

Presentation to the East Africa Capacity Building Workshop for Updating and revising NBSAPs,
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Invasive Species and Biodiversity in Eastern Africa

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THE IUCN RED LIST
OF THREATENED SPECIES™



Biological Invasions

A **biological invasion** occurs when a species is introduced to an ecosystem where it has not been before and it spreads and causes damage to the ecosystem

That species is now called an **Invasive Species**, in that place

The term **Alien Invasive Species** is often used because the invading species is foreign (or alien, or non-indigenous) to the ecosystem where it was introduced

The **CBD** emphasises that invasions cause **damage** to biodiversity - **ecosystems, species, populations, genes**

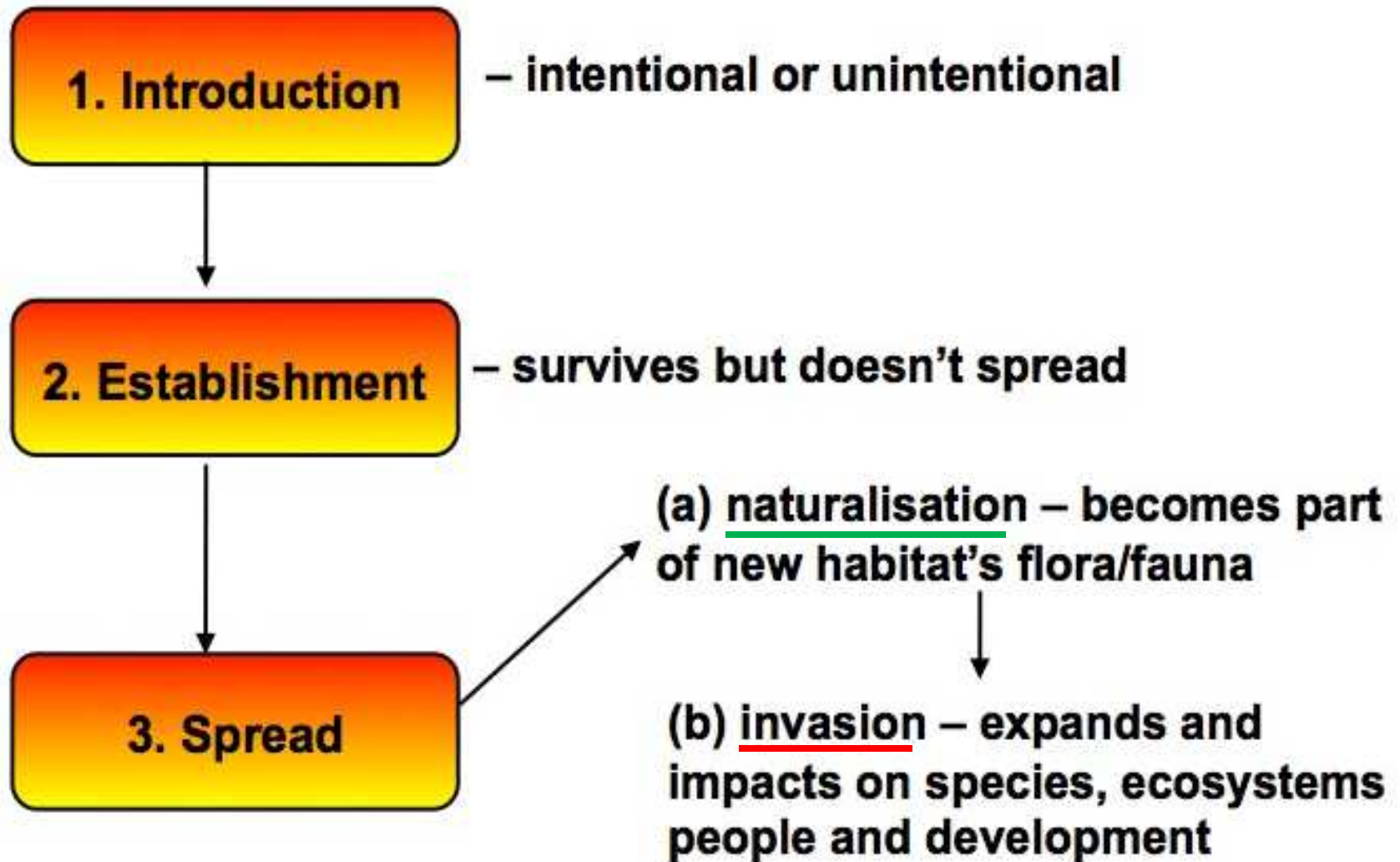
Steps to invasion

the progression to invasion:

