



National Conservation Council

Species Conservation Plan for Mangroves

National Conservation Law, section 17

This Conservation Plan applies to the following species wherever they are naturally occurring or have been restored:

Red Mangrove (*Rhizophora mangle*)
White Mangrove (*Laguncularia racemosa*)
Black Mangrove (*Avicennia germinans*)
Buttonwood (*Conocarpus erectus*)

1. Conservation Status

All of the mangrove species covered by this Conservation Plan are protected species in Part 2 of Schedule 1 of the National Conservation Law 2013 (NCL). These are all widespread species with neotropical to hemispherical distributions, and are not listed as globally threatened in the IUCN Red List.

However within the Cayman Islands, mangrove loss has been so extensive over recent decades that it triggers local Red-Listing criteria. In 2008 the Cayman Islands national IUCN Red List status of Black Mangrove was assessed as Endangered, White Mangrove and Buttonwood both as Vulnerable, and Red Mangrove as Near-Threatened.

The Ramsar Convention (1971) has been extended to the Cayman Islands, requiring a commitment to work towards the wise use of our mangrove and other wetlands through national plans, policies and legislation, management actions and public education.

2. Ecology and Threats

In the Cayman Islands, the four mangrove species dominate and form the framework for mangrove ecosystems in tidally flooded and seasonally flooded wetlands. They grow on peat substrates laid down by the mangroves themselves, forming forests and shrublands, with the species occurring alone and in various combinations depending on local patterns including geographic setting, peat depth, salinity, flooding, hurricane history and nutrient availability.

These mangrove communities support a diverse fauna, notably including crustaceans, insects and birds. During spring tides and periods of heavy rain they export nutrients to adjacent lagoons and sounds, supporting marine life including a highly diverse and productive fish nursery zone where the mangroves interface with the sea. In the Cayman Islands and elsewhere, mangroves are noted for their role in shoreline protection, carbon sequestration and storage, filtering of sediment and pollutants, and as habitat for threatened species.

The dominant threats to mangroves in the Cayman Islands include the continuation of practices involving conversion of mangrove ecosystems into artificial environments for various human uses.

Climate change also poses a growing threat. Further acceleration in sea level rise may overwhelm the mangroves' ability to lay down peat at the same rate, resulting in extensive drowning and die-off. Any increase in the frequency or intensity of hurricanes, especially when compounded by alteration or blocking of surface water outflow pathways by road construction and land filling, can also lead to general mangrove drowning and death.

3. Conservation objectives

The primary objective of this Conservation Plan is to ensure that the ecological benefits the mangroves provide to humans and the environment generally are allowed to continue, by ensuring that:

- The Central Mangrove Wetland continues to function as a viable and hydrologically connected ecosystem, helping to support a living North Sound
- Mangrove islands, Mangrove Buffer Zones and other mangrove areas remaining on the west and south coasts of North Sound, are

retained as functional habitats protecting shorelines and supporting a living North Sound

- Barkers mangroves and mangrove ponds are protected and managed to optimize their value for supporting native biodiversity and for compatible recreational activity
- Coastal mangrove systems in Little Cayman, especially Tarpon Lake, Jackson Pond and the Crown East Interior, are protected as a nature tourism asset and as key habitat for resident and migratory birds
- Mangroves fringing coasts and natural saline ponds throughout the Cayman Islands are allowed to continue their role in maintaining water quality, and as habitat for water birds, crabs and other native species
- Coastal and inland mangroves throughout the Cayman Islands continue to capture and store greenhouse gasses through deposition of peat while sea level and groundwater levels rise

4. Conservation Strategies

The primary conservation strategy is to bring significant areas of mangrove into the Cayman Islands' Protected Area system, through a combination of:

- Designation of Crown mangrove wetlands as protected areas under s.7 of the NCL
- Voluntary purchase of mangrove wetland property, at fair market price, using funds voted from the Environmental Protection Fund, leading to protection under s.7 of the NCL
- Conservation Agreements on mangrove wetland property, leading to protection of the land through s.13 of the NCL
- Management Planning for protected wetland areas under s.10 of the NCL

Other strategies are:

- Designation of new mangrove protected areas as RAMSAR sites under the Convention on Wetlands of International Importance (1971)
- National Conservation Council (NCC) advice to government agencies under s.41 of the NCL, to continue to recommend

measures to limit damage especially to storm buffers and other mangroves generally

