



# The effect of Climate Change on Invasive Alien Plants in South Africa



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# The threat of invasive alien plants

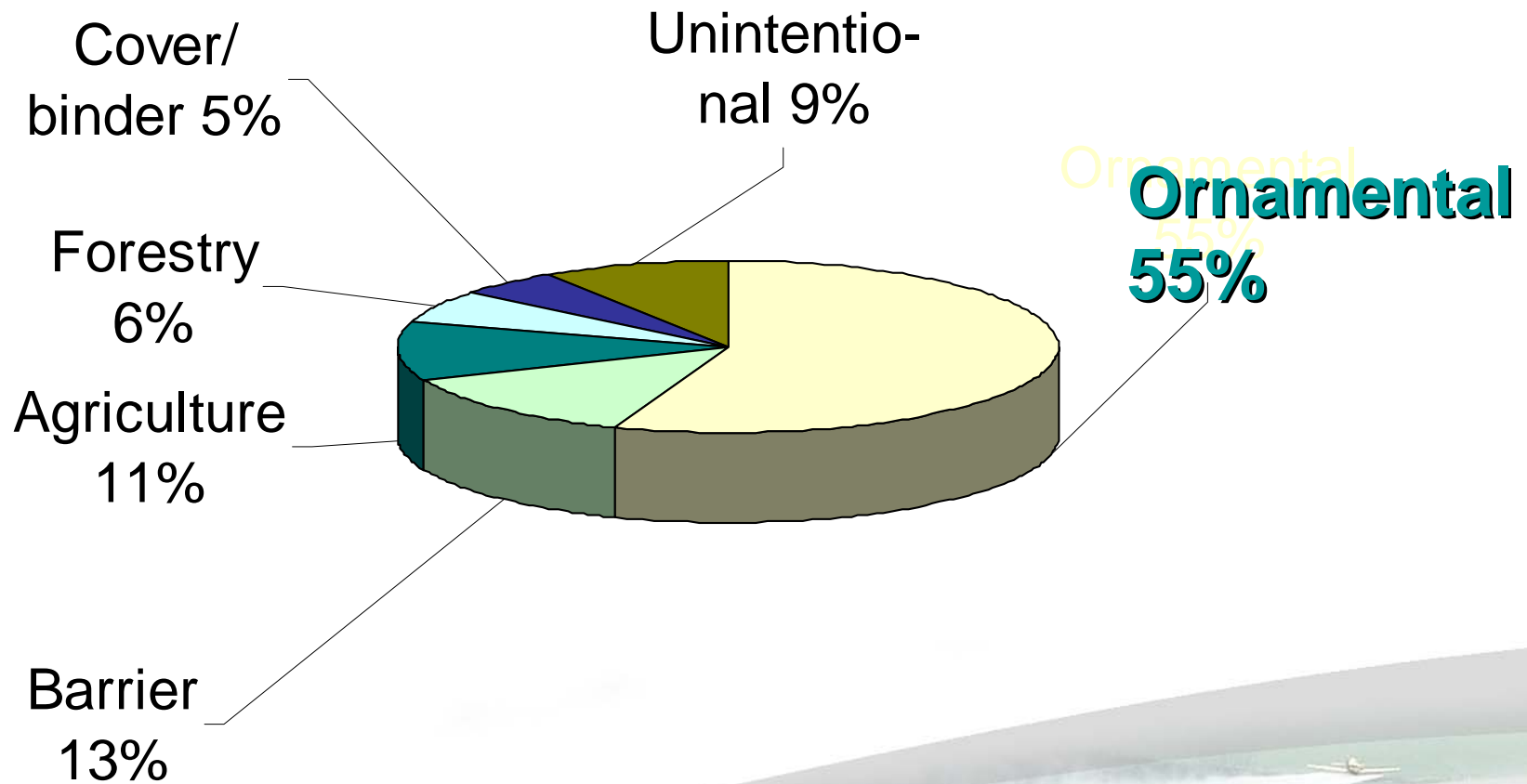
The International Conservation Union (IUCN) and other international organizations recognize that invasive alien species are the second most important threat to conservation and biodiversity

