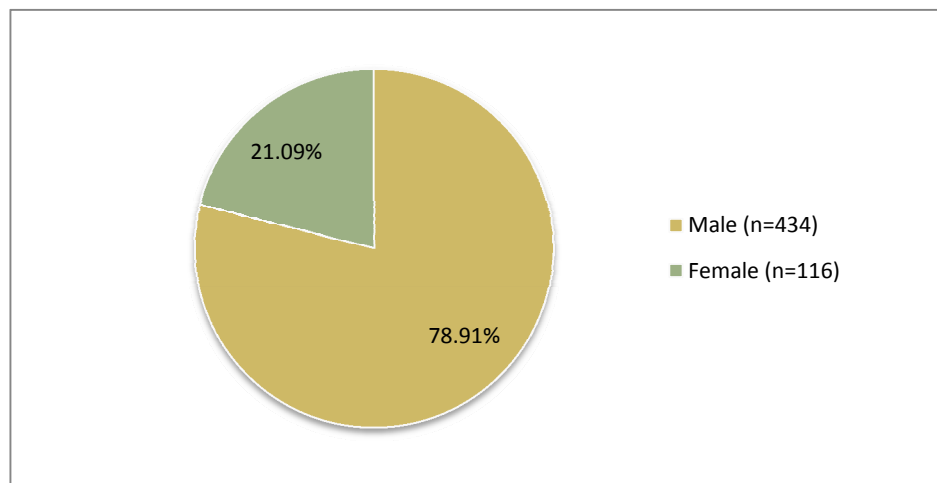


Fig. 4.4 **Distribution of male and female employees at Dow Electronic Materials, as of December 2010 (n=551) (Source: Dow Electronic Materials)**

The sustainable landscaping initiative began in spring of 2010, when an interested employee engaged the services of two outside consultants—one independent, and one from the University of Delaware—to provide perspective on how sustainable landscaping practices might be developed on site. The company then entered a formal agreement with the University of Delaware, in which the consultant would develop a landscape plan for the site and assist with developing interpretive materials related to sustainable landscaping practices. By Fall 2010, the first targeted landscape area was designed and installed. Other landscaping areas are slated for design and installment starting Spring 2011.

Interviewee respondents included employees involved in the sustainable landscaping project, communications personnel, and the consultant hired to design and assist with implementation of the project (Table 4.2). Four employees of Dow Electronic Materials that are currently unconnected with the project also participated in a focus group.

Table 4.2 List of case study interviewee names, position, and responsibilities

INTERVIEWEE	POSITION	JOB RESPONSIBILITIES
Ethan Simon	Global Director for Research and Development, Chemical and Mechanical Planarization	Research and development of new products
Peter Freeman	Site Leader	Site operations, including functional and business needs
Charles Perry	Facilities and Building Services, Contract Administration	Facilities-related aspects and outside contractors, including grounds and facilities maintenance (reports up to Site Leader through Manager of Maintenance)
Pat Wharton	Employee Engagement Manager	Employee engagement and behavioral change within organization, including employee communications and development
Barbara del Duke	Public Affairs Manager, Northeast Corridor	Community outreach; coaching and direct support services for site leadership
Susan Barton	Landscaping Consultant (University of Delaware)	Sustainable landscaping and education planning
Focus group	Various	Various

Expert Interviews

The experts consulted were Janet Marinelli of Blue Crocus Consulting, and Steve Bogash of the Pennsylvania State University Cooperative Extension in Franklin County. Marinelli provides consulting services for public gardens and related institutions in the areas of interpretation, program planning, and communication media, with a focus on sustainability. Bogash provides education and support to the commercial vegetable, small fruit, and horticulture industry and lectures on the topic of green industry marketing. Full biographies are included in Appendix L.

Sustainable Landscaping Practices

Definitions of Sustainable Landscaping Practices

Survey. In the survey, “sustainable landscaping practices” was defined by the researcher as being synonymous to “environmentally friendly landscaping practices” with no other definition provided; respondents presumably used their own definitions of the concept to reply to the survey. For the types of sustainable landscaping practices used or promoted by respondents, see Appendix P.

Organization Interviews. Interview respondents were asked for their definition of sustainable landscaping, and the following themes emerged from the responses:

- Reduced inputs (5 respondents)
- Environmental stewardship (3 respondents)
- Reduced outputs (2 respondents)
- Taking advantage of existing conditions (2 respondents)
- Economic sustainability (1 respondent)

Additionally, two respondents offered alternate terms for the concept: “environmentally friendly” and “regenerative landscaping.”

Case Study. Case study respondents’ definitions of sustainable landscaping generally encompassed concepts of environmental stewardship, reduced inputs, and taking advantage of existing conditions. Sub-themes included increasing wildlife habitat, using renewable resources, and using plants that match existing site conditions.

Sources of and Motivations for Sustainable Landscaping Initiatives

Survey Multiple Choice Responses. A majority of respondents deemed “Very Important” the sources or motivations of “environmental responsibility and stewardship” (69.67%), “remedying a problem in the landscape” (59.01%), “providing an outdoor space for people” (57.14%), and “cost savings” (52.80%). Nearly 50% of respondents cited as “Very Important” the sources or motivations of “helping green the community” (49.07%), “complying with legal requirements” (49.07%), and “promoting the organization’s ‘green image’” (49.07%) (Fig. 4.5). The least important sources or motivations, judged to be “Not Important” by respondents, were “public or stakeholder pressure” (40.99%), “mandate by upper or corporate management” (36.02%), and “complying with legal requirements” (20.50%) (Fig. 4.5).

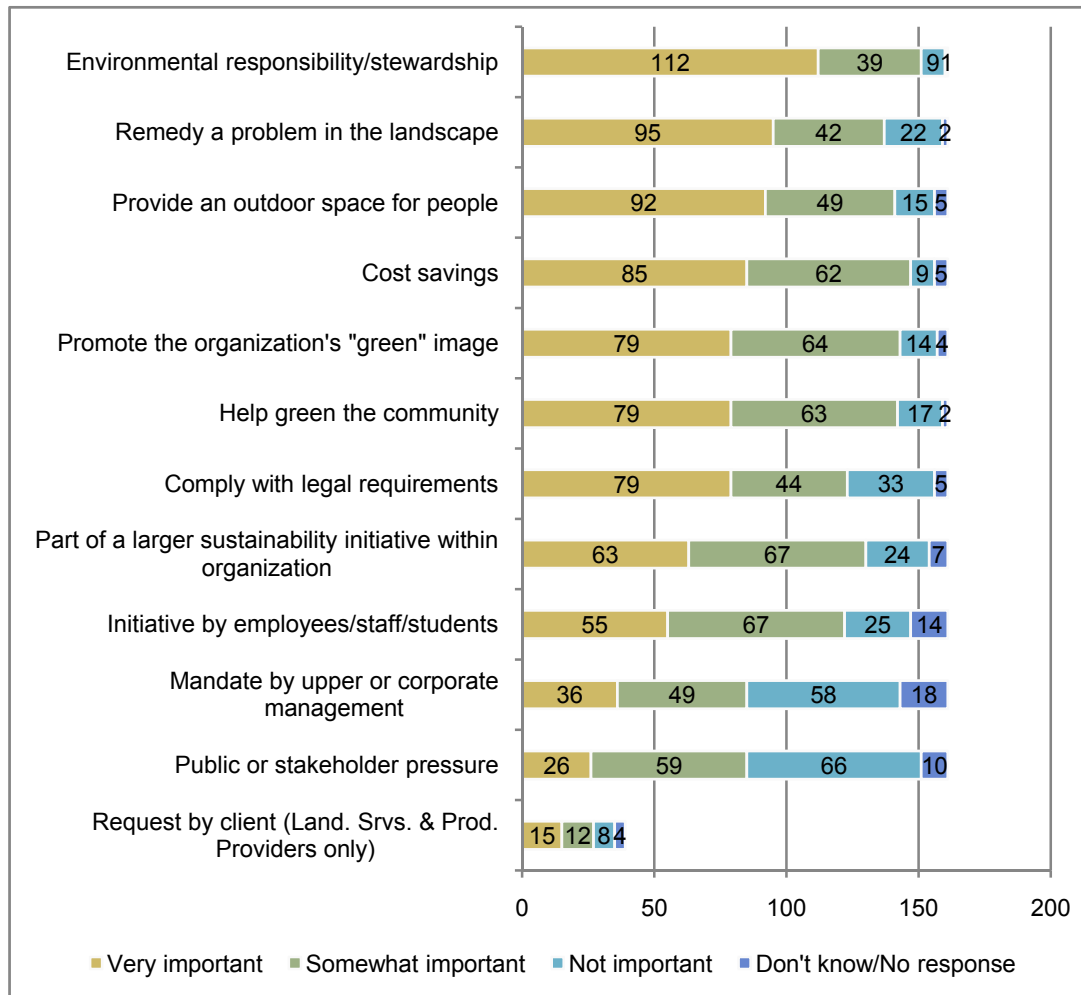


Fig. 4.5 Importance of sources of or motivations for using/promoting sustainable landscaping practices, as reported by survey respondents (n=161)

Organization Interviews and Survey Open-text Responses.

Organization interviewees reported a variety of motivations for implementing sustainable landscaping practices. These motivations included changing negative stereotypes about landscaping practices; creating a better place or product for people; educating people about sustainable practices; doing “the right thing”; increasing

product marketability; doing what “makes sense”; preparing for increased environmental regulations; recognizing the importance of a place, reducing environmental impact of operations; setting an example or providing leadership; and using resources effectively (Table 4.3). Among interviewee organizations, landscape design and management staff were key drivers of sustainable landscaping initiatives, though upper-level management, the green industry, clients, and landscape users also influenced the efforts (Table 4.4). Some organizations reported that they were simply continuing to do what is customary within the organization.

Table 4.3 Motivations for using sustainable landscaping practices reported by organization interview respondents and survey respondents. I=# interview respondents; S=# survey respondents.

MOTIVATIONS	I	S
Change stereotypes	1	0
Cost savings	3	2
Create a better place/product for people	2	2
Educate people about sustainable practices	0	3
Ethics – It’s the right thing to do	1	9
Increase product marketability	0	1
Practicality – It makes sense	0	4
Prepare for increased environmental regulations	1	0
Recognize the importance of a place	1	0
Reduce environmental impact of operations	3	1
Set an example/provide leadership	1	4
Use resources effectively	0	1

Table 4.4 Sources of sustainable landscaping initiatives reported by organization interview respondents and survey respondents. I=# interview respondents; S=# survey respondents.

SOURCE OF INITIATIVE	I	S
Client has already implemented landscape practices	1	0
Initiative by landscape users/viewers	0	1
Mandate from upper level management	4	1
Personal initiative of staff	6	2
Practices being promoted by the green industry	2	0
We've been doing it that way for a long time	1	4

Case Study. Motivations for implementing sustainable landscaping practices on Dow Electronic Materials campus varied among project participants. Key motivations included enhancing the outdoor environment for employee use, setting an example of environmental stewardship, and promoting the company's goals for and image of sustainability.

The Global Research and Development Director—an employee unconnected to grounds management—was the key driver of the initiative due to a personal interest in sustainable landscaping. His authority and budget resources as an upper-level manager facilitated initiation of the project. Key motivations and goals are to 1) enhance wildlife habitat on the site and reduce environmental impacts of operations and 2) educate site users about sustainable landscaping, both indirectly by setting an example and directly through educational initiatives. Other motivations included enhancing safety for landscape maintenance personnel, creating a better outdoor space for employee use, correcting drainage problems in the landscape, and to

take advantage of the company's resources and his position to "do the right thing."

For him, cost savings provided by the practices was not a key motivator.

The Site Leader, who is ultimately responsible for the campus landscaping, was approached by the Global Research and Development Director with the idea for sustainable landscaping. He approved development of a site-wide landscaping plan that would include sustainable practices, with the caveat that the practices be aesthetically acceptable. His motivations for implementing sustainable practices included cost savings, to help green the community, to use resources effectively, and because it would fit with the company's larger goals of sustainability.

The Global Research and Development Director and the Site Leader then engaged the Facilities and Buildings Manager, who is directly responsible for landscape management and landscape maintenance contract administration. Having already implemented a number of sustainable practices into the indoor facilities, the Facilities and Building Manager immediately embraced the project. His motivations included creating a better outdoor environment for employees, helping green the community, and because it was "the right thing to do" in terms of the environment. He also was motivated by the organizational structure, in that the mandate to implement the practices came from upper-level management (i.e., the Site Leader and the Global Research and Development Director). He shared the Site Leader's vision for creating a better site identity through development of a comprehensive landscape plan, and specifically to enhance the appearance of the site in general.

The Landscape Planning Consultant, an Assistant Professor and Cooperative Extension Specialist at University of Delaware, was solicited to develop a design for Dow Electronic Materials campus that utilized sustainable landscape

practices. Her motivations for participating were to enhance educational opportunities and contribute to environmental stewardship of the site.

Challenges to Using or Promoting Sustainable Landscaping Practices

Survey Multiple Choice Responses. Relatively few of the challenges listed in the survey were significant for respondents (Fig. 4.6). Almost a third of organizations judged “Our budget is limited” to be “A Significant Challenge” (32.30%); the only other factor considered to be “A Significant Challenge” by more than 10% of respondents was “No one has requested or required that we use or promote these practices” (12.42%). The only factors judged by less than 50% of respondents to be “Not a Challenge” were “Our budget is limited” (18.63%) and “People think sustainable landscaping is less attractive” (42.24%). The five least significant challenges, cited as “Not a Challenge,” were “Being environmentally friendly is not part of my organization’s values” (71.43%), “There aren’t any direct benefits to my organization” (68.94%), “Property owner won’t allow us to change the landscaping” (64.60%), “No one in my organization will lead the effort” (65.22%), and “It is difficult to obtain buy-in from upper management” (60.25%) (Fig. 4.6).

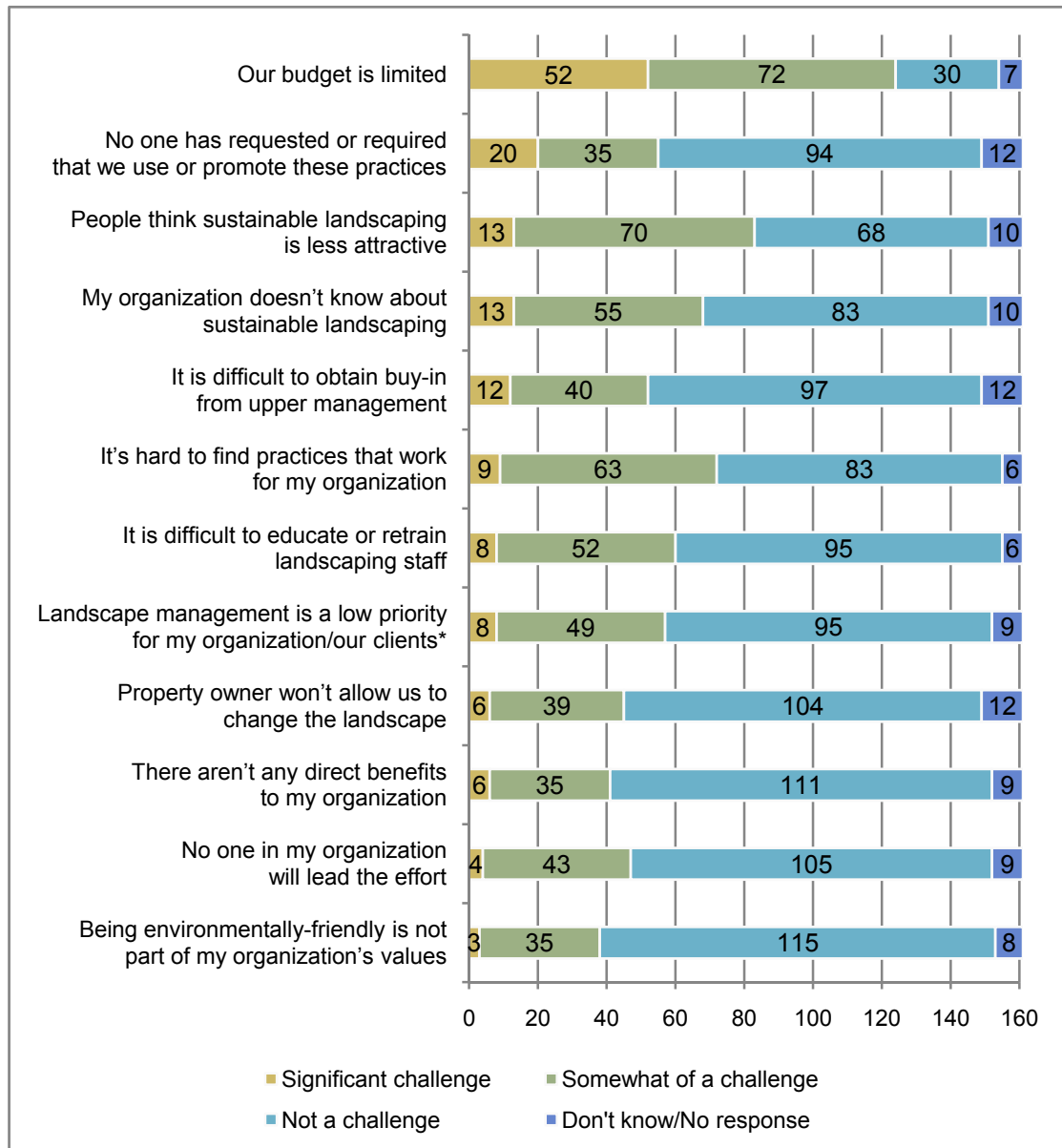


Fig. 4.6 **Significance of challenges to using/promoting sustainable landscaping practices, as reported by survey respondents (n=161)**

Organization Interviews and Survey Open-text Responses. Internal

challenges to implementing sustainable landscaping practices included lack of operational resources, lack of organizational support, and difficulties in communicating the benefits of sustainable landscaping to stakeholders (Table 4.5). External challenges stemmed from how the mechanics of sustainable landscaping differs from conventional landscaping, and how public opinion drives landscaping decisions (Table 4.6).

Table 4.5 Internal challenges to implementing sustainable landscaping as reported by organization interview respondents and survey respondents. I=# interview respondents; S=# survey respondents.

THEME/SUB-THEME	I	S
<i>Communication difficulties</i>		
Difficult to communicate the benefits of sustainable landscaping to stakeholders	0	2
<i>Lack of operational resources</i>		
Budget constraints	2	3
Lack of knowledge/skills among landscaping staff	3	0
Space constraints	0	1
Time/labor constraints	2	1
<i>Lack of organizational support</i>		
Lack of buy-in from landscaping staff	5	0
Lack of support from upper management	0	6

Table 4.6 External challenges to implementing sustainable landscaping initiatives as reported by organization interview respondents and survey respondents. I=# interview respondents; S=# survey respondents.

THEME/SUB-THEME	I	S
<i>Mechanics of sustainable landscaping differ from conventional landscaping</i>		
Long-term dynamics of landscape is different	1	0
Maintenance regimes are different	4	0
Need to experiment to find practices that work	1	0
<i>Public perception of sustainable landscaping practices</i>		
Aesthetic preference for conventional landscaping	4	3
Client requests for conventional landscaping practices	0	2
Concerns about undesirable wildlife	1	1
Conflicts with function	3	0
Lack of understanding of sustainable landscaping	4	1
Landscapes are a low-priority for client	1	0
Need to change practices when public is dissatisfied	2	0
There is a general resistance to change	2	1

Case Study. Several challenges to implementing sustainable landscaping initiatives at Dow Electronic Materials surfaced during the interviews and focus group. Internal challenges for implementing sustainable landscaping at Dow Electronic Materials campus included potential costs of implementing the practices—both monetary and in terms of staff time—as well as the relatively low priority of landscaping within the larger organization. Other challenges included finding appropriate places on campus to implement desired practices, including consideration of potential conflicts with functional uses of campus spaces.

One external challenge that surfaced was that the landscaping itself is maintained by a contractor who may not personally buy into the concept of sustainable landscaping or have sufficient knowledge to contribute to sustainable landscape planning. Public perception of sustainable landscaping also emerged as a challenge, due to presumed aesthetic preferences for conventional landscaping and general lack of knowledge about sustainable landscaping among employees. Finally, the Site Manager noted that a challenge for any landscaping initiatives on campus was ensuring sustained funding.

Factors Affecting Communication to Stakeholders about Sustainable Landscaping Initiatives

Management-based Factors

Management-based factors found to affect communication about sustainable landscaping initiatives at interview organizations and Dow Electronic Materials included the desire or need for communication; goals for communication; organization mission, vision and/or values; operational resources for communication; and organizational support for communication.

Desire and Need for Communication.

Organization Interviews. Organization interview respondents reported both a desire and need to communicate about sustainable landscaping initiatives (Table 4.7). The majority of respondents indicated a strong desire to enhance communication efforts related to sustainable landscaping, although one interviewee commented that sound landscape design is of greater importance than communication about environmental benefits. For the institutions involved in the Audubon

Cooperative Sanctuary Program, communication to stakeholders about sustainable landscaping practices is a requirement for certification.

Table 4.7 **Desire and need to communicate to stakeholders about sustainable landscaping practices as reported by organization interview respondents**

THEME	N=
Desire for enhanced communication efforts	5
Good design is needed more than communication efforts	1
Third-party certifier requires communication efforts	2

Case Study. Case study respondents generally agreed that communication about the sustainable landscaping practices was both desired and needed. The Site Leader and Employee Engagement Manager both noted that while the organizational culture promotes sustainability in general, employees would not necessarily recognize that the new landscaping practices were sustainable. The Facilities and Buildings Manager noted that organizational policy requires communication about on-site changes that affect the employee population.

Goals for Communication.

Organization Interviews. Organization interviewee respondents expressed three main goals for communication about sustainable landscaping initiatives: attitude change, behavior change, and raising awareness of sustainable landscaping initiatives (Table 4.8).

Table 4.8 Goals for communication about sustainable landscaping initiatives as reported by organization interview respondents

THEME	N
Attitude change	3
Behavior change	3
Raise awareness of sustainability initiatives	3

Case Study. At Dow Electronic Materials, raising awareness of the sustainable practices and encouraging employees to adopt the practices at home are main goals for communication about sustainable landscaping initiatives. By raising awareness of the practices, it is desired that employees not only understand that the practices are sustainable, but can become aware of amenities that will enhance their enjoyment and use of the landscape.

Organizational Mission, Vision, and/or Values.

Organization Interviews. Although not always directly cited by interviewees as affecting communication, the researcher found that mission, vision, and/or values indirectly influenced communication initiatives about sustainable landscaping (Table 4.9).

Table 4.9 Mission, vision, and/or values themes of interviewee organizations, with supporting statements and quotes from organizational websites, publications, and/or interviewees

INSTITUTION	THEMES
Bellevue State Park	Recreation, resource protection, and education
	Historic resource protection
	Recreation management
Montgomery County Golf	Community enrichment
	Environmental sustainability
	Customer satisfaction
University of Delaware	Education, research, and betterment of society
	Sustainability
	Sustainability leadership
St. Mary's College of MD	Education, research, and betterment of society
	Sustainability
Ruppert Landscape (PA branch)	High-quality products, customer and community service, good atmosphere for employees, safety, profitability
	Customer satisfaction
	Profitability
Larry Weaner Landscape Associates	Customer satisfaction, combining environmental science with art

Case Study. Several respondents indicated that The Dow Chemical Company's commitment to sustainability was a factor influencing development of the sustainable landscaping initiatives and communications about them (see also "Organizational Support," below). On its website and publications, The Dow Chemical Company positions itself as a company that helps address sustainable solutions to global problems.

Operational Resources.

Survey. The majority of respondents (60.25%) had neither staff nor budget resources designated specifically for educating people about their organization's sustainable landscaping initiatives (Fig. 4.7). Having designated staff and no designated budget (19.88%) was much more common than having a designated budget without designated staff (1.86%). Only six respondents (3.73%) had both staff and budget resources dedicated to educating people about sustainable landscaping initiatives.

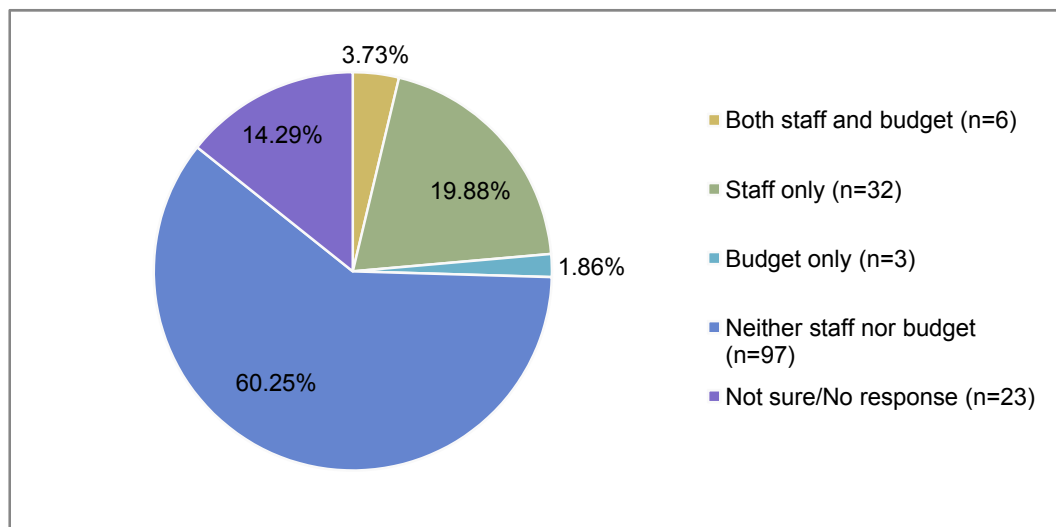


Fig. 4.7 **Designated staff and budget resources for educating people about sustainable landscaping initiatives at survey respondent organizations (n=161)**

Organization Interviews. Both internal and external resources for communicating about sustainable landscaping initiatives were identified by organization interview respondents. Internal resources included assistance from other departments, budget resources for communication, dedicated space for communication, good internal communication in general, landscaping staff experience in implementing communications about sustainable landscaping, landscaping staff time dedicated specifically to implementing/maintaining communication initiatives, and established avenues for communication (Table 4.10). The respondents also noted that several external resources enhanced operational capacity and provided education/inspiration, including third-party certification programs, grant programs, professional colleagues, public gardens, professional associations, and universities (Table 4.11).

Table 4.10 Internal resources for communication about sustainable landscaping initiatives as reported by organization interview respondents

THEME	N
Budget resources for communication	3
Dedicated space for communication	1
Dedicated staff or consultants for communication	6
Good internal communication	6
Landscaping staff experience	1
Landscaping staff time dedicated specifically to communication initiatives	2
Existing communication avenues	6
<i>Emails</i>	3
<i>Handouts/visual aids</i>	5
<i>Marketing/PR</i>	5
<i>Meetings/presentations/tours</i>	5
<i>Notice boards</i>	4
<i>One-on-one/small group conversations</i>	2
<i>Organizational newsletter/publications</i>	3
<i>Signage</i>	3
<i>Website</i>	6

Table 4.11 External resources for communication about sustainable landscaping initiatives as reported by organization interview respondents.

THEMES/SUB-THEMES	N
<i>Resources to enhance operational capacity</i>	
Assistance from third-party certifiers	2
Grants	1
<i>Sources of inspiration or education</i>	
People at other organizations that are using the practices	4
Professional associations	3
Public gardens	2
Universities/cooperative extension	2

Case Study. Case study respondents identified both internal and external resources for implementing communication about sustainable landscaping practices.

Although there are no budget resources dedicated specifically to communication about sustainable landscaping initiatives, it appears that internal resources would support such communications. So far, the Facilities and Building Manager has taken the main responsibility for communicating about sustainable landscaping initiatives, though both the Research and Development Director and the Employee Engagement Manager indicated they could support these efforts.

Many avenues currently exist for internal and external communications at Dow Electronic Materials. Written media include email, digital and physical notice boards, newsletters, and a site-specific text messaging system called “e-log.” Live media include “town hall” meetings; health and safety fairs with temporary exhibits; and management meetings after which managers are advised to share information with their subordinates.

External communications with other organizations and interests is facilitated through a Community Advisory Council, which meets five times a year at Dow Electronic Materials campus. The Council is composed of representatives of local businesses, government agencies, and other entities that gather to share information about issues that may affect the community. The Public Affairs Manager noted that word-of-mouth communications stemming from the Community Advisory Council also helps information about Dow Electronic Materials campus spread into the local community. Presentations to other community groups also serve as a medium for communication.

The key external resource for communication about sustainable landscaping initiatives is the partnership with University of Delaware, as consulting services for education and interpretation will be provided in addition to the landscape design. In terms of learning more about the topic of sustainable landscaping, Dow Electronic Materials employees involved in the project cited the internet, public horticulture organizations, professional associations, and outside consultants as sources of education and inspiration.

Organizational Support.

Organization Interviews. In general, interviewees indicated there was good organizational support for communications about sustainable landscaping initiatives, stemming from organizational culture, staff, and stakeholders (Table 4.12).

Table 4.12 Organizational support for communication about sustainable landscaping initiatives as reported by organization interview respondents

THEME/SUB-THEME	N
Organizational mission, vision, and/or values support communication about sustainable landscaping initiatives	3
Staff buy-in to sustainability and/or communication efforts	3
Stakeholder support for sustainable landscaping initiatives	3

Case Study. There is strong support for sustainable initiatives within the global Dow Chemical Company as well as locally at the Newark site. The larger Dow Chemical Company encourages and mandates sustainability initiatives within its subsidiaries; a voluntary global network of employees acts as a forum for exchange

information about sustainable initiatives. Locally at Dow Electronic Materials, a voluntary employee “Green Team” regularly promotes environmental agendas within the organization and organizes educational activities to promote environmentally friendly behaviors among employees. The Facilities and Buildings Manager noted that his department has recently increased its attention to environmental issues, enhancing recycling programs and converting to green cleaning and maintenance products. Several of the interviewees noted that a significant portion of employees at Dow Electronic Materials are interested in environmental initiatives that have been promoted thus far, and that there will likely be good support for sustainable landscaping initiatives. Members of the Community Advisory Council also have shown support for the proposed landscaping practices.

There is also strong support for internal and external communications in general at the Newark Plant. The Employee Engagement Manager suggested that the existence of her position is indicative of an organizational emphasis on internal communications. The Newark Plant website offers information to community members, and meetings and presentations to community groups are a regular occurrence.

Current Management Challenges.

Organization Interviews. Management-related challenges to implementing communication about sustainable landscaping initiatives included lack of budget and staff buy-in, skills, and time (Table 4.13). The need to have good topic expertise was also identified as a challenge, as well as constraints of organizational structure.

Table 4.13 Current management challenges to communication about sustainable landscaping initiatives as reported by organization interview respondents

THEME	N
Budget constraints	2
Lack of buy-in from staff for communication initiatives	1
Lack of communication skills among landscaping staff	2
Lack of communications staff	1
Lack of staff time to dedicate to communication initiatives	2
Need for topic expertise	3
Organizational structure	1

Case Study. Interviewees generally foresaw no significant management-related challenges for communicating about sustainable landscaping initiatives at the Dow Electronic Materials site.

Market-based Factors

Organization Interviews. Organization interview respondents reported varying levels of acceptances of sustainable landscaping practices among stakeholders, as well as varying levels of understanding (Table 4.14). The respondents also cited several other-market based challenges, including the difficulty of communicating to non-intentional audiences, the difficulty of evaluating public perception, and the diversity of perspectives and interests among audiences.

Table 4.14 Market-based factors affecting communication about sustainable landscaping initiatives as reported by organization interview respondents

THEME/SUB-THEME	N
<i>Mixed acceptance of practices by stakeholders</i>	
Aesthetic concerns/alternate landscaping preferences	4
Appreciation of aesthetic and wildlife benefits	3
Concerns about functionality/wasted resources	3
Concerns about undesirable wildlife	1
Growing market for ecological-based design	1
Mixed buy-in to sustainable landscaping practices by staff	5
Resistance to change	2
<i>Mixed understanding of sustainable landscaping practices</i>	
Generally, stakeholder knowledge about sustainable practices is low	4
Stakeholders look for third-party verification of your expertise	1
Sustainable landscaping is beginning to be better understood	1
<i>Other market-based factors</i>	
Difficulty of communicating to non-intentional audiences	1
Difficulty of evaluating public perception	1
Diversity of perspectives and interests among audiences	4

Case Study. Market-based factors that affect communication about sustainable landscaping factors at Dow Electronic Materials campus include mixed acceptance of practices by stakeholders as well as limited understanding of the concept of sustainable landscaping among on-site employees.

Generally, there appears to be high acceptance among employees for general environmental initiatives on campus, although acceptance for environmentally based landscaping initiatives is not yet clearly understood. While some employees may appreciate the aesthetic benefits and the outdoor amenities provided by the

proposed practices, employees interviewed as part of the focus group expressed concerns about safety, undesirable wildlife, and preserving current functional uses of the affected spaces. Interviewees indicated that on-site employees likely do not have a high level of understanding of the concept of sustainable landscaping; employees interviewed in the focus group offered only vague definitions of the concept that did not align well with definitions proffered by the literature. Interviewees also suggested that the level of interest among employees in landscaping initiatives is not yet understood, and that some employees may be more engaged than others by communication initiatives. Finally, the Site Leader noted that it might be difficult to evaluate public perception of the landscape on hearsay alone, as complaints tend to be proffered more readily than compliments.

In terms of external stakeholders, the Public Affairs Manager reported that members of the Community Advisory Council showed high acceptance and understanding of the proposed practices, and were interested in learning about how they could possibly implement them at their own site.

Mechanics-based Factors

Organization Interviews. Organization interview respondents identified several mechanics-based factors that affect development of communication about sustainable landscaping initiatives (Table 4.15). The need for the affected site to be aesthetically pleasing and truly demonstrating sustainable practices was one prerequisite to establishing communication. Respondents also indicated that any new communication media would have to match existing communication media, and the placement of the media would need to reflect movement of the target audience.

Table 4.15 Mechanics-based factors affecting communication about sustainable landscaping initiatives as reported by organization interview respondents

THEME	N
Communication media needs to match existing media	2
Landscaping practices must be sustainable before they are promoted as such	1
Need to consider placement of communication media	2
Site needs to be aesthetically pleasing	3

Case Study. Several factors relating to mechanics of the Dow Electronic Materials campus and proposed communication were cited by case study respondents. The need to have a landscape that looks aesthetically pleasing is prerequisite of implementing sustainable landscaping practices at Dow Electronic Materials, and the practices should be sited to meet aesthetic expectations for specific areas without being extravagant. Communication about the practices needs to be branded according to company standards. When implementing the practices and/or using signage as a communication method, easements and right-of-ways need to be taken into consideration, though they do not seem to be an especially inhibiting factor.

