

LOVELY HOMEGROWN MENUS: SUBSTITUTING BEAUTIFUL EDIBLES
FOR ORNAMENTALS IN RESIDENTIAL LANDSCAPES

By

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A thesis submitted in partial fulfillment of
the requirements for the degree of

MASTER OF SCIENCE IN LANDSCAPE ARCHITECTURE

WASHINGTON STATE UNIVERSITY
Department of Horticulture and Landscape Architecture

MAY 2006

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ACKNOWLEDGEMENT

I thank my husband, John Haight, and my daughters, Lacey and Tilese Haight, for all their patience and support in this venture. I also thank my Chairperson, Phil Waite, for all the time he spent encouraging and advising me; Ginny Lohr for advising, editing and her help with my survey; Cathy Perillo for the time spent advising and editing, and Tonie Fitzgerald for her willingness to edit and participate. And thanks to the many others willing to listen throughout the last three years: parents, siblings and friends.

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Abstract

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May 2006

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Aesthetics appears to be one of the highest priorities of residential landscape design. Edible plants are typically excluded from residential design palettes even though edible plants produce flowers and fruit and come in an array of shapes and colors. By asserting that edible plants can replace ornamental plants in residential designs, specifically in the Palouse, this thesis used three methods to explore edible landscaping as a residential design solution and general perceptions about edible plant use: 1) a literature review including the history of edible use, evidences of awareness of edible plant potential in landscaping, knowledge needed to better understand edible plant potential and social influence like local foods movement; 2) a survey conducted at nurseries in the Palouse area (a geographic region in SE Washington State) and at Washington State University's Cooperative Extension Office in Spokane, Washington; and 3) a case study replacing ornamental plants with edible plants in a typically designed residential landscape in Pullman, Washington.

The literature review showed little evidence of historical or current aesthetic edible plant use. The survey results showed a general lack of knowledge among participants about which

plants are edible. The significant factors in participants' willingness to grow edible plants outside a rectilinear vegetable, herb or fruit garden: already growing edible plants, frequency and enjoyment of gardening, and personal design needs. As part of the case study ((3) above), this thesis contains a matrix of 190 edible plants which can be grown in cold hardiness zones and residential landscapes similar to those of the Palouse area and used with or without typical ornamental plants. The original design was divided into seven areas and plants were coded according to architectural, engineering and aesthetic plant uses. The case study re-design substituted 28 edible plant species from the matrix (two examples: *Vaccinium angustifolia* 'St. Cloud' and *Amelanchier alnifolia*) for 22 original design ornamental plant species (parallel examples: *Azalea* 'Northern Lights' hybrid and *Rhus typhina*). Increasing edible plant use in residential design palettes requires the positive interactions between landscape professionals, publication writers and clients to raise awareness, provide instruction and express the possibilities as a design solution.

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Dedication

To my Father and Elder Brother, thank you

CHAPTER ONE

LITERATURE REVIEW

Introduction

Aesthetics, that is, the enjoyment or satisfaction that comes through the appreciation of beauty or conforming to accepted notions of good taste (from American Heritage Dictionary, 2000), appears to be one of the highest priorities of residential landscape design. The author has experienced many residential landscapes, artfully designed by homeowners themselves or by professionals, yet all very similar in their appearance, making commonplace that which evokes an image of attractiveness. The author has also noticed that edible plants are overlooked in residential design palettes based on uniform notions of aesthetics, even though edible plants produce flowers and fruit and come in an array of shapes and colors. This raised the question of whether a residential landscape with strictly non-food producing ornamentals could contain plants with one or more parts consumable by people and be aesthetically pleasing. It also led to the question of whether a homeowner's aesthetic considerations about landscape design could be broadened to include the use of edible plants and how this might be accomplished.

Somewhere at the late 19th century, the concept of what constitutes an aesthetically pleasing residential landscape shifted heavily to the look of the European estate, such that well-manicured lawns, a profusion of flowers and/or fruit, and a wealth of shapes and colors became the epitome of uniformity in upper- and middle- class America (Creasy, 1982; Ball, 2000; Hagy, 1990). Before Colonial times in America,

there were many who planted edibles along with flowers for beauty and efficiency. Persian, Egyptian, Greek/Roman, medieval monastery, Renaissance (French and Italian), 18th century English and early American gardens had some mixture of edibles and ornamentals because the edibles were considered to be lovely to look at in their own right (Thacker, 1979; McGuire, 1989). Chinese and Japanese gardens also had ornamental edibles in them (Pennington, 2002).

In America, there has been a reintroduction of incorporating edible plants into some landscapes. Rosalind Creasy is the most notable force behind using edible plants in residential landscapes. Robert Kourik is another noted name in this endeavor called “edible landscaping”, which is “the way to bring food gardening into its rightful place – all around the home – but with a sense of design, an eye to color and an emphasis on good taste” (Kourik, 1990, p. 53). Creasy (1982) talks about how the palette of plants used around an American home changed from a mix of food producers and ornamentals to strictly ornamentals during the middle of the 20th century. She mentions factors contributing to this change, most notably the move of large numbers of people from rural areas to urban or suburban areas and the increased efficiency of agriculture to produce food for the populace. As home lot sizes and the cost of purchasing food decreased, fewer edible plants were included in residential landscapes. Suburban developers decided how neighborhoods would look based on wealthy leisure design principles inherited from European ancestors: pristine, formal and manicured. If edible plants were included around homes, they were often hidden in an unseen place. American dependence upon commercial agriculture enlarged, natural resource consumption increased and people lost touch with where their food comes from (Creasy, 1982).

Encouraging more environmentally sound landscaping practices by increasing the amount of edible plants used in residential landscapes could potentially influence at least two social issues relating to food (Creasy, 1982; Haag, 1980). The first issue is the consumption of natural resources used to grow food commercially and to ship food thousands of miles. The second issue is the decreased health from eating less fresh, highly processed, chemically altered food. Edible landscaping (or the promotion thereof) is a small piece of a larger movement to bring the production of food back to a local level.

Some cities get food from community gardens and outlying farms, but “millions of acres of our nation’s best agricultural soil are covered with ornamental shrubs and lawns” (Creasy, 1982, p. 2). The property of homeowners in cities as a potentially useful large land area is generally overlooked when thinking about producing healthy food locally. Each homeowner has enough space to contribute in a small way to the production of locally grown food – so local they can step outside their home and get it! People seem to buy and use plants either to eat from them or to look at them, but don’t usually use the same plant for both.

Landscape professionals perform a service and create a product that serves specific functions as beautifully as possible (Creasy, 1982). From a landscape professional viewpoint, promoting locally grown food (a specific function) while not compromising aesthetics is possible. Three ways to promote locally grown food as a design solution are: 1) advocating the use of edible plants in residential landscapes; 2) educating people about which plants are edible; and 3) demonstrating how edible plants can be aesthetically pleasing. McKinnon (1984) listed ways that people who sell or

propagate plants for landscaping use could aid in the push for edible plant use. The advertisement and placement of well-labeled plants in conspicuous locations for customer notice helps advocate the use of edible plants. Providing information to advise customers about cultural requirements and risks (insects, diseases, etc.) related to growing edible plants not only educates people about using edibles in landscaping but helps prevent frustrations in their use (McKinnon, 1984). The best opportunity for professionals to demonstrate the aesthetics of edible plant use is to show living landscapes, either ones that are already built or at venues such as garden shows, with graphic illustrations as the next best opportunity.

By asserting that edible plants can replace ornamental plants in residential designs, specifically in the Palouse, this thesis explored three methods to encourage edible landscaping as a residential design solution. The first, discussed later in this chapter, consisted of conducting a literature review related to the use of edible plants in residential landscapes. This included, but was not limited to:

- history of edible plant use in landscaping
- evidence of awareness of edible plant potential in landscaping
- knowledge that might be needed to better understand edible plant potential
- the social influence of edible plant use in communities and for individuals

The second method, discussed in Chapter Two, endeavored to discover local attitudes about edible plant use through surveys conducted with customers of Palouse area nurseries, Palouse area nursery owners and clients of Washington State University's Cooperative Extension Office in Spokane, Washington. The third method (Chapter Three) examined a case study of a typically designed residential landscape in Pullman,

Washington and replaced as many of the characteristically ornamental plants with edible plants as possible. This thesis also contains an informative matrix list of edible plants which can be grown in Palouse area residential landscapes and other locations with similar climates.

Evidence of awareness of edible plant use

The author was unable to find literature discussion of surveys assessing the knowledge of people about the aesthetic use of edible plants in residential landscapes. So it appears that the survey conducted by the author is an unusual item. Twenty-four newspaper articles referring to edible landscaping were found from 15 of the 50 states in the United States from 1991 to 2005. Seventeen magazine articles and four university extension publications were found from the same time period. There were concentrations of articles in the years 1995 and 2003 (5 articles each year), and 1998, 2000 and 2002 (4 articles each year). Ten articles (newspaper, magazine and extension publication) that best represent the general awareness of edible landscaping are listed in the bibliography with a # symbol. There does appear to be an awareness of the concept of edible landscaping from the newspapers and magazines talking about edible plant use in residential landscapes, but it does not appear that there has been an increase in helping the public to be aware of edible landscaping through the written word.

Knowledge needed

There are three fundamental areas of understanding that will increase awareness of the potential of using edible plants in residential landscapes. Understanding how any

plant is used in a landscape design is the first fundamental. Gary Robinette (1972) and William Nelson (2004) provided good information on the subject of plant use in design. Learning the cultural requirements of plants is the second fundamental. Robert Kourik (1986), Rosalind Creasy (1982) and Darrel Bienz (1993) were good sources for plant cultural requirements and maintenance concerns. Third, it is necessary to understand what an edible plant is (including what parts of a plant are eaten). J. G. Vaughn and C. Geissler (1997), Rosalind Creasy (1982), G. Kunkel (1984) and U. P. Hedrick (1972) furnished good information about edible plants.

How plants are used in design

Plants are essentials on the palette of landscape architecture. The design uses of plants in the landscape are broken down into three main areas, involving physical and psychological functions. Architectural uses, or the forming of space, provide both physical boundaries and psychological feelings of privacy and security (Robinette, 1972; Ulrich, 1999; Nelson, 2004). Engineering uses, or the modulating of space, provide physical protection from the glare, heat and wind (Robinette, 1972; Hackett, 1979). Aesthetic uses, or the embellishment of space, provide physical pleasure to the ears, eyes, nose and hands and a psychological “sense of creativity” (Goodell, 1983, p. 124; Robinette, 1972; Hackett, 1979)

Walls, windows, ceilings and floors comprise the forming of space. Shrubs and low trees form walls and windows. Canopies of tall trees form ceilings. Vines (with some sort of framework) form walls, windows and ceilings. Groundcovers and vines form floors (Robinette, 1972).

Plants modulate environmental conditions and a person's exposure to them within the spaces formed. These environmental conditions are light, air, sound and soil. Direct sunlight or artificial light generates glare and reflection which plants absorb and create shade and shadow. The movement and temperature of air are tempered by plants. Plants increase the amount of water in the air through respiration and form wind breaks, which aid in the reduction of wind, dust, pollution particles and heat. People, animals and human artifacts such as machines create sounds that plants absorb or redirect. Plants also increase soil fertility and keep existing soil in place (Robinette, 1972; Hackett, 1979; Kourik, 1986).

By carefully controlling artistic elements, plants aesthetically embellish a space, or contribute to the enjoyment or satisfaction of the observer through the appreciation of beauty. Line, form, texture and color are the main artistic elements. Line "carries the eye along its route, be it upward, downward, horizontal, or diagonal." Form constitutes a plant's "direction and arrangement of branches and twigs." Texture evokes the idea that a plant can be "'read' and 'felt' by sight". The color of a plant is characterized by its hue (technical name), value (lightness or darkness), intensity (purity, strength, and saturation), glossiness (shiny), brightness (sparkle), and dullness (how much light is absorbed) (Nelson, 2004, pp. 9, 10, 12, 15-20). Other closely related artistic elements are: repetition – how often a main element is used; variation – different versions of the main element; balance – equilibrium between number and weight of elements used; emphasis – causing one main element or portion of a main element to stand out from the others; sequence – the unfolding to a person of the main element(s) used in the landscape; and scale – the size of the main element relative to people. Of course, plants are

combined with the hardscape (wood, concrete, stone, metal, glass) in a design to create an aesthetically pleasing space, but only plant uses are discussed in this thesis (Nelson, 2004; Robinson, 2004; Hackett, 1979).

Plant cultural requirements

Cultural requirements are the basic needs of a plant in order for it to grow. All plants, edible and ornamental, need some combination of soil, water and light. Pesticides in their many forms are not considered cultural requirements. Pest and disease resistance, harvesting time and pruning are other constraints to consider when growing edible plants, though they are not cultural requirements (Bienz, 1993).

The four main components of soil are: air, water, minerals and organic matter – “the fiber of the soil”. Providing air in soil allows plants to ‘breathe’. Water provides the means through which plants obtain most of their nutrients (Kourik, 1986, p. 29). Watering plants with the least amount of water possible is best so as to conserve this precious natural resource and not drown plants’ roots. Minerals are the nutrient components that a plant uses for growth, such as potassium. The amount of organic matter determines how much moisture soil holds due to the aggregates formed with soil particles and how well micro-organisms break down nutrients for plant absorption (Creasy, 1982; Kourik, 1986). Other soil factors influencing plant growth include pH, salt levels and temperature.

Usually edible plants require full sun, but some may grow in partial shade or occasionally in full shade. The duration of light also affects how well a plant grows (Bienz, 1993). If a plant needs full sun and only receives it for three hours a day, it will

most likely not grow as well as if the plant receives full sun for six to eight hours a day. The time of the year that sunlight is available also affects a plant's growth. If full sun is only available in the winter months because of the shading of a building or another plant, the plant's basic need of light will not be met.

What an edible plant is

An edible plant is any plant that has a part which can be eaten by humans. Though a person could consume any part of any plant, toxicity must be taken into account. Consuming plants or plant parts that are known to be toxic is always discouraged. Consuming plant parts that are edible in the wrong quantities, at the wrong time in a plant's growth or that are not prepared correctly will also result in toxicity problems (Vaughan, 1997; Tilford, 1997; Barash, 1995). There are varying levels of edibility due to little (or bad) flavor or texture. A plant's edibility may be more accepted in one region of the world than another. The most common edible plants are those that are grown both commercially and in home gardens such as grains, fruits and vegetables. Uncommon edible plants are those from regions outside the USA or little known natives such as Mediterranean medlar (*Crataegus azaroles*) or Eve's date (*Yucca baccata*) (Simmons, 1972, pp. 118 and 219).

The plant parts that are eaten are the leaves, fruit, seed, root, stem or stalk, flower and shoot. Here fruit refers to the fleshy part eaten, such as hardy kiwi (*Actinidia arguta*), and seed (nut) refers to the non-fleshy part eaten, such as shagbark hickory (*Carya ovata*). The roots include bulbs, corms and tubers. Plant parts can be eaten raw, boiled, fried, steamed, dried, made into drinks or preserved as jams, jellies, pickles, etc.

The order of edible parts (listed in order of most commonly mentioned in references) and the ways edible parts can be used are derived from the nineteen references on edible plants, asterisked in the bibliography.

Social influence

In addition to being aesthetically pleasing for individual properties, edible landscapes benefit communities socially and an individual psychologically. There is less land waste, meaning land sitting idle that could be used to help provide for a community's food needs. Travis Beck and Martin Quigley (2003) present information about energy efficiency and resource consumption when individual properties are combined together in communities. Promoted by local and slow food movements, pleasure is derived from the land through increased health by eating fresh, local food and through the enjoyment of a diverse palette of edibles (Gariglio, 2006). Brian Halweil (2002) provides good information about using local land for food production. Other resources are books about local food use by Joan Gussow (2001) and Gary Paul Nabhan (2002), and the Slow Food website (2006).

Community positives

Approximately half of the earth's population lives in urban areas (Halweil, 2002). According to United Nation's projections (2002), 60 percent of the world's population will live in urban areas by 2030. This increase in urbanization promotes a disconnection from the land that grows the food urban dwellers consume (Josiah and Lackey, date not available; Halweil, 2002) If farmland around cities is consumed for housing as it is now,

there will be an even greater need to use the virtually untapped resource of spaces within a city to help feed the populace. Residential landscapes are a large part of the space available.

A study done by Beck and Quigley (2003) found that edible landscapes are one of the ways that a city could contribute to its own food needs. Thirty-two percent of a typical residential city block, which is 3.4 acres, could be used for food production (Beck, 2003). This land area could provide anywhere between 20% and 60% of the needed produce for a given community (Halweil, 2002).

Large scale agriculture expends huge amounts of natural resources in the form of pesticides and preservatives and only grows a limited selection of food (Roley, 1993). Through an analysis of energy input and consumption, single edible landscapes (small plots at individual residences) were not found to be energy efficient from a strictly mathematical viewpoint as compared to an ornamental landscape. However, Beck and Quigley (2003) did posit that if edible landscapes were implemented on a larger scale such as the whole of a residential lot, in neighborhoods or in a community, material input and resource consumption would decrease and productivity would increase. In turn, larger numbers of people would have access to a greater variety of fresh food thus improving physical health. Significant areas of cities could be aesthetically pleasing. It is possible that fewer natural resources would be expended because the shipping distance from 'farm' to 'table' is far less than with conventional agriculture.

The local food and slow food movements address the issues of improved health through the access of fresh local food, pleasure with food, pleasure in the landscapes food comes from, and reduction in resource consumption through local production, processing

and marketing. These movements have essentially the same premise: focus on how local communities can provide their own food needs and pleasures, and preserve or revive local cultural methods of production (especially biodiversity), processing and marketing (Slow Food website, 2006; Gussow, 2001; Nabhan, 2002; Halweil, 2002). Carlo Petrini, the founder of the slow food movement said that a “hundred years ago, people ate between one hundred and a hundred and twenty different species of food. Now our diet is made up of at most ten or twelve species.” (quoted in Stille, 2001) Roley (1993) noted that “most Americans eat just 20 basic foods and relatively little fresh produce. Of the 3,000 to 10,000 edible plants, only 150 are commercially used.” The reduction of diversity in diet is mostly due to increased urbanization, the consolidation of companies that purchase, process and market food products and a general unawareness of people about where their food comes from (Halweil, 2002). The rate of obesity and illness related to obesity is linked to the non-local diet defined by large amounts of sugar, fried foods, meat and highly processed foods marketed by international conglomerates (Halweil, 2002). Through Rodale Press, a series of studies of America’s food systems have contributed to an increased public awareness of food and agricultural systems (Feenstra, 1997). One of the opportunities to raise awareness is to provide homeowners with the means and methods of growing edible plants in their landscapes.

Psychological positives of gardening

Rachel Kaplan is a notable source on the psychological effects of plants on people. She has concluded that “‘nature’ is a critical component in how people experience the environment.” (Kaplan, 1992, p. 127) She noted that not all plants or

settings are equal at influencing human well-being, but she has discovered some psychological benefits of gardening, a human controlled part of nature. First, people are interested in seeing things grow. Second, they derive aesthetic pleasure from plants. Third, they enjoy the feeling of producing some of their own food (Kaplan, 1973). The last benefit does not occur with strictly ornamental plants and is a reason to promote edible plant use in residential landscapes. The involvement in a garden from planting a seed to harvesting a fruit encourages a “sense of creativity” (Goodell, 1983). An aesthetically pleasing edible landscape provides an arena for observing the growth of plants and a heightened sense of involvement in the health of the individuals living in the household, the neighborhood and the community.

Potential Negatives

Most of the negatives associated with growing food-producing plants have to do with the amount of time and labor needed for planting, maintaining, harvesting and preserving, at least as compared to ornamental plants. Higher maintenance edibles should be planted closer to the house and lower maintenance edibles farther from the house. This will reduce the time spent pruning, watering and harvesting (Mollison, 1990). Along with the above, planting only as many plants as a person has time available to maintain them will reduce maintenance pressures. Planting appropriate species for the growing area will also reduce maintenance. This includes species with pest and disease resistance as well as soil and climate tolerance (Creasy, 1982; Kourik, 1986, 1990). Pests (diseases, insects, birds, animals, weeds) that distress edible plants in residential landscapes are maintenance issues. Greater plant diversity helps keep diseases and

insects at lower levels (Creasy, 1982). Edible landscapes attract many kinds of birds and these can help control insect populations, though a certain amount of fruit may also be consumed by those same birds (Creasy, 1982; Kourik, 1986; Josiah and Lackey, date not available; Gussow, 2001). Netting and screening are some ways to prevent birds and other animals from feasting on edible plants (Creasy, 1982). Choosing species that produce food at differing times will reduce the time and labor involved in harvesting and preserving (Josiah and Lackey, date not available).

The appearance of a plant or landscape after harvest is an issue not normally considered with non-food producing landscapes. Many perennials and most shrubs and trees will be largely unaffected by the harvesting of edible parts because of the form of the plant. Complex planting plans using annual or perennial fillers can mask empty spaces in the landscape. These fillers could be edibles or ornamentals (Goodell, 1983). Structural elements, such as arbors, paving patterns and seating, will draw the eye away from the effects of harvesting in an edible landscape (Kourik, 1990).

CHAPTER TWO

SURVEY

Introduction

In support of the second avenue of exploration in this thesis (discovering local attitudes about edible plant use), an Edible Plant Use Survey was created and conducted to ascertain four points: 1) do people know which landscape plants have edible parts; 2) do people already grow edible plants at their homes; 3) are people aware of the aesthetic characteristics of edible plants. The fourth point, would people be willing to grow edible plants outside of the structured, rectilinear shape of a vegetable, herb or fruit garden (orchard), was the focus of the survey. A brief Plant Selection Survey (see Appendix A) for nursery owners was also created to achieve a list of thirty or so popular plants currently purchased in the Palouse, listed in Appendix B and titled 'Current Palouse Landscape Plant Palette'.

Methodology

A draft of the Edible Plant Use Survey was pre-tested on 13 people and then modified for clarity in wording and organization. The final survey (see Appendix A) was administered to clients and customers at the WSU Master Gardener Extension office in Spokane, Washington, and at six nurseries around the Palouse (spring 2005). The nurseries in Pullman, Washington, were: 1) SYG Nursery and Landscaping, 2) Crossroads Nursery and 3) Prairie Bloom. The nurseries in Clarkston, Washington, were Patt's Garden Center and Hay's Produce and Garden Center. The single nursery in

Potlatch, Idaho, was Fiddler's Ridge Garden and Nature Store. These places were chosen to attempt to limit the survey participants to those who would be actively purchasing/growing plants. This population was selected because those surveyed would be more likely to be homeowners and more likely to garden than people shopping at box store garden centers.

Participants were randomly selected from the clients and customers coming to the Extension office and the nurseries. They ranged in age from 18 to over 70 and included both males and females. Race/nationality was not noted (see Appendix A).

The survey had 13 questions. First, a list of twelve plants was presented to participants with the instruction to select, to the best of their knowledge, which of the plants on the list had edible parts. The list contained nine plants with edible parts – amaranth, artichoke, borage, chrysanthemum, firethorn, lovage, mulberry, quince and salal – and three plants without edible parts – cinquefoil, honey locust and hydrangea.

A series of questions was then asked about growing and purchasing edible plants and why edibles were purchased. A distinction was not made between vegetables, herbs or fruiting shrubs or trees. Respondents were asked what percentage of plants purchased within the last two years were edible to see if they purchase more edible plants than ornamental plants (here defined as plants without edible parts). To find out if people are aware of the aesthetic characteristics of edible plants, they were asked why they purchased edible plants. The choices fell into two categories: "edibility" – meaning better flavor or less expensive than or not available in stores; and aesthetic characteristics – foliage, flowers, etc.

Several other questions inquiring about participants' relationships with plants were asked. These questions asked: what influences the participants' decision to purchase plants, what kind of information participants would need to know in order to be willing to grow edible plants, whether participants would be willing to consider growing edible plants in ways or places not currently used, how often participants garden and if they enjoy gardening. The first two questions were asked to determine where future education might be directed in order to increase knowledge about using edible plants in residential landscapes. The third question was asked to ascertain whether people even consider growing edible plants somewhere other than the usual rectilinear space in their landscapes. The last two were asked to see if how much gardening is done influences participants purchasing/growing needs and desires.

