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Colombo 00700, Sri Lanka

Strengthening the capacity to control invasive alien species – Sri Lankan experience

IAS Sri Lanka

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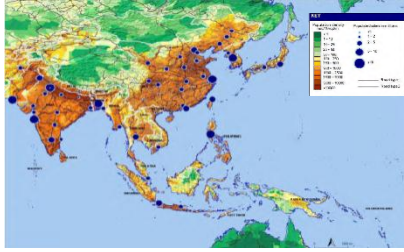
Biological Diversity = Biodiversity

- Variety or richness of life at all structural levels (molecular/genetic, species, ecosystem).

- Exploited and depleted - current rate of biodiversity loss is comparable to previous extinction events.

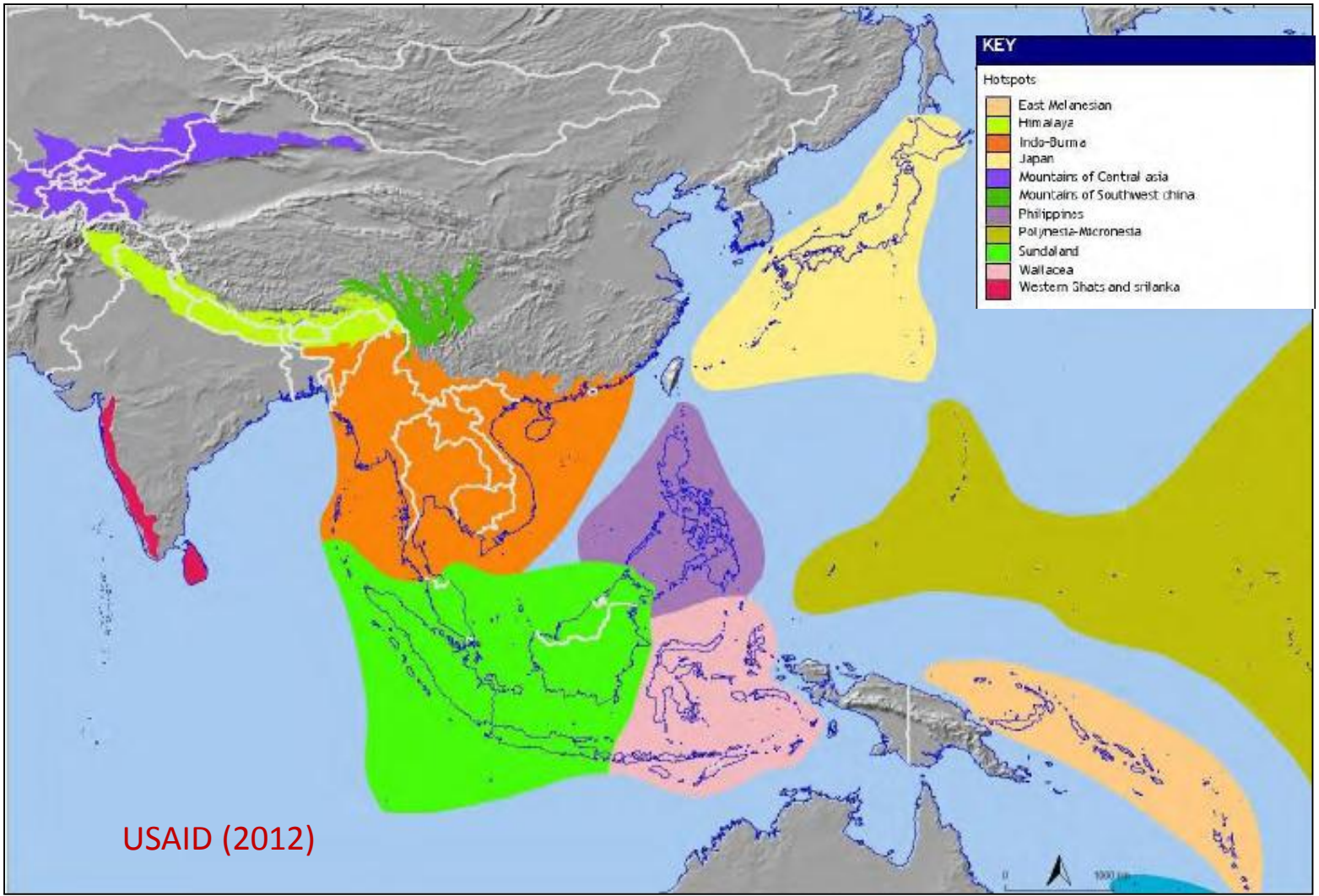
Globally significant biodiversity in Asia



