Activity and Recommendations Report
Nature Foundation St Maarten (NF)

Activity name: Mangrove removal Zagersgut and Fresh pond
Date: 22nd of September 2021
Time: 8:00-9:00amd
Staff members NFSXM involved: Melanie Meijer zu Schlochtern (Manager
Involved organizations: VROMI infrastructure department
Involved persons: Ms. Lia Dania and Mr. Johannes Schaminee
NFSXM equipment used: Pick up vehicle, buckets and several fishing nets.

Summary of the Activity:

21st of September 2021 a call was received regarding the planned mangrove trimming and clearance in the area of Zagersgut and the Fresh Pond. The need of the situation was explained by VROMI, as the flow of water was hampered due to the sediment and trash trapping in the roots and branches of the mangroves and zagersgut channel.

On the 22nd of September Nature Foundation met with the VROMI Infrastructure department on the location to discuss the concerns and current removal activities. Upon arrival it was established that mostly white mangroves (*Laguncularia racemose*) were located around the pond and Zagersgut channel, several of those mangroves were already removed by VROMI as can be seen on the pictures. Large amounts of trash and garbage were recorded in the water ways and in between the mangroves, mostly single use plastic products.
In between the mangroves multiple bird species were found using the area, resting or feeding, such as common moorhens with babies, black-crowned night heron, great egret, bananaquit, great blue heron, and green heron. Red-eared slider turtles were found in the gutter beside the zagersgut channel, but upon attempting to remove the turtles they all disappeared. The gutter probably was in connection with the pond and the turtles were able to swim in and out.

VROMI explained the need to remove the mangroves, as the water from Cul de Sac is stagnating due to the sediment slip building up, trash being trapped and the vegetation growth. NF explained that the large amounts of trash and garbage need to be removed and cleaned, as this is a significant cause hampering the water flow. Also, some of the mangrove trees need to be trimmed to increase water flow, often removal may not be needed as the white mangrove roots are mostly located on land and not in the pond itself. The mangroves are also important as they filter the water and increase the quality, considering the large amount of pollution and trash, water filtering by mangroves is much needed.
An abundance of important bird species are using the area, especially the mangroves and pond water, therefore it is important to keep most of the mangroves intact and decrease removal as much as possible. The mangroves decrease disturbances for birds and contribute to their health, feeding and nesting success

Ecosystem and Species Importance:

Wetlands are vital for human survival and the world's most productive environment; wetlands are protecting coastlines as they reduce storm wave power and protect us against extreme droughts and flooding (especially red and black mangroves). Wetlands and their mangroves are a habitat for many

wildlife species, marine life species and birds, they call it home or rest in wetlands during migrations, in addition mangroves improve water quality due to filtration of the water.

Mangroves are the most import key species in wetlands, mangroves provide a slew of benefits such as acting as storm barriers, reducing flooding and erosion from storms, acting as nurseries for fish, and filtering pollutants from water. Their role as fish nurseries can have big impacts on local economies and food production. Mangroves are powerhouses when it comes to carbon storage. Studies indicate that, pound for pound, mangroves can sequester four times more carbon than rainforests can. Most of this carbon is stored in the soil beneath mangrove trees.

The mangrove forests provide a habitat for a number of different plants and animals dispersed from the muddy sediments through the trees into the canopy. These include many invertebrates, reptiles, fish and birds. Many animals find shelter either in the roots or branches of mangroves. Mangroves serve as rookeries, or nesting areas, for coastal birds such as brown pelicans. Many migratory species depend on mangroves for part of their seasonal migrations.

Mangroves maintain coastal water quality by abiotic and biotic retention, removal, and cycling of nutrients, pollutants, and particulate matter from land-based sources, filtering these materials from water before they reach seaward coral reef and seagrass habitats. Mangrove root systems slow water flow, facilitating the deposition of sediment. Toxins and nutrients can be bound to sediment particles or within the molecular lattice of clay particles and are removed during sediment deposition. Compared with the expense of constructing a wastewater treatment plant, mangroves are commonly selected as receiving areas of effluent.
As a result of their intricately entangled above-ground root systems, mangrove communities protect shorelines during storm events by absorbing wave energy and reducing the velocity of water passing through the root barrier.

On St. Maarten four species of mangroves can be found: *Rhizophora mangle* (Red mangrove), *Avicennia germinans* (Black mangrove), *Laguncularia racemosa* (White Mangrove) and *Conocarpus erectus* (Buttonwood).

Mangrove Trimming:
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. The upper canopy of old, mature black mangroves also should not be removed to maintain the tree's vitality and habitat. 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. Removing most of the branch tips, which is where most of the new growth occurs, on a red mangrove can kill a tree.

Of the mangrove species, the red mangrove is the least tolerant to trimming. Cut red mangrove branches do not regenerate well or at all, if they are greater than approximately 2.5 cm (1 inch) in diameter (Gill and Tomlinson 1971, Beever 1989). Severe trimming kills mature red mangroves. White mangrove trees are less sensitive to trimming damage than red mangroves because of specific anatomical differences which allow coppicing from trunk and root stock. However, improper severe cutting of both white and black mangroves will kill these trees as well. Buttonwood is more robust tree

and can recover well from trimming. If buttonwood trees must be trimmed it is recommended to leave the upper 50% of the canopy intact and remove no more than 25% of the overall foliage.