Analysis

The survey was scored as follows:

- Question 1, Knowledge of Edibles, "To the best of your knowledge, does each of the following plants have edible parts." The response for each of the 12 plants was assigned a value as follows:
 - +2 was given for answering YES for a plant with edible parts or NO for a plant without edible parts
 - +1 was given for answering PROBABLY YES for a plant with edible parts or PROBABLY NO for a plant without edible parts
 - 0 was given for answering I DON'T KNOW to any question, edible or not

-1 was given for answering PROBABLY NO for a plant with edible parts and
PROBABLY YES for a plant without edible parts

-2 was given for answering NO for a plant with edible parts and YES for a plant
without edible parts

A single score for Question 1, Knowledge of Edibles, was created by adding the values for the 12 plants. A person answering all of Question 1 “yes” would receive a knowledge score of 24 and a person answering all of Question 1 “no” would receive a knowledge score of -24.

- Question 2, Grow Edibles, “Do you plant or grow edible plants in your home, garden or yard?”, Question 4, Obtain Plants, “Did you obtain plants or seeds of edible or ornamental plants for growing during the past two years?” and Question 7, Consider Growing outside Rectangle, “Would you consider planting or growing edible plants outside of a vegetable, herb, or fruit garden?” were given a simple 1 for YES and 0 for NO.
- Question 2a, Not Grow Edibles, “If No, why not?”, Question 2b, Grow Edibles Where, “If Yes, then where do you use them?”, Question 4c, Why Edible Plants, “If you obtained edible plants, why did you get them?”, Question 5, Consider Ornamentals for Aesthetic Characteristics, “Would you consider planting or growing ornamental plants for the characteristics listed below?”, Question 6, Consider Edibles for Aesthetic Characteristics, “Would you consider planting or growing edible plants for the characteristics listed below?” and Question 11, Rent or Own, “Do you rent or own your home?” were given a higher number to mark the best answer as more important.

- Question 3, Plant Purchase Influences, “Which best describes what influences your decision to obtain plants” and Question 8, Information to Grow Edibles, “What kind of information would you want to know about edible plants before planting or growing them in your home, garden or yard?” were given a score of 1 for being marked and 0 for not being marked for each answer possible.
- Question 4a, Percentage Ornamental, “What percentage of the plants obtained were ornamental plants?”, Question 4b, Percentage Edible, “What percentage of the plants obtained were edible plants?”, Question 9, Garden Often, “How often do you garden?” and Question 10, Enjoy Gardening, “Do you enjoy gardening?” were labeled with sequential numbers to distinguish answers from each other for scoring purposes.
- Question 13, Age, “Please mark the one that best describes your age group” was labeled with sequential numbers also. Question 11, Rent or Own, “Do you rent or own your home?” and Question 12, Gender, “What is your gender?” were not given a score. These three questions were for demographics.

Chi-square tables were generated to show which comparisons were significant (SAS, 2002). For example, a comparison between question 2, Grow Edibles, and question 7, Consider Growing outside Rectangle, could show that a participant already growing edible plants would be more likely to consider using edible plants throughout their landscape.

Results

Overall, there was a lack of knowledge about which plants are actually edible (Table 2.1). Only artichoke, a vegetable commonly available in grocery stores, was consistently known to be edible. After that, knowledge dropped off dramatically, with only half of the participants knowing that quince and mulberry are edible and roughly a third that chrysanthemum and borage are edible.

The distinct lack of knowledge suggested that respondents are not exposed to edible plants, beyond the more popular ones such as tomatoes, peppers, cucumbers, strawberries, raspberries and herbs (from Current Palouse Landscape Plant Palette, see Appendix B). Part of this lack of knowledge could be from being unfamiliar with the common names listed in the survey. The lack of knowledge could also come from a lack of interest in growing, or an understanding of how to grow, other edible plants in addition to the more popular ones. This is a positive feedback effect –information is given on the plants more commonly purchased and more plants are purchased that have more information about them. Until information about other edible plants is provided, less will be done with them.

By comparing Question 1 with five other questions (Questions 6, 7, 9, 10, and 13), a relationship was shown to be significant between Question 1 and Questions 6, 9 and 10. The significance of Question 6 will be discussed later. The significance of the frequency of gardening, Question 9 (Chi-Square = .039) and enjoyment of gardening, Question 10 (Chi-Square = .027) will be discussed here (Table 2.2). Of those surveyed, 26.4% had a knowledge score above 8 and garden frequently, and 8.2% had a knowledge score above 8 and do not garden frequently. Of those surveyed, 29.1% had a knowledge

score above 8 and enjoy gardening, and 5.5% had a knowledge score above 8 and do not enjoy gardening. The demographic questions were not a significant factor for edible plant knowledge.

The comparison between Question 1, Knowledge of Edibles, and Question 6, Consider Edibles for Aesthetics, was generated to determine if having a higher knowledge of which plants were edible would influence a homeowner's consideration of growing edible plants for aesthetic reasons. This was shown to be significant (Chi-Square = .016). Of those surveyed, 37.2% had a knowledge score above 8 and would consider growing edible plants for aesthetics and 1.8% had a knowledge score above 8 and would not consider growing edible plants for aesthetics (Table 2.2).

Of the 110 people surveyed, 91 had purchased plants in the last two years. Of those 91 people, 4 people bought edible plants exclusively and 18 people bought ornamental plants exclusively (Table 2.3). Thirty-three had purchased more ornamental plants than edible plants, and 11 had purchased more edible plants than ornamental plants. Fairly equal amounts of ornamental and edible plants were purchased by 25 people. Overall, three times more ornamental plants were purchased than edible plants. Eighty-three of the 91 people who purchased plants in the last two years bought some number of edible plants. Of those 83, only 30 considered the edible plants for aesthetics – foliage, flowers, size or type – and 53 bought them specifically for food (Table 2.4).

Eighty-six of the total number of respondents grow edible plants at their home currently – 40 of them in a structured, rectilinear shape/space, 11 in some kind of container (pots or raised beds) and 35 in the overall landscape (Table 2.5). “The overall landscape” was not defined in this survey, but it is assumed that this refers to mixing

edible plants with ornamental perennials, shrubs or trees. Only 24 of the total respondents had *never* thought to grow edible plants. Frequency of gardening (Chi-Square = .0001) and enjoyment of gardening (Chi-Square = .015) were significant factors in whether respondents grow edible plants (Table 2.6). Demographic questions were not a significant factor in whether respondents were growing edible plants.

It was shown, by comparing Question 1, Knowledge of Edibles, with Question 7, Consider Growing outside Rectangle, that having a higher knowledge score was not a factor in whether a person would be more likely to consider growing edible plants outside a vegetable, herb or fruit garden (Chi-Square = .531). This relationship was anticipated. By comparing Question 1, Knowledge of Edibles, with Question 6, Consider Edibles for Aesthetic Characteristics, it was shown that having a higher knowledge score was a significant factor in whether a person would be more likely to consider growing edible plants for aesthetics (Chi-Square = .016; Table 2.2).

By comparing Question 7, Consider Growing outside Rectangle, with most other questions in the survey, several traits emerged as influencing whether a homeowner or renter would be more likely to consider growing edible plants outside of a vegetable, herb or fruit garden (Table 2.7). Having information about the plants' growth requirements (Chi-Square = .0003) and maintenance requirements (Chi-Square = .0015) were the most influential factors for increasing the likelihood of a person considering growing edible plants outside of a structured, rectilinear shape/space (68.2% of those surveyed). The comparison also showed that a participant who would consider growing outside of a vegetable, herb or fruit garden will be growing edible plants already (65.5%) (Chi-Square = .008).

Participants who purchased plants with their own design research and needs in mind, Question 3, (55.5% of those surveyed) were more likely to consider growing edible plants outside of a vegetable, herb or fruit garden (Chi-Square = .055). This means that people are doing one or more things: 1) looking up plants in books, catalogs or on the internet; 2) deciding they want something with a particular color, texture or shape in “this spot” and then going and finding it; 3) seeing a particular plant in someone else’s yard or public place and going to get one. A sophistication of the gardener’s initiative is implied and a person’s own design research and needs encompasses all the influences of purchasing plants. Demographic questions were not significant factors to whether people consider growing edible plants outside of a vegetable, herb or fruit garden.

Similarly, by comparing Question 6, Consider Edibles for Aesthetic Characteristics, with most other survey questions, traits emerged as influencing whether a person would be more likely to consider growing edible plants for aesthetic reasons (Table 2.8). The most influential factor was purchasing plants with his/her own design research and needs in mind, Question 3 (Chi-Square = .014), followed by gardening frequently, Question 9 (Chi-Square = .001) and enjoying gardening, Question 10 (Chi-Square = .007). As these results are for only about half of the participants, this strengthens the observation that aesthetics are a strong factor in determining what plants are placed in landscapes and that edible plants aren’t seriously considered. It could be that people who already enjoy gardening or frequently garden might be more able and willing to extend the type, content and location of plants they are growing. Demographic questions were not significant factors to whether people consider growing edible plants for aesthetic reasons.

Table 2.1 Number and percentage of participants (n=110) responding “Yes”, “Probably Yes”, “Don’t Know”, “Probably No”, or “No” on Question 1, Knowledge of Edibles, for each of the plants listed in the survey.

Plant	“Yes” ^z		“P. Yes”		“DK”		“P. No”		“No”	
	#	%	#	%	#	%	#	%	#	%
Edible:										
Artichoke	107	97.3	1	0.9	2	1.8	0	0	0	0
Quince	58	52.7	8	7.3	37	33.6	3	2.7	4	3.6
Mulberry	52	47.3	21	19.1	30	27.3	3	2.7	4	3.6
Chrysanthemum	38	34.5	7	6.4	35	31.8	14	12.7	16	14.5
Borage	32	29.1	8	7.3	65	59.1	2	1.8	3	2.7
Salal	27	24.5	11	10.0	68	61.8	2	1.8	2	1.8
Lovage	23	20.9	7	6.4	74	67.3	5	4.5	1	0.9
Amaranth	19	17.3	15	13.6	62	56.4	8	7.3	6	5.5
Firethorn	0	0	4	3.6	83	75.5	11	10.0	12	10.9
Non-edible:										
Hydrangea	4	3.6	6	5.5	55	50.0	23	20.9	22	20.0
Honey locust	8	7.3	13	11.8	57	51.8	15	13.6	17	15.5
Cinquefoil	2	1.8	7	6.4	82	74.5	10	9.0	9	8.2

^z “Yes” indicated that participant felt sure that the plant was edible.

Table 2.2 Number and percentage of total participants (n=110) with greater knowledge as influenced by frequency of gardening and enjoyment of gardening.

Influence	Participants with a greater knowledge of edible plants (Question 1)^z		
	#	%	P^y
Frequently garden (Question 9)			.011
Yes	29	26.4	
No	9	8.2	
Enjoy gardening (Question 10)			.0001
Yes	32	29.1	
No	6	5.5	
Consider Edibles for Aesthetics (Question 6)			.0155
Yes	36	32.7	
No	2	1.8	

^z Greater knowledge means participant scored more than 8 on Question 1

^y Probability that level of knowledge is significantly related to Influence, based on Chi-Square Test

Table 2.3 Number and percentage of participants (n=110) purchasing plants in the last two years by type of plant, edible or ornamental (Questions 4, 4a and 4b).

Type of plant purchased	Participants purchasing plants in the last two years	
	#	%
Exclusively ornamental	18	16.4
More ornamental than edible	33	30.0
Equal edible and ornamental	31	28.2
More edible than ornamental	11	10.0
Exclusively edible	4	3.6
Not purchasing plants	19	17.3

Table 2.4 Number and percentage of participants (N=91) who purchased edible plants for different uses (Question 4c).

Use of edible plants purchased	Participants purchasing edible plants	
	#	%
For aesthetic use	30	33.0
For food use	53	58.2
Not purchasing edible plants	8	8.8

Table 2.5 Number and percentage of participants (n=110) that grow edible plants in different types of spaces (Question 2b).

Type of space grown in	Participants growing edible plants	
	#	%
Structured, rectilinear space	40	36.4
Container	11	10.0
Overall landscape	35	31.8
Not growing edibles	24	21.8

Table 2.6 Number and percentage of total participants (n=110) that grow edible plants and garden frequently and/or enjoy gardening (Questions 9 and 10).

	Participants that do grow edible plants			Participants that do not grow edible plants		
	#	%	P ^z	#	%	P ^z
Frequently garden			.0001			.0001
Yes	60	54.5		6	5.5	
No	26	24.6		18	16.4	
Enjoy gardening			.0150			.0150
Yes	56	50.9		9	8.2	
No	30	27.3		15	13.6	

^z Probability that growing edible plants is significantly related to frequency of gardening or enjoyment of gardening, based on Chi-Square Tests

Table 2.7 Number and percentage of total participants (n=110) who would consider growing edible plants outside of a structured, rectilinear space (Question 7).

Consideration Factors	Consider growing outside a structured, rectilinear space		
	#	%	P ^z
Already grow edible plants	72	65.5	.0078
Purchasing plants with individual design needs in mind	61	55.5	.0550
Have information about growth requirements	75	68.2	.0003
Have information about maintenance requirements	75	68.2	.0015
Garden frequently	55	50.0	NS
Enjoy gardening	54	49.1	NS

^z Probability that growing outside of a structured, rectilinear space is significantly related to consideration factors

^{NS} Not significant

Table 8. Number and percentage of total participants (n=110) who would consider growing edible plants for aesthetics (Question 6).

Consideration Factors	Consider growing edibles for aesthetics		
	#	%	P ^z
Already grow edible plants	72	65.5	NS
Purchasing plants with individual design needs in mind	65	59.1	.0139
Have information about growth requirements	73	66.4	NS
Have information about maintenance requirements	76	69.1	NS
Garden frequently	61	55.5	.0010
Enjoy gardening	59	53.6	.0073

^z Probability that growing edibles for aesthetics is significantly related to consideration factors

^{NS} Not significant

Application

There are at least three applications for the results of the survey. The first application would be to educate people about which plants are edible to increase the use of edible plants in residential landscapes. This is not directly addressed in this thesis. However, the main plant matrix in Appendix E (or something like it), if distributed, could provide a way of educating people. The second application would be to illustrate, either graphically or in a real landscape, how edible plants can be used aesthetically; both through a direct comparison between ornamental and edible plants and through encouraging the growing of edibles outside traditional rectilinear confinements (vegetable, herb or fruit gardens). The case study in this thesis addresses these aspects.

Also, as mentioned in the analysis part of this chapter, there are factors that affect whether a person will be more likely to consider using edible plants for aesthetic reasons and more likely to consider growing edible plants outside the rectilinear form. Those factors should be considered along with the case study for the second application. The third application would be to encourage the industry side (for example, nurseries, garden centers and other plant sellers, as well as propagators and researchers of plants and their growth and maintenance requirements) to distribute and provide information about plants that are both edible and ornamental.

It is assumed that there are many people who buy plants from other sources and who like to garden. Also, not everyone likes or wants to garden, even among those surveyed. In order to apply the above three applications, all the people that garden would need to be informed. If there is more “noise” made about edible plants, people’s knowledge about what is edible and aesthetically pleasing in landscapes would increase. The survey helps to determine where the deficiencies are in the understanding of using edible plants, and how to increase that understanding.

Conclusions

Average gardeners, while growing a dozen or so obvious edible plants – garden vegetables, a few select shrubs or canes, and some fruit trees – do not think about growing these obvious edible plants outside a structured, rectilinear form or for aesthetic reasons. Based on which plants were known to be edible by the participants and the responses to Questions 6 and 7, a generalization can be made that people don’t know of the aesthetic value of edible plants in the landscape. The people surveyed do not

understand how to aesthetically enjoy edible plants in their yards. That plants can be grown for food AND for looks was a foreign concept to participants and by extension, to gardeners in general.

From Question 8, homeowners are more interested in growth and maintenance requirements of any edible plant they may grow regardless of where they are growing them and are less interested in using or preserving the food from the edible plants. This is probably due to the fact that the edible plants that are grown are very well known, i.e., nobody needs to be told how to use a tomato, raspberry or apple, but people do need to know how to get them to grow and produce fruit/food. Again, it is important that gardeners be educated beyond the most common edible plants. From the analysis of the survey, age, gender, renting or owning, and location (meaning urban versus rural – this was determined by where the survey was administered) do not have bearing on where edible plants are or might be grown, that is, in rectilinear spaces or incorporated in to the overall landscape for aesthetic reasons. Those respondents that grow edibles, even in limited number and kind, and enjoy gardening and/or garden frequently, lay a foundation for expanding the aesthetic use of edible plants in landscapes.

CHAPTER THREE

CASE STUDY

Introduction

The focus question for this thesis was how edible plants can be used in residential landscapes in place of typical ornamental plants without compromising aesthetics. A recent landscape design was obtained for use as a case study to analyze the current use of plants and to apply the concept of using edible plants in residential landscapes in the Palouse. A registered Landscape Architect, Phillip S. Waite, created the original design used as the case study. The clients, Douglas and Judy Hobart, granted permission to use the original design in this thesis.

Selection of case

The location of the original designed landscape is in the Southwest quarter of Pullman, Washington. The site was chosen because of its location in the Palouse region which has a somewhat severe climate and its proximity to Washington State University. The Palouse is located in the southeast corner of Washington State and the western Idaho State panhandle. The Palouse covers the majority of Whitman County in Washington and Latah County in Idaho. It also covers portions of Spokane, Lincoln, Adams and Walla Walla Counties in Washington and Nez Perce County in Idaho. For simplification, the Palouse is limited to the Palouse River watershed boundary (Figure 3.1). The Palouse is in the Sunset Western Garden Book climate zone 2B and the USDA cold hardiness zones 5&6 (Figures 3.2 - 3.4). The Palouse has hot, dry summers and cold, wet winters

(U.S. Dept. of Agriculture, 1978). There are 20 different soil associations in the Palouse area (Figure 3.5). As these growing conditions are typical of other locations in the western United States, the results of the case study could be used in areas with similar climate conditions. Places with milder summers and winters, e.g. coastal and southern California, and hot summers and mild winters, e.g. the desert southwest, have had research done with relation to the use of edible plants in the landscape, but little has been done for the Palouse region (Barash, 1995; Creasy, 1982 and 1999; Crowley, 2005; Nabhan, 2002).

The original design is on a 1/5 acre lot (9000 square feet) with the street side facing the north. The lot slopes up from the north side to the south side. The plants used in the original design represent a typical palette of plants used by regional landscape professionals and are readily available at nurseries in the region. The original design is typical for a residential plot in Pullman, Washington. Images of the original design and planting plan are in Appendix C, with cropped sections at the end of this chapter.

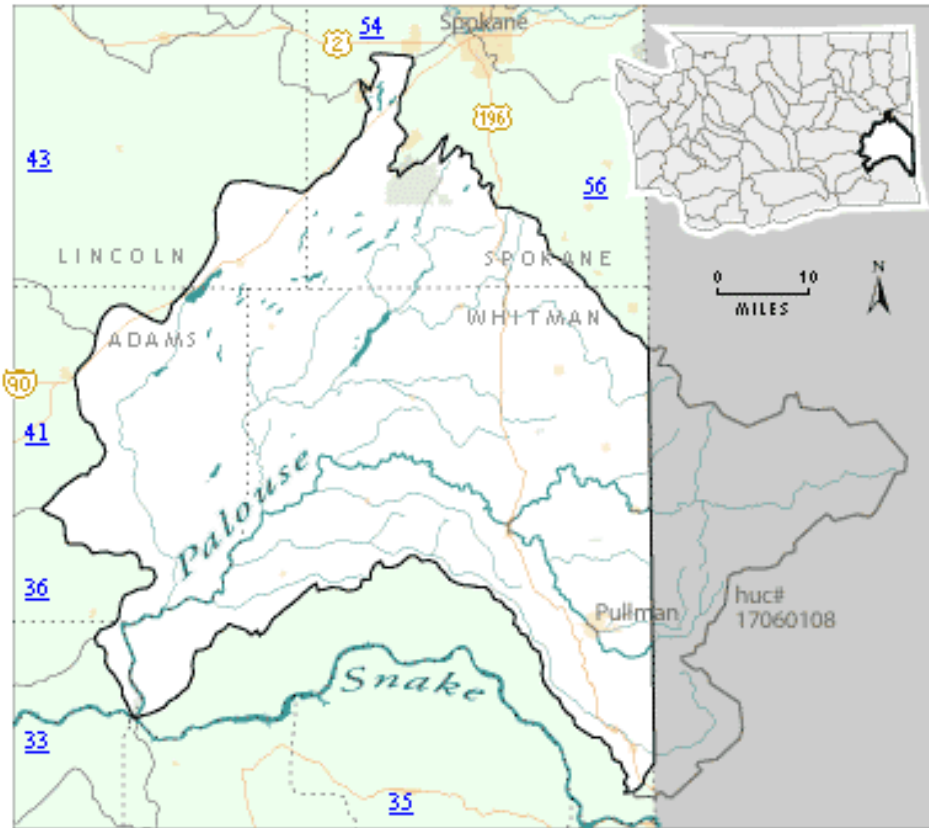


Figure 3.1 The Palouse River watershed boundary. (WA State DOE, 2006)

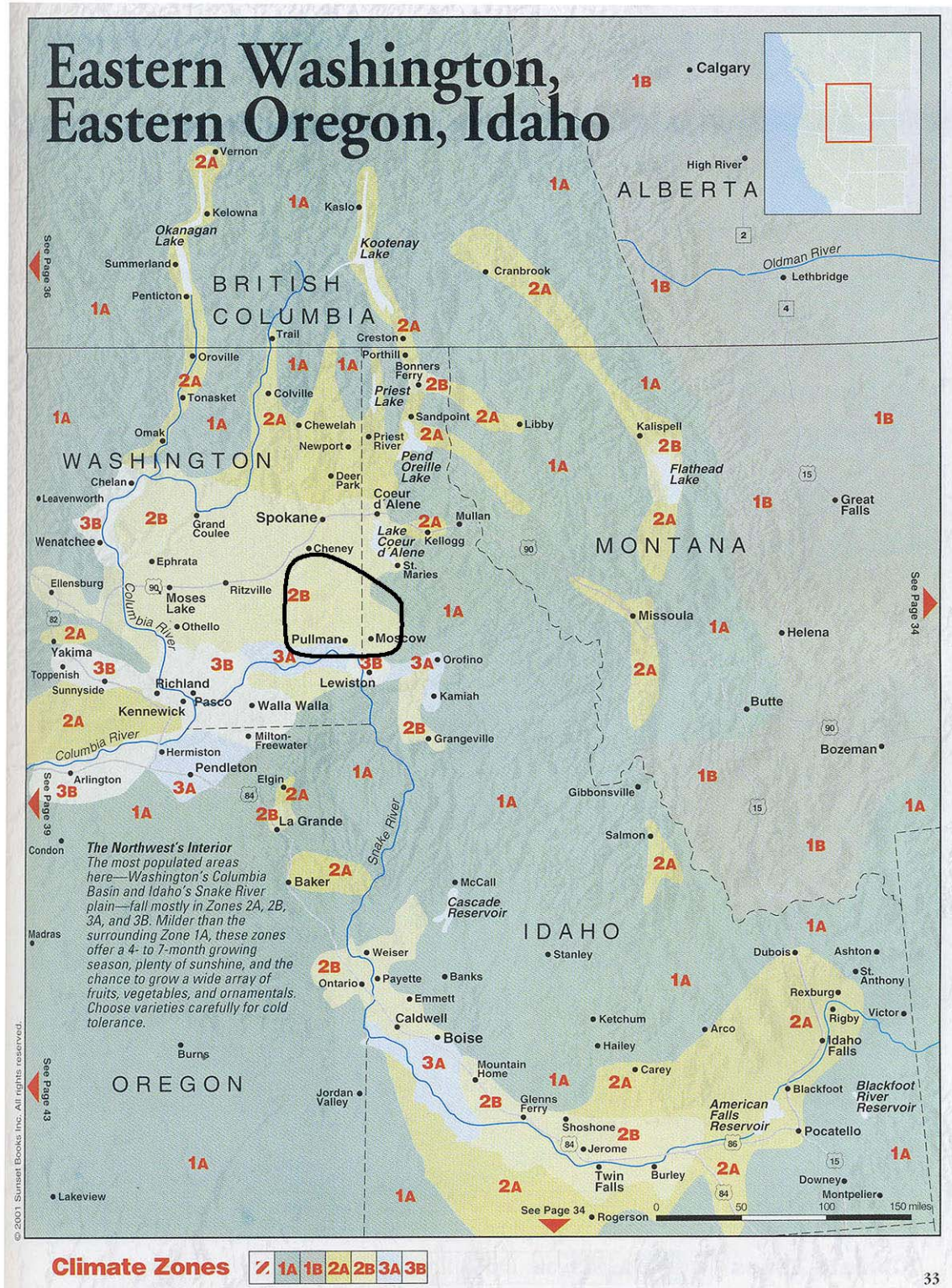


Figure 3.2 Sunset Western Garden Book's Climate Zone Map. Palouse area circled. (Brenzel, 2001)

