NATIVE PLANT PALETTES: PERCEPTIONS OF NORTH TEXAS HOMEOWNERS IN UPPER-INCOME SUBURBIA

by

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ABSTRACT

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UPPER-CLASS SUBURBIA

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This study examines the perceptions of upper-income homeowners in North Texas regarding their knowledge of native plant palettes and their commitment to using them in their residential landscapes. Literature on the topic highlights different perspectives on the actual definition of 'native' plants. However, for the purpose of this study a 'native plant palette' refers to the use of a plant species that "occurs naturally in a particular region, ecosystem or habitat without direct or indirect human intervention" and in return helps support its surrounding ecological community (Tallamy 2009; US National Arboretum 2006, pg. 1)."

Current literature on homeowners' perceptions of native plants is limited. Therefore, this study investigates factors influencing residential landscapes in order to understand homeowners' plant choices in present-day suburbia. In addition, expert opinion reflects the current debate between native plants versus non-native plants in the landscape. By identifying homeowners' perceptions, landscape professionals will be able to market and design future proposals to homeowners' expressed needs and wants.

This study employs qualitative research methods using in-depth interviews to gain an understanding of a participant's view on the topic (Taylor and Bogdan 1998). The participants of

the study included volunteers, primarily elected officials due to privacy concerns, and residents of homeowner's associations in the following four suburban neighborhoods in North Texas: Montgomery Farm in Allen, TX; Stone Lakes in Southlake, TX; Bakers Branch in Flower Mound, TX; and Wellington in Flower Mound, TX. Overall, respondent selection is part of a grander categorization according to climatic division, North Central Texas. The North Central Texas climatic division represents the cross-timbers and backland prairie regions (National Agriculture Statistics Service 2012). Although the regions are diverse in native plant representation, this study does not focus on regions, rather homeowners' perceptions of native plants in general. Additional narrowing of participants includes suburb popularity, proximity, household income status, and access.

The findings collected from respondents revealed limited knowledge from informants regarding native plant palettes. Interview results also illustrated a positive opinion among respondents regarding native plants in residential landscapes to accomplish needs such as water conservation and plant longevity. However, in order to commit to native plants, homeowners request the aid of design professionals to accomplish aesthetic goals. This request is important to the landscape architecture profession as they are the professionals who will adapt future native plant design proposals to meet the needs and wants of the homeowner.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

This research examined North Texas, upper-income homeowners regarding their perceptions of native plant palettes in their residential landscapes. The actual definition of a native plant varies between individual experts ranging from native plant enthusiasts to entomologists. For the purposes of this study, the following statements serve as a basis for the utilized definition of a native plant. A plant species that "grows naturally in a particular region, ecosystem or habitat without direct or indirect human intervention" and in return helps support its surrounding ecological community (Tallamy 2009; US National Arboretum 2006):

1. A plant that lives or grows naturally in a particular region, ecosystem or habitat without direct or indirect human intervention (US National Arboretum 2006, pg. 1)".
2. A plant can only function as true 'native' while it is interacting with the community that historically helped shape it (Tallamy 2007).

The literature review outlines the debate between experts and garden enthusiasts regarding the advantages and disadvantages of native plants in the landscape, giving spectators a good understanding of the experts' knowledge and commitment to the plant palette. In addition, factors that influence residential landscapes are explored to provide a basis for the qualitative research in order to understand homeowners' perceptions of native plant palettes. The consensus of whether or not these factors influenced participants in this study is presented in the concluding analysis.

Face to face, in-depth interviews were conducted with respondents representing the top 25 percent of household incomes according to North Texas zip codes, as defined by the New

York Time's analysis of the University of Minnesota's US population center data (White et al. 2012). The findings collected from respondents were analyzed using the constant comparative method. The strategy is used to develop the grounded theory approach. It codes the data in the form of lists in order to allow themes to emerge (Glaser and Strauss 1967 in Taylor and Bogdan 1998). The results provided the level of knowledge and commitment North Texas homeowners had regarding native plant palettes.

1.2 Statement of Purpose

The primary objective of this study is to provide the landscape architecture professionals with information regarding how much upper-income homeowners know about native plants and the level of commitment they have towards using native plant palettes in residential landscapes. As mentioned previously, current literature referencing homeowner's perspectives of native plants in residential landscapes is limited. In turn, this limits the professionals' understanding of the homeowners' current perceptions of native plants. Providing landscape architecture professionals with this information will enable them to adapt their marketing and future design proposals to homeowners' needs and wants.

1.3 Research Questions

The following questions address the perceptions of study participants regarding the use of native plant palettes in upper-income suburban neighborhoods of North Texas:

- What are homeowners' knowledge of and commitment to native plants?
- Do homeowners accept native plant palettes as a necessity for the health of the environment in suburbia?
- What landscape plant palette do homeowners gravitate to and why?

1.4 Research Methods

The methodology used for this study was a qualitative approach using in-depth interviews to gain an understanding of the participants' views on the topic. The four North Texas suburban areas chosen for the study are: Montgomery Farm in Allen, TX; Stone Lakes in

Southlake, TX; Bakers Branch in Flower Mound, TX; and Wellington in Flower Mound, TX. Although participant selection is narrowed, informants represent a grander categorization according to the North Central Texas climatic division. The climatic division represents the cross-timbers and blackland prairie regions (National Agriculture Statistics Service 2012). Although the regions are diverse in native plant representation, this study does not focus on regions, rather homeowners' perceptions of native plants in general.

In order to obtain interview subjects, the researcher contacted homeowner's associations (HOAs) by phone and/or email to gain access to the community's' homeowners. Interviews were conducted with the group of residents who responded positively to participating in the study until themes were detected among the individual interviews. The interviews took place at individual residences, local Starbuck's cafes, and HOA offices, according to the participant's request.

1.5 Definition of Terms

Biodiversity is defined as "species, genetic, and ecosystem diversity in an area, sometimes including associated abiotic components such as landscape features, drainage systems, and climate (Swingland 2012, p.1)".

DDT pesticide (dichloro-diphenyl-tricholor-ethane) is an organocholorine pesticide that was commonly used in the United States until the Environmental Protection Agency banned its use (DDT Technical Fact Sheet 1999).

Exotic plants are species that have been created through cultivation or transported by people across regional boundaries (Buckstrup and Bassuk, 1997).

Homeowner's associations are involuntary membership organizations that originated as implementations of the real estate law. They ensure that common area, amenities and infrastructure, are properly maintained (Hyatt 1995, 2000 in McCabe 2011).

Levittowns were master-planned housing communities built from scratch by Abraham Levitt and Sons, a respected and popular developer, post WWII (Kimmel 2010).

Native plants a plant that “occurs naturally in a particular region, ecosystem or habitat without direct or indirect human intervention” and in return helps support its surrounding ecological community (Tallamy 2009; US National Arboretum 2006, pg. 1).”

Nature deficit disorder is defined as “the human costs of alienation from nature, among them diminished use of the senses, attention difficulties, and higher rates of physical and emotional illness (Louv 2005, p.36).”

Upper-income suburbia is defined as US suburban neighborhoods in the top 25% of household incomes starting at or above $89,125 (White et al. 2012).

1.6 Significance and Limitations

The significance of this study is that it provides landscape architects an opportunity to address the needs and wants of their clients as applied to native plants in North Texas residential designs. This in return offers the professional a chance to adapt his or her marketing and future design proposals accordingly. Furthermore, this study lends itself to ‘bend the curve’ toward sustainability or ecological diversity in focusing on native plant palettes. By additionally focusing on upper-income suburbia, this study can improve the response for the social class that professionals work with most consistently.

The primary limitation found in the literature review was the lack of literature focusing on the perceptions of homeowners regarding native plants. The research methodology provided additional limitations in regards to the availability of homeowners. In most cases, for privacy concerns, the respondent was only allowed to interview board members and landscape committee members. In addition, the study was limited to four suburban neighborhoods, due to time constraints. Finally, referencing native plants in the title took away from the authenticity of the participants’ answers and deterred some people from participating in the study. In most cases, people have a varying understanding of the definition of a native plant.

1.7 Chapter Summary

The first chapter introduces the purpose statement of this study, addressing the lack of literature regarding current homeowners' perceptions of native plants in their residential landscapes. The second chapter, literature review, addresses factors influencing plant choice in residential landscapes. In addition, expert opinion, suggested design, and current news coverage regarding native plants is examined for further clarification. The third chapter, research methods, elaborates on the research design, and significance and limitations of the study. Chapter four discusses findings and analysis derived from the in-depth interviews. The concluding chapter summarizes the findings and its correlations to the literature review, the study's significance to the landscape architecture profession, and suggestions for future research.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The literature review provides a foundation for this study by creating a profound understanding regarding the debate over native plants in residential landscapes by outlining expert opinions, aesthetics, and recent news coverage in North Texas. In order to provide a basis for the qualitative research, significant factors influencing homeowners' perceptions of native plants in residential landscapes is explored. The literature review is concluded with a brief summary of the significance of upper-income suburbia as it relates to this study.

2.2 Native Plants

2.2.1 Native versus Non-native: Expert Opinions

The promotion and use of native plants in the landscape has increased over the past few decades (Hooper et al. 2008). However, the utilization of native plants create disagreements including the functionality of the claimed advantages of native plants compared to non-native and or exotic species, as well as the promotion of nonnative species (Kendle and Rose 2000; Stein and Moxley 1992 in Hooper et al. 2008). This study explains the origins of the native plant controversy and documents expert opinions on both sides of the debate.

In 1926, Jens Jensen, a pioneer in the landscape architecture profession and early advocate of the use of native plants, expressed his concern with the "show gardens" in American society (Grese 1992 p.28). Jensen spoke to the 26th annual American Society of Landscape Architects conference advocating for the use of native plants and "native styles" in residential landscapes. He expressed additional concerns about formal garden styles and marked them as "inappropriate to the manner of life" of the American people (Grese 1992 p.28). Jensen's presentation created controversy within the conference, and debates about native vs.

non-native plants and formal versus non-formal landscape styles. The debates have continued to the present day in an ongoing controversy over native and exotic plants. Exotic plants, also called non-native/alien plants, are species that have been created through cultivation or transported by people across bio-regional boundaries (Buckstrup and Bassuk 1997).

2.2.1.1 Native Plant Advocacy

Recent advocates have promoted native plant advantages, including improved wildlife habitat, adaptation to extreme climatic conditions, and biodiversity (Buckstrup and Bassuk, 1997).

The late Sarah Stein, advocate and author of *Noah's Garden: Restoring the Ecology of our Own Backyards*, wrote of her own successes incorporating small ecosystems of native plants into her landscape (Lehmann-Haupt 2005). The native plant inspired landscape attracted wildlife including birds, insects, and small mammals. Douglas Tallamy, entomologist, professor and author shares similar views:

> "I needn't elaborate on the many things our gardens do for us. Properly designed, gardens tie our homes to the surrounding landscape as well as provide an outlet for artistic expression and a source of natural beauty that can be enjoyed year round. Our gardens can also provide refuge from an increasingly hectic and unpleasant world. But because gardens are in essence, groups of plants, they also have the potential to perform the same essential biological roles fulfilled by healthy plant communities everywhere (Tallamy 2007, p.18)".

Tallamy's statement illustrates the potential of native plants in suburban landscapes to impact residential gardens positively for both the homeowner and plant communities. Tallamy believes native plants provide comfort and beauty in the landscape, while simultaneously contributing to the health of the surrounding plant community. He also lists further advantages including the unbreakable link between native plants and wildlife (Tallamy 2007). He expresses views similar to Jensen and Stein, stating, "The typical suburban landscape is a highly simplified community consisting of a few species of alien ornamental plants that provide neither food nor shelter for animals. Our challenge is to redesign our living spaces in ways that provide both (Tallamy 2007, p.25)". His answer is native plant diversity, which is historically proven to support

wildlife. Additionally, Rachel Carson supports the views of Stein and Tallamy stating, “In the economy of nature, the natural vegetation has its essential place. Native species along country roads and bordering fields provide food, cover and nesting areas for birds and homes for man small animals (Carson 2002, p.72)”.

In regards to extreme climatic conditions, Sally Wasowski, a Dallas native landscape designer and native plant advocate, explained the importance of native plants in her book, *Landscaping with Native Texas Plants*. She stated, “Native plants are not indestructible, but as a group they are hardier than exotics because they are adapted to their locales” (Wasowski and Ryan 1985, p.1).

Additionally, wildlife specialists at Florida universities emphasized the advantages of native plants on biodiversity. Specialists noted that suburban landscapes affect biodiversity in two ways because of the common use of turf grass and non-native ornamentals. Conservationist Janet Marinelli stated,

> “We are poisoned on the brink of extinction of a biological disaster that could be among the worst in environmental history. As the wilderness shrinks as the backyard acreage increases, the home gardener's role in the crisis grows even greater. Across a continent of breathtaking biological diversity, we have basically planted turf and petunias (Marinelli 1999, p. 26)”.

According to Hostetler and Main (2010), exotic turfs and ornamentals create an artificial environment that restrict assortments of native species in areas dominated by turf and non-native species, and (b) modify surrounding habitats by eliminating native plants and animals from their natural environment. Additionally, some non-native exotic turf and ornamentals also require an extensive amount of maintenance, including herbicides and fertilizers. Both contribute negatively to biodiversity by eliminating native plants others call weeds (Hostetler & Main, 2010). The use of herbicides and fertilizers was criticized in Rachel Carson’s *Silent Spring.* Her statement reiterated the positive role of native plants on biodiversity:

> "Those who find an answer to all problems in spraying also overlook a matter of great scientific importance--the need to preserve some natural plant communities. We need these as standard against we measure the changes our own activities bring about. We need them as wild habitats in which original populations of insects and other organisms can be maintained (Carson 1962, p. 79)".

2.2.1.2 Opposition to Native Plant Advocacy

The opposition to native plants in the landscape is in large part due to the naturalistic design approach in which creative and/or human design is discouraged (Pollan, 1994). As early as 1938, a German landscape designer, Rudolf Borchardt, protested his country's shift towards the promotion of native plant palettes in the garden. Borchardt advocated for multi-horticulture and international garden culture stating; "The garden of humanity is a huge democracy… It is not the only democracy which such clumsy advocates threaten to dehumanize" (Pollan 1994 p.1). Borchardt valued a garden's ability to connect people both through history and culture, and welcomed human intervention such as exotics. According to Dave Egan and William Tishler (1999}, Pollan and other exotic enthusiasts such as German landscape historians Joachim Wolschke-Bulhmann and Gert Groening, believed the contemporary use of native plants to be politically and racially driven. They further explain enthusiasts illustrating the use of native plants as an individual's choice, contributing to "sense of place". In some cases, the aesthetic benefits of exotic plants appeal to an individual's choices. According to wildlife specialists in Florida, people who value the aesthetic benefits of exotic plants argue that there is not enough evidence to condemn non-native plants officially, as exceptions do occur. Exotic plant enthusiasts claim that if homeowners manage their landscapes appropriately, the impact on the environment is minimal (Hostetler and Main 2010).

Opposition to the strict use of native plants continues with views from Dr**.** Carl Whitcomb**,** creator of the horticulture research company, Lacebark. Dr. Whitcomb has stated that in an urban environment, original site conditions dramatically change with the addition of construction debris and litter. Therefore, the site may not be suited for a "native" plant's growth. In response to conditions such as this; "our focus should be on plants adapted and with

acceptable “manners” relative to the desired purpose. The plant that grows best on a site may or may not be desirable and it may be native or it may be an exotic (Whitcomb 2012, p.2)”.

Researchers at The Urban Horticulture Institute, Department of Floriculture and Ornamental Horticulture at Cornell University, agree with the views of Pollan, continuing to appreciate planting variety and beauty through human intervention in the landscape. However, the effort to find a balance between exotic and native plant species is highly encouraged (Buckstrup and Bassuk 1997).

The literature indicates that exotic plant enthusiasts do not necessarily condemn the use of native plants, but highly encourage an individual’s preference as long as the environment is considered. By contrast, native plant advocates encourage adoption of native plants in the landscape for both environmental and ecological benefits, including wildlife attraction, biodiversity and climate tolerance. For homeowners that are interested in incorporating native plants in the landscape, there are reliable sources providing aesthetic advice.