# How did the invasive alien plants get into the country?

- ★ As garden ornamentals
- ★ As barrier plants
- ★ As forestry or agro-forestry species
- ★ Unintentionally



# Reason for introduction of invasive alien plants



# Legislation on invasive alien plants in SA

Conservation of Agricultural Resources Act  
(CARA)  
Act 43 of 1983

National Environmental Management:  
Biodiversity Act, (NEMBA )  
Act 10 of 2004  
(Regulations not yet approved)

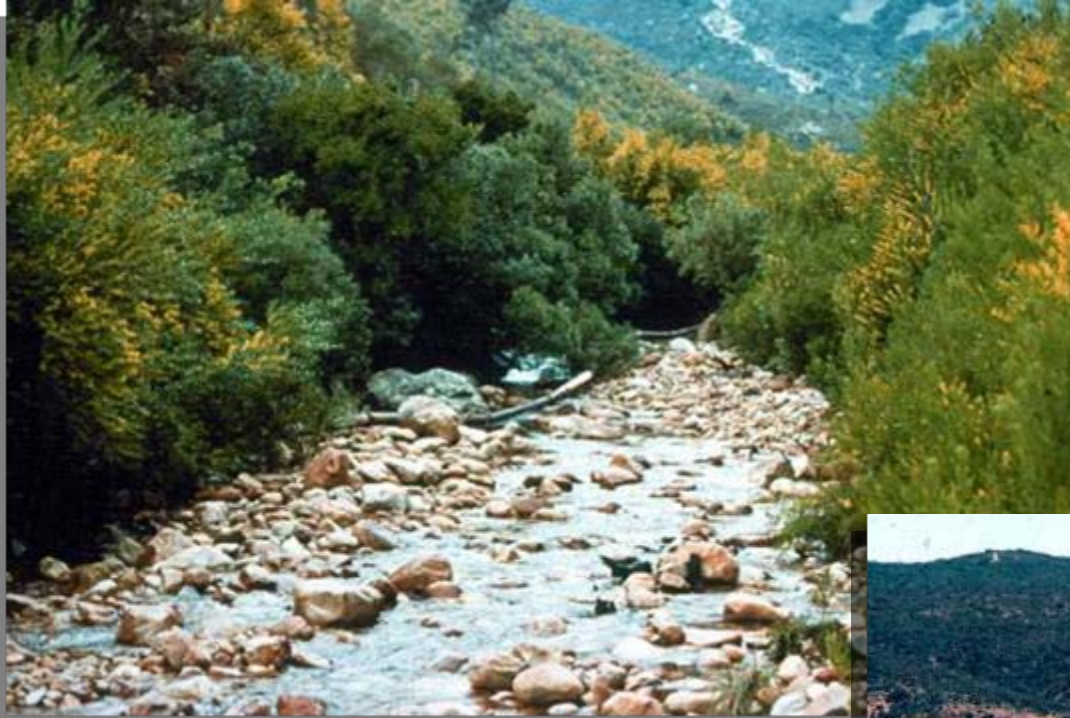
# Risks associated with alien plants

# Risks: Water



Gums, poplars, syringas, willows...

# Risks: Watercourses



Sesbania (*Sesbania punicea*)

Long-leaved wattle  
(*Acacia longifolia*)





# Risks: Biodiversity



Pompom weed (*Campuloclinium macrocephalum*)

**Risks:** Nitrogen  
fixation – soil  
enrichment



Pearl Acacia (*Acacia podalyriifolia*)