Message-based Factors

Organization Interviews. Seven message content themes for communication emerged from organization interviews: advertising environmental stewardship, assuaging fears of negative outcomes, describing the practices and their benefits, highlighting non-environmental benefits of the practices, justifying use of the practices, recognizing third-party oversight, and teaching the practices/asking for behavior change (Table 4.16).

Table 4.16 Desired message content for communication about sustainable landscaping initiatives as reported by organization interview respondents

THEME	N
Advertising environmental stewardship	4
Assuaging fears of negative outcomes	3
Describing the practices and their benefits	5
Highlighting non-environmental benefits of the practices	4
Justifying use of the practices	2
Recognizing third-party oversight	2
Teaching the practices/asking for behavior change	3

Case Study. Case study respondents reported several messages they would like to convey when communicating about sustainable landscaping initiatives on Dow Electronic Materials campus. Message content themes included describing the practices and their environmental benefits; highlighting non-environmental benefits; and encouraging/educating people to use the practices. Employees will be encouraged to use their practices in their homes and communities; external stakeholders, including local community members and employees of the global Dow Chemical Company, will be encouraged to implement them at their places of business. The Public Affairs Manager indicated that the message about how the Newark Plant uses sustainable landscaping practices would be framed as a local story of how the company effects positive change in its community.

Current Communication Strategies

Survey

When asked how well their organizations' sustainable landscaping initiatives have been explained to landscape users or viewers, less than one-sixth of respondents replied "Very well" (Fig. 4.8). More than a third of respondents indicated the sustainable landscaping initiatives have not been well explained, with more than a quarter replying "Not very well" (27.95%) and about one-tenth replying "They have not been explained at all" (10.56%).

For organizations that did engage in explaining sustainable landscaping initiatives to stakeholders, the most used medium was "Word-of-Mouth" (59.63%) (Fig. 4.9). More than a quarter of respondents also reported using "Website" (39.75%), "Organizational newsletter, pamphlet, or flyer" (39.13%), and "Meetings or assemblies," including lectures and tours (26.71%). The other media listed in the survey—"Signs" (21.12%), "Email notice" (16.15%) and "Open house" (11.18%)—were all used to some extent as well (Fig. 4.9). "Other" media (6.21%) reported in an open-text response question included one-on-one discussions, news media, and model plantings (Table 4.17). On average, each organization used between two and three different methods (mean=2.57) to explain their sustainable landscaping initiatives, with a standard deviation of ± 1.49 .

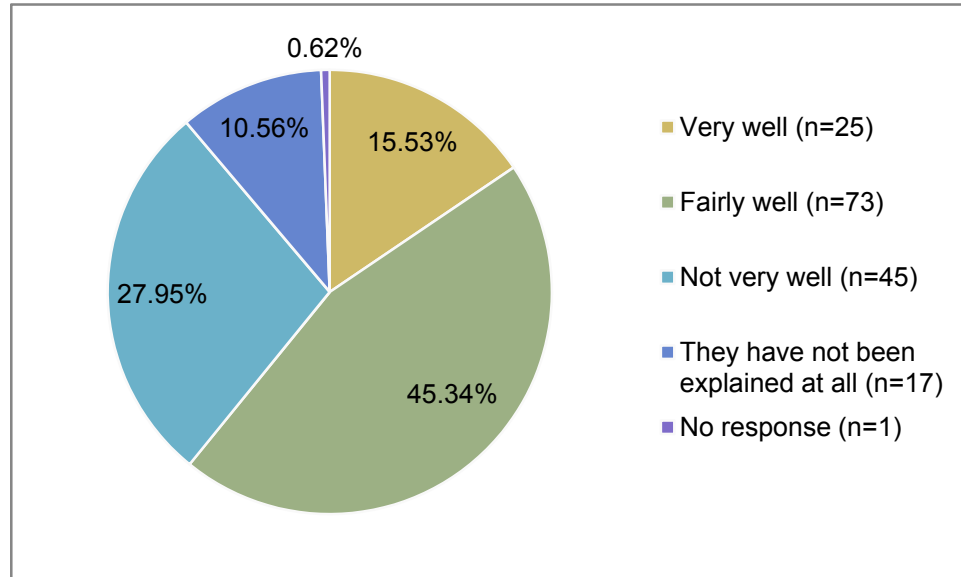


Fig. 4.8 Survey respondent opinions of how well their organization's sustainable landscaping initiatives have been explained to landscape users or viewers (n=161)

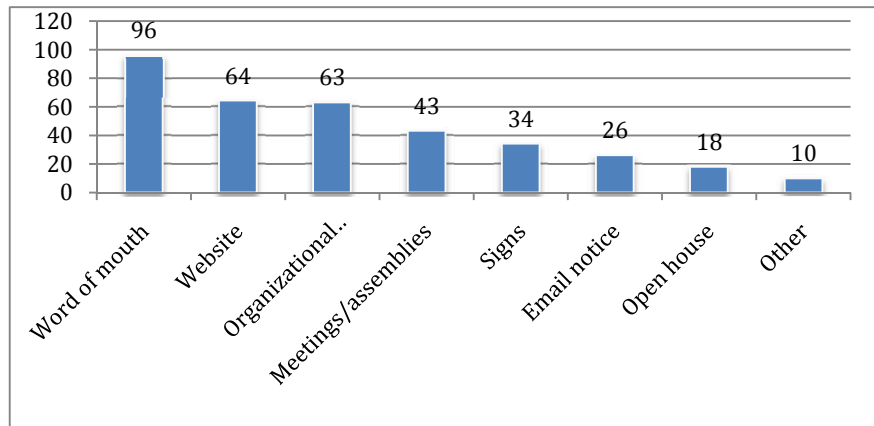


Fig. 4.9 Media used for explaining sustainable landscaping initiatives to landscape users or viewers by survey respondent organizations (n=138)

Table 4.17 Open-text responses describing media used for explaining sustainable landscaping initiatives to landscape users or viewers by survey respondent organizations. Responses were placed into indicated categories in addition to categories already marked by respondent.

TYPE OF MEDIA	“OTHER” TEXT RESPONSES
Organizational newsletter, pamphlets, or fliers	campus newspapers
Meetings or assemblies (including tours and lectures)	Garden Club Presentation my books, articles, and lectures [also coded under “Miscellaneous”]
Miscellaneous	educating the homeowners by the designer/salesperson presentations to customers Actual plantings within our garden center to demonstrate natives, and sustainable gardening. by design / details / explanations based on gardening experiences In response to complaints news media Not really relevant to us. We do get wider public involvement on project-by-project basis, based on needs and opportunities available. We need to make information about our sustainable landscaping initiatives available to the public.

Organization Interviews

Media for Communication with Landscape Users/Viewers or the

Larger Community. Vehicles for communicating with landscape users/viewers or the larger community about sustainable landscaping initiatives included audio-visual media, branding, demonstration/model areas; directly answering questions; handouts/visual aids; management plan documents; meetings, presentations, or tours; notice/information boards; organizational newsletters/publications; press releases/public relations; signage; social media; stakeholder participation; temporary exhibit; third-party recognition; website; and word-of-mouth (Table 4.18).

Table 4.18 Current media for communication with landscape users/viewers or the larger community at interviewee organizations

THEME	N
Audio-visual media	1
Branding	1
Demonstration/model area	2
Directly answering questions/one-on-one conversation	5
Handout/visual aid	2
Management plan document	1
Meeting, presentation, tour	5
Notice/information board	1
Organizational newsletter/publication	2
Press releases/public relations	2
Signage	4
Social media	1
Stakeholder participation	1
Temporary exhibit	1
Third-party recognition	4
Website	1
Word-of-mouth	1

Media for Communication with Landscaping Staff or Upper-level

Management. For communicating about sustainable landscaping initiatives with landscaping staff or upper-level management, organization interview respondents reported using direct answers to questions; management plan documents; meetings, presentations, or training sessions; off-site professional development opportunities; soliciting participation in decision making; and word-of-mouth (Table 4.19).

Table 4.19 Current media for communication with landscaping staff or upper-level management at interviewee organizations

THEME	N
Directly answering questions/one-on-one conversations	2
Management plan document	3
Meetings/presentations (upper-level management)	2
Off-site professional development opportunities	1
On-site meetings/training sessions (landscaping staff)	4
Soliciting participation in decision making	1
Word-of-mouth	1

General Communication Strategies. Current strategies for communicating about sustainable landscaping initiatives included external and internal partnerships, and establishing a non-profit organization dedicated to education (Table 4.20).

Table 4.20 Current strategies for communication with landscape users/viewers or the larger community at interviewee organizations

THEME	N
Establishing a non-profit for educational purposes	1
Partnerships, External (other organizations; including third-party certifiers)	3
Partnerships, Internal (people in other departments)	3

Case Study

Case study respondents reported several current methods and strategies for communicating about sustainable landscaping initiatives to stakeholders.

Media for Communication with Landscape Users/Viewers or the

Larger Community. When installing the first area of sustainable landscaping in Fall 2010, the Facilities and Buildings Manager disseminated an email to all Dow Electronic Materials employees to notify them the changes would be taking place and describe how the project related to goals of sustainability. The Facilities and Buildings Manager also provided a live presentation about the project at a Community Advisory Council meeting in Fall 2010. At the time of research, no other formal initiatives to communicate about sustainable landscaping had taken place, though the project participants plan to use additional communications in the future.

Media for Communication with Landscaping Staff or Upper-level

Management. Communications about the project between project participants, landscaping staff, and upper-level management has thus far taken place through one-on-one conversations and small group meetings.

General Communication Strategies. The Global Research and

Development Director noted that one way to gain support for the project is to implement it in stages, and “demonstrate by doing.” This will then build interest in the project over time, and offer new avenues for communication along the way.

Potential Communication Strategies Identified by Respondents

Organization Interviews

Media for Communication with Landscape Users/Viewers or the

Larger Community. Ideas for communicating about sustainable landscaping

initiatives to landscape users/viewers and the larger community included audio-visual media; demonstration or model areas; directly answering questions through one-on-one conversation; handouts or visual aids; meetings, presentations, or tours; organizational newsletters or publications; signage; and website (Table 4.21).

Table 4.21 Potential media for communication with landscape users/viewers or the larger community as reported by organization interview respondents

THEME	N
Audio-visual media	1
Demonstration/model area	1
Directly answering questions/one-on-one conversation	1
Handouts/visual aids	3
Meeting, presentation, tour	2
Organizational newsletter/publication	1
Signage	2
Website	1

Media for Communication with Landscaping Staff or Upper-level

Management. Media proposed for enhancing communications with landscaping staff or upper-level management included handouts or visual aids; meetings, presentations, and training sessions; and soliciting participation in decision making (Table 4.22).

Table 4.22 Potential media for communication with landscaping staff or upper-level management as reported by organization interview respondents

THEME	N
Handouts/visual aids (landscaping staff)	1
Meetings/presentations (upper-level management)	1
Off-site professional development opportunities	2
On-site meetings/training sessions (landscaping staff)	3
Soliciting participation in decision making	1

General Communication Strategies. Organization interview respondents mentioned several general strategies that could bolster communication efforts related to sustainable landscaping, including hiring additional staff to support sustainability efforts, increased advocacy by professional organizations, conducting market research, and seeking third-party recognition (Table 4.23).

Table 4.23 Potential strategies for communication with landscape users/viewers or the larger community as reported by organization interview respondents

THEME	N
Hiring additional staff to support sustainability efforts	1
Increased advertising/advocacy by professional organizations	1
Market research	1
Seeking third-party recognition	1

Case Study

Case study respondents identified many potential media and strategies for communicating about sustainable landscaping initiatives.

Media for Communication with Landscape Users/Viewers or the

Larger Community. Case study respondents had numerous ideas about potential media for communicating to employees about sustainable landscaping initiatives, including:

- Audio-visual media (e.g. a video about the practices)
- Notice/information boards (digital and paper)
- Emails
- Seminars
- Signage (e.g. plant labels)
- Organizational newsletter
- Educational activities/contests
- Soliciting direct participation with planning or implementing of practices

In addition to communicating to on-site employees, the Site Leader indicated that it may be possible to publicize sustainable landscaping efforts within the larger Dow Chemical Company through the company newsletter and website.

The Global Research and Development Director noted that a book with practical advice about how to implement sustainable landscaping initiatives in a corporate setting—from establishment, management, and a communications perspective—would be a helpful tool for encouraging other sites to implement similar practices.

Media for Communication with Landscaping Staff or Upper-level

Management. No ideas were explicitly reported for enhancing communications with the landscape contractor or upper-level management within Dow Electronic Materials.

General Communication Strategies. Potential future strategies for communications about sustainable landscaping initiatives included taking advantage of existing communications avenues and staff expertise in communications.

The Global Research and Development Director suggested that communication efforts should be targeted to employees that show an interest in the topic. He also suggested that “thought leaders,” or employees that were especially interested in the topic, could be identified and sent to outside training to become resident experts on the topic. The company could also purchase extra plants when installing the landscaping, and sell them to employees at cost.

Establishing and continuing outside partnerships was also cited as a potential strategy for future communication efforts. One suggestion was to invite the consultant from University of Delaware to make a presentation to employees. The Public Affairs Manager thought that Dow Electronic Materials could collaborate with government agencies that share goals for environmental education.

Expert Commentary

Expert 1: Sustainable Landscaping and Interpretation

Several observations and recommendations related to the topic of communicating about sustainable landscaping initiatives were offered (Table 4.24).

Table 4.24 Observations and recommendations related to communication about sustainable landscaping, from Janet Marinelli of Blue Crocus Consulting

OBSERVATIONS/ RECOMMENDATIONS
A sustainable landscape is defined as a landscape that restores healthy ecological function
Stormwater management and energy conservation are high priority sustainable landscaping practices in the Mid-Atlantic region
Communication methods should be developed to address resource constraints
Highlighting non-environmental benefits could be helpful
There is a growing trend to seek third-party certification for sustainability initiatives
The Sustainable Site Initiative's "Landscape for Life" campaign could be a good educational resource for institutions establishing communications about sustainable landscaping practices
Mission-based interpretation would be an appropriate communication process to use, even for institutions that don't typically focus on interpreting the landscape
Public horticulture institutions or associations could provide assistance with communication initiatives

Expert 2: Green Industry Marketing

Steve Bogash offered observations and recommendations about green industry marketing, focusing on marketing sustainable products and practices (Table 4.25).

Table 4.25 Observations and recommendations related to green industry marketing of sustainable products and practices, from Steve Bogash of the Pennsylvania State University Cooperative Extension, Franklin County

OBSERVATION/ RECOMMENDATIONS
Consumers want to feel intelligent about their purchases
Consumers often make decisions instinctually, so sustainability initiatives should be visible and pervasive
People can't always see environmental-friendly products/practices directly, so there is a need to communicate
Price is often the deciding factor when consumers consider purchasing green products/services
Sustainable initiatives need to be economically sustainable as well; you can't compromise your business at the expense of being green
Hiring well-trained staff that can communicate well is key
Green marketing is not separate from other marketing initiatives
Consumer demand exists for green gardening practices and products
A challenge for communication about sustainable initiatives is translating the science for the general public
Third-party certification and recognition is a great strategy for advertising sustainable initiatives
There are certain practices that convey the message of environmental sustainability

Sources of Error

Survey

Coverage and sampling error was introduced by use of professional association mailing lists to recruit survey respondents. Given that the survey population consisted of green industry professionals in the Mid-Atlantic region, those not belonging to the selected professional associations were not included in the study. The most significant result of this sampling error relates to geographical distribution, as the number of association members per state likely does not reflect actual

distribution of green industry members (see Appendix Q). The extent to which this error may affect study findings is unknown.

The low response rate and the high dropout rate indicate non-response error may have also affected the findings (Dillman, Smyth, and Christian, 2009; see Appendix M). It is likely the survey timing played a major role in influencing the response and dropout rate. The survey was distributed at a time of year that is quite busy for landscape professionals (V. Budischak, personal communication), and this probably affected ability and willingness to participate. Since surveys were distributed by professional association contacts and not the researcher, differences in survey invitation administration may have also played a role.

Given the broad range of organization types among respondents, some measurement error likely occurred when choices did not match experiences. At least one survey respondent commented that some of the questions did not apply to him, and that a “not applicable” response category was desired. However, this circumstance was minimized by using a survey design that branched according to type of organization so vocabulary and answer choices could be tailored. Responses were not forced unless required for branching. In addition, a “don’t know,” “not sure,” or “this is not a factor”-type response choices were present for the vast majority of questions.

One set of questions where measurement error might have been more pronounced were the queries about designated staff and designated budget. The question did not make clear the definition of “designated.” For instance, “designated staff” could have been interpreted as 1) staff devoted singularly to this end or 2) staff whose responsibilities included communications. The high proportion of respondents

selecting “Not sure” for these questions implies confusion related to question wording. Interview results reinforce the idea that resource allocation for communications is not as clear-cut as the yes-no dichotomy presented on the survey; generally, staff and budget resources were available to some extent, but lack of such resources was also cited as a barrier to enhancing communication efforts.

Qualitative Research

The researcher’s role and purposeful selection of interview respondents may serve as a threat to the study’s reliability. However, this threat has been addressed by clarifying the bias the researcher brought to the study and thorough disclosure of the basis for selecting respondents (see Chapter 3: Methods) (Creswell, 2009; Maxwell, 2005). The close association and familiarity of the researcher and research advisor with several of the interviewee institutions provided additional context for results interpretation, which likely improved the quality of the findings more than it degraded them. The association of the research advisor with three of the study organizations almost certainly did influence the types of practices used, and, in the case of the university, the extent of communications. Her involvement also likely influenced some interview respondents’ perspective on communications, particularly their desire to implement them. However, any such influence can be considered one of the ranges of factors affecting communications, and it is unlikely that this influence altered the study outcomes as a whole.

Chapter 5

DISCUSSION

Definitions, Motivations, and Challenges of Sustainable Landscaping

Although each qualitative research respondent defined “sustainable landscaping” using slightly different terms, their perspectives aligned well with literature describing the concept as having both environmental and maintenance elements. Findings also support the literature’s less-than-strict interpretation of “sustainable” as “tending towards sustainability,” rather than capable of being sustained indefinitely (Thayer, 1989).

One notable feature of respondents’ “sustainable landscaping” definitions was an emphasis on reducing inputs required for landscape maintenance—including natural resources, harmful chemicals, human labor, and financial capital. This highlighted a perception that “sustainable” encompasses practices that are not only environmentally friendly but require fewer resources to maintain. Cost savings was a very important motivation for implementing sustainable practices among both survey and interview respondents. However, several interview respondents argued that implementing sustainable practices tends to alter maintenance regimes rather than reduce maintenance requirements, and budget constraints was cited by a majority of survey respondents as a challenge to implementing sustainable landscaping initiatives. Clearly, the economic requirements and outcomes of implementing or promoting sustainable practices are not well understood. Given that cost savings or reduced maintenance could be a key benefit communicated to stakeholders, further research

into the relationship between sustainable practices and maintenance requirements is warranted.

Cost savings was reported as only one of many motivations for implementing sustainable landscaping practices. Others involved a desire to influence attitudes and behavior towards the landscape and the institution in general, including promoting the organization's "green image," changing negative stereotypes about the environmental impact of landscape management, educating people about sustainable practices, increasing product marketability, and serving as a model for other sites. These motives justify the present research, as they highlight a desire to communicate about sustainable landscaping initiatives.

Challenges to implementing sustainable landscaping were reported to be scarce; not surprising, given that the organizations studied had already implemented sustainable landscaping initiatives. This finding could bolster the confidence of other organizations having similar interests because perceived challenges may not actually present significant barriers.

In addition to budget constraints, the other challenge recognized as either very significant or somewhat significant by a majority of survey respondents was that "people think sustainable landscaping is less attractive." In this study, stakeholder opinion drove landscape management decisions, confirming that public perception is an impediment to implementing sustainable landscaping initiatives. Stakeholder preferences for conventional landscaping—in addition to lack of knowledge about sustainable landscaping—were clearly cited as a challenge to implementing sustainable landscaping. Such preferences and a dearth of knowledge were most common in landscape users and landscape maintenance staff, and sometimes present

in upper-level management. Since knowledge interventions can help change attitudes and behaviors towards sustainable landscaping (Byrne and Grewal, 2008; Gobster, 1999; Thayer, 1994; Thayer, 1989; SSI, 2009a), then establishing communication about sustainable landscaping initiatives will help ameliorate some of the challenges associated with implementing such initiatives.

Factors Affecting Communication about Sustainable Landscaping Initiatives

In terms of the 5-M interpretive planning model that considers how management, market, mechanics, message, and media inform communications (Brochu, 2003), the factors related to management emerged most often. Since respondent institutions do not traditionally communicate about landscape management to a broad array of stakeholders, determining how such communications can be established requires careful consideration of organizational mission, resources, and support.

Management-based Factors

Desire, Need, and Goals for Communication. Communication about sustainable landscaping is desirable and in need of enhancement. In fact, landscape managers possessed an enthusiasm for communicating about the practices that often went beyond their site; several wanted to explain their sustainable landscaping initiatives to green industry professionals and community groups. Enthusiasm for communication initiatives was reflective of enthusiasm for the sustainable landscaping initiatives themselves. Although communication with stakeholders was required at some organizations—for third-party certification or according to institutional policy—in no case was the requirement perceived as an unwanted burden. Survey responses

also support the need for better communication about sustainable landscaping initiatives, as over a third of respondents indicated that sustainable landscaping initiatives had not been explained well to stakeholders.

Goals for communication about sustainable landscaping initiatives—raising awareness, changing attitudes, and changing behaviors—reiterated motivations for implementing the initiatives. The desire to influence off-site landscaping behaviors especially supports the Sustainable Sites Initiative’s call for education efforts that “positively influence user behavior on site and beyond” (SSI, 2009a).

Although most interview respondents advocated for knowledge interventions to change landscape perceptions, the respondent representing a landscape design firm advocated instead for sound design:

As professionals, we have to learn to make these things look good in the different types of settings that we are hired to act, and not just assume that people don’t understand and got to learn to understand it. I think that argument can mask bad design. (LD)

This viewpoint is well supported by literature that calls for creating sustainable landscapes within the framework of accepted design standards, using “cues to care” that demonstrate the landscape is being managed in a deliberate, purposeful way (Nassauer, 1995; Hands and Brown, 2002; Gobster et al., 2007). As Gobster et al. (2007) asserts, “a key societal pathway to addressing ecological goals is through aesthetic experiences.” Qualitative findings do indicate that the more visually attractive and conventional-looking landscape is, the less need there is for knowledge interventions to promote acceptance. When asked about landscape user reactions to sustainable landscaping initiatives, one interview respondent remarked:

I think overall, people just haven't noticed, because I think we see a healthy golf course.... I think generally people enjoy it; the grasses waving in the breeze look nice. (GC)

However, use of design cues alone does not automatically garner acceptance; some types of practices may still violate expected land use contexts. Many of the stakeholder complaints reported by interviewees were in reference to meadow plantings or reduced mowing areas; in contrast, more formal plantings tended to receive compliments. The variation in appearance of different practices and the complexity of landscape preferences imply that in some cases, design cues are not sufficient to gain support, especially when the practices being used are inherently unconventional.

Furthermore, if the objective is not merely acceptance but a deeper understanding that leads to behavior change, design conventions will definitely not be enough. Accepting the appearance of a landscape is not the same as understanding its contributions to environmental sustainability. Interviewees shared the view that “people cannot see ecological quality directly” (Nassauer, 1995; see Schutt, 1999 and Gobster et al., 2007), and that communication can raise awareness. As one interview respondent commented:

Do I think students; staff and visitors understand that the landscaping practices are more sustainable? Probably not. ...Certainly, if it looks pretty, they enjoy that: “Oh, this looks pretty.” You know, let's look at it a little further. (C)

Given the goals for enhanced awareness as well as attitude and behavior change, interpretation and green marketing are appropriate frameworks for the desired communications. Interpretation, through its emphasis on audience relevancy and facilitating emotional connections, serves as a pathway to attitude and behavior

change (Tilden, 2008; Pierssené, 1999; Ham, 2007). Similarly, green marketing fosters attitude and behavior change towards green products by increasing awareness of environmentally friendly options, facilitating understanding of environmental benefits, and promoting green lifestyles (Grant, 2007; Pickett-Baker and Ozaki, 2008).

Based on the research findings, the interpretive planning approach of first identifying management goals, realities, and resources and then developing interpretive themes and media would be a functional framework for the study organizations (Veverka, 2005; Brochu, 2003). The 5-M model of interpretive planning (Brochu, 2003) was a valuable tool for reporting and analyzing factors affecting communication about sustainable landscaping initiatives.

Organizational Support and Operational Resources for

Communication. Sustainable landscaping and communications about them were not expressly part of the mission or values of organizations featured in this study. However, the organizations' guiding principles were supportive of such efforts. For institutions successfully using sustainable landscaping practices, the initiatives mesh well with organizational values and culture, as evidenced by four of the five factors considered least challenging by survey respondents in terms of implementing sustainable landscaping: "Being environmentally friendly is not part of my organization's values," "There aren't any direct benefits to my organization," "No one in my organization will lead the effort," and "It is difficult to obtain buy-in from upper management." A commitment to sustainability and landscape user enrichment was featured prominently in interviewee organizations' mission and vision statements, sentiments that would, in a broad sense, support sustainable landscaping efforts and communication about them.

However, in terms of operational resources and actual organizational backing, support for communication about sustainable landscaping was mixed. In some ways, internal support was lacking; designated staff and financial resources for communication about sustainable landscaping were very uncommon. Although staff time and financial resources were available to some extent, communication initiatives were often deferred when funds or time ran low.

As mentioned above, lack of buy-in from landscaping staff was cited as a challenge to implementing sustainable landscaping initiatives; this also emerged as a constraint in terms of implementing communication initiatives. Having maintenance staff buy-in to both sustainability and communication initiatives was considered critical for the success of communication efforts, which aligns well with green marketing's call for employee "eco-training" and other internal communications that aim to make environmental values part of organizational culture (Esty and Winston, 2009). One interviewee mentioned that language was a barrier to involving some maintenance staff in sustainable landscaping initiatives and communications about them; organizations facing this issue will need to think critically about how to engage and train staff for whom English is a second language.

One important internal resource was staff with a passion for sustainable landscaping initiatives and enthusiasm for communicating about them. In the majority of cases, the interview respondents themselves were the main drivers of sustainable landscaping initiatives. Given their specific communication goals, they also emerged as the main drivers of communication efforts.

Another operational resource was the set of established avenues and strategies for communicating with stakeholders in general. Numerous in-house and

external communication avenues were already in existence; to some extent, all organizations interviewed had designated communications staff, ranging from marketing and public relations to visitor education, community relations, and employee engagement. These findings imply that internal assistance and support for communication initiatives about sustainable landscaping is available.

Multiple outside resources expanded organizational capacity for communications about sustainable landscaping. Professional associations, universities, public gardens, and peers at other organizations served as sources of information and inspiration. The Audubon Cooperative Sanctuary Program offered assistance with education and outreach efforts related to sustainable landscaping, including provision of tangible communication materials like branded signage, press releases, and fact sheets. External resources played a significant role in the implementation of robust communication efforts.

In sum, the findings illuminate a range of management factors that affect how sustainable landscaping initiatives are and could be communicated to stakeholders. Identifying both internal and external resources that could provide assistance is critical for developing effective communication strategies.

Market-based Factors

Interpretive planning and green marketing literature advocate strongly for assessment and analysis of targeted audiences to tailor communications and allocate resources effectively (Brochu, 2003; Ottman, 1998). Not surprisingly, the research brought to light a number of market-based factors that would affect how sustainable landscaping initiatives are explained to stakeholders. Given that user opinion drives landscape management (Gobster et al., 2007; Kaplan and Kaplan, 1989) understanding

landscape users—and specifically their landscape perceptions—is critical for the success of sustainable landscaping and communications about them.

The research focused primarily on three stakeholders groups—landscape users or viewers, landscape maintenance staff, and upper-level management. In terms of communicating to these stakeholder groups, landscape users or viewers presented the biggest challenge, though communicating to landscape maintenance staff was also cited as a challenge. For interview respondents, communicating to upper-level management was not a significant barrier, though this is not surprising since sustainable landscaping initiatives had been successfully implemented by the majority of organizations. However, nearly a third of survey respondents indicated that obtaining buy-in from upper-level management was at least somewhat of a challenge. Though the research investigated perspectives of the interview respondents rather than the stakeholders themselves, the findings confirm that to some extent, all three stakeholder groups are appropriate targets for enhanced communication efforts.

According to interview respondents, stakeholders have displayed mixed reactions to sustainable landscaping initiatives. As noted above, stakeholder preferences for conventional landscaping can pose a challenge to implementing sustainable landscaping practices (Byrne and Grewal, 2008). Some landscape users or viewers have conveyed dissatisfaction with the visible attributes of some practices, especially reduced mowing; others have expressed concern about reduction of functional uses of landscape spaces or resources. However, stakeholders have also shown appreciation for the attractiveness of sustainable landscaping practices, increased visits by desirable wildlife, and amenities that enhance enjoyment of outdoor spaces, confirming that nature settings at a walkable scale are often deemed

attractive and desirable (Kaplan, 2007). These findings verify that landscape perceptions are affected by a variety of interconnected factors, which may include site context (e.g. placement, implied significance, and planned change) as well as the landscape users' prior knowledge, familiarity with a place, and socio-economic and cultural upbringing (Gobster et al., 2007; Hodgson and Thayer, 1980; Jorgensen, 2005; Kaplan and Kaplan, 1989; Thayer, 1989; Van den Berg and Vlek, 1998).

As Gobster et al. (2007) remarked, “understanding how people perceive and experience the beauty of all landscapes is central to achieving public support of, and compliance with, ecologically motivated landscape change.” The complexity of landscape perceptions described by the literature, the mixed support for sustainable landscaping evident from the study, and the diversity of sustainable landscaping practices themselves reinforce that audience research is key to understanding perceptions about specific initiatives. Market research could help determine the extent to which stakeholders are already receptive to sustainable landscaping within a specific context, shaping efforts to communicate about them in an efficient and effective way.

The findings also support the view that market research is needed to appropriately segment audiences for targeted messages and media (Brochu, 2003). Some interview respondents reported varying acceptance of sustainable landscaping among user groups, such as college students displaying higher acceptance than visiting alumni. Levels of interest and knowledge differed among audiences as well. The interpretation and green marketing literature articulates that target communications to segmented audiences is critical to the success of communication efforts (Esty and Winston, 2009; Ham and Krumpe, 1996).

If visitors to free-choice learning institutions such as museums, public gardens, and zoos are considered non-captive audiences (Ham, 1992), landscape users and viewers at the majority of organizations investigated for this study might be considered non-intentional audiences: Their reason for visiting the landscape has nothing to do with learning about the landscape itself. A significant challenge of interpretation is its reliance on non-captive audiences and brief encounters, making it difficult to influence attitudes and long-term behaviors (Ham, 2007; Hammit, 1984; Knapp, 1996). Findings indicate this challenge is even more significant when communicating to non-intentional audiences. As the golf course interview respondent remarked:

You have so many people coming through here. You have your groups of regulars that are always here, but we might see 20,000 different people come through the door on an annual basis. If you don't communicate with them on that one round—they're on a mission, they come in, they pay, they want to play golf, and then they're out of here—how do you stop them? How do you try to catch them with new information? (GC)

Offering relevant and meaningful communications rather than an overload of information is a key aim of interpretation (Knudson, Cable & Beck, 1995; Tilden, 2008); engaging but not overwhelming non-intentional audiences will be vital for communications about sustainable landscaping. Given the low stakeholder knowledge about sustainable landscaping reported by several interview respondents and the inherent difficulty of translating complex scientific information into layman's terms, making information understandable and relevant presents a considerable challenge.

Although landscape users or viewers, landscape maintenance staff, and upper-level management serve as the main market focus of this study, green industry

professionals arose as another potential audience. Several of the interviewees mentioned a desire—or current efforts—to share information about their sustainable landscaping initiatives with their peers, to raise awareness of and enhance technical knowledge about sustainable landscaping. As this audience represents individuals managing a wide range of landscapes, effective communication to this audience could influence behavior and attitude change on a larger scale.

Mechanics-based Factors

In considering how visible attributes of sustainable landscaping initiatives affect communication efforts about them, one strong theme emerged: The context and appearance of the practices is of great importance. As one interviewee noted:

You have to combine grooming with environmental stewardship; they both can be blended together. There is a fine line, but so long as you can sell both of those together, you can have your cake and eat it too.
(C)

Interviewees opined that if sustainable landscaping practices had the appearance of being unkempt, they would not be acceptable to landscape users and viewers regardless of communication efforts. In essence, before communications could take place, the landscapes have to display the “cues to care” (Nassauer, 1995) that denote intentional design and management. This perceived pre-requisite of communications also echoes the need to avoid “green marketing myopia,” in which a product’s greenness is emphasized at the expense of customer satisfaction (Ottman et al., 2006).

The other main mechanics-based theme that arose from the study was the need to ensure that a site is truly sustainable before promoting it as such. When discussing a potential tour, one interviewee commented that some of the sites needed to be made more sustainable before such a tour was offered; the expert on green

industry marketing emphasized that all visible operations of an organization need to reflect a commitment to sustainability before that commitment is publicized. These sentiments reinforce green marketing literature that warns about the image-damaging effects of being perceived as “green washing,” or initiating false claims of environmentally friendly efforts (Ottman et. al., 2006). Interpretation literature echoes the idea that “everything is the message”; the very concept of interpretation encompasses every part of the visitor experience, including institutional operations and appearance of facilities (Brochu, 2003; T. Merriman, personal communication).

Message-based Factors

Desired message content for communication about sustainable landscaping initiatives was clearly based on interviewees’ goals of raising awareness and fostering attitude and behavior change. The desire to convey a message describing the sustainable practices and their benefits was not surprising given that ecological quality of a sustainable landscape is not directly visible (Nassauer, 1995); messages with this focus would be an important step towards raising awareness about sustainable landscaping practices. Connecting the visual manifestation of sustainable practices with their positive environmental impact would certainly align well with Tilden’s definition of interpretation as aiming to “reveal meanings and relationships” (Tilden, 2008).