- NCC to seek requirements through the Coastal Works licensing process to restore coastal mangroves in situ where practical, whenever mangroves are damaged
- NCC to propose through the relevant permitting agencies, requirements for ex-situ mitigation of environmental damages arising from large-scale destruction of mangroves
- Direct restoration of mangroves damaged by hurricanes, in protected area settings where this is practical and would provide a clearly defined environmental benefit
- Provision of mangrove trimming guidelines (Appendix 1 to this Conservation Plan) to developers and property owners
- Management of invasive species affecting mangrove habitat

5. Habitat protection

a). Critical Habitat

No Critical Habitat for mangroves is defined in this Conservation Plan.

b). Protected Areas

Proposals will be made by the NCC for protection of Crown mangroves, and for purchase and protection of privately owned mangrove areas through the nominations, selection, consultation and recommendation process laid out in s.9 of the NCL, and through negotiation of Conservation Agreements with owners of mangrove areas under s.13 of the NCL.

6. Additional conservation measures

a). Control of take

Under authority given by NCL s.17 (3) (b) (iii) mangroves may not be taken, meaning they may not be killed, collected, destroyed, damaged, or harmed, except under the following conditions:

1. Planning Permission has been granted for a project impacting mangroves, by the Central Planning Authority or Development Control Board, and any conditions which must be met before this permission is valid or implementable, have been met
2. A Coastal Works Permit for a project impacting mangroves has been granted by Cabinet, any required conditions have been met and any fees due have been paid
3. A road is being constructed by the National Roads Authority or the Public Works Department on mangroves falling within a gazetted road corridor
4. A permit has been issued by the NCC under s.20 of the NCL and any conditions therein are being adhered to
5. Hand clearing only as strictly necessary for a licensed land surveyor to survey property boundaries, is permitted
6. Tree trimming of mangroves when in accordance with Appendix 1 to this Conservation Plan
7. Collection of mangrove seeds or fallen propagules for the purpose of growing mangroves in pots, and potted mangroves may be bought and sold
8. Restoration of mangroves in areas where they previously occurred, and restoration of mangroves in new habitat, may only be carried out with a permit under s.20 of the NCL, or to fulfil conditions attached to planning permission or a coastal works permit as per paragraphs 1 or 2 above
9. Maintenance of mosquito control dykes and canals by the Mosquito Research and Control Unit, is permitted

Except where conditions 1-5 apply, standing dead mangrove trees may not be felled, cut into, or otherwise disturbed.

Planted buttonwood hedges and other cultivated mangroves which may be planted in domestic, civic and commercial landscapes, are neither naturally occurring nor restored and are therefore not subject to the protective measures in this Conservation Plan.

Taking of mangroves in circumstances other than as permitted in this plan constitutes an offence under s.33 of the NCL.

b). Consultation on development proposals

Guidance Notes to Government Agencies issued under the NCL (Gazette Issue 05/2015, 2 March 2015) set out criteria to determine which government agency actions require consultation with the NCC under s.41 of the NCL.

Consultation with the NCC is triggered for all mangrove areas in undisturbed, primary state, and for all mangrove areas within 500 feet of the high water mark.

In making recommendations to government agencies on decisions that may affect mangroves, the NCC will seek to advance the objectives of this Conservation Plan.

c). Monitoring and research

The Department of Environment will conduct monitoring and research on mangroves which may include but is not restricted to:

- Periodic mapping of mangrove areas to monitor rates of mangrove loss and gain
- Assessment of productivity, carbon storage and carbon sequestration rates in the peat of the Central Mangrove Wetland and other areas

d). Public outreach, education and awareness

Management Plans for new protected areas with mangroves will include many opportunities for public outreach, education and awareness about mangroves. These may range from infrastructure (visitor centers, trails, interpretation) to activities (guided recreation, school projects etc.)

Designation of new protected areas and RAMSAR sites will stimulate positive local and international media interest.

7. Implementation, Evaluation and Review

Responsibility for implementing this plan lies primarily with the National Conservation Council, and the Department of Environment. Protected area proposals require Cabinet approval and any associated land

acquisitions are subject to funds being voted from the Environmental Protection Fund for this purpose by Finance Committee.

This Conservation Plan will be evaluated annually by the Department of Environment, and at such time that any revision appears to be necessary, the Department will bring proposed revisions to the NCC.

Legal Basis

Section 17 of the National Conservation Law, 2013 requires the National Conservation Council to formulate and adopt a conservation plan for each protected species whose range includes the Islands.

Schedule 1, Part 2 of the Law designates protected species which require protection under this Law other than for such limited hunting or collecting of specimens as may be permitted by regulations or a Conservation Plan [section 16(1)(b)].

Species Conservation Plans must set out the steps which the Council considers to be necessary to achieve the conservation and survival of the species and their critical habitat.

