# Communication Tools Used for Management of IAS - The Sri Lankan Experience

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# Importance of Education and Awareness in Combating AIS

- There are three steps in the progression to invasion by an AIS
  - Introduction (*Ex situ* or *In Situ*)
  - Establishment
  - Spread
- Each of these steps are influenced by man either
  - Intentionally
  - Unintentionally
- Thus humans play a central role in AIS





# Importance of Education and Awareness in Combating AIS

- Yet majority of the people remain unaware/ under aware about AIS
- Therefore awareness and education is a key action to be undertaken in any AIS combat strategy
  - Alien invasive species and their impacts
  - Best practices to follow when dealing with potential AIS/ AIS
  - Specialized education for officers involved in regulation





# Education, Training and Capacity

- The coverage of IAS in the formal teaching is not adequate
- Not much attention has been paid to carry out focused training of officers in the implementing agencies
- Some have obtained training indirectly when they enroll in various formal and non-formal education activities
- The awareness of officers of the implementing agencies are more on biology and ecology and less on actual measures needed for managing alien invasive species





# Target Groups

1. General Public
2. Students and Teachers
3. Agencies involved in regulation of entry alien invasive species
4. Agencies involved in control/ management of alien invasive species
5. Non regulatory agencies that has a bearing on introduction or spread of alien invasive species
6. Private sector organizations that has a bearing on introduction or spread of alien invasive species

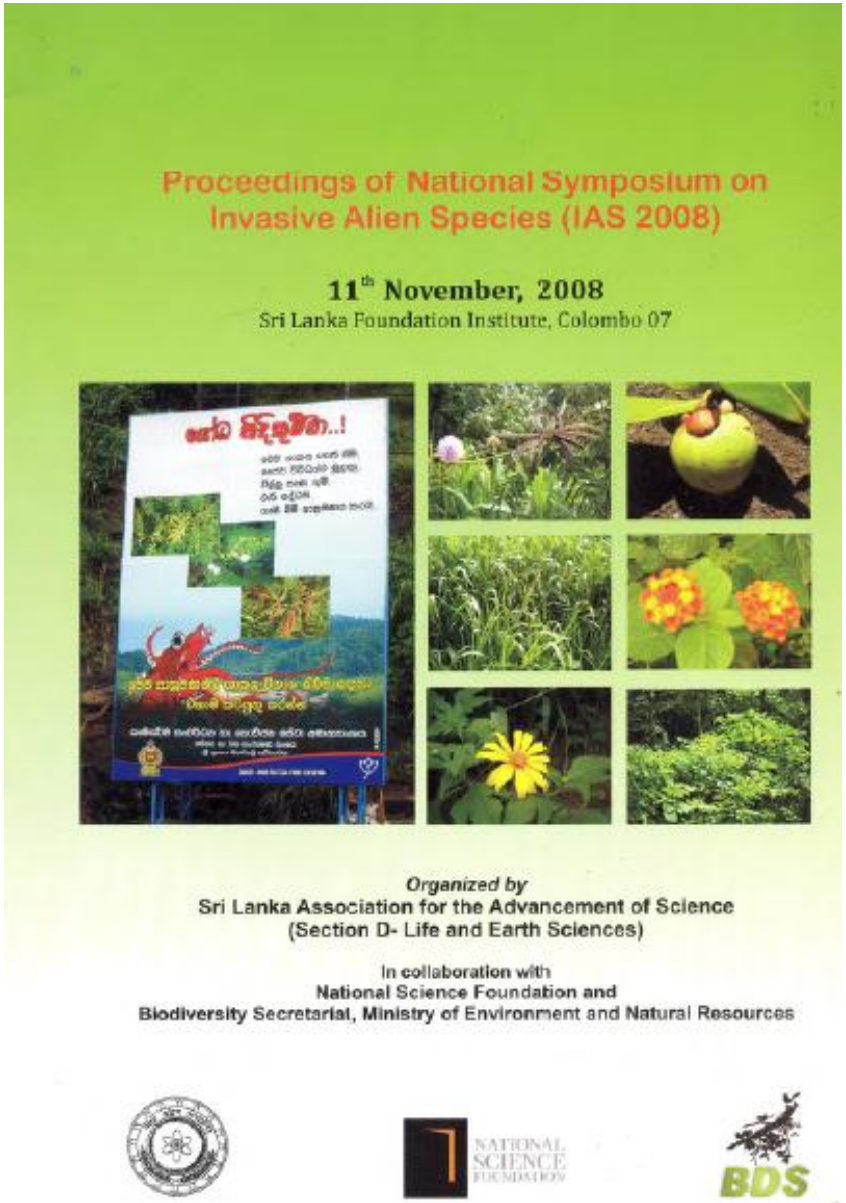




# Tools Used Currently for Education and Awareness

- National/ International Symposia
- Articles in newspapers, popular magazines and scientific journals
- Electronic media
- Posters, Brochures and Pamphlets
- Sign boards
- Workshops and public lectures
- Formal education
- Non formal education