The desired approach of justifying use of sustainable landscaping practices would also be appropriate when the goal is to gain acceptance for the practices, as implied significance of landscape can affect judgments of landscape attractiveness (Hodgson and Thayer, 1980) and perceived beauty can be affected by knowledge of planned change (Van den Berg and Vlek, 1998). Thus, level of

acceptance may increase if people understand that the landscape is intentionally being changed to enhance its environmental sustainability.

Promoting non-environmental benefits was also identified as desired message content. Citing benefits such as reduced costs, improved aesthetics, and inclusion of amenities for people aligns well with green marketing literature that advocates advertising how green products or services provide consumer value beyond what is environmentally sound (Crain Communications, 2010; Ottman et al., 2006; Vermillion and Peart, 2010).

Promoting the organization's green image was a key motivation for implementing sustainable landscaping; accordingly, advertising environmental stewardship arose as another type of message. Highlighting how sustainable landscaping initiatives further an organization's overall commitment to sustainability meshes well with the definition of interpretation as being founded on an organization's mission and values (Merriman and Brochu, 2009). This message also aligns well with the call for organizations to position their green products and practices as part of a existing corporate commitment to environmental excellence (Ottman, 1998).

The interpretive planning literature suggests that message themes be informed by three elements: resource stories, visitor interest, and management desires (Brochu, 2003). The majority of message content ideas emerging from this study consisted of resource stories and management desires. In many cases, interview respondents indicated they simply did not know to what extent stakeholders were interested in the topic of sustainable landscaping, or how likely they were to be engaged by communications. From the perspective of both interpretation and marketing frameworks, audience relevancy is critical for the success of

communication efforts (Davis, 1993; Ottman et al., 2006; Ham, 2007). Increased market research would yield ways to ensure that visitor interest elements are appropriately accounted for when crafting message themes.

Communication Strategies

Personal, written, and digital media are currently being used to communicate about sustainable landscaping initiatives; these media largely represented adoption of existing communication avenues that were tailored with messages about sustainable landscaping. Both internal and external collaborators provided assistance with communications about sustainable landscaping. For instance, in both of the higher education institutions, faculty and communications staff provided assistance; at the golf course, marketing consultants helped coordinate communications. The findings indicate that when there are many existing operational resources for communications and a good level of organizational support for sustainability initiatives, seeking assistance from communications personnel or other interested staff is an effective strategy to build capacity for communications.

Partnerships with outside organizations also helped enhance communication efforts. The Audubon Cooperative Sanctuary Program, which offers third-party certification for sustainable landscaping, was found to provide significant assistance with communication initiatives. Among the most proactive in developing communication efforts were the two organizations participating in this program, where education and outreach planning is required. The requisite for outreach specifically meant that these education efforts reached a wider audience than landscape users, providing interpretation to the local community as well. Although it is difficult to surmise whether the requirement to plan or the planning itself contributed to more

robust efforts than were evident at other organizations, the landscape manager's focus on communication as a priority—rather than just an afterthought—likely made a difference.

The landscape design firm's development of a non-profit seminar series dedicated specifically to educating green industry professionals about ecological-based landscaping represented an unconventional approach to communications. As an organizer and frequent speaker at the seminars, the firm founder essentially advertised his expertise and commitment to environmentally friendly landscaping. His success at this approach, as well as the success experienced by ASCP participants, highlights how establishing credibility through a third party helps achieve goals for communication about sustainable landscaping initiatives. According to interview respondents, association with Audubon International, an entity widely associated with environmental values, enhanced landscape user acceptance of sustainable landscaping efforts. The green industry marketing expert echoed this assertion, commenting that recognition by a third-party is an important avenue for advertising an organization's commitment to sustainability. Green marketing literature certainly emphasizes that ensuring credibility for environmental claims protects against accusations of "greenwashing" (Ottman, 1998; Ottman et al., 2006; Polonosky, 1994).

Despite the communication assistance offered by third-party certification programs, information about opportunities for participating in such programs was not well known. For instance, the landscape manager at Dow Electronic Materials—a company that has just begun exploring options for sustainable landscaping—had no prior knowledge of the existence of certification programs for sustainable landscaping. Although the Audubon Cooperative Sanctuary certifies many types of publicly viewed

landscapes, few organizations other than golf courses have taken advantage of this opportunity (Audubon International, 2010b; 2009). This is underscored by the golf course manager's report that he discovered an additional opportunity for a certification only by chance:

I came across this on a whim; I didn't even know it existed, and anyone I've talked to in the industry has never heard of it before...Last winter, I formed an Environmental Committee, and I was Googling around one day, and I searched for "green golf course," and the Green Guardian Groundwater Program came up in the Google search. It was luck of the draw. (GC)

The findings highlight a need for increased awareness of third-party certification programs among green industry professionals; organizations offering such programs should seek opportunities to better advertise their offerings.

Though many existing communication strategies were cited, only the university interviewee reported an effort to evaluate the effectiveness of these strategies post-implementation (see Saksa, 2010). However, evaluation is central to interpretive planning; it helps determine whether communication objectives have been met, which in turn informs future efforts (Brochu, 2003; Ververka, 2005; Ham and Krumpe, 1996). Measuring the efficacy of current communication initiatives would help inform decisions about future strategies.

In terms of enhancing communication efforts, interviewees enthusiastically offered a range of ideas when asked to imagine potential strategies without regard to current resources. Most of the suggestions for communication media fell within the collective set of media already being used for communications at the study organizations. The suggestions also tended to reflect use of existing

communication avenues with the organization; constraints of budget and time were cited as barriers that prevented them from taking advantage of existing opportunities.

At Dow Electronic Materials, where sustainable landscaping initiatives were just beginning to be implemented, the act of questioning respondents about potential communication media and strategies helped generate ideas. For instance, the Employee Engagement Manager knew little about the sustainable landscaping initiatives before the interview; she had not yet considered how she could assist although she seemed interested in doing so. During the interview, she began brainstorming ideas based on her work experiences and knowledge of the target audience. Her reaction reinforces how internal staff can be an important resource when developing communication initiatives, and illuminates the importance of explicitly asking for assistance.

Bringing together staff with a range of perspectives, interests, and expertise can indeed be an effective way to jumpstart communication planning. At Dow Electronic Materials, the Public Affairs Manager suggested collaborating with regulatory agencies that have a vested interest in educating people about environmental issues. This suggestion echoes the strategy of establishing partnerships with outside organizations for assistance with communication initiatives. According to green marketing literature, community outreach programs are popular ways for companies to partner with non-profits, public agencies, and other companies to further environmental causes (Kotler and Lee, 2005; Manget, 2009, Ottman, 1998). Such programs can increase credibility of a company's environmental efforts while showcasing their environmental stewardship (Manget, 2009).

Another innovative suggestion for Dow Electronic Materials came from the Research and Development Director, who envisioned something akin to a social marketing campaign, in which people are encouraged to adopt sustainable landscaping at home. The employee-led Green Team had already set the precedent for behavior change campaigns with initiatives related to recycling, energy savings, and water conservation. These findings indicate that if a core group of staff are interested in the topic, an employee-driven social marketing campaign can be an effective approach to addressing goals of behavior change; corporate social marketing also advertises a company's image of social and environmental responsibility (Kotler and Lee, 2005).

Although such efforts take financial and staff resources away from the primary focus of the company, the paradigm of corporate social responsibility illuminates the need for attention to the “triple bottom line” of economic, social, and environmental performance (Hindle, 2009; Kotler and Lee, 2005). Several of the important motivations for implementing sustainable practices—environmental responsibility/stewardship, greening the community, and creating a better place for people—indicate that many of the study organizations do desire to contribute to the social and environmental wellbeing of their communities.

Conclusion

The depth and breadth of management, market, and mechanics factors, desired messages, and potential communication strategies described by this study illuminate the range of factors to consider when planning communication initiatives about sustainable landscaping. For each organization featured in the study, these factors combine in a different manner, offering unique opportunities to create communications reflective of operational capacity, the attitudes and interests of target

audiences, the nature of the sustainable landscaping initiatives, and the desired outcomes of communication efforts. While budget, time, and landscape management staff may be limited, both internal and external resources can enhance capacity for such communications.

It is clear that communications about sustainable landscaping initiatives are desirable, and oftentimes needed to effect the desired objectives of attitude change, behavior change, or simply enhancing awareness about sustainable landscaping initiatives that are not inherently visible. However, with the exception of Audubon Cooperative Sanctuary Program participants and the non-profit lecture series founder, efforts at communication tended to be spontaneous, occurring as an afterthought to sustainable landscaping implementation. Translating the implicit desire for communications into an explicit plan of action is needed to thoughtfully prioritize communications, and to recognize more fully the role of communications as an essential component of sustainable landscaping itself (SSI, 2009a).

Chapter 6

RECOMMENDATIONS

Guidelines for Communicating Sustainable Landscaping Initiatives

Sustainable landscaping is not yet widely understood by the public, nor has it been widely embraced by the landscaping industry. Although sustainable landscaping practices are being implemented by some organizations, they are not yet considered industry norms. The findings of this study can be a resource for early adopters, informing the development of communications about sustainable landscaping practices that will encourage wider acceptance and use.

As Brochu asserts, there is no “cookie-cutter” approach to determining interpretive media, just as there are “no easy answers to interpretive planning” (Brochu, 2003). Instead, each organization’s unique goals, resources, and audiences should inform communication approaches. The following guidelines (Table 6.1) are intended to assist green industry professionals in developing appropriate communication strategies for their organization.

Table 6.1 Proposed guidelines for developing communications about sustainable landscaping initiatives

GUIDELINES FOR COMMUNICATING SUSTAINABLE LANDSCAPING INITIATIVES	
1	Sustainable landscaping practices must offer something beyond being environmentally friendly. Additional assets might include beauty, community green space, cost savings, reduced maintenance needs, solutions to landscape problems, and increased visibility of environmental commitments. In terms of aesthetic merit, landscapes should be designed in accordance with accepted design conventions, so that people understand the landscape is being managed in a purposeful way. No matter how sustainable they are, landscapes perceived as messy will not be acceptable in most contexts.
2	Everything is the message: Landscaping practices must be genuinely “green” before being promoted as such. People are increasingly skeptical of environmental claims, and credibility is at risk when eco-friendliness is proclaimed prematurely. Research best practices for sustainable landscaping and see how you compare. If you’ve only begun greening your practices, emphasize not how sustainable you are, but how you are moving towards that goal.
3	Seek internal support for sustainable landscaping initiatives. Gaining buy-in from your landscape maintenance staff and upper-level management can be critical to the success of sustainable landscaping initiatives and communications about them. You may need to focus communications inwardly before bringing the message to landscape users. Frame the landscaping initiatives within larger institutional goals of sustainability or landscape user satisfaction. Seek opportunities to educate your landscaping staff with professional development opportunities, field trips, and training sessions. Help them become contributors to the process so they’ll be your advocates in the field.

GUIDELINES FOR COMMUNICATING SUSTAINABLE LANDSCAPING INITIATIVES, CON'T	
4	<p>Look for potential partners within your organization. Collaborating with staff in other departments that have communication expertise or a personal interest in sustainable landscaping can help expand your department's capacity for communicating to landscape users. At the very least, ask other people for ideas—their expertise and perspective may illuminate potential communication strategies that you hadn't considered.</p>
5	<p>If you desire to communicate about sustainable landscaping initiatives, establish it as a priority instead of an afterthought. As you plan for implementation of sustainable landscaping, plan your communication strategies. Use the 5-M interpretive planning approach to guide your thinking (Brochu, 2003):</p> <ul style="list-style-type: none"> • <u>Management</u>: What goals do you have for communications? What operational resources do you have to support communication efforts (e.g. budget, staff, internal and external partners)? • <u>Mechanics</u>: Do your sustainable landscaping practices look good? Are the landscapes you want to promote genuinely sustainable? • <u>Market</u>: Who do you want to communicate to, and what is their current level of interest, knowledge, and acceptance of sustainable landscaping? • <u>Message</u>: What do you want to say about your sustainable landscaping initiatives? How do you frame it in a way that your audience cares about the message? • <u>Media</u>: Given your goals, resources, site, and audience, what is the best strategy for getting your message across?

GUIDELINES FOR COMMUNICATING SUSTAINABLE LANDSCAPING INITIATIVES, CON'T

6	<p>To share your message, use the principles of interpretation, a communication process that forges “intellectual and emotional connections between the interests of the audience and the meaning inherent in the resource” (NAI, 2009b). Don’t confront your audience with a barrage of facts, because knowledge alone does not lead to caring. Instead, appeal to their emotions as well as their mind. For instance, if they are excited more by wildlife than storm water management, highlight how rain garden plantings attract birds and butterflies. Center your communications around a theme that connects with your audience—how will sustainable landscaping impact them? Research shows that communications that relate to people’s belief systems are most effective at changing attitudes.</p>
7	<p>Enhance your sustainability credibility through third-party recognition. People increasingly look to third-party authorities to verify claims of environmental-friendliness. Several organizations offer official recognition of sustainable efforts (Appendix R). Seek award opportunities through professional associations and community organizations. A visible seal of approval from environmentally minded organizations can help raise awareness that the landscaping efforts are being implemented with sustainability in mind.</p>
8	<p>Collaborate with outside organizations to increase your capacity for communications and gain a wider audience. Your organization’s focus is likely something other than sustainable landscaping or communications. Seek partnerships with organizations whose mission does reflect that goal—it’s a win-win situation. Cooperative Extension, public gardens, environmental advocacy groups, government agencies, and urban greening associations are potential collaborators.</p>

- | | |
|----------|---|
| 9 | <p>Make it a model landscape, and share your sustainable landscaping expertise. Expand your communication efforts to other green industry professionals or the larger community. Showcase your efforts via speaking engagements and/or writing articles for local, regional, or national publications. By becoming a recognized authority on sustainable landscaping, you can raise awareness of your efforts both within and outside of your organization. If one of your goals for communication is to change landscaping conventions, sharing insight with other green industry professionals can help encourage the use of sustainable landscaping practices at other sites.</p> |
|----------|---|

A Role for Public Horticulture Institutions

The findings of this study indicate that external partnerships are important for expanding organizational capacity for communications about sustainable landscaping initiatives. Public horticulture institutions, “scientific and educational institutions whose purpose is the advancement and diffusion of a knowledge and love of plants” (APGA, 2011), could be key collaborators with organizations that do not typically communicate to people about landscaping.

Botanic Gardens Conservation International calls for public gardens to take an active role in sustainable development education (Willison, 2006). Many North American public gardens are actively utilizing sustainable landscaping practices to some degree (Sifton, 2009), and many are increasingly interested in educating the public about sustainability (Flanagan, 2010). Given that a cornerstone of public gardens is education and outreach, public gardens are natural allies for communicating about sustainable landscaping practices. By partnering with organizations in their community, public horticulture institutions could extend messages of environmental stewardship to a wider audience.

Based on the current research, the following recommendations can guide public horticulture institutions to help green industry professionals in enhancing communications about sustainable landscaping initiatives:

- Awards and certification programs: Public horticulture institutions could offer third-party recognition for sustainable landscaping practices through awards or certification programs. Not only would this benefit the recipient organizations by providing third-party verification of their sustainable landscaping initiatives, but it could also help promote the public garden to new audiences.
- Outreach and consulting programs: Public horticulture staff could offer sustainable landscaping-related outreach programs at the partner organization. Generic signage, handouts, or similar media about sustainable landscaping initiatives could be produced and distributed to organizations as pre-made communication tools. Better yet, staff could serve as paid consultants to help develop communications about sustainable landscaping practices specific to the client organization.
- Professional development opportunities: Seminars or workshops for green industry professionals that teach sustainable landscaping practices could also provide education related to developing communication strategies for explaining sustainable landscaping practices to stakeholders.

Avenues for Further Research

The current study examines communication considerations at organizations in the Mid-Atlantic region, with a focus on organizations that have successfully implemented sustainable landscaping practices. Research that expanded the focus to other geographical regions could illuminate regional factors that affect communications about sustainable landscaping. In addition, investigating organizations that have not been successful at implementing sustainable landscaping

initiatives could enhance understanding of barriers to doing so, specifically those related to stakeholder communication.

Most of the sustainable landscaping initiatives implemented by organizations in this study were retrofitted to existing landscapes, meaning that stakeholders reacted to a change in landscaping appearance. Future research could examine whether organizations that installed sustainable landscaping elements on newly developed sites faced the same barriers associated with stakeholder landscape preferences, and whether need or desire for communication was reduced. In a broader sense, the current study certainly supports the call for continued research into public perceptions of sustainable landscaping, and how communications affect them (Gobster, et al., 2007). A comparative study of organizations with successful communication initiatives and those who have been unsuccessful at such efforts could highlight additional factors related to developing effective communication strategies.

Appendix A:

SURVEY INSTRUMENT

Notes about the Offline Version

- This survey will be given online only, through Qualtrics™, University of Delaware's survey system.
- This version shows all questions in their entirety; the online version will only show certain questions depending on responses. All section skipping will be done automatically by the web survey—the “**SKIP**” and “**CONTINUE**” notes are just for this version and won't be seen by survey takers.
- * indicates that at least one response is required
- **FIELD #** or ****** notations indicate that wording is dependent on previous responses. Explanation of each notation is available below the question.

Survey Instrument – Offline Version

INTRO

This survey investigates design and management practices for outdoor landscapes.

The study is being conducted by Rebecca Pineo, a student in the Longwood Graduate Program at the University of Delaware, under the advisement of Dr. Robert Lyons.

This brief questionnaire will take you about 15 minutes to complete.

More information:

Individual responses will be collected on a secure web server. These data will remain confidential and viewed only by the study team.

Your participation is entirely voluntary. To leave the study at any time, close the web browser before you press the final submission button at the end of the survey. Any responses you previously made will not be saved.

If you have any questions concerning the study, please contact the principal investigator, Rebecca Pineo, at rspineo@udel.edu. For questions about your rights as a subject or about any issues concerning the use of human subjects in research, please contact the Chair, Human Subjects Review Board, University of Delaware at (302) 831-2137.

Thank you for participating.

***To the best of your knowledge, have you or anyone else in your organization already taken this survey?**

☐ No

→ **CONTINUE TO SECTION 1**

☐ Yes

→ **GO to END of SURVERY, MESSAGE #4**

SECTION 1

***How would you best describe yourself?**

☐

Employee or owner of a company in the landscape/nursery industry

☐

Employee at a public horticulture institution

☐

Employee responsible for landscape maintenance or management at an organization that is not within the landscape/nursery industry

☐

None of the above

Which professional association(s) do you belong to? Please check all that apply.

☐

Professional Grounds Management Society (PGMS)

☐

Professional Landcare Network (PLANET)

☐

Golf Course Superintendents Association of America (GCSAA)

☐

DE Nursery and Landscape Association (DNLA)

☐

MD Nursery and Landscape Association (MNLA)

☐

NJ Nursery and Landscape Association (NJNLA)

☐

NY State Nursery and Landscape Association (NYSNLA)

☐

PA Landscape and Nursery Association (PLNA)

☐

VA Nursery and Landscape Association (VNLA)

→ IF “Employee or owner of a company in the landscape/nursery industry,” **CONTINUE to SECTION 2**

→ IF “Employee at a public horticulture institution,” **SKIP to SECTION 3**

→ IF “Employee responsible for landscape maintenance or management at an organization that is not within the landscape/nursery industry,” **SKIP to SECTION 3**

→ IF “None of the above,” **GO to END OF SURVEY, MESSAGE #3**

SECTION 2

***How would you best classify your organization's services? Please check all that apply.**

- ☐ Landscape design
- ☐ Landscape construction
- ☐ Landscape installation
- ☐ Landscape maintenance
- ☐ Wholesale nursery
- ☐ Retail nursery / garden center
- ☐ Other (please specify): _____

→ IF "Landscape design, Landscape construction, Landscape installation, Landscape maintenance, or Other" is **SELECTED**, **CONTINUE TO NEXT QUESTION**

→ IF "Landscape design, Landscape construction, Landscape installation, Landscape maintenance, or Other" is **NOT SELECTED**, **SKIP to SECTION 6**

***What type of clients do you primarily serve for your landscape services?**

- ☐ Commercial or non-profit
- ☐ Residential
- ☐ Approximately half commercial/non-profit, and half residential
- ☐ Other (please specify): _____

→ **SKIP TO SECTION 6**

SECTION 3

***How would you best describe your organization?**

- ☐ Private business or corporation
→ **SKIP to SECTION 6**
- ☐ Accredited educational institution
→ **CONTINUE to SECTION 4**
- ☐ Government agency
→ **SKIP to SECTION 5**
- ☐ Non-profit organization
→ **SKIP to SECTION 6**
- ☐ Other (please specify):
→ **SKIP to SECTION 6**

SECTION 4

***How would you best describe your accredited educational institution?**

- ☐ Preschool or grade school (up to grade 12)
- ☐ Technical or vocational school
- ☐ College or university
- ☐ Other (please specify): _____

→ **SKIP TO SECTION 6**

SECTION 5

***How would you best describe your government agency?**

- ☐ Municipal agency (e.g. city, town, borough)
- ☐ County agency
- ☐ State agency
- ☐ National agency
- ☐ Other (please specify): _____

→ **CONTINUE TO SECTION 6**

SECTION 6

Does your organization **FIELD 5** any sustainable (environmentally-friendly) landscaping practices? *

- ☐ Yes
- ☐ No

→ **IF “YES” IS SELECTED (or if neither answer is selected), CONTINUE TO SECTION 7.**

→ **IF “NO” IS SELECTED, SKIP TO SECTION 10.**

<u>FIELD 5</u> <i>For those who selected <u>only</u> “Wholesale nursery,” “Retail nursery/garden center,” or “Landscape design”, or any combination of these three, in SECTION 2</i>	use or promote
<i>For all others</i>	use

Section 7

Which of these sustainable landscaping practices does your organization **FIELD 5?** Please check all that apply.

- ☐ Using low-maintenance plantings
- ☐ Avoiding use of invasive plants
- ☐ Using regionally native plants
- ☐ Conserving water
- ☐ Creating wildlife habitat
- ☐ Avoiding use of chemicals that can harm human and ecosystem health
- ☐ Reducing mowing frequency
- ☐ Reducing mowing acreage
- ☐ Reducing impervious surfaces
- ☐ None of the above

Which of these sustainable landscaping elements does your organization **FIELD 5?** Please check all that apply.

- ☐ Organic mulch on all planting beds
- ☐ Rain barrels or cisterns to collect rainwater
- ☐ Green roof and/or wall
- ☐ Rain gardens or bioswales to manage stormwater
- ☐ Locally produced materials
- ☐ Recycled or reused materials
- ☐ **FIELD 4**
- ☐ Sitting areas, paths, or other amenities to encourage people to enjoy the outdoors
- ☐ None of the above

Please list any other sustainable landscaping practices or elements that your organization **FIELD 6.**

FIELD 5

<i>For those who selected <u>only</u> "Wholesale nursery," "Retail nursery/garden center," or "Landscape design", or any combination of these three, in SECTION 2</i>	use or promote
<i>For all others</i>	use

FIELD 6

<i>For those who selected <u>only</u> "Wholesale nursery," "Retail nursery/garden center," or "Landscape design", or any combination of these three, in SECTION 2</i>	uses or promotes
<i>For all others</i>	uses

FIELD 4

<i>For those who selected "Employee or owner of a company in the landscape/nursery industry" in SECTION 1</i>	Composting at client's site
<i>For all others</i>	On-site composting

→ CONTINUE TO SECTION 8

Section 8

Why have you decided to **FIELD 5** sustainable landscaping? Please mark how important each of the following motivations are.

	<u>Motivations from within your organization:</u>		
	Very important	Somewhat important	Not important
Part of a larger sustainability initiative within my organization	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mandate by upper or corporate management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Initiative by FIELD 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Promote the organization's "green" image	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cost savings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Provide an outdoor space for people	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	<u>Motivations from outside your organization:</u>		
	Very important	Somewhat important	Not important
Request by client**	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Motivations from outside your organization:		
	Very important	Somewhat important	Not important
Public or stakeholder pressure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental responsibility/stewardship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Comply with legal requirements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Remedy a problem in the landscape (e.g. erosion, flooding)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Help green the community	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please list any other motivations for FIELD 3 sustainable landscaping:

**** Only display this option for those who selected “Employee or owner of a company in the landscape/nursery industry” in SECTION 1**

FIELD 1 <i>For those who selected “Accredited educational institution” in SECTION 3</i>	students and/or staff
<i>For all others</i>	employees

FIELD 3

<i>For those who selected <u>only</u> “Wholesale nursery,” “Retail nursery/garden center,” or “Landscape design”, or any combination of these three, in SECTION 2</i>	using or promoting
<i>For all others</i>	using

→ CONTINUE TO SECTION 9

Section 9

In your opinion, how well have your organization’s sustainable landscaping initiatives been explained to landscape users or viewers?

- ☐ Very well
☐ Fairly well
☐ Not very well
☐ They have not been explained at all

If your organization's sustainable landscaping initiatives have been explained to landscape users or viewers, how were they explained? Please check all that apply.

☐ Signs

- ☐ Website
- ☐ Organizational newsletter, pamphlets, or fliers
- ☐ Email notice
- ☐ Meetings or assemblies
- ☐ Open house
- ☐ Word of mouth
- ☐ Other (please specify): _____

Is there a designated staff person, department, or committee responsible for educating people about your organization's sustainable landscaping initiatives?

- ☐ Yes
- ☐ No
- ☐ Not sure

Is there a designated budget for educating people about your organization's sustainable landscaping initiatives?

- ☐ Yes
- ☐ No
- ☐ Not sure

→ CONTINUE TO SECTION 10

Section 10

Thanks for your responses so far, only a few more questions to go!

FIELD 2

	A significant FIELD B	Somewhat of a FIELD B	Not a FIELD B	Don't know
My organization doesn't know about sustainable landscaping	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It's hard to find practices that work for my organization	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our budget is limited	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being environmentally-friendly is not part of my organization's	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	A significant FIELD B	Somewhat of a FIELD B	Not a FIELD B	Don't know
My organization doesn't know about sustainable landscaping values	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There aren't any direct benefits to my organization	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Landscape management is a low priority for my organization**	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
No one in my organization will lead the effort	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is difficult to educate or retrain FIELD 8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

FIELD 9

	A significant FIELD B	Somewhat of a FIELD B	Not a FIELD B	Don't know
People think sustainable landscaping is less attractive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Landscape management is a low priority for our clients***	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
No one has requested or required that we FIELD 5 these practices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is difficult to obtain buy-in from upper management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Property owner won't allow us to change the landscape	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

FIELD 7:

→ IF “No” WAS SELECTED IN SECTION 6, CONTINUE TO NEXT QUESTION
 → IF “Yes” WAS SELECTED IN SECTION 6, SKIP TO SECTION 11

If these barriers could be overcome, does your organization have an interest in sustainable landscaping?

- ☐ Yes
- ☐ No
- ☐ Not sure

**** Only display this option for those who did not select “Employee or owner of a company in the landscape/nursery industry” in SECTION 1**

***** Only display this option for those who selected “Employee or owner of a company in the landscape/nursery industry” in SECTION 1**

	<i>For those who selected “Landscaping Practices” in SECTION 6</i>	<i>For those who <u>did not</u> select “Landscaping Practices” in SECTION 6</i>
FIELD 2	<p>The following lists some challenges organizations have faced when suggesting or implementing sustainable landscaping.</p> <p>Which of the following have been challenges for your organization?</p> <p><u>Challenges within your organization</u></p>	<p>You indicated that your organization does not currently use or promote sustainable landscaping practices.</p> <p>Which of the following have been barriers to using or promoting sustainable landscaping practices?</p> <p><u>Barriers within your organization</u></p>
FIELD 9	<u>Other challenges</u>	<u>Other barriers</u>
FIELD 7	Please describe any other challenges you have experienced when suggesting or implementing sustainable landscaping:	Please describe any other barriers to using or promoting sustainable landscaping:
FIELD B	challenge	barrier

FIELD 8

<i>For those who selected “Employee or owner of a company in the landscape/nursery industry” OR “Employee at a public horticulture institution” in SECTION 1</i>	our employees
<i>For those who selected “Employee responsible for landscape maintenance or management at an organization that is not within the landscape/nursery industry” in SECTION 1</i>	our landscaping staff

→ CONTINUE TO SECTION 11

Section 11

Thanks for taking this survey -- your feedback is much appreciated.

The next step in my research is to examine specific organizations to learn more about their sustainable landscaping initiatives. My goal is to develop recommendations to help green industry professionals educate landscape users and viewers about their sustainable landscaping practices.

Below, you are asked whether your organization might like to participate in a case study. If you select "yes," you will be asked to input your contact information on the following page. This contact information will be kept confidential, known only to the researchers. Selecting "yes" does not commit you to participating; it only means that you may be interested.

***Would your organization be interested in participating in a case study?**

☐

Yes

→ **CONTINUE TO SECTION 12**

☐

No

→ **END OF SURVEY, MESSAGE #2**

Section 12

Please state the name of your organization and your contact information. *Note: This information will be kept confidential, known only to the researchers.*

Name of organization:

Your name:

Your position:

Email:

Phone:

How would you prefer to be contacted?

☐

Email

☐

Phone

☐

No preference

→ **END OF SURVEY, MESSAGE #1**

END OF SURVEY MESSAGE #1

Thank you for participating! Your responses are a valuable addition to the study.

If your organization is selected as a potential case study, we will contact you in the next few weeks to verify your interest in participating.

Questions or comments about the survey can be directed to the principal investigator, Rebecca Pineo, Longwood Graduate Fellow, at rspineo@udel.edu.

For more information about the Longwood Graduate Program, please visit our website at <http://ag.udel.edu/Longwoodgrad/>.

END OF SURVEY MESSAGE #2

Thank you for participating! Your responses are a valuable addition to the study.

Questions or comments about the survey can be directed to the principal investigator, Rebecca Pineo, Longwood Graduate Fellow, at rspineo@udel.edu.

For more information about the Longwood Graduate Program, please visit our website at <http://ag.udel.edu/Longwoodgrad/>.

END OF SURVEY MESSAGE #3

Thank you for your willingness to participate in this survey.

At this time, the survey is only being administered to employees or owners of companies in the landscape/nursery industry, employees at public horticulture institutions, and employees responsible for landscape maintenance or management at an organization that is not within the landscape/nursery industry.

Questions or comments about the survey can be directed to the principal investigator, Rebecca Pineo, Longwood Graduate Fellow, at rspineo@udel.edu.

For more information about the Longwood Graduate Program, please visit our website at <http://ag.udel.edu/Longwoodgrad/>.

END OF SURVEY MESSAGE #4

Thank you for your willingness to participate in this survey. At this time, we need only one response from each organization.

Questions or comments about the survey can be directed to the principal investigator, Rebecca Pineo, Longwood Graduate Fellow, at rspineo@udel.edu.

For more information about the Longwood Graduate Program, please visit our website at <http://ag.udel.edu/Longwoodgrad/>.

Appendix B:
**PROFESSIONAL ASSOCIATIONS SOLICITED FOR SURVEY
PARTICIPATION**

**denotes actual survey participants*

- American Nursery and Landscape Association
- APPA: The Association of Higher Education Facilities Officers
- Delaware Nursery and Landscape Association*
- Eastern Region of APPA
- International Facilities Management Association
- Maryland Nursery and Landscape Association*
- National Recreation and Park Association
- National Roadside Vegetation Management Association
- New Jersey Nursery and Landscape Association*
- New York State Nursery and Landscape Association*
- Pennsylvania Landscape and Nursery Association*
- Professional Grounds Management Society*
- Professional Landcare Network
- Society of Municipal Arborists
- The Golf Course Superintendents Association of America*
- Virginia Nursery and Landscape Association*

Appendix C:

SURVEY INVITATION

I would like to invite you to participate in a survey for my thesis research at the University of Delaware, in the Longwood Graduate Program in Public Horticulture. Under the advisement of Dr. Robert Lyons, I am asking **FIELD 1**.

I would really appreciate your input. **This is a short online survey and should take about 15 minutes to complete.**

Survey link: [\[link\]](#)

Thank you in advance for participating! Your feedback is very important, as I will use it to develop recommendations for **FIELD 2**, to help educate stakeholders about their landscaping practices.

Your participation in the survey and all of your responses will be kept confidential. Should you have any further questions or comments, please feel free to contact me, Rebecca Pineo, at rspineo@udel.edu or 302-831-2517.

Many thanks,

Rebecca Pineo
Longwood Graduate Fellow
University of Delaware & Longwood Gardens
rspineo@udel.edu
302-831-2517

FIELD 1

<i>For landscape association members</i>	members of [organization], and other green industry professionals, to offer some information about the landscaping practices you use or promote.
<i>For Taillores Declaration universities respondents</i>	university and college landscape managers to offer some information about the landscaping practices you use or promote. If you are not directly responsible for grounds management, please feel free to forward this survey to the appropriate person.
<i>For highway officials respondents</i>	highway officials responsible for roadside vegetation management to offer some information about their management practices.

FIELD 2

<i>For landscape association members</i>	green industry professionals
<i>For Taillores Declaration universities respondents</i>	landscape management professionals
<i>For highway officials respondents</i>	landscape management professionals

Appendix D:
SURVEY REMINDER

Dear [name],

One week ago, you received an email inviting you to take an online survey, as part of my thesis research at the University of Delaware.

The survey takes only about 15 minutes to complete and is available online at [link].

If you have not had a chance to take the survey yet, I would appreciate your participation. Your feedback will help me develop recommendations and tools for **FIELD 1**, to help educate stakeholders about their landscaping practices.

Again, **your participation in the survey and all of your responses will be kept confidential.** Should you have any further questions or comments, please feel free to contact me, Rebecca Pineo, at rspineo@udel.edu or 302-831-2517.

Thank you,

Rebecca Pineo
Longwood Graduate Fellow
University of Delaware & Longwood Gardens
rspineo@udel.edu
302-831-2517

FIELD 2

<i>For Taillores Declaration universities respondents</i>	landscape management professionals
<i>For highway officials respondents</i>	landscape management professionals

Appendix E:

INTERVIEW AND CASE STUDY ORGANIZATION DESCRIPTIONS

Bellevue State Park (Source: <http://www.destateparks.com/park/Bellevue>)

Bellevue Hall mansion commands a grand view of this historic estate, and its present form reflects alterations made by William du Pont, Jr. Mr. du Pont surrounded his home with the finest facilities: tennis courts, equestrian stables, gardens, and a picturesque pond, amid woodlands and fields overlooking the Delaware River. The park was acquired by the State of Delaware in 1976.