Priority is accorded to the development of Plans for threatened or endangered species that are at risk from development projects or other forms of economic activity, or that would otherwise be most likely to benefit from such plans.

Species Conservation Plans may take into account traditional cultural needs and applicable regional programmes under the various biological, conservation and climate change Conventions to which the Cayman Islands are party [section 6(2)(j)].

Appendix 1:

Mangrove Trimming Guidelines



DEPARTMENT OF
ENVIRONMENT
CAYMAN ISLANDS GOVERNMENT



Mangrove Trimming Guidelines

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(These guidelines have been adapted from the Florida Department of Environmental Protection guidelines)

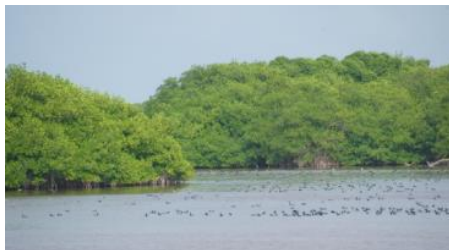
INTRODUCTION

These guidelines are intended to assist coastal property owners in identifying, trimming and altering mangrove trees in a manner that will:

- provide a view or navigational access;
- protect valuable mangrove resources, and
- be in compliance with the National Conservation Law & Species Conservation Plan for Mangroves.

Cayman has four native species of mangroves: red, black, white and buttonwood. While they can grow in freshwater, their physiological adaptations to life in salt water allow them to thrive and outcompete other freshwater species. Each species responds differently to trimming; information on the identification and trimming tolerances of these species is provided in this guidance. Many property owners trim mangroves along their shorelines to obtain or enhance their view of the water. Unfortunately, if not done properly, trimming can harm or kill the mangroves. While this might maximize a view, many people do not realise that killing or harming mangroves can have many unintended adverse consequences to the benefits mangroves provide, including:

- Habitat for marine food webs;
- Assist with maintaining and improving the quality of our coastal waters;
- Their roots and trunks help prevent shoreline erosion, and
- Protection of homes and property from severe wind damage.



Coastal mangroves

Cayman mangroves are tropical to subtropical trees that grow on peat substrates laid down by the mangroves themselves, forming forests and shrublands, with the species occurring alone and in various combinations depending on local patterns of geographic setting, peat depth, salinity, flooding, hurricane history and nutrient availability.



Marine life within red mangrove prop roots



Red footed booby chick in its nest within mangroves

Within the Cayman Islands, mangrove loss has been so extensive over recent decades that their National Red List Status as of 2008 lists Red Mangrove as Near Threatened, Black Mangrove as Endangered and both White Mangrove and Buttonwood as Vulnerable. Mangroves and Buttonwood are listed under Schedule 1 Part 2 of the National Conservation Law, 2013. Please note, if your property is located in a Mangrove Buffer Zone (Development Plan, 1997), you require planning permission to conduct trimming.

RED MANGROVE (*Rhizophora mangle*)

Red mangroves (*Rhizophora mangle*) are characterized by their arching 'prop roots'. These roots, also referred to as 'aerial' or 'stilt' roots, extend from the main trunk and lateral branches and grow down into the substrate. Prop roots provide support for the tree and assist in nutrient uptake and gas exchange (through pores called 'lenticels'). They are also physiologically developed to prevent most salt infiltration through a 'salt exclusion' process.

Red mangroves grow well in sea water but not in hypersaline conditions (saltier than sea water). Of the mangrove species, red mangroves tend to grow closest to the water due to the advantage of their aerial prop roots. Their extensive root system prevents erosion of coastal properties, stabilizing the shifting substrate of shorelines and providing sheltered structure for young fish, shellfish, and other invertebrates (tunicates, sponges, etc.). Wading birds use red mangrove prop roots and the tree's large, and sometimes horizontal limbs, as refuge during high tides.



Prop roots are characteristic of the red mangrove

Red mangrove leaves are the largest of the four species mentioned in these trimming guidelines. They are elliptical, glossy and dark green on top, and paler, dull green, often with tiny black spots, underneath and grow in pairs opposite each other on the stem. Red mangroves are "viviparous", which means that the seeds germinate while still attached to the parent mangrove. The seedlings, commonly referred to as propagules, can float for over a year before establishing in a substrate. As the tip of the propagule gets saturated with water, it becomes heavy, falls to the substrate, and sends out roots that establish the propagule into a juvenile tree.



