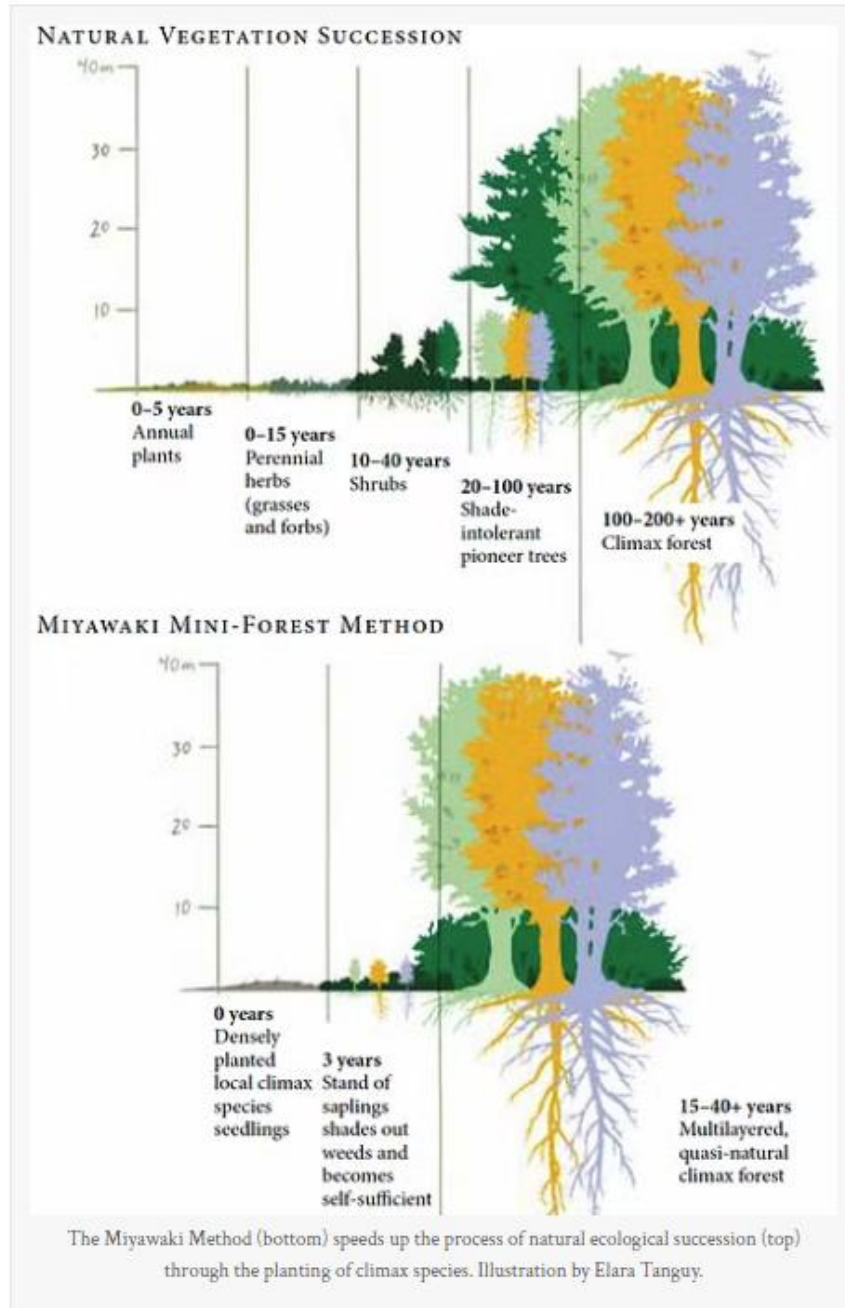


The Miyawaki Method

- Tree and shrub seedlings are planted at very high densities (3-4 per m² or 0.3-0.4 per sq.ft.)
- Plants grow very fast due to competition for light and water
- Forest will become self-sustainable after 2-3 years and will reach maturity after 15-40 years
- By incorporating different height classes of native plants such as canopy trees, smaller trees, shrubs and herbaceous plants, a Miyawaki forest is very close to a natural forest ecosystem
- Species are selected based on 'potential natural vegetation' of the area based on surveys of local old-growth forests.



