

GUIDELINES FOR PLANTING A ROCKLAND HAMMOCK IN SOUTH FLORIDA

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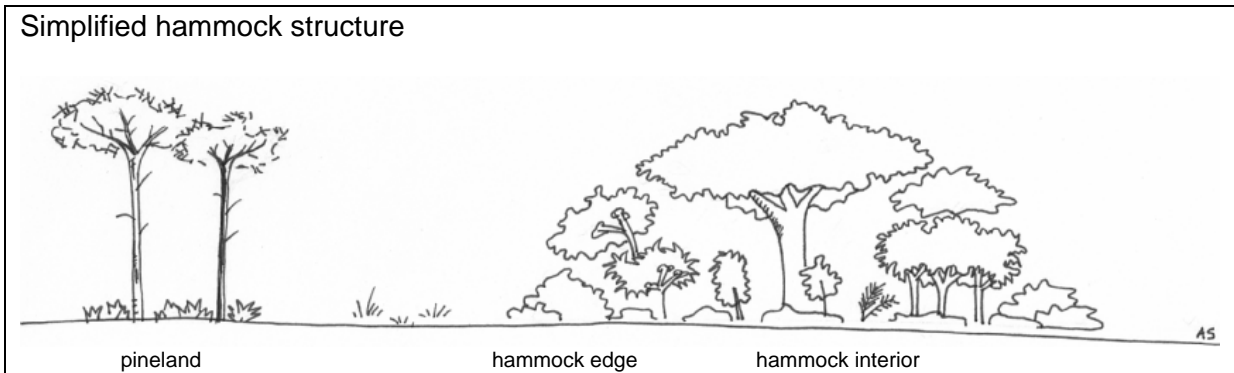


Purpose. These guidelines provide basic information that can be used to restore rockland hammocks in their original locations, as well as the creation of rockland hammocks within their historical range on fill pads, on spoil piles, and in areas where pine rocklands have been destroyed and cannot be restored. They are intended principally for residential landscapes, school yards and commercial plantings. They are not a substitute for site-specific restoration design carried out by a professional restoration practitioner, nor are they intended for those more interested in other forms of native plant landscaping, including mixed native/exotic gardens. For more information on ecological restoration research and practice, please refer to the Society for Ecological Restoration International's website at www.ser.org. For more information on native plant landscaping, please see the Florida Native Plant Society website at www.fnps.org.

Background. Rockland hammocks are broad-leaved forests found on limestone substrate with an accumulation of organic material on the surface. They are closed, dome-shaped forests typically dominated by evergreen trees and shrubs of West Indian origin. Rockland hammocks are similar throughout their range, although the flora and vegetation varies according to type of limestone, hydrological conditions, local climate, and other ecological factors. Rockland hammocks are multi-layered, diverse forests, with several to many species found in the canopy and subcanopy. The understory is dominated by seedlings and saplings of canopy and subcanopy trees. Rockland hammocks hold a great allure, harboring populations of rare orchids and ferns, colorful snails, and a diversity of native wildlife.

In South Florida, rockland hammocks were historically found in areas of elevated limestone that were protected from frequent fire: along the Miami Rock Ridge from the mouth of the Miami River south and west to Long Pine Key in Everglades National Park; throughout the Florida Keys from Elliott Key to Key West; and in the Pinecrest region of the Big Cypress Swamp. Rockland hammocks have received significant protection in Everglades National Park and Big Cypress National Preserve; however, this habitat has been severely impacted by development throughout most of the Miami Rock Ridge and in the Florida Keys.

Rockland hammock is one of several types of hammocks found in South Florida, including prairie hammock, mesic hammock, maritime hammock and coastal berm. Prairie hammocks differ by being wetter and more typically composed of temperate species, mesic hammocks and maritime hammocks are found on sandy soils, and coastal berms are found on sand or shell deposits near the coast. Rockland hammocks are closely associated with pine rocklands and marl prairies on the mainland and with mangrove swamps and coastal berms in the Florida Keys.



Why plant a rockland hammock? Planting a rockland hammock is relatively simple and inexpensive, and can be accomplished in a wide variety of situations. Rockland hammocks provide wonderful habitats for native plants and wildlife, are aesthetically pleasing, contribute to the conservation of energy resources, reduce pollution and long-term maintenance costs, and mitigate the effects of global climate change.



Site selection. Unlike many other native plant habitats, rockland hammocks can be planted almost anywhere within the urban and suburban environment. Even the smallest spaces between buildings can house "micro-hammocks" of small trees and shrubs. Rockland hammocks are well suited to residential yards, as well as to forest islands within commercial and institutional areas (such as schools), and in rights-of-ways along highways. While some rockland hammock trees become very large, many species of rockland hammock trees can

