

# **Trees, Spirituality, and Science**

## **A Guide to the Trees**

of  
**The First Unitarian Church of Salt Lake City**



569 South 1300 East  
Salt Lake City, Utah 84102

***“Trees are the earth’s endless effort to speak to the listening heaven.”***

*-- Rabindranath Tagore, Indian poet, 1861-1941, Fireflies*

## About This Guide

Trees hold an important place in the spiritual beliefs of many cultures and religions. With roots deep in the soil and branches extending skyward, trees sustain both physical and spiritual connections between Earth and the heavens.

Use this booklet to learn about the unique features of the trees under the care of the First Unitarian Church of Salt Lake City. You will find inspirational quotes and poetry from a variety of authors, naturalists, and spiritual leaders.



This guide was created by Jennifer Baguley and the University of Utah’s Center for Science and Mathematics Education (CSME, [www.csme.utah.edu](http://www.csme.utah.edu)). It is part of an effort to engage faith-based communities into a greater awareness, understanding, and stewardship of trees and other aspects of nature and science. The booklets were produced as a part of the Research Ambassador Program, an effort to engage scientists with public audiences. The Research Ambassador Program is supported by a grant from the National Science Foundation [DEB-1141833].



## Glossary of Terms

### Tree Shape

Tree canopies can take a variety of forms as they mature:

- Conical: oval at the base, elongated and tapering at the top
- Oval: elliptical, resembling an egg
- Rounded: ball-like or circular
- Umbrella: branches extending outward and down
- Vase: narrow base, widening and arching outward at the top

### Flowers

There are three broad categories of tree flowers:

- Perfect flowers = male and female parts in each flower
- Monoecious = separate male and female flowers on the same tree
- Dioecious = either male or female flowers

### Fruit

Tree fruits come in different shapes and sizes. Many of the terms used to describe fruits are self-explanatory (e.g. nut, capsule, winged seed). Other terms include:

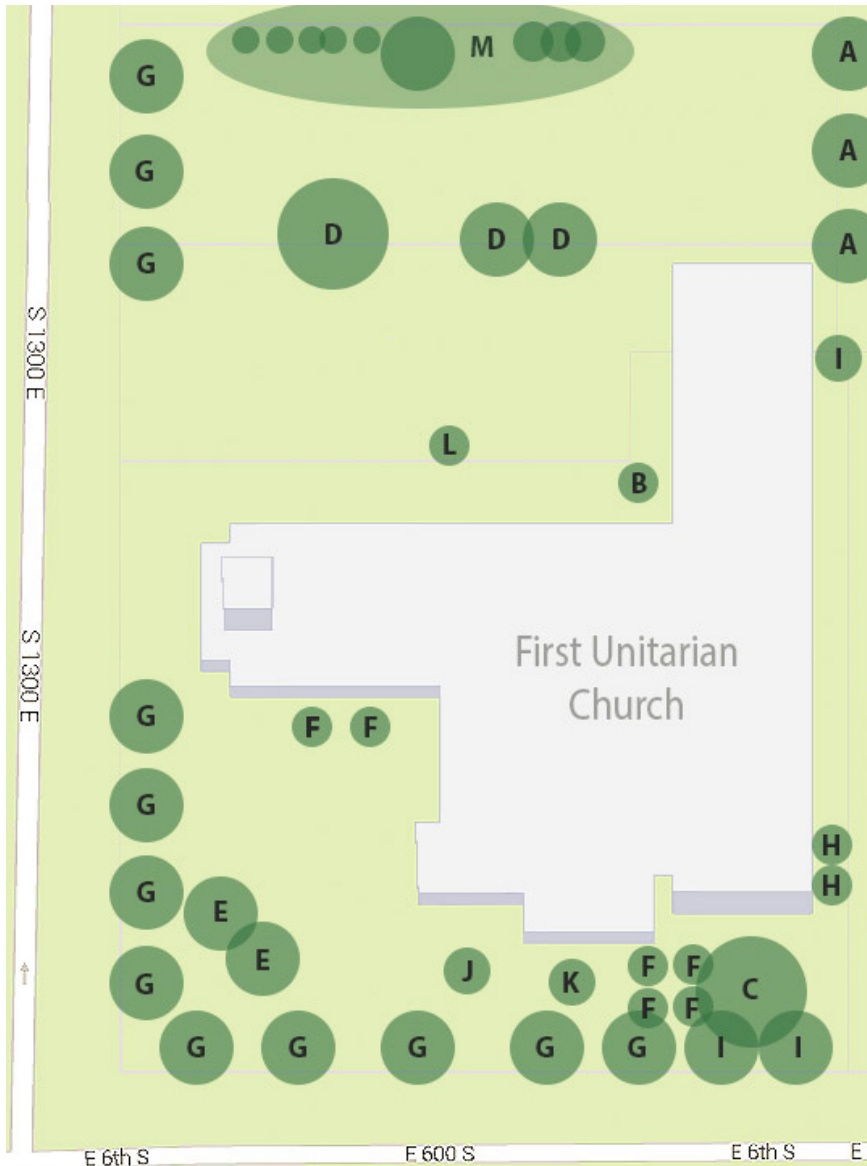
- Drupe: fruit with outer skin and a central stone, e.g., a plum
- Cone: dry fruit of overlapping scales that release seeds
- Pome: fruit with a tough central core, e.g., an apple or pear
- Pod: elongated seed vessel

