Why Should We Care About Invasive Grasses?

It's not the snake in the grass you should be wary of !

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Principal Botanist (Ret)
Queensland Parks and Wildlife Service

August 2023

SMART NEWS

How Swaths of Invasive Grass Made Maui's Fires So Devastating

Scientists have long warned that Hawaii's cover of nonnative shrubs is kindling waiting to burn

Thursday Jan 24 2002 01:44 PM
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FIRE AND INVASIVE PLANTS IN HAWAI'I VOLCANOES NATIONAL PARK

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Non-native grass species blamed for ferocity of Hawaii wildfires

Failure to heed warnings over unchecked growth meant blaze was 'a disaster waiting to happen', say scientists and academics

The age of extinction is supported by

the guardian .org

How invasive grasses could have contributed to the magnitude of Maui's fires

Hawai'i Public Radio | By Cassie Ordonio

Published September 11, 2023 at 4:35 PM HST

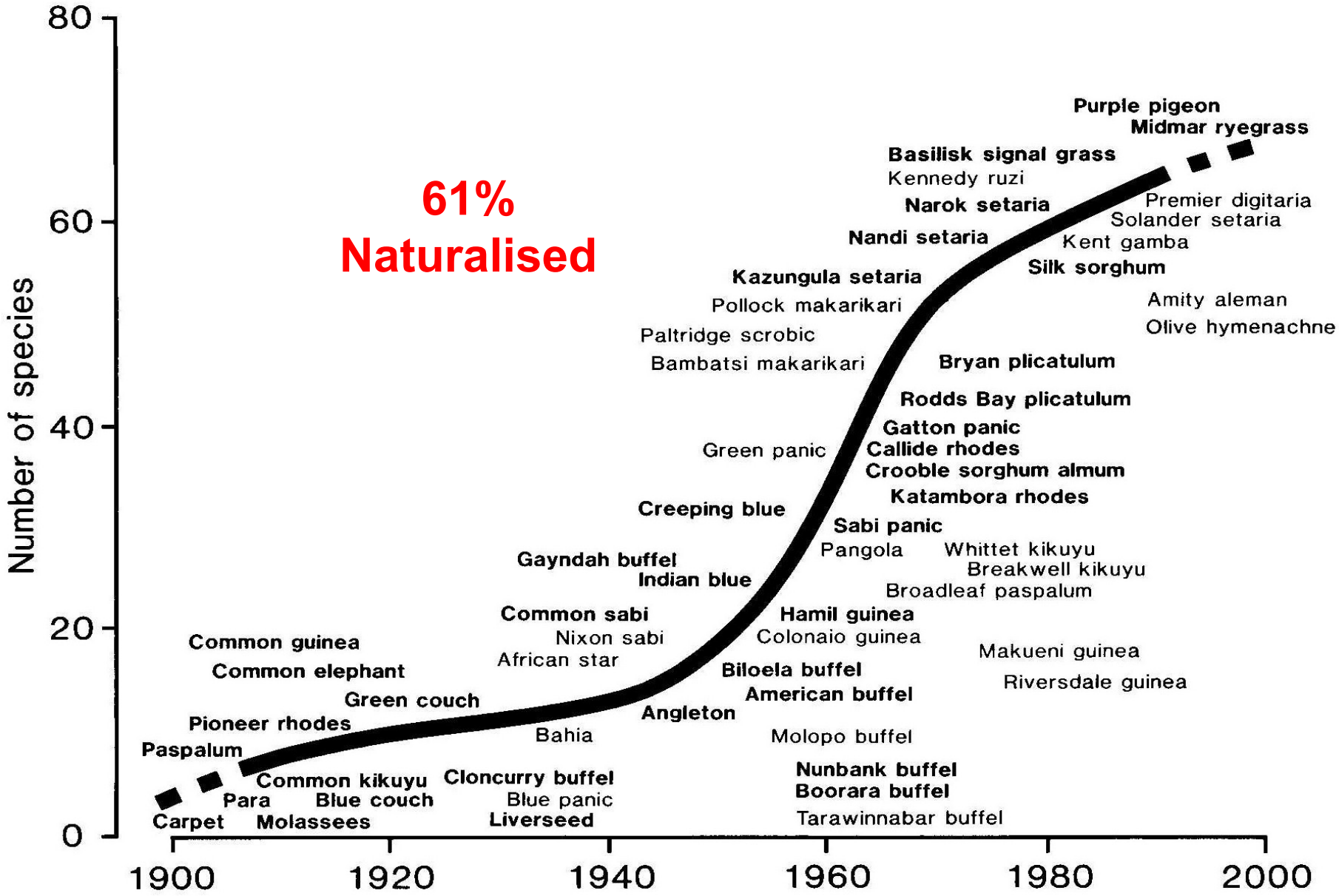
F.M. Bailey

1867

Guinea grass (*Megathyrsus maximus*)