# Risks: Tourism

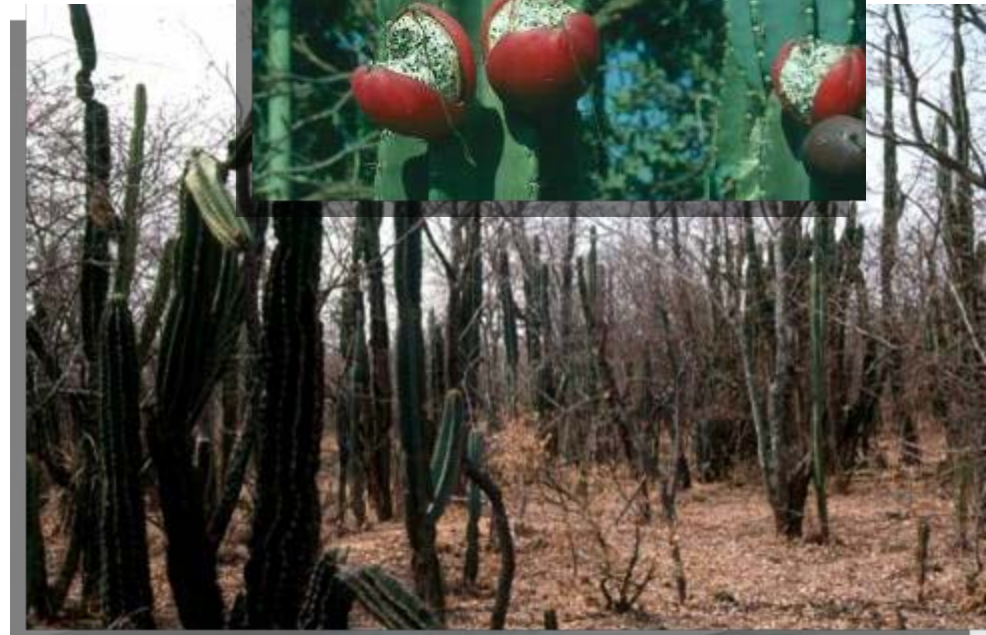


*Hakea sericea*

# Risks: Agriculture



Silverleaf nightshade/ satansbos  
(*Solanum elaeagnifolium*)



Queen of the night (*Cereus jamacaru*)

# Risks: spiny, block access

Torch cactus (*Echinopsis spachiana*)



Rosea cactus (*Opuntia fulgida*)

# Risks: toxic, injuries

Oleander  
(*Nerium oleander*)



Jointed cactus (*Opuntia aurantiaca*)

# Risks: allergies



Bugweed (*Solanum mauritianum*)

Parthenium weed  
(*Parthenium hysterophorus*)

# Risks: forestry



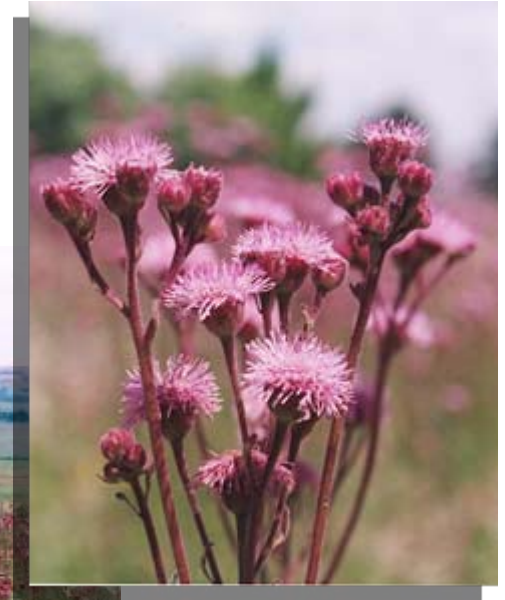
*Lantana camara*



Bugweed (*Solanum mauritianum*)