***“In our totality we are born of the Earth. Our spirituality itself is earth-derived... If there is no spirituality in the earth, then there is no spirituality in ourselves.”***

*-- Thomas Berry, priest and Earth scholar, 1914-2009*

# Tree Reference Map

This map illustrates the trees on the grounds of the First Unitarian Church in Fall, 2013. Use the key on page 5 to identify the trees, and turn to the corresponding page number for more information.



Symbol	Common Name	Page Number
A	Green Ash	6
B	Purple European Beech	7
C	Colorado Blue Spruce	8
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## Green Ash



The Green Ash, *Fraxinus pennsylvanica*, is native to the eastern United States and is related to the lilac. Its wood is tough and often used for woodworking. Ash trees are threatened by wood-boring beetles that tunnel destructively beneath the bark to feed.



***"God is the experience of looking at a tree and saying, 'Ah!'"***

*-- Joseph Campbell, writer, 1904-1987*

Shape	Oval
Height	50 ft (15 m)
Canopy Width	70 ft (21 m)
Longevity	150 years or more
Flower	Inconspicuous. Dioecious. Flowers in spring.
Fruit	Beige, brown, yellow or mostly green winged seed, large (1-3 in, 3-8 cm), fruit in summer or fall.

### Tree Rings

Counting tree rings is a simple, but effective way to tell the age of trees in the temperate zone. Trees add one ring of growth for each growing season. The size of the ring indicates the success of that growing season. Times of drought, fire, or insect damage can be reflected in the size and shape of tree rings. The same conditions that impact a tree's growth are felt by people as well. Tree rings can be used as a living record of our past.



## Purple European Beech



Purple European Beech, *Fagus sylvatica* 'Atropunicea', has a columnar structure. Its leaves emerge deep purple and then fade to a purple-green in the summer. This slow-growing tree is somewhat tolerant of heat and dry soil, but grows best with adequate moisture.

Shape	Conical, oval, or rounded
Height	35 ft (11 m)
Canopy Width	20 ft (6 m)
Longevity	50-150 years
Flower	Inconspicuous. Flowers in spring. Monoecious.
Fruit	Brown nut in spiny husk, medium (less than 2 in, 4 cm), fruit in fall. Edible.



***"In a tree's highest boughs, the world rustles, its roots rest in infinity."***

*-- Herman Hesse, poet, 1877-1962*



### Stress Response in Trees

As with most living things, trees can show physical signs of environmental stress. Beech trees are susceptible to aphids, spider mites, and various types of rot. Like us, a tree under stress is less able to fight off illness. Providing a nurturing, healthy environment gives trees - and people - a stronger foundation for success.