2.2.2 Aesthetics

It is a common misunderstanding that the aesthetic appearance of native plants must mimic prairies, woodlands, etc. Native plants are capable of replacing non-native ornamentals in many styles of existing or future landscape design (Texas A&M AgriLife Extension 2012). Although the possibilities are endless regarding landscape design styles for native plants, there are many common design styles typically used for aesthetic value: Formal, traditional, naturalistic, and various combinations of each.

The Lady Bird Johnson Wildflower Center, located in Austin, TX, is a botanical research facility and public garden that emphasizes the use of native plant species. Specific recommendations for native plant varieties for North Central Texas are found on their website, examples include Blue Mist Flower, Purple Cone Flower, and Mexican Plum. Additional information includes three types of homeowner gardens:

1. The formal homeowner garden is a design style that relies heavily on architectural form, balance, symmetry, and clean lines, and is usually high maintenance (Lady Bird Johnson Wildflower Center 2012).
2. The traditional homeowner garden is a popular cross between a formal and naturalistic landscape. The design uses free form lines and geometric layouts to achieve a balance of both design styles (Lady Bird Johnson Wildflower Center 2012).
3. The natural homeowner garden is the closest design style to nature providing a habitat formed from diverse species of native plants. The habitat allows wildlife sustainment by providing food, water, and shelter. This design style promotes year-round interest if properly designed (Lady Bird Johnson Wildflower Center 2012).

Figures 2.1, 2.2, and 2.3 illustrate three types of gardens.

Figure 2.1 Native-Formal Homeowner Garden (Lady Bird Johnson Wildflower Center 2012)

Figure 2.2 Native-Traditional Homeowner Garden (Lady Bird Johnson Wildflower Center 2012)

Figure 2.3 Native-Naturalistic Homeowner Garden (Lady Bird Johnson Wildflower Center 2012)

2.2.3 Recent News Coverage in North Texas

Within the past three decades, native plants have been in the headlines of news coverage in the Dallas-Fort Worth Metroplex. This section provides information on sample articles and local advocates of native plants from local media. For the purposes of this study, gardening articles in the archives of the Fort Worth Star Telegram and the Dallas Morning News were analyzed to provide context on the percentage of native plant articles available over the decades.

The 1997 *Fort Worth Star-Telegram* article, “Going Native,” introduced a “new trend” amongst North Texas homeowners: native plants in the landscape. At the time, the article claimed native plant palettes seemed nonexistent to the average observer. However, Andy and Sally Wasowski, co-authors of *Native Plants: Landscaping Region by Region* and former Dallas residents, discovered that native plants were being used in North Texas landscapes. Homeowners in the cities of Burleson and Arlington were adopting native plant palettes for their low maintenance, drought tolerant qualities (Nuckols 1997). Molly Hollar, an Arlington homeowner, expressed her love for native plants; “They’re also very beautiful. To my own way of thinking, the most beautiful places I see are in an unspoiled region, out in the wild (Nuckols 1997, p.1)”. The article expressed positive views of native plant palettes and design styles using natives useful for North Texas residents, but also reiterated the importance of personal preference. Judy Sloan of Burleson stated, “You can’t be real compulsive like people in town are” in their zeal to achieve a manicured look. Native plants reseed where they please, so “you have to be a little freer (Nuckols 1997, p.1)”. Since 1997, news coverage regarding homeowners’ views and knowledge of native plant palettes in the landscape has been limited. However, recent articles expressed positive reinforcement for the use of native plants in general, but especially regarding the use of native plants in public park designs and along interstate highways.

In 2011, the Texas Department of Transportation (TxDOT) made a decision to use native plant palettes along medians of the Dallas central expressway. The built expressway resulted in disregard of native plant palettes, resulting in landscape maintenance, upkeep costs of $650,000 a year for previously planted non-native ornamentals, and irrigation. The decision was to convert to native grasses to “plant some green and make some green/money (Watson 2011, p.1)”. TxDOT installed the native grasses during the fall months to avoid climate stress during summer months.

In May of 2012, reporter Jeff Ray stressed the importance of using native plants in the landscape, citing the Botanical Research Institute of Texas (BRIT) as his primary source of research. BRIT is currently in the process of researching native plants on its green roof and landscape. The research intends to determine the best native plant varieties for a homeowner’s yard. In response to the extreme summer temperatures and resulting drought-like conditions, Ray emphasized the importance of using native plants of North Texas because they are most adapted to the environment. Ray also stated that the use of native plants is a personal preference, albeit a highly recommended one. He stated, “Growing a wide variety of native plants is a different look think patches of prairie, broken up by houses, sidewalks, and roads in suburbia, and you are starting to picture the future, but likely the look of inevitability. Zoning laws will have to change, small businesses will have to adapt, and the sense of aesthetics will have to be adjusted (Ray 2012, p.1)”.

Howard Garrett, landscape architect and current columnist for the Dallas Morning News, provides expert advice to readers about gardening, landscape design, and the plants of North Texas. On his website, *The Dirt Doctor*, Garrett provides additional information for gardeners and landscape enthusiasts including answers to landscape questions and organic advice. Garrett emphasizes the importance of native plants in the landscape on both his website and in his publications *Plants for the Metroplex* and *Plants for Texas*. For example, when asked if he would recommend planting a Princeton Elm in the Fort Worth area, Garrett replied,

> "I don't recommend Princeton elms. Stick with native cedar elms. Introduced trees and hybrids don't grow as well as native trees. Although the tree you asked about is supposed to be a true American elm, few other American elms introduced in North Texas have survived (Garrett 2011, p.1)."

Garrett claims homeowners save dollars when choosing native plant plants for the landscape.

Neil Sperry primarily promotes non-native plants in the landscape. However, in his book, Sperry briefly states, "Want a plant that will survive in your area? One that likes your climate and soil? Consider a native, a plant that's already growing there, one that's proved its adaptability in the Lone Star State" (Sperry 1982). Sperry believes natives should be planted more often, because they are infrequent in our suburban landscapes.

Sources such as the *Dallas Morning News*, *Fort Worth Star-Telegram*, and Howard Garrett have promoted written articles and advice broadcasts on native plants in North Texas media. Although Neil Sperry, briefly states the above quote advocating native plants; he is often seen on the opposite side of native plant advocacy. In general, the sources outlined for this study, often feature non-native and/or basic gardening articles and advice. Examples include Howard's 2010 article*,* Apple and Pear Trees Need Little Pruning and Sperry's 1982 publication, *Eight Steps for Getting Your Lawn Started.*

Table 2.1 illustrates a comparison between gardening articles in the *Dallas Morning News* and *Fort Worth Star-Telegram* over the past four decades. The information was collected using a news database, outsourced by the University of Texas at Arlington library. For each news media, the key word 'native plant' was used to identify the number of articles addressing the topic for each year, in comparison with the overall database 'gardening'. In context, native plant articles make up a small percentage of news coverage compared to the total amount of gardening articles in each decade. The sample shows an increase in articles on native plants over the years.

Table 2.1 Sample: North Texas Articles (Adapted From: Dallas Morning News 1980:2000; Fort Worth Star Telegram 1980:2000)

DFW Gardening Articles: 1980s to 2012						
Year	Dallas Morning News			Fort Worth Star Telegram		
	Native Plants	Non-Native_Other	%	Native Plants	Non Native_Other	%
1980s	99	733	11	N/A	N/A	N/A
1990s	600	5464	9.8	171	616	21.7
2000s	492	2224	18.1	189	519	26.6

In summary, news coverage in North Texas over the past four decades has provided followers with limited information and awareness regarding native plants. In context, news regarding native plants is relatively small compared to other plant and gardening topics. However, coverage of the topic has grown in recent years.

The debate between experts regarding native plants in the landscape provides insight on experts' opinion, knowledge and commitment to the plant palette. To provide a basis for qualitative research, this thesis study determines factors that influence residential landscapes in order to provide insight on homeowners' perceptions of native plants in the landscape.

2.3 Factors Influencing Residential Landscapes

2.3.1. Local Climate Change and Water Restrictions

Drought-like conditions and consequential water restrictions affect homeowners of North Texas to different degrees depending on the location, the price of water, and personal landscape preferences (Henry 2012; McCann 2011; Repko 2012). For the purpose of this study, these factors are explored to determine how they affect homeowners' plant choices.

Since October of 2010, most of the state of Texas has experienced drought conditions, including residents of North Texas (Henry 2012). During the summer of 2011, Dallas hit a record of 70 days at or above 100 degrees (Campbell 2011). The severe drought caused North Texas cities to mandate a series of increasing water usage restrictions for residents, according to their water district. Most cities had stage two water restrictions, which restrict residents from watering their landscape during the day and limit watering to two days a week (McCann 2011).

Since June 19, 2012, 33% of the state of Texas is officially drought-free, including North Texas (Henry 2012). However, in light of water conservation awareness, unpredictable climate variations, and circumstances affecting individual cities, many water usage restrictions are still in effect. The current water restrictions for suburban cities of Allen, Flower Mound, and Southlake are displayed in Table 2.2.

Table 2.2 Stages of Water Restrictions (adapted from TRWD Public Works, 2012; City of Allen, 2012).

City	Stage	Ordinance/Restrictions	Effective Dates	Website/Contact Info.
Allen	2	• Limit landscape watering with sprinklers or irrigation systems to no more than two days per week (if needed), as delineated by the stage. •Prohibit landscape watering with sprinklers or irrigation systems from 10 AM to 6 PM •Hand-held hose, soaker hoses or permanently installed drip irrigation systems watering of plant materials during this time may be permitted as long as no runoff occurs.	Until no Longer Needed April 1 – Oct. 31	http://www.cityofallen.org/
Flower Mound	1	• No landscape watering between 10:00 a.m. and 6:00 p.m. unless by hand, soaker hose, or drip irrigation.	April 1 – Oct. 31	http://www.flower-mound.com
Southlake	1	• No landscape watering between 10:00 a.m. and 6:00 p.m., unless by hand or soaker hose. • No watering during rain event. • Prevent water runoff. • Maintain irrigation systems to prevent water waste. • Rain / freeze sensors on new irrigation systems, hand or soaker hose. • No watering during rain event. • Prevent water runoff. • Maintain irrigation systems to prevent water waste.	Jan. 1-Dec. 31	http://www.ci.southlake.tx.us/

The city of Allen is in stage two water usage restrictions, despite the official lifting of drought status, while the neighboring North Texas cities of Flower Mound and Southlake are in stage one water restrictions. Although rainfall has improved recently, Allen and the other cities in the North Texas Municipal Water District (NTMWD), unlike other cities in the Dallas Forth-Metroplex, rely on Lake Texoma for their water supplies. Currently, Lake Texoma is infested with invasive zebra mussels, and until federal measures are conducted to eradicate them, the NTNWD will have to implement higher water restrictions on its residents (City of Allen 2012). According to the Tom Harvey (2009), Zebra mussels have affected water quality in Lake Texoma since 2009.

> "Zebra mussels multiply rapidly and can block water treatment plant intakes and pipes as well as attach themselves to boats, ropes or anything else left in the water. They can cause declines in fish populations, native mussels, and birds. They can also restrict water flow in pipes, foul swimming beaches, damage boat engine cooling systems and cause navigation buoys to sink. The financial cost of controlling and removing zebra mussels from fouled water intake structures can be significant (Harvey 2009, p.1)".

The cities of Flower Mound and Southlake are under stage one water restrictions to ensure sufficient water supply and prevent water evaporation during the hottest parts of the day (City of Flower Mound 2012; City of Southlake 2012).

Despite water conservation efforts and restrictions in affluent cities such as Southlake, their residents are using three times as much water per person compared with other cities in the metroplex, and landscape irrigation is the number one cause (Repko 2012). Within the next 50 years, state experts predict that North Texas will need $21 billion in reservoir infrastructure improvements to sustain the area's population growth and water consumption at current rates. Until then, residents are encouraged to conserve water. However, well-manicured lawns are a part of suburban values and deviating from this mindset is not widely accepted. As reported by Repko, Professor T. L. Point with the University of North Texas stated,

> "Bright, green lawns are classically seen as the way to go for a homeowner. Everybody loves a green lawn. It's been built into our psyche, and it will take time to change that. People, even affluent people, are aware of what they are spending for their bills, and right now, it [water] is so low-priced that people just ignore the price and say, 'I'll just water my lawn (Repko 2012, p.2)."

Lawn advocates, such as Neil Sperry, encourage the 'love for a green lawn'. Sperry (1982, p. 244) stated, "Lawns are an integral part of every landscape. It's the living surface your family will use for relaxation and recreation." According to Repko (2012), T. L. Point believes that water is highly under-valued and therefore, under priced. In order for circumstances to change, water should be relatively cheap for everyday use, but cost more for extra use such as watering lawns. As long as there is plenty of cheap water, education regarding water conservation and native plants will not affect homeowners as much it would if it was scarce.

In summary, a homeowner's location in the metroplex significantly influences the plant choices for the resident's landscape (Repko 2012). According to the severity of the water restrictions, each city's circumstances are different. Homeowners' income, environmental concerns, climate, and political actions such as mandatory water restrictions all have an effect on homeowners' landscapes. In some cases, homeowner's disregard restrictions in order to maintain manicured lawns in order to uphold suburban values (Repko 2012). Homeowner's values and commitment to plant palettes incorporating native plants is futher explained in the suburban orgins.

2.3.2 Suburbia: History and Lawns

The suburban lifestyle has represented the American dream of ownership and prosperity since WWII. Critics often see its landscapes as a stereotype, a cliché of uniformity and monotony, caused by historical and cultural influences in the U.S. (Archer 1989; Graham 2011). This study focuses on the influences of suburban history and socio-culture and measures their impact on homeowners' choice of plant palettes.

2.3.2.1 History

According to Graham (2011), the concept of the American suburb began in the late 19th century. In 1890, 90% of United States citizens lived in rural areas. New York City was America's largest city with a population of only 300,000. Of those 300,000 citizens, 266,000 lived in rural areas on the edge of the city. As time passed, both population and economic

growth led to a collision of city and wilderness, considered the making of suburbia. According to Mattingly (2001), it was not until after WWII that significant growth and changes occurred in suburbia. The post-war years saw mass production of single-family housing to accommodate soldiers coming home from war, such as the developments of Levittowns in Pennsylvania and New York. Levittowns were master-planned housing communities built from scratch by Abraham Levitt and Sons, a respected and popular developer (Kimmel 2010). According to Kimmel, residents moved to these communities because "the idea of green grass and open space was … paradise!"

After the creation of automobiles and highways, Levittowns [mass production of single family housing] encouraged urban sprawl and increased suburban development. The increase in development created stereotypes:

> "A multitude of uniform, unidentifiable houses, lined up inflexible, at uniform distances, on uniform roads, in treeless communal waste, inhabited by people of the same class, the same income, the same age group, witnessing the same television performances, eating the same tasteless prefabricated foods, from the same freezers, conforming in every outward and inward respect to a common mold, manufactured in a central metropolis (Archer and Blauvelt, 2008, p. 129)".

This statement is similar to the views of many critics, from as early as the 1960s, regarding suburbia and its landscapes. The common cliché theme of uniformity and monotony adopted from critics such as Archer and Blauvelt (2008) led to what the typical suburban, American landscape represents, common plant palettes of green lawns, trimmed hedges, and small flowering beds (Archer 1989). According to Graham (2011), the anxiety of uniformity was common for homeowners in post war years. The challenge for designers was accommodating homeowners who had the means to live in suburbia and the request to have a unique landscape appearance. For many, "Living in cookie-cutter suburbs was no more acceptable than living in a trailer park, but adding a bit of customization to your tract home could establish the right note of distinction (Graham 2011, p. 279)".

According to Archer (2011), although suburban criticism occurs, many citizens embrace the concept of suburbia. Suburbia represents the "production of selfhood, family, neighborhood,

and wider social relations (Archer 2011, p.6)". Ownership of a suburban home represents the American dream, establishing status and personal identity. Therefore, the surrounding landscape and/or aesthetic is either accepted or denied based on personal taste.

For those who accept the suburban landscape, the popularity of clichéd landscape elements such as green lawns is credited to socio-culture. The concept of socio-culture contributes to man-made habitats including buildings, landfills, and parking lots. This thesis study addresses the most familiar man-made landscape element, lawns (Bryne 2005).