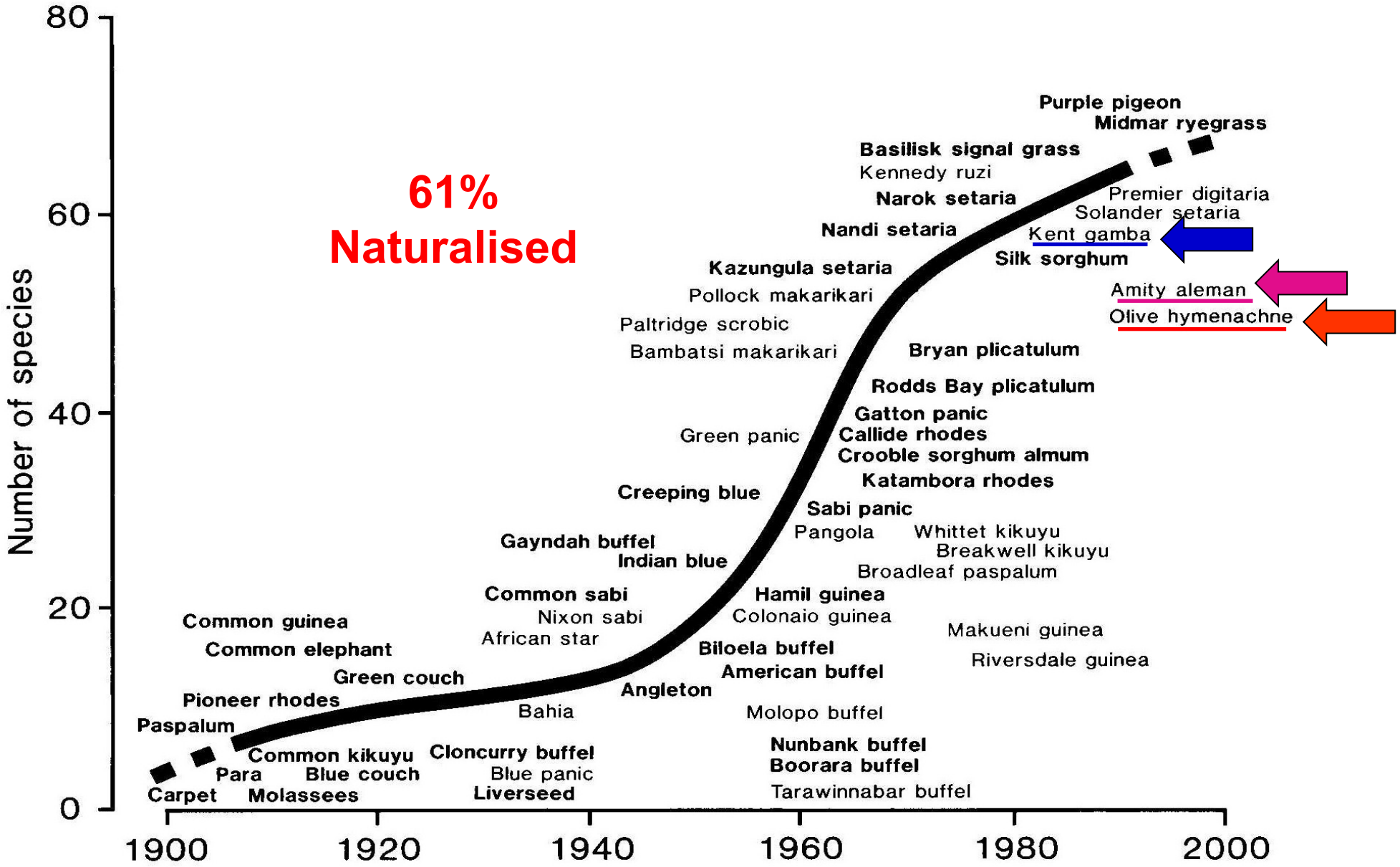
syn *Panicum maximum*

Introduction of Pasture Grasses to Queensland



Gramshaw & Walker (1988)