Benefits of Princeton Microforest

Over the next 40 years, the Microforest can:

- 🌳 Sequester approximately 130 tons carbon in the soil
- 🌳 Reduce air pollution by approximately 1,700lbs of pollutants, including carbon monoxide, ozone, nitrogen dioxide, sulfur dioxide and fine particulate matter
- 🌳 Avoid around 12,500 gallons of stormwater runoff

Other benefits:

- 🌳 Creates an urban classroom and a space to connect with nature
- 🌳 Boosts local biodiversity
- 🌳 Increases soil health
- 🌳 Reduces the urban heat island effect: a study from the Netherlands shows that temperatures inside the forests were up to 20°C lower than those in the streets on hot days. Access study here:



Dominant canopy and sub-canopy trees



Red Maple *Acer rubrum*

Average mature height: 80' - 100'

Red Maple has the greatest north-south distribution of all tree species along the East Coast, ranging from eastern Canada to Florida and east Texas. Not readily browsed by deer, it is often over-abundant in regenerating forests.

Natural range: Eastern North America

Native habitats: Forests and forest edges, meadows and fields, wetlands and wetland margins.

Wildlife value: Red maple trees are a host plant for the larvae of the Rosy Maple Moth. All parts of the tree are eaten by numerous mammals, birds, and insects.



Shagbark Hickory *Carya ovata*

Average mature height: 80' - 100'

Shagbark hickory is a large and long-living deciduous tree with a distinct bark that looks like it is peeling off the trunk in older trees.

Natural range: Eastern North America and Mexico

Native habitats: Shaded woods and wetlands

Wildlife value: Shagbark hickory serves as a host plant for Hickory Horned Devil and Luna moths as well as the Banded Hairstreak butterfly. The nuts are an important food source for squirrels and other mammals and are eaten by birds such as bobwhites and ducks.



Sweetgum *Liquidambar styraciflua*

Average mature height: 60' - 80'

Sweetgum often dominates young woodlands but grows sufficiently tall to survive in mature woods. Fall leaves can turn brilliant combinations of red and yellow, orange, and purple. In winter, they produce prickly ball-shaped fruits.

Natural range: Eastern United States and Mexico

Native habitats: Wet woods and coastal plains

Wildlife value: Sweetgum is an important host for the larvae of Imperial Moth and Hickory Horned Devil. The seeds are eaten by birds, chipmunks and squirrels.





Tulip Tree *Liriodendron tulipifera*

Average mature height: 100'+

The tulip tree is a close relative of magnolias that evolved nearly 100 million years ago. They are the largest North American hardwood with an attractive, tulip-like flower.

Natural range: Eastern North America

Native habitats: Mesic woodlands, lower areas of wooded slopes and protected wooded valleys.

Wildlife value: Tulip trees are the sole host plant for the larvae of the Giant Silkmoth and a common host for Eastern Swallowtail larvae. The seeds are eaten by birds and mammals.



White Oak *Quercus alba*

Average mature height: 80'- 100'

The stately White oak is found in uplands throughout New Jersey. Gray bark and leaves with rounded lobes distinguish it from other kinds of oaks.

Natural range: Eastern and central North America

Native habitats: Dry upland slopes and ledges, as well as lowland valleys and ravines.

Wildlife value: White Oak is the host plant for hundreds of moth and butterfly larvae. Its acorns are a high value food source for many mammals and birds and it is a good cavity tree.

Supporting canopy and sub-canopy trees



Blackgum *Nyssa sylvatica*

Average mature height: 40' - 60'

Blackgum, also known as Tupelo, is an adaptable medium-sized tree that is widespread in local forests. The glossy foliage turns scarlet in fall.

Natural range: Eastern North America and Mexico

Native habitats: Wetlands and upland areas among other hardwoods

Wildlife value: The flowers are a good source of nectar for pollinators and fruits are eaten by a variety of birds. Blackgums will frequently turn hollow when mature, making them attractive homes for cavity nesting birds and mammals.