Surface of a red mangrove leaf

Underside of a red mangrove leaf



Red mangrove sapling



Red mangrove propagules attached to parent mangrove

BLACK MANGROVE (*Avicennia germinans*)



Black mangrove tree

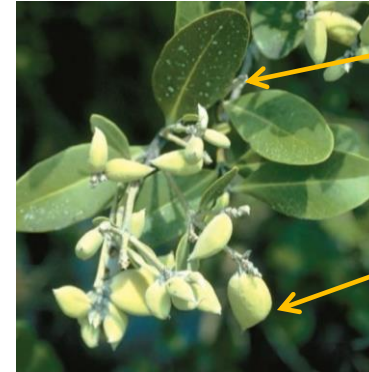
Black mangroves (*Avicennia germinans*) are distinguished by leaves that are a dull, dark green on the upper side and whitish green/ grey underneath. The leaves aid in the removal of salt from the tree and salt crystals are often observed on the leaves. Black mangroves have an extensive underground cable root system that gives rise to above-ground pencil-like roots called pneumatophores. Pneumatophores grow above the seasonal flood level and act like snorkels, channeling oxygen down to the roots. Black mangrove roots are responsible for water and nutrient intake.

In the Cayman Islands black mangroves can grow into tall trees of 30ft or more, usually with a single main trunk that often has a large diameter. They are useful as windbreaks during severe weather. They are most attractive when the lower branches are trimmed (windowed) and the upper canopy is left intact or thinned. Their form, color and slender leaves often allow a pleasing, and somewhat private view from waterfront homes.

Black mangrove propagules (lima-bean shaped) are much smaller than red mangrove propagules and are light greyish green. They are not as hardy as red mangrove propagules, but can be free floating for several weeks before sprouting roots in a suitable environment.



Black mangrove's characteristic pencil-like roots called pneumatophores



Salt excretion on black mangrove leaves

Black mangrove propagules



Black mangrove leaves. Notice the "sweatiness" of the top surface of the black mangrove leaf. This is because they excrete salt and the humidity turns salt crystals into concentrated salt solution

Black mangroves can tolerate more saline conditions than other mangroves and generally grow landward of the Mean High Water Mark. Older trees develop hollow trunks which are often used by nesting parrots.

WHITE MANGROVE (*Laguncularia racemosa*)

White mangroves (*Laguncularia racemosa*) are characterized by paddle-shaped leaves that are uniformly light green on both their upper and lower surfaces. The leaves are characterized by being notched at the tip, and two small bump-like glands at the base of the leaf (petiole). The glands secrete sugar and are thought to attract ants which aide in the control of other small plant-eating insects.

White mangroves generally do not tolerate the same extent of flooding that black and red mangroves can tolerate. However, in some cases where there is good tidal flushing of the soils, white mangroves will sometimes grow seaward of black mangroves and produce above ground knobby, pneumatophore-like roots. White mangroves produce greenish-white flowers. White mangrove propagules are small, vase shaped and are the least hardy of the mangroves.



The greenish white flowers and smooth, thick and leathery leaves of the white mangrove. The small vase-shaped fruit pictured are the mangrove's propagules

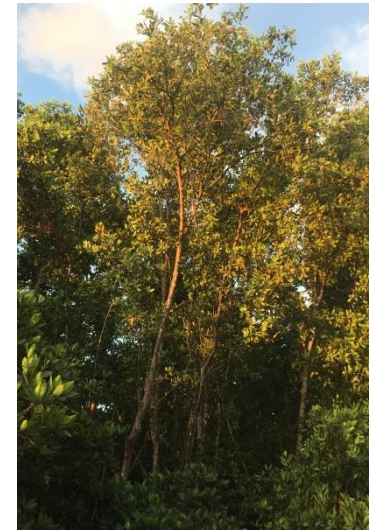


Characteristic notch at the tip of white mangrove leaves

The white mangrove has two small glands at the base of each leaf



Young white mangrove tree



Mature white mangrove trees

BUTTONWOOD (*Conocarpus erectus*)

Buttonwood (*Conocarpus erectus*) is often found among mangrove species but differs by reproducing through seeds. Buttonwood naturally occurs in two main varieties; green buttonwood which is the most common variety while the silver buttonwood (*Conocarpus erectus sericeus*) is often used for gardens in hedges and landscaping.

Buttonwood is a low –branching shrub or tree growing to a typical 10.5 meters (~35ft.). While buttonwood can be found inland, it is a seaside shrub or tree offering protection and retention of the soil and banks during storm surges. This evergreen is a highly salt tolerant plant and it also tolerates frequent flooding and wet soil making it a highly attractive plant around the Cayman Islands where reclaimed and low-lying land is common. While buttonwood trees do not have any prop roots or pneumatophores, they may produce short, thin, and flexible roots on the lower trunk in areas of frequent saturation or inundation by water. It further has low nutrient requirements making it cheap to propagate or sow.