The Delaware Division of Parks and Recreation has retained the historic charm of Bellevue while providing many opportunities for recreation. Walking and jogging are popular activities at any time of the year. A 1-1/8 mile fitness track circles a catch-and-release fishing pond stocked with bass, catfish, and sunfish, while the nearby exercise trail offers a refreshing workout. Hiking trails allow you to explore other parts of the estate. If you prefer cycling, both paved and unpaved paths lead you on a leisurely tour.

Location: Wilmington, DE

Larry Weaner Landscape Associates (Source: <http://www.lweanerdesign.com/>)

Larry Weaner Landscape Associates is a nationally recognized leader in the natural landscape field. Founded in 1982, our approach combines environmental science with the rich artistic traditions of garden design.

Our projects have been featured in numerous publications and have been included in tours by many institutions including The Garden Conservancy, The Association of Professional Landscape Designers, The American Horticulture Society and The Central Park Conservancy.

We offer design, consulting and installation services from our offices in Glenside, Pennsylvania and Wilton, CT.

Montgomery County Golf (Source: <http://www.montgomerycountygolf.com/>)

Montgomery County Golf operates nine golf courses in and around the Baltimore and Washington, DC metro area including Potomac, Silver Spring, Rockville and Bethesda Maryland. The nine courses: Falls Road, Hampshire Greens, Laytonsville, Little Bennett, Needwood, Northwest, Poolesville, Rattlewood all offer full-service facilities including snack bar, pro shop, instruction, leagues, driving range, putting greens, golf outing and tournament facilities. Sligo Creek is a nine hole course located directly off of the Washington beltway.

Ruppert Landscape, Inc. (Source: <http://www.ruppertlandscape.com/>)

Ruppert Landscape is an organization built from a strong set of values and a genuine dedication to providing the highest quality landscape management, landscape construction and tree growing and moving services available.

Ruppert Landscape offers the following landscape management services:

- Grounds Management/Contract Services
- Design & Landscape Enhancement
- Turf Care
- Irrigation System Management
- Pond and Lake Management
- Arbor Care
- Snow and Ice Management
- Holiday Decorations

Ruppert Landscape currently serves the central and eastern United States from seven branches.

St. Mary's College of Maryland (Source: <http://www.smcm.edu>)

St. Mary's College of Maryland is a 2,000-student residential campus that shares grounds and its name with Historic St. Mary's City, site of the first capital of Maryland (1634). Designated Maryland's Public Honors College by statute in 1992, it is the state's commitment to providing a residential, liberal arts education as a public trust—available to students of superior potential regardless of their backgrounds and personal circumstances. Each St. Mary's student is a high-achieving student, living and studying in an environment that fosters independent thinking, social engagement, and environmental stewardship. St. Mary's awards the Bachelor of Arts degree in 22 disciplines, a student-designed major, and a Master of Arts in Teaching degree.

University of Delaware (Source: <http://www.udel.edu>)

The University of Delaware has a great tradition of excellence, from our founding as a small private academy in 1743, to the research-intensive, technologically advanced institution of today.

A state-assisted, privately governed institution, UD offers courses in a broad range of disciplines, including 4 associate's programs, 130 bachelor's programs, 79 master's programs and 39 doctoral programs through our seven colleges and in collaboration with more than 50 research centers. Our student body includes more than 16,000 undergraduates, 3,500 graduate students, and 1,000 students in professional and continuing studies from across the United States and around the world.

Dow Electronic Materials

(Source: http://www.rohmhaas.com/wcm/about_us/locations/newark/who_we_are.page?)

The Newark facility serves CMP Technologies business of The Dow Chemical Company.

Electronic Materials develops and manufactures products used for chemical mechanical polishing (CMP) and are used in the fabrication of almost every type of electronic chip made today. CMP is the process used to create the flawless surfaces required to make faster and more powerful integrated circuits and electronic substrates semiconductors. Our products include polishing pads, pad conditioners, slurries, reactive chemical solutions, carrier films and template assemblies.

We operate 24 hours a day, seven days a week with approximately 600 employees in 15 buildings of the Diamond State Industrial Park.

In addition to our manufacturing facility, we have state-of-the-art research facilities, applications labs, clean rooms, finished product warehousing, and a small scale pilot line.

Appendix F:

INTERVIEW AND CASEY STUDY RESPONDENT QUOTES

Unless otherwise noted, quotes provided in this appendix are from the primary contact at each organization. Identification codes are as shown in Table AF.1 and Table AF.2.

Table AF.1 List of interviewee organizations, primary interviewees, and quote identification codes (ID)

ORGANIZATION	INTERVIEWEE	ID
Bellevue State Park	Andrew Driscoll	SP
Montgomery County Golf	Jon Lobenstine	GC
University of Delaware	Tom Taylor	U
St. Mary's College of MD	Kevin Mercer	C
Ruppert Landscape (PA branch)	Garth Jorgensen	LM
Larry Weaner Landscape Associates	Larry Weaner	LD

Table AF.2 List of case study interviewee names, position, and quote identification code (ID)

INTERVIEWEE	POSITION	ID
Ethan Simon	Global Director for Research and Development, Chemical and Mechanical Planarization	RD
Peter Freeman	Site Leader	SL
Charles Perry	Facilities and Building Services, Contract Administration	FB
Pat Wharton	Employee Engagement Manager	EE
Barbara del Duke	Public Affairs Manager, Northeast Corridor	PA
Susan Barton	Landscaping Consultant (University of Delaware)	LC
Focus group	Various	FG

Table AF.3 Quotes describing motivations for using sustainable landscaping practices, from organization interview respondents and survey respondents. I=# interview respondents; S=# survey respondents.

MOTIVATIONS	SUPPORTING QUOTE(S)
Change stereotypes (I=1; S=0)	“One of the biggest things for me is to try to change people’s stereotypes of golf courses....People just think it’s a wasteland.” (GC)
Cost savings (I=3; S=2)	“For people that are paying for freshwater usage, using stormwater [will] save money on freshwater usage.” (C)
Create a better place/product for people (I=2; S=2)	“Our goal was just to be greener...to make a better place for people to visit and walk around.” (LM)
Educate people about sustainable practices (I=0; S=3)	“We teach it, recently receiving the 2010 Schuylkill action network scholastic award. It is part of our signature learning experience.” (survey) “Educate our students about the green choices that they will need to make in the future.” (survey)
Ethics – It’s the right thing to do (I=1; S=9)	“It is about doing the best we can for the planet, we are SUPPOSED to be the stewards of the environment.” (survey) “It is about time that we follow other parts of the world and do right by nature and not just use up its resources as though they will always be there.” (survey)
Increase product marketability (I=0; S=1)	“Profitable and marketable” (survey)

MOTIVATIONS	SUPPORTING QUOTE(S)
Practicality – It makes sense (I=0; S=4)	<p>“It makes sense to protect our landscape and our overall environment.” (survey)</p> <p>“We just call it "good sense", not "green"! The bottom line is by doing things right the first time...you get happy clients, healthy butterfly, bird, and beneficial populations, and healthy, low-maintenance landscapes. A win-win all around!” (survey)</p>
Prepare for increased environmental regulations (I=1; S=0)	<p>“So, as we look to the future, more than likely go 10 years down the road, there will be more and more regulations and restrictions on pesticide use.” (GC)</p>
Recognize the importance of a place (I=1; S=0)	<p>“I think to take a landscape...and to make it just a visual thing, never sat that well with me. I always felt like a place that I’m interested in ought to have some use, it ought to be part of a bigger picture... To me, that’s a lot of hubris to just take property that has all kinds of effects on what goes on around it and make it into something that has no use except to look nice.” (LD)</p>
Reduce environmental impact of operations (I=3; S=1)	<p>“I do most of that pushing, and just trying to see how we can change our practices to become greener, how maybe we can do less mowing, reduce our emissions of our equipment and use less fuel.” (GC)</p> <p>“And I talk about the benefits of buffer management...they filter out pollutants carried from stormwater, erosion control, protects your wildlife habitat; it protects your local watershed.” (C)</p>
Set an example/provide leadership (I=1; S=4)	<p>“We want to try to lead by example.” (C)</p> <p>“There is minimal awareness and call for sustainability in my area. Besides being the right thing to do—I want to take the lead in my area!” (survey)</p> <p>“Our industry should be the leaders in the effort for sustainability.” (survey)</p>
Use resources effectively (I=0; S=1)	<p>“To make as much possible with the smallest inputs possible...sometimes an unrealistic goal!” (survey)</p>

Table AF.4 Quotes describing sources of sustainable landscaping initiatives, from organization interview respondents and survey respondents. I=# interview respondents; S=# survey respondents.

SOURCE OF INITIATIVE	SUPPORTING QUOTE(S)
Client has already implemented landscape practices (I=1; S=0)	<p>“We’ve got a site [where]...they have a brand new state-of-the-art facility; it’s LEEDs certified. We don’t take care of the rooftop garden, but we take care of the grounds there, and they’ve definitely got the bio-filters all over the place that get mowed once a year, once a month, whatever the case may be.” (LM)</p>

Initiative by landscape users/viewers (I=0; S=1)	“We also have a small vegetable garden that was initiated by our Honors college that is all organic.” (survey)
Mandate from upper level management (I=4; S=1)	“It’s funny, because we had some higher-level management up here from our corporate office a couple of weeks ago. The saying is, ‘if it’s not broke, leave it alone.’ Well, they’re telling us to break it, and figure out a better way of doing things.” (LM) “As far as sustainability on campus, really when the new administration came on board, they wanted to make the campus more sustainable.” (U)
Personal initiative of staff (I=6; S=2)	“[The field manager] probably got the ball rolling, to be honest. He talked about it, he measured up some areas, and we were looking to put some numbers together to show [our client] the reduction in cost.” (LM) “We have an aware, motivated work force which keeps abreast of local, state, national and global trends and practices and seeks to apply them in our work.” (survey)
Practices being promoted by the green industry (I=2; S=0)	“However, I think there s a lot of initiatives, through the USGA, ‘Brown is good, brown is the new green.’ There’s a big focus on that.” (GC)
We’ve been doing it that way for a long time (I=1; S=4)	“Well, I can honestly say that, I guess the phrase sustainable wasn't quite in vogue back in the early nineties. But I started using even then, in landscapes, I switched to more native plants and cultivars of natives, because I found those to be more successful on campus.” (U) “Practices that are now being lumped as ‘sustainable’ initiatives have been the core of my design and management ethics for my entire career.” (survey)

Table AF.5 Quotes describing motivations for planned implementation of sustainable landscaping practices at Dow Electronic Materials

CASE STUDY INTERVIEWEE	SUPPORTING QUOTE(S)
Global Research and Development Director	“So for me one big passion is to educate other people. Not in an aggressive way, but just show by example, so that those people who are really interested in something but just don't have the information needed, you sort of help them over the hump and allow them to enable people to take action. That's what it's all about.” “At the end of the day, I also believe it's the right thing to do. We’re a big company that has the resources to do something like this, why shouldn't we? And I happen to be in a position right now where I can affect change, just through the position I'm in.”

CASE STUDY INTERVIEWEE	SUPPORTING QUOTE(S)
Global Research and Development Director (con't)	"Many people are realizing we need to enhance environmental habitats rather than reduce them, so the goal is to simply set up landscaping that has the minimal amount of inputs needed to make it work. [It] increases the availability of useful habitats in the area for [wildlife]; improves shading for the buildings to reduce heat [and cooling] demand, and acts as a filter system for run-off water."
Site Leader	"It's absolutely part of the Dow culture to work with the environment and try to be a good sustainable, a good neighbor, and utilize resources only where we have to—that's part of our goals... This is a perfect example of where it not only works with the environment but it also works with expenses and budgets. It's a win-win, why wouldn't you?"
Facilities and Buildings Manager	<p>"Right now we have a little bit of an employee disconnect, because of some layoffs we've had over the last two years, so we're looking at this also to help engage our employees a little bit, give them a better atmosphere, give them somewhere to relax."</p> <p>"We always are looking to make a good impression on our neighbors, and actually do the right thing."</p> <p>"We want to put our best foot forward, because we're in a really high profit industry and there's no reason why we shouldn't have the best looking landscapes and buildings around."</p>
Landscape Planning Consultant	"It becomes a visible place where ideas that I have about how landscapes should be managed can be demonstrated, both to their employees and to any visitors. Plus, it gives me an opportunity to take photographs, and use those to educate more people through other talks. And certainly, as an extension person, I have a role to play in disseminating university information to a wider audience. And, while I can't go to every homeowners' house in DE and give them personal advice, by working through corporations we're then able to impact more people."

Table AF.6 Quotes describing internal challenges to implementing sustainable landscaping, from organization interview respondents and survey respondents. I=# interview respondents; S=# survey respondents.

THEME/SUB-THEME	SUPPORTING QUOTE(S)
<i>Communication difficulties</i>	
Difficult to communicate the benefits of sustainable landscaping to stakeholders (I=0; S=2)	<p>"Communicating to people the multiple benefits of implementing sustainable landscape practices – social, economic and environmental." (survey)</p> <p>"It is extremely difficult to educate upper management about the benefits of sustainable landscaping." (survey)</p>

THEME/SUB-THEME	SUPPORTING QUOTE(S)
<i>Lack of operational resources</i>	
Budget constraints (I=2; S=3)	“Budget restrictions. While there is often a desire by some to implement sustainable practices it is often difficult to find funds to truly launch a comprehensive program.” (survey)
Lack of knowledge/skills among landscaping staff (I=3; S=0)	“If we send a different crew out there, say once a month, they may see some of these areas that are left high for a reason, these bio-filters, and they may cut them down because they’re ignorant. As a whole, our group probably isn’t educated enough on it.” (LM)
Space constraints (I=0; S=1)	“space and money to set up our own composting” (survey)
Time/labor constraints (I=2; S=1)	“Yeah, for me time is always a juggling act, and we only have a short window to do so many projects, and trying to get them all done sometimes is incredible” (C)
<i>Lack of organizational support</i>	
Lack of buy-in from landscaping staff (I=5; S=0)	<p>“Our mowers really have to have the buy-in to think that they don't have to mow once a week, so I think for them it's really a job security issue if we start saying that we don't want certain things mowed.” (SP)</p> <p>“I think honestly, maybe it’s more of a language barrier thing, but I feel the Latino staff just want to work and they don’t care. They are here for the check and they just want to do their job.” (GC)</p> <p>“You’re upsetting the apple cart. People are used to doing things a certain way.” (LM)</p>
Lack of support from upper management (I=0; S=6)	<p>“My county has developed a green initiative, but a grounds maintenance and sustainable landscape initiative has not been included in the effort.” (survey)</p> <p>“I’m the supervisor of landscape maintenance at a governmental agency and a graduate of the University of Delaware. Unfortunately, there is a mentality that maintenance personnel is uneducated and not a good source of input.” (survey)</p>

Table AF.7 Quotes describing external challenges to implementing sustainable landscaping, from organization interview respondents and survey respondents. I=# interview respondents; S=# survey respondents.

THEME/SUB-THEME	SUPPORTING QUOTE(S)
<i>Mechanics of sustainable landscaping differ from conventional landscaping</i>	
Long-term dynamics of landscape is different (I=1; S=0)	“In traditional landscaping, the design is done after it’s planted most of the time. And the only thing that changes is that the plants get bigger; the arrangement stays the same, and the composition of plants over time stays the same. In [natural landscaping] it doesn’t. There are species that are short term, they live for a little while and die off, and other things take over, over time, and that’s changing compositions, and all kinds of things are going on.” (LD)
Maintenance regimes are different (I=4; S=0)	“I would say now that they're established, watering to get them to get established was a challenge, because I eliminated the irrigation system to start with.” (U) “It is a little more labor intensive to hand water. What we’re finding is that when we have to go hand water, especially in the summer time, instead of the guys leaving at 2 o’clock, because they’re coming in at 5 or 6, they’re a select bunch of people that will stay to hand water until 5 or 6 if necessary.” (GC)
Need to experiment to find practices that work (I=1; S=0)	“Certainly, a lot of it's trial and error, I mean, I've found some plants that, you know, they're natives, maybe to the area, but they still weren't working here, so they go by the wayside.” (U)
<i>Public perception of sustainable landscaping practices</i>	
Aesthetic preference for conventional landscaping (I=4; S=3)	“I think that in some cases, people, homeowners especially, are used to manicured lawns. That’s what they want. It’s the norm, it’s keeping up with the Joneses in some respects. That same mentality carries over to the business side of things, for instance, if you’ve got a retail center, a shopping center or a retail banking center.” (LM)
Client requests for conventional landscaping practices (I=0; S=2)	“We are a little garden center and have decided not to carry many invasive plants, teach classes to promote bio-diversity, and sustainability and feel we are doing a good job. But when one of the larger landscape companies in the area creates a plan using Bradford Pear, Acer platanoides, and Berberis and sells it to a client and they bring the plan to us we can not change that or we could loose valuable customers.” (survey)

Concerns about undesirable wildlife (I=1; S=1)	“Convincing them that no-mow areas, buffer strips, etc are not unkempt areas that foster snakes and spiders” (survey)
Conflicts with function (I=3, S=0)	“What they do comment on is the native areas, sometimes it’s a negative comment because they lost their golf ball, ‘Why don’t you mow this stuff down?’” (GC)
Lack of understanding of sustainable landscaping (I=4; S=1)	“A lot of the people that we deal with at the buildings, granted, I’m sure that they’ve heard about [sustainable landscaping] or read different articles about it, but it’s not something that’s a constant in their mind. They need to be more educated about it, and the benefits that it would bring about.” (LM)
Landscapes are a low-priority for client (I=1; S=0)	“There was a change in management over there on their end, and it just wasn’t a priority.” (LM)
Need to change practices when public is dissatisfied (I=2; S=0)	“Yeah, it was a situation that my boss calls growing pains. The summer went by, and we installed all these meadows. When the students came back, they did not like [one of the areas]. We quickly went to see if any wildlife was nesting there, and then we mowed it, because we wanted the students to know we heard their opinion.” (C)
There is a general resistance to change (I=2; S=1)	“It’s a challenge. People don’t like to change.” (GC)

Table AF.8 Quotes describing challenges to implementing sustainable landscaping at Dow Electronic Materials

SUPPORTING QUOTES
<p>“[The landscape maintenance contractor] had a couple of suggestions, like a ‘Red Spire’ pear, and a paperbark maple. So I responded with, well ‘Red Spire pear would be in the Callery pear group, and since that’s an invasive plant we definitely wouldn’t want to be adding that to the project.’” (LC)</p> <p>“Our plant manager...said, you know, ‘I’m not much of a gardener. I like things neat. I don’t quite get it. You know, I don’t want any jungle in front of [the building]... Sustainable landscaping just sounds wild, I’m not so sure.’” (RD)</p> <p>“The idea that these mowed grass areas have other uses...is a challenge. We just can’t change something that will not allow them to have a fire drill space.” (LC)</p> <p>“The real challenge is making sure that we can afford to have good landscaping. If we’re not doing well—and we’re doing fine—if the economy turns down, it’s something that you can let go, and you’re business won’t go with it. So, whether it’s sustainable or not, that could still happen.” (SL)</p>

Table AF.9 Quotes describing desire and need to communicate to stakeholders about sustainable landscaping practices, from organization interview respondents

THEME	SUPPORTING QUOTE(S)
Desire for enhanced communication efforts (n=5)	<p>“I would say that the customers are reluctant to make changes. And again, we’ve got to take part of that blame for not educating them enough. We probably need more tools in our bag, if you will, to go to them and say this is why we think this is a good idea, and this is why we think you should implement this.” (LM)</p> <p>“I have the desire, I can't really speak for anyone else, and I haven't really heard them specifically express it but I personally think people need to know about it.” (SP)</p> <p>“I'd like to communicate it. That's just typically my style, under the radar.” (U)</p>
Good design is needed more than communication efforts (n=1)	<p>“In order to get these things to be accepted, we need to make sure they look good. And it’s not ‘Well, you better learn to like this.’ We need to make it look good...and not just assume that people don’t understand, and got to learn to understand it. I think that argument can mask bad design.” (LD)</p>
Third-party certifier requires communication efforts (n=2)	<p>“Yeah, especially the community outreach [is required for the Audubon certification].” (GC)</p>

Table AF.10 Quotes describing desire and need to communicate to stakeholders about sustainable landscaping practices at Dow Electronic Materials

SUPPORTING QUOTES
<p>“I think there’s a need to inform people. I don’t think I’m the 99th percentile that doesn’t know the difference between a sustainable plant and a non-sustainable plant, I think that’s probably the majority. So, you have to tell people that you’ve done this. They’ll see that you’ve changed the landscape; I think most people won’t know that you’ve done something different with that landscaping that will be better for the whole environment and community. But, I think it’s important that you make that connection for them.” (SL)</p> <p>“Whenever we do something on site here that affects the population we always communicate it beforehand. And sometimes depending on the magnitude of it we have safety reviews.” (FB)</p>

Table AF.11 Quotes describing goals for communication about sustainable landscaping initiatives, from organization interview respondents

THEME	SUPPORTING QUOTE(S)
Attitude change (n=3)	<p>“I think there is a need to do that because, again, I really want to try to change the stereotype, I want people who are not golfers to understand that [if] you look at Chesapeake Bay pollution [from] runoff, we’re not the cause of that...[That] the water leaving the golf course is actually cleaner than the water coming on to the golf course. Grass is one of nature’s best filters.” (GC)</p> <p>“We really want to get my departmental staff on board or aware more.” (U)</p> <p>“To have that buy-in here will help support us in keeping [sustainable landscaping practices], because what I’ve found in my few months in this position is that, really what it ultimately depends on is legislation, with a lot of things. If...somebody complains to a representative, it comes straight down to us and we have to fix it no matter what, generally.” (SP)</p>
Behavior change (n=3)	<p>“We can teach environmental practices...targeting people in the county of St. Mary’s, to protect the local watershed of the St. Mary’s River.” (C)</p> <p>“We need not only to educate our customer, but try to change behavior and get them to think differently about this new sustainable landscape.” (LM)</p> <p>“And I think it’s important to educate them so that they know...why we have a composting toilet [and] the benefits of that composting toilet so that they can support it and use it. Some people view it as more port-A-potty, than an actual toilet, so they don’t use it.” (SP)</p>
Raise awareness of sustainability initiatives (n=3)	<p>“You didn’t know anything about the admission field, but if you did, you’d have been that much more in tune with what we’re doing here, and why we’re doing it...Well, even if people wouldn’t appreciate it, at least they’d understand why.” (C)</p>

Table AF.12 Quotes describing goals for communication about sustainable landscaping initiatives at Dow Electronic Materials

SUPPORTING QUOTES
<p>“The first goal I mentioned is one that is shared by all the other projects and that’s really teaching employees about more environmentally sustainable practices...One of the things I hope to do is just keep doing things that show people what’s possible, and then people will adopt practices at home, tell a neighbor, and basically serve as a nucleus to improve the community.” (RD)</p> <p>“I said to...put a note out that describes what’s going to be happening in the next day. So, that people, when they see the construction that’s going on out there, that they understand that we’re not just changing the landscape, that it’s a different type of landscaping.” (SL)</p>

SUPPORTING QUOTES
“I didn’t know there were picnic tables outside of Building 9, and I work here in this building. I think it’s a knowledge thing that keeps people inside. So, I think that would be good for people, as long as we communicate that we have some picnic areas for people to use.” (EE)

Table AF.13 Mission, vision, and/or values themes of interviewee organizations, with supporting statements and quotes from organizational websites, publications, and/or interviewees

INSTITUTION	THEMES	SUPPORTING STATEMENTS/QUOTE(S)
Bellevue State Park	Recreation, resource protection, and education	“Our mission is to provide Delaware's residents and visitors with safe and enjoyable recreational opportunities and open spaces, responsible stewardship of the lands and the cultural and natural resources that we have been entrusted to protect and manage and resource-based interpretive and educational services.” (Delaware State Parks website, ‘Our Mission Statement’)
	Historic resource protection	“And what I find with this specific park, an issue is that [the state park administration’s] view of this park is very much as a historic site more than a natural area.” (SP)
	Recreation management	“We manage, primarily, I would say, for recreation, and then we also manage for wildlife.” (SP)
Montgomery County Golf	Community enrichment	“Dedicated to providing services, products and opportunities of value that offer enrichment to the community.” (Montgomery County Golf, Facebook page)
	Environmental sustainability	“The MCRA is committed to taking steps to reduce our impact on the environment. Our golf courses are managed by superintendents who have completed extensive education and training regarding the use of water, fertilizer, and plant protectants.” (Montgomery County Golf website, ‘Environment’)
	Customer satisfaction	“Our mission is to provide great golf courses...It’s all public, we try to make a great experience for a good value.” (GC)
University of Delaware	Education, research, and betterment of society	“The University of Delaware exists to cultivate learning, develop knowledge and foster the free exchange of ideas....University faculty are committed to the intellectual, cultural and ethical development of students as citizens, scholars and professionals. University graduates are prepared to contribute to a global society that requires leaders with creativity, integrity and a dedication to service.” (University of Delaware website, ‘About Us’)

INSTITUTION	THEMES	SUPPORTING STATEMENTS/QUOTE(S)
	Sustainability	“Sustainability is inherently rooted in the core principles of the University of Delaware, through research, action and engagement.” (University of Delaware website, ‘A Sustainable UD’)
	Sustainability leadership	“From the President: ...Just as 'eco-innovation' describes one of UD's biggest research areas, 'eco-leadership' describes one of our key missions." (University of Delaware Research, 2010, 2[1])
St. Mary's College of MD	Education, research, and betterment of society	“St Mary's College of Maryland, designated the state's honors college, is an independent public institution in the liberal arts tradition...Our faculty and staff foster intellectual, social, and ethical development within a community dedicated to diversity and accessibility. We provide students with opportunities to understand and serve local, national, and global communities and to accomplish social change...Our beautiful residential campus on the banks of the St. Mary's River inspires our work, our play, and our commitment to the environment.” (St. Mary's College of MD website, ‘Mission’)
	Sustainability	“Welcome to the St. Mary's Sustainability website...We welcome you to check in regularly for information to help you go green at St. Mary's.” (St. Mary's College of MD website, ‘Sustainability’)
Ruppert Landscape (PA branch)	High-quality products, customer and community service, good atmosphere for employees, safety, profitability	“We intend to be a continuously advancing organization that provides our clients with exceptional value by delivering products and services of the highest quality. We will strive toward this goal by preserving an atmosphere in which employees can attain their personal goals through the organization, be proud of the company in which they work and enjoy themselves. Our corporate culture will be defined by a strong work ethic, conscientiousness, community service, a positive image, a commitment to safety, profitability, and above all, respect for one another. These characteristics will allow us to be a leader in the markets we serve and an asset to our community.” (‘Ruppert Landscape Mission’ handout)
	Customer satisfaction	“Our ultimate goal is to make sure our customers are satisfied...We can educate them along the way, but ultimately we want them to be happy with the service that we provide, with the product we provide.” (LM)
	Profitability	“Ruppert is very very detail oriented. In any given week or even day, we know how many man-hours we've spent on a job already... We've got to make decisions because labor is our biggest expense.” (LM)

INSTITUTION	THEMES	SUPPORTING STATEMENTS/QUOTE(S)
Larry Weaner Landscape Associates	Customer satisfaction, combining environmental science with art	“Larry Weaner Landscape Associates is a nationally recognized leader in the natural landscape field. Founded in 1982, our approach combines environmental science with the rich artistic traditions of garden design...Our goal is not to evoke the comment ‘What a wonderful landscape project,’ but rather ‘What a wonderful place.’” (Larry Weaner Landscape Associates website, homepage)

Table AF.14 Statements describing mission, vision, and/or values of Dow Chemical, from organizational website and publications

SUPPORTING STATEMENTS
<p>“Dow combines the power of science and technology with the “Human Element” to passionately innovate what is essential to human progress. The Company connects chemistry and innovation with the principles of sustainability to help address many of the world's most challenging problems such as the need for clean water, renewable energy generation and conservation, and increasing agricultural productivity.” (The Dow Chemical Company website, ‘Our Company’)</p> <p>“As a part of the company's 2015 Sustainability Goals, the people at Dow are committed to using resources more efficiently, providing value to our customers and stakeholders, delivering solutions for customer needs and enhancing the quality of life of current and future generations.” (The Dow Chemical Company website, ‘Sustainability’)</p> <p>“The Dow Chemical Company: Setting the Standard for Sustainability” (Placard in the visitor waiting area of Dow Electronic Materials)</p>

Table AF.15 Quotes describing internal resources for communication about sustainable landscaping initiatives, from organization interview respondents

THEME	SUPPORTING QUOTE(S)
Budget resources for communication (n=3)	<p>“I could [budget for signage], and I probably will in the future, if it's a site that I think would be in need of that, I would put it in up front.” (U)</p> <p>“Now, there’s not a specific line item for that. But, if we need to do it, we make it work.” (GC)</p>
Dedicated space for communication (n=1)	<p>“We have an area in each one of the clubhouses is dedicated to environmental information as far as what’s going on.” (GC)</p>
Dedicated staff or consultants for communication (n=6)	<p>“We don’t have anyone who is directly [responsible for communication], but...we do work with a marketing company.” (GC)</p>

THEME	SUPPORTING QUOTE(S)
Good internal communication (n=6)	<p>“So, design is somewhat of a cooperative effort here. I got a really good group of people. They all have different areas where they have particular strengths and expertise. A design might require a couple of different areas. So, we’re cooperative and work together a lot, which I think everyone likes.” (LD)</p> <p>“We usually have a monthly staff meeting and that's all full-time people who are at that meeting.” (SP)</p> <p>“All of our field managers, the guys who actually run the crews, are equipped with Nextel radios, and we’re probably going to be going to actual Blackberries and phone access with them.” (LM)</p>
Landscaping staff experience (n=1)	<p>“Ten years ago, when I was at Chevy Chase Club where I started working, they were in the certification process there, and they got the [Audubon] certification right after I left, so I was familiar with the program.” (GC)</p>
Landscaping staff time dedicated specifically to implementing/maintaining communication initiatives (n=2)	<p>“Whether it’s a speed limit sign or Audubon signs, it’s 100% of signs outside that we take care of.” (C)</p> <p>“We’ve been working on refining the presentation, and trying to really tailor it.” (GC)</p>
Avenues for communicating with landscape users/viewers (n=5)	
<i>Emails (n=3)</i>	<p>“Email is by far the most heavily used way of communication right now, I would say. Again, it’s different for different customers. Some like the emails because it keeps them updated; it’s a quick read. Others, you can stop in and see them, sometimes it’s hit or miss.” (LM)</p> <p>“There's signage; there's a few pamphlets about things. One pamphlet we have is why you keep your dog on a leash in the park, why you shouldn't feed the geese.” (SP)</p>
<i>Handouts/visual aids (n=5)</i>	
<i>Marketing/PR (n=5)</i>	
<i>Meetings/presentations/tours (n=5)</i>	
<i>Notice boards (n=4)</i>	
<i>One-on-one/small group conversations (n=2)</i>	
<i>Organizational newsletter/publications (n=3)</i>	
<i>Signage (n=3)</i>	
<i>Website (n=6)</i>	

Table AF.16 Quotes describing external resources for communication about sustainable landscaping initiatives, from organization interview respondents.