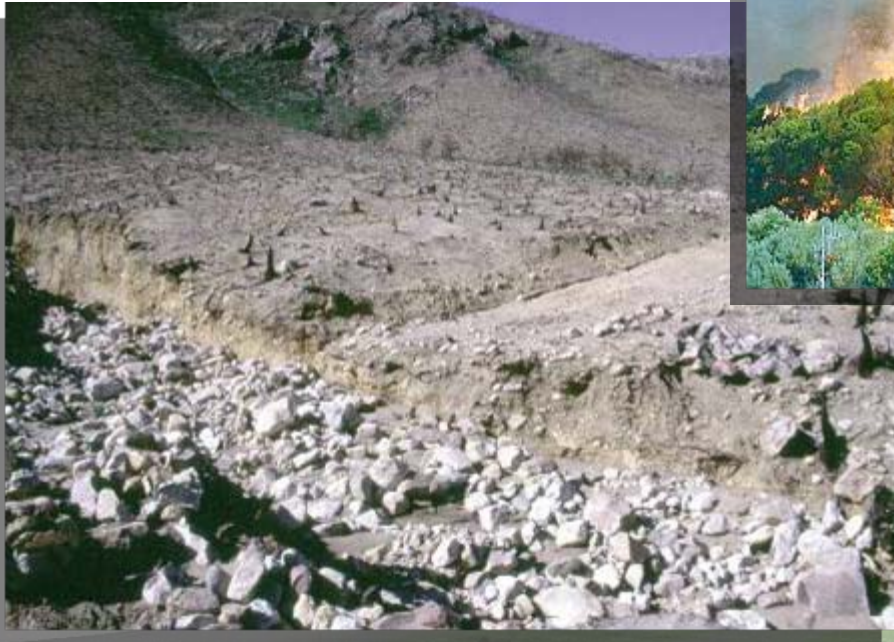


# Risks: pasture



Pompom weed  
(*Campuloclinium  
macrocephalum*)

# Risks: fire, followed by erosion



# Risks: smothering vegetation



Cat's claw creeper (*Macfadyena unguis-cati*)

# Risks: aquatic systems

Water hyacinth  
(*Eichhornia crassipes*)



Red water fern (*Azolla filiculoides*)

Water lettuce (*Pistia stratiotes*)

# Risks: water utilization



*Salvinia molesta*



Red water fern



Water hyacinth

# Consequences of climate change on invasive alien plants

## Anticipated climate changes:

- Hotter and drier in Western region
- Hotter and wetter along KZN coast
- Higher carbon dioxide levels
- Intense weather events will aid dispersal of weeds

# Consequences of climate change

## ★ Effect on indigenous vegetation:

- Climate no longer suitable for indigenous vegetation – local extinctions
- Disturbance due to weather events – colonization by weeds