1. Introduction – intentional or unintentional
2. Establishment – survives but doesn't spread
3. Spread:
 - 3a. Naturalisation – becomes part of the flora/fauna of its new habitat
 - 3b. Invasion – expands and impacts on species and ecosystems and people and development

Probability = 10% (2) x 10% (3a) x 10% (3b) = 0.1%
i.e. **only 1 in 1000 introduced species ever become invasive – usually less, some say 1 in 1,000,000**

The Process of Invasion



Invasive taxa (types)

- Invasive species can be: animals, plants or micro-organisms (including those causing disease in plants, animals and people)
- They can be terrestrial, aquatic or marine
- They can be pathogens, parasites or predators
- They can be minute, small, large – as well as widespread or locally abundant



Invasions in Eastern Africa

ALL of the countries in East Africa, Horn of Africa and WIO islands are invaded by plants and some invertebrates and few vertebrates



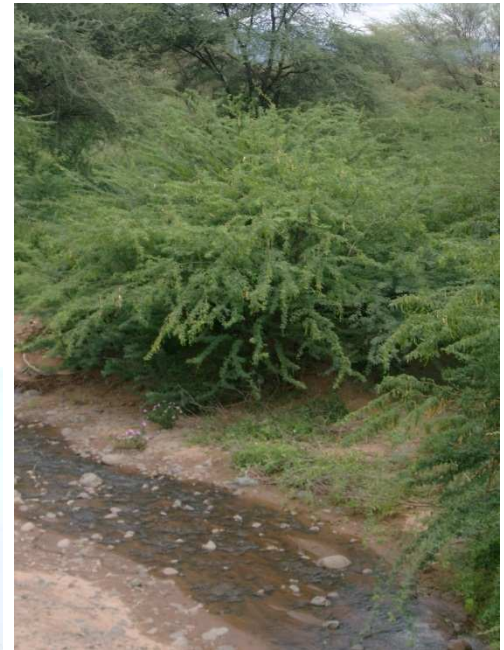
examples of invasion impacts

The House Crow (*Corvus splendens*, from Asia) has invaded most coastal cities in Eastern Africa, WIO Islands and the Middle East, thrives on garbage



kills domestic and wild birds, spreads human diseases, raids human food, attacks children, destroys radio aerials, etc.