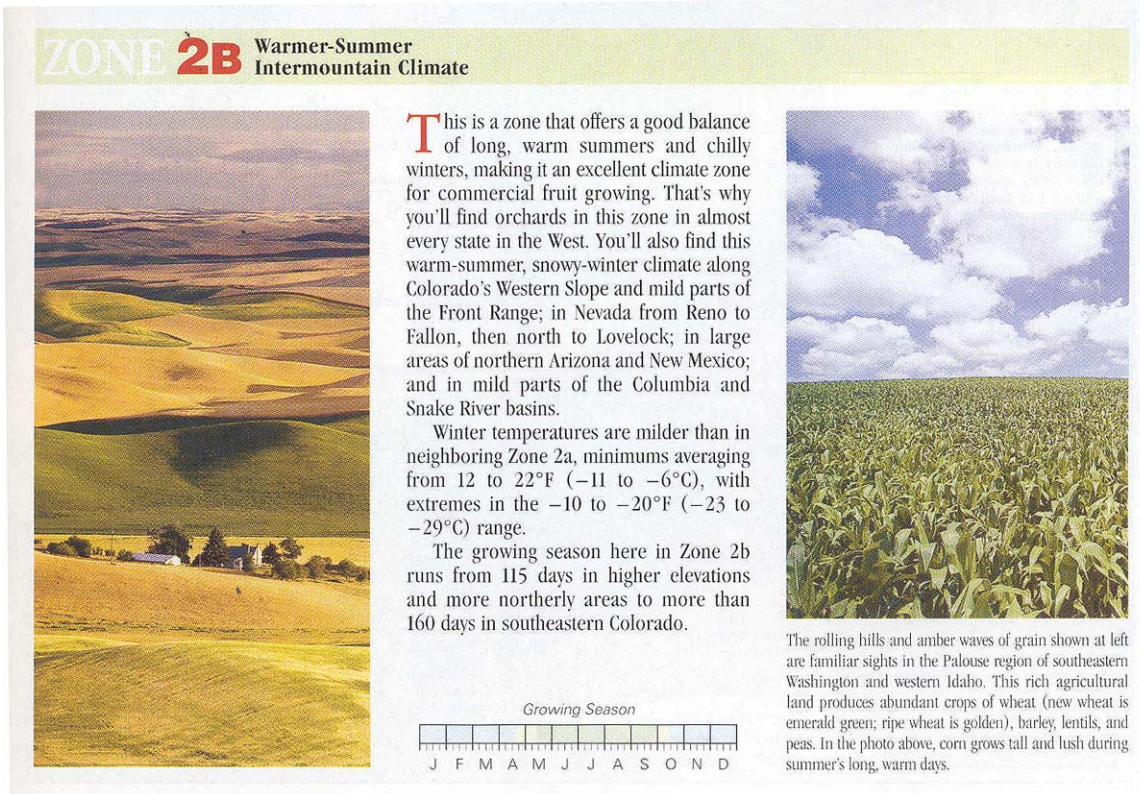


Figure 3.3 Sunset Western Garden Book's description of the 2B climate into which the Palouse fits. (Brenzel, 2001)

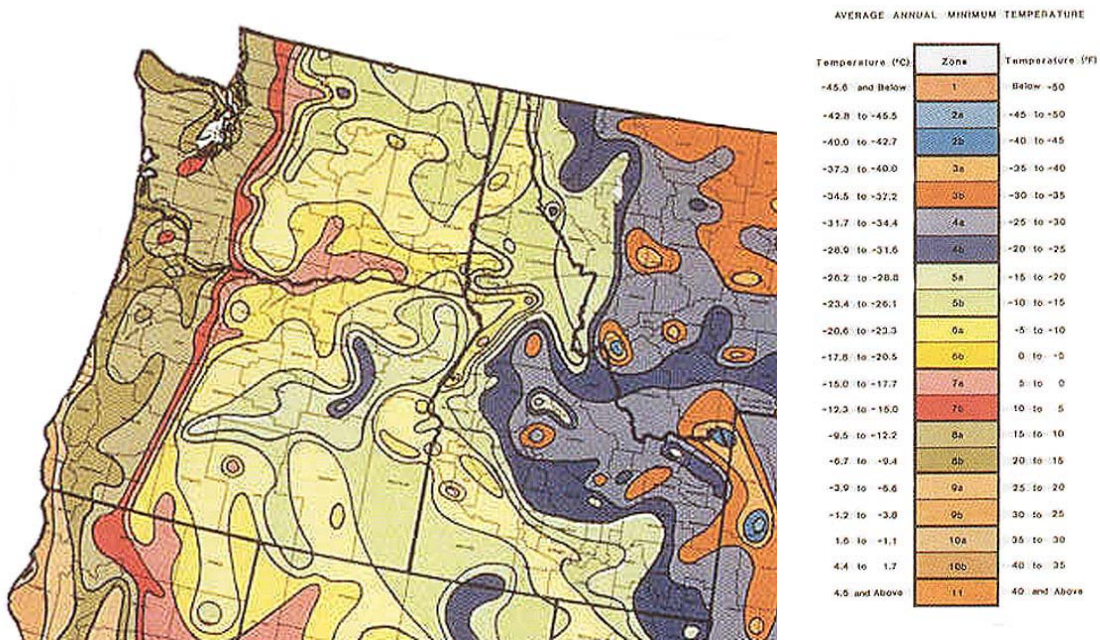


Figure 3.4 USDA Cold Hardiness Map and Key (MacKenzie, 1997)

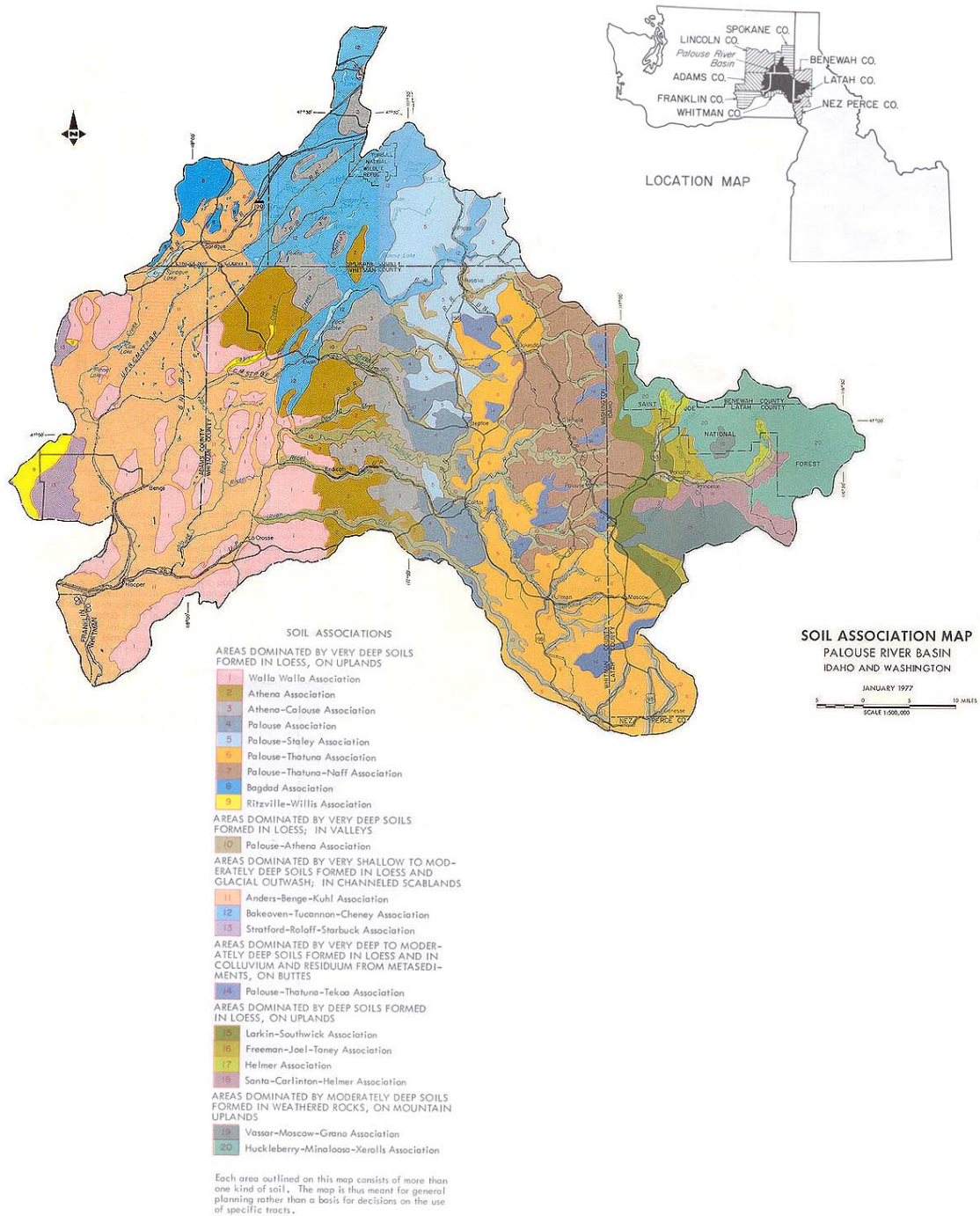


Figure 3.5 Soil Association Map, Palouse River Basin.
(U.S Department of Agriculture, 1978)

Methodology

Case study

The original design was examined in the following sequence: assessing the needs of the clients, dividing the lot into seven sub-areas, and applying design principles to understand how the plants were used in the landscape. Then ornamental plants were replaced with appropriate edible plants following the sequence above. The main consideration in the assessment of the original design was low maintenance. There were several other preferences that were related to meeting the needs of the clients: 1) native or climate adapted plants; 2) lawn area minimal; and 3) dwarf or miniature size plants closest to house; and 4) all other plants in the landscape left to grow mostly unhindered. These four preferences allow for the least amount of time to be spent in maintaining the landscape.

The author used the same yard space designations that were in the original design to analyze the case study. The front yard was named the Entry Garden (Figures 3.8 and 3.9). The west side of the house was named the Sideyard (Figures 3.12 and 3.13). The east side of the house was named the Sideyard Garden (Figures 3.16 and 3.17). The backyard was divided into four areas: the Patio Garden (Figures 3.20 and 3.21), the Deck Garden (Figures 3.24 and 3.25) and the naturalized slope on the south side of the property, named the Lower and Upper Slopes (Figures 3.28 and 3.29). The re-design space names correspond to the original space names and are shown in figures 3.10 and 3.11; 3.14 and 3.15; 3.18 and 3.19; 3.22 and 3.23; 3.26 and 3.27; and 3.30 and 3.31. The plants within these areas were categorized according to architectural, engineering and aesthetic plant uses – the forming of space, the modulating of space, and the

embellishment of space – in accordance with the design uses enumerated in the ‘how plants are used in design’ section of Chapter One. This was discussed in the ‘case study matrix’ section of this chapter.

Edible plants were then substituted for the ornamental plants in the original design. Careful attention was given to matching the uses of plants in the landscape as closely as possible as mentioned above. These plants were selected from the full plant matrix found in Appendix E. There were 31 plant species used in the original design with a total of 253 individual plants. There were 36 plant species used in the redesign with a total of 255 individual plants.

Figures 3.8 – 3.29 (at the end of this chapter) contain sections of the original and re-design drawings for the case study. There are two sheets for each section. One is the rendered drawing and the other is the planting plan. The re-design plant list (see Appendix D) is coded according to the type of design uses for plants (architectural, engineering and aesthetic) contained in both the original and re-design plans. A letter code is given to each plant used. The codes are listed in Table 3.1, the original plant list is in Appendix C and the re-design plant list is in Appendix D. The codes correspond to the design uses discussed in the ‘how plants are used in design’ section of Chapter One.

Table 3.1 Design codes used in the case study re-design planting plan.

Design Use Codes

<u>Architectural</u>	<u>Engineering</u>	<u>Aesthetic</u>
Ac=ceiling	El=light	Cl=line
Awl=wall	Ea=air	Cf=form
Aww=window	Esd=sound	Ct=texture
Afl=floor	Esl=soil	Cc=color

Full plant matrix

The full plant matrix (Appendix E) was set up to specify edible plants that can be grown in the Palouse. A total of 190 plants were listed. The matrix contains the following information: scientific and common names, plant type, architectural, engineering and aesthetic uses in the landscape, what parts of the plants are edible and when, and the growth requirements of water, soil and light. Nineteen books, listed in the bibliography with an asterisk, were consulted to compile the full plant matrix. Descriptions of the information contained in the full plant matrix categories are found in the section named full plant matrix organization, below.

Approximately 250 edible plants appropriate for growing in the Palouse were on an initial list of plants. The Sunset Western Garden Book (2001) was chosen as the most definitive source for determining if a plant could grow in the Palouse. Other books were also used as well as an internet source (Barash, 1995; Creasy, 1982 & 1999; Hagy, 1990; Reich, 2004; and *Plants for a Future* website). After determining which plants would grow in the Palouse, the list was revised. Toxicity was the main factor considered during revision (Barash, 1995; Hedrick, 1972; Kunkel, 1984; and Tilford, 1997). If a plant was thought to have high levels of toxins or if a plant looked too similar to a plant with high levels of toxins, such as angelica (*Angelica archangelica*) looking too much like water hemlock (*Cicuta douglasii*), it was removed (Tilford, 1997). It must be noted that all plants have chemicals in them that could be regarded as toxic in varying amounts or combination and for differing people (Barash, 1995; Tilford, 1997). Plants must be identified correctly before consumption. The plants chosen were listed as edible in at least two sources. A second factor determined if a plant had aesthetic qualities, which

were established by viewing photographs of the plants or from seeing a live plant. The author's criteria were if a plant showed two or more of the main aesthetic plant use elements (line, form, texture or color) and if a plant appealed to the author. Thirdly, plants were eliminated if listed on the noxious weed lists for Washington State (WA State NWCB, 2005). A fourth factor considered during revision was whether a plant was a commonly grown vegetable garden annual. With the exception of vining vegetable plants (squash, melons, beans, cucumbers), these plants were eliminated in an effort to encourage the use of less known edible plants. The vining plants were retained because they can be used on trellises or other vertical surfaces, which is a non-typical use for these common edible plants.

Plant Matrix Organization

Full matrix

The full plant matrix was organized by alphabetizing the scientific name. For simplicity, some plants are listed as genus only, because many if not all of the species in that genus have edible parts. If the matrix cell reads 'variable', this means that there were too many options to list in that cell.

The scientific names listed in the matrix were the most recent names that could be found. Again, the Sunset Western Garden Book (2001) was used as the definitive source. The scientific names are found on the left side of the matrix and the common names are found on the right. This was done to enclose the information about the plant between the two names and so that a person could search for a plant by either name and have it clearly

listed. The common names for the plants are the ones found in the books researched. If more than one common name was listed, the first name was placed in the matrix.

The plant type category has 12 codes: trees, shrubs, perennials/annuals/biennials, vines, ground covers and water plants. The trees, shrubs and vines are also listed as deciduous or evergreen. Perennials, such as asparagus (*Asparagus officinalis*), or tulips (*Tulipa* spp.), were not distinguished by how they grow, only that they live longer than the 1-2 years ascribed to annuals and biennials, such as peanut (*Arachis hypogaea*), or caraway (*Carum carvi*).

The possible plant use categories were divided similar to the divisions for plant use in the background section in chapter one. They are: 1) architectural, or ceiling, wall, window and floor; 2) engineering, or light, air, sound and soil; and 3) aesthetic, or line, form, texture and color. Many of the plants have more than one code in each category.

A plant was determined to form a 'ceiling' if it had the potential to grow 10 feet or higher. If a plant was less than 24 inches in height, it was listed as a 'floor'. Anything in between 24 inches and 10 feet was listed as a 'wall'. If a plant with a wall code was higher than eye level, or 5 feet, it was also listed as a 'window'.

A plant that was determined to be particularly good at modulating light, air, sound or soil was given an appropriate code. All plants can intercept and absorb light to reduce glare and heat whether directly from the source or a reflection. For a plant to be given the light code in the matrix, it needed to be able to create shade that could be used by people, such as a tree with a bench under it for seating. The air and sound codes were listed if a plant can slow air movement, or essentially if a plant can create a wall. If a plant is listed with an architectural code of 'floor', it didn't receive an 'air' code because

the change in air speed derived from a groundcover is minimal. All plants listed can make the air cooler or moister, so a distinction was not made for this in the matrix. No distinction was made between plants that are particularly good at soil amending and those that are not. All plants in the matrix can assist in preventing soil erosion and were listed that way in the matrix.

Aesthetic codes were listed for a plant based on the main element or elements that were apparent to the author when researching. The descriptions of the design elements are found in Nelson's (2004) book. A 'line' code was given if the plant "carries the eye along its route, be it upward, downward, horizontal, or diagonal." Line is hard to see in a single plant, as it is a two-dimensional design element, thus it was not often listed in the matrix. A 'form' code was listed because of the plant's "line, direction and arrangement of branches and twigs." If a plant gave an appearance of being able to be "'read' and 'felt' by sight", it was given a 'texture' code. The last two codes, form and texture, were most often listed in the matrix. The 'color' of a plant is characterized by the hue (technical name), value (lightness or darkness), intensity (purity, strength, and saturation), glossiness (shiny), brightness (sparkle), and dullness (how much light is absorbed). Color is the most commonly used element in design, so this code was listed only sparingly in the matrix. All the plants in the matrix could have been given a color code as they all have color, but the author chose to note only plants she thought exceptional. A color code was given only if the plant was richly green or had a lovely flower wash or leaf color other than green.

There are seven codes describing which part(s) of a plant is/are edible. The codes are organized by the most commonly eaten plant part through the least often eaten – leaf,

fruit, seed, root, stem/stalk, flower and shoot. Leaves grow in various patterns on a plant. Most often young leaves are eaten. Fruits and seeds (nuts) are listed separately, though some seeds (nuts) are considered to be the “fruit” of the plant. Here fruit refers to the fleshy part eaten, such as hardy kiwi (*Actinidia arguta*), and seed (nut) refers to the non-fleshy part eaten, such as shagbark hickory (*Carya ovata*). Roots include true roots, bulbs, rhizomes, corms and any other plant part that grows underground. Stems and stalks may refer to the stem of the flower, such as chives (*Allium* spp.), or to the stem of the leaf, such as rhubarb (*Rhuem x cultorum*), or the part that gives structure to the plant, such as bamboo (*Bambusa* spp.). Flowers are not often eaten, but can be. It is usually only the petals which are eaten. The stamen, pistil and sepals are all removed on most edible flowers because they are inedible. Some flowers are sweet, some bitter, some spicy, some fairly plain – a distinction was not made in the matrix as to flavor. Examples of edible flowers are calendula (*Calendula officinalis*) and squash blossoms (*Cucurbita pepo*). Shoots are the immature plants coming up from the ground, such as hops (*Humulus lupulus*), usually from rhizomes or another form of spreading the plant employs.

A simple five code system was created to describe the growth stage reached and preparation needed for a plant part to be eaten. ‘Young’ refers to fairly new growth in leaves, fruit, roots, stems or shoots, and refers to flower buds, (i.e. endive, okra, sweet flag, asparagus and poppy). ‘Mature’ refers to a plant part at its peak (i.e. many fruits and most seeds). ‘Raw’ simply means not processed, such as frying or pickling. ‘Cooked’ means heat is applied in some way. ‘Dried’ often means the plant part is used in tea or ground for a flour-like substance. Whether a plant part is eaten at a young or

mature stage was almost always listed in the matrix (the only time it is not is for sap from maples, as it is neither young nor mature). If a plant part needs to be eaten either raw or cooked or dried, that fact is listed as such. If it doesn't matter if a plant part is raw, cooked or dried, no code is listed. Positive identification of a plant and parts as well as how to prepare the edible parts is essential.

Cultural requirements for edible plants were limited to three general categories: water – high, moderate or low needs; soil – pH, moisture content and organic content; and light – full sun, partial shade or full shade. A soil code was listed only if the researched description for a plant specifically noted a plants needs, such as acidic soil or rich soil.

Case study matrix

The plant matrix of the case study (Table 3.2) was divided in a way similar to the full plant matrix. On the left side of the page are the alphabetized scientific names of the plants used in the original design. Following this column is the plant type and the architectural, engineering and aesthetic uses for which these original plants were selected. On the right side of the page are the scientific names of the plants that are replacing those in the original design. These are not alphabetized, but correspond to the originals, mostly plant for plant. In some cases in the re-design, multiple plant species were selected to replace one of the original plant species. For example, the boxwood (*Buxus* 'Green Velvet') plants used in the original design were replaced with lavender (*Lavandula angustifolia*), oregano (*Origanum vulgare*) and rosemary (*Rosmarinus officinalis*). To

the left of the re-design scientific names are the two columns for edible parts and when the part is edible. These columns refer to the re-design plants and not the original plants.

Not all of the original plants were replaced. Sub-alpine fir (*Abies lasiocarpa*) was not replaced because there was not an edible evergreen conifer that was similar to it.

Kinnikinnick (*Arctostaphylos uva-ursi*) berries were described as being both edible and inedible (Kunkel, 1984; Hedrick, 1972), so kinnikinnick plants were not listed in the full plant matrix, but were included in the case study matrix because they were already included in the original design and some berries may be more edible than others.

Results

The following list shows the edible plant parts that would be available to the owners of the case study property. Twenty-one of thirty-one ornamental plant species were replaced with twenty-seven edible plant species. Additional edible plants could be combined with the existing plants if the owners wished to grow garden vegetables or other tree or bush fruits. Twenty edible plant parts are listed below because 6 represent more than one species. The edible plant parts listed below with a number one (1) will be available during the spring, those listed with a number two (2) will be available during the summer and those listed with a number three (3) will be available during autumn. The food can either be used raw as snacks, flavorings or desserts, cooked as jams, jellies or desserts, or dried as flavorings.

The type of plant parts available to the case study property owners:

- Bamboo shoots (1)
- Barberries (3)
- Bee balm flowers (2)
- Beechnuts (3)
- Blueberries (1, 2)
- Cornelian cherries (2, 3)
- Cowberries (2)
- Currants (2, 3)
- Elaeagnus berries (2, 3)
- Juneberries (1, 2)
- Juniper berries (1, 2, 3)
- Kinnikinnick berries (3)
- Lavender flowers (2, 3)
- Oregano flowers (1) and leaves (1, 2, 3)
- Pine nuts (3)
- Plums (2)
- Rhubarb (2, 3)
- Rosemary flowers (1) and leaves (1, 2, 3)
- Strawberries (1, 2, 3)
- Viburnum fruits (2, 3)

The other plants in the original design that were not replaced provide the following food:

- Crabapples (2, 3)
- Daylily leaves (1), flowers and roots (2, 3)
- Oregon grape berries (2, 3)
- Rose hips (2, 3)
- Yucca flowers (1) and fruit (2, 3)

The owner's desire for lower maintenance is possible with the substituted edible plants. The plants that require the most maintenance are located closer to the house. Most substitutions need slightly more watering but fairly equal pruning when compared with the original ornamentals, with the possible exception of the quaking aspen (*Populus tremuloides*) and staghorn sumac (*Rhus typhina*) replacements of juneberry (*Amelanchier alnifolia*) and Cornelian cherry dogwood (*Cornus mas*). The 3 plants – lavender (*Lavandula angustifolia* 'Munstead'), rosemary (*Rosmarinus officinalis* 'Arp') and oregano (*Origanum vulgare* 'Aureum') that replaced the boxwood (Buxus 'Green Velvet') – will need less watering and pruning than the boxwood.