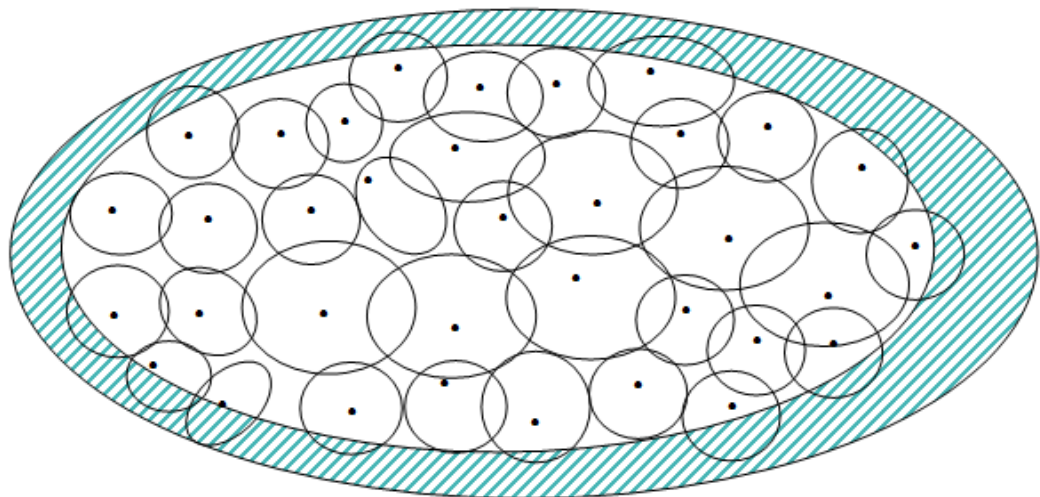
be planted surprisingly close to buildings and other structures. Although the site can be small, be sure to avoid conflicts with overhead (or underground!) power lines or other structures. An open site with few non-native trees and shrubs is easiest to work with. Remember that the hammock canopy will ultimately be larger than the footprint of the planting area. Some native species, especially strangler fig (*Ficus aurea*), have invasive root systems that are best kept away from septic tanks and other artificial sources of underground water.

Timing. Rockland hammocks can be installed year-round. In the winter, plants will grow more slowly, but water stress is lessened. In the summer, plants will grow faster and there is more rainfall, but temperatures are higher and even a few days without rain can cause serious water stress and the death of recently installed plants. See **Water** below for a recommended schedule.

Site preparation. Remove exotic plants from the hammock restoration site (see the Florida Exotic Pest Plant Council website at www.fleppc.org for information on invasive exotics and their control in Florida). Certain non-invasive exotic trees may be left on occasion to provide temporary canopy, and may be removed later. Lawn grass may be dug up – or killed with an herbicide such as Roundup; killed by covering with heavy black plastic for several weeks; or, killed after hammock planting by covering the grass with a 5-6 inch layer of fresh wood chips. The latter technique must be used with care to avoid injury to planted trees and shrubs (see **Mulch** below) and is recommended when planting at relatively high densities.

Plant selection and placement. Rockland hammock is a diverse plant community. To mimic this diversity, install at least ten species of trees and shrubs; more species is better. Install trees and shrubs at densities no lower than one plant per 50 square feet of planting area, and no higher than one plant per 25 square feet of planting area. Make sure that canopy and subcanopy trees make up at least 50 percent of the installed plants. Place plants in a random pattern. It is generally best to put large species, such as wild mastic (*Sideroxylon foetidissimum*) and strangler fig toward the center of the site and more compact species such as lancewood (*Ocotea coriacea*) and pigeonplum (*Coccoloba diversifolia*) toward the edges. In addition, it is helpful to take into consideration each species' light preferences.

Conceptual hammock layout



Included below is a list of 14 common rockland hammock species with wide historical ranges, broad ecological tolerances, and relatively good market availability. For more detail on these species, to get a list of additional species recommended for your specific project area, and to obtain information on availability, please refer to The Institute for Regional Conservation's Natives For Your Neighborhood program, which can be viewed on the IRC website at www.regionalconservation.org. Whenever possible, it is best to obtain plants grown from locally-collected seed, rather than from cuttings. It is also important to note that some plants have different appearances within different parts of their ranges. For instance, satinleaf (*Chrysophyllum oliviforme*) in the Florida Keys has smaller leaves and denser pubescence than most plants found on the mainland. Also, some species not on the list are quite abundant in some areas. Live oak (*Quercus virginiana*), for example, is common in rockland hammocks on the mainland, but is known only from one small area in the Florida Keys.

Plants in two to three gallon containers (plants 2-4 feet in height) and seven to fifteen gallon containers (plants 4-10 feet in height) are recommended for hammock restoration. Plant at least fifty percent of the plants from the smaller containers as they will become established and will grow more quickly. This is especially important in the Florida Keys, where it is difficult to dig holes and plants are more likely to be water-stressed following installation. Balled and burlapped (field grown) material can be used if larger specimens are desired. However, field grown trees and shrubs are more expensive, require larger holes and more water, and take longer to establish than container grown plants.

Installation. Dig the hole so that the plant will be level with the surrounding ground surface when installed. While some prefer a planting hole just wider than the container, others recommend digging a hole twice as wide as the container. Regardless of the method used, do not add special soils or place fertilizer in or around the hole. The soil excavated from the hole is used as back fill. Once the plant is placed in the planting hole, water thoroughly to eliminate air pockets under and around the plant. Use a shovel or trowel to lightly pack the back fill around the plant. Finally, level out the planting surface so that it grades smoothly into the surrounding terrain.