- 8.6 % of the world‘s total land area
- 61 % of the world‘s human population
- 33% of all the threatened species (UNEP 2010)
- China, India, Indonesia, Malaysia, Papua New Guinea, and the Philippines: among 17 mega-diverse countries - contain 70 % of the world‘s biodiversity
- Southeast Asia: 3 % of the world‘s land area, 20 % of the known terrestrial species, including 27,000 endemic species
- Asian elephants, tigers, and orangutans: found only in Asia.

Biodiversity Hotspots

- Of the 34 biodiversity hotspots, 11 are in Asia & Pacific



Sri Lanka

- Highest biodiversity per unit area in Asia
- High proportion of endemic species
  - 98% of freshwater crabs
  - 85% of amphibians
  - 81% of land snails
  - 60% of reptiles
  - 55% of freshwater fish
  - 51% of Spiders
  - 28% of flowering plants
  - 17% of mammals

(Source: The National Red List 2012 of Sri Lanka)



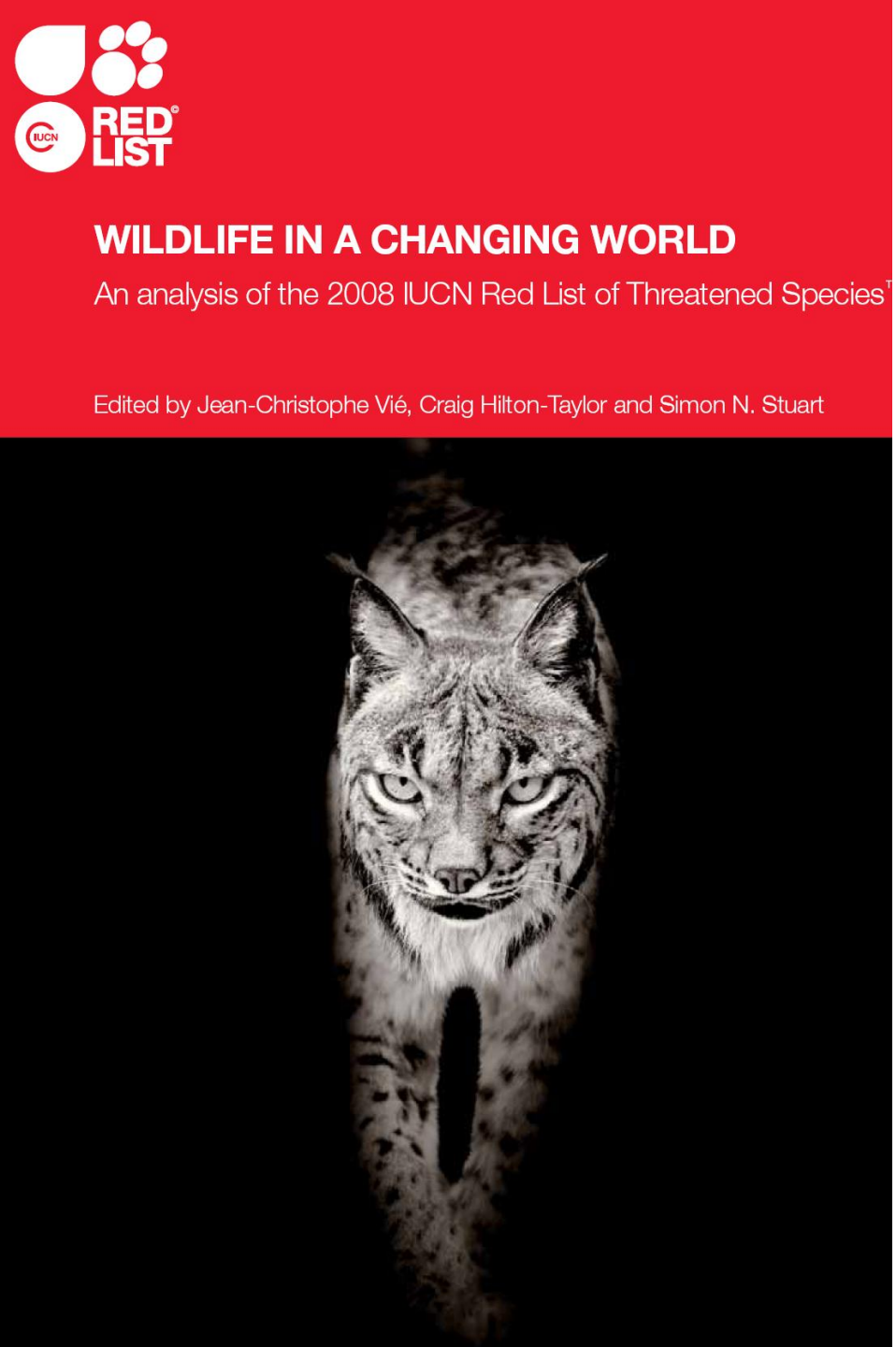


Tropical Biodiversity – Sri Lanka

Native Biodiversity

Tropical Biodiversity – Sri Lanka

Agro-biodiversity



Analysis of 2008 Global IUCN Red List of threatened Species

Invasive Alien Species are second only to human beings in their contribution to habitat destruction and loss of biodiversity

Convention on Biological Diversity
(CBD; Rio 1992)

Article 8(h)

"Prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats and species"




IAS - Impacts

- The significance of IAS as a global problem

  widely recognized

  adverse effects well described