Buttonwood has inconspicuous white flowers and its leaves are similar to black mangroves, however they are the same colour green on both sides and are alternately placed on the stems (mangroves have opposite leaf placement). As buttonwood flower and fruit throughout the year, it is a very important native species providing both food and cover for wild birds. The brownish red fruit look like old leather buttons, hence giving the plant its common name.



Green buttonwood



Silver buttonwood



The brownish red fruit of the buttonwood tree look like old leather buttons which gives this tree its common name



The alternating placement of leaves on a buttonwood stem

Naturally growing buttonwood trees.



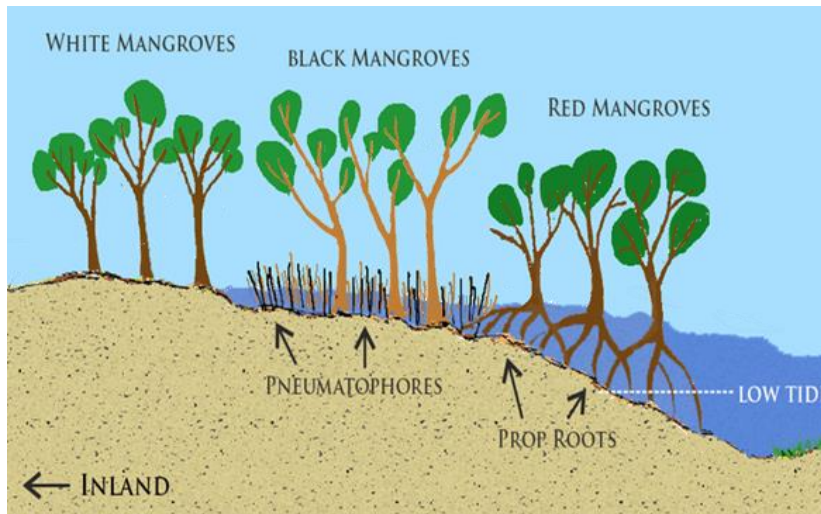
QUICK IDENTIFICATION TIPS

A quick way to differentiate between the four species referenced in these guidelines is by using their leaves :

- **Red mangrove leaves** are the largest of these 4 species with a dark green surface and a paler green underside.
- **Black mangrove leaves** have a dark green surface and whitish green/ grey underside. Salt crystals are often found on their leaves.
- **White mangrove leaves** are thick, rounded and light green on both sides, with a notch at the tip of the leaf and two glands at the base of the leaf.
- **Buttonwood leaves** are similar to black mangrove leaves but are dark green on both sides and have an alternating leaf placement.



Pictured from left – right: red mangrove, black mangrove, buttonwood and white mangrove leaves: surfaces.



Mangrove succession diagram



Pictured from left – right: red mangrove, black mangrove, buttonwood and white mangrove leaves: undersides.

BEFORE YOU TRIM

Shoreline owners have a unique opportunity to directly participate in the stewardship of Cayman's marine environment by understanding that there are many ways that a reasonable view may be obtained without severely injuring or killing mangroves. The heights to which a mangrove tree may be trimmed will depend upon the species and condition of the tree. In most instances, mangroves may not be trimmed lower than 6 feet in height as measured from the substrate (ground surface), except for certain government and utility oriented exemptions. Reduction in height for larger trees will need to be conducted in stages over several years. Many large trees cannot legally be trimmed to 6 feet; this is mainly due to the tree's pre-trim canopy configuration. In no case shall trimming result in defoliation (loss of most of the tree's leaves), destruction (death of part or all of the tree, including roots) or removal of a mangrove.

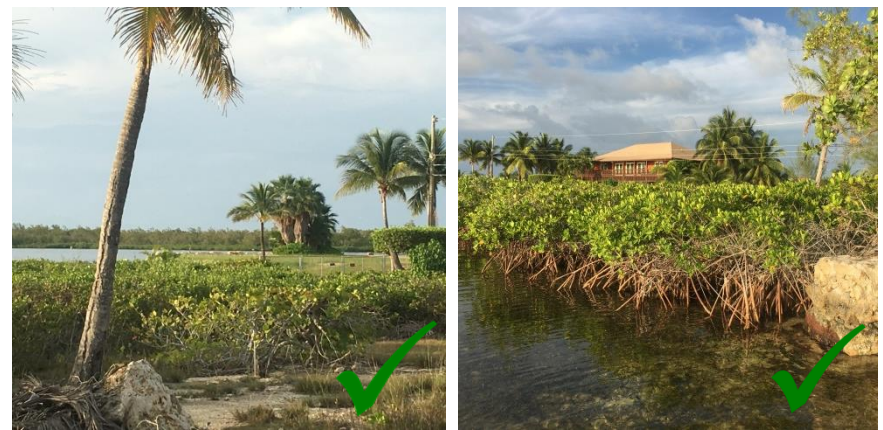
COMPLIANCE:

Under the Mangrove Conservation Plan, dead mangroves and dead portions of living mangroves are protected to the same degree as living mangroves. The dead plants and stems provide important habitat and detrital material, and may only be trimmed to the same extent as the living mangroves.

In all cases, the applicant, permittee, landowner, and person performing the trimming are jointly and severally liable for complying with the Cayman Islands Conservation Plan for Mangroves, unless evidence indicates otherwise. It is important for all parties involved to always take photos before and after any trimming activities occur to document pre and post-trimming conditions.



Two examples of over-trimming resulting in the destruction of the red mangroves in these residential canals



Hedge-trimmed buttonwood and red mangrove for a view of the water

TRIMMING FOR HEALTHY PLANTS

Healthy mangroves are more beneficial to the shoreline, fisheries, water quality, and to your landscape design than unhealthy mangroves that have been improperly trimmed.

OBJECTIVE:

When trimming a branch, the desired result is a nice, clean-cut against the branch side of the juncture of the branch and the limb (or trunk), leaving the branch collar in place. Damage to that junction will wound the tree (see diagram on right).

EQUIPMENT:

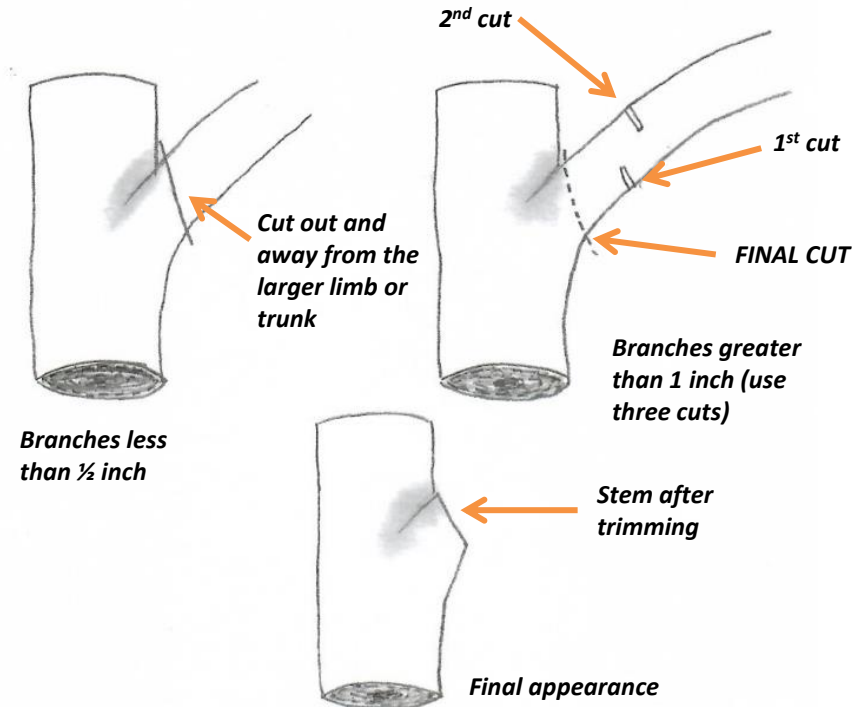
Tools must be clean and free of oils. It is important that the tools are sharp for a clean cut. The wood at the cut should be smooth, not frayed. Frayed cuts may not heal properly and may be a source of infection. If fraying occurs, your trimmer's tools may not be sufficiently sharp. Do not use pesticides or pruning paint on any cuts. Pruning paint can seal in harmful fungi and bacteria and slows healing.

HERBICIDES:

Herbicides may never be used on mangroves for trimming or otherwise.

TIMING:

Mangroves will only produce new leaves and fruits once or twice per year. Trimming is best done during the months of October through March, when mangrove growth is somewhat slowed and the plant's energy demand for producing flowers and propagules is reduced, leaving more energy for recovery from the trimming. Don't trim prior to a hurricane. The tree will need whatever leaves it can maintain to generate energy for recovery. To allow for flowering and fruiting, and for a healthy mangrove area, regular trimming, once or twice a year at the most, will reduce stress to the tree in the future, allow propagule production and will maintain your view.