Black Cherry *Prunus serotina*

Average mature height: 60' - 80'

This widespread species is the largest and most important native cherry. The valuable wood is used particularly for furniture or paneling. Wild cherry syrup, a cough medicine, is obtained from the bark, and jelly and wine are prepared from the fruit.

Natural range: Eastern North America, Mexico and Guatemala

Native habitats: Deciduous and mixed evergreen-deciduous forests, riparian terraces.

Wildlife value: Throughout its range, Black Cherry is said to be the primary food plant for more than 200 species of butterfly and moth larvae. Its flowers and fruit in particular are extremely important food for mammals, birds and insects.



Swamp White Oak *Quercus bicolor*

Average mature height: 60' - 80'

While thriving in wet areas, the adaptable Swamp White Oak also grows well in drier areas. The leaves are more shallowly lobed than that of White Oak and the peeling bark on their branches distinguish it from other oak species.

Natural range: Eastern North America

Native habitats: Moist woods, bottomlands and stream edges.

Wildlife value: Like White Oak, this species is of huge value to local wildlife, supporting numerous insects, mammals and birds.

Small tree species



American Hornbeam *Carpinus caroliniana*

Average mature height: 25' - 35'

This species has very hard wood and a distinctive smooth gray bark with a sinewy appearance, characteristics that also give the tree the names Ironwood or Musclewood.

Natural range: Eastern North America

Native habitats: Shaded woods, bottomlands and stream edges.

Wildlife value: The catkins are occasionally eaten by ruffed grouse, ring-necked pheasants, and quail. The nutlets are eaten by these birds as well as by yellow-rumped warblers and by foxes and squirrels.



Eastern Redbud *Cercis canadensis*

Average mature height: 20' - 30'

Eastern redbud is a flowering tree that blooms before the leaves appear. In early spring, clusters of rose pink to light purple flowers mature and attract many pollinators, including butterflies, and bees.

Natural range: Eastern United States to Mexico

Native habitats: Woods; stream banks; limestone bluffs

Wildlife value: Used by several species of Lepidoptera as a larval host plant. Pollinating insects are attracted to the early flowers while songbirds and small mammals occasionally eat the seeds.



American Witch-Hazel *Hamamelis virginiana*

Average mature height: 20' - 30'

Witch-Hazel is notable for its yellow flowers that bloom in late fall, often after the leaves have dropped. The name is derived from old-English 'wych', meaning 'to bend' - its flexible branches were used as divining rods.

Natural range: Eastern North America

Native habitats: Moist woods, thickets and bottomlands.

Wildlife value: Flowers are pollinated by noctuid moths. Wild turkeys eat the seeds while the fruit is eaten by small mammals and birds.

Dominant shrub species



Northern Spicebush *Lindera benzoin*

Average mature height: 10'-20'

This shrub is very common in the local forests and its early spring flowering gives a subtle yellow tinge to the understory. A tea can be made from the aromatic leaves and twigs.

Natural range: Eastern North America

Native habitats: Low, deciduous woods, stream banks, swamps.

Wildlife value: This plant supports the larvae of the Eastern Tiger and Spicebush Swallowtails. Fruits are eaten by songbirds, especially during fall migration.



Elderberry *Sambucus canadensis*

Average mature height: 10' – 20'

This member of the Viburnum family is very tolerant of different soils. Its flowers and (cooked) berries are enjoyed by wildlife and humans alike.

Natural range: Eastern North America

Native habitats: Alluvial forests, bogs, ditches, drier, old fields.

Wildlife value: Butterflies and other insects are attracted to the flowers. Fruits are eaten by mammals and many species of songbirds. It makes an excellent nesting site for birds and dead stems are used by stem-nesting bees.



Arrowwood Viburnum *Viburnum dentatum*

Average mature height: 10' – 20'

Arrowwood Viburnum tolerates a wide variety of soil conditions. Its name likely results from the use of its stems as arrows by native Americans.