THEMES/SUB-THEMES	SUPPORTING QUOTE(S)
<i>Resources to enhance operational capacity</i>	
Assistance from third-party certifiers (n=2)	"[Audubon does] provide resources as far as giving us ideas for signs, display, and stuff you can do around the course. They provide a lot of material you can provide to customers or the public, fact sheets, etc. They help in that regard." (GC)
Grants (n=1)	"For example, I recently applied and received urban forestry grants from the Delaware Forest Service and part of those grants is going to be education related to proper tree planting and just general care of trees and your yard at home." (SP)
<i>Sources of inspiration or education</i>	
People at other organizations that are using the practices (n=4)	"One of my biggest mentors is...the superintendent over at Chevy Chase Club." (GC)
Professional associations (n=3)	"Trade magazines, put out by the different associations. We attend, pretty frequently throughout the year, our local superintendents association, [which] has monthly meetings and educational seminars as part of the meeting." (GC)
Public gardens (n=2)	"I'm not just saying this because you're a graduate through there, but Longwood Gardens. I've been there and I like what they're doing [though] there's a few things I have problems with." (SP)
Universities/cooperative extension (n=2)	"A lot of information comes form university research; University of Maryland has a big research arm. There's a lot of research coming out of Cornell, Rutgers, Ohio State, Auburn, all over the U.S. there's a lot of schools with good turf programs." (GC)

Table AF.17 Quotes describing resources for communication about sustainable landscaping initiatives at Dow Electronic Materials

SUPPORTING QUOTES
<p>"It's really probably just the internal use of resources; we don't usually put any budget against those type of communications. If there was something grander in mind, then that would be a [Site Leader] discussion." (EE)</p> <p>"Our best tool is the TVs and our email systems. We have a couple other tools in house that are really specialized to us. We have what's called e-log books. We have 300 operators here; every day they have to log in to their e-log book and it'll basically be almost like a blog." (FB)</p>

SUPPORTING QUOTES
<p>“For the Newark site, dialogue with our community takes many forms. Community Advisory Committees, and presentations to civic associations, community organizations and municipal, county, and state agencies are ways we gather and share information from residents and leaders in the community. Industry groups, local chambers of commerce, and trade associations are ways we interact with the business.” (website, ‘Community Dialogue’)</p> <p>“The UofD agrees to provide the following services.... Education/Interpretation plan – strategies will be outlined for informing and educating employees and visitors about the sustainable landscape approach at the Newark site of The Dow Chemical Company.” (Memorandum of Understanding between University of Delaware and Dow Electronic Materials)</p> <p>“Big source was doing a lot of reading, there's an amazing amount of information on the web...I was also influenced by someone at Meadowbrook Farm, which is a place in Abington, which is part of [Pennsylvania Horticultural Society].” (RD)</p>

Table AF.18 Quotes describing organizational support for communication about sustainable landscaping initiatives, from organization interview respondents

THEME/SUB-THEME	SUPPORTING QUOTE(S)
Organizational mission, vision, and/or values support communication about sustainable landscaping initiatives (n=3)	<p>“I don’t think [the students] clearly understand [why we have meadows]. I think they understand somewhat; I don’t think they understand all the reasons. But when they graduate here, they do. Because the professors are behind what we’re doing 100%. Not only are they behind, but it’s part of how they teach and why they’re teaching.” (C)</p> <p>“I’m saying we need to go in to our customers and tell them, you know, you don’t want your grass cut every week, you don’t want to have to water it every single day, or four times a week, you know. Let some things go, and see where it goes.” [Gets up to point to a poster on the wall] “These are Ruppert values, and innovation is one of them. I say...that these are pushed down everyday to all of our employees.” (LM)</p> <p>“Technically this park is everyone's park. It's a public park; it's owned by the state so if you pay state taxes, this is your park. So I think that [the public] should know what we're doing here.”(SP)</p>
Staff buy-in to sustainability and/or communication efforts (n=3)	<p>“Some of the guys have really taken liberty and done a great job [with the information board]. At Little Bennett, they have an aerial photo of the course; they’ve got push pins where all the bird houses are, signs and arrows, and notes...” (GC)</p> <p>“The caretakers and crews on those areas...they're certainly actively participating in the change in those types of landscapes there. Both of those groups are more pro-active and will ask questions, ask if they can change this, change that, just to make things a little bit easier, or they'll see that maybe something isn't working.” (U)</p>

THEME/SUB-THEME	SUPPORTING QUOTE(S)
Stakeholder support for sustainable landscaping initiatives (n=3)	<p>“Yeah, management definitely was on board. And again, I think that definitely, the other employees would be too.” (LM)</p> <p>“This campus is so environmental-positive, in a way that they literally welcome that. Now, if I went to Princeton and tried to sell them on this, it might be a little harder for me.” (C)</p>

Table AF.19 Quotes describing organizational support for communication about sustainable landscaping initiatives at Dow Electronic Materials

SUPPORTING QUOTES
<p>“Dow pushes sustainability... There is a sustainability push, there's a push on energy conservation; we're supposed to cut energy by 15% this year.” (FB)</p> <p>“‘Evergreen’ is a global sustainability network within the Dow Company that's run by employees and the purpose of it is to share best practices around the company about what's happening and also to share information about what's happening elsewhere in the world.” (RD)</p> <p>“There's a grassroots Green Team; I don't know how many people are on it, but they've been around for quite a number of years and they've done some really nice initiatives on this site.” (RD)</p> <p>“We're just getting on the environmentally friendly kick [in terms of facilities]. We've recycled lately in the past and now we're really starting to recycle even some of our by-products here.... And like I said we use the non-VOC paints, the green paint [and] we switched to green products for cleaning.” (FB)</p> <p>“I'm taking a refresher course right now to maintain my certification, and I'm in a class now with 24 other HR people, and no one has an employee engagement manager at their company.... Even Dow does not have it, it's actually from the site, so you have to respect this site for recognizing that that's a good thing to have.” (EE)</p> <p>“Thank you for visiting our Community website. We're always looking for ways to improve communication with our neighbors and others stakeholders in our community. This site focuses on The Dow Chemical Company's operations at its Newark Delaware site what we do on this site, our environmental, health and safety efforts and our community involvement.” (website, ‘Newark Plant’).</p>

Table AF.20 Quotes describing current management challenges to communication about sustainable landscaping initiatives, from organization interview respondents

THEME	SUPPORTING QUOTE(S)
Budget constraints (n=2)	<p>“Unfortunately at Laird Campus we ran out of funds before we were able to [put in interpretive signage].” (U)</p>

THEME	SUPPORTING QUOTE(S)
Lack of buy-in from staff for communication initiatives (n=1)	The superintendent takes care of [the information boards]. It's to the point now where I need to tell everybody what they're supposed to put up there...Some of them seem to be just a couple of pictures and not much description about what's really going on.
Lack of communication skills among landscaping staff (n=2)	<p>"Generally we hire people to mow grass and weed whack, so if they're asked a question, they don't necessarily know the answer and they have to say that. And then if the person doesn't want to come to the main office for the answer, then they just go without knowing why." (SP)</p> <p>"The majority of them are Latinos, and there's a language barrier there. I think that the staff is well informed as well as what we're doing out there, but as far as them explaining it to a customer in an educated sounding way is probably not happening." (GC)</p>
Lack of communications staff (n=1)	"We recently went through a change where our full-time educator [was] transferred and so...[that] position doesn't exist anymore." (SP)
Lack of staff time to dedicate to communication initiatives (n=2)	"Yeah, it's something that would be nice to have, but unfortunately, we're stretched to the limit...we barely keep everything going and it's hard to [reach out and start new things]." (SP)
Need for topic expertise (n=3)	<p>"Again, I don't have as much knowledge as I probably need to push that forward, and I would love for an expert to help us come in and do that." (LM)</p> <p>"As a land manager, you have to be open to people questioning your practices, and really understand your practices so you can explain them. It's not just something that someone told you or that you read in a book; [you need to] really understand why you're doing it. So when someone does come and ask, you can be willing to talk with them...because people are critical and will try and debunk you if they don't think you're right in what you're doing." (SP)</p>
Organizational structure (n=1)	"We used to be able to [make our own pamphlets], but from what I understand now our education staff have to get [the central governing agency] to make the pamphlet." (SP)

Table AF.21 Quotes describing market-based factors affecting communication about sustainable landscaping initiatives, from organization interview respondents

THEME/SUB-THEME	SUPPORTING QUOTE(S)
<i>Mixed acceptance of practices by stakeholders</i>	
Aesthetic concerns/alternate landscaping preferences/(n=4)	<p>A lot of people [say] when we mow it, ‘Wow, it looks good out there.’ They won’t necessarily complain about it, but they mention ‘I’m glad you mowed; it looks so much better.’” (SP)</p> <p>“But on the same token I’ve heard other maintenance, not grounds maintenance, but other maintenance people, say, ‘Oh, did you lose your lawn mower?’” (U)</p>
Appreciation of aesthetic and wildlife benefits (n=3)	<p>“[I heard from] one of the staff at the Visitor's Center, that when they were looking out their window.... they were tickled to death just to see the color and the flowers and the butterflies. It was the prettiest landscape they had ever been next to on campus.” (U)</p>
Concerns about functionality/wasted resources (n=3)	<p>“I think as far as people just accepting the practices, I think that overall, everyone’s been pretty receptive and okay with it. Of all [stakeholder] groups, the golf course customers themselves, wouldn’t be as accepting. Just simply from a playability standpoint.” (GC)</p> <p>“Or like some people don't understand why there's ever downed wood in a forest. Why we don't go in there and pull it out and just use it for firewood. It's a very utilitarian view, that we're wasting that wood.” (SP)</p>
Concerns about undesirable wildlife (n=1)	<p>“The custodial staff, they perceive the unmowed turf as potential...areas for rodents and other critters to get into.” (U)</p>
Growing market for ecological-based design (n=1)	<p>“My industry is pretty depressed at the moment, however we’ve been very busy. I can only attribute it to the fact that the trend towards ecological design is outweighing, or at least ameliorating the downward trend in the economy. And we’re putting together a series of conferences for professionals about how to establish yourself in this field, and one of the arguments for doing it is that a lot of people want it, and not a lot of people know how to do it, so if you do, you will be in an advantageous position from a business standpoint.” (LD)</p>
Mixed buy-in to sustainable landscaping practices by staff (n=5)	<p>“The tours will be given by the Assistant Superintendent at Hampshire Greens golf course. He’s someone that is very passionate about educating people.” (GC)</p> <p>“I would say the maintenance staff probably was the biggest challenge. Particularly individuals who may have been here 20, 25, 30 years, who were used to doing things the same old way.” (U)</p>
Resistance to change (n=2)	<p>“I would say that the customers are reluctant to make changes.” (LM)</p>

THEME/SUB-THEME	SUPPORTING QUOTE(S)
<i>Mixed understanding of sustainable landscaping practices</i>	
Generally, stakeholder knowledge about sustainable practices is low (n=4)	<p>“It seems like the general public doesn't understand why you would leave a field growing as opposed to mowing it.” (SP)</p> <p>“Do I think students, staff and visitors understand that the landscaping practices are more sustainable? Probably not. Certainly, if it looks pretty, they enjoy that. I mean, it is a given fact that the landscape of the campus is one of the initial impacts on visitors, whether they've already decided to come here or whether they're on their first visit: ‘Oh, this looks pretty.’ You know, let's look at it a little further.” (U)</p>
Stakeholders look for third-party verification of your expertise (n=1)	<p>“People are smart... [They would] rather see, ‘oh, you’ve wrote and article for this magazine, oh, you spoke here, oh, you’re a member of, oh, you’re on the board of the environmental committee of the professional association of landscape designers.’ These are things that someone else decided that you were worthy of.” (LD)</p>
Sustainable landscaping is beginning to be better understood (n=1)	<p>“I think that the benefits of it are becoming pretty commonly understood, the idea that it’s going to require less inputs, and the idea that it will be beneficial to wildlife, and those things I think are beginning to become pretty common knowledge.” (LD)</p>
<i>Other market-based factors</i>	
Difficulty of communicating to non-intentional audiences (n=1)	<p>“You have so many people coming through here. You have your groups of regulars that are always here, but we might see 20,000 different people come through the door on an annual basis. If you don’t communicate with them on that one round—they’re on a mission, they come in, they pay, they want to play golf, and then they’re out of here—how do you stop them? How do you try to catch them with new information in the pro shop?” (GC)</p>
Difficulty of evaluating public perception (n=1)	<p>“One thing that's a shame is that if people like it, they don't usually speak up as much as the people who have a problem.... There are probably compliments out there that people will say to their friends, but we don't necessarily hear.” (SP)</p>
Diversity of perspectives and interests among audiences (n=4)	<p>“Some people might not care about wildlife... What they care about is [the money], where their tax dollars are going.” (SP)</p> <p>“What’s the more amazing than that is that the students seem to get it more than the adults for some reason. When the alumni comes back, they have a hard time putting their heads around that...but the students had zero problems of grasping that.” (C)</p> <p>“If you have a group EPA folks, and they’re at this level of education about pesticides or whatever, and then you got a group of ten year old boys scouts, it’s a completely different presentation!” (GC)</p>

Table AF.22 Quotes describing market-based factors affecting communication about sustainable landscaping initiatives at Dow Electronic Materials

SUPPORTING QUOTES
<p>“The population is small but growing that will care whether it’s a sustainable, environmentally friendly landscaping design versus not.” (SL)</p> <p>“People do say, ‘Let’s go to the breakroom. Oh, it’s a nice day so let’s go outside, where are we going to go sit?’ So I think that eating areas [would be] nice. I was wondering if there would be anything like a walking trail that would connect the buildings somehow, in the back, along the fence of I-95.” (EE)</p> <p>Focus group comments about whether the current landscaping was environmentally friendly:</p> <ul style="list-style-type: none"> • “Limited on chemical usage” • “Recyclable” • “Do we even have perennials on this campus? Then you wouldn’t have to worry about replanting” • “Not adding any invasive species” • “We do have some ducks or geese that end up walking down the road” • “I’ve seen stray cats around here somewhere” <p>Focus group comments about proposed landscaping:</p> <ul style="list-style-type: none"> • “Make sure the plants aren’t out too far or too large in front of the sign so we can see when pulling out of the drive” • “The bugs are also a concern if you have to walk past the tall grass” • “[Will] the tall grass look neat or does it just look like we don’t want to mow? If it’s out front of B9 it should look neat...Cut grass or gardens would look neater instead of the unmowed areas” • “Some of these areas are assembly areas for fire drills so that might be a concern, they happen about once a year” <p>“I’m not sure how many people really care about sustainable landscaping. Most people might say, yeah, sure whatever, but there may be some, there is a certain part of the population that’s, ‘This is the right thing to do, I’m so glad we’re doing it.’ I just know, is that ten people or 10% or 50% of the population? We’ll get a better sense of that as we go forward. “ (RD)</p> <p>“If we do a poor job of upkeep, we’ll usually get some complaints... So, I think that people complain if it doesn’t look good, they tend not to complain if it looks okay.” (SL)</p>

Table AF.23 Quotes describing mechanics-based factors affecting communication about sustainable landscaping initiatives, from organization interview respondents

THEME	SUPPORTING QUOTE(S)
Communication media needs to match existing media (n=2)	“The team really put it together, to go with the campus traditional style.” (C)

THEME	SUPPORTING QUOTE(S)
Landscaping practices must be sustainable before they are promoted as such (n=1)	“And [we could] certainly highlight...areas designated on campus in the information. But it might take some fixing up to go back to these areas and make them more sustainable than they currently are.” (U)
Need to consider placement of communication media (n=2)	“Yeah, I think you can put signs up all over the place, and a lot of people don’t read signs....People have a tendency to walk by signs, unless they’re waiting for something. I guess we need to target those signs where people are waiting, maybe at the tee box of a par three where people tend to get backed up. Having a sign just on the side of the cart path as you’re whizzing by, no one’s going to stop and read it.” (GC)
Site needs to be aesthetically pleasing (n=3)	<p>“So, while I think that signage is huge—and other communication—if you got a landscape that doesn’t look good, nobody’s going to like it. And the definition of what looks good is different to different people, but it’s also different to different settings. A little rectangular patch, a little front yard in a city neighborhood is going to require a different approach in a 40 acre open field 70 miles from Philadelphia.” (LD)</p> <p>“You have to combine grooming with environmental stewardship; they both can be blended together. There’s a fine line, but so long as you can sell both of those together, you can have your cake and eat it too.” (C)</p> <p>“And certainly, wild and wooly doesn’t cut it, or equate with sustainable.” (U)</p>

Table AF.24 Quotes describing mechanics-based factors affecting communication about sustainable landscaping initiatives at Dow Electronic Materials

SUPPORTING QUOTES
<p>“I think it’s important that it not look bad, cheap, or unmaintained. I don’t think it’s important that it look extravagant, because I think our employees in general, or even our customers, if they saw us spending huge amounts of money, they would wonder why we’re putting the money into that instead of something else, right? I think most people are fairly conscious of that stuff. But if we look like we are not maintaining, that’s not a good sign. We have a lot of customers that come through on visits, and appearance makes a difference to them.” (SL)</p> <p>“The signage is critical, because it’s all trademark, and marketing, it has to be exactly the same. We have very very specific restrictions on what our signs can look like.” (FB)</p> <p>“For the most part we’re not affected by any easements...On each side of the road there’s a five-foot utility easement, but for the most part...we’ve got pretty much open reign here on site.” (FB)</p>

Table AF.25 Quotes describing desired message content for communication about sustainable landscaping initiatives, from organization interview respondents

THEME	SUPPORTING QUOTE(S)
Advertising environmental stewardship (n=4)	<p>“When you start putting yourself in that kind of limelight with the Department of Natural Resources, you’re setting good example, saying we do care, and we’re doing all we can to protect our local watershed and wildlife, etc.” (C)</p> <p>“Quite honestly, we thought it would be a good fit with them, and it would send a good message not only to the people who work there, but people who are going by the hospital, seeing that they are doing their part to sustain things, to be a greener company.” (R)</p>
Assuaging fears of negative outcomes (n=3)	<p>“You have to reassure them, because there’s less lawn to mow. I’m not trying to take a job away from them, I’m trying to make what we do more friendly to the environment. But what they’re going to do, they’re still going to have the same amount of work, it’s just going to be a different type of work.” (U)</p> <p>“Grooming [and] environmental stewardship, they both can be blended together.” (C)</p>
Describing the practices and their benefits (n=5)	<p>“So, incorporating that same concept into campus, you really got to focus on the wildlife. You cannot just tell the kids ‘I’m not going to mow the grass because it’s bad, or because it’s a cop out.’ You have to come up with an educational value of why these are important. What we say is stormwater, carbon footprint, labor, and the money we save on gas and fuel.” (C)</p>
Highlighting non-environmental benefits of the practices (n=4)	<p>“So, when we add all those [numbers] up, it’s pretty impressive. It’s labor and fuel costs; it’s lots of money you save.” (C)</p> <p>“To go back to the fact that I don’t talk much about ecology with my clients: I’m making the assumption that I’m a good enough designer to be able to take the ecological inclinations that I have, the largest part of which is using native plants, and turn it into a landscape that is visually acceptable to these people and people in the surrounding neighborhood.” (LD)</p>
Justifying use of the practices (n=2)	<p>“And I think it’s important to educate them so that they know why we don’t cut the grass in our meadows, why we have a composting toilet.” (SP)</p> <p>“You’re saying this is why we do it, these are the good points, there aren’t a whole lot of bad points, why wouldn’t you do it.” (LM)</p>
Recognizing third-party oversight (n=2)	<p>“I wasn’t them to know that the products we use, that if there pesticides we apply—we do apply pesticides—that they’re all approved by the EPA, they go through a ten-year approval process before they’re even able to touch the golf course.” (GC)</p> <p>“To be Audubon certified, and to do everything they ask you to do, is really a good selling point.” (C)</p>

THEME	SUPPORTING QUOTE(S)
Teaching the practices/asking for behavior change (n=3)	<p>“To me, that is the biggest thing right now. Just master the techniques, both the design and implementation and management. Which is why that in my conferences, I try to focus on how to do this stuff, and not just running around, rah rah rah, let’s save the world.” (LD)</p> <p>“I’m not saying what we’re doing here is the right thing, but maybe it could turn on a light switch for them, to show them they could do it this way or that way.” (C)</p>

Table AF.26 Quotes describing desired message content for communication about sustainable landscaping initiatives at Dow Electronic Materials

SUPPORTING QUOTES
<p>“And we would tell them a little bit about the landscape and what plants we used, and why we're doing this. In this atmosphere you might even put in something about costs...that it could save fuel, that it could [reduce] pollution.” (FB)</p> <p>“Part of the reason why this is getting good favor is that there's some places that just look terrible and are hard to maintain and we're talking about making them look better, so, great! And [some] people don't care if it's sustainable or not, they just are happy that there's some ideas about making things look better.” (RD)</p> <p>“This is a great way to share an example with other sites, as well as with the employees with what they can do at their own site and at their own homes...It generally is a local story because our greater sustainable/environmental efforts come from the corporate level, and they are larger and more impactful partnerships. This one is symbolic of localized, positive steps in the right direction, and that is just an extension of all that work.” (PA)</p>

Table AF.27 Quotes describing current media for communication with landscape users/viewers or the larger community at interviewee organizations

THEME	SUPPORTING QUOTE(S)
Audio-visual media (n=1)	“Think Green: Needwood Golf Course” (GC, online video)
Branding (n=1)	“New logo developed by MCG’s Environmental Committee will help spread the word about the many green practices and programs in place at Montgomery County Golf facilities!” (GC, press release)

THEME	SUPPORTING QUOTE(S)
Demonstration/model area (n=2)	<p>“And then we have a compost demonstration plot. Which is small, like what you could do if you were at home doing composting.” (SP)</p> <p>“We are doing an educational nine holes. So what that means for us is that we are taking the opportunity to educate people, and golfers, on the environment, and about the impact golf makes on the environment, and how we can do a better job at eliminating those impacts.” (GC, online video)</p>
Directly answering questions/one-on-one conversation (n=5)	<p>“But [until the website], I didn’t really do any advertising or anything where I had to make a decision as to how I was going to present myself. How I presented my self is how I talked to someone on the phone when they first called.” (LD)</p> <p>“Sometimes students will ask you, ‘Why?’ and then you tell them.” (C)</p> <p>“There is a county council member who had written him a letter, something about the Rachel Carson Council...an anti-pesticide group that really focus on golf courses.... So, we formulated a sort of rebuttal, a ‘Hey, here’s what’s going on for real.’” (GC)</p>
Handout/visual aid (n=2)	<p>“We purchase 100% green power, build green to LEED standards, and are the first college in Maryland to be certified by Audubon International’s Cooperative Sanctuary Program.” (C, campus map)</p>
Management plan document (n=1)	<p>“This document provides key background information on aquatic buffer types, functions and needs, along with distinct strategies for buffer establishment, protection and management for St. Mary’s College of Maryland (SMCM). This document...may also be useful for engaging other local institutions and regional partners in providing sound buffer management for the campus, the St. Mary’s River, its tributaries and related surface waters and wetlands.</p>
Meeting, presentation, tour (n=5)	<p>“Here, at Needwood....we’re going to start doing tours. It could be environmental groups, it could be high school classes, it could be girl and boy scout troops, to come out and kind of learn about things we do to promote environmental initiatives, and that golf courses aren’t a bad place.” (GC)</p> <p>“We’re going to be doing workshops about meadows, and about shoreline buffers, and about rain gardens, and about how you can have an organic lawn.” (C)</p>
Notice/information board (n=1)	<p>“We have an area in each one of the clubhouses [that] is dedicated to environmental information as far as what’s going on.” (GC)</p>
Organizational newsletter/publication (n=2)	<p>“UD groups work to promote sustainable landscapes on campus” (U, online newsletter)</p>
Press releases/public relations (n=2)	<p>"Montgomery County Revenue Authority Using Environmentally Friendly Fertilizer at its Golf Courses" (GC, press release)</p>
Signage (n=4)	<p>“We put up signage for our meadow areas and our stormwater buffer areas. And we went from getting 15-20 calls a week to 0.” (C)</p>

THEME	SUPPORTING QUOTE(S)
Social media (n=1)	“We have a Facebook page. We have 820 friends or fans on Facebook; it’s a good number of people. So, anything that comes out related to these articles [about our practices], we post it.” (GC)
Stakeholder participation (n=1)	“Student involvement is the best, best way to get these programs started because they’re here, they live here; they’re a part of it. Getting them to be a part of the program, make them involved, give them ownership of it makes it a lot easier...Ironically, our community service kids—they’ve did something crazy, got in trouble—will come work for us, and we’ll put them as part of a project, and get fascinated by it, and say, ‘Wow, we didn’t know you were doing this.’” (C)
Temporary exhibit (n=1)	“I just built a rain garden on the Lewes Campus. And I’m working with...people down there, [and] we’re going to have a display and some handouts for Coast Day in October.” (U)
Third-party recognition (n=4)	<p>“I’m not sure if you’ve seen it; it’s on our website. In the New York Times there was a big article on Larry’s work.” (staff person, LD)</p> <p>“For example, when we started doing the Groundwater Green site program, I was contacted by some national pubs in the golf industry who ended up doing a couple of articles with what we’ve done.” (GC)</p> <p>“When we got [certified by the Audubon Cooperative Sanctuary Program], it was pretty good, because we got a lot of recognition from it, and that’s really what lead me to do a lot of these national lectures across the United States. It’s from this very thing.” (U)</p>
Website (n=1)	“The MCRA is committed to taking steps to reduce our impact on the environment.” (GC, website)
Word-of-mouth (n=1)	“As far as my campus users, I have to say word-of-mouth. Word-of-mouth is the best tool we have going on. I know it isn’t fancy, but it works.” (C)

Table AF.28 Quotes describing current media for communication with landscaping staff or upper-level management at interviewee organizations

THEME	SUPPORTING QUOTE(S)
Directly answering questions/one-on-one conversations (n=2)	“Instead of me trying to teach [the landscape maintenance staff], it was easier for me to manage them if they come to me, ‘Why are we doing this?’ Then I will be telling them, ‘This is why.’ Then, they get it...Then, they buy into it, and they understand it.” (C)
Management plan document (n=3)	“I have begun putting together landscape maintenance manuals...Not only in a booklet, but also on the facility server, so that grounds folks can access it that way as well.” (U)

THEME	SUPPORTING QUOTE(S)
Meetings/presentations (upper-level management) (n=2)	“We have a board of directors that our director reports to... I do an annual presentation to the board, and some of that is environment, some of that is projects on the course and other stuff.” (GC)
Off-site professional development opportunities (n=1)	“We attend, pretty frequently throughout the year, our local superintendents association, [which] has monthly meetings and educational seminar as part of the meeting... We get together to talk about what’s working, and what’s not working.” (GC)
On-site meetings/training sessions (landscaping staff) (n=4)	“We do a walk through with the maintenance team, give them directions, and send them a report afterward, so they have a documents that outlines what they should do.” (LD)
Soliciting participation in decision making (n=1)	“I have found that working with the grounds division on installations has been more beneficial because if they install it, they're more apt to buy into the maintenance of it, and understand, because I'll work closely with them and be able to explain to them why I'm using [the practices].” (U)
Word-of-mouth (n=1)	“I have a couple of watermen that work for me... They’re local folks, so they’ll appreciate what you’re doing for their environment.... And they’ll also go out to talk to other people and say, this is why we’re doing it.” (U)

Table AF.29 Quotes describing current strategies for communication with landscape users/viewers or the larger community at interviewee organizations

THEME	SUPPORTING QUOTE(S)
Establishing a non-profit for educational purposes (n=1)	““[‘New Directions in the American Landscape’] is basically a native design conference... with the mission to educate professionals and non-professionals about ecological landscaping. And because I was running that conference, I probably became associated with it, with that style of work, and that led to other speaking engagements at other places... So I never had some marketing person come in here and say, ‘oh, here’s how we brand you’ or anything.”” (LD)
Partnerships, External (other organizations; including third-party certifiers) (n=3)	“The extension office from the University of Maryland... has superb programs that they have in place. Then, from the practices that we do, came about a collaboration effort, where they said ‘Hey, this is a good way to use your campus as a model.’” (C)
Partnerships, Internal (people in other departments)	“But it goes back to [a professor and cooperative extension specialist] promoting it. Since the installations, there have been events that she has sponsored; she has had tours of the facilities... I

THEME	SUPPORTING QUOTE(S)
(n=3)	<p>know there were two buses of visitors that went to these sites. She did most of the talking but I had the opportunity to answer questions and so forth.” (U)</p> <p>“The team really put [the interpretive sign] together, to go with the campus traditional style.... Some people from the President’s Cabinet, myself, and some people from Marketing.” (C)</p>

Table AF.30 Quotes describing current media and strategies for communication with stakeholders at Dow Electronic Materials

SUPPORTING QUOTES
<p>“We’ll be sending out emails as we do things. [The Facilities and Buildings Manager] already sent out one explaining the changes we’re making at the entrance. It was a nice email explaining what sustainable landscaping is and why we’re doing it.” (RD)</p> <p>“At the [Community Advisory Council] meeting on this past Friday, [the Facilities and Buildings Manager] presented a description of the work, that we’ve engaged with the University of Delaware, the progress to date, and the future plans.” (PA)</p> <p>“I think if we were to try to do one big megaproject all at once, I probably wouldn’t get support for it, because there would be a lot of financial issues, and there would be a lot of questions: ‘Will this work? Will that work?’ We’ll be in an endless loop. So, basically, the approach of demonstrating by doing is a good way to get started... We may find that employees are interested enough that we will plant out areas as employee projects over time.” (RD)</p>

Table AF.31 Quotes describing potential media for communication with landscape users/viewers or the larger community at interviewee organizations

THEME	SUPPORTING QUOTE(S)
Audio-visual media (n=1)	<p>“I think that with unlimited resources, we would have a little LCD screen in each golf cart, and as people drove around the golf course, it would maybe be a 10 second message, about ‘You’re driving through an area that’s home to the monarch butterfly,’ or ‘Look to the left through the woods, there’s a brush piles that we leave piles of sticks that are good habitats for raccoons or foxes.’” (GC)</p>
Demonstration/model area (n=1)	<p>“Have demonstration plots with signage that people could do self-guided tours.” (SP)</p>
Directly answering questions/one-on-one conversation	<p>“And I think it would be great if we had the money to employ even our seasonal workers being people who have the background to be able to explain to people about what they’re doing.” (SP)</p>

THEME	SUPPORTING QUOTE(S)
(n=1)	
Handouts/visual aids (n=3)	<p>“I think what I would do is probably have drawings done to show the different areas that we would like to potentially reduce the mowing. Have pictures of what it could look like, and give them a couple different scenarios.” (LM)</p> <p>“Even a handout, because people love those handouts.... [With] educational information about...a specific management technique we're using.” (SP)</p>
Meeting, presentation, tour (n=2)	<p>“Maybe even having almost a management tour...occasionally have someone go through and talk about the management.” (SP)</p> <p>“If I could just have the expense to travel and get the word out, that would really be the best medicine.” (C)</p>
Organizational newsletter/publication (n=1)	<p>“I would certainly go through the [alumni publication], because I know that the administration is seeking more support from the alumni and the more ways that you can, you know, bring in the money from donors, the better.” (U)</p>
Signage (n=2)	<p>“I want it to be like the zoo when you go around. Not overdone, but subtle, with nice little displays all over the place that really catch your eye.” (GC)</p>
Website (n=1)	<p>“Whether it’s a company, retail, a college, or a restaurant...for people to show what they’re doing, I highly recommend it in the website, because people always look in the website.” (C)</p>

Table AF.32 Quotes describing potential media for communication with landscaping staff or upper-level management at interviewee organizations

THEME	SUPPORTING QUOTE(S)
Handouts/visual aids (landscaping staff) (n=1)	<p>“But, I think that maybe, probably on our part, there could be more of an effort to reach out in Spanish documents about what we’re doing. There are some Spanish golf industry magazines from Spain, from golf courses over there, so I could probably find some articles to print out for them and get them more engaged.” (GC)</p>
Meetings/presentations (upper-level management) (n=1)	<p>“And then taking them on a tour—not all of them play golf, but I want them to come out and see the facility.” (GC)</p>
Off-site professional development opportunities (n=2)	<p>“I would seek out opportunities to take these people to different places and look at the different situations. Good ones and bad ones...I'm talking day trips here.” (U)</p>
On-site meetings/training sessions (landscaping)	<p>“Again, not sounding like a broken record, but it’s having people like Sue [a cooperative extension specialist] come in and educate</p>

THEME	SUPPORTING QUOTE(S)
staff) (n=3)	us.” (LM) “Doing some education about native plantings...and just learning the names of plants, so that when they walk through there, it's not just a bunch of strange plants to them, they're familiar with them.” (SP)
Soliciting participation in decision making (n=1)	“And then, working side-by-side with people that are going to end up maintaining and taking care of these areas, about their concerns with it and about, and trying to address the concerns.” (SP)

Table AF.33 Quotes describing potential strategies for communication with landscape users/viewers or the larger community at interviewee organizations

THEME	SUPPORTING QUOTE(S)
Hiring additional staff to support sustainability efforts (n=1)	I think the biggest thing would be having one or two staff members, maybe on a senior level, that are focused specifically on all of the environmental initiatives. As far as ‘Let’s let this grow up, let’s get a sign over here,’ we [already] do that, but to really, really, dig in to this program, I think to have the extra people to deal with that on a year-round basis would be great.” (GC)
Increased advertising/advocacy by professional organizations (n=1)	“I think the resources that are there are pretty good as far as the Environmental of Institute of Golf...[but] I don’t think as much effort goes into publicizing the environmental side of things...I guess that it comes down to TV time, getting better press from the local TV stations or Discovery Channel or those types of thing, if they would do one of their one-hour shows on environmental initiatives for golf.
Market research (n=1)	“We might wait on the permanent sign [for the new rain garden], to see the kind of reaction we get from people who come to our table [at Coast Day]. Or hear what they ask, so that we can gear the sign to that.” (U)
Seeking third-party recognition (n=1)	“Write articles. If you are okay with it, do lectures. My philosophy on publicizing your work...is not to do things that you wrote yourself or somebody that you hired wrote, as in an ad. Do things where someone else made a determination that you have something to say. If you write an article, and it’s in the Brandywine Conservancy’s newsletter, that’s saying that an impartial, knowledgeable organization has determined that you have some knowledge that is worthwhile. If your website is saying ‘greatest landscape designer that has ever lived,’ all that means is that you’re talking about yourself...it doesn’t really mean much.” (LD)

Table AF.34 Quotes describing potential media and strategies for communication with stakeholders at Dow Electronic Materials

SUPPORTING QUOTES
<p>“It’s when we have a message to share, at that point deciding what the best vehicle is for that message. Because we have so many vehicles and you don’t want to overload them; pare it down to the two or three best vehicles to use, and let’s do that, designing the communication for those vehicles.” (EE)</p> <p>“We’ll share this when we have town halls with all 600 employees on site, we’ll put a story in our intranet to share it across the globe, but more specifically across the U.S. We’ll also incorporate it in other mentions of [sustainability] efforts made.” (PA)</p> <p>“There are two other things that I would like to do. One is to have at least a few sites where we have labeled the plants, similar to what’s done at the university gardens...so people can actually come and see if they’re interested, and know what they can do at home.” (RD)</p> <p>“I think it’d be great to do things like put up the design and describe to people why the details are there. And, people that are interested will be into it, and somebody who didn’t think they were might get interested, so I think it’s a valuable thing.” (SL)</p> <p>“I’m trying to think, is there some kind of contest that I could run with employees, with finding certain species or something...Maybe that’s part of the education, ‘We’re using an elm because of this.’ In addition, anyone who fills it out correctly can put it in a box and there’s a drawing for something.... I’m wondering if that’s a way to actually get people to use, see and learn at the same time.” (EE)</p> <p>“We have a fairly large employee team called Evergreen within the company global team that shares all sorts of information about best practices around sustainability. What I think will happen with this activity is once we get it going...we’ll use that mechanism as way...to explain what’s going on and hopefully we’ll spark other interest in the company.” (RD)</p> <p>“Thought leader training I think is a really visionary way to promote the activity...to find some of the thought leaders in the organization who are interested in the topic and basically have...the company pay to send them away for a day to the university or somewhere and really get some in-depth background on what it means by sustainable landscaping. And they’ll come back and they’ll be able to interpret that to other people...as voices within the organization. It’s an idea; I don’t know if we’ll do that or not.” (RD)</p> <p>“Clearly, the company pays the water bill. And clearly, the municipalities and locales regulate them. So, I think that if you work with county or municipal governing body...they have many outreach efforts that promote [sustainable landscaping]. And essentially, you can use employers who do something like this as an example. Partnerships are the key.” (PA)</p> <p>“I think the timing is perfect for someone to write a book aimed at plant managers and maintenance managers—people who are responsible for the landscaping of existing company sites—to give them guidance as to what’s possible: How do you convince companies to do it? How do you get started? That would be really helpful. Something that would basically pull it all together...Much of what’s out there is just too general.” (RD)</p>

Table AF.35 Observations and recommendations related to communication about sustainable landscaping, from Janet Marinelli of Blue Crocus Consulting

OBSERVATIONS/ RECOMMENDATIONS	SUPPORTING QUOTE(S)
A sustainable landscape is defined as a landscape that restores healthy ecological function	“I think a sustainable landscape is a landscape that restores healthy ecological function. In a nutshell, as I would define it, healthy landscapes provide all kinds of natural benefits that are essential to life—including human life—like flood control, cleansing air and water, carbon sequestration, and maintaining soil fertility. I mean, there is a whole list of natural benefits that healthy landscapes provide. And so, to be truly sustainable, a landscape has to restore or at least provide the conditions so that the landscape can naturally regenerate that kind of ecological function and processes.”
Stormwater management and energy conservation are high priority sustainable landscaping practices in the Mid-Atlantic region	“If we’re talking about the Mid-Atlantic, one of the biggest priorities should be restoring some of the site’s natural hydrological function, because stormwater is a huge issue in the Mid-Atlantic...But then, energy conservation is important everyone. So, taking some relatively simple steps to shade air conditioning units so that they function more efficiently and don’t require as much energy, and other steps to make the landscape more able to help conserve energy in buildings.”
Communication methods should be developed to address resource constraints	“It would be interesting to find out specifically what the impediments to communication are—is it staff, is it expertise, and then you can target your recommendations to fulfill those needs...If it is the lack of staff or the lack of money, then obviously, you wouldn’t want to do some expensive signage project. It might be more person-to-person, where the people in charge of making the changes do lunchtime tours on the corporate campus for the people who work there or whoever the target audience is.”
Highlighting non-environmental benefits could be helpful	“You could put together a fact sheet on the financial advantages that can be gained by sustainable, you know savings in water bill, savings in electricity.”
There is a growing trend to seek third-party certification for sustainability initiatives	“As the [Sustainable Sites Initiative] develops and becomes better known, I think people will be more apt to do that, just as more and more sites of all types are starting to participate in LEED, just because there is more social pressure and public relations benefits for doing that, in addition to being the right thing to do.”