The re-design maintains the original aesthetics in many ways. The plants next to the foundation on the sides of the house will still be lower than the windows. There is a slight change in the color pattern on the upper and lower slopes; the orange-red of the sumac is replaced by the purple-red of the juneberry and the yellow in the aspen is replaced with the yellow of the dogwood, but the changes maintain the screening affect, as does the change in the pines on the back corners of the lot. The rocky mountain juniper (*Juniperus scopulorum* 'Blue Heaven') provides a similar blue-green color and mostly the same form as the Colorado blue spruce (*Picea pungens* 'Glauca'), but the texture is finer. The focal points are maintained: the yucca (*Yucca filamentosa* 'Golden Sword') remains the same, a fruiting plum (*Prunus* x 'Superior') replaces the weeping cherry (*Prunus pendula* 'Plenorozea'), and a weeping purple beech (*Fagus sylvatica* 'Purpurea Pendula') replaces the Japanese maple (*Acer palmatum*) and should be shorter than the maple thus maintaining the view from the front of the house. The elaeagnus (*Elaeagnus multiflora*) for mock orange (*Philadelphus* x *virginialis* 'Natchez') substitution in the Sideyard Garden maintains the fragrant flowers and deciduous screen desired there. Replacing arborvitae (*Thuja occidentalis* 'Smaragd') with common juniper (*Juniperus communis*) provides the same uniform evergreen screen from the Sideyard to the Slopes on the west side of the house. Stem color changed from the red of the redosier dogwood (*Cornus sericea* 'Isanti') to the green of bamboo (*Pseudosasa japonica*) in the bank filler in the Sideyard, but is still an aesthetic interest in that area. Year round color and interest are provided by viburnums (*Viburnum* x 'Conoy' and *V.* x 'Eskimo') and blueberries (*Vaccinium angustifolia* 'Northcountry' and *V. a.* 'St. Cloud') that replaced the rhododendron (*Rhododendron* x 'PJM'), azalea (*Rhododendron* x 'Northern Lights') and

holly (*Ilex* x 'Mondo') in the front beds, and are all moist, acid loving plants as in the original design. The blueberries chosen are early bearers so the amount of shade they receive should not hinder their berry production. Bee balm (*Monarda didyma* 'Mahogany') and currants (*Ribes aureum*) provide lovely summer flowers as did the original spirea (*Spiraea x bumalda*). The hostas (*Hosta* spp.) are replaced by rhubarb (*Rheum* spp.) in the Patio Garden, which provides large colorful leaves and stems for interest, and cowberry (*Vaccinium vitis-idaea*) in the Entry garden, which provides year round green with red berry interest in the summer. The strawberries (*Fragaria* spp.) that replaced some of the kinnikinick (*Arctostaphylos uva-ursi*) still provide an evergreen groundcover and red leaf color as winter interest.

The re-design demonstrates that edible plant use can provide aesthetically pleasing plants in a residential landscape. The re-design allows a person to see how plants are used through placing the plants into design categories and maintaining those uses with the substitutions. The possible unappealing post-harvest appearance of the edible plants used in the re-design is minimized by the strong hardscape elements and the use of shrubs, trees and perennials that are less affected by harvesting and by not using annuals which also helps reduce maintenance.

Table 3.2 Plant matrix for edible plant substitution in case study

Scientific Name (Hobart Design)	How used in original design			Edible Parts	When Edible	Scientific Name (re-design)
	Plant Type	Architectural	Engineering			
<i>Abies lasiocarpa</i>	ET	Ww	A	F, T	none	<i>Abies lasiocarpa</i>
<i>Acer palmatum</i> 'Wolff'	DT	Ww	A	F, T, C	MC	<i>Fagus sylvatica</i> 'Purpurea Pendula'
<i>Arctostaphylos uva-ursi</i> 'Massachusetts'	G	F	SI	T	none	<i>A. uva-ursi</i> 'Massachusetts'
	G	F	SI	T	MR; MR	<i>Fragaria chiloensis</i> (female)
	G	F	SI	T	MR; MR	<i>Fragaria chiloensis</i> (male)
<i>A. uva-ursi</i> 'Vancouver Jade'	G	F	SI	T	none	<i>A. uva-ursi</i> 'Wood's Red'
<i>A. uva-ursi</i> 'Wood's Compacta'	G	F	SI	T	MR; MR	<i>Fragaria vesca</i>
<i>Buxus</i> 'Green Velvet'	ES / P	W1	SI	L, C	MR	<i>Lavandula angustifolia</i> 'Munstead'
	ES	W1	SI	L, C	Y; MR	<i>Rosmarinus officinalis</i> 'Arp'
	P	W1	SI	L, C	YRD	<i>Origanum vulgare</i> 'Aureum'
<i>Cornus sericea</i> 'Isanti'	DS	W1	A, SI	F, C	Y; Y	<i>Pseudosasa japonica</i>
<i>Daphne burkwoodii</i> 'Carol Mackie'	P	Ww	A	F, T	M	<i>Viburnum</i> x 'Conoy'
<i>Hemerocallis</i> x 'Pastel Pink'	P	F	SI	F, C	variable	<i>Hemerocallis</i> x 'Pastel Pink'
<i>Hemerocallis</i> x 'Pink Sparkler'	P	F	SI	F, C	variable	<i>Hemerocallis</i> x 'Pink Sparkler'
<i>Hemerocallis</i> x 'Purple Magic'	P	F	SI	F, C	variable	<i>Hemerocallis</i> x 'Purple Magic'
<i>Hosta</i> x 'Antioch'	P	F	SI	F, C	M	<i>Rheum</i> x <i>cultorum</i> 'Cherry'
<i>Hosta</i> x 'Big Daddy'	P	F	SI	F, C	M	<i>Vaccinium vitis-idaea</i>
<i>Hosta</i> x 'Pearl Lake'	P	F	SI	F, C	M	<i>Rheum</i> x <i>cultorum</i> 'Strawberry'
<i>Ilex</i> x 'Mondo' (male)	ES	Ww	SI	F, T	M	<i>Vaccinium angustifolia</i> 'Northcountry'
<i>Mahonia aquifolium</i> 'Compacta'	ES	W1	SI	F, T	M	<i>Mahonia aquifolium</i> 'Compacta'
KEY						
Plant Type	Architectural	Engineering	Aesthetic	Edible Parts	When Edible	
DT=deciduous tree	C=ceiling	L=light	L=line	L=leaves	Y=young	
ET=evergreen tree	W1=wall	A=air	F=form	FR=fruit	M=mature	
DS=deciduous shrub	Ww=window	Sd=sound	T=texture	SE=seed / nut	R=raw	
ES=evergreen shrub	F=floor	SI=soil	C=color	R=root	C=cooked	
P=perennial				ST=stem / stalk	D=dried	
A=annual				FL=flower		
BI=biennial				SH=shoot		
DV=deciduous vine						
EV=evergreen vine						
G=groundcover						
W=water plant						

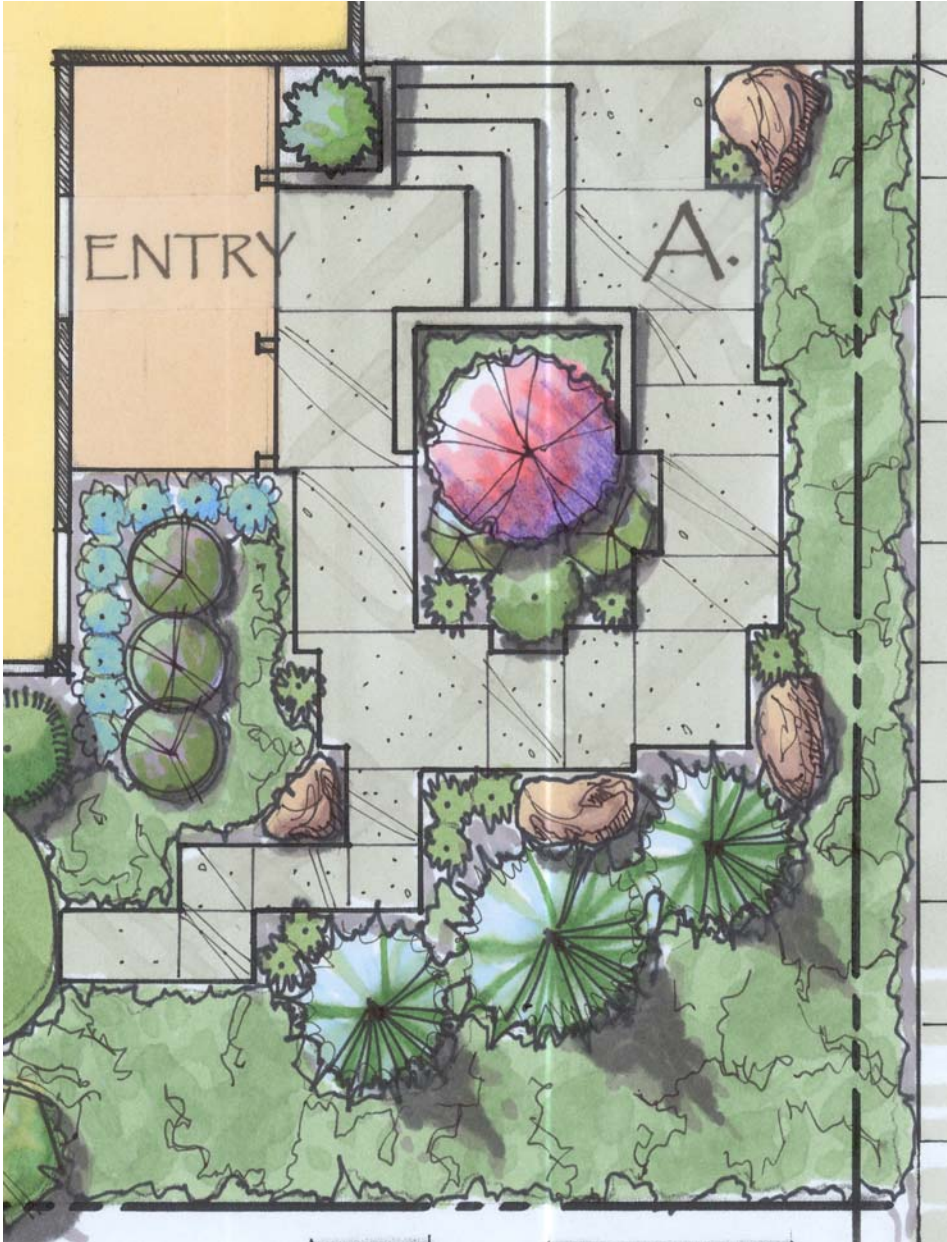


Figure 3.6 Entry Garden rendering for the original design

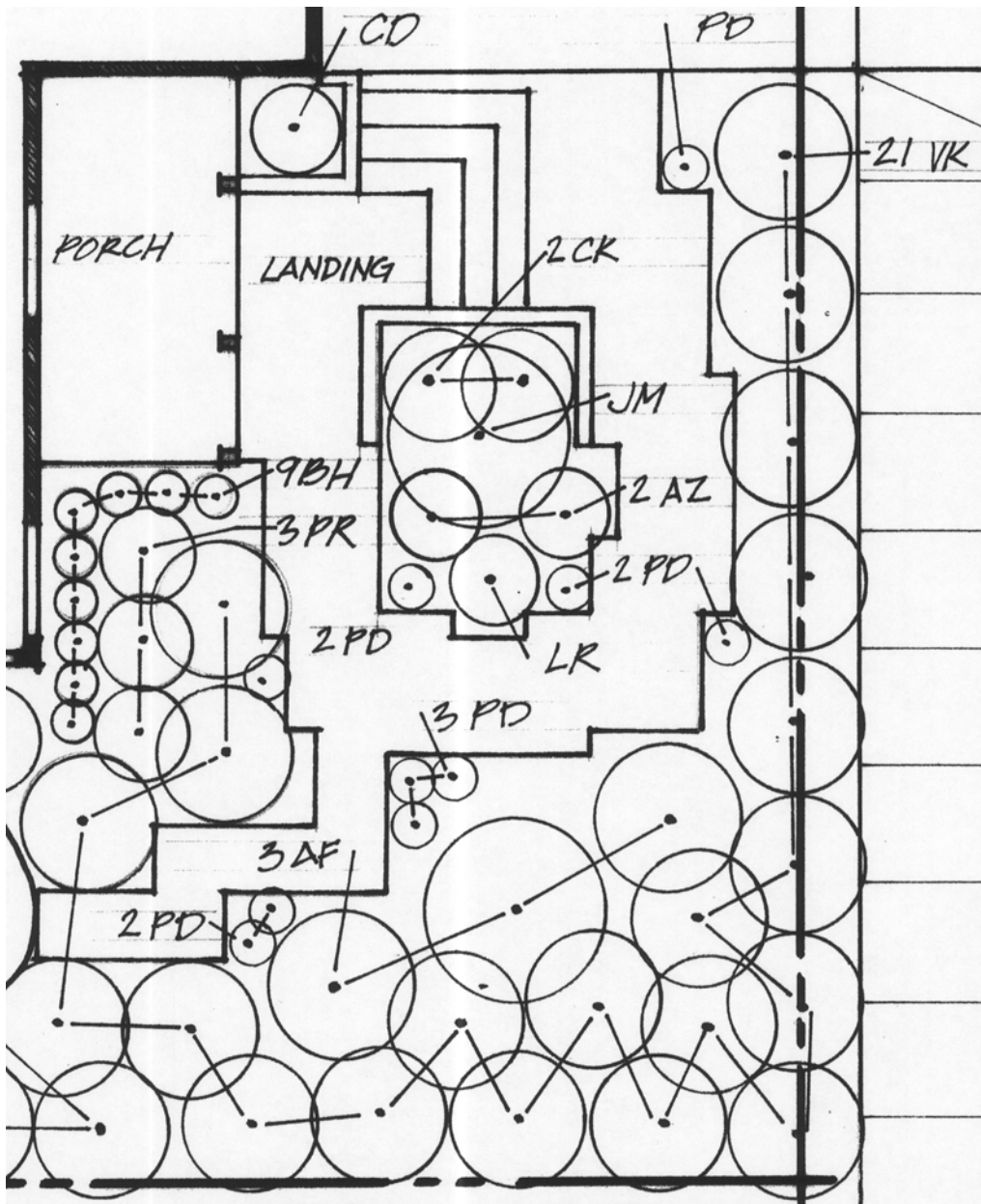


Figure 3.7 Entry Garden planting plan for the original design

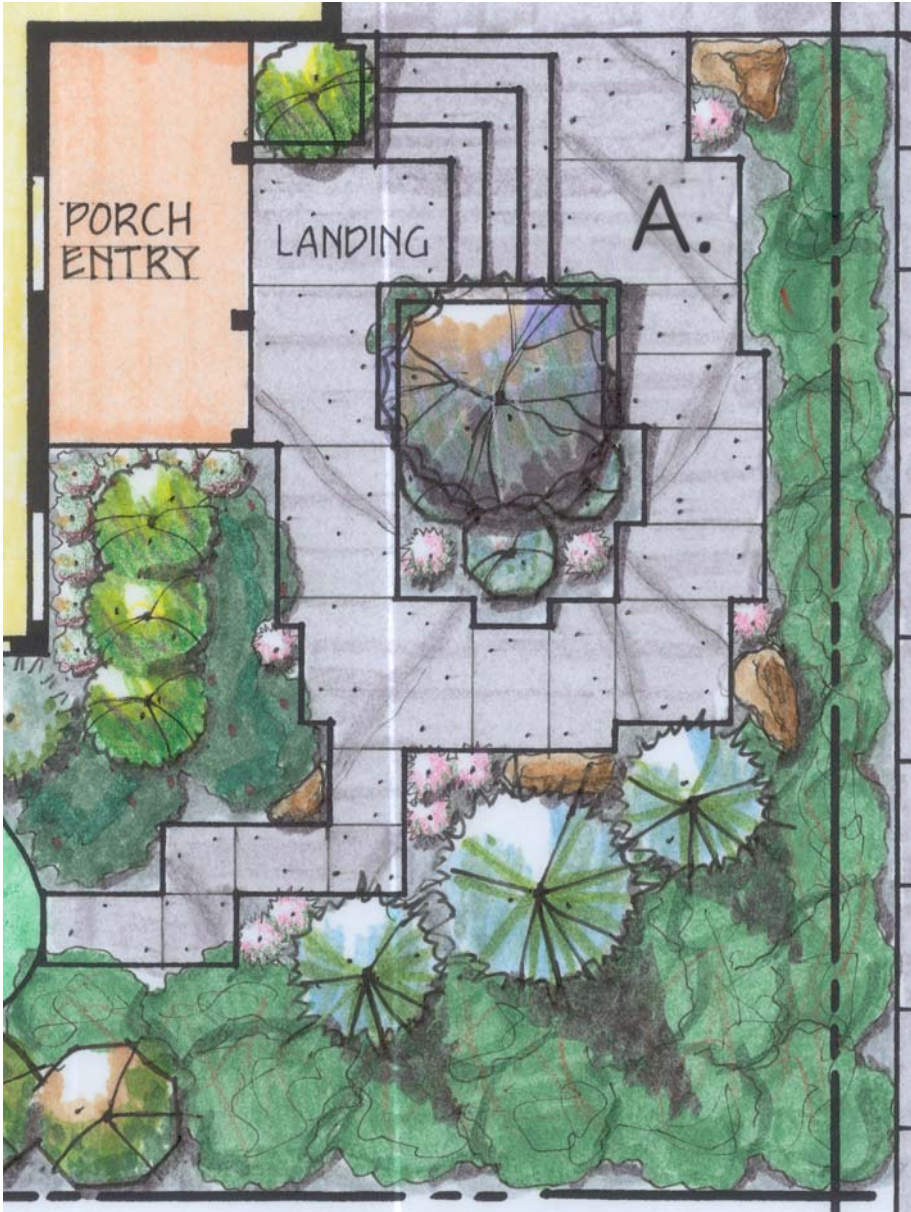


Figure 3.8 Entry Garden rendering for the re-design

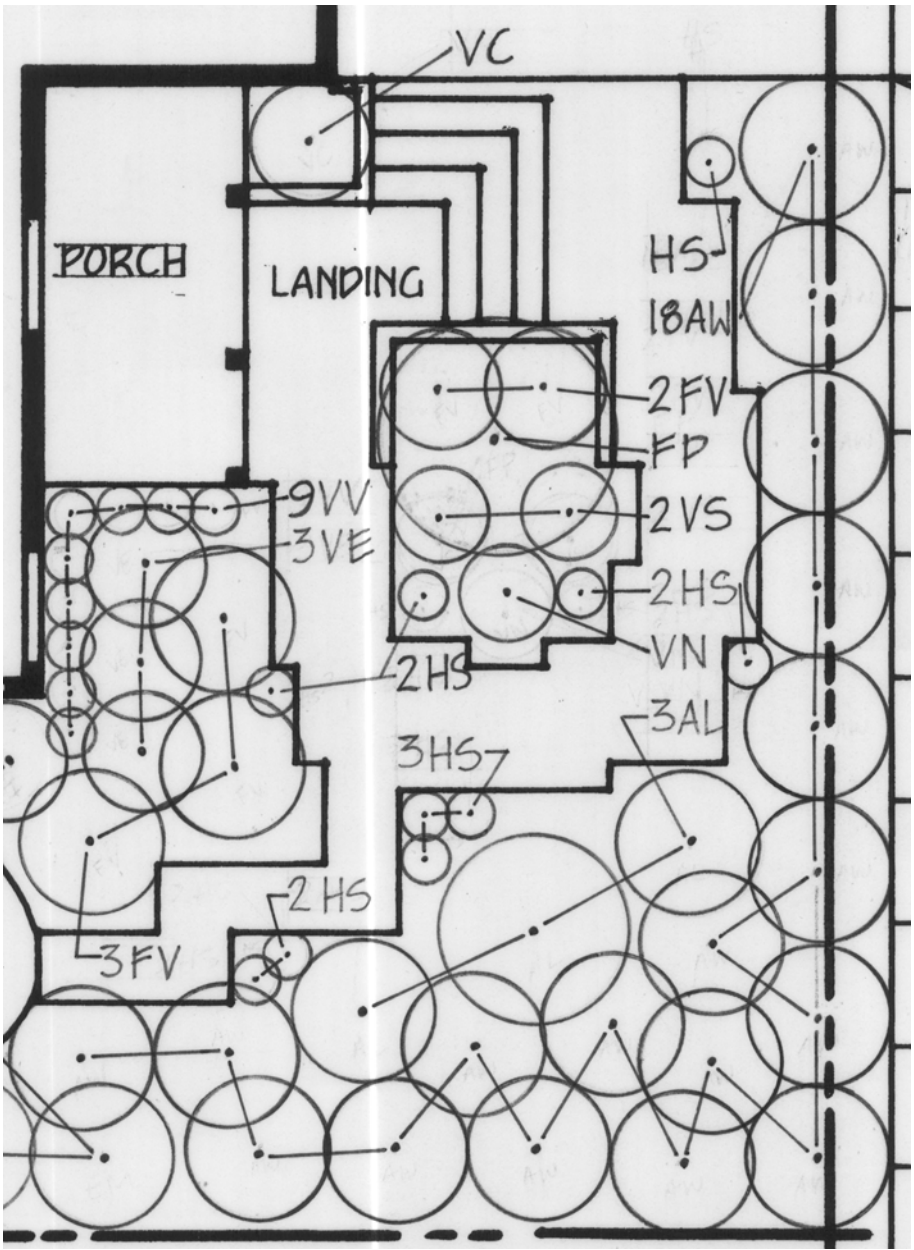
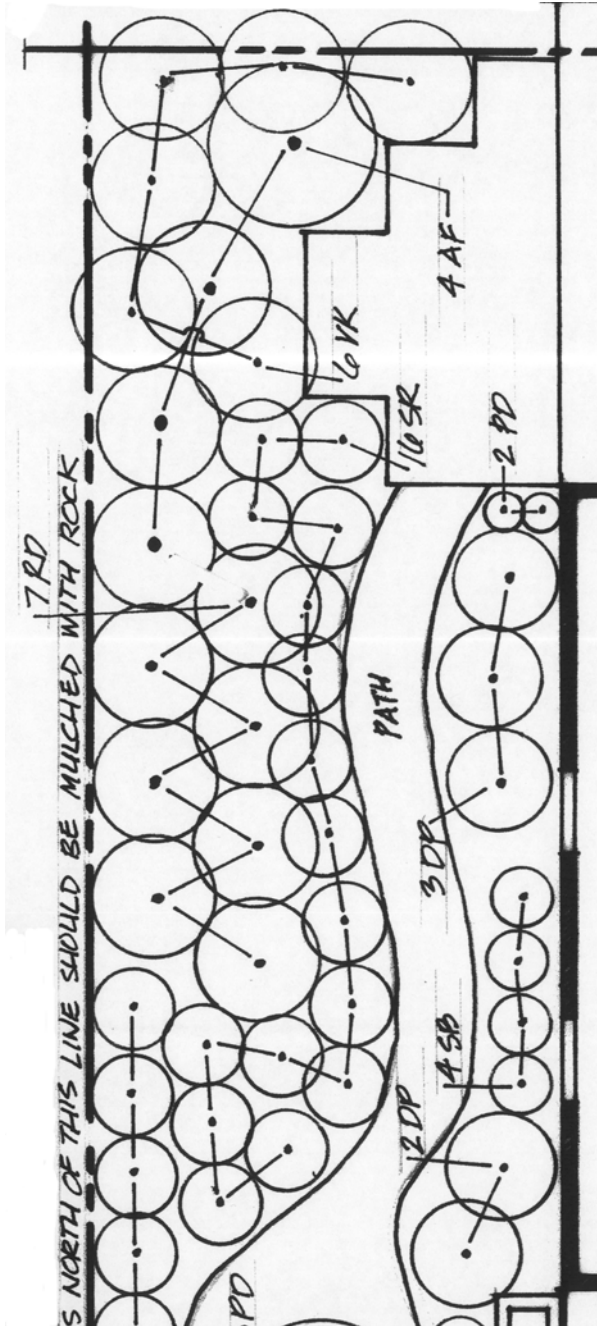
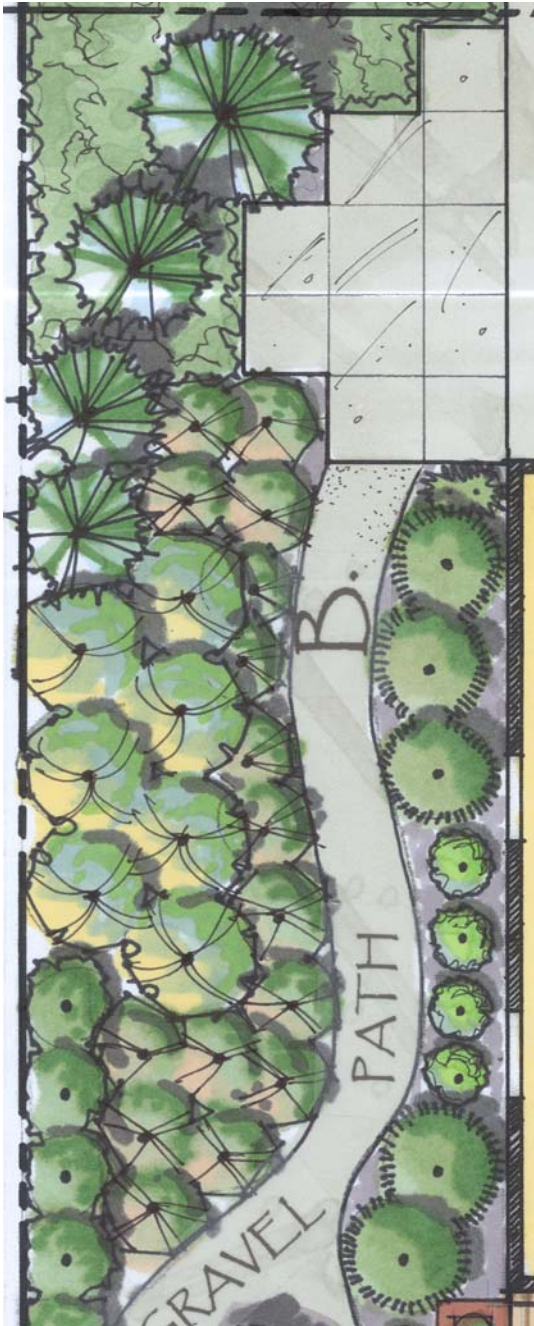
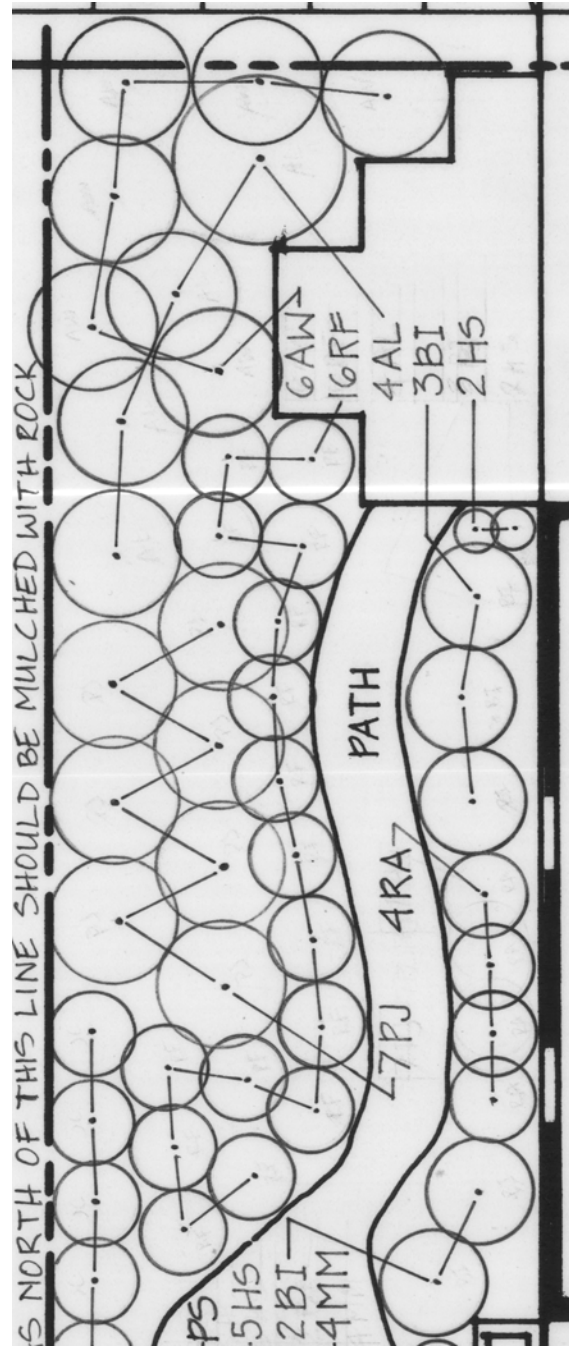