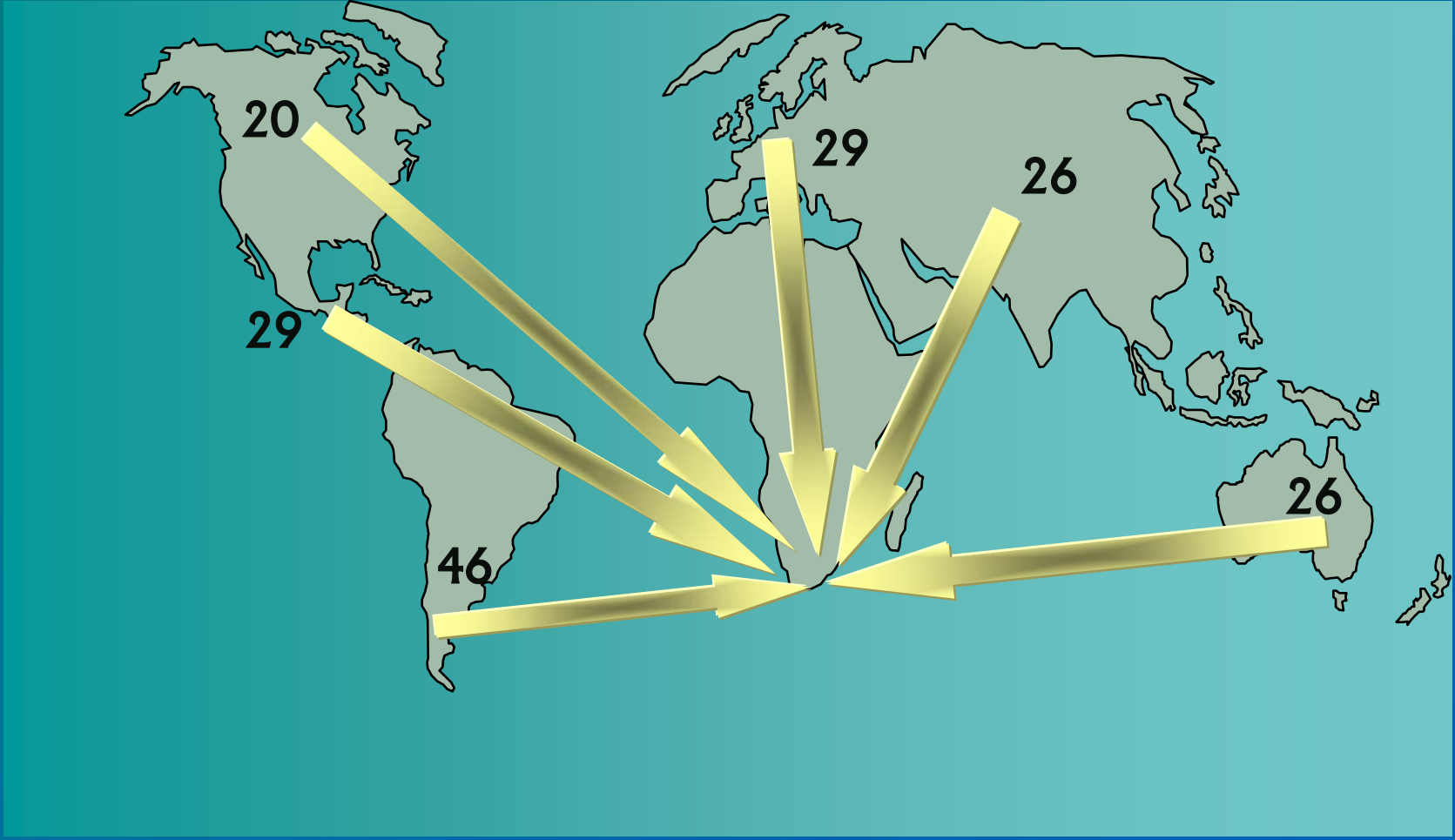
# Consequences of climate change

## ★ Effect on invasive alien plants:

- Existing alien plants in SA mainly subtropical
- Will be better suited to changed climate
- Thrive on increasing disturbance
- Higher CO<sub>2</sub> levels will favour woody plants and C4 tropical grasses
- Outbreaks of “sleeper weeds”



# Origin of invasive plants currently in South Africa



# Impact of climate change on Fynbos Biome

- ★ Unreliable rain & hotter climate - local extinctions of unique flora
- ★ Invasive Acacias will increase their range
- ★ Water courses: prime targets for invasives
- ★ Expansion of emerging weeds, e.g. cactus
- ★ Increased fire risk

# Fynbos Biome



Black wattle  
(*Acacia mearnsii*)

*Cylindropuntia tunicata*

# Fynbos: River courses



River red gum (*Eucalyptus camaldulensis*)



Water hyacinth (*Eichhornia crassipes*)

# Fynbos: Lantana

**Lantana**  
*Lantana camara*



# Grassland Biome

- ★ Invasion of tropical grasses
- ★ Invasive cacti will spread
- ★ Invasive *Prosopis* spp., and wattles

# Grassland



Fountain grass (*Pennisetum setaceum*)



Queen of the night cactus  
(*Cereus jamacaru*)