# Colorado Blue Spruce



The Blue Spruce, *Picea pungens* 'Glauca', is the state tree of Utah. The specimen on the church grounds is estimated to be 75 years old. It has a co-dominant structure, with two trunks growing together. This type of trunk is a common feature in street, highway, and park trees.



Shape	Conical
Height	30-65 ft (9-20 m)
Canopy Width	10 - 20 ft (3-6 m)
Longevity	Greater than 150 years
Flower	Inconspicuous. Flowers in spring. Monoecious.
Fruit	Large brown cone, (over 3 in, 8 cm), fruit in fall or winter.

***"Between every two pines is a doorway to a new world."***

*-- John Muir, naturalist, 1838-1914*

### About Co-dominant Trunks

Most tree species evolved in forest communities. Due to natural shading from close spacing, most forest trees do not retain low limbs, so multi-trunk or co-dominant stems are rare in a naturally occurring forest.

However, those same species planted in the open, sunny environments of our yards and along our streets will not develop the same way. Because sunlight reaches the lower part of the canopy, trees retain these lower limbs, and trees in urban settings are more likely to develop co-dominant trunks.

Trees, much like humans, grow differently in different settings. They grow taller when closely surrounded by others, but more broadly when they are given space and other resources.

# Box Elder



Box Elder, *Acer negundo*, is perhaps one of the best known species in the maple family. The trees on the church grounds are most likely volunteers. It is not common to deliberately plant this species of tree because Boxelder Bugs, a highly specialized insect that feeds almost exclusively on maple seeds, can be a nuisance. Box Elders have beautiful fall colors with vibrant orange hues.

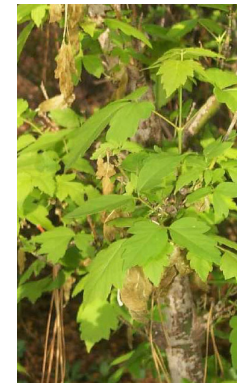
Shape	Rounded or umbrella
Height	Up to 60 ft (18 m)
Canopy Width	50 ft (15 m)
Longevity	50-150 years
Flower	Inconspicuous, green. Flowers in spring. Dioecious.
Fruit	Prolific, beige or red winged seed, medium (less than 2 in, 1 cm), fruit in summer.

### Trees and Water Usage

Utah is an arid region with few native trees, and water is a precious commodity. Most of the trees native to the Salt Lake Valley are a part of the Jordan River riparian habitat. These include Box Elder, Fremont Cottonwood, Peach-leaf Willow, and River Hawthorn.

Water use is an important consideration when planting trees in any urban setting, but it is especially important when planting trees in an arid environment. In Utah, urban landscape irrigation accounts for 50-75% of the annual municipal water use. The following is a list of drought-tolerant trees compiled by Utah State University. There are many examples of water-wise trees on the grounds of the Unitarian Church.

Amur Corktree	Black Locust
Box Elder	Eastern Redbud
Elm (many varieties)	Hawthorns (Most)
Honey Locust	Juniper (many varieties)
Kentucky Coffeetree	Maple (many varieties)
Northern Catalpa	Oak (many varieties)
Pear (common)	Pine (many varieties)



***"To plant trees is to give body and life to one's dreams of a better world."***

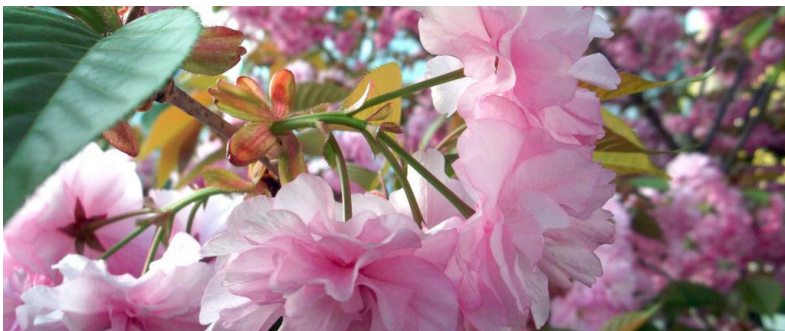
*-- Russell Page, landscape architect, 1906-1985*