Natural range : Eastern North America

Native habitats: Stream banks, moist woods.

Wildlife value: Arrowwood Viburnum is a potential host for the Spring Azure butterfly and several moth larvae. Flowers attract pollinators, fruits are eaten by songbirds, grouse, wild turkeys and squirrels.



Blackhaw Viburnum *Viburnum prunifolium*

Average mature height: 10' – 20'

This shrub can grow up to the size of a small tree in favorable conditions. The white cymes of spring flowers produce a sweet and pleasant scent.

Natural range : Eastern United States

Native habitats: Low to upland wood edges, thickets, roadsides.

Wildlife value: It is a host plant for Spring/Summer Azure butterflies. Flowers attract pollinators and fruits are eaten by songbirds, squirrels and chipmunks. The dense growth form provides good shelter to wildlife.

Supporting shrub species



Red Chokeberry *Aronia arbutifolia*

Average mature height: 10'

Red Chokeberry produces clusters of white to light pink flowers in spring and the foliage turns an orangish-red or purple in the fall. Bright red pear-shaped berries may persist through the winter.

Natural range: Eastern North America

Native habitats: Pine bottomlands, swamps, open bogs.

Wildlife value: The berries provide food for a variety of birds such as Mockingbirds and Thrashers, Cedar Waxwings, Bluejays, Vireos, and Sparrows. Butterflies and other pollinators feed on the flower nectar.



Black Chokeberry *Aronia melanocarpa*

Average mature height: 10'

This very adaptable shrub occurs in very wet as well as dry areas. The common name, Chokeberry, references its tart and bitter berries which are edible but so astringent they may cause choking.

Natural range: Eastern North America

Native habitats: Lowlands, bogs, dunes, bluffs.

Wildlife value: This is a host plant for Coral Hairstreak butterflies and the Large Lace-border moth. Fruits attract birds and small mammals.



Sweet Pepperbush *Clethra alnifolia*

Average mature height: 6' - 8'

A tall, many-branched, shrub with spike-like, upright clusters of fragrant white flowers that blossom in shady locations in late summer when few other shrubs are in bloom.

Natural range: Eastern North America

Native habitats: Swamps, sea shores, stream banks, hillside bogs.

Wildlife value: The flowers produce high-quality nectar and pollen that support hummingbirds, butterflies, bees and other pollinators. The shrub produces brown, dry capsules that provide seed to birds during the winter.



Redstem Dogwood *Cornus sericea*

Average mature height: 8'-10'

Redstem Dogwood is the most widespread native species of dogwood, occurring over most of the continent except for the southern Great Plains and the southeast. It has conspicuous red twigs and colorful fall foliage.

Natural range: North America

Native habitats: River banks, lake shores, wooded or open, wet areas.

Wildlife value: Fruits are attractive to birds and small mammals and plants provide nesting sites. It is the larval host plant of the Spring Azure butterfly. Members of the genus *Cornus* support several specialized bee species.



Winterberry *Ilex verticillata*

Average mature height: 10'

While Winterberry is a member of the holly family, its' leaves are not sharp-teethed and fall off the shrub in winter. The common name refers to the plant's red berries that mature in the fall, providing winter interest and food for birds and small mammals.

Natural range: Eastern North America

Native habitats: Swamps, stream banks, near lakes or ponds.

Wildlife value: Winterberry is a host plant for Henry's Elfin butterfly and attracts many other pollinators. Its fruits are eaten by over 48 species of birds, including cedar waxwings, and small mammals.



Highbush Blueberry *Vaccinium corymbosum*

Average mature height: 8' - 12'

This blueberry species produce white or pink, bell-shaped flowers in spring that are followed by edible, blue fruit and an attractive, reddish fall foliage. Our cultivated blueberries are derived from this shrub.

Natural range : Eastern North America

Native habitats: Swamps, bogs, dry barrens, oak woods.

Wildlife value: Highbush Blueberry is a host plant for Brown Elfin larvae. Flowers attract pollinators, while its fruit provide food for mammals and birds. Members of the genus *Vaccinium* support several specialized bees.