- Solutions

  prevent introduction to new areas

  prioritize management and control measures for already established IAS.




- Funded Project

- Prof. Buddhi Marambe – University of Peradeniya
- Dr. Siril Wijesundera – National Institute of Fundamental Studies
- Prof. Pradeepa Silva – University of Peradeniya
- Prof. Devaka Weerakoon – University of Colombo
- Mr. Jagath Gunawardena – Environmental Lawyer
- Prof. Nirmalie Pallewatte - University of Colombo
- Dr. Sudheera Ranwala – University of Colombo
- Prof. Lasantha Manawadu – University of Colombo
- Dr. Nihal Atapattu – Canadian Development Agency
- Dr. Ananda Mallawatantri – IUCN (Sri Lanka)
- Mr. Ajith Silva – Min. Mahaweli Devpt & Environment
- Ms. Pathma Abeykoon - Min. Mahaweli Devpt & Environment
- Mr. Gamini Gamage – Min. Mahaweli Devpt. & Environment

Identifying IAS - Risk Assessment

- Pre-entry Risk Assessment Protocol (2010; 2015)
- Post-entry Risk Assessment Protocol (2010; 2015)

- Priority species
- Potential species
- Black lists



Key Project Outcomes

- National IAS Policy – Done
- National Strategy and Action plan for IAS Control – Done
- National IAS Act - ongoing
- Pre- and Post-entry risk assessment protocols - Done
- National Lists of IAS - Done (updated once in five years)
- Website and Database - Done
- Research prioritization - Done
- National IAS Communication Strategy - Done
- Best practice demonstration – ongoing
- Case studies - Done
- Capacity Building and Awareness - ongoing