## Flowering Cherry

The Kwanzan Japanese Flowering Cherry Tree, *Prunus serrulata* 'Kwanzan,' is "utility-friendly", meaning it is small, reaching 25 feet or less at maturity, and does not interfere with power lines. This species has fragrant, colorful spring blossoms.

Shape	Oval, rounded, or umbrella
Height	25 ft (8 m)
Canopy Width	25 ft (8 m)
Longevity	40 - 150 years
Flower	Showy, fragrant, or pink perfect. Flowers in spring.
Fruit	Small black drupe (less than 1 in, 2 cm), fruit in fall, winter or summer.



***If ours were a world  
Where blossoming cherry trees  
were not to be found  
What tranquility would bless  
The human heart in springtime!***

*-- Ariwara no Narihara, Japanese waka poet, 825-880 AD*

### Spiritual Chemistry

Our connection to trees is as essential as the air we breathe. When humans breathe, we exhale carbon dioxide. Trees use this same carbon dioxide for their own energy. Trees take in carbon dioxide and, using the sunlight as fuel through the process of photosynthesis, convert carbon dioxide and water into sugar. Trees then "exhale" oxygen, which is used by humans. Through this give and take, the use and reuse of materials, we recognize our spiritual connection with trees.



## Washington Hawthorn

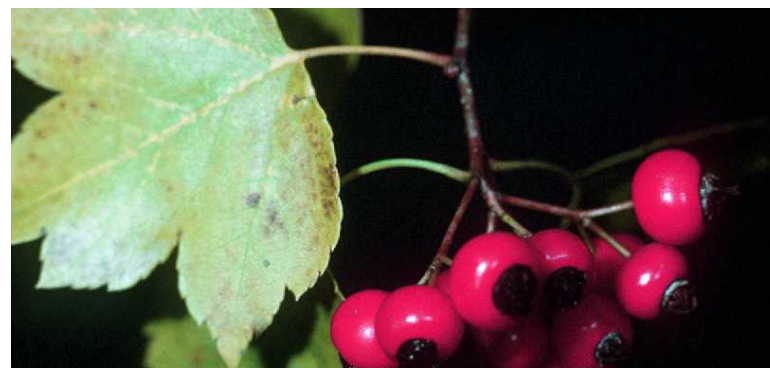
The Washington Hawthorn, *Crataegus phaenopyrum*, is a small flowering tree native to the southeastern United States. The flowers often attract bees, and the berries in fall provide a showy accent. This is a hardy tree, making it a popular choice for urban settings. It also provides food, shelter, cover, and nesting for many kinds of birds and wildlife.

The thorns on a Washington Hawthorn are a good example of how trees use defense mechanisms to protect themselves. Sharp and numerous, the slender thorns are can be up to 3 inches long.

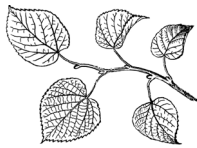
Shape	Rounded, umbrella, or vase
Height	25 ft (8 m)
Canopy Width	20 -25 ft (6-8 m)
Longevity	50 - 150 years
Flower	Showy, white perfect flowers in spring or summer
Fruit	Prolific. Large red pome (1-3 in, 4-8 cm), fruit in fall or winter.

***"For me, trees have always been the most penetrating preachers. Trees are sanctuaries. Whoever knows how to speak to them, whoever knows how to listen to them, can learn the truth. They do not preach learning and precepts, they preach, undeterred by particulars, the ancient law of life."***

*-- Herman Hesse, poet, 1877-1962*



## Littleleaf Linden



The Littleleaf Linden, *Tilia cordata*, is native to England and western Europe. It is sometimes referred to as a “lime tree” in the British Isles, even though it is not related to the lime fruit. Lindens are some of the largest trees in England, with lifespans of up to 600 years. They are common in Salt Lake City’s urban forest because they are resistant to cold weather and storm damage. Their leaves display a lemon yellow in the autumn.