2.3.2.2 Lawns

In the United States, lawns comprise 60% of residential areas (Byrne 2005; Kaye et al. 2004). The lawn is traced to European gardens, which were first developed for estates and palaces in the 1600s. Designers of these European gardens developed geometric landscape design concepts via the use of ornamental shrubs and fields. Fields, also known as lawns, were maintained by hand, reflecting human control of the landscape (Byrne 2005).

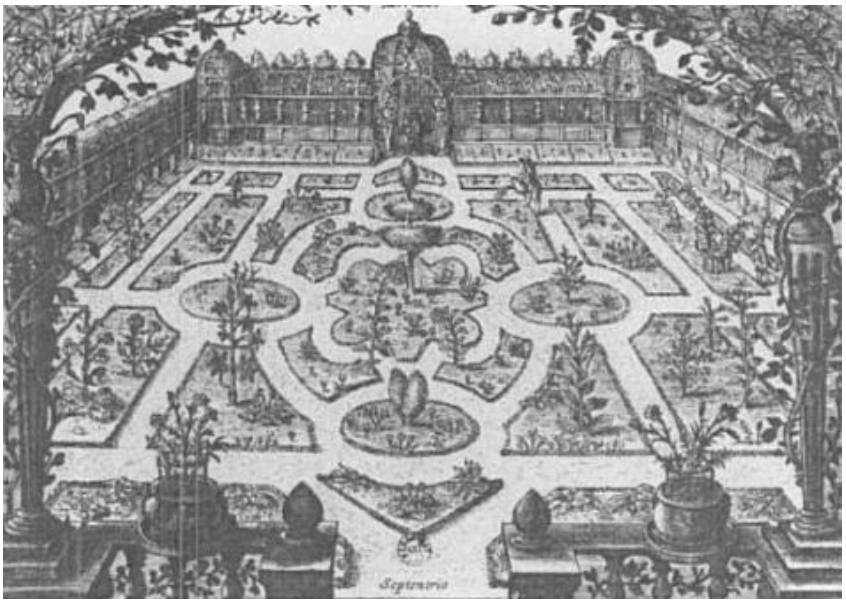

Figure 2.4 Medieval Style Garden (Mukerji 1997)

Lawns did not become prominent in America until landscape designers began to influence residential landscapes by developing standards for suburban aesthetics. In *The Art of*

Beautifying Suburban Home Grounds, Frank J. Scott stated, “A smooth, closely shaven surface of grass is by far the most essential element of beauty on the grounds of a suburban home (Scott 1870 quoted in Graham 2011, p.102).” Landscape architects, such as Fredrick Law Olmstead, created uniform setbacks for housing developments [Riverside, Illinois]. This allowed lawns to be installed creating “the illusion that houses were located on a continuous green field (Schroeder 1993, quoted in Byrne 2005, p.43)”. Landscape designer, Andrew Jackson Downing, promoted the value of the continuous green field. He advertised it as a fast, inexpensive way to beautify a yard and emphasized its advantage of mimicking “vast greenswards” of English manors. “Transforming the humble American rural dwelling into a miniature version of a baronial manor,” contributed to residential influences (Graham 2011, p.103).

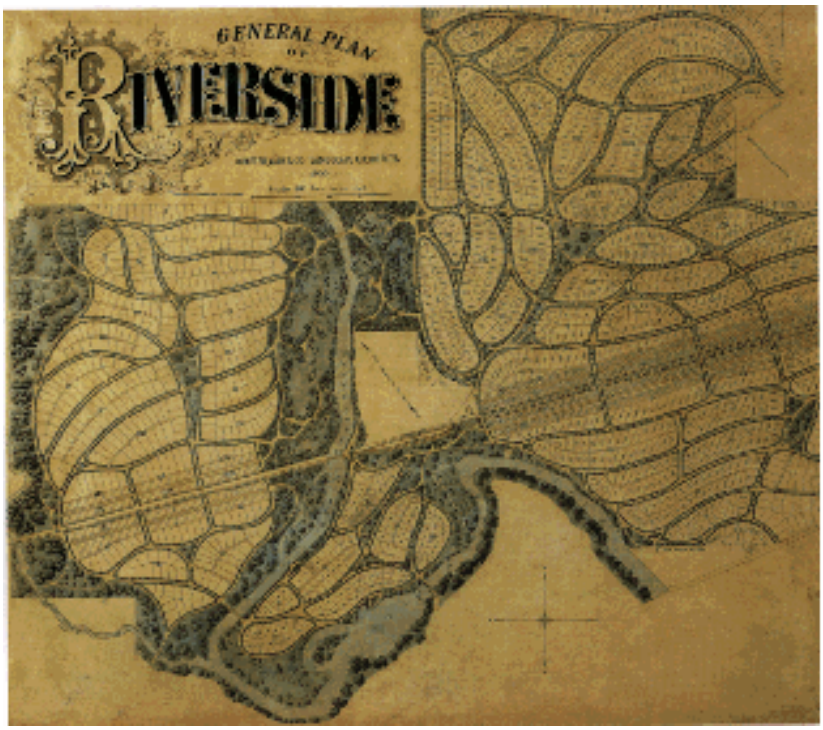

Figure 2.5 Riverside Illinois (Riverside Illinois 2011)

In response to the increase in lawn production, vast numbers of products were created to maintain them, including pesticides, lawn mowers, and irrigation systems. These products and the lawn industry itself frequently influence and promote lawn aesthetics to boost sales by homeowners. (Byrne 2005; Sharp and Robins 2003). According to Sperry (1982), lawns are considered an integral part of American residential landscapes. He referenced the lawn and its surronding plants as being equivalent to a carpet and its furniture. With that being said, Sperry (1982), supports and advises readers on lawn products such as lawn mowers and fertilzers. According to Dickelmann (2002), the maintenance of contemporary landscapes is estimated to use 40 million lawn mowers, requiring 200 million gallons of gasoline a year. It is also estimated that one-sixth of commercially produced fertilizers are used to produce the “ideal” lawn. The ideal lawn concept continues to be a popular part of the present day American landscape.

The origins of suburban/residential landscapes and the influence of socio-culture contribute to the appearance of residential landscapes. Lawns have been adapted from European origin, which continue to be a strong influence on residential landscape palettes to the present day. Although criticisms and clichés exist regarding suburban landscapes; homeonwers’ personal taste for aesthetics continue to fuel suburban acceptance of traditional suburban landscape forms or lawns. The acceptance, and in some cases iplementation of traditional suburban landscape forms or lawns, is further encouraged by homeowners associations.

2.3.3. Homeowners Association Regulations

Homeowners Associations (HOAs) are involuntary membership organizations that originated as implementations of the real estate law (Hyatt 1995, 2000 in McCabe 2011). They ensure that common area, amenities and infrastructure, are properly maintained. Elected board members who have volunteer status run the HOA (McKenzie 2003 in McCabe 2011). According to the Community Associations Institute, there are approximately 300,000 homeowners’ associations in the United States. According to the Community Association’s Institute, in the

Dallas-Fort Worth Metroplex, some 90,000 families are active members of HOAs (Dallas-Fort Worth Chapter, 2012). According to economics professor Robert Nelson (2011, p.546), "The US Census of Governments collects essentially no information on HOAs. The lack of scholarly attention may be due to HOAs confusing legal and economic status, which does not fit any of the conventional boxes." Therefore, this section addresses a brief explanation of homeowners' associations based on the literature, followed by information from recent articles and broadcasts regarding the varying influence homeowners' associations have on residential landscapes.

In the first half of the 20th century, suburban development resulted in a rise in the number of planned neighborhoods across the country. Consequently, awareness of homeowners' actions and their effects on neighborhoods also increased. In 1916, New York addressed any potential problems by creating zoning laws governing neighborhood property rights (Nelson 2011). Between 1920 and 1960, American suburbs adopted New York's zoning solution. Beginning in 1970, HOAs became the official private government for most suburban neighborhoods. Since the 1970s, HOAs have multiplied 30 times across the United States, primarily in the South and West (McCabe 2011; Nelson 2011). "Places such as Celebration, Florida; Reston, Virginia; and Columbia, Maryland, are not cities—they are homeowner's associations (Shearmur 2002 quoted in McCabe 2011, p. 536)." According to McCabe (2011), HOAs are developed in real property records, prior to home building in the designated neighborhood. The HOA is responsible for the common areas in the development and upholding the initial land use restrictions set up by the developer. According to Nelson (2011, p.547), many HOAs "define details of neighborhood land use [through] house color, placement of trees and shrubbery, and parking rules."

2.3.3.1 Implications on the Homeowner

As reported in many recent articles and broadcasts, the regulations that homeowners' associations place on their members' landscapes play a significant role on the choice of plants made by homeowners. The first two-news coverage's are local representations of HOAs

implications on residential landscapes. The third represents a national sample. In 2005, a woman and her family who were originally from Lebanon, bought a house with a manicured lawn in Coppell, TX. Their neighborhood was governed by an HOA. Shortly afterwards, she took measures to revamp their landscape to a style to which they were more accustomed, including organic vegetable gardens and grass-free landscapes. In Lebanon, there are typically two associations with crops in the landscape: to feed the family and to feed livestock. Grass is not encouraged and often given to goats if grown (Karish 2011). In response to her landscape renovation, the HOA sent her a letter in 2009 stating she was; “in non-compliance for changing the landscape without seeking prior approval from the Architectural Committee (AC) (Karish 2011, p.1)”. The woman wrote a formal apology and explained her landscape. The HOA responded by informing her that the “residence does not in our opinion incorporate a consistent community image.” In reference to native plants, their response stated, “Similar plantings should be grouped and shaped to their unique feature as demonstrated in the street medians along Sandy Lake Road (Karish 2011, p.1)”. The HOA’s stress on maintaining a uniform community image is one of the main reasons for its existence, as well as being responsible for increasing the prosperity of its members and maintaining high property values (Ingram et al. 2010). After months of debate between the homeowner and the association, in favor of both parties, consensus showed that the homeowner could comply with the uniformity regulations, but also allowed her more freedom of plant selection.

According to Fox (2010) of the Dallas Morning News, a Plano couple was reprimanded by their homeowner’s association for an abundance of blue bonnets in their front yard. The intention five years ago was to add a splash of color between their Iris and Knockout Roses, with three pots bought at the local home improvement store. However, due to seed spread, the blue bonnets expanded their location into the lawn and into the HOAs common areas (Fox, 2010). The couple states, “We didn't add more seeds, didn't fertilize, didn't water any extra. It was God's handiwork." The homeowner’s association sent a series of letters requiring the

couple to mow the blue bonnets and re-sod the front yard. When action was not taken, the couple was met with a letter from a law office stating, they were not conforming to the “aesthetic harmony” of the subdivision (Fox 2010). Fox (2010) quote the couple as stating, "It's funny to us that we can get in such trouble for growing the Texas state flower. If we can't have bluebonnets, we're gonna be really sad. They represent something unique. And sometimes different is kind of fun". According to Fox (2010), compromise with homeowners and HOA was met allowing the homeowners to keep the bluebonnets in designated planting beds, if they maintained seed spread.

In July of 2012, a Denver woman had a $200 fine given to her by her HOA for brown spots in her front yard. The woman commented, “Maybe I’m cursed with grass. I hired someone to fix the sprinkler, started watering more, and put some new seed down. I agree it’s still not beautiful, but we’ve tried everything we can think of. I’m glad to try to reseed again when it cools off, but we’re in the middle of a heat wave (Ellen 2012, p.1).” Despite her efforts, the HOA president believed she had already had sufficient time to fix the problem. He stated, “If your house looks like trash, then it’s going to depreciate the value of everything around you. That’s what a HOA is for, is to establish and maintain property values (Ellen 2012, p.1).” His statement provides a blunt summary reiterating why homeowners associations exist, emphasizing the importance of property values and uniformity within the community (Ingram et al. 2010).

The articles mentioned show various degrees of influence that a HOA places on homeowners’ landscapes. According to contemporary articles, the fines and strict policies discussed can be a burden to some homeowners, but can also provide a catalyst for change, as proved by the woman in Coppell and couple in Plano. Because the methodology for this research used HOAs to gain access to willing participants for interviews, their influence on participants’ plant selections will be examined in concluding analysis. Similarly to HOAs, suburban landscape forms and or lawns are additionally encouraged by local nurseries, botanical gardens and extension services.

2.3.4. Local Nurseries, Botanical Gardens and Extension Service

North Texas homeowners have limited access to educational opportunities regarding environmental concerns and native plants through local nurseries, botanical gardens and extension services. According to Ken Druse, author of *The Collector's Garden: Designing with Extraordinary Plants*, "The plants at a local garden center just won't be enough to feed your appetite or paint the garden of your dreams, and the desire to possess the latest botanical curiosity will be stronger than you can stand (Druse 1996, p.3)." This statement emphasizes the effects plant displays at local nurseries and botanical gardens have on consumers. In many cases, the display is driven by color. A representative for a nursery in Washington stated; "Color drives our business and is one of the highest profit items for us, accounting for about 20% of our sales (Gunderson 2012, p.1)." According to Wasowski and Ryan (1985), naitve plants are not the standard in advertisement at local nurseries. Therefore, for the purposes of this study, local nurseries, botanical gardens, and extension services were explored to document the types of plants sold, displayed, and promoted to North Texas homeowners. This provided an understanding of how much exposure homeowners received regarding native plants as well as which plants they could actually purchase.

Figure 2.6 represents the plant database for Calloway's, a local nursery in North Texas. Calloway's offers 1,267 plant varieties to their customers, but only 58 plants in their database are promoted as Texas natives (Calloway's Nursery 2011; 2012a; 2012b). According to the Lady Bird Johnson Wildflower Center (2012), 9 of the 58 native plants displayed in Table 2.3 are recommended for North Central Texas. Therefore, Calloway's provides North Texas homeowners with limited access to both state and regional native plant varieties. Although marketing native plants is a growing trend in the southeastern United States, such plants usually comprise only a small percentage of the stock found in commercial nurseries (Brzuszek and Harkess 2009).

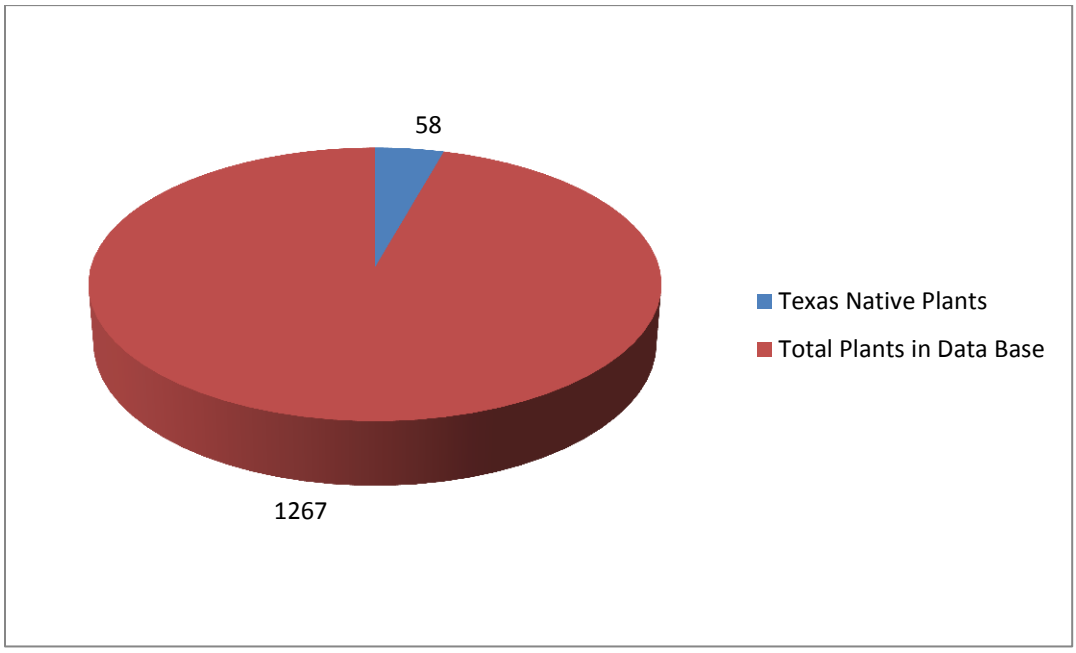

Figure 2.6 Plant Data Base: Calloway's Nursery (Plant and Product Finder 2012, This Year, Go Native 2012)

Table 2.4 illustrates plant advice articles distributed via website by Covington's, another local nursery in North Texas. Article titles were distributed into three categories: environmental concern/native plants, ornamental/non-native plants, and miscellaneous plants. The results show 23% of the articles cater to environmental concerns and native plant promotion, while 64% promote plant and maintenance recommendations for ornamental and/or non-native plant species. The remaining 13% of the articles covered information about soil, temperature, and professional advice. Covington's tries to keep up with current trends in the Southeast, including increased awareness of and promotion of native plants, while still catering to the larger market for non-natives and ornamentals (Brzuszek and Harkess 2012).