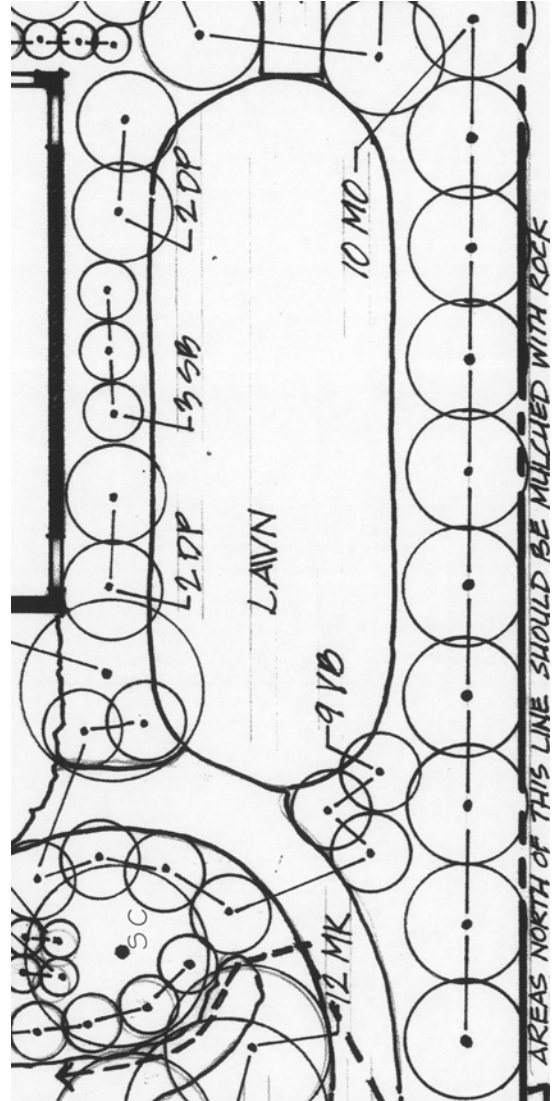
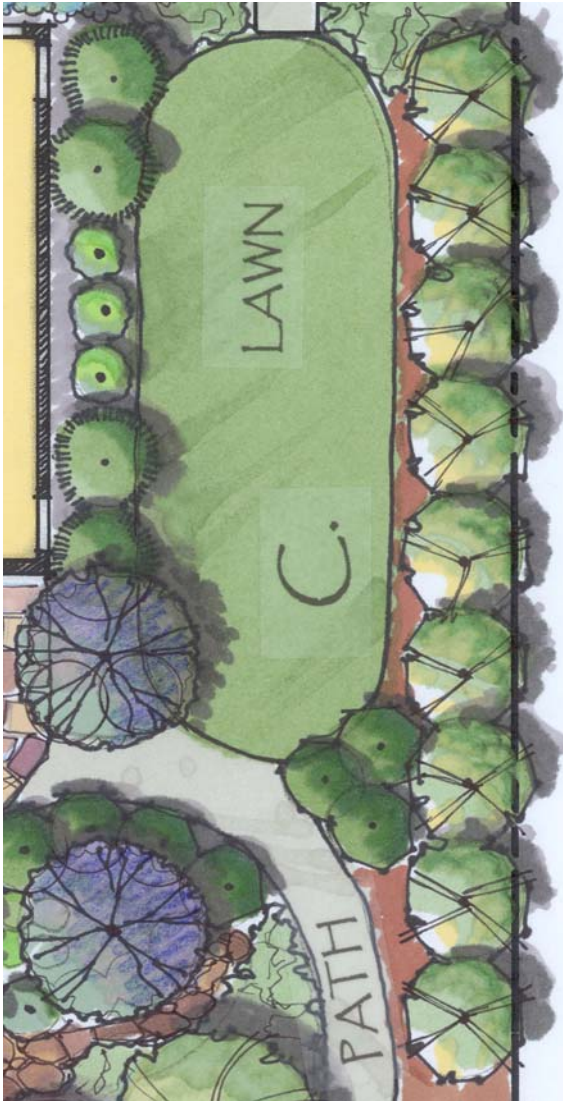
Figure 3.9 Entry Garden planting plan for the re-design



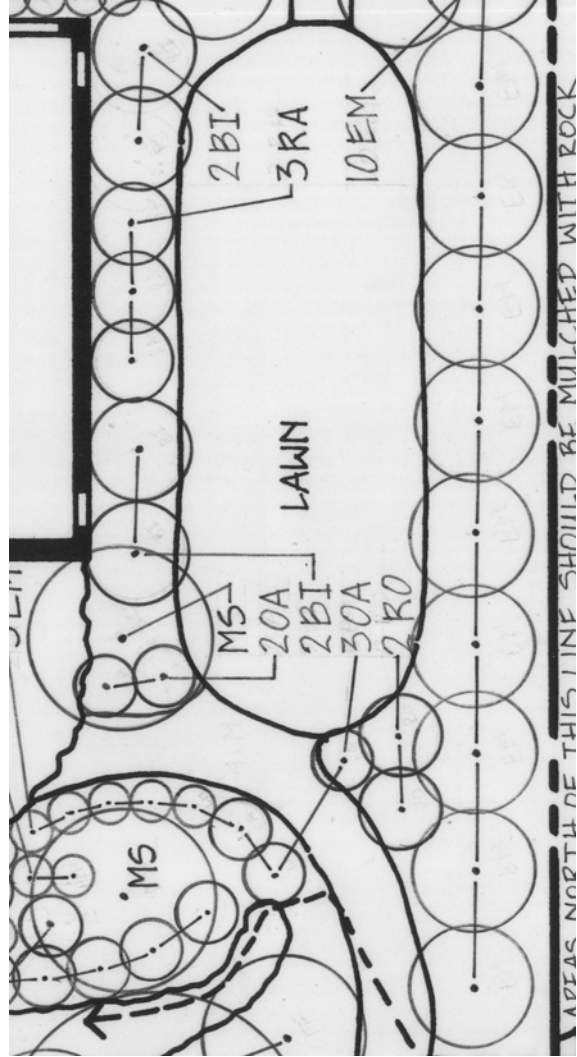
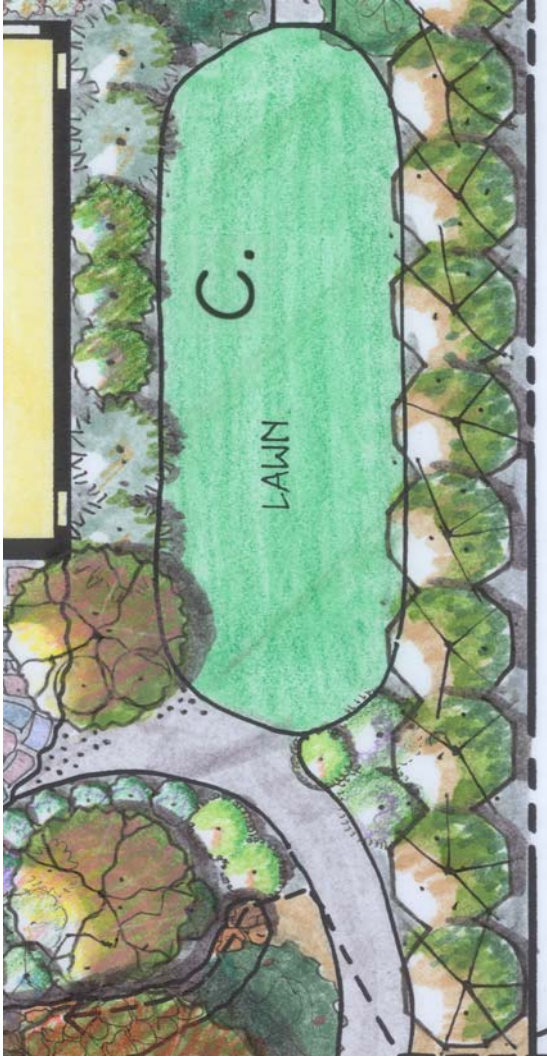
Figures 3.10 and 3.11 Sideyard rendering and planting plan for the original design



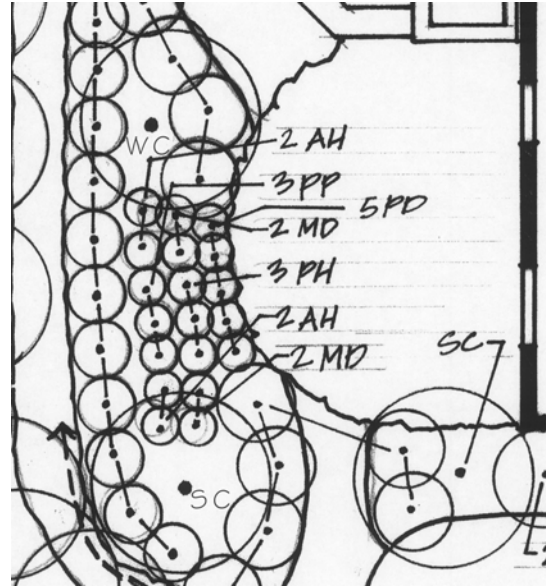
Figures 3.12 and 3.13 Sideyard rendering and planting plan for the re-design



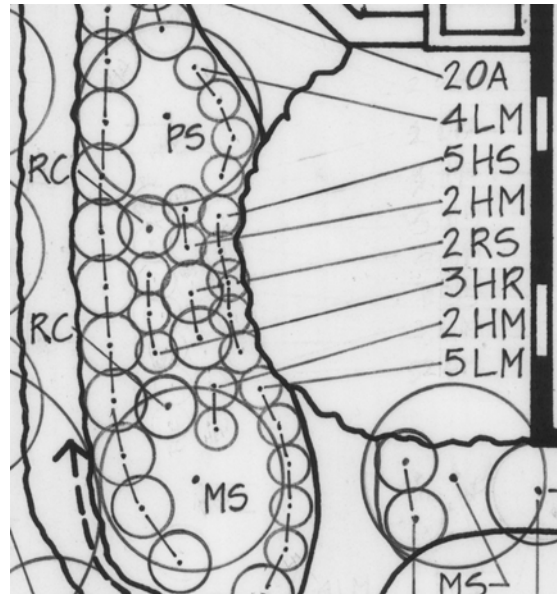
Figures 3.14 and 3.15 Sideyard Garden rendering and planting plan for the original design



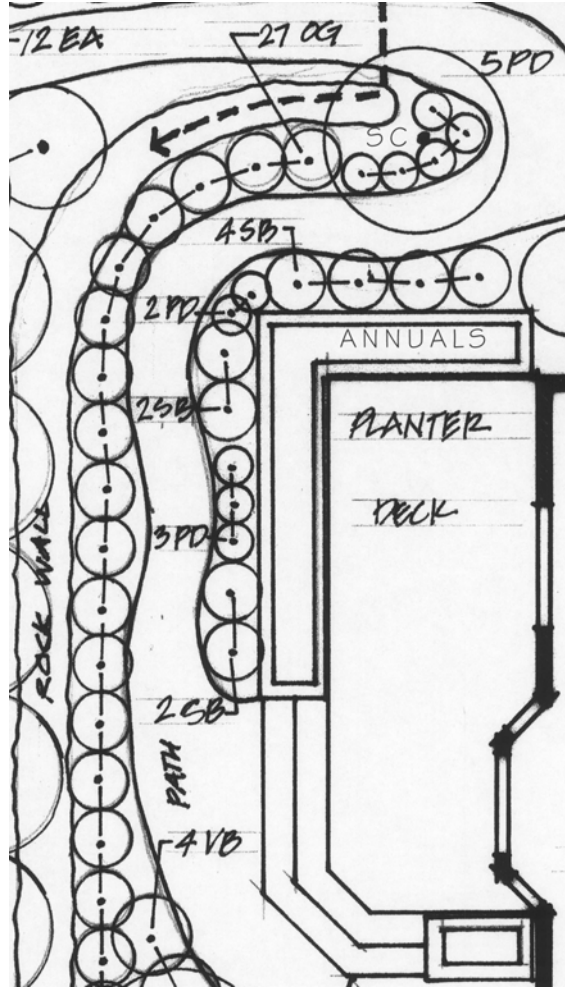
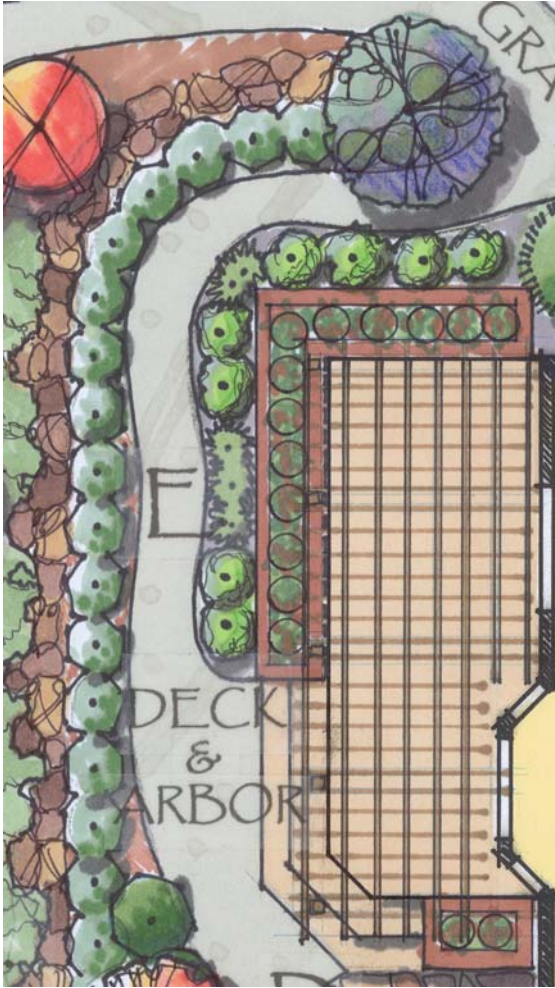
Figures 3.16 and 3.17 Sideyard Garden rendering and planting plan for the re-design



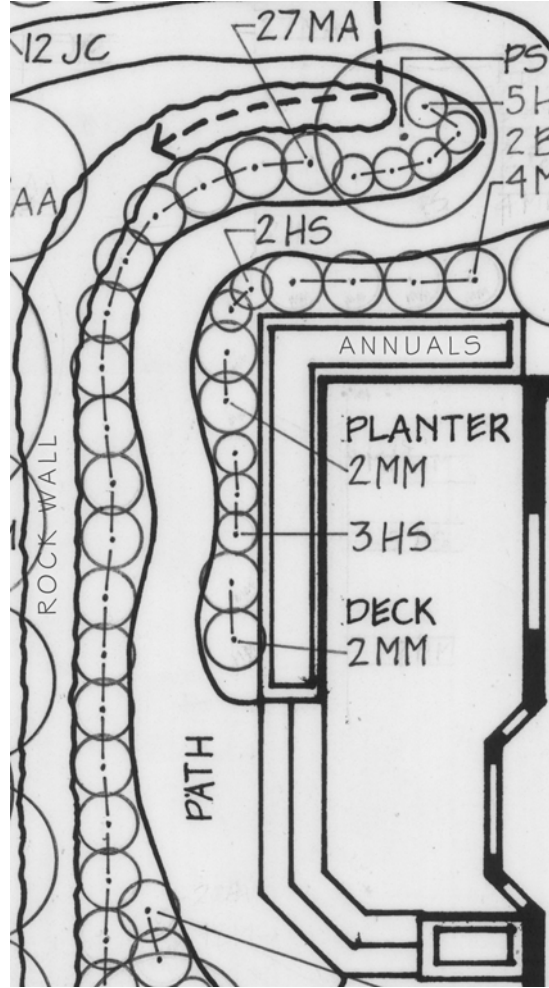
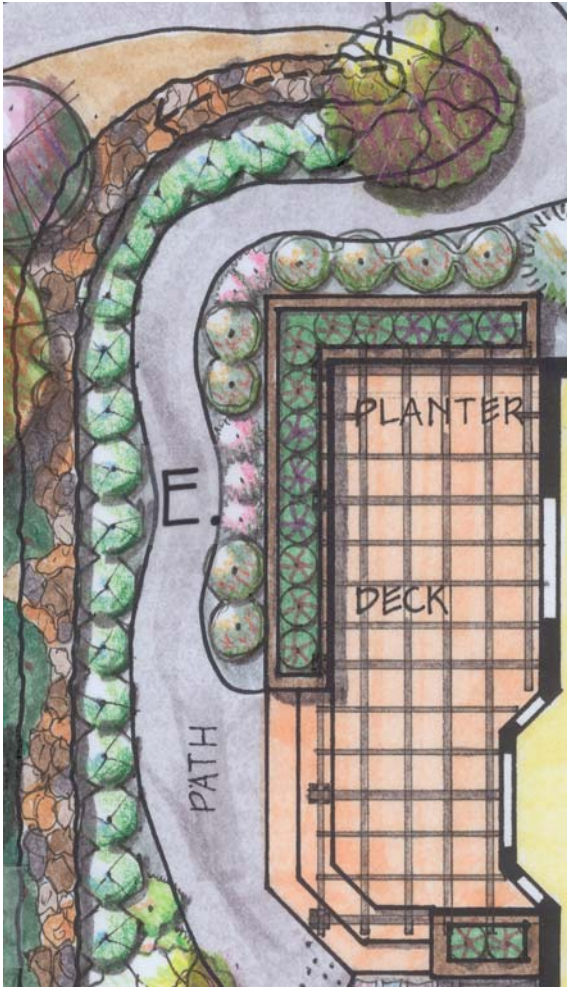
Figures 3.18 and 3.19 Patio Garden rendering and planting plan for the original design



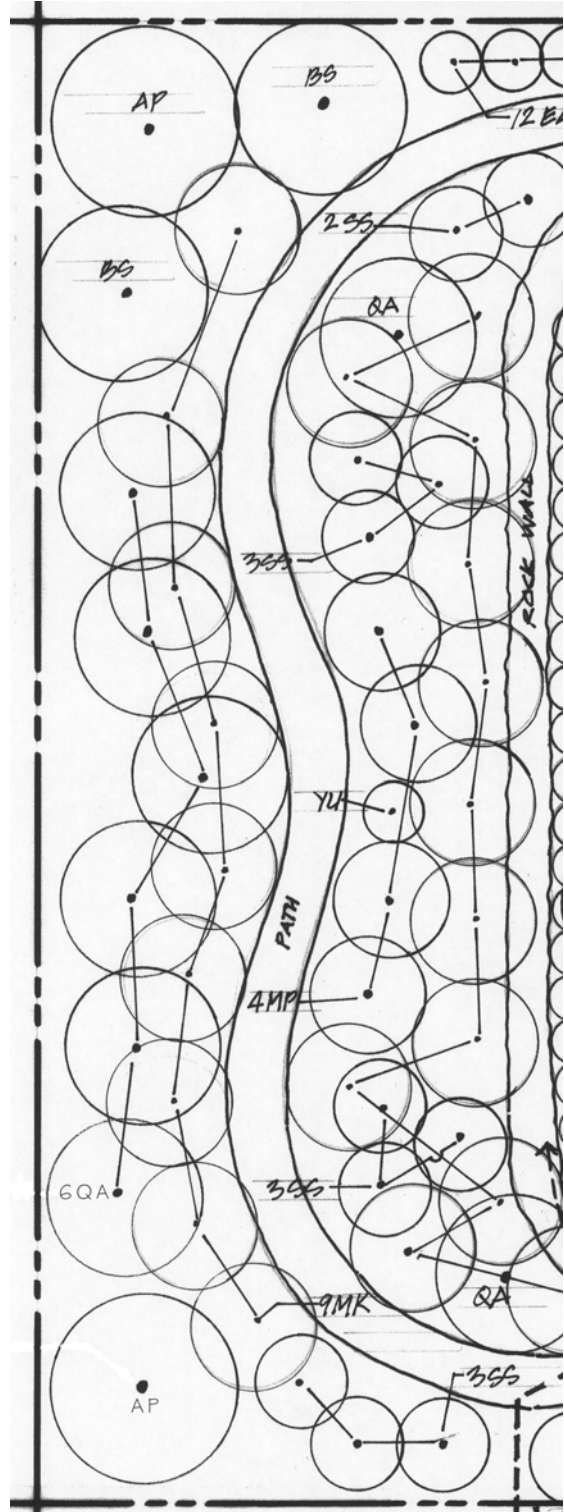
Figures 3.20 and 3.21 Patio Garden rendering and planting plan for the re-design