# Grassland

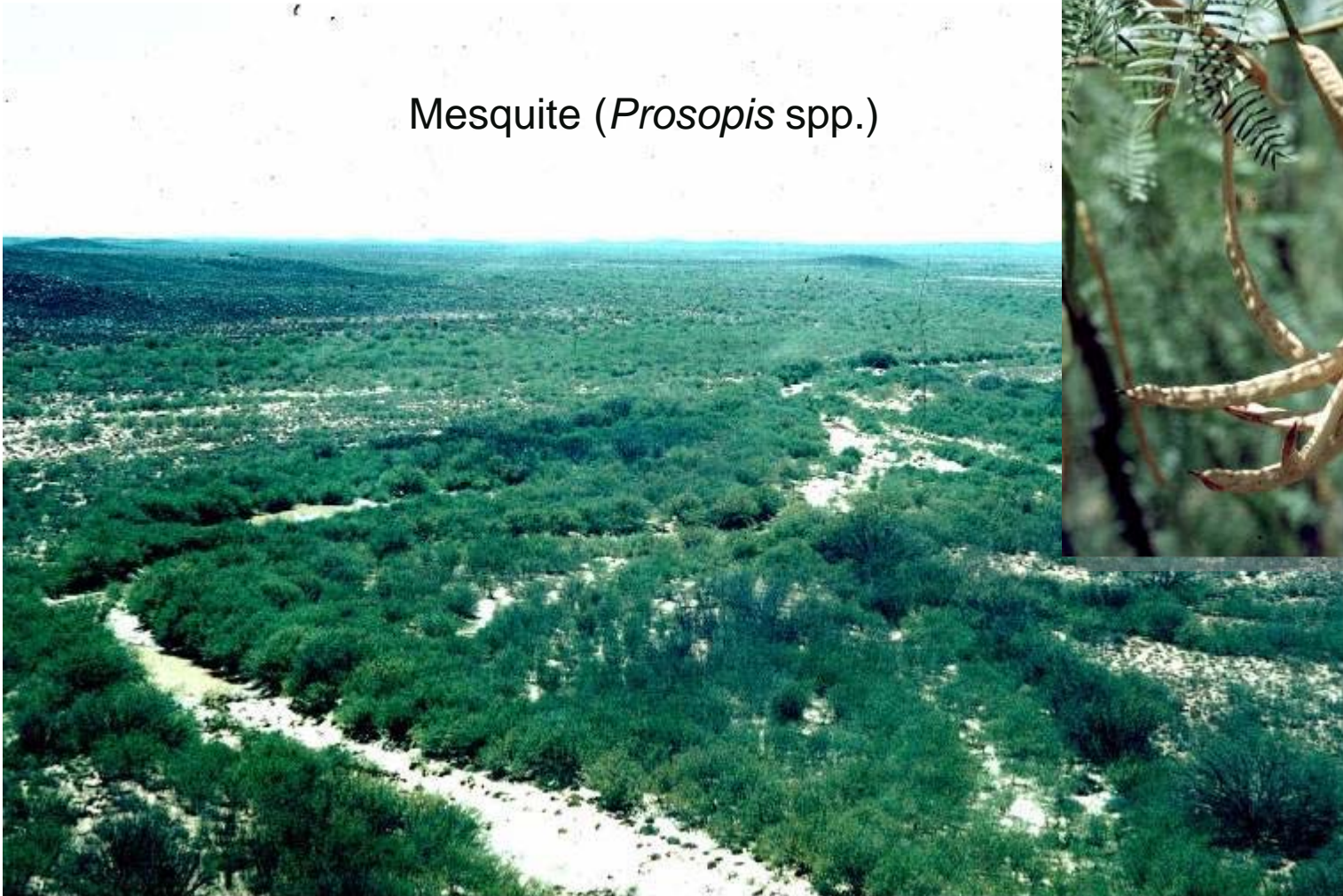


Pompom weed (*Campuloclinium macrocephalum*)



# Grassland

Mesquite (*Prosopis* spp.)



# Arid zone

- Increased invasions of *Prosopis* spp. and cactus
- Dominance of tropical C4 grasses



Chain-fruit cholla  
*Opuntia fulgida*

# Bushveld region

- ★ Invasion of cactus
- ★ Diversity of trees will diminish, monocultures of mopane, etc.



Australian pest pear  
(*Opuntia stricta*)

# Subtropical regions

- ★ Hotter and wetter climate will favour weeds of subtropical and tropical origin, e.g. pereskia, cat's claw, chromolaena, parthenium, jacaranda, seringa.



Cat's claw creeper  
(*Macfadyena unguis-cati*)

*Jacaranda*  
(*Jacaranda mimosifolia*)



Chromolaena (*Chromolaena odorata*)



# Consequences

- ★ Destruction of biodiversity, especially in Fynbos and grassland biomes
- ★ Reduced carrying capacity of veld
- ★ Invasion of satansbos & parthenium into marginal agricultural land
- ★ River courses blocked, trees use lot more water

# Impacts on biocontrol

- ★ Variable impacts on current biocontrol agents – ranges may expand or contract, efficacy may increase or decrease
- ★ Lantana biocontrol agents may do better along the coast in more humid conditions
- ★ Hakea and Acacia biocontrol agents will suffer in the hotter and drier Western Cape



# Conclusions

## ★ Possible remedial action:

- Intensify national weed clearance efforts
- Vastly increase biocontrol capacity
- Information and awareness campaigns to landowners
- Intensive climate modelling & economic impact studies
- Intensive mapping of weed distribution

# Thank you