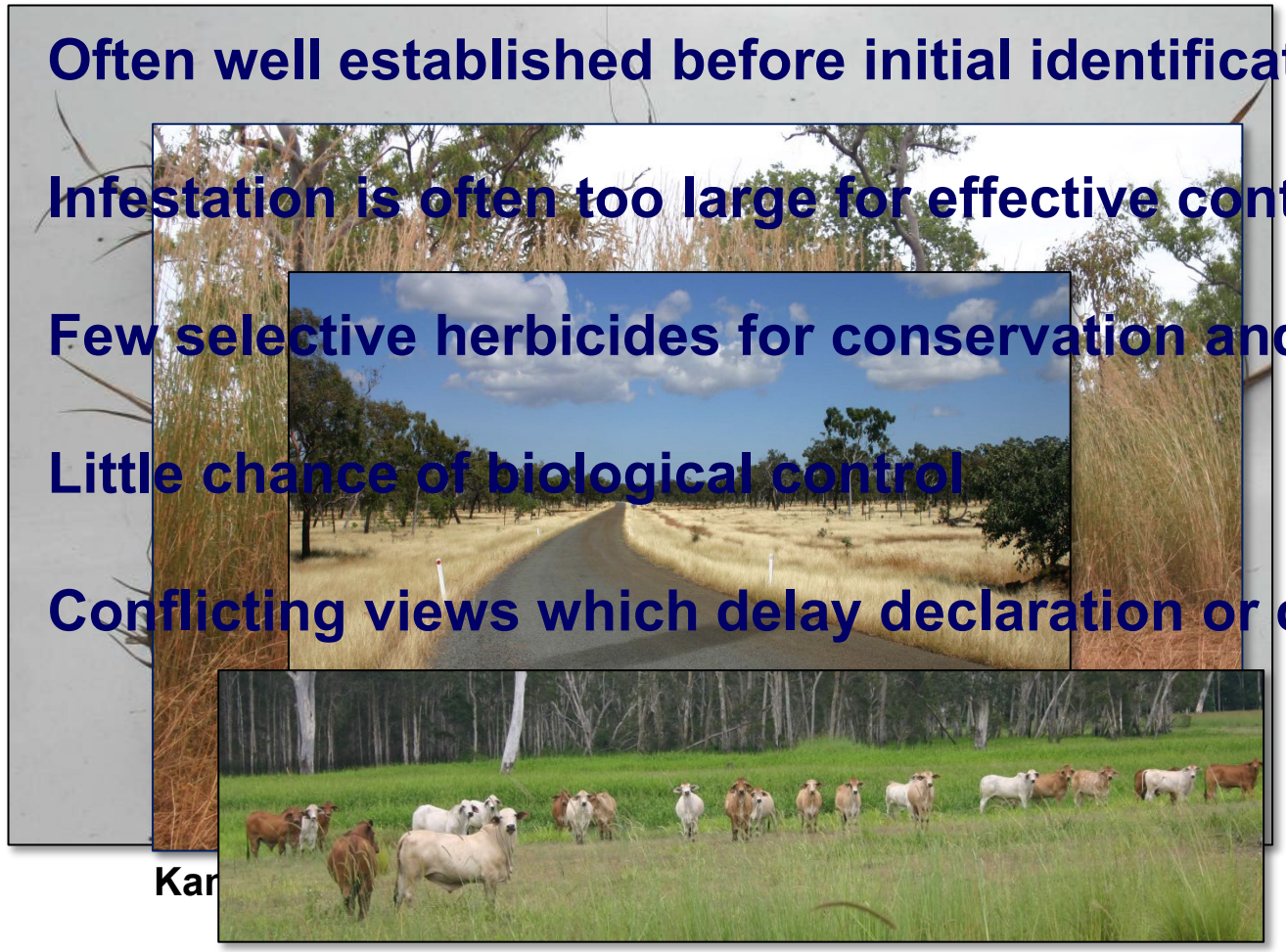
Introduction of Pasture Grasses to Queensland



Gramshaw & Walker (1988)

Why focus on grasses?