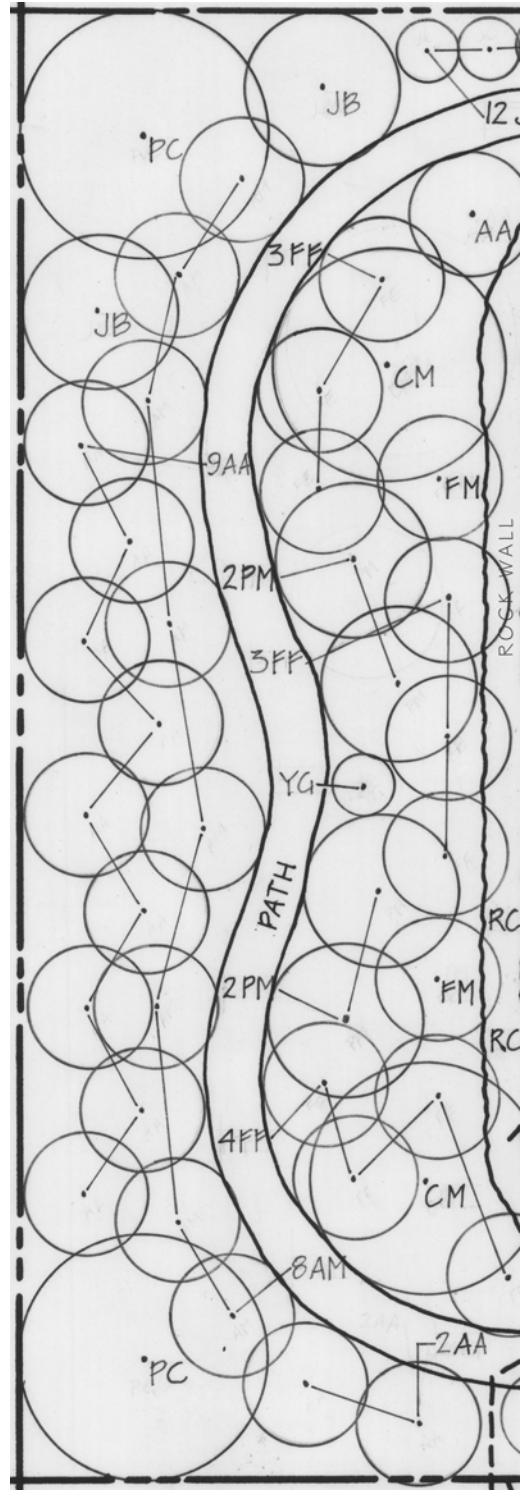
Figures 3.22 and 3.23 Deck Garden rendering and planting plan for the original design



Figures 3.24 and 3.25 Deck Garden rendering and planting plan for the re-design



Figures 3.26 and 3.27 Upper & Lower Slopes rendering and planting plan for the original design



Figures 3.28 and 3.29 Upper & Lower Slopes rendering and planting plan for the re-design

CHAPTER FOUR

CONCLUSIONS AND SUGGESTIONS

Conclusions and suggestions

Landscape professionals craft beautiful landscapes that accomplish specific functions. Residential landscapes are just one area that these professionals achieve their art. Plants are essentials on the palette of landscape professionals and are heavily involved in the crafting. Edible plants produce beautiful flowers and fruit and come in an array of shapes and colors. Thus edible plants should be considered when fashioning residential sites.

There is a history of edible plant use, which has recently been revitalized by a small number of people, specifically Rosalind Creasy and Robert Kourik. There is information available on the subject of edible landscaping, but there doesn't seem to be much effect from the articles and the few professionals advocating edible plant use. From the survey conducted by the author, it appears that people are unaware of the potential uses of edible plants in their landscapes, though this may only be true of the Palouse area as other surveys were not discovered by the author.

Edible plant use will increase if publication writers and landscape professionals work together. This means that prominent magazines, newspapers, and periodicals should routinely feature articles on this subject. Extension publications and/or workshops should be made available that provide information about which plants can be grown in a particular region of the country as well as providing information about cultural and maintenance requirements, which parts of a particular plant are edible, and when to

harvest and prepare the edible parts. The full plant matrix in this thesis, which focuses on the Palouse, could provide a template for such publications. Plant propagators should research and promulgate and publicize edible plants, focusing on aesthetics as well as edibility. Nursery owners and garden centers should label edible plants well, place them in conspicuous areas for customer notice and educate customers about pests, cultural requirements and maintenance. Landscape professionals such as landscape architects and garden designers should encourage or at least promote the potentials of using edible plants in residential landscapes in addition to typical ornamental plants.

There are two important reasons why edibles should be used more often in residential landscapes. These reasons are: 1) the increased consumption of farmland due to urban growth, and the corresponding residential land that is a large, virtually untapped resource for providing food for urbanites; and 2) more fresh, unprocessed foods are made available to local citizens.

In order to provide homeowners with ideas for using edible plants and allow them to view the beauty that is available when using edible plants, tours could be arranged to locations that currently have edible landscapes, exhibits could be set up at garden shows or county fairs or Master Gardener demonstration gardens, and displays of images and illustrations could be set up at libraries, nurseries, home improvement centers and other public locations that touch on the subject of home enhancement. The case study in this thesis is an example of a display that could be set up as a demonstration of edible plant aesthetics.

Limitations

A few changes or additions might have made this thesis more informative. The survey conducted by the author might have been better in a couple of ways. A series of questions could have been asked to determine what participants meant when they marked that they incorporated edible plants in the overall landscape. Understanding the types of edible plants (vegetables, herbs, fruiting shrubs, fruit trees, vines, brambles, etc.) participants meant when they marked that they already grow edible plants could have been helpful in understanding the knowledge level of people in regards to residential edible plant use potential. The case study could have been enhanced by including perspectives of the original design and re-design to aid people in viewing the aesthetic possibilities and similarities in the designs. Including maintenance requirements on the full plant matrix could have been helpful.

Suggestions for Further Research

Some possible further research topics are: researching how people see or might see edible plants in the landscape with harvesting in mind or the “messiness” of edible plants (fruit drop and rotting), and if that affects or would affect whether they buy/grow edible plants; researching the implications on local food movements including a reduction in resource consumption and the health of humans; researching the effects of providing a diversity of plants in an urban area; researching the accessibility of edible plants at local nurseries and to what extent the sellers (and propagators) of plants impact the purchase of edible plants; surveying with the actual change from ornamentals to edibles could inform landscape professionals as to how best to demonstrate edible landscaping.

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ten articles that best represent the general awareness of edible landscaping

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APPENDIX A

Edible plant use survey and responses, plant selection survey and responses, WSU survey
subject rights and consent forms and WSU IRB human subjects approval

Edible Plant Use Survey (Number of responses next to option)

The survey questions apply to the plants used in the immediate vicinity around your place of residence and not to any agricultural property. Please select the most correct answer unless directed otherwise.

1. To the best of your knowledge, does each of the following plants have edible parts:

Amaranth	yes(19)	probably yes(15)	probably no(8)	no(6)	I don't know(62)
Artichoke	yes(107)	probably yes(1)	probably no(0)	no(0)	I don't know(2)
Borage	yes(32)	probably yes(8)	probably no(2)	no(3)	I don't know(65)
Chrysanthemum	yes(38)	probably yes(7)	probably no(14)	no(16)	I don't know(35)
Cinquefoil	yes(2)	probably yes(7)	probably no(10)	no(9)	I don't know(82)
Firethorn	yes(0)	probably yes(4)	probably no(11)	no(12)	I don't know(83)
Honey locust	yes(8)	probably yes(13)	probably no(15)	no(17)	I don't know(57)
Hydrangea	yes(4)	probably yes(6)	probably no(23)	no(22)	I don't know(55)
Lovage	yes(23)	probably yes(7)	probably no(5)	no(1)	I don't know(74)
Mulberry	yes(52)	probably yes(21)	probably no(3)	no(4)	I don't know(30)
Quince	yes(58)	probably yes(8)	probably no(3)	no(4)	I don't know(37)
Salal	yes(27)	probably yes(11)	probably no(2)	no(2)	I don't know(68)

2. Do you plant or grow edible plants in your home, garden or yard? **86 Yes** **22 No**

2a. If **No**, why not?

<u>0</u> I can't afford to	<u>6</u> I don't have enough space
<u>11</u> I never thought to use them	<u>0</u> It's not my home
<u>3</u> Other (please explain) _____	

2b. If **Yes**, then where do you use them?

65 In an area mainly for edible plants, such as a vegetable, herb, or fruit garden
17 In containers or window boxes outside
35 Incorporated into the overall landscape
12 Inside the home
1 Other (please explain) _____

3. Which best describes what influences your decision to obtain plants:

<u>6</u> Advertisements	<u>40</u> Friend/family recommendations
<u>31</u> Impulse (you see it in a store and buy it)	<u>72</u> My own research/design needs
<u>8</u> Professional advice	<u>7</u> Other (please explain) _____

4. Did you obtain plants or seeds of **edible** or **ornamental** plants for growing during the past two years? 91 Yes 19 No (skip to #5)

4a. What percentage of the plants obtained were **ornamental** plants? (mark best choice)

9 0-10% 12 11-40% 19 41-60% 33 61-90% 18 90-100%

4b. What percentage of the plants obtained were **edible** plants? (mark the best choice)

37 0-10% 26 11-40% 12 41-60% 11 61-90% 4 90-100%

4c. If you obtained **edible** plants, why did you get them? (mark all that apply)

41 Better flavor 19 Flowers
20 Foliage (leaves) 54 Food
21 Fragrance 25 Fruit/seed
11 Less expensive than store produce
13 Not available in stores 2 Size (height, width)
5 Type (tree/shrub/groundcover) 14 Other _____

5. Would you consider planting or growing **ornamental** plants for the characteristics listed below? (mark all that apply)

76 Ease of care 93 Flowers
75 Foliage (leaves) 69 Fragrance
42 Fruit/seed 58 Size (height, width)
57 Type (tree/shrub/groundcover) 64 Water needs
7 Other _____

6. Would you consider planting or growing **edible** plants for the characteristics listed below? (mark all that apply)

73 Flowers 66 Foliage (leaves)
58 Fragrance 73 Fruit/seed
49 Size (height, width) 37 Type (tree/shrub/groundcover/etc.)
9 Other _____

7. Would you consider planting or growing **edible** plants outside of a vegetable, herb, or fruit garden?

86 Yes 22 No

8. What kind of information would you want to know about **edible** plants before planting or growing them in your home, garden or yard? (mark all that apply)

30 Preservation techniques 87 Growth requirements (soil, light, fertilizer)
51 Harvesting techniques 87 Maintenance requirements (pruning, pest control)
41 Recipe/preparation ideas 5 Other (please explain) _____

9. How often do you garden? 66 Frequently 20 Often 22 Sometimes 2 Never

10. Do you enjoy gardening? 65 Absolutely 22 Very much 21 Somewhat 2 Not at all

11. Do you rent or own your home? 12 Rent 97 Own 1 Other

12. What is your gender? 67 Female 40 Male

13. Please mark the one that best describes your age group:

8 18-30 47 31-50 41 51-70 14 over 71

THANK YOU FOR PARTICIPATING.

Plant Selection Survey (Number of responses next to option)

I am trying to compile a “current palette” of plants used in the Palouse area and who uses them most. By answering these questions you will aid me in compiling this list. These plants can be ornamental (planted just for aesthetics) or edible (plants with parts eaten by people). They can be commonplace or unusual.

1. Which group of people purchases plants from you? (mark all that apply)

 1 Contractors 4 Landscaping companies
 3 Landscape architects 5 Private Owners
 2 Other _____

2. Which customers purchase more plants for use?

 1 Commercial customers 6 Residential customers

3. Would you be willing to provide me with a list of the most popular plants (for example, the top 20) purchased at your business in recent years?

See Current Palouse Palette, Appendix B

CONSENT: I may want to use this information in my thesis and any subsequent publications. I will assume that if you provide me with a list of plants, you are giving your consent for me to use the information provided and be intentionally identified. If you do not wish to have this information used in my thesis or any subsequent publications or do not wish to be identified, please indicate this preference.

WASHINGTON STATE UNIVERSITY

SURVEY SUBJECT RIGHTS AND CONSENT FORM

The information in this consent form is to provide you with information so you can decide if you wish to participate in this study. It is important that you understand that your participation is voluntary. This means that even if you agree to participate, you may choose to withdraw at any time, without penalty. If you feel that your privacy will be invaded if you answer a question, you may choose to not answer.

Participants are being randomly chosen from patrons of nurseries around the Palouse area and from people using the services of Washington State University's Extension office in Spokane. **DO NOT** put your name on your survey. This will guarantee anonymity for you. Once you are finished, you should place your survey in the sealed box provided. You will receive a copy of this form to keep for your records. You may have a cookie whether you participate or not.

The purpose of this survey is to gain information that cannot be obtained through documented publications. Through administering the survey, I hope to find out whether edible plants (plants with a part that is eaten by people) are obtained more or less than ornamental plants (plants that are used for visual beauty only) and, if edible plants are obtained, if it is purely for eating or if the visual beauty of the plant is considered. If you participate in this study, you could benefit from contributing to the research of the use of edible plants in landscape design. The survey results will be used to aid me in writing my thesis and in any subsequent publications about this research.

Thank you for your time,

Bonnie Haight
Principal Investigator, Graduate Student
Department of Horticulture and Landscape Architecture
Washington State University
509-335-3245

CONSENT STATEMENT:

I have read the above comments and agree to participate in this study. I give my permission for you to use my answers in your master's thesis and any subsequent publications. I understand that if I have any questions regarding this project, I can contact the investigator at 509-335-3245. Furthermore, if I have questions concerning my rights as a participant in this study, I can contact the WSU Institutional Review Board at 509-335-9661.

MEMORANDUM

TO: Bonnie Haight
Horticulture & Landscape Architecture, WSU Pullman (6414)

FROM: Malathi Jandhyala (for) Cindy Corbett, Chair, WSU Institutional Review Board (3140) MJ

DATE: 10 May 2005

SUBJECT: Approved Human Subjects Protocol - New Protocol

Your Human Subjects Review Summary Form and additional information provided for the proposal titled "*Beyond Garden Vegetables: Comparing the Aesthetic Qualities of Edible and Ornamental Plants in Landscape Design*," IRB File Number **8550-a** was reviewed for the protection of the subjects participating in the study. Based on the information received from you, the WSU-IRB **approved** your human subjects protocol on **10 May 2005**.

IRB approval indicates that the study protocol as presented in the Human Subjects Form by the investigator, is designed to adequately protect the subjects participating in the study. This approval does not relieve the investigator from the responsibility of providing continuing attention to ethical considerations involved in the utilization of human subjects participating in the study.

This approval expires on 9 May 2006. If any significant changes are made to the study protocol you must notify the IRB before implementation. Request for modification forms are available online at <http://www.ogrd.wsu.edu/Forms.asp>.

In accordance with federal regulations, this approval letter and a copy of the approved protocol must be kept with any copies of signed consent forms by the principal investigator for THREE years after completion of the project.

Washington State University is covered under Human Subjects Assurance Number FWA00002946 which is on file with the Office for Human Research Protections.

If you have questions, please contact the Institutional Review Board at (509) 335-9661. Any revised materials can be mailed to the Research Compliance Office (Campus Zip 3140), faxed to (509) 335-1676, or in some cases by electronic mail, to irb@mail.wsu.edu.

Review Type: NEW OGRD No.: NF
Review Category: XMT Agency: NA
Date Received: 29 April 2005

APPENDIX B

Current Palouse Landscape Plant Palette

Current Palouse Landscape Plant Palette

The Current Palouse Palette (Author, summer 2005) is a list of the most popular plants purchased at the nurseries that completed the Plant Selection Survey (these are same nurseries at which the participants for this thesis were surveyed). In addition, the Palouse Hills Greenhouse and Wholesale in Moscow, Idaho, who sells to locations other than nurseries, such as local grocery stores, florists and home improvement centers, completed a survey. The list is in alphabetical order by the name common. The plants in **bold** are plants used in the re-design case study section of the thesis and correspond to plants selected from the plant list matrices in Appendix D. The plants underlined are plants used in the original design.

Alyssum (*Lobularia maritima*)
Arborvitae (*Thuja* spp.)
Ash (*Fraxinus* spp.)
Aspen (*Populus* spp.)
Azalea (*Rhododendron* spp.)
Bacopa (*Sutera cordata*)
Barberry (*Berberis* spp.)
Boxwood (*Buxus* spp.)
Burning bush (*Euonymus alatus*)
Butterfly bush (*Buddleja davidii*)
Cinquefoil (*Potentilla* spp.)
Coleus (*Solenostemon scutellarioides*)
Colorado blue spruce (*Picea pungens*
‘Glauca’)
Common aubrieta (*Aubrieta deltoidea*)
Cucumber (*Curcubita* spp.)
Daylily (*Hemerocallis* spp.)
Delphinium (*Delphinium* spp.)
Flowering cherry (*Prunus* spp.)
Flowering crabapple (*Malus* spp.)
Flowering hawthorn (*Crataegus* spp.)
Flowering kale/cabbage (*Brassica* spp.)
Flowering pear (*Pyrus* spp.)
Flowering plum (*Prunus* spp.)
Fruit trees (variable genera)
Fuchsia (*Fuchsia* spp.)
Garden mum (*Chrysanthemum* spp.)
Geranium (*Pelargonium* spp.)
Heavenly bamboo (*Nandina domestica*)
Hedge cotoneaster (*Cotoneaster lucidus*)
Herbs (variable genera)
Honey locust (*Gleditsia triacanthos*)
Hosta (*Hosta* spp.)
Hydrangea (*Hydrangea* spp.)
Impatiens (*Impatiens* spp.)
Kinnikinnick (*Arctostaphylos uva-ursi*)
Lavender (*Lavandula* spp.)
Lobelia (*Lobelia* spp.)
Lupine (*Lupinus* spp.)
Maple (*Acer* spp.)
Marigold (*Tagetes* spp.)
Million bells (*Calibrachoa* spp.)
Oak (*Quercus* spp.)
Oriental lily (*Lilium* spp.)
Ornamental grass (variable genera)
Pansy (*Viola* spp.)
Pepper (*Capsicum annuum*)
Periwinkle (*Vinca minor*)
Petunia (*Petunia x hybrida*)
Phlox (*Phlox* spp.)
Primrose (*Primula* spp.)
Raspberry (*Rubus* spp.)
Rhubarb (*Rheum* spp.)
Rose (*Rosa* spp.)
Rose of Sharon (*Hibiscus syriacus*)
Seed potato (*Solanum tuberosum*)
Small fruit shrubs (variable genera)
Snapdragon (*Antirrhinum majus*)
Spirea (*Spiraea* spp.)
Strawberry (*Fragaria* spp.)
Tomato (*Lycopersicon esculentum*)
Verbena (*Verbena* spp.)
Viola (*Viola* spp.)
Woolly thyme (*Thymus*
pseudolanuginosus)
Yew (*Taxus* spp.)
Zinnia (*Zinnia* spp.)

APPENDIX C

Original design and plant list of case study

GARDEN DESIGN



SCALE: 1/8" = 1'-0"

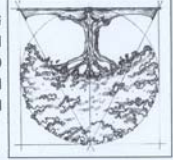
LEGEND:

- A. ENTRY GARDEN
- B. SIDYARD
- C. SIDYARD GARDEN
- D. PATIO GARDEN
- E. DECK GARDEN
- F. LOWER SLOPE
- G. UPPER SLOPE

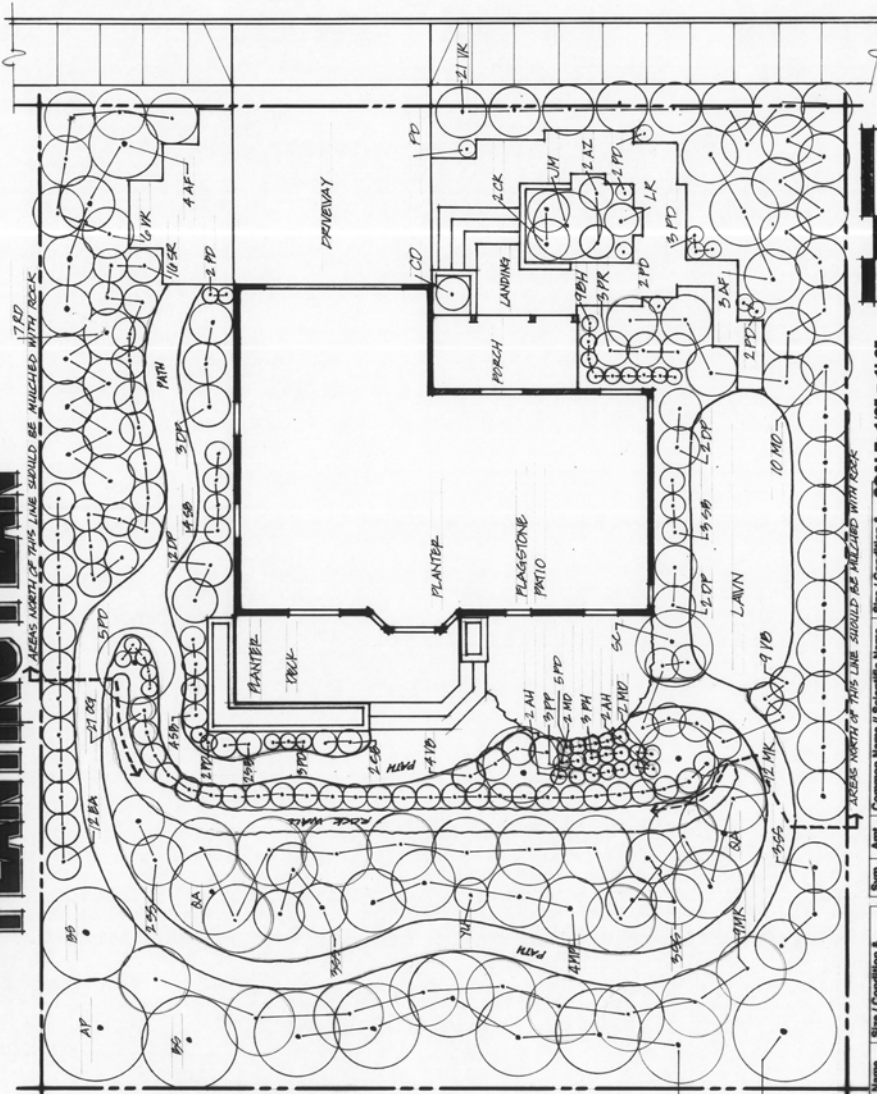
NORTH

HOBART RESIDENCE
 DOUGLAS & JUDY HOBART, 965 CRESTVIEW DR., PULLMAN, WA 99163
 ORIGINAL PLAN

LAND VISIONS DESIGN
 PHILLIP S. WAITE, BSLA, MA, RLA
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PLANTING PLAN



Notes:

- No substitutions in plant material shall be made without prior approval of the owner.
- All planting areas shall be mulched. Use DeWitt Pro 6 mulch. Mulch shall be placed under all mulched planting areas.
- Planting areas closest to the house shall be mulched with two inches of 1" minus washed river rock match over weed fabric. See drawing for locations.
- Planting areas furthest from the house will be mulched with chipped fir bark to a depth of 2 inches over weed fabric. See drawing for locations.