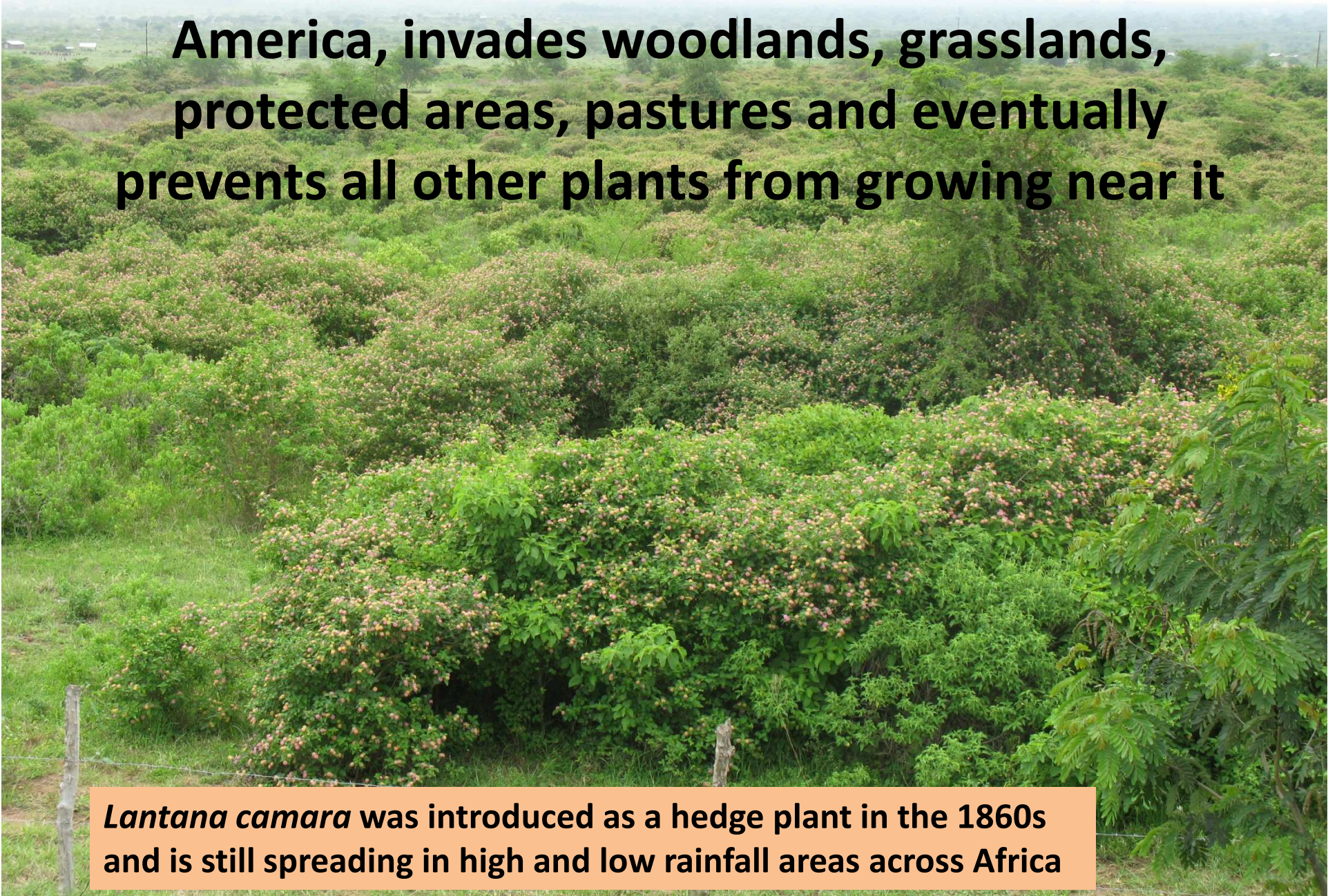
Prosopis juliflora, **Mesquite**, from Central America. An alien invasive introduced for agrofresty, grows well in drylands and pastoral areas



Reduces ground water, forms impenetrable thickets, prevents other plants from growing nearby

Causes wounds with its spines, replaces native dryland vegetation and destroys pastures for livestock and wildlife