Table 2.3 Calloway's 'Native' List (adapted from Calloway's Nursery 2011; 2012a; Lady Bird Johnson Wildflower Center 2012)

Type	Common Name	Texas Native	Texas Adapted	North Central Texas Recommended
Perennials	Bicolor Sage		√	
	Blue Flax	√		
	Cedar Sage	√		
	Chile Petin	√		
	Lantana 'Confetti'		√	
	Copper Canyon Daisy		√	
	Damianita	√		
	Fall Aster	√		
	Flame Acanthus	√		
	Fragrant Mistflower	√		√
	Frog Fruit	√		√
	Gray Shurb Sage		√	
	Greg's Mistflower	√		√
	Heartleaf Skullcap	√		
	Inland Sea Oats	√		
	Katie's Dwarf Ruellia		√	
	Lanceleaf Coreopsis	√		
	Mealy Blue Sage	√		√
	Mexican Bush Sage		√	
	Mexican Feather Grass	√		
	Mexican Oregano		√	
	Moss Verbena		√	
	Lantana 'New Gold'	√		
	Pink Greg's Salvia	√		
	Pink Skullcap		√	
	Prostrate Rosemary		√	
	Purple Coneflower	√		
	Purple Leaf Sage		√	
	Purple Skullcap	√		
	Red Gregg's Salvia	√		
	Russian Sage		√	
	Salvia Indigo Spires		√	
	Nierembergia 'Stary Eyes'		√	
	Texas Betony	√		
	Texas Lantana	√		√
	Walker's Low Catmint		√	
	Wavy Scaly Cloak Fern	√		
	Wedelia		√	
	Winecup	√		√
	Wooly Stemodia	√		
Shrubs	Coral Honeysuckle	√		√
	Yellow Bells 'Sangria'	√		
	American Beautyberry	√		√
	Coralberry	√		
	Esperanza 'Gold Star'		√	
	Skeleton Leaf 'Goldeneye'	√		
	Twist Leaf Yucca	√		
Trees	Mexican Buckeye	√		√
	Desert Willow	√		
	Yaupon Holly 'Pride of Houston'		√	

Table 2.4 Articles Regarding Plants Carried at Covington's Nursery (adapted from Calloway's Nursery 2011)

Covington's Nursery-Keys to Gardening Success Articles		
Environmental Concern/Native Plant Promotion 23%	**Ornamental/Non-Native 64%**	**Miscellaneous 13%**
Vegetable Planting Guide	Shade Tree Guide	How to Make Compost
Water Conservation Tips	Holly Guide	Preparing your Soil for Success
Summer Survival in North Texas	Ornamental Grasses Guide	Preparing Your Yard for Freezing Temperatures
Watering to Protect your Green Investment	Boxwood Guide	Soil Recipe for Acid Loving Plants
Planting with Texas Tough Perennials	Crape Myrtle Guide	Soil Recipe for Great Tomatoes
The Organic Yard - Making the Transition from Conventional Gardening	Vining Plants	Know your Landscaper
Helping Mother Nature	Indian Hawthorn in North Texas	Tree Care for the First Two Years
Perennials Chart	Winter is All About Berries	
Butterfly Gardens for North Texas	Fall Bulbs for Spring Blooms	
Planting Wildflower Seeds	Holly Selection and Care in North Texas	
Plants that Attract Hummingbirds (PDF)	Pansy Partners Class Handout	
Plants that Attract Butterflies	Fall Vegetable Garden	
	Crape Myrtles	
	Azaleas...Turns Out, Not So Scary After All!	
	Creative Container Gardening	
	Drift Roses	
	Conventional Easy-Timing Calendar	
	Japanese Maples	
	Warm Season Annuals	
	Best Amendments for North Texas Soil	
	Made for the Shade	
	Lawn Care for North Texas	
	Fall Vegetable Garden	
	Crape Myrtle	
	Azaleas...Turns Out, Not So Scary After All!	
	Creative Container Gardening	
	Successful Onion Planting	
	Successful Potato Planting	
	Best Herbs for North Texas	
	2012 Rose List and Description	
	Palm Care in North Texas	
	Garden Soils and Vegetable Selection in North Texas	
	Act Now on Palms to Reduce Damage from Winter Weather	
	Nandinas Selection and Care	

The Dallas Arboretum and the Fort Worth Botanical Gardens provide visitors with garden displays illustrating themes, dedications, plant colors, and textures. The Arboretum attracts more than 541,000 local and foreign visitors annually. The following statements from a book published by the Dallas Arboetum provide sample descriptions of gardens found at each institution.

> "As guests enter the garden from the octagonal fountain, an overlook offers a beautiful, unexpected view of the area. A wall provides the backbone of the garden, with a series of circular buttresses covered with red cascade rose trellises. Symmetrical, serpentine plantings mirrored by topiary hollies surround a circular lawn area. Cubed topiary hedges and a red and yellow-leafed barberry hedge in a double-helix configuration align the existing walk to the McCasland Sunken Garden (Dallas Arboretum 2010)".

> "Designed to delight your nose and renew your sense of wonder, the Fragrance Garden features dozens of scented plants for your enjoyment. Just rub the leaves to release amazing and astonishing aromas into the air. Complete with a delightful fountain and ivy-covered fence, this pocket garden is the perfect intimate setting for small weddings, garden parties, or simple quality time with children (Dallas Arboretum 2010)".

Figure 2.7 Boswell Garden (Dallas Arboretum 2012)

Fourteen gardens are described in the book. The Trial Garden promotes environmental concerns and education (Dallas Arboretum 2012). Although native plants are not specifically

mentioned in the trial garden's description, the plants in it are studied by both the Arboretum and Texas A&M University in order to determine which plants are most suitable for the North Texas climate. The information from the plant trials is available to professionals, the public, and homeowners (Dallas Arboretum 2010; 2012).

The Fort Worth Botanical Garden has 12 garden descriptions on its website. Three of these gardens promote native plants and water conservation (Fort Worth Botanical Garden 2012). Although the initial influence of the majority of the garden displays is non-native, both the Dallas Arboretum and Fort Worth Botanical Garden provide educational classes on native plants and environmental concerns. (Dallas Arboretum 2012; Fort Worth Botanical Garden 2012).

Texas A&M University provides a multitude of native and non-native plant sources for residents of Texas, including university research and extension services. Their primary outlet for plant resources is the Texas A&M AgriLife Extension service, in which horticultural agents, professors and experts provide plant advice, and promote researched plant brands (Texas A&M AgriLife Extension 2012).

The Texas A&M AgriLife Extension Service (2012) recommends plants labeled as Texas Superstars. These plant varieties are chosen specifically for their quality and growing reliability in the state of Texas. The plants are selected by an executive board of horticulturists, landscape designers, growers, researchers, botanical garden representatives, and additional green industry professionals. Texas Superstars can be found at local nurseries and wholesalers including Calloway's and Covington's (Calloway's Nursery 2012; Covington's Nursery 2012). In addition, according to thesis research, Texas Superstars are advocated by former Texas A&M student and well-known horticulturist, Neil Sperry, in owned trade shows and radio broadcasts (Dinarte 2009). Further description of Neil Sperry views on plants, and native plants in particular are discussed in later sections.

Previous research provides an understanding of the program's effectiveness on consumers in the green industry. According to a master's thesis research study conducted at Texas A&M University by Dinarte (2009), 88% of 248 respondents surveyed within a years time, were not aware of the brand labeling. The remaining respondents knew of the brand due to store displays, family, friends, and media resources. According to research, brand usage was credited to acknowledgement of no pesticides and minimal soil preparation required of the plants.

Superstar plants are advertised in Go Texan marketing campaigns promoted by the Texas Department of Agriculture. The campaign states, "What does it mean to the average homeowner? It means landscape success with beautiful, proven, Texas-tough plants [superstars]" (Staples 2012, p.2). Of the 59 "Texas-tough plants" recommended to homeowners, none are labeled as natives of North Texas. However, a more general terminology of 'Texas natives' is displayed on the Go Texan website (Staples 2012).

The Texas A&M AgriLife Extension Service additionally promotes their Earth-Kind Program (2012). The Earth-Kind Program is an advocate of environmental awareness through water conservation, fertilizer and pesticide reduction, minimal landscape wastes and energy conservation through landscaping. According to Dinarte (2009), 86% of the 248 respondents were unaware of the Earth-Kind Program. The respondents who utilized the program credited adaptablity and reduction of fertilizers as the best attributes to the program. Under utilization of the brands and or programs is credited to poor marketing and demographics.

In summary, results from this literature study indicate that the availability of native plants is limited, and few are on display at local nurseries and botanical gardens. According to current and past research, programs and or brands promoted by the Texas A&M AgriLife Extension promote environmental awareness but are not fully utilized by the public due to demographics and poor marketing. Poor advertising of native plants is additionally found in garden magazines and books.

2.3.5. Publishing: Garden Magazines and Books

> "For that mobile population, one of the most vexatious problems arose with the acquisition of property, especially the most prized of American institutions, a single family family house, privately owned, set on a distinct plot of privately owned land. Ownership of land brings with it terrible responsibility. How does one design a house and the adjacent property to it—at the very minimum to escape opprobrium, at the best to win the admiration of one's neighbors? How does one learn the rules of proper architecture and landscape design? The answers to those questions came as they usually did in America, from books, magazines and a blizzard of popular advertising, all providing advice on how to choose the correct architectural style for ones new house, the correct furnishings for the interior, and the proper arrangement of one's yard or garden (Lewis 1993, p.133)".

According to Lewis (1993), the influence of garden magazines and books made a significant impact on American residential landscapes. The American Society of Landscape Architects (ASLA) encourages the use of these resources for inspiration in designing a residential landscape (Thompson 2008). ASLA encourages homeowners attempting to renovate their landscapes to look at garden magazines and books before hiring a landscape architect or designer because these resources allow homeowners to sort through various landscape designs, gardens, and plant recommendations to determine what they like and dislike for their personal landscape. Inspiration or things to avoid can then be communicated to the landscape professional (Thompson 2008).

For this study, magazines and books illustrating gardening and plant advice were sampled to document topic trends over the past three-to-four decades. The information collected provided a sample of information available to homeowners regarding environmental concerns and native plants.

The magazines sampled for this study included *Garden Design, Better Homes and Gardens, Southern Living,* and *Landscape Architecture Magazine.* The gardening magazines were chosen for their reputation, landscaping advice, and availability in local stores, as well as their targeted demographic: homeowners. According to Lewis (1992, p.118), magazines such as *Southern Living* focus on "the host of small decisions that a property owner with his family is called upon to make from one day to the next." *Landscape Architecture* magazine articles were

sampled for two reasons: (a) because they covered the professional realm's topic trends over the decades, and (b) to see if any correlation of topics existed between the garden magazines and the professional journal.

Figure 2.8 illustrates common topics discussed in *Garden Design* over the past three decades, in five-year increments. The results reveal top trends within each decade. During the 1980s, the magazine's articles focused on gardening, providing examples, recommendations, and design plans, as well as articles illustrating gardens in various locations. Example articles from the premiere issue of 1982 were "I'm Busy Gardening" and "A Castle Garden in Kent." The 1990s had more articles relating to miscellaneous [other] categories such as "*Weddings Alfresco,"* found in the spring issue of 1992. The focus on gardens from various locations and gardening in general continued into the 21st century. Articles related to environmental concerns and promotions of native plants were limited and only began to appear in the 1990s, with the most mention coming in the spring of 2007. According to the samples, topics related to garden design were most common, reflected by the title of the magazine.

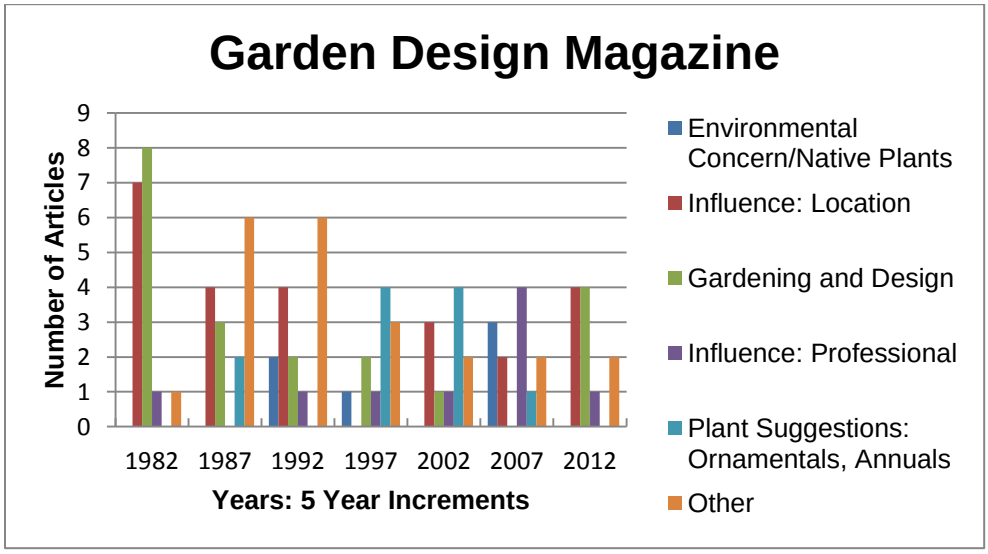

Figure 2.8 Garden Design Magazine: Article Topics (adapted from Garden Design 1982:2012)

Figure 2.9 illustrates article topics mentioned in May issues of *Landscape Architecture* magazine over the past 30 years, in five-year increments. According to the sample, the most

consistent topic was landscape design inspiration from various locations, such as the article "China Walls, Japan Fences" from the May 1982 issue. This trend is consistent with *Garden Design* magazine. Other [miscellaneous] topics, such as technology, and the office setting, created a tie in the 1990s, and continued to be a popular trend in the following decades. Articles about environmental concerns and native plants consistently appeared at least once in each decade, with a significant increase in 2007. In comparison with *Garden Design*, the professional realm had more consistency with environmental issues.