PLANT LIST

Sym.	Am't.	Common Name // Scientific Name	Size / Condition & Planting Notes
AP	7	Active Fir // <i>Abies balsamica</i>	Plant in groups as indicated.
AH	4	Azalea // <i>Indigo</i>	1 gal.
AP	2	American Elm // <i>Ulmus americana</i>	5 gal.
AZ	2	Spicy Light Acacia // <i>Acacia saligna</i>	2 gal / Amend soil with peat
BH	9	Big Jolly Holly // <i>Ilex</i>	1 gal.
BS	2	Blue Spruce // <i>Picea canadensis</i>	2 o.c.
CD	1	Carroll Juniper // <i>Juniperus horizontalis</i>	5 gal.
CK	2	Cherry Birdwood // <i>Cornus amomum</i>	2 gal.
DP	9	Dwarf Dogwood // <i>Cornus alternifolia</i>	5 gal.
EA	12	Emerald Arbutus // <i>Arbutus menziesii</i>	5 gal.
JM	1	Japanese Maple // <i>Acer palmatum</i>	5 gal.
LR	1	Lily of the Valley // <i>Lilium</i>	1 gal.
MD	4	Manitowish // <i>Manitowish</i>	2 o.c.
MK	21	Manitowish // <i>Manitowish</i>	5 gal.
MO	10	Manitowish // <i>Manitowish</i>	5 gal.
MP	4	Manitowish // <i>Manitowish</i>	5 gal.
OQ	27	Manitowish // <i>Manitowish</i>	5 gal.
PD	27	Manitowish // <i>Manitowish</i>	5 gal.
PH	3	Manitowish // <i>Manitowish</i>	5 gal.
PP	3	Manitowish // <i>Manitowish</i>	5 gal.
PR	3	Manitowish // <i>Manitowish</i>	5 gal.
QA	8	Manitowish // <i>Manitowish</i>	5 gal.

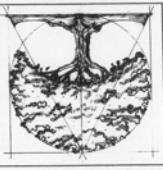
Sym.	Am't.	Common Name // Scientific Name	Size / Condition & Planting Notes
LR	1	Lily of the Valley // <i>Lilium</i>	1 gal.
MD	4	Manitowish // <i>Manitowish</i>	2 o.c.
MK	21	Manitowish // <i>Manitowish</i>	5 gal.
MO	10	Manitowish // <i>Manitowish</i>	5 gal.
MP	4	Manitowish // <i>Manitowish</i>	5 gal.
OQ	27	Manitowish // <i>Manitowish</i>	5 gal.
PD	27	Manitowish // <i>Manitowish</i>	5 gal.
PH	3	Manitowish // <i>Manitowish</i>	5 gal.
PP	3	Manitowish // <i>Manitowish</i>	5 gal.
PR	3	Manitowish // <i>Manitowish</i>	5 gal.
QA	8	Manitowish // <i>Manitowish</i>	5 gal.

Sym.	Am't.	Common Name // Scientific Name	Size / Condition & Planting Notes
RO	7	Rose of Sharon // <i>Hibiscus</i>	5 gal.
SB	15	Sweet Briar // <i>Rosa rubra</i>	5 gal.
SC	3	Sweet Briar // <i>Rosa rubra</i>	5 gal.
SR	18	Sweet Briar // <i>Rosa rubra</i>	5 gal.
SS	11	Sweet Briar // <i>Rosa rubra</i>	5 gal.
VB	13	Sweet Briar // <i>Rosa rubra</i>	5 gal.
VK	27	Sweet Briar // <i>Rosa rubra</i>	5 gal.
WC	1	Sweet Briar // <i>Rosa rubra</i>	5 gal.
YU	1	Sweet Briar // <i>Rosa rubra</i>	5 gal.



HOBART RESIDENCE
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Original Plant List

Sym.	Quan.	Common Name Scientific Name	Size /Condition Notes
AF	7	Alpine Fir <i>Abies lasiocarpa</i>	B&B, mixed heights, 5' to 8' Plant in groups as indicated.
AP	2	Austrian Pine <i>Pinus nigra</i>	B&B, 6' to 8'
AZ	2	Spicy Lights Azalea <i>Rhododendron</i> x 'Northern Lights' hybrid	2 gal.
BH	9	Big Daddy Hosta <i>Hosta</i> x 'Big Daddy'	1 gal. 2' o.c.
BS	2	Colorado Blue Spruce <i>Picea pungens</i> 'Glauca'	B&B, 6' to 8'
CD	1	Carol Mackie Daphne <i>Daphne</i> x <i>burkwoodii</i> 'Carol Mackie'	5 gal.
CK	2	Wood's Compact Kinnikinnick <i>Arctostaphylos uva-ursi</i> 'Wood's Compacta'	2 gal.
DP	9	Dwarf Mugo Pine <i>Pinus mugo</i> <i>pumilo</i>	5 gal. 5' o.c.
EA	12	Emerald Arborvitae <i>Thuja occidentalis</i> 'Smaragd'	5 gal, 5' 4' o.c.
JM	1	Emperor I Japanese Maple <i>Acer palmatum</i> 'Wolff'	B & B; 5' to 7'
LR	1	Little Rascal Holly <i>Ilex</i> x 'Mondo' (Male)	5 gal.
MK	21	Massachusetts Kinnikinnick <i>Arctostaphylos uva-ursi</i> 'Massachusetts'	1 gal. Spacing varies; usu. 8' o.c.
MO	10	Natchez Mock Orange <i>Philadelphus</i> x <i>virginialis</i> 'Natchez'	5 gal. 5' o.c.
MP	4	Mugo Pine <i>Pinus mugo</i>	B&B 3' to 5' 6' o.c.
OG	27	Compact Oregon Grape Holly <i>Mahonia aquifolium</i> 'Compacta'	1 gal. 3' o.c.
PD	27	Pink Sparkler Daylily <i>Hemerocallis</i> x 'Pink Sparkler'	1 gal. Spacing varies
PR	3	P.J.M. Rhododendron <i>Rhododendron</i> x 'P.J.M.'	2 gal. 4' o.c.
QA	8	Quaking Aspen <i>Populus tremuloides</i>	B&B, 6' to 8' 8'-10' o.c.
RD	7	Isanti Red-Osier Dogwood <i>Cornus sericea</i> 'Isanti'	2 gal. 6' o.c.
SB	15	Lemon Princess Spirea <i>Spiraea</i> x <i>bumalda</i> 'Lemon Princess'	2 gal. 3' o.c.
SC	3	Sargent Crabapple <i>Malus sargentii</i>	B&B, 5'
SR	16	Sea Foam Shrub Rose <i>Rosa</i> x 'Sea Foam'	2 gal. 4' o.c.
SS	11	Staghorn Sumac <i>Rhus typhina</i>	5 gal. 5' o.c.
VB	13	Green Velvet Boxwood <i>Buxus</i> 'Green Velvet'	2 gal. 3' o.c.
VK	27	Vancouver Jade Kinnikinnick <i>Arctostaphylos uva-ursi</i> 'Vancouver Jade'	1 gal Spacing varies; usu. 6' o.c.
WC	1	Double Weeping Rosebud Cherry <i>Prunus pendula</i> 'Pleno-rosea'	B&B 5'
YU	1	Golden Sword Yucca <i>Yucca filamentosa</i> 'Golden Sword'	5 gal.

APPENDIX D

Re-design and plant list of case study

HOBART RESIDENCE

DOUGLAS & JUDY HOBART, 965 CRESTVIEW DR., PULLMAN, WA 99163

RE-DESIGN PLAN

LAND VISIONS DESIGN
 PLANNING & LANDSCAPE DESIGN

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SCALE: 1/8" = 1'-0"

LEGEND:

- A. ENTRY GARDEN
- B. SIDYARD
- C. SIDYARD GARDEN
- D. PATIO GARDEN
- E. DECK GARDEN
- F. LOWER SLOPE
- G. UPPER SLOPE

NORTH

Re-design Plant List

Sym.	Quan.	Scientific Name Common Name	Size/Condition Notes	Design Codes
AA	11	<i>Amelanchier alnifolia</i> Juneberry	5 gal. 7' o.c.	Awl, Ea, EsL, Cf, Cc
AL	7	<i>Abies lasiocarpa</i> Sub-alpine fir	B&B, mixed heights, 5' to 8' Plant in groups as indicated.	Aww, Ea, Cf, Ct
AM	8	<i>Arctostaphylos uva-ursi</i> 'Massachusetts' Massachusetts kinnikinick	1 gal. Spacing varies	Afl, EsL, Ct
AW	24	<i>Arctostaphylos uva-ursi</i> 'Wood's Red' Wood's red kinnikinick	1 gal. Spacing varies; usu. 6' o.c.	Afl, EsL, Ct
BI	9	<i>Berberis x stenophylla</i> 'Irwinii' Rosemary barberry	2 gal. 5' o.c.	Awl, EsL, Cf, Ct
CM	2	<i>Cornus mas</i> Cornelian cherry dogwood	5 gal.	Aww, Ea, EsL, Cf, Cc
EM	10	<i>Elaeagnus multiflora</i> Elaeagnus/goumi	5 gal. 5' o.c.	Awl, Ea, Esd, Cf
FF	10	<i>Fragaria chiloensis</i> (female) Female beach strawberry	4" pot Spacing varies	Afl, EsL, Ct
FM	2	<i>Fragaria chiloensis</i> (male) Male beach strawberry	4" pot	Afl, EsL, Ct
FP	1	<i>Fagus sylvatica</i> 'Purpurea Pendula' Purple weeping European beech	B & B; 3' to 5'	Aww, Ea, Cf, Ct, Cc
FV	5	<i>Fragaria vesca</i> Alpine stawberry	4" pot Spacing varies, usu. 6' o.c.	Afl, EsL, Ct
HM	4	<i>Hemerocallis x</i> 'Purple Magic' Purple magic daylily	1 gal. 2' o.c.	Afl, EsL, Cf, Cc
HP	3	<i>Hemerocallis x</i> 'Pastel Pink' Pastel Pink daylily	1 gal. 2' o.c.	Afl, EsL, Cf, Cc
HS	27	<i>Hemerocallis x</i> 'Pink Sparkler' Pink sparkler daylily	1 gal. Spacing varies	Afl, EsL, Cf, Cc
JB	2	<i>Juniperus scopulorum</i> 'Blue Heaven' Blue heaven rocky mtn. juniper	B&B, 6' to 8'	Awl, Ea, EsL, Cf, Cc
JC	12	<i>Juniperus communis</i> Common juniper	5 gal., 5' 4' o.c.	Awl, Ea, Esd, Cf
LM	9	<i>Lavandula angustifolia</i> 'Munstead' Lavender	1 gal. 2' o.c.	Awl, EsL, Cl, Cc
MA	27	<i>Mahonia aquifolium</i> 'Compacta' Dwarf Oregon grape	1 gal. 3' o.c.	Awl, EsL, Cf, Ct
MM	8	<i>Monarda didyma</i> 'Mahogany' Mahogany bee balm	1 gal. 3' o.c.	Awl, EsL, Cf, Cc
MS	2	<i>Malus sargentii</i> Sargent crabapple	B&B, 5'	Ac, Aww, El, Ea, Cf, Cc
OA	7	<i>Origanum vulgare</i> 'Aureum' Golden oregano	1 gal. 3' o.c.	Awl, EsL, Cl, Cc
PC	2	<i>Pinus cembroides</i> Mexican pinon pine	B&B, 6' to 8'	Awl, Ea, EsL, Cf, Cc
PJ	7	<i>Pseudosasa japonica</i> Arrow bamboo	2 gal. 6' o.c.	Awl, Ea, EsL, Cf, Cc
PM	4	<i>Pinus monophylla</i> Single-leaf pinon pine	B&B, 5' to 8' 8' o.c.	Awl, Ea, EsL, Cf, Ct
PS	2	<i>Prunus x</i> 'Superior' Superior plum hybrid	B&B, 5'	Aww, El, Cf, Cc

Sym.	Quan.	Scientific Name Common Name	Size/Condition Notes	Design Codes
RA	7	<i>Ribes aureum</i> Golden currant	2 gal. 3' o.c.	Awl, Esl, Cf, Cc
RC	2	<i>Rheum x cultorum</i> 'Cherry' Cherry rhubarb	2 gal.	Afl, Esl, Cf, Cc
RF	16	<i>Rosa</i> x 'Sea Foam' Sea foam rose	2 gal. 4' o.c.	Awl, Ea, Esl, Cf, Cc
RO	2	<i>Rosmarinus officinalis</i> 'Arp' Rosemary	1 gal. 4' o.c.	Awl, Esl, Cl, Cc
RS	2	<i>Rheum x cultorum</i> 'Strawberry' Strawberry rhubarb	2 gal. 3' o.c.	Afl, Esl, Cf, Cc
VC	1	<i>Viburnum</i> x 'Conoy' Conoy viburnum	5 gal.	Aww, Ea, Cf, Ct
VE	3	<i>Viburnum</i> x 'Eskimo' Eskimo viburnum	5 gal. 4' o.c.	Awl, Ea, Cf, Cc
VN	1	<i>Vaccinium angustifolia</i> 'Northcountry' Northcountry blueberry	5 gal.	Aww, Esl, Cf, Ct
VS	2	<i>Vaccinium angustifolia</i> 'St. Cloud' St. Cloud blueberry	5 gal.	Aww, Esl, Cf, Cc
VV	9	<i>Vaccinium vitis-idaea</i> Cowberry	4" pot 2' o.c.	Afl, Esl, Cf, Cc
YG	1	<i>Yucca filamentosa</i> 'Golden Sword' Golden sword yucca	5 gal.	Aww, Esl, Cf, Ct

Design Use Codes

Architectural Engineering Aesthetic

Ac=ceiling El=light Cl=line
 Awl=wall Ea=air Cf=form
 Aww=window Esl=sound Ct=texture
 Afl=floor Esl=soil Cc=color

APPENDIX E

Full Plant Matrix

This is a full listing of the 190 edible plants that will grow in the Palouse area. From this list, plants were chosen and used in the case study re-design. The scientific names (alphabetized from the original plant list), plant type/use and edible parts are recorded in the case study matrix in the body of the thesis. There are accompanying paragraphs about the organization of the matrix (i.e. the divisions into architectural, engineering and aesthetic plant uses) in chapter three.

Full plant matrix of edible plants suitable for landscape purposes in the Palouse.											
Scientific Name	Possible Plant Uses:				Aesthetic	Edible Parts	When Edible	Water	Soil	Light	Common Name
	Plant Type	Architectural	Engineering	Plant Uses							
<i>Abelmoschus esculentus</i>	A	W1	L, A, SI	T	FL; FR	M; Y	M	H	FS	okra	
<i>Acer</i> spp.	DT	C, W1, Ww	L, A, Sd, SI	F	sap	flowing C	M	RW	FS	maple	
<i>Acorus calamus</i>	W	F	SI	T	R	Y	H	R	FS-PS	sweet flag	
<i>Actinidia arguta</i>	DV	C, W1, Ww	L, A, Sd, SI	L	FR	M	H	GW	FS	hardy kiwi	
<i>Actinidia kolomikta</i>	DV	C, W1, Ww	L, A, Sd, SI	L	FR	M	H	GW	FS	arctic beauty kiwi	
<i>Agastache foeniculum</i>	P	W1, Ww	A, SI	C	L; FL	YR; MR	M	G	FS	anise hyssop	
<i>Akebia</i> spp.	DV	W1, Ww	L, A, Sd, SI	L, C	FR	M	M	G	PS	akebia	
<i>Alcea rosea</i>	BI	W1	A, SI	T	L	Y	M	G	FS-PS	hollyhock	
<i>Allium</i> spp.	P	F	SI	F, T	L; R; FL; ST	variable	M	RM	FS	chives, et al	
<i>Amaranthus</i> spp.	A	W1, Ww	A, SI	C	L; SE	Y; M	M	GW	FS	amaranth	
<i>Amelanchier</i> spp.	DS	C, W1, Ww	L, A, Sd, SI	F, C	FR	M	M	GW	FS	juneberry	
<i>Ampelopsis brevipedunculata</i>	DV	C, W1, Ww	L, A, Sd, SI	L, T	FR	M	M	GM	PS	porcelain berry	
<i>Anethum graveolens</i>	A	W1	A, SI	T	L; FL; SE	YR; MR; MD	M	RW	FS	dill	
<i>Anthriscus cerefolium</i>	A	F	SI	T	L	Y	H	M	FS-PS	chervil	
<i>Arachis hypogaea</i>	A	F	SI	T	SE	M	H	AcLW	FS	peanut	
<i>Artemisia dracunculus</i>	P	F	SI	T	L	Y	M	GW	FS	tarragon	
<i>Asimina triloba</i>	DT	C, W1, Ww	L, A, Sd, SI	F, T	FR	M	H	RW	FS-PS	pawpaw	
<i>Asparagus officinalis</i>	P	W1	A, SI	T	SH	Y	M	RW	FS	asparagus	
<i>Atriplex hortensis</i>	A	F	SI	C	L	Y	M	GW	FS	orach	
<i>Bambusa</i> (& other genera) spp.	P	C, W1, Ww	L, A, Sd, SI	L, F, T	SH; ST	Y; Y	M	RW	FS-PS	bamboo	
<i>Bellis perennis</i>	A	F	SI	C	FL	MR	M	G	FS	English daisy	
KEY											
Plant Type	Architectural	Engineering	Aesthetic	Edible Parts	When Edible	Water	Soil		Light		
DT=deciduous tree	C=ceiling	L=light	L=line	L=leaves	Y=young	H=high	N=neutral		FS=full sun		
ET=evergreen tree	W=wall	A=air	F=form	FR=fruit	M=mature	M=moderate	Ac=acid		PS=partial shade / sun		
DS=deciduous shrub	Ww=window	Sd=sound	T=texture	SE=seed / nut	R=raw	L=low	Al=alkaline		SH=shade		
ES=evergreen shrub	F=floor	SI=soil	C=color	R=root	C=cooked		W=well-drained				
P=perennial				ST=stem / stalk	D=dried		M=moist				
A=annual				FL=flower			B=bog				
BI=biennial				SH=shoot			R=rich				
DV=deciduous vine							G=good				
EV=evergreen vine							L=light				
G=groundcover							H=heavy				
W=water plant											

Full plant matrix, page 2										
Scientific Name	Plant Type	Possible Plant Architectural	Engineering	Aesthetic	Edible Parts	When Edible	Water	Soil	Light	Common Name
<i>Berberis</i> spp.	DS, ES	W1	A, SI	T	FR	M	M	W	FS-PS	barberry
<i>Borago officinalis</i>	A	W1	A, SI	T	L; FL	Y; MR	M	G	FS	borage
<i>Calendula officinalis</i>	A	F	SI	C	FL	MR	M	RW	FS	calendula
<i>Caragana arborescens</i>	DS	C, W1, Ww	L, A, Sd, SI	F, T	FR	YC	M	G	FS	Siberian peashrub
<i>Carthamus tinctorius</i>	A	W1	A, SI	T	FL; SE	MRD; M	L	LW	FS	safflower
<i>Carum carvi</i>	BI	F	SI	T	SE	MD	M	GW	FS	caraway
<i>Carya illinoensis</i>	DT	C, W1, Ww	L, A, Sd, SI	F	SE	M	M	AcRW	FS	pecan
<i>Carya laciniosa</i>	DT	C, W1, Ww	L, A, Sd, SI	F	SE	M	L	GW	FS	shellbark hickory
<i>Carya ovata</i>	DT	C, W1, Ww	L, A, Sd, SI	F, T	SE	M	L	GW	FS	shagbark hickory
<i>Castanea</i> spp.	DT	C, W1, Ww	L, A, Sd, SI	F, T	SE	M	L	GW	FS	chestnut
<i>Celtis</i> spp.	DT	C, W1, Ww	L, A, Sd, SI	F	FR	M	M	GW	FS	hackberry
<i>Cercis canadensis</i>	DT	C, W1, Ww	L, A, Sd, SI	F, C	FL	variable	M	G	FS-PS	redbud
<i>Cercis siliquastrum</i>	DT	C, W1, Ww	L, A, Sd, SI	F, C	FL	variable	M	G	FS-PS	judas tree
<i>Chaenomeles</i> spp.	DS	W1, Ww	A, SI	F	FR	MC	M	G	FS	flowering quince
<i>Chamaemelum nobile</i>	P	F	SI	T	FL	MD	M	G	FS	chamomile
<i>Chenopodium album</i>	A	F	SI	T	L	Y	M	GW	FS	lamb's quarter
<i>Chiognes hispidulum</i>	ES, G	W1, F	A, SI	F	FR	M	M	GM	FS-PS	snowberry
<i>Chrysanthemum balsamita</i>	P	F	SI	T	L	Y	M	G	FS	costmary
<i>Chrysanthemum coronarium</i>	A	F	SI	T	L; FL	YC; MR	L	G	FS	shungiku
<i>Chrysanthemum leucanthemum</i>	P	W1	A, SI	T	L; FL	YR; MR	M	G	FS	oxeye daisy
<i>Chrysanthemum parthenium</i>	A	F	SI	T	FL	MR	M	GW	FS	feverfew
KEY										
Plant Type	Architectural	Engineering	Aesthetic	Edible Parts	When Edible	Water		Soil	Light	
DT=deciduous tree	C=ceiling	L=light	L=line	L=leaves	Y=young	H=high	N=neutral		FS=full sun	
EF=evergreen tree	W=wall	A=air	F=form	FR=fruit	M=mature	M=moderate	Ac=acid		PS=partial shade / sun	
DS=deciduous shrub	Ww>window	Sd=sound	T=texture	SE=seed / nut	R=raw	L=low	Al=alkaline		SH=shade	
ES=evergreen shrub	F=floor	SI=soil	C=color	R=root	C=cooked		W=well-drained			
P=perennial				ST=stem / stalk	D=dried		M=moist			
A=annual				FL=flower			B=bog			
BI=biennial				SH=shoot			R=rich			
DV=deciduous vine							G=good			
EV=evergreen vine							L=light			
G=groundcover							H=heavy			
W=water plant										

Full plant matrix, page 3

Scientific Name	Possible Plant Uses:		Aesthetic	Edible Parts	When Edible	Water	Soil	Light	Common Name
	Plant Type	Architectural							
<i>Chrysanthemum x morifolium</i>	P	F	SI	T	FL	MR	L	FS	garden mum
<i>Cichorium endiva</i>	A	F	SI	T	L	Y	M	FS	endive
<i>Citrullus lanatus</i>	A	Wl, Ww, F	L, A, Sd, SI	F, T	FR	M	M	FS	watermelon
<i>Coriandrum sativum</i>	A	F	SI	T	L, FL, SE	YR, MR, MD	M	FS	coriander/cilantro
<i>Cornus mas</i>	DT	Wl, Ww	L, A, Sd, SI	F	FR	MC	M	FS	cornelian cherry dogwood
<i>Corylus avellana</i>	DT	C, Wl, Ww	L, A, Sd, SI	F	SE	M	L	FS	filbert
<i>Corylus colurna</i>	DT	C, Wl, Ww	L, A, Sd, SI	F	SE	M	L	FS	Turkish hazel
<i>Corylus maxima</i>	DT	C, Wl, Ww	L, A, Sd, SI	F	SE	M	L	FS	hazelnut
<i>Cotoneaster</i> spp.	DS, ES, G	Wl, Ww, F	A, SI	L, F, T	FR	MC	L-M	FS-PS	cotoneaster
<i>Crocus sativus</i>	P	F	SI	C	stigma	MD	M	PS	saffron
<i>Cryptotaenia japonica</i>	A	F	SI	T	L	YR	M	FS	mitsuba
<i>Cucumis melo</i>	A	Wl, Ww, F	L, A, Sd, SI	L, T	FR	M	M	FS	melon
<i>Cucumis sativus</i>	A	Wl, Ww, F	L, A, Sd, SI	L, T	FR	Y	M	FS	cucumber
<i>Cucurbita</i> spp.	A	Wl, Ww, F	L, A, SI	L, T	FL, FR	Y; Y	M	FS	squash / pumpkin
<i>Cudrania tricuspidata</i>	DT	C, Wl, Ww	L, A, Sd, SI	F, C	FR	M	M	FS	che
<i>Cydonia oblonga</i>	DS, DT	C, Wl, Ww	L, A, Sd, SI	F	FR	MC	M-L	FS	quince
<i>Cynara scolymus</i>	P	Wl	A, SI	F, T	FL	YC	M	FS	artichoke
<i>Dianthus caryophyllus</i>	P	Wl	L, A, SI	F, C	FL	MR	M	FS	carnation
<i>Dianthus plumarius</i>	P	F	SI	T, C	FL	MR	M	FS	cottage pink
<i>Dolichos lablab</i>	A	Wl, Ww, F	L, A, Sd, SI	F, C	FR	YC	M	FS	hyacinth bean
<i>Elaeagnus multiflora</i>	DS	Wl, Ww	L, A, Sd, SI	F, C	FR	M	M	FS	elaegnus / goumi
KEY									
Plant Type	Architectural	Engineering	Aesthetic	Edible Parts	When Edible	Water	Soil	Light	
DT=deciduous tree	C=ceiling	L=light	L=line	L=leaves	Y=young	H=high	N=neutral	FS=full sun	
ET=evergreen tree	Wl=wall	A=air	F=form	FR=fruit	M=moderate	M=moderate	Ac=acid	PS=partial shade / sun	
DS=deciduous shrub	Ww>window	Sd=sound	T=texture	SE=seed / nut	R=raw	L=low	Al=alkaline	SH=shade	
ES=evergreen shrub	F=floor	SI=soil	C=color	R=root	C=cooked		W=well-drained		
P=perennial				ST=stem / stalk	D=dried		M=moist		
A=annual				FL=flower			B=bog		
BI=biennial				SH=shoot			R=rich		
DV=deciduous vine							G=good		
EV=evergreen vine							L=light		
G=groundcover							H=heavy		
W=water plant									