Mulch. After all plants are installed, apply a 3-6 inch top dressing of mulch or wood chips to the planting area. Mulch can be obtained commercially in bags from stores or from a local tree-trimming company in bulk; the latter is almost always less expensive and is usually of good quality. If store bought mulch is used, then melaleuca or eucalyptus mulch is recommended. Do not use cypress mulch or pine chips. Cypress mulch is harvested from native cypress forests and pine chips do not provide the soil nutrients preferred by native hardwood trees. When applying mulch, make sure not to cover the trunks or root crowns of the installed plants; piling mulch against the plant can cause rot, or heat stress if fresh wood chips are used.

Water. Careful watering is essential to successful hammock establishment. Each watering should be equivalent to one inch or more of rainfall. During the first two weeks after installation, water once per day; during the next two weeks, water every other day; during the next four weeks, water twice per week; and during the next four weeks, water once per week. If your site receives one inch or more of rainfall within 24 hours of when a watering is scheduled, you can skip that watering. If field grown plants are installed, water them at least once per month for an entire year. Additional watering may be necessary during the hot, dry periods of the spring and summer, and in areas of drier, hotter climates such as the Florida Keys.

Maintenance. Long-term maintenance of a rockland hammock primarily involves weeding, trimming, and occasional re-mulching. If the site has been properly prepared and mulch has been applied, then few weeds are likely to invade the planting area. Plan on doing a light weeding every two or three months. Once the canopy has formed, weeding will be necessary every six months or so. More frequent weeding may be needed where the hammock connects with any lawn areas, as lawn grasses and weeds will continuously invade the edges of the hammock. To combat this problem, some people install wood, rock, or plastic borders between the lawn area and the hammock to prevent the lawn from spreading. Whenever weeding, make sure to not pull up seedlings of native trees and shrubs that might have recruited since the hammock was installed. On the other hand, vigorously weed out any invasive exotic plants that might become established.

Within a year of installation, trees and shrubs will show significant growth. Select trimming may be necessary every six months or so to keep the understory open, to promote canopy development, or for aesthetic reasons. If lateral branches of trees and large shrubs are trimmed, do so a few at a time, making sure that no more than one third of the total leaf area is removed in any one trimming. Some large or medium shrubs (especially shiny-leaved wild-coffee) may also be trimmed in this manner. Most small and medium shrubs are trimmed within a few inches of the ground if they become too overgrown.

In most cases, a second mulching will not be required. However, in some cases the mulch may be too thin or may decompose relatively quickly and a complete or partial re-mulching may be required. You can usually tell if the mulch is too thin if an abundance of weeds begins to appear within the planting area. Fertilizing is unnecessary as mulch and falling leaf litter provide the needed nutrients for native hammock species. Some pests of native plants, such as lobate lac scale and the green iguana, have become established in South Florida. Lobate lac scale in particular is of some concern in Miami-Dade County – see http://creatures.ifas.ufl.edu/orn/scales/lobate_lac.htm for more information.



Common trees and shrubs recommended for planting a rockland hammock in Miami-Dade, Monroe and Collier counties.

Trees

Gumbo-limbo	<i>Bursera simaruba</i>
Inkwood	<i>Exothea paniculata</i>
Lancewood	<i>Ocotea coriacea</i>
Pigeonplum	<i>Coccoloba diversifolia</i>
Strangler fig	<i>Ficus aurea</i>
Satinleaf	<i>Chrysophyllum oliviforme</i>
Shortleaf fig	<i>Ficus citrifolia</i>
White stopper	<i>Eugenia axillaris</i>
Wild lime	<i>Zanthoxylum fagara</i>
Wild mastic	<i>Sideroxylon foetidissimum</i>
Willow-bustic	<i>Sideroxylon salicifolium</i>



Shrubs

Marlberry	<i>Ardisia escallonioides</i>
Shiny-leaved wild-coffee	<i>Psychotria nervosa</i>
White indigoberry	<i>Randia aculeata</i>



Advanced hammock restoration. These guidelines provide the basics for planting a rockland hammock in South Florida. Once mastered, other more challenging aspects of hammock restoration can be explored. These include the introduction of vines, plants that provide food for wildlife, rare species, and plants that are difficult to grow. In addition, much can be done to enhance and maximize wildlife habitats within the hammock. All natural hammocks have edges that interface with other native plant habitats, such as pine rocklands. These rockland hammock edges make excellent landscape features, attract butterflies and birds, and provide an abundance of color. Many rockland hammocks also contain sinkholes that contain rare ferns, and trees and shrubs usually found in swamps and other wetlands. For more information on rockland hammock edges, sinkholes, and other habitats that may be appropriate for planting at your project site, please refer to IRC's Natives For Your Neighborhood program on the IRC website. Once begun, the restoration of a rockland hammock can turn into a life-long experience that is not only aesthetically rewarding, but also contributes to the restoration of South Florida's native plant heritage.

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