DEFOLIATION IS STRESSFUL:

If all or most of the leaves are trimmed off of a mangrove, its survivability is severely reduced. Red mangroves and large black mangroves are the most susceptible to death from defoliation. To prevent this from happening, it is recommended and generally required that no more than 25% of the foliage is removed annually from **any** tree.

TRIMMING STYLES

Before trimming try to determine exactly where you would like a view and try to limit the trimming as much as possible.

WINDOWING:

Windowing is a view through large trees that can be obtained by selective limb removal within the lower or central area of the tree. Windowing allows for a view while maintaining shade, privacy, windbreak, and additional habitat for wildlife (especially birds). The bottom height of a window may not be lower than 6 ft. from the substrate. Arborists recommend that the window openings be no more than 1/3 of the canopy for smaller trees and not more than 1/5 of the canopy of larger trees.



Windowed red mangrove along a residential complex

HEDGING:

Hedging is not recommended for mature red or black mangroves. Red mangroves do not sprout from older, lower branches and so can only form a hedge when young and low growing. Leaf mass must remain on the tree for the tree to continue its life processes. Consider leaving some areas with uneven heights or emergent stems to provide habitat and richer detrital output than flat-topped compact hedges. Alternate trimming styles can provide a 'healthier' view.



Red mangrove hedging along landscaping at a local condo

UNDERCUTTING:

Undercutting is the trimming of the lower portion of a tree (below 6ft.). Undercutting is allowed, so long as defoliation of all or part of the tree does not occur, however it is not preferred due to the damage that can occur to mangrove propagules colonizing in that area. The young mangroves (<6 feet tall) may not be removed, defoliated or destroyed. Consider a style of trimming that can maintain leaf mass and some open canopy (arboreal habitat). Mangrove leaves are an important source of nutrients for the smaller animals of the marine food chain, including sea grass and coral reef communities. Leaves that die naturally on the tree and then fall into the water are quickly biodegraded and available as a food source, unlike healthy leaves cut from the tree. Fresh cut green leaves will stay mostly intact lying on the substrate for months before total leaf breakdown. It is important to avoid frequent trimming in poorly flushed areas (if possible) i.e. water with poor circulation which can result in the leaves turning the water anoxic (low oxygen) due to natural processes.



Undercutting with red mangrove

TRIMMING PRINCIPLES

(see definitions, page 16)

1. Only trimming, not alteration, may be performed. Defoliation is not allowed. Trimming shall be staged i.e. removal of not more than 25% of the leaves from any tree annually to prevent alteration.
2. No mangrove may be trimmed to less than 6 feet in height as measured from the substrate (mud).
3. Mangrove roots may not be trimmed. Cutting mangrove roots is considered alteration and shall not be conducted without a permit.
4. Trimming may only be done with the permission of the property owner. Where mangroves are growing in a Crown-owned canal, the Crown is the owner of the mangroves. Trimming of Crown mangroves requires a permit under section 20 of the National Conservation Law, issued by the Department of Environment on behalf of the National Conservation Council. Trimming on another person's property is not authorised.
5. For shorelines greater than 150 feet, only 65% of the mangrove area may be trimmed. The area is determined by square feet of mangrove cover.



Hedge-trimmed mangrove fringe



Mangrove hedges incorporated into a luxury home development in Florida

SPECIES SPECIFIC TRIMMING

Species specific guidance must be read in conjunction with the trimming principles on page 12.

RED MANGROVE TRIMMING GUIDANCE:

Red mangroves are the most susceptible of the mangroves to damage from severe trimming. The following principles should be remembered when trimming red mangroves:

- They primarily grow from their branch tips “apical meristems”; removing most of these can kill a tree.
- When most of the leaves and apical meristems are removed, the tree’s survival is very doubtful because red mangroves lose their ability to resprout new branches from older parts of the tree (coppicing), especially when the diameter of the branch is greater than 1/2-1 inch thick.
- ‘Topping’ of red mangroves can be very damaging.
- The upper 50% of the canopy of tall red mangroves should not be cut (i.e. no top trimming of red mangroves).
- Red mangroves rarely recover from severe trimming and do not resprout most trimmed branches.
- They are best cut by trimming windows in the lower part of the canopy, with the bottom of the window being at least 6 ft. from the substrate (mud) to prevent illegal trimming of young mangroves growing into the windowed area.
- Cutting of the aerial/prop roots is prohibited unless it falls within section 6 of the Mangrove Species Conservation Plan. The smooth roots are readily distinguished from the stems which have obvious scar rings completely encircling them.