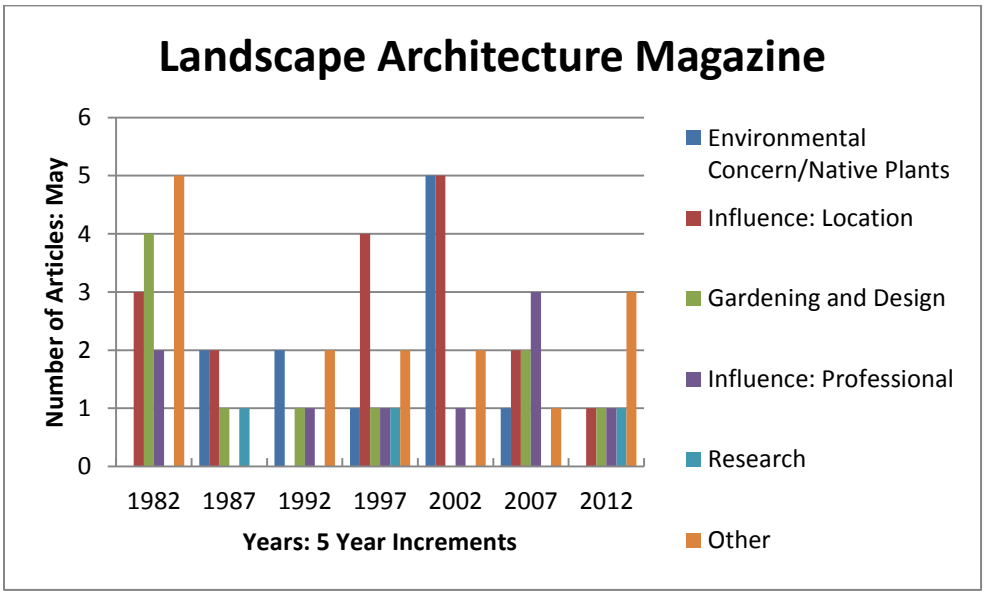

Figure 2.9 Landscape Architecture Magazine: Article Topics (adapted from Landscape Architecture 1982:2012)

The May 2012 issues of *Better Homes and Gardens: Garden Issue* and *Southern Living* were sampled in order to discover current article topics. *Better Homes and Gardens: Garden Issue* included four articles with themes such as raised beds, recommended plants [non-natives, color, blooms], garden showcases, beds and borders, and gardening advice. In addition, the issue covered environmental concerns and native plants by advising homeowners to welcome wildlife into their backyards. The advice also recommended using native plants to provide nuts, seeds, and nectar for the wildlife (Butler 2012). The *Southern Living* issue

provided four articles. The topics covered recommendations for flowers near fences, petunias, tomato gardening, and shrub roses. As with *Better Homes and Gardens*, using color was a common theme (Bierman 2012). The *Southern Living* issue did not recommend or advise on environmental concern or native plant palettes.

The books selected for this study include a sampling of titles from the Arts and Architecture library at the University of Texas at Arlington. Key words used to select books off the shelf included gardening and landscaping. The books represented illustrations of gardening and landscaping advice over the past four decades. Table 2.5 illustrates an emphasis on gardening over the past four decades as related to color, plant choice, and design in residential landscapes. Topics regarding environmental concern and native plants were not discussed until the 1980s.

The books sampled revealed that the majority of gardening books are representative of general gardening design and planting advice. Native plants or environmental concern represented less than one percent of a book's entirety, unless the book was dedicated to native plant promotion.

In summary, there is a limited amount of information regarding environmental concerns or native plant topics in general gardening books and magazines. However, samples of magazine articles show awareness of the topic slowly increasing over the last few decades, especially in books specifically dedicated to native plants. Nevertheless, color and non-native plant recommendations continued to be the most common themes in both magazines and books, thus influencing homeowners' landscape preferences. As stated by Sperry, "Once the trees are all planted and the lawn is green and growing, it's time for the color. In fact, color is the artwork of landscaping. For most gardeners, it's the whole reason for being there… for planting plants in the first place (Sperry 1982, p. 58)". The promotion of color in the landscape, specifically non-native plants is a direct result of the green industry and its promotions (Great Plants Catalog 2008).

Table 2.5 Sample: Gardening and Landscape Books (See Reference List)

Sample: Gardening and Landscape Books					
Year	Book	# of Pages: Total	# of Pages: Native Plants/Environmental Concern	3 Most Discussed Topics	Environmental Topics
1977	Complete Home and Gardening	330	0	Gardening: Flowers, Vegetables; Maintenance	None
1978	Readers Digest	648	0	Gardening, Plants for Food, Plants	None
1980	Fundamentals of Gardening	140	0	Plant Choice, Maintenance, Gardening	None
1980	All About Landscaping	95	3	Design, Styles, Plant Suggestions	Native Character, Wildscape
1982	Landscaping	140	2	Design, Styles, Plant Suggestions	Wildscape, Climate Zone
1982	Complete Guide to Texas Gardening	488	2	Maintenance, Color, Adapted Plants	Climate Zone
1991	Planting Design: 2nd Ed.	187	0	Design Process, Principles, Functionality	None
1997	Native Texas Plants: Region by R.	408	408	Native Plants: Texas Regions, Design	Native Plants
1997	Garden Designs	161	0	Gardening, Themes, Location	None
2006	The Perfect Garden	172	1	Plant Choice, Color, Gardening	Native Garden
2007	Dream Gardens	348	0	Inspiration, Location, Color	None
2007	Texas Garden Almanac	467	5	Gardening, Flowers, Plant Choice	Native Plants, Water Conservation
2009	Easy Gardens: N.C Texas	307	32	Color, Simplicity, Low Water	Texas Natives, Low Water, Climate
2009	Bringing Nature Home	388	388	Native Plants, Wildlife Attraction, Suburbia	Native Plants, Wildlife, Biodiversity
2010	Dallas Arboretum	76	1	Themes, Color, Designers	Plant Selection for Climate

2.3.6 The Green Industry

For the purposes of this study, samples of primary factors pushing against non-native plants in the green industry are further explored to understand their impacts on the homeowner. According to production and marketing reports, the United States green industry is "comprised of wholesale nurseries, sod growers; landscape architects, designer/builders, contractors and maintenance firms; retail garden centers, home centers and mass merchandisers with lawn and garden centers (Hall et. al 2006, p.345)". In the nation's agricultural economy, the green industry is fast growing and profitable, even during an economic downfall. It is estimated that the green industry's economic impact on the US is resulting in 147.8 billion dollars in output and sustains a total of1,964,339 jobs (Hall et. al 2006).

According to Reichard and White (2001), the agriculture, forestry, and horticulture industries in North America are actively using plants non-native to the continent, due to the implications of national growers and overall marketing tactics in the green industry. "Most retail nurseries buy plants from wholesale growing facilities; some retail and wholesale nurseries have active plant exploration programs. The expeditions may include both collection of plants from the wild and purchases of local favorites from foreign nurseries (Reichard and White 2001)". These factors pushing against the promotion of native plants affect nursery displays across the country and therefore affect consumer preferences.

2.3.6.1 National Growers and Innovators

Since 1926, Monrovia Growers has been nationally recognized as both a leader and innovator in the acquirement, testing, and advertising of 'new plants' in the green industry. Monrovia's slogan states, "AT MONROVIA, WE WORK WITH OUR HEARTS, hands and minds. Our gifted horticultural craftsmen intimately know each 'new variety' we introduce and only bring to market plants that are healthier, with stronger root systems, greater disease resistance and more tolerance of cold or heat. Finding and growing distinctively better plants is what we do best (Great Plants Catalog 2008)". The words 'new plants' and 'new variety' sum up

the majority of Monrovia's plant products as being non-native. Evidence of this conclusion is further explained throughout their catalog with sample headings entitled; tropical gardens, topiary, Azaleas, and Bamboo. An advertising sample states: "Topiary takes horticulture in to the land of indulgence. Once limited to privileged few, today topiary forms are available to anyone with a sense of fantasy and an interest in unusual shapes in the garden (Great Plants Catalog 2008)." Overall, ornamentals, specifically flowering plants and tropical make up the majority of the plants advertised in the catalog.

Monrovia's effort in being environmental stewards is their suggestion of water-wise gardens. However, according to the Great Plants Catalog (2008), native plants are not the solution. Monrovia suggests grouping plants according to watering needs. The trusted grower additionally suggests high quality compost soil to avoid runoff and 'savvy watering techniques'.

The Southern Living Plant Collection is nationally recognized as an innovator for their efforts in advertising and branding plants that have undergone plant trials and research. Information regarding their services to retailers, growers and landscape architects can be found on their website. The Southern Living Plant Collection is in direct connection with Southern Living magazine, a trusted source for homeowners regarding lifestyle and interests such as gardening (Southern Living Plant Collection 2012). The branding is carried in nurseries across the nation, including the local nursery, Calloway's (Calloway's Nursery 2012). Similarly, to the marketing of Monrovia, non-native plants are the focus of the plant collection. Examples of the plant collection include Pink Rain Lily, Bonita Shea Begonia and Oakland Holly. Color and texture make up the main characteristics of the plant varieties. Common characteristics found in plant nurseries due to direct influences such as The Southern Living Plant Collection and Monrovia Growers.

2.3.6.2 Chemical Companies

An additional factor pushing against the use of native plants in the landscape are the advertisements of chemical companies. Products such as pest control, plant fertilizers and

weed control do not promote natives but encourage the upkeep of non-natives in the landscape. The products are familiar to consumers in stores such as Home Depot, Lowes and Walmart. A sample chemical company is Scott's Miracle Grow. The company promotes its products with headlines such as; help your lawn through the drought and rose and flower care.

Figure 2-10 Scott's Miracle Grow Marquee (Lawn Care 2012)

2.3.6.3 Local Horticulturist

Neil Sperry, horticulturist, author, magazine owner, column writer for the Dallas Morning News and syndicated gardening radio broadcaster from the Dallas area, provides Texas homeowners with a popular gardening information source. Sperry has been a well-known figure in Texas gardening since 1970. He currently publishes a magazine, *Gardens*, and claims it is Texas's most reliable source for gardening and landscape information. His book, *Complete Guide to Texas Gardening*, is the fourth best-selling gardening book in America. The majority of plants promoted and advised by Sperry in his outlets are non-native plant species. Neil Sperry's common headlines include: What is an annual? An additional headline reads; steps to getting your lawn started (Sperry 1982). Sperry provides solutions to numerous questions from followers regarding non-natives. A sample question asks, "Why won't my wisteria bloom (Sperry 1982)?" Sperry's popularity and trusted source information provides minimal mentions of native plants and their benefits.

The green industry's impact on native plants is an overall negative connotation. National growers, innovators, and horticultural spokespersons provide plant products and advertisements that contribute to non-native plant promotion in nurseries and stores across the country. Plants are grown and advertised to provide color and unique features in the landscape. Therefore, homeowners seek out these features. They contribute to the overall perceptions of plant palettes whether they are native or non-native. However, in some cases, homeowners perceptions of plant palettes are non-existent due to their disconnection with nature (Louv 2005).

2.3.7. Disconnection with Nature

For the purposes of this study, research-indicating society's disconnection with nature shows a connection with the degree of commitment homeowners have to their landscapes and the environment. Nature deficit disorder is a social term introduced in Richard Louv's 2005 book, *Last Child in the Woods*. The term is defined as "the human costs of alienation from nature, among them diminished use of the senses, attention difficulties, and higher rates of physical and emotional illness (Louv 2005, p.36)." Individuals, families, and communities are all prone to the disorder.

Nature deficit disorder became apparent to Richard Louv after he conducted a research study for his upcoming book [at the time], *Childhood's Future*. He conducted 3,000 interviews with children and parents across the nation. Children responded with statements such as, "I like to play indoors better because that's where all the electrical outlets are (Louv 2005, p.10)". His book has contributed to a growing awareness of society's disconnection with nature, leading to further studies, awareness organizations, and governmental action.

In a study conducted by UCLA on the daily lives of families in Los Angeles, researchers found that children spent less than 40 minutes a day in their yards, while adults spent 15 minutes or less. The majority of families had well-kept yards with pools and claimed to use their yards daily. However, when recorded, results contradicted their statements (Vanderkam 2012).

Lead researcher Jeanne Arnold stated; "They're willing to spend, to sort of perpetuate that illusion. By having nice yards, pools, and decks, they could attempt to project something that's not necessarily going on, but is clearly ideal (Vanderkam 2012, p.1).” Researchers concluded that although a well-maintained, private yard seems to be the American dream, they are not used.

Studies also indicate that Americans think they know more about their environment than they actually do. According to Coyle (2005, p. 1), “45 million Americans think the ocean is a source of fresh water; and another 120 million people think disposable diapers are the leading problem with landfills, when they actually represent about one percent of the problem. Years of research collected from Romper surveys indicate that environmental ignorance is high, even among upper-income Americans (Coyle 2005).

2.3.7.1 Organizations and Regulations with Environmental Focus

Society’s disconnection with nature contributes to a lack of environmental knowledge and commitment, including the use of native plants. According to Jennie Cramer (2008, p.278), Director of Ecological Education at the Institute for Applied Ecology, in an effort to return to the concept of biophilia; “Engaging students in environmental restoration through service-learning partnerships is an effective tool for restoring native ecosystems while simultaneously rebuilding relationships between children and nature and inspiring future stewards of the land”. Organizations and regulations offering environmental protection and awareness create an effort to respond to America’s loss of interest in the outdoors and environmental concerns.

The Nature Conservancy, formed in 1951, protects ecologically significant land and water across the globe. Over the course of the environmental movement and into present day, the organization has protected 119 million acres of land and 5,000 miles of rivers across the world. The conservancy is working with all 50 states in America and an additional 30 countries worldwide, protecting habitats ranging from grasslands to coral reefs (The Nature Conservancy, 2012). The Nature Conservancy currently promotes and protects native plant species through

articles on their website such as “Garden with Native Plants,” a commentary explaining the advantages of native plant species in the garden. The advantages listed include less watering, preventing the introduction of invasive species, and creating a sense of place (Reemts 2011).

In 1970, the first National Earth Day addressed the environmental concerns of the American people. The first event caught the attention and support of over 20 million people. Today, Earth Day has evolved into the Earth Day Network, working with 22,000 partners in 92 countries worldwide. The network addresses current environmental issues, ranging from climate change to saving animals (Earth Day Network 2012). Earth Day influences other organizations to use their event as a basis for promoting native plant palettes. For example, The Native Plant Society of New Jersey published the article “Reflections on Earth Day, Why We Need Native Plants (Vaidya 2012)”. The article gives a synopsis on the current trends of native plant palettes and the people promoting them including, Dr. Douglas Tallamy’s book, *Bringing Nature Home: How You Can Sustain Wildlife with Native Plants.* The book is the *Silent Spring* of today. (Vaidya 2012).

In addition, organizations such as the National Park Service have made collective efforts to reach out to younger generations through electronic media. The National Park Service encourages campouts and walks in parks to reconnect with nature. Both the Park Service and Outdoors Foundation believe that if there is an introduction to nature at an earlier age, younger generations will be more inclined to stay connected with nature as they grow older (Repanshek 2009).

In regards to governmental action, in 2009, congress passed The No Child Left Inside Act to address the decline in environmental knowledge. The act requires states to develop environmental literacy curriculums for children in grades pre-kindergarten to 12^{th} grade, and emphasizes environmental education and further training programs for teachers (No Child Left Inside Act 2009).

In summary, research that indicated the limited amount of time homeowners spend in private, well-maintained yards is because they prefer to spend time with technological entertainment contributing to Louv's theory of nature deficit disorder. Recent efforts by researchers and organizations have created new regulations and fund awareness of, and action against the decline of environmental concerns and outdoor pastimes in society. However, although the effort is present, studies indicate environmental ignorance remains high.

2.4 Significance of Upper-Income Suburbia

This study focused on upper-income suburbia primarily due to the economic impact and influence on residential design in the landscape architecture profession. According to the American Society of Landscape Architects (ASLA 2012), residential design is the largest market sector for the profession, and private homeowners are the professions largest clientele group. Additionally, the upper-income bracket is described as being "elite," and "a class that has influenced landscape tastes and has been imitated" throughout residential design (Duncan and Duncan 2012, p.2). It is for these reasons that upper-income suburbia represents this study.

2.5 Chapter Summary

This literature review explored factors influencing residential landscapes in order to understand choices homeowners make regarding their landscape palette. Expert opinions addressing the controversial topic of native plants vs. the alternative were documented, including the aesthetics of native plants in residential landscapes and recent media coverage in North Texas. Finally, an exploration of the significance of upper-income suburbia pinpointed the areas of concentration for this study as it pertains to native plants.

CHAPTER 3

RESEARCH METHODS

3.1 Introduction

This study used a qualitative methodology, analyzing in-depth interviews to gain an understanding of the participants' views on the topic. The four suburban study areas represented in this research include: Montgomery Farm of Allen, TX; Stone Lakes of Southlake, TX; Bakers Branch of Flower Mound, TX; and Wellington of Flower Mound, TX. The selection of participants was due to their community's popularity in North Texas, household income status according to zip code, and their HOAs' willingness to allow access to the homeowner. The selection of participants whose incomes ranked in the top 25% of household incomes in the United States (based on a *New York Time's* analysis of the Minnesota Population Center Data), was considered sufficient for this study (White et al. 2012).