Shape	Conical, oval, or umbrella
Height	30-50 ft (9-15 m)
Canopy Width	15-30 ft (4-9 m)
Longevity	50 to 150 years (can live up to 600 years)
Flower	Showy, fragrant, yellow or white. Flowers in summer. Perfect flowers.
Fruit	Gray or green capsule, small (less than 1 in, 2 cm), fruit in fall.

***“Us sing and dance, make faces and give flower bouquets, trying to be loved. You ever notice that trees do everything to git attention we do, except walk?”***

*--Alice Walker, American writer, 1982-present, The Color Purple*

### Trees in Motion

Although tree trunks appear solid and unmoving, the diameter of a tree trunk changes throughout the day because of changes in water content of the trunk. The diameter of the stem is largest just before sunrise because the tree has taken up water. As dawn breaks, the tree begins to lose its water through transpiration and the trunk diameter starts to shrink. The stem diameter is at its minimum in the afternoon, when light is brightest and the temperature peaks. Although trees may seem stable and unmoving, they, like humans, are dynamic.



## Japanese Maple



The Japanese Maple, *Acer palmatum*, is a slow-growing, ornamental tree that is native to Japan and Korea. It grows best near shelter and is often planted close to homes and buildings. The deeply lobed leaves are red or reddish-purple and may turn green in the summer.

Shape	Rounded, umbrella, or vase
Height	25 ft (8 m)
Canopy Width	30 ft (9 m)
Longevity	50 - 150 years
Flower	Inconspicuous, purple. Flowers in spring. Monoecious.
Fruit	Brown winged seed, medium (less than 2 in, 5 cm), fruit in summer.



### Japanese Spirituality

Shinto is the indigenous spirituality of the people of Japan, who worship Kami as nature spirits. Kami are not separate from nature, but are of nature, possessing good and evil characteristics. They are manifestations of Musubi, the interconnecting energy of the universe, and are what humanity should strive towards.

***“The natural world is our bible. We don’t have chapters and verses; we have trees and fish and animals.”***

*-- John Mohawk, social activist, member of the Turtle Clan of Seneca Indians, 1945-2006*



# Norway Maple



The Norway Maple, *Acer platanoides*, is native to eastern and central Europe and southwest Asia. It tolerates a wide variety of soils, slight alkali, and smog. It is a drought tolerant species, but grows best in moist soils.

***“And this, our life, exempt from public haunt, finds tongues in trees, books in the running brooks, sermons in stones, and good in everything.”***

*-- William Shakespeare, playwright, 1564-1616, “As You Like It”*



Shape	Rounded
Height	65 ft (20 m)
Canopy Width	50 ft (15 m)
Longevity	50-150 years
Flower	Green or yellow. Flowers in spring. Monoecious.
Fruit	Brown winged seed, large (1-3 in, 4-8 cm), fruit in summer.

## Trees: An Ecosystem

An ecosystem is a community of living organisms (plants, animals, and microbes) in conjunction with the non-living components of their environment (air, water, and minerals in the soil), interacting as a system. Trees play an important role in many ecosystems and can, themselves, contain all the components of an ecosystem. The roots of a tree absorb water, air, and nutrients with the help of beneficial microorganisms, such as bacteria and fungi. These fungi can then become food for various small organisms, such as worms and insects.

The trunk and branches can play host to mosses and lichens, which then become food for insects, providing food for birds and small mammals. The tree also provides sap, nectar, and fruit, which are consumed by animals.

Additionally, trees provide important habitats for a large variety of animals and are used by people in a variety of ways - for food, shelter, and deep and varied connections to spirituality.