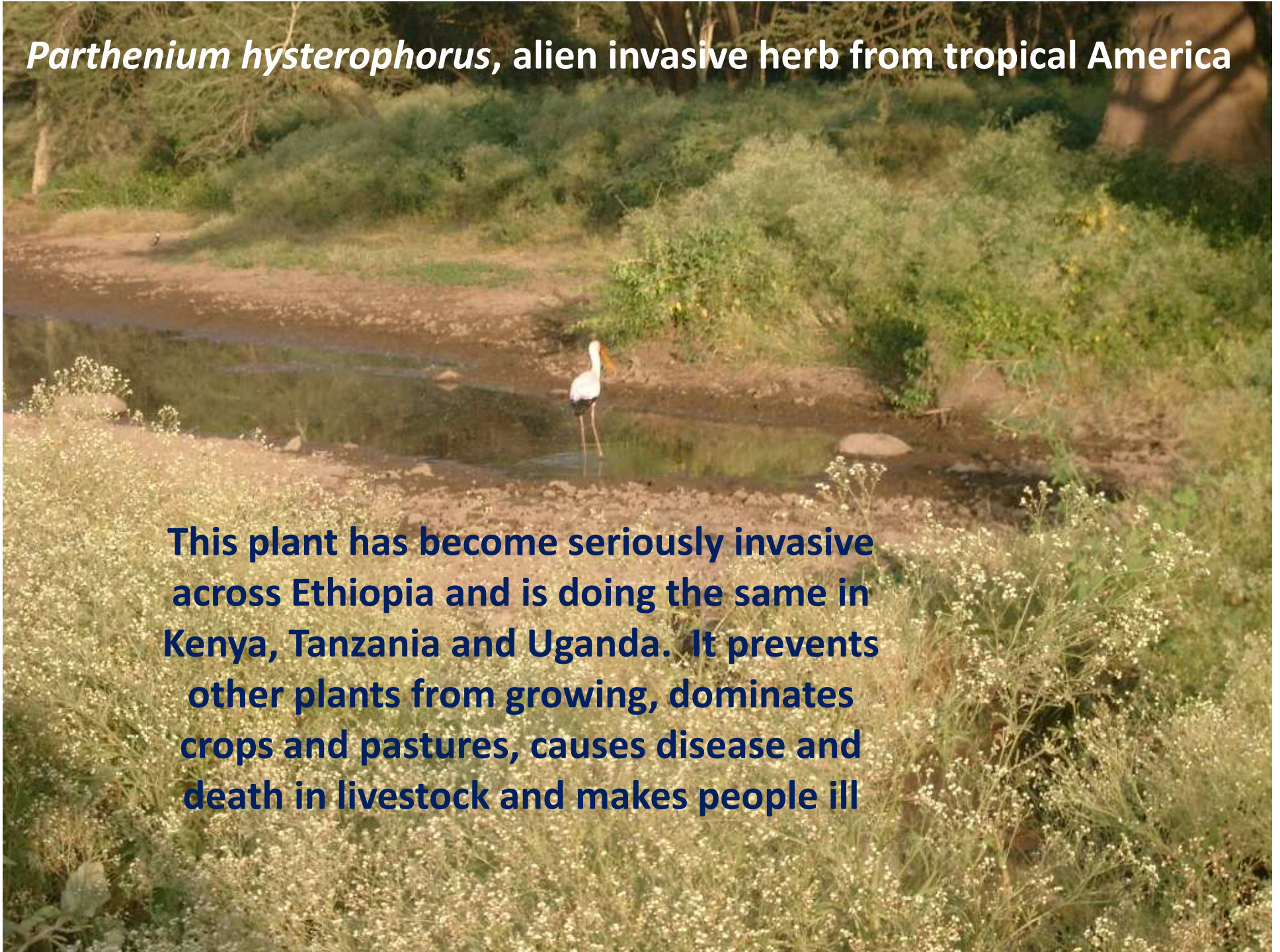
***Lantana camara*, an invasive shrub from tropical America, invades woodlands, grasslands, protected areas, pastures and eventually prevents all other plants from growing near it**



***Lantana camara* was introduced as a hedge plant in the 1860s and is still spreading in high and low rainfall areas across Africa**

Parthenium hysterophorus, alien invasive herb from tropical America

This plant has become seriously invasive across Ethiopia and is doing the same in Kenya, Tanzania and Uganda. It prevents other plants from growing, dominates crops and pastures, causes disease and death in livestock and makes people ill

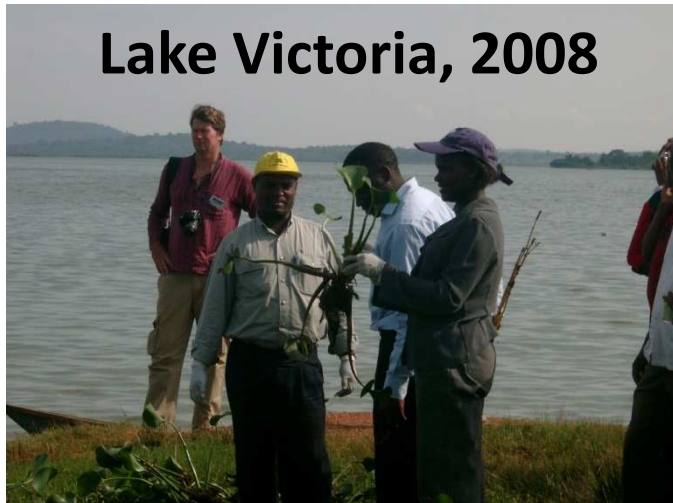


Water Hyacinth, *Eichhornia crassipes*, the world's worst water weed, in almost all large lakes and rivers in Africa