3.2 Research Design

The research design used for this study was a procedure outlined by Taylor and Bogdan (1998), which emphasizes five specific categories addressed by the study. The categories include (a) technique, (b) access strategy to gain participants, (c) anticipated number of participants, (d) data and recording procedures, and (e) analysis.

3.2.1. Technique

The primary technique used for the research was qualitative in-depth interviews, designed to gather descriptive data from both people's verbal responses and behavior. The in-depth interviews conducted for this research entailed informal conversations in a face-to-face environment. The participants in the study were able to choose where they wished to have the interviews conducted. Suggestions from the researcher included; at their homes, the HOA's office, or a coffee shop (Taylor and Bogdan 1998; Appendix A and B).

3.2.2. Access Strategy

Overall, participant selection is part of a grander categorization according to the climatic division, North Central Texas. The North Central Texas climatic division represents the cross-timbers and blackland prairie regions (National Agriculture Statistics Service 2012). Although the regions are diverse in native plant representation, this study does not focus on regions, rather homeowners' perceptions of native plants in general.

Additionally, a three-tiered system represented the selection process for participants. Initially, the researcher examined areas in the Dallas-Fort Worth (DFW) metropolitan area deemed "The Best Suburbs of 2012*,"* from an article in *D Magazine*. This magazine specifically caters to residents of the DFW area. The suburbs were ranked according to their safety, education, housing values, and ambiance (McMullan 2012). Of the top 10 suburbs listed, the ones in Allen, Flower Mound, and Southlake were selected primarily for their close proximity to the researcher.

The selection was narrowed according to zip codes for suburbs that were representative of the top 25% of household incomes in the United States, according to a *New York Time's* analysis of the Minnesota Population Center Data (White et al. 2012). Access to household income statistics, according to zip code, came from the Neighborhood Link: National Network online. The network is a database providing neighborhood statistics across the country (Neighborhood Link: National Network, 2012). The researcher then obtained a list of potential participants primarily through contacting the officials and/or "gatekeepers" of each master-planned community's HOA (Becker, 1970; Burgess, 1991; Taylor & Bogdan, 1998). HOA governed neighborhoods willing to participate in the study included Montgomery Farm in Allen, TX; Baker's Branch in Flower Mound, TX; Wellington in Flower Mound, TX; and Stonelakes in Southlake, TX. From this initial contact, the researcher was either given permission to contact a list of approved homeowners or the HOA forwarded the researcher's initial email to homeowners who then contacted the researcher if they wished to participate in the study.

Figure 3.1 HOA Neighborhoods Participating in Study

3.2.3. Participants

There were no preconceived numbers of participants. Kvale (1996) commented on the collective question, "How many interview subjects do I need?" by stating, "Interview as many subjects as necessary to find out what you need to know (Taylor and Bogdan 1998, p. 93)". This model allows as many interviews to take place as necessary, in order to allow themes or patterns to emerge from the participants' responses. Reoccurring themes and patterns during the interview process cued the researcher of sufficient data.

3.2.4. Data Collection and Recording Procedures

An Olympic recording device recorded the data collection from the interviews. The answers and statements recorded were then transcribed for detailed analysis. During the

interview process, the researcher kept a journal to record themes emerging from the interviews, as well as participants' behavioral tendencies and emotions (Taylor and Bogdan 1998).

3.2.5. Data Analysis Procedure

After recording the findings, the analysis process utilized grounded theory. The grounded theory approach "is a method for discovering theories, concepts, hypotheses and propositions directly from the data rather than from prior assumptions (Taylor and Bogdan 1998, p. 137)." The researcher used the constant comparative method strategy in order to develop grounded theory, by "simultaneously coding and analyzing data in order to develop concepts" and or themes (Glaser and Strauss 1967 in Taylor and Bogdan 1998, p.137). Taylor and Bogdan encouraged researchers to examine the collected data in a variety of ways. They wrote, "There is no simple formula for identifying themes and developing concepts (Taylor and Bogdan 1998, p.142)." For the purposes of this study's analysis, coding in the form of lists aided the researcher in developing themes and patterns from the interviewees' responses. The findings are organized according to themes from individual questions, and examined as a whole during concluding thoughts.

3.3 Interview Questions

The interview questions developed for this study were designed to reveal how much upper income homeowners in North Texas know about native plants and how committed they are to the use of them in their landscapes. The interview questions were split into two sections. The first set of questions was open-ended, addressing the participants' backgrounds in relation to their age and environment, in order to "learn how the participants construct their realities—how they view, define, and express the world (Taylor and Bogdan 1998 p.101)". This allows the researcher to understand the participants better for further analysis. The second section addressed questions specifically related to the study. The interviews were meant to be conversational, which allowed more questions to be asked if prompted.

Section one (background)

1. What is your age?
2. When was the last time your landscape had a major renovation? If so, what design firm did you use?

Section two (questions specific to the study)

1. Please tell me about the landscape plant palette surrounding your home.
2. Are ecological or environmental benefits a high priority when making decisions about the plants surrounding your home? If so, what are they?
3. Do you consider yourself knowledgeable about native plants?
4. Are you interested in incorporating native plant palettes in your landscape? Why or why not?
5. Do you believe native plants are necessary for the health of the environment in suburban areas? Why or why not?
6. Is there anything else you would like to add?

3.4 Research Limitations

The major limitations to this study are specific to access of “typical” homeowners. The methodology for obtaining participants required permission from each neighborhood’s homeowner’s association. The HOAs responses created limitations to access due to privacy issues. In an effort to protect privacy, most HOAs gave strict access to board members and committee members. Further limitations to the study’s focus on native plants which both deterred homeowners from participating in the study and took away some authenticity of specific answers. Additionally, the study was limited to four suburban neighborhoods, due to time constraints. Finally, prior to interviews, some participants voiced concern with not knowing much about native plants and believed they did not meet the qualifications for the interview. However, after reassurance that their perceptions were valid, they continued with participation in the study.

3.5 Chapter Summary

For the purposes of this study, interview questions presented to each participant were intended to provide landscape professionals and the green industry with the perceptions of upper-income homeowners regarding native plants. This chapter outlined the five-step, qualitative research procedure used for the interviews, as recommended by Taylor and Bogdan (1998). The findings were organized according the themes that emerged from individual questions, and further examined in parallel with the literature review in chapter 5. Although limitations to the research included; HOA involvement in the initial selection of participants and questioning of participants' authenticity, adjustments were made as necessary.

CHAPTER 4

FINDINGS AND ANALYSIS

4.1 Introduction

In chapter four, there is analysis of data collection from a series of in-depth interviews. The findings are organized according to individual interview questions. This organization method allows overall themes to emerge within each question, followed by further description from informants.

The intent of the first set of questions is to provide background information from each informant including; age and documentation of past landscape renovations. The second set of interview questions, specifically targets the primary research questions for this topic including commitment, knowledge, and preference to native plant palettes in residential landscapes. In the subsequent chapter, the themes in chapter four provide discussion and parallels to literature references.

4.2 General Information

During initial recruitment for the interview process, a total of 11 informants agreed to participate in the study. Informants represented four neighborhoods in North Texas including: Montgomery Farms of Allen, TX; Baker's Branch of Flower Mound, TX; Wellington of Flower Mound, TX; and Stone Lakes of Southlake, TX. According to opening background questions, respondents ranged from 42 to 65 years of age. The average age documented for the 11 informants is 58.

The average time lapse for informants that had a major landscape renovation is 8 years. 10 out of the 11 informants used local based landscape companies or nurseries that helped guide both design and plant selection.

4.3 Landscape Plant Palette

Please tell me about the landscape plant palette surrounding your home.

The respondents had technical, unique and thematic responses when describing their individual plant palettes. In most cases, informants were inclined to list off plants in their garden. The most repeated plants [non-native] included crape myrtle, roses, Indian hawthorns, hollies, lantana, Bermuda grass, and [general mention] perennials. Description topics mentioned once include no xeriscape, drought tolerance, low water consumption, native mix and wildlife. For the purpose of this study, thematic descriptions revealed from the findings are further analyzed including:

1. Unique qualities
2. Tradition
3. Color and blooms
4. Low maintenance

4.3.1 Respondent Data

4.3.1.1 Unique Qualities

Respondents A and D both emphasized the need to be unique and or different in their landscape. Respond A stated, “The first thing we decided was…What are the front two trees we need? Those were oak and live oak. And the reason we made a choice was, comparing ourselves with other two neighbors we had. They did not have those. So we wanted to have something unique in our front yard. That’s the number one reason”. During the interview with respondent D, the informant further explains why he chooses non-natives in his landscape. Respondent D stated, “Well, to be a little different, I guess”.

4.3.1.2 Tradition

Respondents B and E explained their landscape and or landscape choices by emphasizing tradition, and the need for a classic landscape. Respondent B stated, “So I’d say it’s a mixture of what I would call sort of classic landscape, classic home builder plants,

because…we have, the Indian Hawthorns, and shrubs in the front. We have a lot of knockout roses". Respondent E similarly referred to the use of knockout roses and trees as a "tradition, that we were used to and accustomed to". Additionally, Respondents C and H agreed to the use of the [traditional] plant palettes referenced by Respondents B and E, stating, "We have a lot of trees. But really, our bushes tend to be pretty much Indian hawthorn or the knockout roses (R.C.)". "My foundational planting is various crape myrtles. The standard crape myrtle, almost 3 size now [three times its original size] (R.H)."

4.3.1.3 Color and Blooms

Many of the respondents were explicit about the importance of color and year-round blooms in their landscapes. In fact, eight out of eleven informants mentioned this description in one form or another while discussing the plant palettes. For the purpose of analysis, this section is broken down into color categories including evergreens/leaf color, blooms and seasonal interest.

Aside from color being achieved through blooms in the landscape, Respondents C, E, G, and I, stressed the importance of leaf color and evergreens in the landscape. Respondent C stated, "We have a lot of Indian hawthorn bushes. And kind of pretty much evergreens: Magnolias and Wax myrtles, things of that nature, that stay green, pretty much years round." Similarly, Respondent E emphasized the need to have evergreens in the landscape. "Okay in the front of the house, we chose to put in more traditional evergreen bushes, and so forth, so that we would have evergreens all year round and trees (R.E.). Respondents G and I did not point out evergreens in the landscape, however, sought after the 'green' leaf color. Respondent G stated, "We were looking for color, and with that color also come the appropriate greens for the leaf material as well". Respondent I concurred, stating, "I'm big on using plants that have leaf color", in order to attract the eye from a distance.

For similar and additional respondents, blooms are the main source of color in the landscape. Respondents B, C, E, F, G, H, I, and J, either passingly mentioned the use of

blooms in the landscape or mentioned blooming varieties such as crape myrtles, knockout roses, and pansies. In addition to Respondent G's requirement of leaf color, additional colors in the landscape were welcomed including "splashes of white, red, blue, yellow, you name it". Respondent G's design concept, an English cottage garden, accomplished wide varieties of color by using perennials and roses in the landscape. The respondent documented 70% of their landscape plant palette dedicated to roses, approximately 100 roses. In an effort to stay clear of a xeriscape design, Respondent D similarly expressed the importance of flowers and roses in the landscape. Respondent B agreed with prior respondent statements expressing the importance of color in the landscape for aesthetics and further explained an issue with native plants. "That's a hard thing sometimes what native is, you get a lot of grass. A lot of things that grow native don't have a lot of color or variety (R.B.)".

The final finding addressed is seasonal color. Respondents B, C, H, J and K agreed in having a plant palette that produces year round bloom and or seasonal color. Respondent H stated, "My foundational planning for colors is various crape myrtles [trees], and lots of the miniatures in the beds, because they provide color during the summer with our hideously unpredictable weather". The remaining responses emphasized year round bloom. Although Respondent C did not have "seasonal stuff", the respondent admitted to "usually changing out flowers a couple of times a year with pansies or vincas".

4.3.1.4 Low Maintenance

The final thematic description included a conscious effort by informants to select plants that require low maintenance efforts. While describing a second priority, Respondent A stated, "We wanted to see that something does not grow too much. And, it becomes a big headache for us maintaining, moving forward and maintaining [pruning] it. That was with the trees". In a personal request, Respondent J asked her designer to incorporate natives into the landscape to avoid maintenance. She stated, "I asked him [designer] to plant native plants that would come up every year, so they would be low in maintenance".

4.4 Ecological or Environmental

Are ecological or environmental benefits a high priority when making decisions about the plants surrounding your home?

Priorities concerning environmental benefits were stated and themes were consistent. However, respondents did not mention themes concerning ecological benefits. Respondents mentioned higher priorities such as; the importance of aesthetics in the landscape. Thematic answers to this question are broken down into two categories including; priorities mentioned and reasoning behind them. An overview of the priorities includes:

1. Low water usage
2. Heat/drought tolerance
3. Aesthetics

Reasoning include:

1. Water restrictions
2. Plant survival

4.2.1.1 Low water usage

4.4.1 Respondent Data: Priorities

4.4.1.1 Low Water Usage

In regards to environmental benefits, low water usage was consistent in mentioning, but not always the top priority among respondents. Respondent A and B were the only respondents that considered it a high priority, while others considered it a medium priority. Respondent B stated, “Yes, we try to do everything that needs as little water as possible. Our house, our home is irrigated. We have a classic irrigation system, but we try to use as little [water] as we can. So we are trying to find things that need less water”.

In contrast, respondent F stated low water consumption is a medium priority. In response to the question Respondent F stated, “Well I don’t think we used to think that way. We wanted lush and flowery you know very abundant looking landscape. When you think of native

plants, being the fact that we are in very hot climate, things are very sparse and thin and don't have very big leaves". Although the informant did not consider it a high priority, they were conscious about future efforts stating, "I think we will start to think about water usage when replacing the landscape. Again, before there was a whole different mentality, water wasn't really a very big deal". Respondent G reiterates the choice of looking for plants that require medium water usage.

4.4.1.2 Heat/Drought Tolerance

Five out of eleven respondents established that temperature tolerance and or drought tolerance were high priorities when selecting plants for environmental benefits. According to Respondent E, resistance to drought and harsh climates is a top concern. "We have cold winters sometimes; we have wild temperature variations and most importantly the extreme hot weather that we have with the lack of rain, water restrictions (R.E.)". Respondent H further explained the importance of selecting something that "is reasonably drought tolerant, tolerant of our wide variety of weather conditions here".

4.4.1.3 Aesthetics

Two respondents agreed that aesthetics were a high priority when selecting plants for the landscape. Respondent H stated, "I would say probably my first and foremost consideration was aesthetics, something that looks pretty". In regards to aesthetics being their number one consideration, Respondent H further explains, "Well I don't know if it's not much of suburban look, but here in North Texas, I found a lot of people don't plant a lot of color. Most of the yards are just green most of the year, which I found a bit dull. But I grew up in California, where variety of colors are relatively common for most gardens, so I kind of prefer a lot of color. If I had enough space, I would like to have a wild flower meadow, where you do various seasonal succession of wild flowers that...trouble is, one of the challenges of that is that it looks unkempt. I rather find that [unkempt look] attractive (R.H)." Additional statements from Respondent C include; "more of a requirement is how it will appear in the aesthetic with the plants that I

already have in the design". In a previous discussion regarding 'plants already in the landscape', Respondent C mentioned Indian hawthorns, magnolias, wax myrtles, pansies, and vincas, making up their plant palette (R.C.) The respondent further explained aesthetics as plants possessing color year round both by bloom and leaf color.

4.4.2 Respondent Data: Reasoning

4.4.2.1 Water Restrictions

In response to the need to incorporate plants with low water usage, respondents identified water restrictions as a significant cause. Respondent E stated, "And the water restrictions probably are going to be here to stay. We are not building more reservoirs; we have a fine [limited] amount of water, so it's only going to get worse". Residents in Montgomery Farms of Allen, TX were the most concerned about water usage due to Allen's strict water policies. Respondent D further explains, "We also believe that the plant should be drought tolerant. So for instance, last year we had to go to stage three-water conservation because of the zebra mussels. One quarter of our water supply, Lake Texoma was shut off to this, because of the zebra mussel. So we had to become very conservative immediately. And if that would have gone to the next stage, we would not have been allowed to water our landscape, except for the foundation around us. It means that plants that are drought tolerant they will go into, they won't die. So we have a lot of plants that you see here in Texas, a lot of people grow saint Augustine. Well, Saint Augustine is not drought tolerant; it will die if it doesn't get water, during the summer heat".

