Management of Forest invasive species in Sri Lanka

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SRI LANKA

Management of Forest invasive species

Management practices for Invasive species

Lantana camara

Miconia calvecens

Alstonia macrophylla

Oclandra stridula

Management of Lantana camara

Introduction to Sri Lanka

- In 1828 through the Royal Botanic Gardens as a ornamental plant

Present distribution

- It is a major invasive species found throughout Sri Lanka.
- It has invaded major National Parks in Sri Lanka and, significantly affect the grazing lands available for elephants.

Habitat

- Lantana invades disturbed sites, especially open sunny areas, such as roadsides, Degraded forests and forest plantation.
- It does not grow well under a heavy canopy as it is not very shade tolerant.
- Therefore, it is not a problem in intact tropical rainforest.

Spread of Lantana in Huru national park, Polonnaruwa

Reproduction and dispersal

- **By seeds**
  - Mature plants produce up to 12,000 seeds annually. Seed germination occurs when sufficient moisture is present
  - germination is reduced by low light conditions.
  - Fruit dispersal is through frugivorous birds, jackals and rodents.
  - Viability of its seeds is improved when the seed passes through the digestive system of birds and animals.
  - High light intensity and soil temperature will stimulate germination of seeds
- **By suckers**
  - Existing colonies spread laterally via production of suckers
- **By braches**
  - Branches take roots after coming into contact with the soil
- **By Stem**
  - Stem fragments or pieces of the rootstock can also give rise to new plants after being moved by machinery or manually

Impact- Biodiversity and wild life

Lantana forms dense, impenetrable thickets that prevent natural regeneration of native species

Displace animal habitats and reduces grassing ground for mammals

Lantana camera excretes allelopathic chemicals which reduces the regeneration and growth of other surrounding plants

Control Method

Method	Population characteristics	Purpose of control	Restoration	Notes
Mechanical control	Large population	Eradication	Close planting of fast growing native tree species	
bulldozing				Not recommended to areas susceptible to erosion
ploughing				Re-growth will be imminent if the rootstock is not removed while weeding
Grubbing				
Manual cutting	Small to medium population	Remove top growth with seeds	ANR, re-vegetation	Repeated cutting is needed
brush cutters				
hand pulling				
Prescribe Fire	Small patchy areas	Removal of top growth		This must be repeated at regular intervals
				Burning is not recommended in natural forest areas

Management of lantana camara

Miconia calvescens

Introduction to Sri Lanka

- In 1888 through the Royal Botanic Gardens as a ornamental plant

Present distribution

- It is one of a major invasive species found in the sub and lower montane zone forests.
- Inhabits forest edges and understory of most lower montane and rain forests habitats.
- It is naturalized in the Kandy, Nuwaraeliya and Rathnapura district in Sri Lanka.

Description

Miconia calvescens is a woody shrubby tree normally growing between 6 and 12 m tall, but sometimes reaching up to 15 m in height

Large leaves are very attractive and have purple underneath and green top.

One of the distinctive features of M. calvescens is the three prominent longitudal veins on the leaves

Scented flowers bloom in an inflorescent and they are purple in colour.

Habitat

- Miconia prefers moist and sunny climate
- Miconia invades disturbed sites, especially open sunny areas, such as roadsides, Degraded forests and forest plantations .
- It also grow well under a heavy canopy even though it is not very shade tolerant.
- Therefore, it is a problem in intact tropical rainforest.