Managing IAS – Best practice demonstrations

Pilot scale demonstration

- Department of Agriculture (DoA)
- Department of Wildlife Conservation (DWC)
- Forest Department (FD)
- Mahaweli Authority of Sri Lanka (MASL)
- National Aquatic Resources Research and Development Authority (NARA)
- Royal Botanic Garden (Department of National Botanic Gardens – DNBG)
- IUCN, NGOs

- Universities of Peradeniya (UoP), Colombo (UoC), Ruhuna (UoR) and Sabaragamuwa (SUSL)
- Marine Environment Protection Authority (MEPA), Sri Lanka Ports Authority (SLPA)



Managing IAS – Education and awareness

Training/awareness

- Policy makers
- Media
- Sri Lanka Customs
- Quarantine authorities/officers
- State and private sector organizations (Universities, implementing agencies)/Authorities/Agencies
- School teachers and children
- Community-based organizations

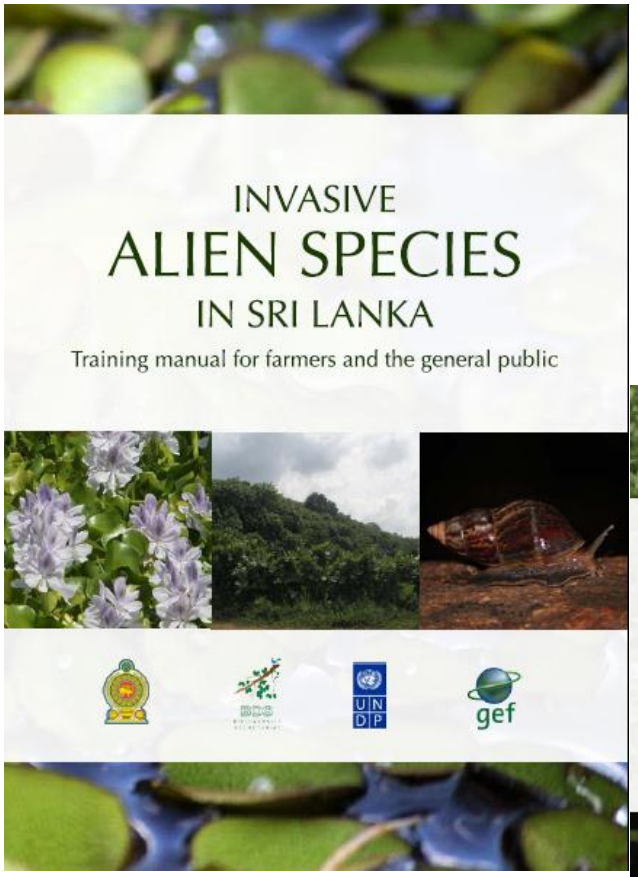


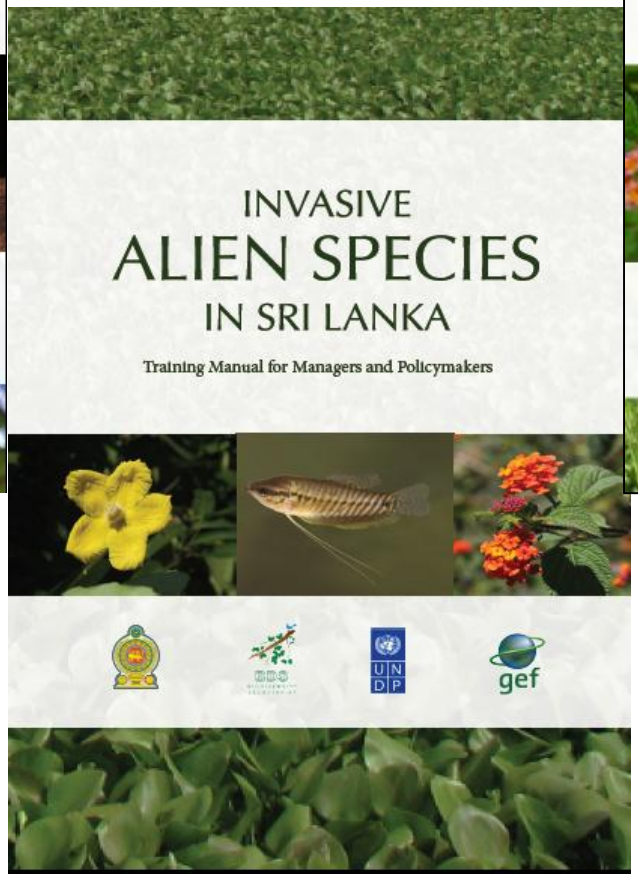
Creating awareness: Book published in 2010