# Knowledge Sharing







# Communication Tools Developed

- Pictorial Guide to IAS
- Descriptive Guide to IAS

Prosopis

*Prosopis juliflora*

**Habit** - A small tree, can reach up to 12 m in height.

**Identification Characters** - The Prosopis tree grows to a height of up to 12 m. It is sometimes shrubby with spreading branches. Branches cylindrical; the shrub is more or less round- or flat-topped, somewhat spiny with persistent, green (sometimes bluish grey/green or greyish, not reddish) foliage. Leaves are deciduous, bi-pinnate (1-3 pairs of pinnae), light green and compounded with 12 to 20 leaflets. It flowers shortly after leaf development. Flowers, 5-10 cm, are long green-yellow cylindrical spikes, which occur in clusters of 2 to 5 at the ends of branches. Pods are 20 to 30 cm long and contain between 10 and 30 seeds per pod. A mature plant can produce many thousands of seeds.

**Invaded Ecosystems/Habitats** - Lagoons, sand dunes, paddy fields, grasslands, home gardens

**Distribution** - Puttalam, Anurdhapura, Vavuniya, Mannar, Jaffna and Hambanthota districts.

**Control Method** - Total uprooting and burning, use in households as firewood, use for dendro-thermal power generation, chemical control.

# *Oncorhynchus mykiss* (Walbaum, 1792)
## Family: Salmonidae

**Common names :** Rainbow trout (English); Trout (Sinhala)

**Synonyms:** *Salmo mykiss* Walbaum, 1792; *Salmo gaidneri* Richardson, 1836; *Oncorhynchus kamloops* Jordan, 1892; *Oncorhynchus mykiss nelsoni* (Evermann, 1908); *Salmo nelsoni* Evermann, 1908; *Salmo irideus argentatus* Bajkov, 1927; *Salmo kamloops whitehousei* Dymond, 1931

**Identification Characters:** D III-IV.10-12; A III-IV.8-12; C 19
The rainbow trout can be distinguished from other freshwater fishes of Sri Lanka by its elongate, moderately compressed body and by the presence of a jaw with teeth. Its colour is grey dorsally and silvery on the sides. A faint pink stripe is present on both sides of the body. Its entire body is spotted, including the head and the fins.

**Total length:** Ranges between 45-60 cm, but can reach a maximum of 120 cm.

**Morphologically similar species:**
There are no known native or introduced species that are morphologically similar to the rainbow trout in Sri Lanka. However, the Brown trout (Salmo trutta, Linnaeus, 1758), which was introduced to the island in 1880 and 1882, is somewhat similar to this species but it has not been recorded within the island since then (Pethiyagoda, 1991; and Welcome, 1988).

**History of introduction:**
The Rainbow trout was introduced to streams in the higher elevations of the Central Hills in Sri Lanka in 1889 (Kottelat & Whitten, 1996) as a sport fish. A hatchery in Nuwara Eliya initially replaced the introduced stocks when they were depleted, but it is no longer functioning (Pethiyagoda, 1991).

**Present distribution:**
Rainbow trout are native to the northern Pacific coastal belt of eastern Siberia, and to the Pacific north-western coasts of USA and Canada (Froese & Pauly, 2014).
In Sri Lanka, populations have only established themselves in a few streams in the montane regions between 1700-2000m above sea level (Pethiyagoda, 1991), for example, Belihul Oya and Agra Oya in the Horton Plains and Pattipola.

**Dispersal and reproduction (breeding and dispersal):**
Rainbow trout females excavate small depressions and deposit eggs. The demersal eggs sink to the bottom and the male externally fertilizes the eggs. Eggs incubate in the bottom of the depression and hatch within four to seven weeks (Gall & Crandell, 1992; and Pethiyagoda, 1991).

**Impact on native species and habitats:**
The actual impact of this species on the native aquatic fauna has not been studied in



Sri Lanka. However, in other countries it has been responsible for driving many native species into extinction or endangerment, such as the Californian golden trout and the humpback chub in the Grand Canyon (Gawrylewski, 2004).

**Direct exploitation/destruction of native species:**
It is suspected that the decline of the endemic freshwater shrimp *Lancaris singhalensis* from Horton plains was caused by the introduced rainbow trout through predation (Pethiyagoda, 1991).

**Current uses:** Rainbow trout is a sport fish and are highly sought after by anglers. However angling/fishing is prohibited within Horton Plains National Park.