Lake Victoria, 1995

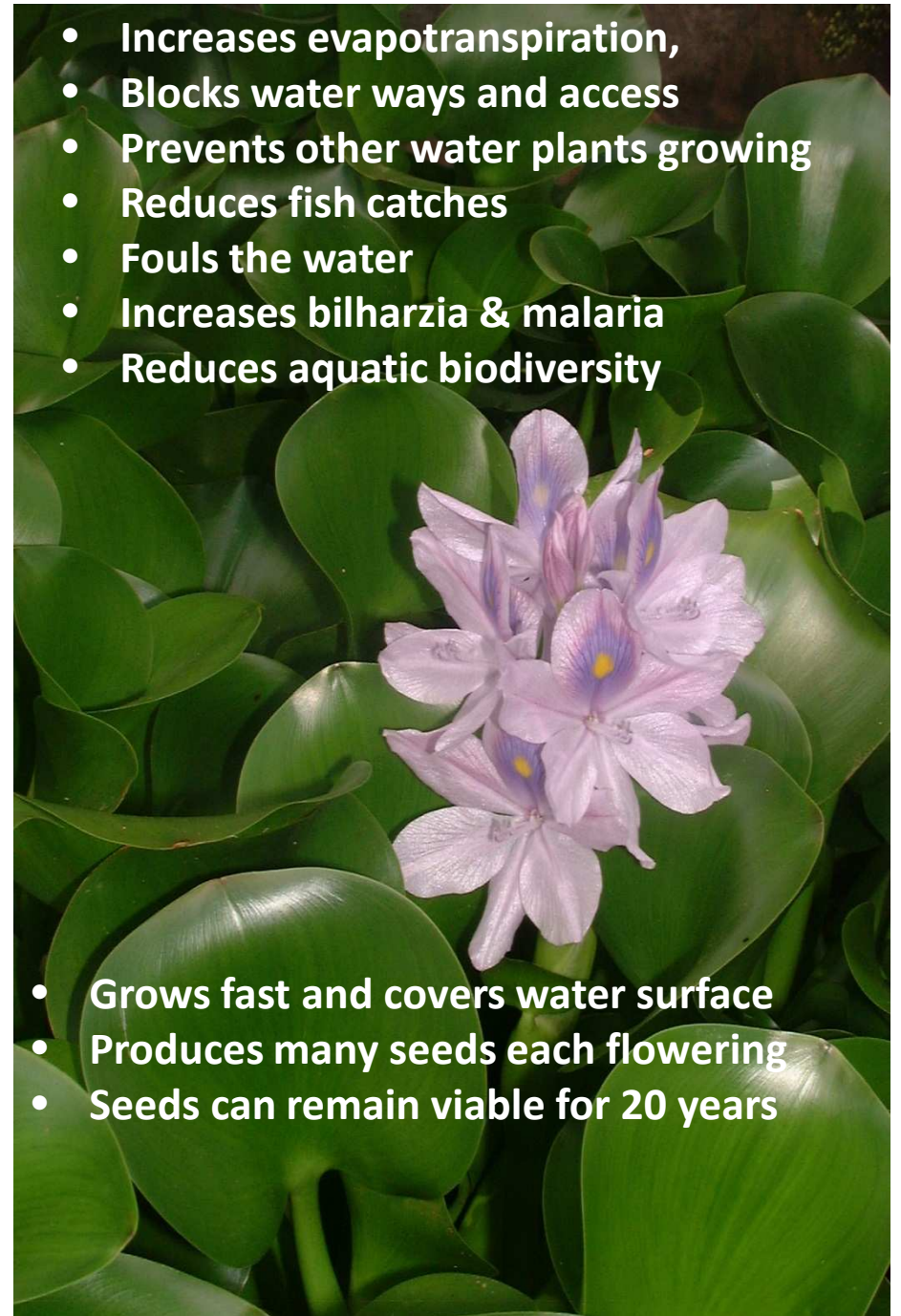


Lake Victoria, 2008



- Increases evapotranspiration,
- Blocks water ways and access
- Prevents other water plants growing
- Reduces fish catches
- Fouls the water
- Increases bilharzia & malaria
- Reduces aquatic biodiversity

- Grows fast and covers water surface
- Produces many seeds each flowering
- Seeds can remain viable for 20 years





*Alien Ravenalia
madagascarensis*

• Alien invasive wild guava in a thicket
• Alien invasive *Clidemia hirta* shrub understory
• No native plants visible in a protected area

Most Western Indian Ocean islands have dominant alien invasions of foreign plants – of many types in many sizes and shapes – affecting development, human livelihoods and biodiversity conservation

One more worrying example



Freshwater Crayfish, Crustaceans.
Louisiana Red Swamp Crayfish,
Procambarus clarkii, invasive in
Kenya, L. Victoria catchment, lakes
in Uganda, also records from
Rwanda (Zambia, etc.)

