Agriculture, Fisheries and Conservation Department
Conservation Branch

Nature Conservation Practice Note No. 06

Ref: AF GR CON 21/2

Guidelines on Clearing Refuse in Mangroves

1. Purpose

1.1 The purpose of this practice note is to provide technical guidance to relevant government departments when deploying in-house staff or outsourced contractors in clearing refuse trapped in mangroves.

2. Background

2.1 Marine refuse has long been a concern among the public as it adversely affects the marine environment and when washed ashore also impacts on the coastal surroundings. Collective effort among government departments [1] has been ongoing to remove the marine/coastal refuse as much as possible. However, difficulties in effectively clearing marine/coastal refuse are sometimes encountered, especially in situations where refuse washed ashore get entangled with coastal vegetation or trapped among densely vegetated locations. While removal or trimming of the vegetation concerned provides the most direct way to help clear the trapped refuse, in areas where coastal habitats of conservation importance such as mangroves are involved, potential damage to the important coastal habitats should be duly considered before carrying out the clearing operation.

2.2 Refuse that get entangled with or trapped inside mangroves, if left unattended and accumulates, may impede the growth or even result in the death of individual mangrove trees. It may in turn adversely affect the wildlife that relies on the mangrove habitats for home, reproduction, food and shelter. As such, it would be important to facilitate departments in the clearing of refuse trapped in such habitats by providing some guidance on how to minimise the impact during the clearing operations.

3. The Mangroves in Hong Kong

3.1 Mangroves are salt-tolerant plants that occur in sheltered intertidal areas that receive regular freshwater input from streams and rivers. They possess extensive root systems that allow the plants to secure their stability in the relatively mobile muddy substrate in the estuarine environment.

[1] Collection of marine/coastal refuse is mainly undertaken by four government departments: gazetted beaches by the Leisure and Cultural Services Department (LCSD), country parks, special areas, marine parks and marine reserves by the Agriculture, Fisheries and Conservation Department (AFCD), unallocated coastal areas by the Food and Environmental Hygiene Department (FEHD) and coastal waters/open waters/typhoon shelters by the Marine Department.

3.2 There are eight true mangrove species in Hong Kong, including *Kandelia obovata* (水筆仔), *Avicennia marina* (白骨壤), *Aegiceras corniculatum* (桐花樹), *Acrostichum aureum* (鹵蕨), *Excoecaria agallocha* (海漆), *Heritiera littoralis* (銀葉樹), *Bruguiera gymnorrhiza* (木欖) and *Lumnitzera racemosa* (欖李). The species composition of each mangrove stand varies, and the average height of most mangrove stands is above 1.8 m, although some dominant trees (e.g. *Kandelia obovata, Aegiceras corniculatum*) may grow up to 7 m in height.

4. Factors to Consider when Clearing Refuse in Mangroves

4.1 A number of factors should be considered when planning refuse clearance in mangroves:

- Distribution and types of refuse to be cleared;
- How the refuse are trapped or entangled in the mangroves;
- Extent of mangroves affected;
- Part of mangroves affected by the refuse (e.g. canopy, root, etc.).

4.2 As mangroves are located in intertidal areas, the time available for working in mangroves will usually be limited to low tide periods. It is often not feasible, if not impossible, to remove every single piece of refuse from the mangroves and effort should be made to remove the refuse as far as practicable. Therefore an assessment of the area to cover and the duration of time available for the clearing operation should be made beforehand.

5. Methods for Clearing Refuse in Mangroves

5.1 Under usual circumstances, refuse entangled with or trapped inside the mangroves should be removed directly by hand (protected with gloves) or the use of light tools such as handheld tongs to avoid/minimise physical damage to the plants.

5.2 Where clearing of refuse at the inner areas of mangroves is required but impeded by the lack of access, trimming of the interfering plants could be considered to facilitate the opening up of some workable space for personnel involved to access the inner areas. From a nature conservation perspective, felling of mangrove trees should be avoided and trimming should be minimised as far as practicable. The advice from AFCD and the respective vegetation maintenance department should be sought in this respect[2].

5.3 During the typhoon seasons, strong tide and wind often result in large amount of refuse being washed ashore and entangled with the branches of the mangrove plants. Manual removal of the entangled refuse is sometimes difficult and not effective. Trimming of the heavily entangled branches in such situation could be considered. The advice from AFCD and the respective vegetation maintenance department should be sought in this respect[2].

5.4 Sometimes refuse is trapped with other coastal vegetation commonly growing on the

[2] Interdepartmental site visit among FEHD, AFCD and the respective vegetation maintenance department should be arranged to determine and agree on the extent of plant trimming or removal.

shore, such as *Sesuvium portulacastrum* (海馬齒) and *Derris trifoliata* (魚藤). Removal of such plants could be considered to facilitate access and refuse removal. The advice from AFCD and the respective vegetation maintenance department should be sought in this respect[2].

5.5 Where removal or trimming of coastal vegetation is necessary for clearing of refuse, it should be carried out by the responsible government departments in accordance with the vegetation maintenance responsibility as stipulated in the Development Bureau Technical Circular (Works) No. 6/2015[3].

6. Additional Remarks

6.1 This Practice Note aims to provide general guidance on the clearing of marine refuse in mangroves only. Pre-operation site assessment is recommended for drawing up any special requirements to cater for site specific conditions. The advice from AFCD should be sought if in doubt.

6.2 Safety precautions and occupational safety and health requirements should be duly observed during the entire course of clearing operations. Personal Protective Equipment (PPE) should be provided and worn by site staff at all times during the operations.[4]

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[3] Delineation of tree and vegetation maintenance responsibilities among government departments is given in Appendix A of DEVB TCW No. 6/2015 – Maintenance of Vegetation and Hard Landscape Features, or any circulars or government guidelines amending or substituting the same as applicable at the relevant point in time

[4] Guidelines on PPE are provided by the Occupational Safety and Health Council.

References

Environmental Protection Department. (2015). *Investigation on the Sources and Fates of Marine Refuse in Hong Kong – Study Report.* 44 pp.

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Mangroves in Hong Kong. Retrieved from website of AFCD: www.afcd.gov.hk/english/conservation/con_wet/con_wet_man/con_wet_man.html

Occupational Safety and Health Council. (2001). Guidelines for the Use of Personal Protective Equipment. 17 pp.

Annex A True Mangrove Species found in Hong Kong

A1 – *Kandelia obovata* (水筆仔)

A2 – *Avicennia marina* (白骨壤)

A3 – *Aegiceras corniculatum* (桐花樹)

A4 – *Acrostichum aureum* (鹵蕨)

A5 – *Excoecaria agallocha* (海漆)[5]

[5] *E. agallocha* exudes a white latex from any broken part. As such white latex could be irritating to eyes and skin, direct contact with this plant should be avoided.

A6 – *Heritiera littoralis* (銀葉樹)

A7 – *Bruguiera gymnorrhiza* (木欖)

A8 – *Lumnitzera racemosa* (欖李)