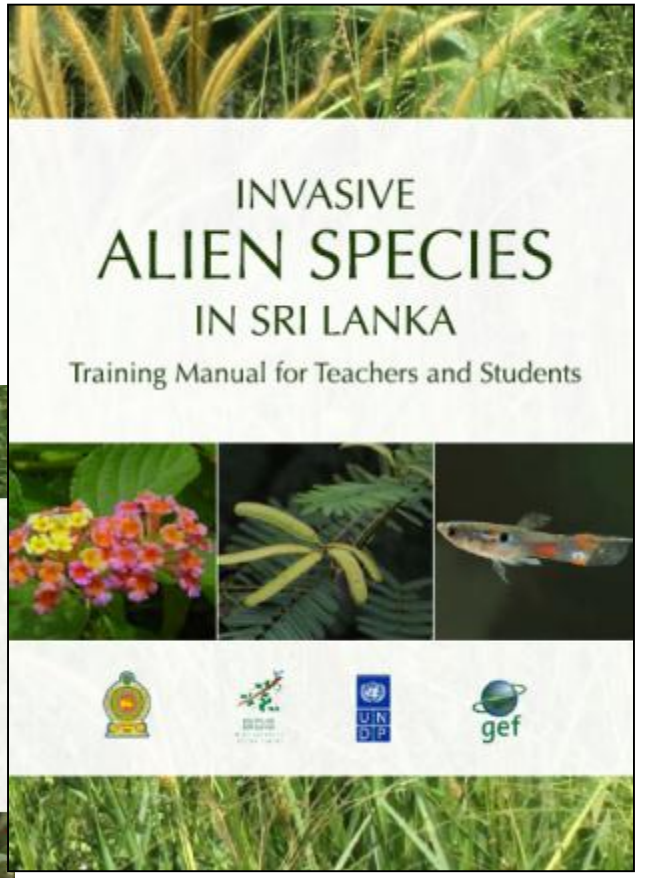
https://www.researchgate.net/publication/236155526_Invasive_Alien_Species__Strengthening_Capacity_to_Control_Introduction_and_Spread_in_Sri_Lanka

Training

Manuals
(English, Sinhala & Tamil)







Parthenium

Parthenium hysterophorus

Habit - Annual, erect herbaceous plant, 30-90 cm in height.

Identification Characters - Parthenium plants first form a basal rosette, up to 30 cm in diameter, of finely lobed leaves. Plants then form a paniculately branched hairy stem with length wise grooves. The leaves on the stem are alternate, and the upper leaves are entirely to slightly lobed. All leaves are light green in colour and pubescent on both sides. Flowers, are borne on the tip of the stems and are small (3-5 mm wide) and whitish with tiny ray florets at each of the 5 distinct corners. A small seed is produced in each of the five corners.

Invaded Ecosystems/Habitats - Native grasslands, woodlands, riverbanks, roadsides and floodplains.

Distribution - Northern dry and arid zones of Sri Lanka.

Control Method - Grading, mowing, slashing and ploughing are considered inappropriate since they may promote seed dispersal as well as rapid regeneration from lateral shoots close to the ground. A beetle native to Mexico, *Zygogramma bicolorata*, is capable of defoliating and killing this weed. This weed has been found to be resistant to glyphosate, a popular systemic herbicide, prohibiting its control in this manner. Paraquat (Gramxone) solution is sometimes applied to plants, when the weeds are young.