# Crimson King Norway Maple



The Crimson King Norway Maple, *Acer platanoides* ‘Crimson King,’ is a cultivar of the Norway Maple. The purple-green foliage throughout the summer turns brown, dark maroon, or bronze before dropping in the fall. Maples are often chosen for urban forests because they are relatively fast-growing.



## Cultivars

Selective propagation of plants can result in new plant varieties, or cultivars. Cultivars have been created for many of the plants that are popular for gardening and agriculture. They are developed to accommodate different growing seasons, disease resistance, or aesthetics. Although the Norway Maple and Crimson King Norway Maple are the same species, they have been cultivated to have very different appearances.

Shape	Rounded
Height	50 ft (15 m)
Canopy Width	40 ft (12 m)
Longevity	50 - 150 years
Flower	Inconspicuous, green or yellow. Flowers in spring. Monoecious.
Fruit	Winged seed, large (1-3 in, 4-8 cm), fruit in summer or fall.

***Every tree, every growing thing as it Grows says this truth: You harvest what***

***You sow. With life as short as a half-Taken breath, don't plant anything but***

***Love.***

*-- Rumi, poet and Sufi mystic, 1207-1273 AD, “Every Tree”*





## Silver Maple



The Silver Maple, *Acer saccharinum*, is so named for the silvery underside of its leaf. Its bark takes on a distinctive look of “ski tracks”. In the eastern U.S., the large rounded buds are one of the primary food sources for squirrels during the spring, after many acorns and nuts have sprouted and food is scarce. The seeds are also a food source for many birds including evening grosbeaks, finches, wild turkeys, and ducks, and small mammals. The bark is eaten by beaver and deer. The trunks often produce cavities, which shelter squirrels, raccoons, opossums, owls and woodpeckers.

Shape	Oval or rounded
Height	40-100 ft (12-30 m)
Canopy Width	50 ft (15 m)
Longevity	50 -150 years
Flower	Inconspicuous green or yellow. Flowers in spring. Monoecious.
Fruit	Beige or brown winged seeds, large (1-3 in, 4-8 cm), fruit in summer.



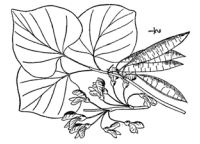
***“He who plants a tree plants hope.”***

*-- Lucy Larcom, poet, 1824-1893, “Plant a Tree”*

***“The wonder is that we can see these trees and not wonder more.”***

*-- Ralph Waldo Emerson, essayist and poet, 1803-1882*

## Eastern Redbud



The Eastern Redbud, *Cercis canadensis*, is known as the “harbinger of spring” because it is one of the first trees to emerge after winter. It is a small tree with zigzagged limbs. It has lavender flowers and heart shaped leaves.

***The rising hills, the slopes,  
of statistics  
lie before us.  
the steep climb  
of everything, going up,  
up, as we all  
go down.***

***In the next century  
or the one beyond that,  
they say,  
are valleys, pastures,  
we can meet there in peace  
if we make it.***

***To climb these coming crests  
one word to you, to  
you and your children:***

***stay together  
learn the flowers  
go light***

*-- Gary Snyder, poet, 1930-present,  
“For the Children”*



### Trees and Healing

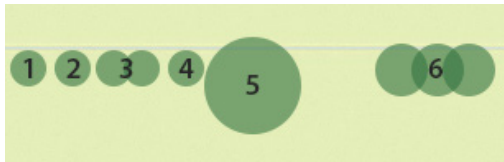
In December 2012, Salt Lake City planted 28 Eastern Redbud trees at the entrance to the Salt Lake City Cemetery as a memorial to the victims of the December 14th shooting at Sandy Hook Elementary in Newtown, Connecticut. The trees, which are native to Connecticut, represent the children and teachers who died there.



Shape	Rounded or umbrella
Height	20 -30 ft (6-9 m)
Canopy Width	15 - 35 ft (5-11 m)
Longevity	40 -150 years
Flower	Showy pink or rose perfect flowers in spring.
Fruit	Brown, purple or mostly green pod, large (1-3 in, 4-8 cm), fruit in summer.