Recovery potential of mangroves to pruning is as follows: buttonwood and white mangroves, highest recovery; black mangroves, moderate recovery; red mangroves, lowest recovery. Removing more than 30 percent of a red mangrove canopy produced significantly fewer propagules than those trees pruned less than 30 percent. Trees pruned more than 50 percent were severely impacted. Red mangroves exhibit difficulty in initiating new shoots when severely disturbed (Snedaker 1982). Trimming of trees immediately preceding and during flower set, propagule growth, and major leaf set can reduce and damage the reproductive success and productivity export for that year. Mangrove trees can only produce new leaves and fruits once or twice per year, trimming can severely impact the health and growth of the tree.

Legislation:

All mangroves are listened in the SPAW (Specially Protected Areas and Wildlife) protocol Annex lll, which are plant and animal species for which the exploitation is authorized but regulated so as to ensure and maintain population at an optimal level (the regulations will often aim, for example, at determining selective ways of capture avoiding the local disappearance of a species or to establish periods of closed season for hunting and fishing). Exploitation is maybe authorized when regulated according to the protocol. However currently these populations are not at an optimal level and are greatly decreased on St. Maarten, and no selective ways are established to avoid local disappearance.
St. Maarten mangroves are an important habitat for the brown pelican, the pelican is a protected native species under the SPAW protocol annex ll. Their (nesting) habitat cannot be damaged. According to article 17 of the nature ordinance, it is forbidden to kill, injure, capture, collect, possess, directly or indirectly disturb the living environment of an animal belonging to a protected animal species, resulting in a physical threat or damage to the fauna or other species. It is prohibited to perform acts therewith that result in the disturbance of an animal. It is forbidden to disturb an animal belonging to a protected animal species, to disturb its nest, hole or reproduction or resting place or to damage or destroy it, and to obtain a nest of such an animal.

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- Local St. Maarten's legislation; 'Protected animal and plant species are all animal and plant species belonging to the native fauna or flora, listed in Annex I of the Bonn Convention, Annexes I and II of the SPAW Protocol, Annex I of the CITES Convention and Annexes I and II to the Turtle Convention' (National Decree on Nature Management and Protection Article 16).

Recommendations:

- Much of the water flow is decreased due to large amounts of trash and garbage. It is strongly recommended to have a contractor remove all trash and garbage in and around the pond and mangroves. Hereby the water flow will increase, and less sediment will be trapped over time.
- It is recommended to not remove or uproot the white mangroves and minimize tree uprooting or removal activities as much as possible.

- Avoid and minimize unnecessary damages to the white mangroves and other trees.
- Rather apply branch trimming techniques instead of removal activities, in order to eliminate excessive growth of mangrove branches which cause the water flow to decrease. Keep root systems of white mangroves intact and follow trimming recommendations as much as possible.
- Whenever possible follow the Nature Foundation recommendations for mangrove trimming for St. Maarten listed below.
- Several different bird species reside in the mangrove trees, in case of mangrove trimming or uprooting, provide sufficient time for these species to leave the area safely.
- Remove bird nests before trimming and tree removal activities.
- Install trash catchments (traps) in the water ways flowing into zagersgut and the Fresh Pond, to prevent garbage to end up in the pond. These catchments or traps need to be empty regularly, especially during hurricane season and rainy periods.

Nature Foundation recommendations for mangrove trimming on St. Maarten:

1. Mangroves cannot be trimmed below 6 feet. This is the minimum height at which the mangrove should stand. Canopy trimming should be done in stages to prevent injury and defoliation of the tree. Canopy or 'topping' trimming should not be done to red mangroves.
2. It is advised to not trim red mangroves at all due to their sensitivity to trimming and ecological importance. Trimming black mangroves should be done very carefully. White and buttonwood mangroves may be trimmed withing the following parameters: no more than 25% of the mangrove's leaves should be removed during trimming.
3. 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. To accomplish this cut out and away from the large limb or trunk.
4. The roots of the mangroves, even those that can be see above the ground or water, should not be trimmed.
5. Pick up and discard all clippings and always keep the tree's planting area free of debris to reduce the potential for diseases.
6. Trimming is best done during the months of October through March.
7. If pelican nests are found or other protected species are found in the mangroves, trimming activities cannot be conducted. Protected species cannot be disturbed according to St. Maarten's legislation.

Pictures:


White mangroves removed at the channel of Zagersgut by the Bridge.


Large amounts of trash and garbage at Zagersgut and the Fresh Pond.


Different bird species present in the pond and waterways, Black-crowned night heron and Common Moorhen.

Much trash located in between the mangroves, behind the church, and several baby Common moorhens using the pond and mangroves.

Gutter were slider turtles were seen in.