As previously mentioned, respondents F and G found water conservation and water restrictions a medium priority in their landscape choices. Respondent G stated, "We are looking for something that is going to withstand, what I would call, the medium water that we can provide them". Instead of energy focused on water restrictions, Respondent G was more concerned with plant survival, discussed below.

4.4.2.2 Plant Survival

Plant survival equally contributed to homeowners' reasoning's for needing high tolerant plant varieties. In context, Respondent G explains the importance of plant survival. "We have a number of Japanese maples that we can't plant because I can't find the right spot to put them. There are other Japanese maples in the garden that are planted in the right spot, and survived just fine. So, we are careful about what we plant where, because we don't like killing plants because of stupid placement or lack of care. So, if a plant does die, we typically go back, take a look at why it was that it didn't survive there, and find something else to go onto that spot (R.G.)." Respondent H agrees specifically with foundational planting stating, "So if you get something that wipes out all of them [bedding plants] once a year or something like that, you know, it is not a major tragedy. You just plant something else. But for the foundational plant, it is something that is pretty hardy". A similar response from Respondent B illustrates the importance of plants' longevity. "We have also found over time, that we have a couple of pots—container pots. And when started out, we used to do a lot more like seasonal color, but as the years have gone on more and more of those pots and other places on the lawn have just become more non seasonal; perennials and other things or grasses or rosemary or something like that. So we are doing more and more stuff that just always goes on."

4.5 Knowledge

Do you consider yourself knowledgeable about native plants?

The majority of informants responded to this question with hesitation and a lack of confidence. Of the eleven respondents, one considered themselves knowledgeable about the topic. Four respondents stated that they have no knowledge regarding native plants, while the remaining informants expressed 'average' and or 'some' knowledge. The conversational interviews allowed for additional information to emerge including; where knowledgeable respondents got their information from. Sources for education concerning native plants include:

1. Internet/ Texas A&M
2. Family members
3. Experience with landscape committee

4.5.1 Respondent Data

4.5.1.1 Internet/Texas A&M

In order to access information regarding native plants, many respondents stated that using the internet as a primary source, specifically the Texas A&M website. Respondent H stated, “Briefly so, a lot of information from various online sites. Texas A&M has a website where there is native plant information inside”. In an earlier portion of the interview, Respondent D stated the Lady Bird Johnson website as a primary source. The informant also used Texas A&M for additional information stating; “Texas A&M is a good source. Of course they are a land grant institution. One or two are here in Texas. And they are part of main grant college. They do extensive research. Particularly they came up with the Earth-Kind Program, which I believe whole heartily (R.D.)”.

4.5.1.2 Family Members

Two of the respondents relied on family members to update them on the best plants and or native plants species for their landscape. Respondent G in particular, was hesitant to confirm his knowledge of native plants and instead stated, “Well, my wife would be more knowledgeable about native plants. More knowledgeable about what survives in the area”. The informant later went on to say, “Well, she knows more the names of the plants and what not. She’s got a lot more plants that she would like to install than she has space for. I look at it more from the, how do you manage the landscape so that you can take care of it”. Similarly, Respondent H said a lot of his information came from his mother. “She had a certificate in California native plants, from UCLA. And when she moved up here in 2000, she did a lot of research on native plants. I don’t remember all the volume she consulted but, [pause] And when she and my father had their house here in Flower Mound, they also lived four blocks from my

backyard. They left it in a very distinctly native state, which included; planting non- native plants like some bulbs and such along the house through the trees and the backyard but mostly was planting, various native ferns and such. There was a nursery actually down by Houston, I don't remember the name but they specialized in various native plants including, things like ferns and such (R.H.)".

4.5.1.3 Landscape Committee Members

During the interview process, five out of the eleven respondents mentioned involvement with their neighborhood's landscape committee. Involvement in the committee allowed for knowledge of native plants species [and non-natives] to circulate from one member to the next. Respondent A stated, "I use the internet and I use my other people...in the landscape committee, we have two very knowledgeable persons: one is [confidential] and the other one is [confidential]. And they basically update me and bring me up to speed. So basically I go to them in order to ask what this grass is. What is the difference between these two plants? Between these, two plants, why red oak is better than live oak? So those kinds of differences they can help me with". Respondent K agreed with this source of information, implying their committee readily talks about native plants for common areas in order to save expenses on watering for the community.

4.6 Commitment

Are you interested in incorporating native plant palettes in your landscape?

Data collected from respondents regarding interest in incorporating native plants varied. Of the eleven respondents, three had conditional responses: five said yes; two said no; and one was indifferent. Most of the respondents had explanations for their answers. However, since each respondent had a unique answer, no themes were extrapolated from the given explanations. Therefore a brief snapshot of each respondent's answer is given, followed by examples of detailed descriptions. An overview of the respondents' explanations is as follows:

R.A: Yes

R.B: Yes: Perennials, bloom all year

R.C: Some: If presented with wider options, happy with landscape now

R.D: Not prejudice of non-natives, hard to define native

R.E: Yes: Nice looking, less cost

R.F: Possibly: If natives had as much appeal as a tropical plant

R.G: No: Native plants are not shade tolerant

R.H: No opportunity-plant beds full; pro-more encouragement; natives look unkempt

R.I: If: provides right look, benefits of drought tolerant and all

R.J: Yes: if someone would install them now

R.K: Yes: if they come back year after year, perennials

4.6.1 Respondent Data

4.6.1.1 Ignorance: Varied Explanations

According to responses, some informants seemed optimistic about incorporating natives into their landscape. Respondent B contemplates an effort to replace knockout roses with natives stating, “Yeah, as much as we can. Um yeah, I mean, we are always changing. The landscape is now 7- 5 years old. So there is one of the areas that are kind of ready for refreshes. And so, we are adding and moving. We have along our pool, a whole bed of roses, knockout roses. I think knockout roses can get a little leggy and a little old over time. So you got to prune them all the time, take care of them, they are a lot of work. So we are thinking to do something more of a just a native garden right there, other things you know—perennials mostly, that can bloom over the course of the year”. Respondent J illustrated an interest to incorporate them now given the opportunity and someone to provide the labor.

However, the majority of informants had ultimatums before committing to incorporating natives into their landscape. Respondent C expressed a need for wider options stating, “Right now I am fairly happy with it [landscape]. I would be interested in incorporating some [natives]. I

think if we change our plants, I definitely want to learn a little more, more about natives, and what kind of options there are. And if I knew more about the wider options, I probably would tend to choose something like that. If I knew it would look good with what I already have". Respondent F expressed an interest, if natives had more appeal. In response to the question, Respondent F stated, "I don't know, when you look at plants the ones that seem to be attractive are the tropicals which obviously require more water. So if there are plants that are native or drought tolerant that have the same appeal, then more people will buy them and install them".

4.7 Health of the Environment in Suburbia

Do you believe native plants are necessary for the health of the environment in suburban areas?

Eight respondents found native plants necessary for the health of the environment in suburbia. Although the remaining respondents disagreed, they acknowledged native plants' contributions to saving water and contributing to local 'Texan' aesthetics. Themes that emerged from respondents finding native plants necessary include:

1. Saving water
2. Reducing toxins

4.7.1 Respondent Data

4.7.1.1 Saving Water

Respondents A, D, E, F, G, agreed that native plants are necessary for the environment primarily to conserve water. Respondent D expressed the need to incorporate native plants into suburban areas as an alternative to large areas of grass. "A lot of people can't do without their turf. But, if you look at a lot of parks… you have a lot of grassy areas that are just not used and, grass is an abuser of water. It takes a whole lot of water. So, so turf grass is not efficient. So we have an alternative to that. So when Montgomery Farm was set up, we still have a lot of turf areas. I'm hoping to convert much of that to a wild flower prairie (R.D.)". Respondent G observed the need to have plants that can survive in common areas with little to no water. "So I

need something that works and will survive. The care and feeding of the common property is not, as vigorous. And some of the plants need to be something that would withstand the burden; some are not having water for a week or things like that. So our plant choices are more (R.G.)".

4.7.1.2 Reducing Toxins

Three respondents found native plants necessary in suburbia in order to reduce fertilizers, chemicals, pollution and energy. Respondent G expressed the need to incorporate plants in common areas in order to reduce the need for fertilizer, which contributes to suburban health. In previous comments, Respondent D spoke of the negative effects of the lawn on suburban landscapes, and suggested alternatives such as natives. "It [lawn] takes a whole lot of water. It also puts a whole lot of carbon in the area. Because we have to mow it and nobody does it by hand, and you got to get out in mowers, that actually put a lot of pollution, a lot of carbon in here. So, so turf grass is not efficient (R.D)".

4.8 Additional Responses

Is there anything else you would like to add?

Informants revealed additional findings during further explanations of certain questions. As well as during the final thoughts portion of the interview process. This final section reveals two themed-based questions respondents answered on a consistent basis. The first question asks; Why homeowners fail to respond to native plants. The second question asks; what is it going to take? According to respondents, the following themes emerged from the first question:

1. HOA requirements
2. Nurseries' lack of native varieties
3. Lack of appreciation for Texas aesthetics

The second question revealed the following themes:

1. Encouragement of HOAs
2. Design

4.8.1 Respondent Data: Failure to Respond

4.8.1.1 HOA Requirements

Three respondents expressed the impact of HOA requirements on homeowner's plant decisions. Respondent G describes strict policies of several HOAs stating, "Yeah now you are dealing with the other side of the equation which is, some of these HOA's are very explicit as to what they are going to allow. And in my case, my HOA, used to ding me, for my English cottage garden, because they thought it was a bunch of weeds. They did not recognize what were actually different plants that were in there at the time. Same thing does happen at these other locations, if you get away from your green front lawn, with the row of bushes in front of the house and some splashes of color you start doing something unusual, the HOA board comes in ok, and dings you. So, and you are dealing a lot of times with ignorant HOA". Respondent G further explains a need to follow rules, "In many cases the homeowners just don't want to upset the upper guard and since they are not gardeners they don't care. They just go with the option a, option b option c. If you drive down the street, that is what you see, a, b and c and they're installed at every household we get on the street." Respondent H jokingly responds to HOA requirements stating, "And of course the reason why someone has a lawn is that it's an HOA requirement. You can't, not have a lawn. You know, it wouldn't be pretty if it wasn't green grass, so (LAUGH)". In response to the informant's neighborhood HOA requirements, Respondent H stated, "Supposedly any major changes have to be approved by the HOA and such. But that is not much of an issue; I mean I am not aware of any conflict arising from that and so forth. But, you do have to have a lawn. And it has to maintained, and there are very you know detailed rules about that, which is pretty typical for most HOA. The HOA, governance and restrictions and all, pretty generic that most all of the HOAs in Flower Mound use. And it's been modified a few times but it's pretty much you'll find all the HOAs require you to have a lawn".

4.8.1.2 Nurseries' Lack of Native Varieties

Homeowners found it difficult to respond quickly to native plants because they are not readily available in local nurseries (R.H., R.J.) Respondent J stated, "That [incorporating natives] is a hard thing to accomplish, because every time you go to a nursery, they are always out of the good plants. There are very few of those, seems like they always push the, was it perennials"? Respondent J further explains the need to seek out rare, specialized nurseries and or wholesalers. "And the people that did our backyard, they actually drove me to Carlton. A nursery there, I don't remember the name [Southwest Nursery] it had been 9 years. They had so many more choices but you have to be whole sale buyer to get in there".

4.8.1.3 Lack of Color/Variety/Appeal

The lack of color, variety, and appeal deterred homeowners from accepting native plant varieties. While describing priorities in the landscape, Respondent B stated, "And then as far as the products themselves, know aesthetics are important to add color. That's a hard thing sometimes, what native is, you get all of grass. A lot of things that grow native don't have a lot of color or a variety. So you have to balance that a little bit". Respondent H agreed with the lack of color exerted from native plants stating, "I think one of the things that is lacking of native plants, is that dependable foundation color aspect that the crape myrtles provide. Because about the chilliest [cold hardy] spring native we have, a perennial, would be the Mexican Plum, which or the red bud, those are nice with relatively short lives, speaking of a few weeks in the spring at best. And we don't have anything really that will be filling that niche during the high summer, which is no surprise, definitely too hot. crape myrtles have done that though".

4.8.2 Respondent Data: What is it going to take

4.8.2.1 Encouragement of HOAs

In response to HOA landscape restrictions on homeowners, Respondent G suggests encouraging HOAs to be more accepting of alternative landscapes. In response to a discussion asking if HOAs would start to consider natives as alternatives, Respondent G states, "Yes, I do,

it's going to take, it takes some radical thought on the HOA board to allow it. And having been on this board for 12 years, lived through a cycle of people are coming in and out we can see the result of that, sometimes you get people that don't want anything to do with natural plants, as far as they want, they want to pick the number of annual color flowers that you got installed. And others are pushing to go with the much natural stuff and we don't want to impose water requirement or money requirements on people and encouraging people to go to something that, more xeriscaping or what we're growing out there. So a lot of that on the HOA's does depend on what the board does".

4.8.2.2 Design

Homeowner's agree that design is a key element in accepting native plant palettes (R.D., R.H., and R.I.). Respondent D is already accepting of native plant varieties. However, in terms of design, a xeriscape is not desired. "You can't sell a home, if it is xeriscaped. Might be able to sell one home but you could not sell a community. There is just not enough demand for it (R.D.)". Other respondents stress the need to accomplish a desired look. "You know is there a native plant that would allow me to create the look that I want, plus have the benefit of the drought tolerant and all (R.I.)". And in most cases the desired look is a 'kept' landscape (R.H.). Respondent H states, "I would love to see more encouragement of native planting and especially in common areas and such. But I think it's a little challenging because it does have the appearance in many people's mind of being unkempt".

4.9 Summary

This chapter documented findings according to respondents' perceptions of native plant palettes in upper-income suburbia. Data collected from transcribed interviews revealed overall themes and patterns according to individual questions.

Overall, informants exerted optimism regarding native plant palettes in residential landscapes due to thematic responses of benefits including conservation of water, and

reduction of toxin use in the landscape. Respondents' knowledge of native plants was limited. While observed, the majority of respondents showed hesitation and a lack of confidence.

Although informants showed optimism regarding native plant palettes, actual commitment involves conditional factors. The conditions involved future thematic suggestions including; encouragement of HOAs to adopt new principles and the need for designs that accomplish the desired landscape look of the homeowner.

CHAPTER 5

CONCLUSION

5.1 Introduction

This chapter provides discussion and comparisons to the literature review, regarding the findings indicating homeowners' knowledge and commitment to native plant palettes in residential landscapes. The chapter proceeds with a brief overview of the remaining, original research questions: Do homeowners accept native plant palettes as a necessity for the health of the environment in suburbia? What landscape plant palette do homeowners gravitate to and why? The discussion precedes a brief overview of the study's relevance to the landscape architecture profession. It concludes with recommendations for further research related to the study.

5.2 Research Findings

5.2.1 Research Questions

The findings from the in-depth interview questions revealed themes relevant for each question. This section analyzes the overall themes revealed, and summarizes according to the original research questions.

5.2.1.1 Knowledge and Commitment

What are homeowners' knowledge and commitment to native plant palettes?

In upper-income suburbia, North Texan homeowners are resourceful, using sources such as; websites, Texas A&M, family members, and fellow landscape committee members for native plant advice and instant education. However, based off this study, conclusions indicate that homeowner's resourceful tactics are not working. Homeowners' knowledge of native plant palettes is limited, and often met with hesitation and a lack of confidence. This finding is linked

to unreliable sources linked to non-scholarly websites and non-expert advice from family members, landscape committee members. Additionally, reliable sources such as Texas A&M University resources and the Ladybird Johnson Wildflower Center website provide limited advertisement and encouragement of native plants in residential landscapes. In order for knowledge to increase, homeowners need to have consistent, readily available education regarding native plants.