Common name and scientific name

Photographs showing habit and special features

Habit

Species description, distribution, control methods

Photographs showing affected habitat and distribution map

In English, Sinhala and Tamil

Parthenium

Parthenium hysterophorus L.

Family: Asteraceae

Common names: Carrot weed, White top, Star weed Congress weed (India) (English), Parthenium (Sinhala)

Character Identification:

This species is an ephemeral, herbaceous, annual weed, which is spread by seeds. Plants first form a basal rosette up to 30 cm in diameter, of finely lobed leaves. Plants then form a paniculately branched pubescent stem with lengthwise grooves. The leaves on the stem are alternate, and the upper leaves are entirely to slightly lobed. All leaves are light green in colour and pubescent on both sides. Flowers, are borne on the tip of the stems and are small (3.2-5.1 mm wide) and whitish with tiny ray florets at each of the 5 distinct corners. A small seed is produced in each of the five corners. The plant grows to a height of 2m.

Fig. 1: ***Parthenium hysterophorus***

Morphologically similar species: None in Sri Lanka.

History and introduction: The species was introduced to Sri Lanka through goats imported from India by the Indian peace keeping force in 1987. This plant was first identified from the Vavuniya district. Seeds of *P. hysterophorus* are also believed to have entered the island along with seeds of onions and chillies imported from India as a contaminant.

Present distribution: It is abundantly distributed in Northern dry and arid zones of Sri Lanka.

Dispersal and reproduction: The seeds are mainly dispersed through water currents, animals and the movement of vehicles, machinery, livestock, grain, stock feed and other products. It can also be spread by the wind because its seeds are small (1-2 mm diameter) and light (50 µg) and therefore are able to travel long distances. The transportation of soil, sand and gravel from Parthenium-infested areas to non-infested areas for construction purposes could also be a mode of dispersal.

Invasive Alien Plants of Sri Lanka
Fact sheet no. 20 – *Parthenium hysterophorus*

Impact on native species and habitats: The Parthenium weed, due to its allelopathic (chemical inhibition of other species) potential, replaces dominant flora and suppresses natural vegetation in a wide range of habitats and thus becomes a big threat to biodiversity. It is a poisonous or lethal weed for agricultural labourers and city-dwellers who are sensitive to it. The weed can cause asthma, bronchitis, contact dermatitis, eye irritation, and sinusitis.

Direct exploitation/ destruction of native species: It is an environmental weed which can cause irreversible habitat changes in native grasslands, woodlands, river banks and floodplains.

Current uses: Reported to have insecticidal, nematicidal and herbicidal properties. It is also used for composting.

Natural threats: Not known.

Prevention and control: Several Parthenium eradication campaigns have taken place in Sri Lanka to control this serious invasive species, especially the campaigns undertaken by Sri Lankan troops, Department of Agriculture and Forest Department are substantial efforts. Although this species has been controlled in some areas, it is still spreading in Jaffna peninsula.

Since these seeds can be spread via wind or flowing water, seed production should be prevented by destroying the plants before flowering or seed setting. Also continuous removal of the weed is required. Grading, mowing, slashing and ploughing are considered inappropriate since they may promote seed dispersal as well as rapid regeneration from lateral shoots close to the ground.