These are dangerous because
there are no indigenous
equivalents in mainland Africa.
They eat: fish eggs, fish larvae,
fingerlings, molluscs, other
crustaceans and aquatic
vegetation; destroy river banks by
burrowing and can walk several
km on a wet night



Another, larger species,
Cherax quadricarinatus,
is becoming invasive in
the Zambezi catchment –
much larger in size



We do have ways to prevent and manage biological invasions

Prevention is better than cure – for biological invasions (as well as diseases)

But if an invasion establishes, there are ways to manage or control or reduce its impacts on biodiversity

Mechanical Control – using hand weeding, hand tools, machinery, fire, traps and hunting

Chemical Control – using pesticides, poisons, herbicides, hormones, pheromones

Biological Control – using native enemies of the invading plant or animal to reduce its vigour and so the impacts on biodiversity

Integrated Control – a combination of the methods listed above



***Lantana camara* managed by biological control**



The biocontrol agents, *Teleonema* sucking bugs

We know where or how most species enter (are introduced to) new ecosystems

The routes by which alien species are introduced are called **PATHWAYS**.

Pathways include:

- Travel, Transport, Trade and Tourism (globalisation)
- Roads, railways, air corridors, boats and ships
- Natural pathways such as rivers, current, winds
- Livestock and wildlife movements (including fish)
- Release or escape of pet animals
- Release or escape of food animals
- Escape of decorative and useful plants

If these **PATHWAYS** are known and recognised, they can be modified or monitored for species likely to become invasive – which can be stopped before they are introduced to, or established in, a new ecosystem



Invasive *Tithonia diversifolia*,
a garden escape in E. Afr.



Invasive *Mimosa diplotricha*,
introduced as a hedge plant

The CBD Cross-cutting Issue on Invasive Alien Species

Biological Invasions, their recognition, prevention, management, and eradication - as well as their pathways of introduction and pathway management - are all important topics for the CBD

These have been considered in detail over the years and a set of Guiding Principles for their prevention and management developed and refined as well as great attention given to the identification of all possible invasion pathways and ways to address those pathways for effective prevention.

The Invasive Alien Species issues are also considered by other Cross-cutting topics and Programmes of the CBD – in such subjects as agricultural biodiversity, biofuels, protected areas, taxonomy and inland waters

This further emphasises the increasing damage that is being done to biodiversity by biological invasions – but also the ways to prevent and managed invasions and to restore lost ecosystem goods and services

Target 9 of the 2020 CBD Strategic Plan

During the development of the 2011-2020 Strategic Plan of the CBD and the Aichi Targets, considerable effort and discussion went towards the development of Target Nine – which refers to biological invasions.

This bold target to be achieved by 2020 intends that:

invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.

This is an admirable target which will take much effort to achieve but will curb some of the negative impacts on wild and domesticated biodiversity

Emphasis on managing the pathways of invasion was made more reachable by efforts of the Invasive Species Cross-cutting Issue which has now addressed all the pathways of invasion that are likely to be a threat to biodiversity. This was finalised earlier this year (February, 2011) during an AHTEG on that subject – the findings of which can be seen at UNEP/CBD/SBSTTA/15/6 of 17 June 2011 on the CBD website, www.cbd.int/

Invasive Species in revised NBSAPs

In the first round of NBSAPs, some countries devoted a chapter to Invasive Species, others mentioned them in less detail.

Since then, the real significance of biological invasions to ecosystems has become clearer and we are aware of the extent of damage done to biodiversity and the methods to address this

This meeting will assist countries at develop revised NBSAPs with due reference to biological invasions.

It would also be helpful if the countries concerned considered the possibility of more regional cooperation in the prevention and management of invasions. IAS can be considered as “pests and weeds without borders” and as such need a regional approach – perhaps through the East African Community, IGAD, SADC and the IOC /OIC (the Indian Ocean Commission, based in Mauritius)



(+ Mauritius) *



Water hyacinth: 10 to 20 flowers per inflorescence, 2-3 inflorescences per plant, 100s of 1000s of plants, seeds remain viable for more than 20 years – perfect invasive!

**THANK YOU FOR
LISTENING**