Full plant matrix, page 4

Scientific Name	Plant Type		Possible Plant Uses:		Aesthetic	Edible Parts	When Edible	Water	Soil	Light	Common Name
	Architectural	Engineering	Architectural	Engineering							
<i>Fagus spp.</i>	DT		C, Wl, Ww	L, A, Sd, SI	F, C	SE	MC	M	GW	FS	beech
<i>Filipendula vulgaris</i>	P		F	SI	T	L	Y	M	GM	FS	dropwort
<i>Foeniculum vulgare</i>	P		Wl	A, SI	T	L; FL; SE	YR; MR; MD	M	RW	FS	fennel
<i>Fragaria chiloensis</i>	P		F	SI	T	FL; FR	MR; MR	M	GW	FS-PS	beach strawberry
<i>Fragaria moschata</i>	P		F	SI	T	FR	M	M	RM	PS-SH	musk strawberry
<i>Fragaria vesca</i>	P		F	SI	T	FL; FR	MR; MR	M	RM	PS	alpine strawberry
<i>Fragaria x ananassa</i>	P		F	SI	T	FL; FR	MR; MR	M	RM	FS	strawberry
<i>Galium odoratum</i>	P		F	SI	T	L; FL	YR; MR	M	RW	PS-SH	sweet woodruff
<i>Gaultheria miqueliana</i>	G		F	SI	C	FR	MC	M	GM	FS-PS	Japanese gaultheria
<i>Gaultheria procumbens</i>	P		F	SI	C	L; FR	Y; M	M	AcM	PS	wintergreen
<i>Ginkgo biloba</i>	DT		C, Wl, Ww	L, A, Sd, SI	F, T	SE	MC	M	GM	FS	ginkgo
<i>Halesia carolina</i>	DT		C, Wl, Ww	L, A, Sd, SI	F	FR	M	M	RW	PS	Carolina silverbell
<i>Helianthus annuus</i>	A		Wl, Ww	L, A, SI	T, C	FL; SE	MR; M	M	W	FS	sunflower
<i>Helianthus tuberosus</i>	P		Wl, Ww	L, A, SI	T	R	M	M	W	FS	jerusalem artichoke
<i>Hemerocallis spp.</i>	P		Wl	A, SI	F, C	FL; ST; R	variable	M	G	FS-PS	daylily
<i>Hibiscus sabdariffa</i>	A		Wl, Ww	L, A, Sd, SI	T	FL	M	M	RW	FS	roselle
<i>Hibiscus syriacus</i>	DS		C, Wl, Ww	L, A, Sd, SI	F, C	FL	MR	M	W	FS-PS	rose of sharon
<i>Hippophae rhamnoides</i>	DS		Wl	A, SI	F, T, C	FR	M	M	W	FS	sea buckthorn
<i>Houttuynia cordata</i>	G		F	SI	T, C	L	YC	H	GM	PS-SH	houituyinia
<i>Hovenia dulcis</i>	DT		C, Wl, Ww	L, A, Sd, SI	F	FR	MR	H	RM	PS-SH	raisin tree
<i>Humulus lupulus</i>	DV		C, Wl, Ww	L, A, Sd, SI	F, T	FL; SH	MD; Y	H	RW	FS	hops
KEY											
Plant Type	Architectural	Engineering	Aesthetic	Edible Parts	When Edible	Water	Soil	Light			
DT=deciduous tree	C=ceiling	L=light	L=line	L=leaves	Y=young	H=high	N=neutral	Light			
ET=evergreen tree	Wl=wall	A=air	F=form	FR=fruit	M=mature	M=moderate	Ac=acid	FS=full sun			
DS=deciduous shrub	Ww=window	Sd=sound	T=texture	SE=seed / nut	R=raw	L=low	Al=alkaline	PS=partial shade / sun			
ES=evergreen shrub	F=floor	SI=soil	C=color	R=root	C=cooked		W=well-drained	SH=shade			
P=perennial				ST=stem / stalk	D=dried		M=moist				
A=annual				FL=flower			B=bog				
BI=biennial				SH=shoot			R=rich				
DV=deciduous vine							G=good				
EV=evergreen vine							L=light				
G=groundcover							H=heavy				
W=water plant											

Full plant matrix, page 5

Scientific Name	Plant Type	Possible Plant Uses:		Aesthetic	Edible Parts	When Edible	Water	Soil	Light	Common Name
		Architectural	Engineering							
<i>Hyssopus officinalis</i>	P	F	SI	T, C	L; FL	YR; M	M	W	FS-PS	hyssop
<i>Juglans</i> spp.	DT	C, W1, Ww	L, A, Sd, SI	F	SE	M	L	RW	FS	walnut / butternut
<i>Juniperus communis</i>	G, ES	W1, Ww, F	L, A, Sd, SI	L, F, T	FR	M	L	W	FS	common juniper
<i>Juniperus occidentalis</i>	ET	W1, Ww	L, A, Sd, SI	F, T	FR	M	L	W	FS	western juniper
<i>Juniperus osteosperma</i>	ET	W1, Ww	L, A, Sd, SI	F, T	FR	M	L	W	FS	Utah juniper
<i>Juniperus scopulorum</i>	ET	W1, Ww	L, A, Sd, SI	F, T	FR	M	L	W	FS	Rocky Mountain juniper
<i>Lavandula angustifolia</i>	P	W1	A, SI	L, C	FL	MR	L	W	FS	lavender
<i>Lepidium sativum</i>	A	F	SI	T	L	Y	H	RM	FS-PS	garden cress
<i>Lindera benzoin</i>	DS	C, W1, Ww	L, A, Sd, SI	F	L; FR	Y; MD	M	GW	FS-PS	spicebush
<i>Linum</i> spp.	P	F	SI	T	SE	MCD	M	GW	FS	flax
<i>Mahonia</i> spp.	ES	W1, Ww	A, SI	F, T	FR	M	L	GW	FS	oregon grape
<i>Malus</i> spp.	DT	C, W1, Ww	L, A, Sd, SI	F, C	FL; FR	MR; M	M	GW	FS	apple
<i>Malva neglecta</i>	A	W1	A, SI	T	L; SE	YC; Y	M	RW	FS-PS	mallow
<i>Malva sylvestris</i>	P	W1	A, SI	T	L; SE	YC; Y	M	RW	FS-PS	mallow
<i>Matricaria recutita</i>	A	F	SI	T	FL	MD	M	G	FS	chamomile
<i>Melissa officinalis</i>	P	F	SI	T	L	Y	M	R	FS-PS	lemon balm
<i>Mentha</i> spp.	P	W1, F	SI	T	L; FL	YR; M	M	RW	PS	mint
<i>Mespilus germanica</i>	DT	C, W1, Ww	L, A, Sd, SI	F	FR	M	M	GW	FS	medlar
<i>Mitchella repens</i>	P	F	SI	C	FR	M	M	GM	PS	twinberry
<i>Momordica charantia</i>	A	W1, Ww, F	L, A, Sd, SI	F, T	FR	YC	M	RW	FS	bitter melon
<i>Monarda didyma</i>	P	W1	A, SI	T, C	FL	MR	M	MW	FS-PS	bee balm
KEY										
Plant Type	Architectural	Engineering	Aesthetic	Edible Parts	When Edible	Water	Soil		Light	
DT=deciduous tree	C=ceiling	L=light	L=line	L=leaves	Y=young	H=high	N=neutral		FS=full sun	
ET=evergreen tree	W=wall	A=air	F=form	FR=fruit	M=mature	M=moderate	Ac=acid		PS=partial shade / sun	
DS=deciduous shrub	Ww>window	Sd=sound	T=texture	SE=seed / nut	R=raw	L=low	Al=alkaline		SH=shade	
ES=evergreen shrub	P=floor	SF=soil	C=color	R=root	C=cooked		W=well-drained			
P=perennial				ST=stem / stalk	D=dried		M=moist			
A=annual				FL=flower			B=bog			
BI=biennial				SH=shoot			R=rich			
DV=deciduous vine							G=good			
EV=evergreen vine							L=light			
G=groundcover							H=heavy			
W=water plant										

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Scientific Name	Possible Plant Uses:				Edible Parts	When Edible	Water	Soil	Light	Common Name
	Plant Type	Architectural	Engineering	Aesthetic						
<i>Monia perfoliata</i>	P		SI	T	L	Y	M	G	FS	miner's lettuce
<i>Morus alba</i>	DT	C, W1, Ww	L, A, Sd, SI	F	FR	M	M	G	FS	white mulberry
<i>Morus rubra</i>	DT	C, W1, Ww	L, A, Sd, SI	F	FR	M	M	G	FS	red mulberry
<i>Myrrhis odorata</i>	A	F	SI	T	L; FL; SE	Y; M; Y	M	R	PS-SH	sweet cicely
<i>Nelumbo</i> spp.	W	F	SI	T, C	L; SE; R	variable	H	R	FS	lotus
<i>Nepeta cataria</i>	P	W1, F	SI	T	L	Y	M	GW	FS-PS	catnip
<i>Nuphar</i> spp.	W	F	SI	T, C	SE; R	MD; Y	H	G	FS	pond lily
<i>Nyssa sylvatica</i>	DT	C, W1, Ww	L, A, Sd, SI	F, C	FR	M	M	AcGW	FS-PS	sour gum
<i>Ocimum basilicum</i>	A	F	SI	C	L; FL	YD; M	M	RW	FS	basil
<i>Opuntia</i> spp.	P	W1	A, SI	F, T	FR	M	L	W	FS	prickly pear cactus
<i>Origanum heracleoticum</i>	P	F	SI	T	L; FL	YRD	M	RM	FS	oregano
<i>Origanum vulgare</i>	P	F	SI	T	L; FL	YRD	L	AIW	FS	marjoram
<i>Osmunda cinnamomea</i>	FERN	W1, F	A, SI	F, T	fiddlehead	YC	H	AcM	PS	fiddlehead fern
<i>Paeonia</i> spp.	P	W1	A, SI	T	R	MC	M	GW	FS-PS	herbaceous peony
<i>Papaver orientale</i>	P	W1	A, SI	T, C	FL head	YC	M	GW	FS	oriental poppy
<i>Papaver rhoeas</i>	A	W1	A, SI	T, C	FL head	YC	M	GW	FS	shirley poppy
<i>Pelargonium</i> spp.	A	F	SI	T	FL	MR	L	W	FS-PS	scented geranium
<i>Perilla frutescens</i>	A	F	SI	T	L; FL; SE	Y; Y; Y	M	GW	FS	shiso
<i>Perovskia atriplicifolia</i>	P	F	SI	F, T	FL	M	L	GW	FS	russian sage
<i>Petroselinum crispum</i>	A	F	SI	T	L	Y	M	R	FS	parsley
<i>Phaseolus</i> spp.	A	W1, Ww, F	L, A, Sd, SI	L, T	FR; SE	Y; MD	M	GW	FS	bean
KEY										
Plant Type	Architectural	Engineering	Aesthetic	Edible Parts	When Edible	Water	Soil		Light	
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DS=deciduous shrub	Ww>window	Sf=sound	T=texture	SE=seed / nut	R=raw	L=low	Al=alkaline		SH=shade	
ES=evergreen shrub	F=floor	SI=soil	C=color	R=root	C=cooked		W=well-drained			
P=perennial				ST=stem / stalk	D=dried		M=moist			
A=annual				FL=flower			B=bog			
BI=biennial				SH=shoot			R=rich			
DV=deciduous vine							G=good			
EV=evergreen vine							L=light			
G=groundcover							H=heavy			
W=water plant										

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Scientific Name	Plant Type	Possible Plant Uses:			Aesthetic	Edible Parts	When Edible	Water	Soil	Light	Common Name
		Architectural	Engineering	Aesthetic							
<i>Pimpinella anisum</i>	A	F	SI	T	L; SE	Y; MD	M	GM	FS	anise	
<i>Pinus</i> spp.	ET	C, Wl, Ww	L, A, Sd, SI	F, T	SE	M	L	GW	FS-PS	pinon / stone pine	
<i>Pontederia cordata</i>	W	F	SI	C	ST; SE	Y; M	H	G	FS-PS	pickereel weed	
<i>Portulaca oleracea</i>	A	F	SI	T	L; ST	Y	M	G	FS	purslane	
<i>Primula veris</i>	A	F	SI	C	L	Y	M	G	PS-SH	cowslip	
<i>Primula vulgaris</i>	A	F	SI	C	L; FL	Y; M	M	G	PS-SH	English primrose	
<i>Prunus armeniaca</i>	DT	C, Wl, Ww	L, A, Sd, SI	F	FR	M	L	W	FS	apricot	
<i>Prunus avium</i>	DT	C, Wl, Ww	L, A, Sd, SI	F	FR	M	M	LW	FS	sweet cherry	
<i>Prunus besseyi</i>	DS	Wl, Ww	A, SI	F	FR	M	L	GW	FS	western sand cherry	
<i>Prunus cerasifera</i>	DT	C, Wl, Ww	L, A, Sd, SI	F, C	FR	M	L	RW	FS	purple leaf plum	
<i>Prunus cerasus</i>	DT	C, Wl, Ww	L, A, Sd, SI	F	FR	M	M	LW	FS	sour cherry	
<i>Prunus dulcis</i>	DT	C, Wl, Ww	L, A, Sd, SI	F	SE	M	L	W	FS	almond	
<i>Prunus hybrids</i>	DT	C, Wl, Ww	L, A, Sd, SI	F	FR	M	L	RW	FS	plum / apricot hybrid	
<i>Prunus insititia</i>	DT	C, Wl, Ww	L, A, Sd, SI	F	FR	M	L	RW	FS	damson plum	
<i>Prunus japonica</i>	DS	Wl, Ww	A, SI	F	FR	M	L	GW	FS	Japanese bush cherry	
<i>Prunus maritima</i>	DS	Wl, Ww	A, SI	F	FR	M	L	GW	FS	beach plum	
<i>Prunus persica nucipersica</i>	DT	C, Wl, Ww	L, A, Sd, SI	F	FR	M	M	LW	FS	nectarine	
<i>Prunus persica</i>	DT	C, Wl, Ww	L, A, Sd, SI	F	FR	M	M	LW	FS	peach	
<i>Prunus salicina</i>	DT	C, Wl, Ww	L, A, Sd, SI	F	FR	M	L	RW	FS	Japanese plum	
<i>Prunus tomentosa</i>	DS	Wl, Ww	A, SI	F, T	FR	M	L	GW	FS	Nanking cherry	
<i>Prunus x domestica</i>	DT	C, Wl, Ww	L, A, Sd, SI	F	FR	M	L	RW	FS	European plum	
KEY											
Plant Type	Architectural	Engineering	Aesthetic	Edible Parts	When Edible	Water	Soil		Light		
DT=deciduous tree	C=ceiling	L=light	L=line	L=leaves	Y=young	H=high	N=neutral		FS=full sun		
ET=evergreen tree	W=wall	A=air	F=form	FR=fruit	M=mature	M=moderate	Ac=acid		PS=partial shade / sun		
DS=deciduous shrub	Ww>window	Sd=sound	T=texture	SE=seed / nut	R=raw	L=low	Al=alkaline		SH=shade		
ES=evergreen shrub	F=floor	Sf=soil	C=color	R=root	C=cooked		W=well-drained				
P=perennial				ST=stem / stalk	D=dried		M=moist				
A=annual				FL=flower			B=bog				
BI=biennial				SH=shoot			R=rich				
DV=deciduous vine							G=good				
EV=evergreen vine							L=light				
G=groundcover							H=heavy				
W=water plant											

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Scientific Name	Plant Type	Possible Plant Uses:				Aesthetic	Edible Parts	When Edible	Water	Soil	Light	Common Name
		Architectural	Engineering	Engineering	Engineering							
<i>Pyrus communis</i>	DT	C, Wl, Ww	L, A, Sd, Sl	F	FR	M	M	M	GW	FS	European pear	
<i>Pyrus pyrifolia</i>	DT	C, Wl, Ww	L, A, Sd, Sl	F	FR	M	M	M	GW	FS	Asian pear	
<i>Rheum x cultorum</i>	P	Wl, F	A, Sl	F, T	ST only	M	M	H	AcRW	FS	rhubarb	
<i>Ribes</i> spp.	DS	Wl	A, Sl	F, T	FR	M	M	L	GW	FS-PS	currant / gooseberry	
<i>Rosa</i> spp.	DS, ES, V	C, Wl, Ww	L, A, Sd, Sl	L, F, T	L; FL; FR	YD; MR; M	YD; MR; M	M	G	FS	rose	
<i>Rosmarinus officinalis</i>	ES	Wl	A, Sl	F, T	L; FL	Y; MR	Y; MR	L	LW	FS	rosemary	
<i>Rubus chamaemorus</i>	P	Wl	A, Sl	T	FR	M	M	M	RM	PS	cloudberry	
<i>Rubus</i> spp.	DV	Wl	A, Sl	L, T	FR	M	M	M	GW	FS	brambleberries	
<i>Salvia officinalis</i>	P	F	Sl	C	L; FL	YRD; M	YRD; M	M	GW	FS	sage	
<i>Sambucus canadensis</i>	DS	Wl, Ww	L, A, Sd, Sl	F, T	FL; FR	MC; M	MC; M	M	G	FS	blue elderberry	
<i>Shepherdia</i> spp.	DS	Wl, Ww	A, Sl	F	FR	MC	MC	M	GW	FS-PS	buffaloberry	
<i>Sorbus</i> spp.	DT	C, Wl, Ww	L, A, Sd, Sl	F, T, C	FR	M	M	M	GW	FS-PS	mountain ash	
<i>Stachys lanata</i>	P	F	Sl	T	L	YD	YD	M	W	FS-PS	lamb's ears	
<i>Stevia rebandiana</i>	A	F	Sl	C	L	Y	Y	M	GW	FS	sugar leaf	
<i>Syringa vulgaris</i>	DS	Wl, Ww	L, A, Sd, Sl	F, C	FL	MR	MR	M	NW	FS-PS	lilac	
<i>Tagetes tenuifolia</i>	A	F	Sl	T, C	FL	MR	MR	M	RW	FS	signet marigold	
<i>Thymus</i> spp.	P	F	Sl	T	L; FL	YR; MR	YR; MR	M	GW	FS	thyme	
<i>Trifolium</i> spp.	G	F	Sl	C	L; FL	YC; YCD	YC; YCD	M	G	FS	clover	
<i>Tropaeolum majus</i>	A	Wl, F	L, A, Sl	C	L; FL; FR	YR; MR; Y	YR; MR; Y	M	G	FS-PS	nasturtium	
<i>Tulbaghia violacea</i>	P	F	Sl	F	FL	MR	MR	M	RM	FS	society garlic	
<i>Tulipa</i> spp.	P	Wl, F	Sl	F, C	FL	MR	MR	M	W	FS	tulip	
KEY												
Plant Type	Architectural	Engineering	Aesthetic	Edible Parts	When Edible	Water	Soil	Light				
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ES=evergreen shrub	F=floor	Sl=soil	C=color	R=root	C=cooked		W=well-drained					
P=perennial				ST=stem / stalk	D=dried		M=moist					
A=annual				FL=flower	B=bog		B=bog					
Bl=biennial				SH=shoot	R=rich		R=rich					
DV=deciduous vine					G=good		G=good					
EV=evergreen vine					L=light		L=light					
G=groundcover					H=heavy		H=heavy					
W=water plant												

Full plant matrix, page 9

Scientific Name	Possible Plant Uses:				Aesthetic	Edible Parts	When Edible	Water	Soil	Light	Common Name
	Plant Type	Architectural	Engineering	Engineering							
<i>Typha latifolia</i>	W		W1	A, SI	L, T	FL; SH; R	YC; YC; MCD	H	G	FS	common cattail
<i>Vaccinium angustifolium</i>	DS		W1	A, SI	F, C	FR	M	H	AcM	FS	hardy blueberry
<i>Vaccinium corymbosum</i>	DS		W1	L, A, Sd, SI	F, C	FR	M	H	AcM	FS	highbush blueberry
<i>Vaccinium macrocarpon</i>	ES		F	SI	F, T	FR	M	H	AcB	FS-PS	cranberry
<i>Vaccinium myrtillus</i>	DS		W1	A, SI	C	FR	M	M	AcB	PS	bilberry
<i>Vaccinium parvifolium</i>	DS		W1	A, SI	F	FR	M	H	AcM	FS-PS	red huckleberry
<i>Vaccinium vitis-idaea</i>	ES		F	SI	C	FR	M	H	AcRM	PS-SH	cowberry
<i>Vaccinium v.-i. var. minus</i>	ES		F	SI	C	FR	M	H	AcRM	PS-SH	lingonberry
<i>Viburnum</i> spp.	DS, ES		W1, Ww	L, A, Sd, SI	F, C	FR	M	M	GW	FS-PS	viburnum
<i>Vigna sinensis sesquipedalis</i>	A		W1, Ww, F	L, A, Sd, SI	L, T	FR	Y	M	GW	FS	asparagus bean
<i>Viola cornuta</i>	A		F	SI	C	FL	MR	M	R	PS	viola
<i>Viola odorata</i>	A		F	SI	T	FL	MR	M	R	SH	violet
<i>Viola tricolor</i>	A		F	SI	C	FL	MR	M	R	PS	johnny jump-up
<i>Viola x wittrockiana</i>	A		F	SI	C	FL	MR	M	R	PS	pansy
<i>Vitis</i> spp.	DV		C, W1, Ww	L, A, Sd, SI	L, T	L; FR	Y; M	M	RW	FS	grape
<i>X Sorbopyrus auricularis</i>	DT		C, W1, Ww	L, A, Sd, SI	F	FR	M	M	GW	FS	shipova
<i>Xanthoceras sorbifolia</i>	DT		C, W1, Ww	L, A, Sd, SI	F	SE	MD	M	GW	FS	goldenhorn tree
<i>Yucca arizonica</i>	P		W1	A, SI	F, T	FL; FR	MD; M	L	LW	FS	wide-leaf yucca
<i>Yucca baccata</i>	P		W1	A, SI	F, T	FL; FR	MD; M	L	LW	FS	datil
<i>Yucca filamentosa</i>	P		W1	A, SI	F, T	FL; FR	MD; M	L	LW	FS	Adam's needle yucca
<i>Zizania aquatica</i>	W		W1, Ww	A, Sd, SI	L, F, T	SE	M	H	R	FS	wild rice
KEY											
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