OBSERVATIONS/ RECOMMENDATIONS	SUPPORTING QUOTE(S)
<p>The Sustainable Site Initiative's "Landscape for Life" campaign could be a good educational resource for institutions establishing communications about sustainable landscaping practices</p>	<p>"If you look at some of the facts in there, and if you look at the print document that we produced, a little brochure, there's a page in there that says why, why to 'landscape for life.' This is tailored for homeowners and gardeners, but the statistics are as relevant for your target audiences as they are for them."</p>
<p>Mission-based interpretation would be an appropriate communication process to use, even for institutions that don't typically focus on interpreting the landscape</p>	<p>"Interpretation is obviously a communication process, but it's one that is designed to create experiences that heighten appreciation of a particular resource, which is most often a place, but it could be a program. In ways that advance the organization or the site's mission. That's how I would define it....A public university's mission, obviously, is education, educating students and other people who use the landscape; [that] certainly fits into this advisability to educate them about sustainability. I think the case could be made in different ways for different audiences. Like for a corporation, marketing and public relations are a really high priority, and making their brands seem more environmentally friendly is increasingly important for them. The case can be made from that angle for corporate campuses. So, it just depends what the particular situation is. At a hospital...well, the health angle. A sustainable landscape isn't just healthy for the environment, it's healthier for people....So, different target audiences that you're investigating could accommodate this notion of interpretation of sustainability in different ways, depending on what their missions are."</p>

OBSERVATIONS/ RECOMMENDATIONS	SUPPORTING QUOTE(S)
Public horticulture institutions or associations could provide assistance with communication initiatives	<p>“I think that these people [who want to communicate about sustainable landscaping initiatives] are going to need help. So this is one fo the reasons that I think it would be a natural for public gardens to reach out these groups and help them. Most public gardens are all about public education, and are increasingly concerned and active about sustainability.”</p> <p>“Individual public gardens or something like [the American Public Gardens Association] could put together a package like Audubon [Cooperative Sanctuary Program] that could be customized by region or situation to make this kind of thing easier for people to do.”</p> <p>“Though, outreach as it’s traditionally done now at public gardens isn’t a for-fee service because it’s usually with community groups or whatever, but there’s no reason it couldn’t be for for-profit entities, such as corporations or hospitals or universities. Public gardens already put together packets of information on creating school gardens, for schools and so on, so it would just be an extension of that to put together a package or program for the kind of organization that you’re working with....Science departments at various public gardens that have them also do for-fee services. If they’re going to do a flora of some site, they’ll get paid for that. So, I think there’s precedent for that sort of thing.”</p>

Table AF.36 Observations and recommendations related to green industry marketing of sustainable products and practices, from Steve Bogash of the Pennsylvania State University Cooperative Extension, Franklin County

OBSERVATION/ RECOMMENDATIONS	SUPPORTING QUOTE(S)
Consumers want to feel intelligent about their purchases	<p>“I have been a long observer of people in markets [and this is] part of the reason I teach this a lot and do a lot of research: There is one thing that motivates the American consumer, and it’s one thing that I would say motivates every consumer, and that is [that] they want to feel like the purchase that they made was the smartest thing that they ever did. That is the most basic marketing tenet.”</p>

OBSERVATION/ RECOMMENDATIONS	SUPPORTING QUOTE(S)
Consumers often make decisions instinctually, so sustainability initiatives should be visible and pervasive	“If you show up to do your sales pitch, and you are in a hybrid, that’s a lot different than somebody showing up in a stinky diesel. Now, that diesel may get 35 miles per gallon, but if you show up in a hybrid you’re green. And so, perception is everything in all of this...If you’re running a garden center, if you’re running a greenhouse business, and your pesticides are organic, or they’re soaps and oils and things along that line. You’re not carrying much from Ortho, you’re carrying things from greener companies. You’re doing a lot with native plants, not that I’m a big fan of natives, but that tends to convince people. Things that are pollinator-related, things that are not plastic, but are made of more natural materials. You have a green perception at this point.”
People can’t always see environmental-friendly products/practices directly, so there is a need to communicate	“And to me, [a large pile of plastic nursery containers] is a very strong advertisement of something that’s not green. If you want to do this, this is fine; you’ve got to prop a sign here that says ‘these are on their way to the recycling.’ Then, it’s green.”
Price is often the deciding factor when consumers consider purchasing green products/services	“You’re the buyer, and you just bought a brand new home, and you’re interviewing me as one of three prospective landscapers, you’ve limited it down from 10-12 in your local market...And you’re going, I like both people, this one’s not as green as I would like, or maybe my perceptions, but I have \$3500 that I can save, and I think that everything else is equal. What are you going to do at that point? You have a tough decision to make. Is green enough for you at this point? ...And so, [companies] have to be within the marketplace.”
Sustainable initiatives need to be economically sustainable as well; you can’t compromise your business at the expense of being green	So, for green industry business, [being sustainable] would be remaining profitable while promoting practices that are environmentally friendly so that the next generation, or the generation after that inherits at least the planet is as good a condition if not a better condition than we gave to them...But from a business point of view, they’ve got to be profitable. A lot of people forget that all the time.”
Hiring well-trained staff that can communicate well is key	“Your crew needs to be better trained, and that’s probably the single biggest aspect that I see that a company could do... And I don’t care if this is the wholesale production end, the retail end, the landscape end; your people need to be trained really well...[so] they can speak the language and also translate that into what a customer can actually understand.”
Green marketing is not separate from other marketing initiatives	“You can’t say, this is my green marketing, and this is my marketing. You have a marketing plan...and your marketing plan is a single piece. It is seamless. I wish it didn’t have leaks in it, but they always do. The idea is that when folks see you, there is a single image that they see of you. You may see different facets of it, but they see a single image and they want to do business with you. It is really important that they want to do business with you.”

OBSERVATION/ RECOMMENDATIONS	SUPPORTING QUOTE(S)
Consumer demand exists for green gardening practices and products	<p>It's nowhere near a fad; it is a trend, and it's a trend for a lot of reasons. Rachel Carson started it in 1962... She really did a very good job of summarizing how bad the green industry was. And now we've done this long, long shift to the point that the entire industry is now largely green."</p> <p>"And the beauty of it is that the consumer is driving the industry. The industry has no choice except to go along with it... And green does cost a little bit more. But, that's not going to go away. It just means that we do a little bit of a stumble, and as the economy picks back up, folks want so badly to feel good about their purchases. You can't feel good about something that either destroys a third world country where they're making the chemicals, adds plastic to the environment, there's no way to feel good about those products. And we do have this desire as humans to feel good about our purchases."</p>
A challenge for communication about sustainable initiatives is translating the science for the general public	<p>"I want [small fruit, vegetable and nursery growers] using a lot more biological fungicides...using practices that are relatively safe and pet-friendly. You could write the marketing thing for that, [but] how you translate that to the American consumer is really a big challenge. They aren't really well educated."</p>
Third-party certification and recognition is a great strategy for advertising sustainable initiatives	<p>"If I am constantly in the local newspaper with articles, I have built my business up based on that. ...One of the beauties now is that local newspapers, well, even big ones, have laid off almost all of their reporters. There are so few reporters left. So, if you send content to them, they are likely to use that content, as long as it is not all self serving."</p>

OBSERVATION/ RECOMMENDATIONS	SUPPORTING QUOTE(S)
There are certain practices that convey the message of environmental sustainability	<p>“What kinds of things can define your greenness?”</p> <ul style="list-style-type: none"> • Pest management practices • Energy use and efficiency • Recycling • Merchandise • Pesticides • Native plants • Bee / Bird / Butterfly plants • Pots and planters • Pot return policies • Signage” <p>“Things we can do to enhance our clients perception of our greenness:</p> <ul style="list-style-type: none"> • Brag about our pest management programs • Signage • Tags • Educational open houses and gardening programs • Xeriscaping • Soil building • Garden Club behind the scenes tours • Demonstrate energy efficiency • Train your staff • Inventory green pest mgt. products” <p>(from S. Bogash’s powerpoint presentation)</p>

Appendix G:

SAMPLE CONSENT FORM

INFORMED CONSENT FORM FOR INTERVIEWS

The Longwood Graduate Program in Public Horticulture

Explaining Sustainable Landscaping Practices to Stakeholders

You have been invited to participate in a research study to gain your perspective on the topic of communicating information about sustainable landscaping practices. The purpose of this study is to develop recommendations for explaining sustainable landscaping practices to users of the landscapes and other stakeholders.

Please read the information below describing this study and feel free to ask questions about anything you do not understand before deciding to take part. Your participation is voluntary and you are free to refuse to answer any question or withdraw from this study at any time without penalty.

Procedures of the Study. This research began with a survey to green industry professionals in the Mid-Atlantic Region, administered through several professional associations. Series of interviews will be conducted with organizations that have implemented or plan to implement sustainable landscaping practices. You have been selected to participate in this research because of your implementation, or planned implementation of sustainable landscaping practices.

This interview will last approximately one hour. Audio recordings of interviews will be necessary to ensure proper collection and comprehension of data by researchers. Audio recordings and notes taken during the interview will serve as the basis of the research. Audio recordings will be destroyed two years after the study is complete. Direct quotations, your name, and the name of your organization might be referenced in the final document. There is no compensation for your voluntary participation in this study.

If you understand that this interview will be audio recorded and you agree to this, please initial here:

_____ **Subject's Initials**

Contact Information. If you have questions about this research, please contact Rebecca Pineo (rspineo@udel.edu), Longwood Graduate Fellow, or Dr. Robert Lyons, Longwood Graduate Program Coordinator by phone at (302) 831-2517. If you have any concerns about your rights as a participant, contact the Chair of the University of Delaware Human Subjects Review Board at (302) 831-2136.

If you agree to participate in this research, please print and sign your name below.

.....

Name of Subject (please print)

Signature of Subject

Date

Appendix H:

INTERVIEW GUIDES

Organizational Interview Questions

All questions are intended to capture the opinion of the interviewee. Not all of the below questions will be asked of all interviewees. The phrases listed below will be substituted as appropriate for phrases specific to the interviewee and his/her organization (indicated by *italics* within the interview questions). General definitions are as follows:

- *Landscape users/viewers* – people who pass through, use, or view the landscape
- *Management* – those ultimately responsible for managing the organization as a whole; those to whom the interviewee reports within the hierarchy of the organization
- *Landscaping staff* – front-line workers responsible for landscape installation and/or maintenance; can be internal staff or outside contractors

Introduction

- Overview of research and what will be covered in the interview
- Informed consent information/form; recognition of voice recorder

General information about organization and respondent's position

- What is the full name of your organization?
- Please describe the mission/business niche of your organization. Do you have any materials (brochures, marketing, website, etc) where more information about your organization is available?
- Where do you fall within the organizational structure of your organization? What is your position?
- What are your main responsibilities? Specifically, please describe your involvement with landscaping at your organization.
- Who in the organization is ultimately responsible for the following:
 - Consultation with the client
 - Making decisions about the landscaping practices
 - Landscape design
 - Landscape installation/construction
 - Landscape maintenance
 - Communicating to landscape users/viewers, management, and/or landscaping staff about landscaping practices

General information about sustainable landscaping practices

- Please describe the sustainable (environmentally-friendly) landscaping practices you are currently using, including when they were implemented. What is your definition of “sustainable”? Please comment on how innovative you think these practices are compared to what other organizations are doing.
- Who decided that sustainable landscaping practices should be used?
- Who was responsible for implementing sustainable landscaping practices?
- What are the main reasons for implementing sustainable landscaping practices?
- What are the main challenges you (or the organization in general) faced when implementing sustainable landscaping practices?
- In your opinion, do the sustainable landscaping practices that you use result in landscaping that looks different than conventional landscaping?
- Has your organization received any referrals, media interest, or special recognition because of your use of sustainable landscaping practices?

***Landscape users/viewers* – responses and communication efforts**

- How have *landscape users/viewers* responded to the implementation of sustainable landscaping practices? Please describe any comments, complaints, and/or compliments that you have received.
- For landscape company only:
 - What is your process for convincing clients to implement sustainable landscaping practices (or, how do you present your landscaping plan in general)?
 - What expectations do clients have, and can you meet them with sustainable practices?
- What do you think are some challenges associated with communicating information about your organization's sustainable landscaping practices to *landscape users/viewers*?
- Do you think the *landscape users/viewers* understand that the landscaping practices are more sustainable than conventional landscaping practices?
- Do you think the *landscape users/viewers* understand specifically why the landscaping practices are considered more sustainable?
- Do you think that there is a need to communicate information about the landscaping practices to *landscape users/viewers*?
- Do you want *landscape users/viewers* to know more about the landscaping practices?
- Have you or anyone else attempted to inform *landscape users/viewers* about sustainable landscaping practices taking place at your organization? Is there a designated staff person or budget allowance for doing so? Please describe any efforts, and how effective you think they have been.
- What information do you think is important for *landscape users/viewers* to know about the landscaping practices?
- If you had unlimited resources, how would you go about communicating information about your organization's sustainable landscaping practices to *landscape users/viewers*?
- What tools/resources would be helpful for you in communicating information about your sustainable landscaping practices to *landscape users/viewers*?

Management – responses and communication efforts

- Has there been a need to communicate information about the landscaping practices to *management*? Do you want *management* to know more about the landscaping practices?
- What information do you think is important for *management* to know about the landscaping practices?
- Please describe any efforts to communicate information about landscaping practices to *management*, and how effective you think they have been. What are your talking points (e.g. revenue, expenses, image, employee morale)?
- Has *management* “bought-in” to the sustainable landscaping practices?
- How has *management* responded to the implementation of sustainable landscaping practices? Please describe any comments, complaints, and/or compliments that you have received.
- Do you think *management* understands that the landscaping practices are more sustainable?
- Do you think the *management* understands specifically why the landscaping practices are considered more sustainable?
- If you had unlimited resources, how would you go about communicating to *management* about the sustainable landscaping practices?
- What do think are some challenges associated with communicating to *management* about the sustainable landscaping practices?
- What tools/resources would be helpful for you in communicating information about your sustainable landscaping practices to *management*?

Landscaping staff – responses and communication efforts

- How has *landscaping staff* responded to the implementation of sustainable landscaping practices? Please describe any comments that you have received.
- How have you communicated the changes to *landscaping staff*? What are your talking points?
- Do you think *landscaping staff* has bought-in to these changes?
- Does *landscaping staff* have the knowledge to implement sustainable landscaping practices? Has retraining/coaching been necessary?
- What tools/resources would be helpful for you in communicating information about your sustainable landscaping practices to *landscaping staff*?

Wrap-up

- Which has been the biggest challenge – getting *landscape users/viewers*, *management*, or *landscaping staff* to accept your organization's sustainable landscaping practices?

- Are there any leaders you look up to in terms of implementing and/or interpreting sustainable landscaping practices?
- The ultimate goal of the research is to develop recommendations for explaining sustainable landscaping practices to stakeholders. Do you have any other comments or suggestions about this topic that have not already been addressed during this interview?

Expert Interview Questions

S. Bogash (green industry marketing)

- Please describe your position and your main responsibilities.
- Please describe your background in the field of marketing, and your background in educating green industry professionals about marketing. What do you specialize in?
- What is your definition of niche marketing? What is your definition of green marketing?
- Do you feel that marketing sustainable landscaping services would be more or less effective than marketing conventional landscaping services?
- How important do you think “being green” is for a company’s image?
- What advantages and disadvantages are there to marketing landscaping services and/or products as sustainable?
- Sustainable landscaping is not a widely understood concept. Can marketing be used as a tool to inform potential or current clients, in addition to getting them to buy a product or service?
- How can a company avoid the pitfall of “greenwashing,” and/or the perception that they are greenwashing?
- Do you think a marketing approach would be useful for internal communications as well as external communications (for instance, communicating to employees about sustainability)?
- Is there anyone you see as a leader in the area of marketing sustainable landscaping?
- What general recommendations do you have for companies wanting to market sustainable landscaping?
- The goal of my research is to develop recommendations for communicating information about sustainable landscaping practices to landscape users and other stakeholders. Do you have any more general ideas or comments on this topic?

J. Marinelli (sustainable landscaping/interpretation)

- What is your definition of sustainable landscaping?
- What is your definition of interpretation?
- Do you feel that the frameworks of interpretation and interpretive planning are appropriate for my topic of research?
- Do you have any ideas/suggestions for communicating about sustainable landscaping practices at a non-interpretive sites?
- Do you see a role for public gardens in providing outreach/assistance to sites that are implementing sustainable practices?
- You’ve worked with the Sustainable Sites Initiative on educational aspects. What’s your perspective on how my research fits in with SSI efforts?
- Any commentary or suggestions about my research methodology would be welcome...e.g. Are there any angles that I missed that would be prudent to investigate?

Appendix I:

CASE STUDY INFORMATION NEEDS CHECKLIST

The list in Table AI.1 was developed based on the interpretive planning “Information Needs Checklist” and the 5-M model found in Brochu (2003). The “Question” column indicates information needed. The five right columns indicate which interviewee was asked the particular question:

- FB – Facilities/Buildings and Contract Administration Manager
- SL – Site Leader
- RD – Global Research and Development Manager
- EE – Employee Engagement Manager
- PA – Public Affairs Manager

Table AI.1 Information needs checklist for case study at Dow Electronic Materials

QUESTION	BF	SL	RD	EE	PA
What is the full name of your organization?			X		
Please describe the mission/business niche of your organization.			X		
Where do you fall within the organizational structure of your organization? What is your position?	X	X	X	X	X
What are your main responsibilities? Specifically, please describe your involvement with landscaping at your organization.	X	X	X		
What are your main responsibilities? Specifically, please describe your involvement with internal/external communications.				X	X
Who in the organization is ultimately responsible for the following? How many staff are dedicated to each of the following? Making decisions about the landscaping practices	X	X	X		

QUESTION	BF	SL	RD	EE	PA
Who in the organization is ultimately responsible for the following? How many staff are dedicated to each of the following? Landscape design	X	X	X		
Who in the organization is ultimately responsible for the following? How many staff are dedicated to each of the following? Landscape installation/construction	X	X	X		
Who in the organization is ultimately responsible for the following? How many staff are dedicated to each of the following? Landscape maintenance	X	X	X		
Who in the organization is ultimately responsible for the following? How many staff are dedicated to each of the following? Internal communications			X	X	X
Who in the organization is ultimately responsible for the following? How many staff are dedicated to each of the following? External communications				X	X
How long has the current landscaping been in place?	X	X			
Who was the current landscaping designed and installed by?	X	X			
Describe any easements or property restrictions that might affect installation of landscaping elements (trees, etc) or signage.	X	X			
Is there a protocol or requirements for signage placed on site? Who designs, manufactures, and installs such signage?	X	X		X	X
Who uses, visits, or otherwise sees the site? How is the outdoor landscape used by employees or visitors?	X	X	X	X	X
What are some of the ways this commitment is being carried out at the Newark campus?	X	X	X	X	X
In your opinion, does the proposed landscaping fit in with this commitment? How does it, or how doesn't it?	X	X	X		
What is your definition of "sustainable" in terms of landscaping practices?	X	X	X		
Please describe your vision for incorporating sustainable landscaping practices into the Dow campus. What are the short- and long-term objectives?	X		X		
Please comment on how innovative you think these practices are compared to what other organizations are doing.	X	X	X	X	X
Do you think the sustainable landscaping practices that will be used result in landscaping that looks different than conventional landscaping?	X	X	X		
Who decided that sustainable landscaping practices should be used?	X	X	X		
Who will be responsible for implementing sustainable landscaping practices?	X	X	X		
What are the main reasons for implementing sustainable landscaping practices?	X	X	X		
What are the main challenges in regards to implementing sustainable landscaping practices at Dow campus?	X	X	X		
How many employees are there at Dow Chemical campus? What is the breakdown of employees between departments? What are their demographics?				X	
Please describe methods for communicating information to employees at the Newark campus. What are the policies or protocol regarding this?				X	

QUESTION	BF	SL	RD	EE	PA
How do you think employees will respond to the implementation of sustainable landscaping practices?	X	X	X	X	X
Do you anticipate any challenges to communicating information about your organization's sustainable landscaping practices to employees?	X	X	X	X	X
Do you think employees will understand that the landscaping practices are more sustainable than conventional landscaping practices?	X	X	X	X	
Do you think employees will understand specifically why the landscaping practices are considered more sustainable?	X	X	X	X	
Do you think that there will be a need to communicate information about the landscaping practices to employees?	X	X	X	X	
Do you want employees to know more about the landscaping practices?	X	X	X	X	
Will there be a designated staff person or budget allowance for explaining landscaping practices to employees?	X	X	X	X	
What information do you think is important for employees to know about the landscaping practices?	X	X	X	X	
If you had unlimited resources, how would you go about communicating information about your organization's sustainable landscaping practices to employees?	X	X	X	X	
What tools/resources would be helpful for you in communicating information about your sustainable landscaping practices employees?	X	X	X	X	
Who do you consider to be the local community?					X
Please describe methods of communicating information about Dow Chemical to community members/neighbors (including the Community Advisory Council, and interactions with the media).					X
Do you think that there will be a need to communicate information about the landscaping practices to the community?					X
Do you want the community to know more about the landscaping practices?					X
Do you anticipate any challenges to communicating information about your organization's sustainable landscaping practices to neighbors?					X
How do you think neighbors will respond to the implementation of sustainable landscaping practices?					X
Do you think neighbors will understand that the landscaping practices are more sustainable than conventional landscaping practices?					X
Do you think neighbors will understand specifically why the landscaping practices are considered more sustainable?					X
Will there be a designated staff person or budget allowance for explaining landscaping practices to neighbors?					X
What information do you think is important for neighbors to know about the landscaping practices?					X
If you had unlimited resources, how would you go about communicating information about your organization's sustainable landscaping practices to neighbors?					X

QUESTION	BF	SL	RD	EE	PA
What tools/resources would be helpful for you in communicating information about your sustainable landscaping practices to neighbors?					X
What is the general chain of command within the organization, including at Newark campus and within Dow Chemical as a whole?	X		X		
Describe methods for communicating information to supervisors, higher-level management, or corporate management.	X		X		
Have you presented the idea for the proposed landscaping to your supervisor(s) or other higher-level management? If so, please describe the experience.	X		X		
How did you convey the information?	X		X		
What were your talking points (e.g. revenue, expenses, image, employee morale)?	X		X		
How did they respond to the idea of implementing sustainable landscaping practices?	X		X		
What do think are some challenges associated with communicating to higher-level management about the sustainable landscaping practices?	X		X		
What information do you think is important for higher-level management to know about the proposed landscaping?	X		X		
In your opinion, has higher-level management “bought-in” to the sustainable landscaping practices?	X		X		
Do you think higher-level management understands that the landscaping practices are more sustainable?	X		X		
Do you think higher-level management understands specifically why the landscaping practices are considered more sustainable?	X		X		
If you had unlimited resources, how would you go about communicating to higher-level management about sustainable landscaping practices?	X		X		
What tools/resources would be helpful for you in communicating information about your sustainable landscaping practices to higher-level management?	X		X		
How is information about landscaping typically communicating to staff responsible for landscape maintenance?	X	X			
Are the staff responsible for landscape maintenance aware of the proposed landscaping changes? If so, to what extent? How have you communicated information about the proposed changes? What are your talking points?	X	X			
How have landscaping staff responded to the idea of implementing sustainable landscaping practices? Please describe any comments that you have received.	X	X			
Do landscaping staff have the knowledge to implement and maintain the proposed landscaping, or will retraining/coaching be necessary?	X	X			
What tools/resources would be helpful for you in communicating information about the proposed landscaping to landscaping staff?	X	X			
What staff resources might be available?	X	X	X	X	X
What funding resources are available?	X	X	X	X	X

QUESTION	BF	SL	RD	EE	PA
What community resources are available?	X	X	X	X	X
What do you think has been/will be the biggest challenge – getting employees, higher-level management, or landscaping step to accept your organization’s proposed landscaping changes?	X	X	X	X	X
Are there any leaders you look up to in terms of implementing and/or explaining sustainable landscaping practices to stakeholders?	X	X	X	X	X
The ultimate goal of the research is to develop recommendations for explaining sustainable landscaping practices to stakeholders. Do you have any other comments or suggestions about this topic that have not already been addressed during this interview?	X	X	X	X	X

Appendix J

FOCUS GROUP QUESTIONS

Introduction

1. Let's go around the table—please tell us your name, and what building you work in.
2. Think about your daily routine on Dow campus. Describe the time that you spend outdoors.
3. ***Current landscaping***
Imagine you had to describe the landscaping on campus to an outsider—both what it looks like, and your opinion of it. What would you say?
4. As a company, Dow Chemical is working to reduce its environmental footprint. How “eco-friendly” do you think the landscaping on campus is?
Describe “eco-friendly” landscaping.

[Presentation about proposed landscaping]

Proposed landscaping

5. What is your opinion of the proposed landscaping?
How would the proposed landscaping affect the time you spend outdoors on campus?
How eco-friendly do you think the proposed landscaping is, compared to the current landscaping?

Conclusion

6. Suppose you had one minute to talk with the site manager about the future of landscaping on campus. What would you say?
7. Because you're the people who use and see the campus every day, we wanted you to help us evaluate the proposed landscaping changes. Is there anything that we missed?
Anything that you didn't get a chance to say?

Appendix K:

FOCUS GROUP PRESENTATION

PRESENTATION OUTLINE

Introduction

- Collaboration with UD to implement new landscaping
- Goals:
 - Improve outdoor environment with focus of providing wildlife habitat
 - Create a better image for Dow Chemical
 - Reduce maintenance resources
- Focused on four areas of campus
 - What does it look like now
 - What changes are proposed
- After presentation, get feedback on these changes

Areas 1 & 4 – I-95 frontage & picnic area

- I-95: it's what people see of Dow from the highway
- Picnic area: it's what people see of Dow when they enter industrial park
- Grove of trees to framing views and enhance picnic space
- Mowed path meadow
- What it may look like the first few years
- What it will look like once established

Area 2 – Rain garden

- An area with drainage problems, and it's hard to mow
- Instead of engineering solution, solve it with plants that can utilize the extra water (concept of a rain garden)
- What it may look like the first few years
- What it will look like once established

Area 3 – Sign

- Opportunity to provide landscaping that promotes Dow's image
- Use low-growing native perennials and shrubs to frame the sign
- Not all color all times of year, but seasonal interest
- What it may look like the first few years
- What it will look like once established

PRESENTATION SLIDES FOLLOW



Proposed Landscaping Plans for Dow Chemical's Newark Plant

A collaboration with University of Delaware

Goals

- Improve outdoor environment
 - Place for employees
 - Wildlife habitat
- Create better image for Dow Chemical
- Reduce maintenance resources

Phase 1: Focus areas

- I-95 frontage, next to Building 9



Phase 1: Focus areas

- I-95 frontage next to Building 9
- Grassy area near industrial park entrance



Phase 1: Focus areas

- I-95 frontage next to Building 9
- Grassy area near industrial park entrance
- Drainage area in front of Building 5



Phase 1: Focus areas

- I-95 frontage next to Building 9
- Grassy area near industrial park entrance
- Drainage area in front of Building 5
- Main entrance sign



I-95 frontage & entrance area



I-95 frontage & entrance area



I-95 frontage



Remove invasive vines on fence

I-95 frontage



Replace with native vines

I-95 frontage



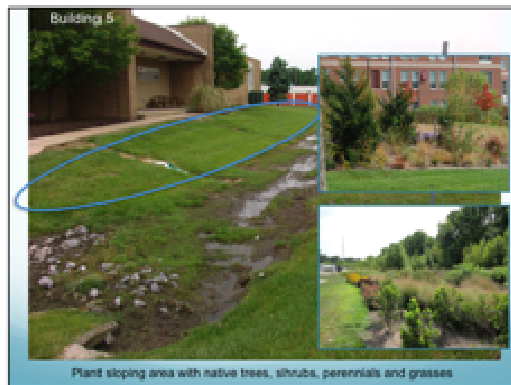
Add additional native trees and groundcover plants to enhance picnic grove

I-95 frontage



Convert lawn to meadow with mowed paths and edges







Appendix L:

EXPERT BIOGRAPHIES

Steve Bogash, Regional Horticulture Educator, Penn State Cooperative Extension
(Source: Personal communication)

Steve is currently a Regional Horticulture Educator serving the Southeast Region of Pennsylvania out of the Franklin County office in Chambersburg. He covers vegetables, small fruit, cut flowers, pond management, greenhouse vegetables, and specialty marketing as his primary areas of responsibility. Cut flowers, tomatoes, garlic, shallots, cantaloupes and container-grown vegetables are regular items in the trial gardens under Steve's management.

Since 2000, Steve has evaluated more than 300 varieties of tomatoes for flavor, yield and marketability. Other applied research programs include Biological control of tomato diseases, cantaloupe variety evaluations, container vegetable evaluations and bell pepper variety trials.

Janet Marinelli, Principal, Blue Crocus Consulting
(Source: <http://207.228.242.230/the-official-bio/> [abridged])

As the principal of her own firm, Blue Crocus Consulting, a prolific author, and a former director at Brooklyn Botanic Garden for more than sixteen years, Janet Marinelli has been at the forefront of the sustainability revolution that is transforming landscapes and buildings. She has been called “an ecological and horticultural visionary.”

In 2006 she founded Blue Crocus Consulting to help public gardens, nature centers, and other groups develop lively and artistic new ways to engage their audiences in conversations about sustainability. She does this through interpretation, program planning, and print and online publications of all types. Marinelli is known for an innovative approach to public education that transforms visitors from passive viewers of signs and exhibits to active participants in the social, economic, and ecological health of their communities. She also works with designers to bring sustainability to life in the site plans of gardens, parks, and museums. For example, she collaborated with the Great Park Design Studio to create an internationally distinguished model for botanic gardens in the 21st century at the site of the former El Toro Marine Corps Airbase in Irvine, California. The Great Park Botanic Garden is envisioned as a living laboratory where visitors collaborate with horticulturists, scientists, educators, and artists to create a sustainable future for Southern California.

Marinelli worked with the U.S. Botanic Garden and the Lady Bird Johnson Wildflower Center to create Landscape For Life, an educational website and workbooks that present the technical specifications of the Sustainable Sites Initiative, which provides professional tools for landscape designers, in an easy-to-understand form that homeowners and gardeners can use themselves to create sustainable landscapes.

Appendix M:

BREAKDOWN OF SURVEY RESPONSES SELECTED AND NOT SELECTED FOR ANALYSIS

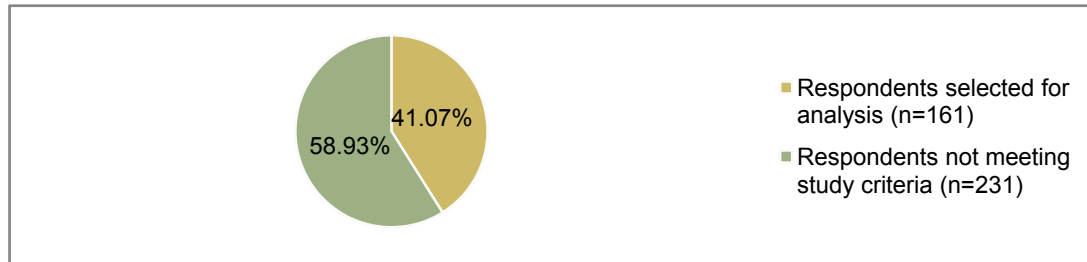


Fig. AM.1 Percentage of survey respondents selected or not selected for analysis (n=392)

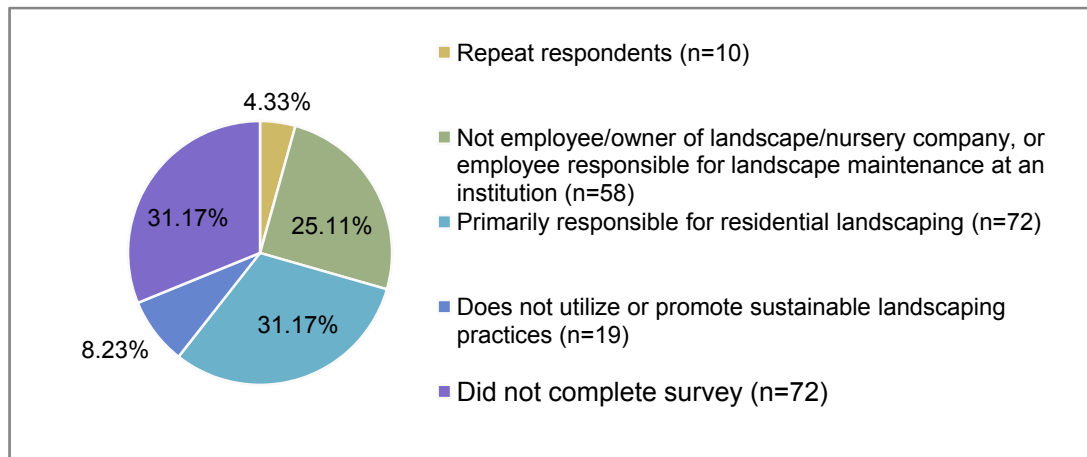


Fig. AM.2 Survey respondents not selected for analysis, broken down by criteria (n=231)

Appendix N:

HUMAN SUBJECTS IN RESEARCH (HSRB) DOCUMENTATION

HSRB Training Certificate

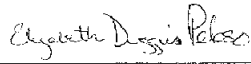
Certification of Human Subjects Training

The University of Delaware certifies that Rebecca Pineo
(Name of researcher)

attended an institutional training session on the use of human subjects in research on
February 24, 2009.
(Date)

The session included the following topics:

- The Belmont Report
- Federal regulations for using humans in research (45 CFR 46)
- The University's Federalwide Assurance
- Informed consent
- Institutional procedures
- Sources for additional information.