BLACK MANGROVE TRIMMING GUIDANCE:

Black mangroves handle most trimming fairly well, however mature black mangroves are susceptible to excessive trimming and do not recover as well as younger trees. The upper canopy of old mature black mangroves should not be removed to maintain the tree’s vitality and habitat. Because black mangroves have such strong, dense wood and are great wind breakers, windowing of the larger diameter trees is highly recommended. Following storm events, the Department has received many accounts of how untrimmed red and black mangrove fringes have saved property owners from incurring extensive property damage. These accounts occur worldwide and go to show the ability of mangrove fringes in protecting coastlines.

Small black mangroves are known to coppice, producing new shoots from the base of the tree, when trimmed, leading to a multiple stemmed shrub.



Hedge-trimmed red mangroves in a canal



Windowing with black mangrove

SPECIES SPECIFIC TRIMMING *(continued)*

Species specific guidance must be read in conjunction with the trimming principles on page 12.

WHITE MANGROVE TRIMMING GUIDANCE:

The white mangrove is highly tolerant of trimming, including hedging. They have reserve growth capability in their meristem. The meristem is a tissue along their trunks, and can provide reserve energy to help the tree recover from trimming. White mangroves can develop blocked vessels leaving parts of older trees weak. When trimming white mangroves, trim for balance of their weight as well as how they look.



White mangrove trees with two trunks and a balanced canopy over a mostly white mangrove hedge

BUTTONWOOD TRIMMING GUIDANCE:

The Buttonwood tree can reach mature heights of up to 45 feet; it develops low-hanging branches and produces small, green-colored spring blooms with rich-green foliage. Buttonwood is an extremely robust tree and lends itself well to trimming. As it can be trimmed extensively and responds well to heavy pruning, it is often used in hedging or as a privacy screen. However, though the buttonwood requires little pruning to develop a strong structure, it does require regular pruning and trimming to maintain its shape and health.



Buttonwood privacy hedging

SPECIES SPECIFIC TRIMMING *(continued)*

Species specific guidance must be read in conjunction with the trimming principles on page 12.

Here are some tips for trimming your buttonwood tree:

- ✓ Early spring is the best time to prune your buttonwood tree to promote healthy growth throughout the year. When hedging buttonwood, make any drastic changes and reductions around this time, then periodically throughout the growing season to maintain its desired shape.
- ✓ Remove any damaged or diseased branches and stems with sharp sterile shears. Remove thick, lower branches with a sterile saw, making one underside cut before cutting through the branch further out and finally making a clean slice closer to the branch collar.
- ✓ Make flush, angular cuts to promote rapid healing. Thin the interior branches of the buttonwood's densely foliated canopy to increase the sun and air flow throughout the tree while promoting healthy development.
- ✓ Trim back drooping and low-hanging branches to allow proper clearance for lawn equipment and walking traffic. Cut back vigorously growing branches and stems to align them with the buttonwood's desired shape. Remove unwanted suckers from the base of the tree by cutting them flush at the tree's planting surface.
- ✓ Pick up and discard all clippings and always keep the tree's planting area free of debris to reduce the potential for diseases. Irrigate your buttonwood tree deeply after each pruning and trimming session to promote rapid healing. Cease all trimming and pruning activities by midsummer to allow the wood to harden before the upcoming dormancy period.



Buttonwood hedges in a residential area

DEFINITIONS & KEY CONTACTS

DEFINITIONS:

- **Trim:** Means to cut mangrove branches, twigs, limbs and foliage, but does not mean to remove, defoliate, or destroy the mangroves.
- **Alter:** Human-induced removal, defoliation, or destruction of mangroves. Under the National Conservation Law this would constitute “take” of a mangrove species, which includes to damage, injure or harm a species.
- **Defoliate:** The removal of leaves by cutting or other means to the degree that the plant’s natural functions have been severely diminished or which result in the death of all or part of the mangrove.
- **Pre-trimmed height:** The height of the mangroves immediately prior to any trimming event, whether it is the first time trimming, staged trimming, or maintenance trimming.
- **Mangrove:** The Mangrove Conservation Plan defines the word mangrove to mean any specimen of the three native Cayman species (*Rhizophora mangle*, *Avicennia germinans*, *Laguncularia racemosa*), also known as the Red, Black, and White mangroves, and Buttonwood (*Conocarpus erectus*). The Plan does not distinguish between living and dead mangroves. Trimming regulations apply to both equally.

CONTACTS:

For more information on designated Mangrove Buffer Zones contact:

- **Department of Planning:**
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For more information on mangrove trimming principles:

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