Many homeowners are optimistic about future commitment and implementations of native plant palettes in their residential landscapes. However, to commit, conditional responses include wider options, more appeal, and design to accommodate their homeowner's desired landscape aesthetic. In many cases, the desired landscape aesthetic involved year round color in the landscape. As well as a proposal for a native plant palette, that complements the homeowners' existing landscape. The conditional response findings are linked to a lack of education, reliable sources, and limited advertisement and promotions of native plants from the green industry. In order for homeowners to fully commit to implementing native plants in their landscape, there needs to be a joint effort between the green industry and landscape architect professionals to educate, promote and design based off of the homeowner's expressed needs and wants.

5.2.1.2 Health of the Environment

Do homeowners accept native plant palettes as a necessity for the health of the environment in suburban areas?

According to respondents, homeowners believe native plant palettes are necessary for the health of the environment in suburbia. In general, ecological benefits were not mentioned as a high priority.

In response to the research methodology, many of the respondents are active members of their HOA, and or specifically the landscape committee. Therefore, they are very in tune with needs of the required landscape aesthetic in their neighborhood. Homeowners and HOAs

acknowledge the importance of native plants to provide conservation of water, and reduction of toxins such as fertilizers and chemicals. The HOAs involvement with their suburban plant palette has a significant impact on whether or not native plants become part of the common aesthetic, and should be considered during future design proposals.

5.2.1.3 Plant Palettes

What plant palettes do homeowners gravitate to and why?

Two homeowners gravitated towards plant palettes that provided unique plant varieties that set their landscape apart from neighboring landscapes. Remaining respondents had consistent plant palettes including knockout roses and Indian hawthorns. Overall, in terms of design, ‘traditional’ and ‘classical’ landscapes are more widely accepted and sought after. This conclusion is met with the mentions of foundational plantings including shrubbery and blooms in the landscape. Plant palettes are selected to better convenient the homeowner, providing; low maintenance, reduce cost [less water consumption and longevity]. Finally, in terms of design, homeowners gravitate to plant palettes that provide year round color and blooms in the landscape. This gravitation is linked to colorful plant displays at local nurseries and botanical gardens, due to the influence of marketing campaigns and promotion of non-native plants from national growers and innovators.

5.3 Discussion: Findings and Literature

The themes revealed from the in-depth interviews, provide comparison discussions between the findings and the literature review in chapter two. For the purpose of this study, the comparisons cover factors influencing residential landscapes including:

1. Climate change and water restrictions
2. HOA requirements
3. Native plants: Availability and sources

5.3.1 Climate Change and Water Restrictions

The literature review's first comparison with the findings is the influence of climate change and water restrictions on residential landscapes. According to the literature, drought-like conditions have been affecting North Texas since October of 2010. The climate change influences cities to mandate water restrictions according to drought severity and location. In an effort to continue to conserve water usage, most cities are in stage 1 water restrictions including; Flower Mound and Southlake. Despite water restrictions, literature documents 3x water usage in affluent cities such as Southlake, compared to other cities in the Dallas-Fort Worth Metroplex area, in order to have 'manicured, green landscapes'. Most respondents in neighborhoods located in Flower Mound and Southlake had similarities to literature findings, medium water usage. They utilized medium water usage to accommodate roses and additional colors in the landscape.

However, literature also illustrates cities located in the North Texas Municipal Water District [Allen], are often under firmer water restrictions due to the infestation of zebra mussels in their water supply, Lake Texoma. All respondents located in Allen were aware of the firmer water restrictions, which had a direct correlation with their plant choices and optimism towards native plants. Respondents in Allen made heat and drought tolerance and water conservation a top priority.

Literature and respondent findings reveal homeowners reacting to water restrictions according to location and circumstance. In most cases, water restrictions are relatively low, giving homeowners more freedom than not to do what they please in the landscape. Therefore, according to literature and respondent findings, affluent cities such as Southlake are willing to spend money for medium to high water usage. This allows manicured landscapes to produce aesthetic value and appealing color, which according to respondents, are high priorities when choosing plants for their landscape.

5.3.2 HOA Requirements

The second comparison found between respondent findings and the literature is the influence of HOA requirements on residential landscapes. As previously mentioned in Chapter 3, the primary contact with a HOA was the only methodology used to gain access to upper-income homeowners in North Texas. Therefore, the findings regarding HOA requirements in the literature had direct impact on all respondents.

According to literature, many HOAs govern fine details related to residential land use including; plant specifications, plant placement and color palettes. The restrictions provide a uniform community with high property values. Respondents confirm literature statements, specifically HOA lawn requirements. According to respondents, lawn requirements make a significant impact on the homeowner's plant palette since it occupies the majority of the front yard in most cases. The HOAs requirement of implementing grass in the landscape is directly influenced by the green industry. National campaigns promote lawn products from companies such as Scotts Miracle Grow. Additionally lawn care advice is readily available in local horticulturist expert, Neil Sperry's, books, magazines and columns.

Both the literature and the respondents interviewed confirm need to maintain a uniform, well maintained community, in order to have higher property values. In response to HOA mandates, Respondent G states, "So it doesn't do you any good if you've got 6 homes, looking really great, you've got one that's just going to hell on a hand basket because they didn't want to do it. You know so they mandate, alright, we're not going to damage these 6 homes, we're going to make the 7th home do it and we will go one step further, we will just do it for them[laugh]". A number of respondents believed native plants looked unkempt in the landscape. This response both contributes and affirms the HOAs poor reactions towards the plant palette and the required mandate of a 'uniform, well maintained community'. In many cases, homeowners that choose to implement native plants do not consider design, and instead, randomly place plants in the landscape. This action contributes to neighbors' preferences

regarding native plants and conclusions by the HOA. Therefore, it is imperative that landscape architects consider preferences of the masses before designing with native plants.

According to news reports from the literature review, and respondent findings, HOA restrictions inhibit a homeowner's creativity or uniqueness in the suburban landscape. One respondent spoke of being reprimanded for having an inspired English cottage garden. Respondents confirmed that in many cases HOAs believe, cottage garden and wild prairie inspirations look unkempt and outside of the box.

Respondent and literature findings show HOA requirements to have both significance and limitations. Although the restrictions mean good intent; to increase property values, they limit creativity and uniqueness in residential landscapes. Respondents believe that in order for more homeowners to accept native plants, it would first take radical thought change by HOAs. This may allow for a chain reaction. If more HOAs became more accepting and incorporated natives into their common areas, homeowners might follow suit.

5.3.3 Native Plants: Availability and Sources

Finally, research and respondents showed concern with the availability of native plants in local nurseries and sources homeowners and HOAs use to educate themselves. According to research of local nurseries, the availability of native plants in is limited compared to the overall quantity of plants offered in their databases. Respondents agreed with the literature findings, voicing disappointment in the lack of native plant varieties at local nurseries.

In most cases, gardening and native plant sources provided in the literature have direct correlation with informants' responses:

1. Websites: Texas A&M University resources, Lady Bird Johnson Wildflower Center
2. Neil Sperry magazines
3. Books

The lack of native plant varieties in local nurseries is a concern among respondents and proven in research. In order to have access to native plants, respondents report contacting

specialized nurseries or gaining access to wholesalers. Therefore, it is understood that the abundant variety of non-native species pushed by national growers and innovators at local nurseries contribute to homeowner's plant choices. In order for homeowners to have access to native plants, the green industry in general, will have to produce radical thought change concerning quantity, advertisement and display of native plants.

There is a strong connection found between literature and respondents regarding native plant sources. Respondents utilize popular websites and education mediums for instant knowledge. Previous research proved a limited utilization of programs and brands specifically endorsed by the Texas A&M AgriLife Extension Service due to lack of awareness. A similar finding showed only 3 of the 11 respondents showing responsiveness to the sources. These findings can further encourage universities and additional sources to increase marketing and continue to educate the public on the advantages of native plants, which may contribute to further utilization.

5.4 Importance to the Profession

The research conducted in the literature review and derived from interview findings, indicate native plant palettes becoming increasingly more appealing to homeowners to address issues such as; water conservation, plant longevity and low maintenance requirements. Findings specified however, the importance of design when homeowners contemplate incorporating natives into their landscape. The highest priorities of homeowners include; aesthetic appeal and refraining from an unkempt look. Therefore, the findings of this research study help contribute to adaptations of future design proposals with native plants, to meet the specified needs and wants of the homeowners. It is up to the landscape architecture profession to set design examples and furthermore, encourage the green industry to promote and educate homeowners regarding native plants in order to help 'bend the curve' toward sustainability and ecological diversity.

5.5 Future Research

Based off of this study, the following questions and or statements provide suggestions for future research:

5.5.1 Promotion

Residential landscape design is one of many areas of specializations for landscape architects. Since landscape architects provide expertise and advice while working with homeowners for future design proposals, it would be worth knowing which landscape architects are promoting or not promoting native plants and why.

5.5.2 Assessment

To further the above, suggested research, a general assessment of North Texas landscape architects' knowledge of native plants, would aide in re-evaluating the promotion of native plants in residential landscapes. If knowledge is limited, how can native plants be properly utilized in the landscape? Furthermore, should landscape architects be more knowledgeable? Should other types of consultants be on the design team and how can they be used without cutting into landscape architect fees.

5.5.3 Perceptions

According to literature and the respondents of this study, the availability of native plants is limited in local, North Texas nurseries, due to color preference and advertisement of non-native species. In order to understand this finding, interviewing professionals at nurseries would help landscape architects apprehend the nurseries' thinking, current trends and client requests.

5.5.4 Implications

Many respondents expressed limitations regarding their landscape plant palette due to HOA requirements. It would be interesting to further assess HOA landscape requirements and their implications to native plant palettes. How many homeowners are being affected by these limitations? What do HOAs think of the plant palette? Why is the plant palette being discouraged?

5.5.5 Preferences

One respondent mentioned their native plant inspiration coming from commercial landscapes and government landscapes [highways]. It would be interesting to allow both professionals and non-professionals to participate in a preference study to indicate their perceptions of native plant aesthetics and design. This particular study did not have observation as part of its research methods, due to a lack of residential landscapes containing native plants

5.5.6 Alternatives

This study revealed a strong influence of the traditional suburban lawn on residential plant palettes. It is a standard requirement of HOAs and found across the board. In an effort to further 'bend the curve' toward sustainability and ecological diversity, it would be interesting to know what alternatives are available for the traditional lawn. Which alternatives are most appealing to homeowners? In addition, are these alternatives feasible for future design proposals?

5.6 Closing Remarks

Chapter 5 began by analyzing the data and themes documented in chapter 4, in order to summarize the findings according to the original research questions of this study. Succeeding the analysis, there is a discussion regarding comparisons found in both the literature review and in-depth interview findings. The discussion subsequently leads to the relevance of the research findings to the landscape architecture profession and ends with suggestions for future research.

Overall, the research revealed a positive opinion among respondents regarding native plants in residential landscapes to accomplish needs such as water conservation and plant longevity. However, in order to commit to native plants, homeowners request the aid of design professionals to accomplish aesthetic values. This request is important to the landscape architecture profession as they are the professionals who will adapt future native plant design proposals to meet the needs and wants of the homeowner.

APPENDIX A

IRB APPROVAL AND EXEMPTION

Office of Research Administration
Regulatory Services
817-272-3723
regulatoryservices@uta.edu
http://www.uta.edu/ra/oric/

Institutional Review Board
Notification of Exemption

September 11, 2012

Amber Davis
Dr. David Hopman
School of Architecture
Box 19108

Protocol Number: 2013-0028

Protocol Title: *Native Plant Palettes: Perceptions of North Texas Homeowners in Upper-Income Suburbia*

Type of Review: **Exemption Determination**

The UT Arlington Institutional Review Board (IRB) Chair, or designee, has reviewed the above referenced study and found that it qualified for exemption under the federal guidelines for the protection of human subjects as referenced at Title 45 Part 46.101(b)(2). You are therefore authorized to begin the research as of September 9, 2012.

Pursuant to Title 45 CFR 46.103(b)(4)(iii), investigators are required to, "promptly report to the IRB ***any*** proposed changes in the research activity, and to ensure that such changes in approved research, during the period for which IRB approval has already been given, are **not initiated without prior IRB review and approval** except when necessary to eliminate apparent immediate hazards to the subject." Please be advised that as the principal investigator, you are required to report local adverse (unanticipated) events to the Office of Research Administration; Regulatory Services within 24 hours of the occurrence or upon acknowledgement of the occurrence.

All investigators and key personnel identified in the protocol must have documented Human Subject Protection (HSP) Training on file with this office. Completion certificates are valid for 2 years from completion date.

The UT Arlington Office of Research Administration; Regulatory Services appreciates your continuing commitment to the protection of human subjects in research. Should you have questions, or need to report completion of study procedures, please contact Robin Dickey at 817-272-9329 or robind@uta.edu. You may also contact Regulatory Services at 817-272-3723 or regulatoryservices@uta.edu.

APPENDIX B

SAMPLE EMAIL AND PHONE REQRUITMENT SCRIPTS

SAMPLE EMAIL AND PHONE REQRUITMENT SCRIPT
HOMEOWNER'S ASSOCIATION

Good Morning/Afternoon/Evening,

My name is Amber Davis, a graduate student at the University of Texas at Arlington, Program in Landscape Architecture. I am currently working on my master's thesis entitled; Native Plant Palettes: Perceptions of Homeowner's in Upper-Income Suburbia. The research is studying the following questions:

- What landscape plant preferences do homeowners gravitate to and why?
- What are homeowner's knowledge of and commitment to native plants?
- Do homeowners accept native plant palettes as a necessity for the health of the environment in suburbia?

I am interested in using your neighborhood as a case study and would like to request permission to gain access to willing homeowners, over the age of 18 for an interview. The interview will last approximately 30-45 min. and can take place wherever the homeowner is most comfortable (home, coffee shop, homeowner's association). The interviewee will remain anonymous throughout the research and all information will be kept confidential.

If your community is willing to participate in the study, what is the best way to contact your homeowners (email, phone, meeting etc.)?

Please contact me with your thoughts and any additional questions you might have.
Email: davis.amber@me.com Phone: 817-716-3926

I appreciate your time and look forward to hearing from you soon.

Thank you,

Amber Davis

SAMPLE EMAIL AND PHONE REQRUITMENT SCRIPT
HOMEOWNER

Good Morning/Afternoon/Evening,

My name is Amber Davis, a graduate at the University of Texas at Arlington, Program in Landscape Architecture. I am currently working on my master's thesis entitled; Native Plant Palettes: Perceptions of Homeowner's in Upper-Income Suburbia. The research is studying the following questions:

- What landscape plant preferences do homeowners gravitate to and why?
- What are homeowner's knowledge of and commitment to native plants?
- Do homeowners accept native plant palettes as a necessity for the health of the environment in suburbia?

Are you interested in participating in an interview for the study? The interview will last approximately 30-45 min. and can take place wherever you are most comfortable (home, coffee shop, homeowner's association). You will remain anonymous throughout the interview and research. All information will be kept confidential.

Please contact me with your thoughts and any additional questions you might have.
Email: davis.amber@me.com Phone: 817-716-3926

I appreciate your time and look forward to hearing from you soon.

Thank you,

Amber Davis

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BIOGRAPHICAL INFORMATION

Amber Michelle Davis was born and raised in McAllen, Texas. In May of 2009, she earned her Bachelor of Arts in Horticulture at Texas A&M University in College Station, Texas. During her undergraduate career, Amber was an active member of the Student American Institute of Floral Designers and held the position of Vice-President from 2008-2009. Additionally, Mrs. Davis took classes in the landscape architecture program at Texas A&M to prepare herself for future graduate studies.

In August of 2009, Mrs. Davis enrolled at the University of Texas at Arlington, School of Architecture, Program of Landscape Architecture. Her graduate school experience involved membership and leadership [Secretary and Vice-President] in UTA's Student Society of Landscape Architects. Additionally, the landscape architecture program at UTA employed Mrs. Davis for two years as a graduate research assistant, under the supervision of Professor David Hopman. Primary research involved the UTA green roof.

In the summer of 2012, Mrs. Davis was employed as a landscape architecture intern at the Texas Department of Transportation, under the supervision of Landscape Architect, Patrick Haigh. The internship gave Mrs. Davis valuable, real-world experience creating planting plans, design and irrigation details, and developing better communication skills for clients.

Amber appreciates the landscape and the beauty of its elements. She enjoys actively pursuing creative endeavors, and hopes to combine her passions for floral design and landscape architecture in the near future.