## Commemorative Fruit Tree Grove

A variety of fruit trees flourish on the grounds of the Unitarian Church. Many of the trees were planted in commemoration of church members. The fruit from these trees provides nourishment to people, birds, rodents, and insects. Use the diagram below to identify each tree.



- 1 Elberta Peach
- 2 Asian Pear (Shinseiki)
- 3 Green Gage Plum
- 4 Sweet Cherry
- 5 Apple
- 6 Wild Plum

### Apple (*Malus spp.*)



Shape	Rounded, umbrella, or vase
Height	20 ft (6 m)
Longevity	50 -150 years
Flower	Showy, fragrant, pink or white. Flowers in spring. Has perfect flowers.
Fruit	Prolific, red, yellow or mostly green pome, fruit in summer or fall.

### Sweet Cherry (*Prunus avium*)



Shape	Oval, rounded, or umbrella
Height	35 ft (11 m)
Longevity	Less than 50 years
Flower	Showy, fragrant, pink or white. Flowers in spring or winter. Has perfect flowers.
Fruit	Prolific, black, purple, red or yellow drupe, medium (less than 2 in, 5 cm), fruiting in spring or summer. Edible.



#### Seed Dispersal

Fruits contain seeds that promote seed dispersal in different ways. While winged seed pods are lightweight and blown from the tree by wind, heavier fruits such as drupes rely on birds and rodents to ingest the fruit and spread the seeds.

## Commemorative Grove (cont.)

### Peach (*Prunus persica*)



Shape	Rounded, umbrella, or vase
Height	25 ft (8 m)
Longevity	less than 50 years
Flower	Showy, pink, rose or white. Flowers in spring. Perfect flowers.
Fruit	Prolific, orange, red, yellow or mostly green drupe, very large (over 3 in, 8 cm), fruiting in spring or summer. Edible.

### Asian Pear (*Pyrus pyrifolia*)



Shape	Oval or rounded
Height	25 ft (8 m)
Longevity	50-100 years
Flower	Showy, white. Flowers in spring. Perfect flowers.
Fruit	Brown, yellow or mostly green pome, very large (over 3 in, 8 cm), fruiting in summer.

### Plum (*Prunus domestica* and *Prunus americana*)



There are two types of plums at the Unitarian Church: European Plum (*Prunus domestica*) and Wild Plum (*Prunus americana*). These trees have a different shape, and the fruit has a different appearance.

#### European Plum

#### Wild Plum

Shape	Oval, rounded, or umbrella	Rounded, umbrella, or vase
Height	25 ft (8 m)	
Longevity	40 -150 years	less than 50 years
Flower	Showy, fragrant, white. Flowers in spring. Perfect flowers.	
Fruit	Prolific, black, yellow or mostly green drupe, medium (less than 2 in, 5 cm), fruit in summer. Edible.	Purple, red or yellow drupe, medium (less than 2 in, 5 cm), fruit in summer. Edible.

# Lost

*by David Wagoner*

Stand still. The trees ahead and bushes beside you  
Are not lost. Wherever you are is called Here,  
And you must treat it as a powerful stranger,  
Must ask permission to know it and be known.  
The forest breathes. Listen. It answers,  
I have made this place around you.  
If you leave it, you may come back again, saying Here.  
No two trees are the same to Raven.  
No two branches are the same to Wren.  
If what a tree or a bush does is lost on you,  
You are surely lost. Stand still. The forest knows  
Where you are. You must let it find you.

Assistance and support provided by Tom Goldsmith and The First Unitarian Church of Salt Lake; Bill Rutherford (Salt Lake City Forestry Department), Kathy Albaury (Wasatch Community Gardens), Frank Delaplaine and Chris Kolb (Arborcare/Arborscape, inc.), Nalini Nadkarni, Emily Gaines, Antonia Fitzgerald (Center for Science and Mathematics Education), and the International Canopy Network ([www.ican.csme.utah.edu](http://www.ican.csme.utah.edu)).

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