Reproduction and dispersal

- The species reproduces mostly by seeds, which are commonly dispersed by fruit eating birds, wind, waterways, vehicles, animals and humans.
- Vegetative reproduction also occurs.
- Rootstocks

Impact

- The plant forms dense thickets that take nutrients from the soil and block sunlight from reaching the forest floor, so that few plants under its canopy can survive.
- It thereby deprives native birds of the plants they need to survive.
- In addition, the species root system is superficial which is believed to contribute to landslides

Control Methods

Method	Population characteristics	Purpose of control	Restoration	Notes
Hand pulling	Seedlings (Small to medium	Reduced the population density	ANR, re-vegetation	Hang on wooden structures or nearby trees until completely dried - out.
Digging	Saplings (Small to medium)	Reduced the population density	ANR, re-vegetation	
De-barking	Matured trees	destroy the trees	ANR, re-vegetation	
Cutting	Large trees	Reduced fruit baring trees		Need Repeated cutting to suppress regrowth

Control

Spread in a natural forest

Alstonia macrophylla

History of introduction:

- Alstonia macrophylla was introduced to Sri Lanka for the purpose of reforestation and also as an important timber species
- The species became naturalized quickly and now it is a prominent tree species in secondary rain forests in Sri Lanka.

Present distribution:

In Sri Lanka, this species has established in the lowland and sub-montane areas of the wet zone (elevation up to 1500 m).

Dispersal and reproduction

- Seeds are the main method of reproduction of A. Macrophylla .
- The lightweight and hairy seeds are dispersed far and wide by wind

Impact

- The plant forms dense stands and other native plants have compete for nutrients from the soil so that few plants under its canopy can survive.
- Shade out other native species by sapling layer on the forest flow and thereby reduce the bio diversity of rainforest

Control Method

Method	Population characteristics	Purpose of control	Restoration	Notes
Hand pulling	Seedlings (Small to medium population)	Reduced the population density	ANR, re-vegetation	
Digging	Sapling (Small to medium population)	Reduced the population density	Re-vegetation	Not recommended for sloppy areas
De-barking	Medium to large population	destroy the trees	ANR, re-vegetation	Recommended for highly diverse forests
Basal Cutting	Medium to large population	Reduced fruit baring trees	Re-vegetation	Mono culture patches in natural forests

Management activities

Hand pulling

digging with tools

De-barking

Oclandra stridula

Oclandra stridula is native to Sri lanka

This species belongs to the plant family Poaceae and subfamily Bambusoideae.

It is an aggressive reed bamboo species common in the wet zone of the country.

Its invasive behavior is due to disturbance of natural habitats by people.

It can prevent regeneration of natural forest once it has invaded, so it often requires managing to reduce both ecological and economic impacts

Habit	*Habitat*
Oclandra stridula is a short, small, pale green shrubby bamboo with about 3-6 m in height.	It needs sun light for part of its life-cycle, so normally invades only open areas
Clumps are crowded and are composed of a large number of closely growing culms.	Its status as an invasive species is therefore partly a result of forest clearance by people.
Reproduction ◦ The plant reproduces mainly by rhizomes and seeds.	*O. stridula* grows as mono-specific stand along riverbanks, roadsides, gaps in natural forests, open grounds and in forest plantations.

Impact

- *Ochlandra* can form dense stands that can compete, outgrow and eliminate native tree species regeneration.
  - It also invades plantations and is a serious weed of forestry.
  - Obstruct the growth of planted tree species and reduces productivity of the plantation

Control method

Method	Population characteristics	Purpose of control	Restoration	Notes
Hand pulling	Seedlings-small population	Reduced the population density	ANR, re-vegetation	
Digging	Small/ medium	destroy the trees	ANR, re-vegetation	Not recommended to sloppy areas
Tarping	mono-specific stand	Block the sunlight and kill the root system	ANR, re-vegetation	Expensive Not recommended to low light areas
Basal Cutting	Large	Reduced the above ground competition	Re-planting	Repeat 3 /year

Management activities

After the control program

Secondery invasion

Dillenia suffruiticosa

Alstonia macrophylla

Natural regeneration of Native species

Restoration and monitoring

Broadcasting seeds of fast growing native tree species and planting large seedlings helped to restore soil conditions and jump- start natural restoration.

Monitoring is an important activity to repeat throughout the year to ensure plants are not re-sprouting.

Thank you