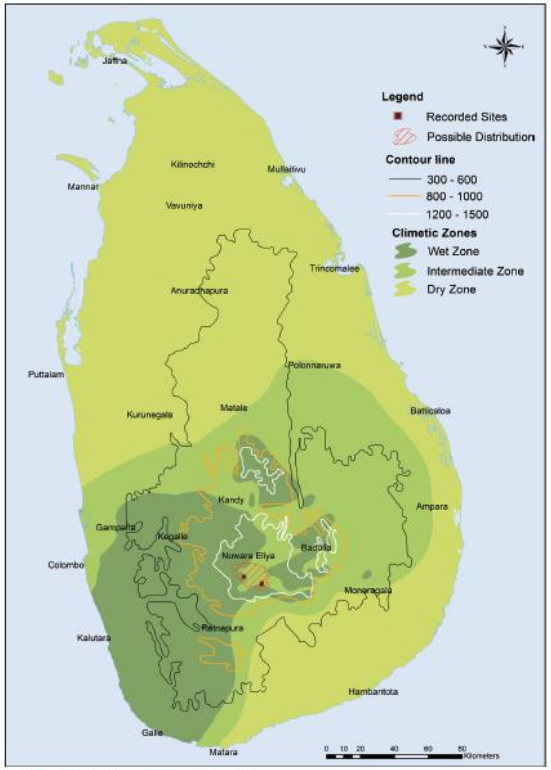
**Natural threats (predators):** Otters are their main natural predators in the area.

**Prevention and control:** Nothing has been reported on preventive or control measures for this species.

**Fig 2 -** *Oncorhyncus mykiss* Juvenile.

**Fig 3 -** *Oncorhynchus mykiss* habitat at Horton plains.






**Map 1 -** Distribution of *Oncorhynchus mykiss*.




# Communication Tools Developed

- Pictorial Guide to IAS
- Descriptive Guide to IAS
- Training manuals

# Training manual – Farmers, Managers, Teachers

## PROJECT TEAM

### IUCN Team of Contributors

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## CONTENTS




# Communication Tools Developed

- Pictorial Guide to IAS
- Descriptive Guide to IAS
- Training manuals
- Posters
- Leaflets

**How can you help control IAS?**

**DO's . . .**

- Learn about IAS in Sri Lanka, the damage they cause, and learn to identify them correctly.
- Remove all invasive alien animals that you identify on your land, before they spread to other areas.
- Follow correct procedure when you remove invasive alien animals.
- Seek advice from relevant authorities if you are not sure about identification, removal, or management of invasive alien animals.
- Inform relevant authorities if you notice any animal reproducing and spreading unusually fast in your area.
- Support regional and national IAS control and management programmes.

**DO NOT . . .**

- Bring exotic animals as pets or for your aquarium from overseas, without checking first with relevant authorities.
- Keep, transport or breed any invasive alien fauna.
- Dump invasive alien animals on other lands or wastelands once you remove such animals from in and around your premises.
- Dump exotic animals (such as fish, birds, snails) into natural habitats or waterways.
- Throw out aquarium tank water into waterways.
- Use poison to control invasive alien animals in open lands or natural habitats.
- Allow domestic animals and pets to become wild (i.e., become feral) as they could threaten native species in natural habitats.

**List of Invasive Alien Fauna in Sri Lanka**

| Common name | Scientific name |
|---|---|
| Rainbow trout | *Oncorhynchus mykiss* |
| Scavenger | *Pterygoplichthys disjunctivus* |
| Scavenger | *Pterygoplichthys pardalis* |
| Clown knife fish | *Chitala ornata* |
| Marble catfish | *Clarias batrachus* |
| Red-eared slider turtle | *Trachemys scripta* |
| Apple snail | *Pomacea spp.* |
| Giant African land snail | *Lissachatina fulica* |

**Red-eared slider turtle** *(Trachemys scripta)*, imported to Sri Lanka in early 90s and some of these captive pets escaped or deliberately released into the wild.

**Marble catfish** *(Clarias batrachus)*, introduced from South Asia for the aquarium trade this omnivore is reported to spreading in Polgolla area, where it is feeding on native fish and competing with the native species of catfish.

**For more information, contact**

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811A, Jayanthipura, Battaramulla

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53, Horton Place, Colombo 7

**Websites**

- IUCN Invasive Species Specialist Group: **www.issg.org**
- Global Invasive Species Database: **www.issg.org/database/welcome/**
- IAS project website **www.iassrilanka.info**

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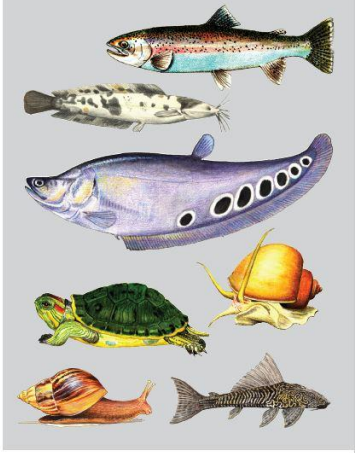
**Invasive Alien Fauna of Sri Lanka**



# Other Communication Measures

- IAS Website





# Other Communication Measures

- IAS Website
- Provincial AIS profiles
- Training of trainers
- Focused awareness programmes
  - Government sector – Detection and control
  - NGOs - Awareness
  - Private sector - Safeguards