Elizabeth Duggins Peloso
IRB Administrator

**Research Office
University of Delaware
Newark DE 19716
302-831-2136**

Exempt Letter for Survey Protocol



RESEARCH OFFICE

210 Hallihen Hall
University of Delaware
Newark, Delaware 19716-1551
Ph: 302/831-2136
Fax: 302/831-2828

DATE: April 21, 2010

TO: Rebecca Pineo
FROM: University of Delaware IRB

STUDY TITLE: [168051-1] Sustainable Landscaping Practices Survey
IRB REFERENCE #:
SUBMISSION TYPE: New Project

ACTION: DETERMINATION OF EXEMPT STATUS
DECISION DATE: April 21, 2010

REVIEW CATEGORY: Exemption category # 2

Thank you for your submission of New Project materials for this research study. The University of Delaware IRB has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

We will put a copy of this correspondence on file in our office. Please remember to notify us if you make any substantial changes to the project.

If you have any questions, please contact Elizabeth Paloso at 302-831-2818 or epaloso@udel.edu. Please include your study title and reference number in all correspondence with this office.

Exempt Letter for Interview Protocol



RESEARCH OFFICE

210 Halliwell Hall
University of Delaware
Newark, Delaware 19716-1551
Ph: 302/831-2136
Fax: 302/831-2828

DATE: August 11, 2010

TO: Rebecca Pineo
FROM: University of Delaware IRB

STUDY TITLE: [168051-2] Sustainable Landscaping Practices Survey

IRB REFERENCE #:
SUBMISSION TYPE: Amendment/Modification

ACTION: DETERMINATION OF EXEMPT STATUS

DECISION DATE: August 11, 2010

REVIEW CATEGORY: Exemption category # 2

Thank you for your submission of Amendment/Modification materials for this research study. The University of Delaware IRB has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

We will put a copy of this correspondence on file in our office. Please remember to notify us if you make any substantial changes to the project.

If you have any questions, please contact Elizabeth Paley at 302-831-8610 or epaley@udel.edu. Please include your study title and reference number in all correspondence with this office.

cc:

Exempt Letter for Focus Group Protocol



RESEARCH OFFICE

210 Hallihen Hall
University of Delaware
Newark, Delaware 19716-1551
Ph: 302/831-2136
Fax: 302/831-2828

DATE: October 13, 2010

TO: Rebecca Pineo
FROM: University of Delaware IRB

STUDY TITLE: [168051-3] Sustainable Landscaping Practices Survey
IRB REFERENCE #:
SUBMISSION TYPE: Amendment/Modification

ACTION: DETERMINATION OF EXEMPT STATUS
DECISION DATE: October 13, 2010

REVIEW CATEGORY: Exemption category # 2

Thank you for your submission of Amendment/Modification materials for this research study. The University of Delaware IRB has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

We will put a copy of this correspondence on file in our office. Please remember to notify us if you make any substantial changes to the project.

If you have any questions, please contact Elizabeth Palese at 302-831-2616 or epalese@udel.edu. Please include your study title and reference number in all correspondence with this office.

Appendix O:
SURVEY RESULTS BY CATEGORY OF ORGANIZATION

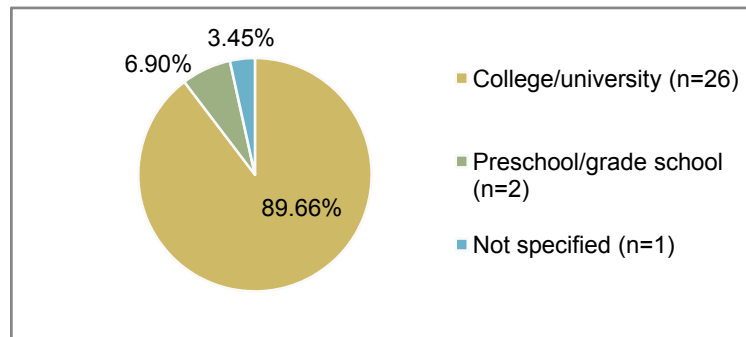


Fig. AO.1 Distribution of Educational Institutions by type of institution (n=29)

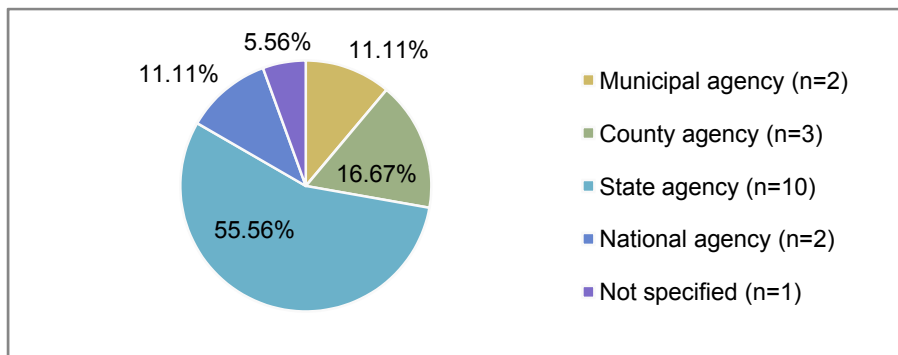


Fig. AO.2 Distribution of Government Agencies by jurisdiction (n=18)

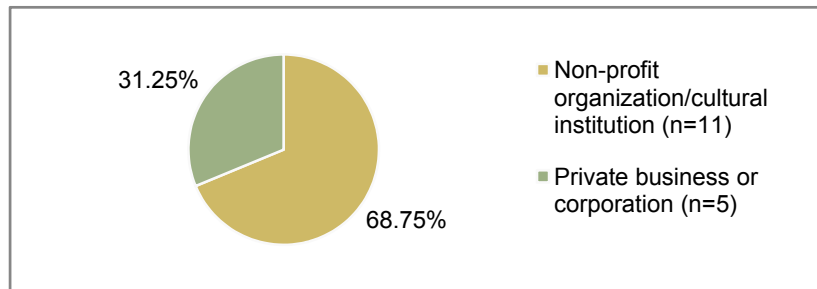


Fig. AO.3 Distribution of Private or Non-Profit Organizations by type of institution (n=16)

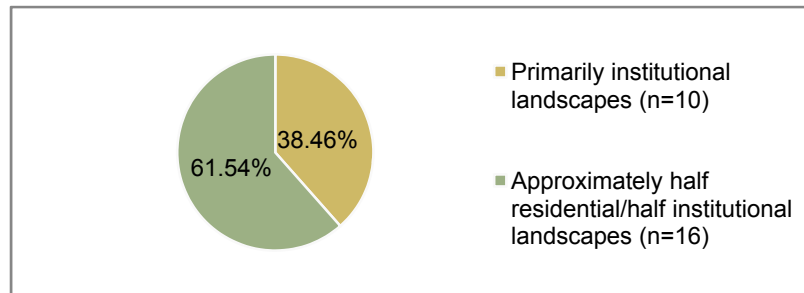


Fig. AO.4 Distribution of Landscape Service Providers by type of landscapes served (n=26)

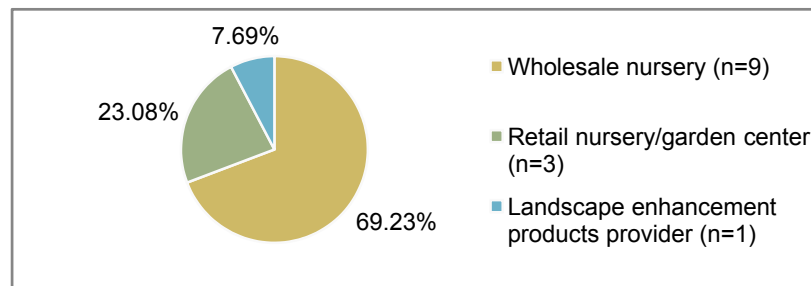


Fig. AO.5 Distribution of Landscape Product Providers by type of company (n=13)

Table AO.1 Sources of or motivations for using/promoting sustainable landscaping practices judged to be “Very Important” by 50% or more survey respondents (n=161), by organization category

EDUCATION INSTITUTION (N=29)	GOLF COURSE (N=59)	GOVERN. AGENCY (N=18)	PRIVATE/ NON-PROFIT INSTITUTION (N=16)	LANDSCAPE SERVICES PROVIDER (N=26)	LANDSCAPE PRODUCTS PROVIDER (N=13)
Provide an outdoor space for people (82.76%)	Environmental responsibility/stewardship (59.32%)	Environmental responsibility/stewardship (77.78%)	Environmental responsibility/stewardship (75.00%)	Environmental responsibility/stewardship (76.92%)	Environmental responsibility/stewardship (84.62%)
Environmental responsibility/stewardship (68.97%)	Remedy a problem in the landscape (55.93%)	Cost savings (77.78%)	Provide an outdoor space for people (62.50%)	Provide an outdoor space for people (73.08%)	Promote the organization's "green" image (84.62%)
Promote the organization's "green" image (65.52%)	Cost savings (52.52%)	Comply with legal requirements (66.67%)	Cost savings (56.25%)	Remedy a problem in the landscape (73.08%)	Help green the community (69.23%)
Comply with legal requirements (62.07%)		Remedy a problem in the landscape (61.11%)	Remedy a problem in the landscape (50.00%)	Help green the community (73.08%)	Comply with legal requirements (69.23%)
Part of a larger sustainability initiative within my organization (58.62%)		Provide an outdoor space for people (61.11%)		Promote the organization's "green" image (50.00%)	Remedy a problem in the landscape (61.54%)
Cost savings (58.62%)		Promote the organization's "green" image (61.11%)		Part of a larger sustainability initiative within my organization (50.00%)	Part of a larger sustainability initiative within my organization (61.54%)
Remedy a problem in the landscape (55.17%)		Help green the community (50.00%)			
Initiative by staff/students (55.17%)					

Table AO.2 Sources of or motivations for using/promoting sustainable landscaping practices judged to be “Not Important” by 25% or more survey respondents (n=161), by organization category

EDUCATION INSTITUTION (N=29)	GOLF COURSE (N=59)	GOVERNMENT AGENCY (N=18)	PRIVATE/ NON-PROFIT INSTITUTION (N=16)	LANDSCAPE SERVICES PROVIDER (N=26)	LANDSCAPE PRODUCTS PROVIDER (N=13)
Public or stakeholder pressure (34.48%)	Public or stakeholder pressure (55.93%) Mandate by upper or corporate management (47.46%) Comply with legal requirements (30.51%)	(none)	Mandate by upper or corporate management (62.50%) Public or stakeholder pressure (25.00%)	Public or stakeholder pressure (46.15%) Mandate by upper or corporate management (30.77%) Comply with legal requirements (26.92%)	Mandate by upper or corporate management (38.46%) Initiative by employees (38.46%) Public or stakeholder pressure (30.77%)

Table AO.3 Factors judged to be “A Significant Challenge” by 10% or more of survey respondents (n=161), by organization category

EDUCATION INSTITUTION (N=29)	GOLF COURSE (N=59)	GOVERNMENT AGENCY (N=18)	PRIVATE/ NON-PROFIT INSTITUTION (N=16)	LANDSCAPE SERVICES PROVIDER (N=26)	LANDSCAPE PRODUCTS PROVIDER (N=13)
Our budget is limited (31.03%)	Our budget is limited (35.59%) People think sustainable landscaping is less attractive (10.17%) It's hard to find practices that work for my organization (13.56%)	Our budget is limited (66.67%) People think sustainable landscaping is less attractive (16.67%) My organization doesn't know about sustainable landscaping (11.11%) Landscape management is a low priority for my organization (11.11%)	No one has requested or required that we use or promote these practices (31.25%) It is difficult to obtain buy-in from upper management (18.75%) My org. doesn't know about sustainable landscaping (18.75%)	No one has requested or required that we use or promote these practices (15.38%) Property owner won't allow us to change the landscape (15.38%) It is difficult to obtain buy-in from upper management (11.54%)	Our budget is limited (38.46%)

EDUCATION INSTITUTION (N=29)	GOLF COURSE (N=59)	GOVERNMENT AGENCY (N=18)	PRIVATE/ NON-PROFIT INSTITUTION (N=16)	LANDSCAPE SERVICES PROVIDER (N=26)	LANDSCAPE PRODUCTS PROVIDER (N=13)
		No one has requested or required that we use or promote these practices (11.11%) It is difficult to educate or retrain landscaping staff (11.11%)	Our budget is limited (12.50%) Being environmentally-friendly is not part of my organization's values (12.50%)	Our budget is limited (11.54%) It's hard to find practices that work for my organization (11.54%)	

Table AO.4 Factors judged to be “Not a Challenge” by less than 50% of survey respondents (n=161), by organization category

EDUCATION INSTITUTION (N=29)	GOLF COURSE (N=59)	GOVERNMENT AGENCY (N=18)	PRIVATE/ NON-PROFIT INSTITUTION (N=16)	LANDSCAPE SERVICES PROVIDER (N=26)	LANDSCAPE PRODUCTS PROVIDER (N=13)
Our budget is limited (17.24%) My organization doesn't know about sustainable landscaping (48.28%) It's hard to find practices that work for my organization (48.28%)	Our budget is limited (13.56%) People think sustainable landscaping is less attractive (37.29%) It's hard to find practices that work for my organization (44.07%) My organization doesn't know about sustainable landscaping (45.76%)	Our budget is limited (11.11%) People think sustainable landscaping is less attractive (27.78%) It is difficult to educate or retrain landscaping staff (44.44%) It's hard to find practices that work for my organization (44.4%)	Our budget is limited (18.75%) It is difficult to obtain buy-in from upper management (43.75%)	Our budget is limited (34.62%) People think sustainable landscaping is less attractive (42.31%) Property owner won't allow us to change the landscape (42.31%)	It is difficult to obtain buy-in from upper management (46.15%) People think sustainable landscaping is less attractive (38.46%) Our budget is limited (23.08%)

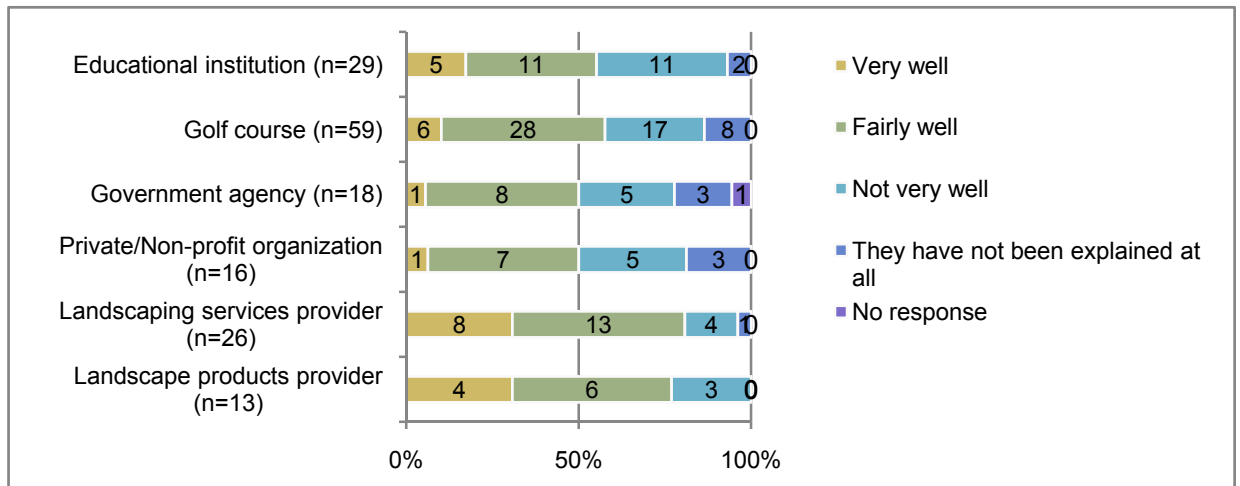


Fig. AO.6 Survey respondent opinions of how well their organization's sustainable landscaping initiatives have been explained to landscape users or viewers, by organization category (n=161)

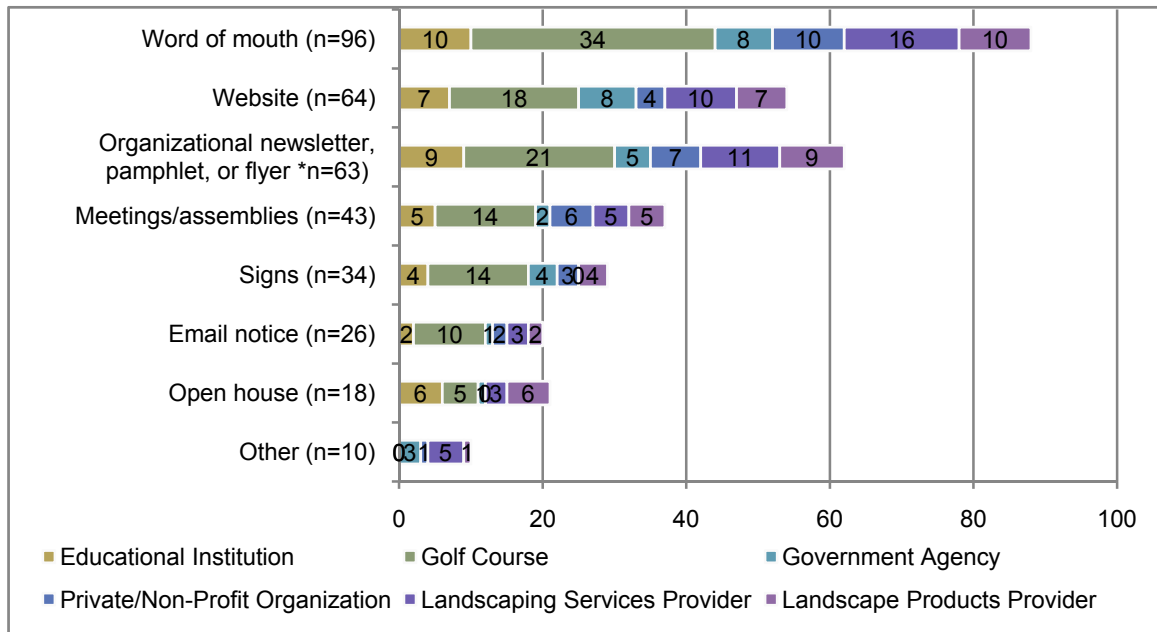


Fig. AO.7 Media used for explaining sustainable landscaping initiatives to landscape users or viewers, by organization category (n=138)

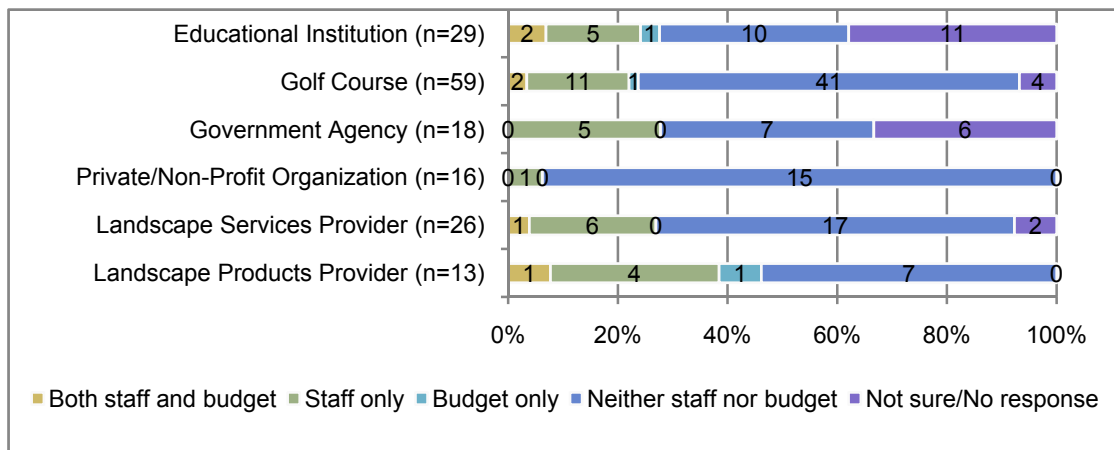


Fig. AO.8 Designated staff and budget resources for educating people about sustainable landscaping initiatives at survey respondent organizations (n=161), by organization category

Appendix P:
TYPES OF SUSTAINABLE PRACTICES USED AND PROMOTED

Survey

To some extent, the respondents used all of the sustainable landscaping practices and elements listed in the survey (Fig. AP.1). The five most widely used practices were using low-maintenance plantings (90.06%), avoiding use of invasive plants (83.85%), using organic mulch on all planting beds (77.64%), using regionally native plants (77.02%), and conserving water (72.67%). The five least used practices were using green roofs and/or walls (15.53%), using rain barrels and or cisterns (16.15%), using rain gardens or bioswales to manage stormwater (34.78%), and reducing impervious surfaces (36.02%). A minority of respondents also specified other practices (13.04%) that were not included in the given categories, including those related to integrated pest management or plant health care; energy conservation or alternate energy sources; and soil protection or enhancement (Table AP.1). On average, each organization used between nine and ten different of practices (mean=9.76), with a standard deviation of ± 1.65 (Fig. AP.2).

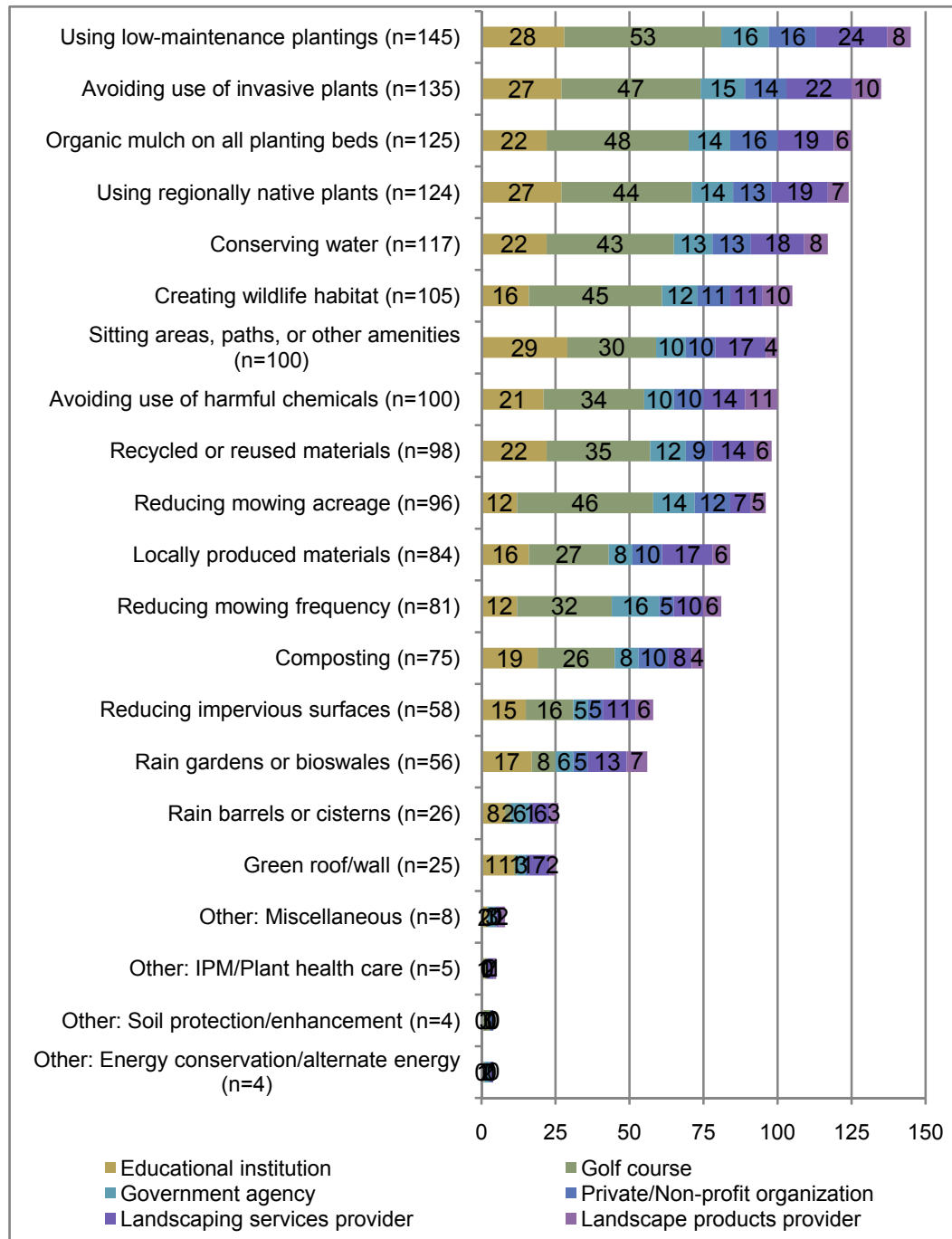


Fig. AP.1 Types of sustainable landscaping practices and elements used by survey respondent organizations (n=116), by organization category

Table AP.1 Open-text responses describing sustainable practices and elements used/promoted by survey respondent organizations. Responses were placed into indicated categories in addition to categories already marked by respondent.

SUSTAINABLE LANDSCAPING PRACTICE/ELEMENT	OPEN TEXT RESPONSES
Composting	<ul style="list-style-type: none"> organic mulch on perennial and shrub beds - recycle all plant material (annuals, grass, leaves dead plant material), irrigation for annual beds We grind our own stumps, and the machine we have makes excellent shredded mulch for the beds.
Green roof and/or wall	<ul style="list-style-type: none"> Compost most post and pre consumer food waste and all coffee grounds/filters from local Starbucks 2) Green space on top of parking deck with turf, trees, shrubs and flowers
Reducing mowing frequency	<ul style="list-style-type: none"> no mow areas or create nature areas where low cut turf was in use
IPM/Plant Health Care (new category)	<ul style="list-style-type: none"> Integrated Pest Management Planning, Nutrient Management Planning [also coded under "Soil protection/enhancement"] IPM, Food waste composting Planting plants correct distances apart for health and future growth; nursery propagation and greenhouses placed away from water bodies with buffers of grass and shrubs [also coded under "Rain gardens or bioswales to manage stormwater (including vegetative buffers)"] We use Integrated Pest Management (IPM) practices to controlling problems, which combines cultural, mechanical, and as a last resort, chemical controls. Comprehensive IPM; Sensor driven irrigation; grassed aisles & buffers; innovative cover crops & green manure; crop rotation [also coded under "Miscellaneous" and "Rain gardens or bioswales to manage stormwater (including vegetative buffers)"]
Energy conservation/alternate energy sources (new category)	<ul style="list-style-type: none"> Complete material recycle program, 100% wind power purchase for buss& res, biodiesel use for whole fleet, waste oil reuse for shop heat, paper reduction and reuse in office Compost in High Traffic Areas for Moisture Retention/reduction of H2O...Eventually use Methane Gas for some energy purpose(golf course built on old landfill) [also coded under "Soil protection/enhancement"] electric vehicles
Soil protection/enhancement (new category)	<ul style="list-style-type: none"> irrigation audits, soil testing, nutrient management planning. Live spikes to aid in river bank retention.
Miscellaneous	<ul style="list-style-type: none"> Propane-Powered Mowers, Solar-Powered Arrow Boards, Low Maintenance Turf grasses (AuroaGold Fine Fescue), Measuring and Increasing City Tree Canopy, Stormwater Quantity and Quality initiatives [also coded under "Energy conservation/alternate energy sources"] Controlling noxious and nuisance weeds and trees and using slow release nitrogen fertilizers

	<ul style="list-style-type: none"> • Preservation of healthy trees, plant communities and turf, invasive and noxious species management, policies for landscape stewardship, integrated vegetation management, and training in these areas; A significant number of maintenance facilities compost road kill deer and re-apply mature product along the roadside, employ best practices for stormwater management; Living snow fences; stream restoration • reforesting timbered acerage • We use a lot of landscaping stone in lieu of mulch to reduce the annual costs • logical, reasonable, affordable design and material solutions • low emission vehicles • "Other" responses that received no coding (categories already marked by respondent) • mulching blades on mowers • Pipe storm water onto landscapes to help trees. • While we do not compost on site we segregate and we recycle all plant materials to a composting facility. • Recycling paper, glass and plastic bottles, and all plastics with a recycling symbol including plant pots and trays. Recycling of all green waste generated at our facility. • drought tolerant, deer resistant • drip irrigation to minimize water consumption • Rainwater capture, storage and re-use for irrigation and ornamental water features • compost tea program instead of pesticides • The sustainable LANDSCAPING elements does not really apply to an wholesale nursery operation, not an appropriate question.
--	---

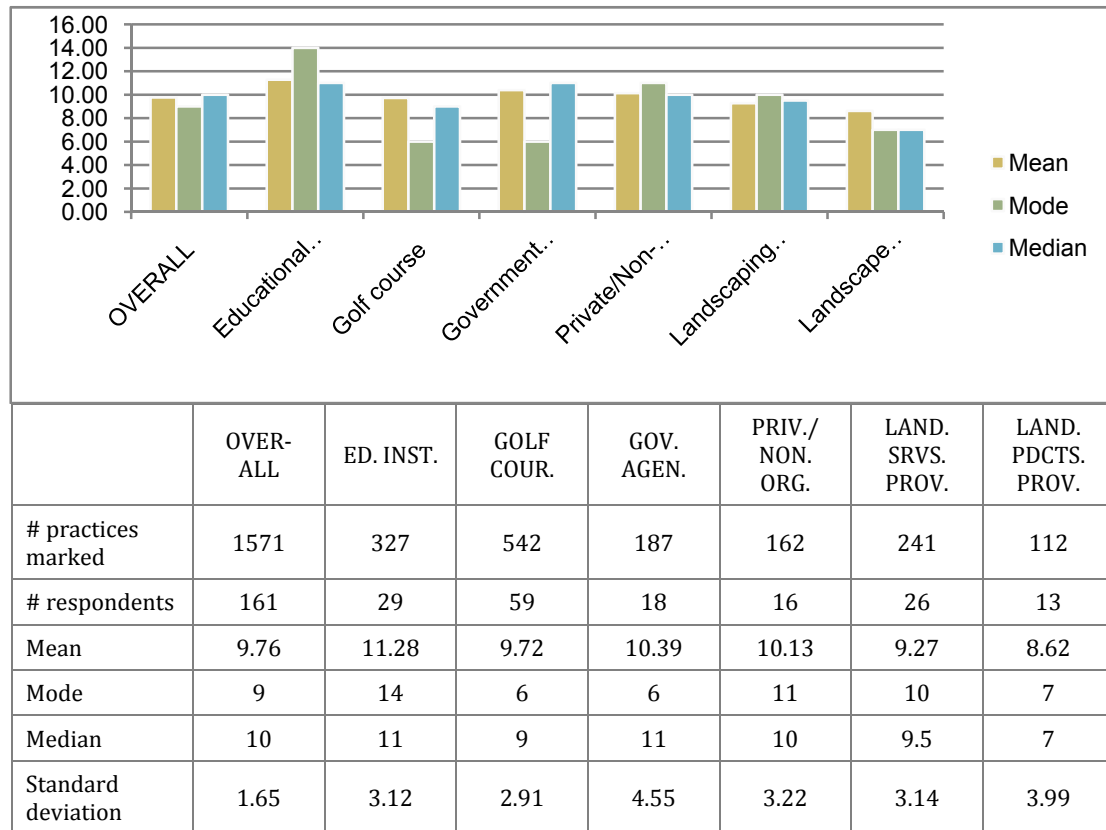


Fig. AP.2 Mean, mode, and median number of sustainable practices used/promoted by survey respondent organizations, by organization category

Organization Interviews

A variety of sustainable landscaping practices were reported as being used by interviewee organizations (Table AP.2). The practices reported by all institutions were avoiding use of harmful chemicals, creating wildlife habitat, reduced mowing, and stormwater management. Using low-maintenance plantings and native plants were also widely reported. However, as no standard definition of

sustainable landscaping practices was used, practices being used may be underrepresented.

Table AP.2 Sustainable landscaping practices used by interviewee organizations, as reported by interview respondents

SUSTAINABLE LANDSCAPING PRACTICE	# ORGANIZATIONS REPORTING USE OF THE PRACTICE
Avoiding use of harmful chemicals	6
Creating wildlife habitat	6
Reduced mowing	6
Stormwater management	6
Low-maintenance plantings	5
Native plants	5
Composting/recycling/waste reduction	4
Conserving water	4
Ecological restoration/conservation	4
Recycled/reused materials	4
Amenities for people	3
Locally produced materials	3
Reducing non-permeable surfaces	3
Soil enhancement	3
Conserving energy	2
Integrated pest management/Plant health care	2
Invasive species management	2
Green roof and/or wall	1
Rain barrels/cisterns	1

Case study

At the time of the research, Dow Electronic Materials was developing a plan for implementing sustainable practices on campus. During the course of the

research, the existing annual bedding plants around the corporate entrance sign were removed and replaced with low-maintenance and native plantings. The company is also planning to remove invasive plant species, reduce mowing, reduce impervious surfaces, install rain gardens and bioswales, develop low-maintenance landscape solutions, utilize native plants, create wildlife habitat, and develop picnic groves and walking paths to enhance employee use of the campus.