Fig. 2: Habitat invaded by ***Parthenium hysterophorus***

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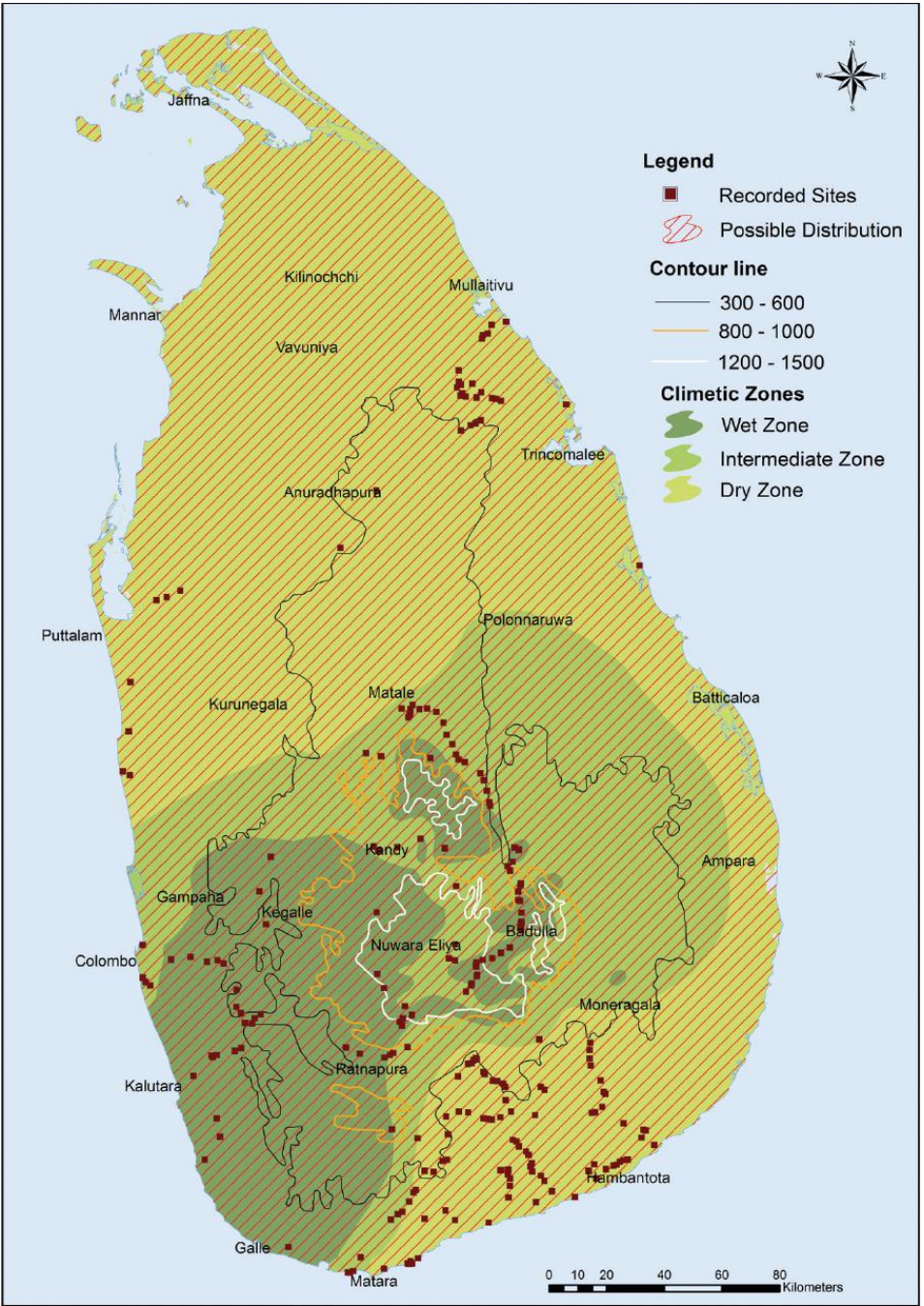
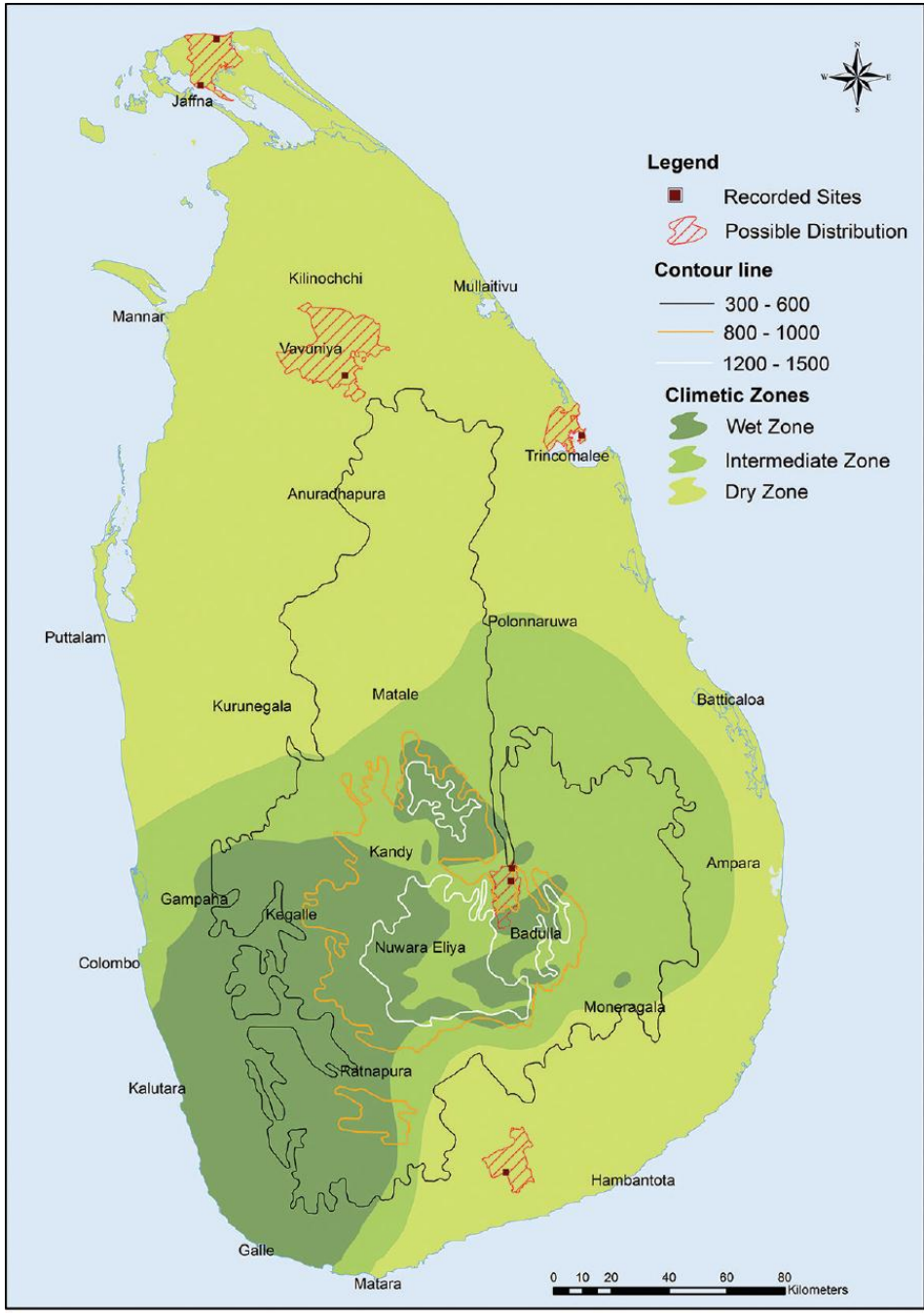
Strengthening Capacity to Control the Introduction and Spread of Invasive Alien Species in Sri Lanka

Lantana camara - 2015



Parthenium hysterophous- 2015



Future: Spill-off effects

- Mainstreaming Invasive Alien Species management activities into plans, projects and programs at the provincial level
- Sharing information and experience: regional context
- Training Programs for scientists and practitioners in the national and regional levels



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Thank you

http://www.iassrilanka.info/