Appendix Q:

DISTRIBUTION OF SURVEY INVITEES, RATE OF RESPONSE, AND NUMBER OF ANALYZED RESPONSES BY PROFESSIONAL ASSOCIATION

Professional Association Abbreviations:

- DNLA – Delaware Nursery and Landscape Association
- MNLA – Maryland Nursery and Landscape Association
- NJNLA – New Jersey Nursery and Landscape Association
- NYSLNLA – New York State Nursery and Landscape Association
- PLNA – Pennsylvania Landscape and Nursery Association
- VNLA – Virginia Nursery and Landscape Association
- PGMS – Professional Grounds Management Association
- GCSAA – Golf Course Superintendents Association of America

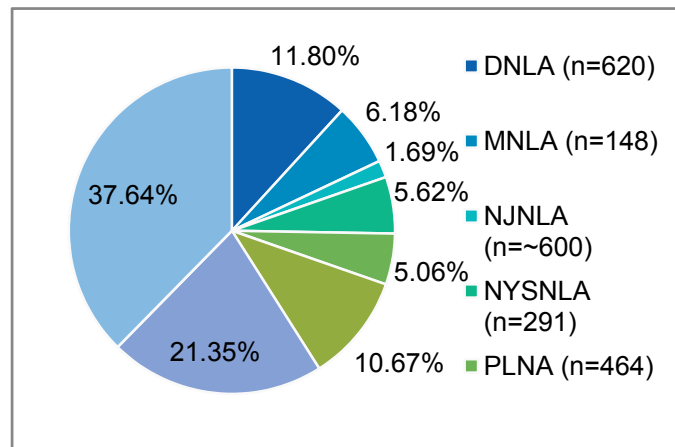


Fig. AQ.1 Distribution of survey invitees by professional association mailing list (n=~4800)

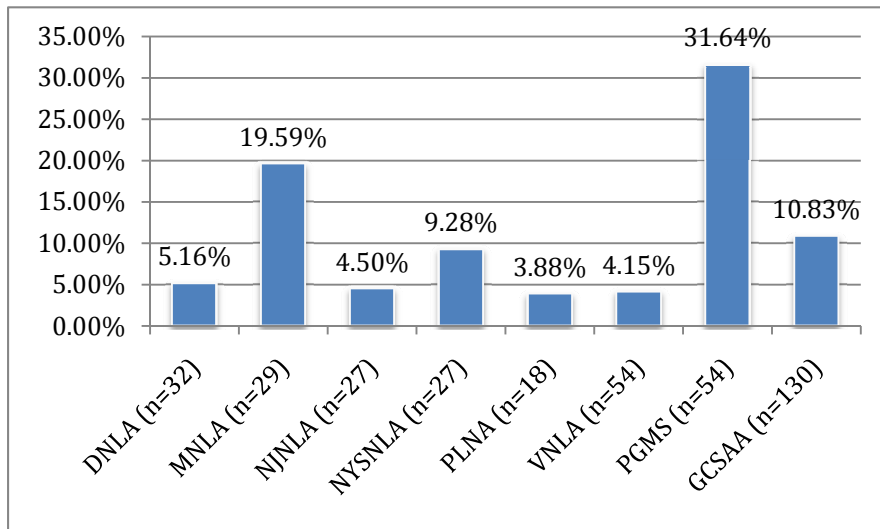


Fig. AQ.2 Rate of response by professional association (# respondents=320; # responses=373)

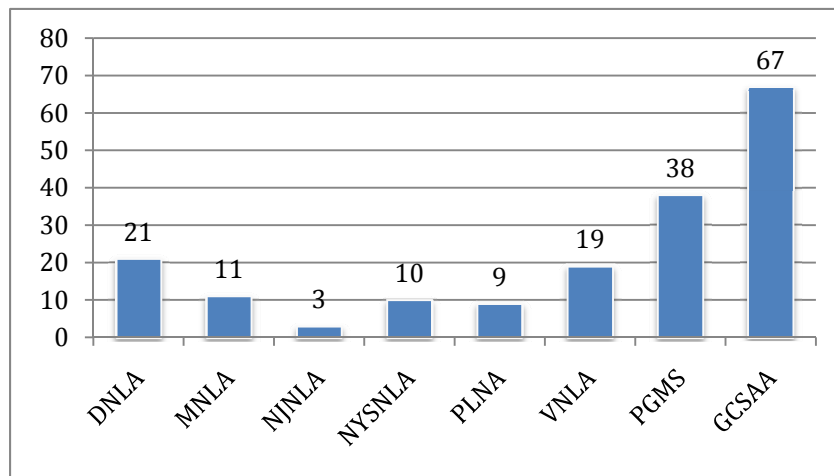


Fig. AQ.3 Number of analyzed survey responses per professional association (# respondents=161; # responses=178)

Appendix R:

SUSTAINABLE LANDSCAPING-RELATED CERTIFICATION PROGRAMS, AWARDS PROGRAMS, AND OTHER COMMUNICATION RESOURCES FOR THE MID-ATLANTIC REGION

Certification Programs

- Audubon Cooperative Sanctuary Program –
<http://acsp.auduboninternational.org/>
- Audubon Lifestyles Landscape Program –
http://www.audubonlifestyles.org/index.php?option=com_content&task=view&id=72&Itemid=1
- Backyard Wildlife Habitat Program, Delaware Nature Society –
<http://www.delawarenaturesociety.org/bwh.html>
- Corporate Wildlife Habitat Certification/International Accreditation Program, Wildlife Habitat Council –
<http://www.wildlifehc.org/certification/>
- Groundwater Guardian Green Sites –
<http://www.groundwater.org/gg/greensites.html>
- Delaware Livable Lawns (emerging program)
<http://www.dnlaonline.org>
- LEED (some credits available for landscape components) –
<http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1988>
- Monarch Watch Waystations –
<http://www.monarchwatch.org/waystations/>
- National Wildlife Federation Certified Wildlife Habitat –
<http://www.nwf.org/Get-Outside/Outdoor-Activities/Garden-for-Wildlife.aspx>
- Sustainable Sites Initiative (pilot phase) –
<http://www.sustainablesites.org/>

Awards Programs

- Philadelphia Sustainability Awards – <http://www.philadelphiasustainabilityawards.org/awards>
- Sustainable Company Award, Professional Landcare Network (PLANET) – <http://www.landcarenetwork.org/awards/index.cfm>
- Wildlife Habitat Council - International Conservation Awards– <http://www.wildlifehc.org/whcawards/>

Other Resources

- Chesapeake Ecology Center (downloadable interpretive signage) – http://www.chesapeakeecologycenter.org/index.asp?Type=B_BASIC&SEC=%7B90B1220A-30AE-4867-BAC2-2C88FA1AC0E1%7D
- Landscape for Life (informational website for the general public) – <http://www.landscapeforlife.org/>
- Sustainable Sites Initiative (downloadable brochure describing sustainable landscaping benefits) – <http://www.sustainablesites.org/why/>

REFERENCES

- Ajzen, I. 1991. The theory of planned behavior. *Organizational Behavior and Human Decision Processes*. 50:179-211.
- Alderson, W.T. and S.P. Low. 1985. *Interpretation of historic sites*. 2nd ed. American Association for State and Local History, Nashville, TN.
- American Nursery and Landscape Association (ANLA). 2009. Our industry: Sustainability. 6 December 2010.
<<http://www.anla.org/index.cfm?area=retail&page=Content&categoryID=211>>.
- American Marketing Association (AMA). 2011. Dictionary. American Marketing Association resource library. 4 January 2011.
<http://www.marketingpower.com/_layouts/Dictionary.aspx?dLetter=G>.
- American Public Gardens Association (APGA). 2011. Public information: What are public gardens? 21 February 2011. <<http://www.aabga.org/content/public-information>>.
- American Society of Landscape Architects (ASLA). 2010. Sustainable ASLA. 6 December 2010. <<http://www.asla.org/ContentDetail.aspx?id=24972>>.
- Ardoin, N. 2009. Behavior change theories and free-choice environmental learning, p. 57-73. In: J.H. Falk, J.E. Heimlich, and S. Foutz (eds.). *Free-choice learning and the environment*. AltaMira Press, Lanham, MD.
- Association of University Leaders for a Sustainable Future (AULSF). 2010. Taillores Declaration Institutional Signatories List. 12 March 2010.
<http://www.ulsf.org/talloires_declaration.html>.
- Association of University Leaders for a Sustainable Future (AULSF). 2008. Taillores Declaration. 24 December 2010.
<http://www.ulsf.org/talloires_declaration.html>.
- Atkinson, P.B. and G.W. Mullins. 1998. Commentary: Applying social marketing to interpretation. *Journal of Interpretation Research*. 3(1):49-53.

- Audubon International. 2010a. Audubon Cooperative Sanctuary Program. 22 December 2010. <<http://acsp.auduboninternational.org>>.
- Audubon International. 2010b. Programs: Recognized properties. 31 December 2010. <[http://auduboninternational.org/PDFs/Recognized Properties list.pdf](http://auduboninternational.org/PDFs/Recognized%20Properties%20list.pdf)>.
- Audubon International. 2009. Audubon Cooperative Sanctuary Program certification overview. 31 December 2010. <<http://auduboninternational.org/PDFs/ACSPCertificationOverview.pdf>>
- Audubon International. 2008. Audubon Cooperative Sanctuary Program certification handbook. Audubon International, Selkirk, NY.
- Balling, J.D. and J.H. Falk. 1982. Development of visual preference for natural environments. *Environment and Behavior*. 14(1):5-28 (abstr.).
- Bandura, A. 1982. Self-efficacy mechanism in human agency. *American Psychologist*. 37:122-147.
- Bandura, A. and N. Adams. 1977. Analysis of self-efficacy theory of behavior change. *Cognitive Therapy and Research*. 1(4):287-310.
- Barton, S. 2005. Enhancing Delaware highways: A natural vegetation project. PhD Dissertation. University of Delaware, Newark, DE.
- Baumgartner, R. 1982. The visual landscape: Inventory and evaluation from the visual/aesthetic perspective, p. 318-319. In: S.P. Tjallingii and A.A. de Veer (eds.). *Perspectives in landscape ecology: Contributions to research planning and management of our environment*. Center for Agricultural Publishing and Documentation, Wageningen, Netherlands.
- Bormann, F.H., D. Balmori, and G.T. Geballe. 2001. *Redesigning the American lawn: A search for environmental harmony*. 2nd ed. Yale University Press, New Haven, CT.
- Briñol, P. and R.E. Petty. 2005. Individual differences in attitude change, p. 575-615. In: D. Albarracín, B. Johnson, and M. Zanna (eds.). *The handbook of attitudes*. Lawrence Erlbaum Associates, Mahwah, NJ.
- Brochu, L. 2003. *Interpretive planning: The 5-M model for successful planning projects*. InterPress, Fort Collins, CO.
- Brochu, L. and T. Merriman. 2002. *Personal interpretation: Connecting your audience to heritage resources*. InterPress, Fort Collins, CO.

- Brunson, M.W. and D.K. Reiter. 1996. Effects of ecological information on judgments about scenic impacts of timber harvest. *Journal of Environmental Management*. 46(1):31-41.
- Budischak, V. 2010. Personal Communication. Executive Director, Delaware Nursery and Landscape Association, Hockessin, DE.
- Byrne, L.B. and P. Grewal. 2008. Introduction to ecological landscaping: A holistic description and framework to guide the study and management of urban landscape parcels. *Cities and the Environment*. 1(2):article 3, 1-20.
- Cable, T.T. and L. Beck. 2002. *Interpretation for the 21st century: Fifteen guiding principles for interpreting nature and culture*. 2nd ed. Sagamore Publishing, Champaign, IL.
- Cable, T.T. and L. Cadden. 2006. The common roots of environmental education and interpretation. *Journal of Interpretation Research*. 11(2):39-46.
- Cadenasso, M.L. and S.T.A. Pickett. 2008. Urban principles for ecological landscape design and management: Scientific fundamentals. *Cities and the Environment*. 1(2):article 4. 6 December 2009. <<http://escholarship.bc.edu/cate/vol1/iss2/4>>.
- Campbell, C.S. and M.H. Ogden. 1999. *Constructed wetlands in the sustainable landscape*. Wiley, New York, NY.
- Center for Public Horticulture (CPH). 2007. About the Center: What is public horticulture? 4 February 2010. <<http://www.publichorticulture.udel.edu/about/about.html>>.
- Chaiken, S., A. Liberman, and A.H. Eagly. (1989). Heuristic and systematic information processing within and beyond the persuasion context, o. 212-252. In: J. S. Uleman and J. A. Bargh (eds.). *Unintended thought*. New York: Guilford.
- Chamorro, A., S. Rubio, and F.J. Miranda. 2007. Characteristics of research on green marketing. *Business Strategy and the Environment* 18, 223–239.
- Collart, A.J., M.A. Palma, and C.R. Hall. 2010. Branding awareness and willingness-to-pay associated with the Texas Superstar™ and Earth-Kind™ brands in Texas. *HortScience*. 45(8):1226-1231.
- Cooper, C.B., J. Dickinson, T. Phillips, and R. Bonney. 2007. Citizen science as a tool for conservation in residential ecosystems. *Ecology and Society*. 12(2):11.

- Crain Communications. 2010. Can green marketing work? *Advertising Age* 81(40):19.
- Creswell, J.W. 2009. *Research design: Qualitative, quantitative, and mixed methods approaches*. 3rd ed. Sage Publications, Thousand Oaks, CA.
- Curthoys, L.P and B. Cuthbertson. 2002. Listening to the landscape: Interpretive planning for ecological literacy. *Canadian Journal of Environmental Education*. 7(2):224-241.
- Davis, J. J. 1993. Strategies for environmental advertising. *Journal of Consumer Marketing*. 10(2):19-36.
- Dillman, D.A., J.D. Smyth, and L.M. Christian. 2009. *Internet, mail, and mixed-mode surveys: The tailored design method*. 3rd ed. John Wiley & Sons, Hoboken, NJ.
- Di Mauro, D. and T. Dietz. 2001. Assessment of an interpretive program for U.S. Coast Guard personnel. *Conservation Biology*. 15(3):776-779.
- Dishneau, D. 2009. Highway shoulders shaggy as states cut back mowing. June 5, 2009. *Seattle Times*, Associated Press. 18 December 2010.
<http://seattletimes.nwsources.com/html/nationworld/2009303612_apusshaggyhighways.html>.
- Dow Chemical Company. 2011a. Newark Plant: Who we are. 3 February 2011.
<<http://www.dow.com/about/>>.
- Dow Chemical Company. 2011b. Our company. 3 February 2011.
<http://www.rohmhaas.com/wcm/about_us/locations/newark/who_we_are.page>.
- Environmental Leader, LLC. 2009. Green marketing: What works, what doesn't: A market study of practitioners.
<<https://reports.environmentalleader.com/report/green-marketing-what-works-what-doesnt-a-marketing-study-of-practitioners/>>.
- Esty, D.C and A.S. Winston. 2009. *Green to gold: How smart companies use environmental strategy to innovate, create value, and build competitive advantage*. 2nd ed. John Wiley and Sons, Hoboken, NJ.
- Falk, J.H. and L.M. Adelman. 2003. Investigating the impact of prior knowledge and interest on aquarium visitor learning. *Journal of Research in Science Teaching*. 40(2):163-176.

- Fishbein, M. 1967. A behavior theory approach to the relations between beliefs about an object and the attitude toward the object, p. 389-400. In: M. Fishbein (ed.). Readings in attitude theory and measurement. John Wiley and Sons, New York, NY.
- Fishbein, M. and I. Ajzen. 1975. Belief, attitude, intention, and behavior: An introduction to theory and research. Addison-Wesley Publishing, Reading, MA.
- Fishbein, M. and M.J. Manfredo. 1992. A theory of behavior change, p. 29-50. In: M.J. Manfredo (ed.). Influencing human behavior: Theory and applications in recreation, tourism, and natural resources management. Sagamore Publishing, Champaign, IL.
- Flanagan, C. 2010. Are we rowing in circles? Carpe plantas! Strategic actions all botanic gardens can take to advance plant conservation. American Public Gardens Association Annual Conference, Atlanta, GA, 2-5 Jun. 2010.
- Freeman Associates. 2008. Market research study: Sustainable practices in the residential sector: Market constraints and opportunities. American Water Works Association Sustainable Water Sources Conference, Reno, NV, 10-13 Feb. 2010. 19 December 2010.
<http://www.awwa.org/files/Resources/Waterwiser/references/PDFs/sustainable2008_mon5-6.pdf>.
- Gallagher, T.J. 1977. Visual preference for alternative natural landscapes. Dissertation Abstracts International 38(03A):1702.
- Golf Course Superintendents Association of America (GCSAA). 2010. GCSAA 2011 Education Conference: Environmental Track. 6 December 2010.
<<http://www.gcsaa.org/conference/education/estack.aspx>>.
- Gobster, P.H. 1999. An ecological aesthetic for forest landscape management. Landscape J. 18(1):54-64.
- Gobster, P.H., J.I. Nassauer, T.C. Daniel, and G. Fry. 2007. The shared landscape: What does aesthetics have to do with ecology? Landscape Ecology. 22:959-972.
- Grant, J. 2007. The green marketing manifesto. John Wiley and Sons, Chichester, West Sussex, UK.

- Ham, S.H. 2007. Can interpretation really make a difference? Answers to four questions from cognitive and behavioral psychology. Proceedings of the Interpreting World Heritage Conference, Vancouver, Canada. 42-52.
- Ham, S.H. 1992. Environmental interpretation: A practical guide for people with big ideas and small budgets. North American Press, Golden, CO.
- Ham, S.H. and E.E. Krumpe. 1996. Identifying audiences and messages for nonformal environmental education—A theoretical framework for interpreters. 1(1):11-23.
- Hammit, W.E. 1984. Cognitive processes involved in environmental interpretation. Journal of Environmental Education. 15(4):11-15.
- Hands, D.E. and R.D. Brown. 2002. Enhancing visual preference of ecological rehabilitation sites. Landscape and Urban Planning. 58(1):57-70 (abstr.).
- Hindle, T. 2009. Triple bottom line. The Economist. 24 February 2011. <http://www.economist.com/node/14301663?story_id=14301663>.
- Hitchmough, J. 2008. New approaches to ecologically based, designed urban plant communities in Britain: Do these have any relevance in the United States? Cities and the Environment. 1(2):article 10, 1-15.
- Hodgson, R.W. and R.L. Thayer. 1980. Implied human influence reduces landscape beauty. Landscape Planning. 7(2):171-179 (abstr.).
- Hoversten, M.E. and S.B. Jones. 2002. The advocacy garden: an emerging model. Public Garden. 17(4): 34-37.
- Jacobson, S.K. and S.B. Marynowski. 1998. New model for ecosystem management interpretation: Target audiences on military lands. Journal of Interpretation Research. 3(1):1-20.
- Johnson, B.T., G.R. Maio, and A. Smith-McLallen. 2005. Communication and attitude change: Causes, processes, and effects, p. 617-669. In: D. Albarracín, B. Johnson, and M. Zanna (eds.). The handbook of attitudes. Lawrence Erlbaum Associates, Mahwah, NJ.
- Jorgensen, A. 2004. The social and cultural context of ecological plantings, p. 293-325. In: N. Dunnett and J. Hitchmough (eds.). The dynamic landscape: Naturalistic planting in an urban context. Spon Press, London, England, UK.

- Kaplan, R. 2007. Employees' reactions to nearby nature at their workplace: The wild and the tame. *Landscape and Urban Planning*. 82:17-24.
- Kaplan, R. and S. Kaplan. 1989. *The experience of nature: A psychological perspective*. Cambridge University Press, New York, NY.
- Knapp, D. 2009. Is environmental interpretation the same thing as environmental education? *Applied Interpretation Blog*. 18 December 2010.
<<http://www.appliedinterpretation.com/?p=38>>
- Knapp, D. 2006. My relationship with interpretation and environmental education. *Journal of Interpretation Research*. 11(2):53-56.
- Knudson, D.M., T.T. Cable, and L. Beck. 1995. *Interpretation of cultural and natural resources*. Venture Publishing, State College, PA.
- Kotler, P. and N. Lee. 2005. *Corporate social responsibility: Doing the most good for your company and your cause*. John Wiley and Sons, Hoboken, NJ.
- Krueger, R.A. and M.A. Casey. 2000. *Focus groups: A practical guide for applied research*. 3rd ed. Sage Publications, Thousand Oaks, CA.
- Lathan, Z. and T.A. Cone. 2005. *Ecoscaping back to the future...Restoring Chesapeake landscapes: Native plant rain gardens and xeriscapes, examples from the Chesapeake Ecology Center*. Chesapeake Ecology Center, Annapolis, MD. 18 December 2010.
<<http://www.chesapeakeecologycenter.org/vertical/Sites/%7BA7B77D20-B5CC-4703-BAAB-C49A8FAC22DD%7D/uploads/%7BBFC3A4B0-5BCF-484B-8357-5A344860BDD3%7D.PDF>>.
- Lawson, J. 2009. Personal Communication. Field Manager, Ruppert Landscape. Toughkenamon, PA.
- Lewis, W.J. 1980. *Interpreting for park visitors*. Eastern Acorn Press, Philadelphia, PA.
- Lindsay, R. 2005. Looking for lawns. NASA Earth Observatory. 17 November 2009.
<<http://earthobservatory.nasa.gov/Features/Lawn/>>.
- Lohr, V.I. and L.H. Bummer. 1992. Assessing and influencing attitudes toward water-conserving landscapes. *HortTechnology*. 2(2):253-256.
- Lucey, A. 2010. *Influencing public perception of sustainable roadside vegetation management strategies*. M.S. Thesis. University of Delaware, Newark, DE.

- Manget, J., C. Roche, and F. Münnich. 2009. Capturing the green advantage for consumer companies. The Boston Consulting Group. 6 December 2010. <http://www.bcg.com/publications/files/BCG_Studie03_2009.pdf>.
- Marynowski, S.B. and S.K. Jacobson. 1999. Ecosystem management education for public lands. *Wildlife Society Bulletin*. 27(1):134-145.
- Maxwell, J.A. 2005. *Qualitative research design: An interactive approach*. 2nd ed. Sage Publications., Thousand Oaks, CA.
- McKenzie-Mohr, D. 2000. Fostering sustainable behavior through community-based social marketing. *American Psychologist*. 55(5):531-537.
- McKenzie-Mohr, D. and W. Smith. 1999. *Fostering sustainable behavior*. Gabriola Island, BC: New Society Publishers.
- Merriman, T. 2009. Personal Communication. Executive Director, National Association for Interpretation. Fort Collins, CO.
- Merriman, T. and L. Brochu. 2009. Comments: Is environmental interpretation the same thing as environmental education? *Applied Interpretation Blog*. 3 November 2009. <<http://www.appliedinterpretation.com/?p=38>>.
- Merriman, T., and L. Brochu. 2006. *The history of heritage interpretation in the United States*. National Association for Interpretation, Fort Collins, CO.
- Mintel Oxygen Reports. 2010. Mintel Press Release: Are Americans willing to pay more green to get more green? 6 December 2010. <<http://www.mintel.com/press-centre/press-releases/514/are-americans-willing-to-pay-more-green-to-get-more-green>>.
- Nassaeur, J.I. 2004. Monitoring the success of metropolitan wetland restorations: Cultural sustainability and ecological function. *Wetlands*. 24(4):756-765.
- Nassauer, J.I. 1995. Messy ecosystems, orderly frames. *Landscape Journal*. 14:161-170.
- Nassauer, J.I., Z. Wang, and E. Dayrell. 2009. What will the neighbors think? Cultural norms and ecological design. *Landscape and Urban Planning*. 92:282-292.
- National Association for Interpretation (NAI). 2011. About NAI: Programs, products, and services. 6 January 2011. <http://www.interpnet.com/about_nai/products.shtml>.

- National Association for Interpretation. 2010. Certified Interpretive Guide Training Workbook. National Association for Interpretation, Fort Collins, CO.
- National Association for Interpretation (NAI). 2009a. About NAI: Overview. 3 November 2009. <http://www.interpnet.com/about_nai/index.shtml>.
- National Association for Interpretation (NAI). 2009b. About NAI: Mission, vision, and core values. 3 November 2009. <http://www.interpnet.com/about_nai/mission.shtml>.
- National Association for Interpretation (NAI). 2009c. Standards and practices for interpretive methods. 24 November 2009. <<http://www.interpnet.com/download/BP-Methods-Jan09.pdf>>.
- National Wildlife Federation (NWF). 2009. Garden in an environmentally friendly way. 24 November 2009. <<http://www.nwf.org/gardenforwildlife/sustainablegardening.cfm>>.
- Novey, L. 2008. Why we should communicate, rather than interpret: A call to arms. *Journal of Interpretation Research*. 13(1):51-58.
- Orians, G.H. and J.H. Heerwagen. 1992. Evolved response to landscapes, p. 555-579. In: J.H. Barkow, L. Cosmides, and J. Tooby (eds.). *The adapted mind: Evolutionary psychology and the generation of culture*. Oxford University Press, New York, NY.
- Ottman, J.A., E.R. Stafford, and C.L. Hartman. 2006. Avoiding green marketing myopia: Ways to improve consumer appeal for environmentally preferable products. *Environment*. 48(5):23-36.
- Ottman, J.A. 1998. *Green marketing: opportunity for innovation*. NTC/Contemporary Publishing Company, Chicago, IL.
- Ottman, J.A. 2011. *The new rules of green marketing: Strategies, tools and inspiration for sustainable branding*. Greenleaf Publishing, Sheffield, England, UK.
- Parsons, Russ. 1995. Conflict between ecological sustainability and environmental aesthetics: Conundrum, canard, or curiosity. *Landscape and Urban Planning*. 32(3):227-244.
- Patton, M.Q. 2002. *Qualitative research and evaluation methods*. 3rd ed. Sage Publications, Thousand Oaks, CA.

- Petty, R. and J.T. Cacioppo. 1986. The elaboration likelihood model of persuasion, p. 123-205. In: L. Berkowitz (ed.). *Advances in experimental social psychology*. Vol 19. Academic Press, New York, NY.
- Petty, R.E., J.T. Cacioppo, and D. Schumann. 1983. Central and peripheral routes to advertising effectiveness: The moderating role of involvement. *Journal of Consumer Research*. 10:135-146.
- Pickett-Baker, J. and R. Ozaki. 2008. Pro-environmental products: marketing influence on consumer purchase decision. *Journal of Consumer Marketing*, Vol. 25 No. 5 pp. 281-293.
- PGAV Destination Consulting, Jerry Henry and Associates, and Missouri Botanic Garden. 2008. U.S. environmental sustainability study and the impact “going green” has upon the attractions industry. Powerpoint presentation. PGAV Destination Consulting, St. Louis, MO.
- Pierssené, A. 1999. *Explaining our world: An approach to the art of environmental interpretation*. 1st ed. Routledge, New York, NY.
- Polonosky, M. J. 1994. An introduction to green marketing. *Electronic Green Journal*. 1(2).
- Pooley, J.A. and M. O’Connor. 2000. Environmental education and attitudes: Emotions and beliefs are what is needed. *Environment and Behavior*. 32(5):711-723.
- Powell, R.B. and S.H. Ham. 2008. Can ecotourism interpretation really lead to pro-conservation knowledge, attitudes and behavior? Evidence from the Galapagos Islands. *Journal of Sustainable Tourism*. 16(4):467-489.
- Professional Grounds Management Society. 2010a. PGMS joins Sustainable Sites Initiative™. 8 December 2010.
<<http://www.pgms.org/SustainableSitesInitiative.htm>>.
- Professional Grounds Management Society (PGMS). 2010b. PGMS Green Star Awards. 14 December 2010.
<<http://www.pgms.org/2010GreenStarWinners.htm>>.
- Professional Landcare Network (PLANET). 2010. PLANET Green Industry Conference: Education Schedule. 8 December 2010.
<<http://www.landcarenetwork.org/events/GreenIndustryConf/program/session.cfm>>.

- Rogers, E.M. and F.F. Shoemaker. 1971. *Communication of innovations: A cross-cultural approach*. 2nd ed. New York, Free Press.
- Saksa, K. 2011. *Student perception of sustainable campus landscapes: University of Delaware Laird Campus case study*. M.S. Thesis. University of Delaware, Newark, DE.
- Schutt, J. 1999. *Roadside naturalization: Give me one good reason*. Proceedings from Roadside Vegetation Management Conference, Pennsylvania Department of Transportation, Lehigh Valley, PA.
- Schwetz, G. 2009. Personal Communication. Director of Programs, Delaware Center for Horticulture. Wilmington, DE.
- Sheppard, S.R.J. 2001. Beyond visual resource management: emerging theories of an ecological aesthetic and visible stewardship. In: S.J.R. Sheppard and H.W. Harshaw (eds.) *Forests and landscapes—Linking ecology, sustainability and aesthetics*. IUFRO Research Series. 6:149–172. CABI Publishing, Wallingford, UK.
- Sifton, M.A. 2009. *Are all gardens green? Sustainable landscape design and maintenance practices in North American public gardens*. M.S. Thesis. Cornell University, Ithaca, NY.
- Slattery, B.E., K. Reshetiloff, and S.M. Zwicker, S.M. 2003. *Native plants for wildlife habitat and conservation landscaping: Chesapeake Bay Watershed*. U.S. Fish & Wildlife Service, Chesapeake Bay Field Office, Annapolis, MD. 24 November 2009. <<http://www.nps.gov/plants/pubs/chesapeake/>>.
- Sluiter, J. 2010. Personal Communication. Staff Ecologist and Program Manager, Audubon Cooperative Sanctuary Program, Audubon International. Selkirk, NY.
- Steinitz, C. 1990. Toward a sustainable landscape with high visual preference and high ecological integrity: The loop road in Acadia National Park, U.S.A. *Landscape and Urban Planning*. 19:213-250.
- Stepath, S.M. 2000. Awareness and community-based monitoring. Proc. 9th International Coral Reef Symposium. 23-27 Oct. 2000, Bali, Indonesia, Vol. 2.
- Sustainable Sites Initiative (SSI). 2010a. About us. 14 December 2010. <<http://www.sustainablesites.org/about/>>.

- Sustainable Sites Initiative (SSI). 2010b. Sustainable Sites Initiative (homepage). 14 December 2010. <<http://www.sustainablesites.org/>>.
- Sustainable Sites Initiative (SSI). 2010c. Frequently asked questions. 14 December 2010. <<http://www.sustainablesites.org/faqs/>>.
- Sustainable Sites Initiative (SSI). 2010d. Pilot program. 15 December 2010. <<http://www.sustainablesites.org/pilot/>>.
- Sustainable Sites Initiative (SSI). 2009a. Guidelines and performance benchmarks 2009. 24 November 2009. <[http://www.sustainablesites.org/report/Guidelines and Performance Benchmarks_2009.pdf](http://www.sustainablesites.org/report/Guidelines_and_Performance_Benchmarks_2009.pdf)>.
- Sustainable Sites Initiative (SSI). 2009b. New landscape rating system to transform the industry, complete green building puzzle. Press release. 5 November 2009. <<http://www.sustainablesites.org/media/press-11-05-09.php>>.
- Tallamy, D.W. 2007. Bringing nature home: How native plants sustain wildlife in our gardens. Timber Press, Portland, OR.
- Taylor, T. 2009. Personal Communication. Landscape Engineer, University of Delaware, Newark, DE.
- TerraChoice. 2010. The sins of greenwashing home and family edition: A report on environmental claims made in the North American consumer market.
- Thayer, Jr., R.L. 1994. Gray world, green heart: Technology, nature, and the sustainable landscape. John Wiley and Sons, New York, NY.
- Thayer, Jr., R.L. 1989. The experience of sustainable landscapes. *Landscape Journal*. 8:101–110.
- Thøgersen, J. 2006. Media attention and the market for 'green' consumer products. *Business Strategy and the Environment*. 15(3):145-156.
- Tilden, F. 2008. Interpreting our heritage. 4th ed. University of North Carolina Press, Chapel Hill, NC.
- Transportation Research Board Committee on Environmental Analysis in Transportation (TRBCEAT). 2010. Directory of state highway agency and federal highway administration environmental officials (last updated January 13, 2010). 12 March 2010. <http://www.itre.ncsu.edu/ADC10/docs/Directory_of_SHA_and_Env_Officials.pdf>.

- Ulrich, R.S. 1986. Human responses to vegetation and landscapes. *Landscape and Urban Planning*. 13:29-44.
- United Nations World Commission on Environment and Development (UNWCED). 1987. Chapter 2: Towards sustainable development. Report of the World Commission on Environment and Development: Our common future. 24 November 2009. <<http://www.un-documents.net/ocf-02.htm>>.
- United States Department of Agriculture Alternative Farming Systems Information Center (USDA). 2008. Alternative crops and plants: Native plants and ecofriendly landscaping. 24 November 2009. <http://afsic.nal.usda.gov/nal_display/index.php?info_center=2&tax_level=2&tax_subject=298&topic_id=1429>.
- United States Environmental Protection Agency (USEPA). 2009. Mid-Atlantic region green landscaping. 24 November 2009. <<http://www.epa.gov/reg3esd1/garden/>>.
- United States Environmental Protection Agency (USEPA). 2008. Region 2 lawn care. 24 November 2009. <<http://www.epa.gov/region02/p2/greenscaping/>>.
- United States Federal Trade Commission (USFTC). 1998. Guides for the use of environmental marketing claims. Federal Trade Commission Act, Part 260 (15 U.S.C. §§ 41-58 § 260). 5 January 2011. <<http://www.ftc.gov/bcp/gnrule/guides980427.htm>>.
- University of Minnesota. 2006. Sustainable urban landscape information series: Glossary. 14 December 2010. <<http://www.sustland.umn.edu/design/gloss.htm>>.
- Van den Berg, A.E. and C.A.J. Vlek. 1998. The influence of planned-change context on the evaluation of natural landscapes. *Landscape and Urban Planning*. 43(1-3):1-10.
- Vermillion, L.J. and J. Peart. 2010. Green marketing: Making sense of the situation. *Proceedings of the Academy of Marketing Studies*. 15(1):68-72.
- Veverka, J. 2005. Interpretive master planning – keep your garden growing. *Roots*. 2:2. Botanic Garden Conservation International. 3 January 2011. <<http://www.bgci.org/worldwide/article/0236/>>.
- Wasowski, A. and Wasowski, S. 2000. *The landscaping revolution: Garden with Mother Nature, not against her*. Contemporary Books, Lincolnwood, IL.

- Welker, D. and D. Green. 2003. Sustainable landscaping: The hidden impacts of gardens. Powerpoint presentation. 14 December 2010.
<<http://www.epa.gov/greenacres/smithsonian.pdf>>.
- Wiles, R. and T.E. Hall. 2005. Can interpretive messages change park visitors' views on wildland fire? *Journal of Interpretation Research*. 10(2):18-35.
- Willison, J. 2006. Education for sustainable development: Guidelines for action in botanic gardens. Botanic Gardens Conservation International, Surrey, UK.
- Yin, R.K. 2009. Case study research: Design and methods. 4th ed. Sage Publications, Thousand Oaks, CA.