- Difficult to distinguish from native species
- Often well established before initial identification
- Infestation is often too large for effective control
- Few selective herbicides for conservation and non-cropping areas
- Little chance of biological control
- Conflicting views which delay declaration or control



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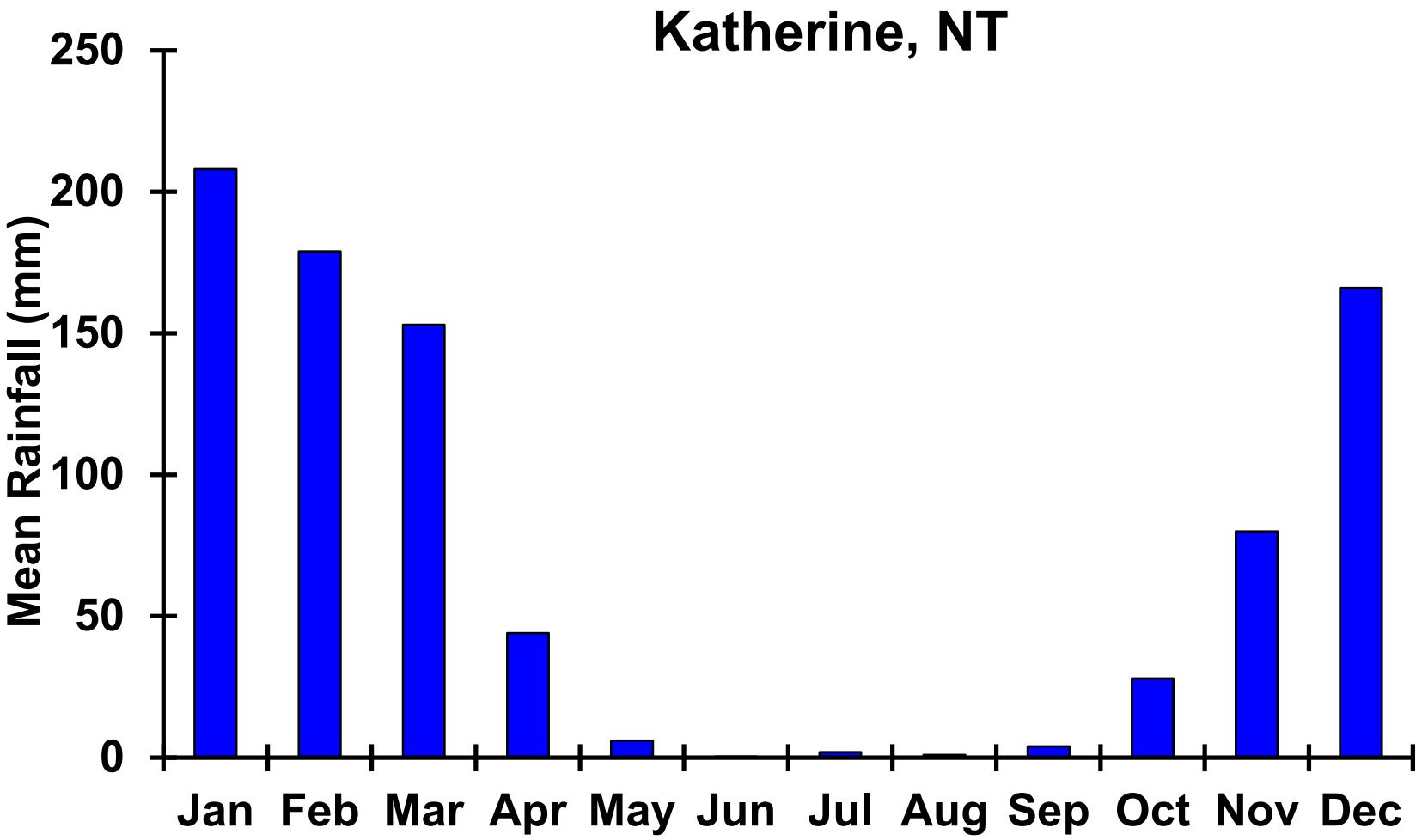
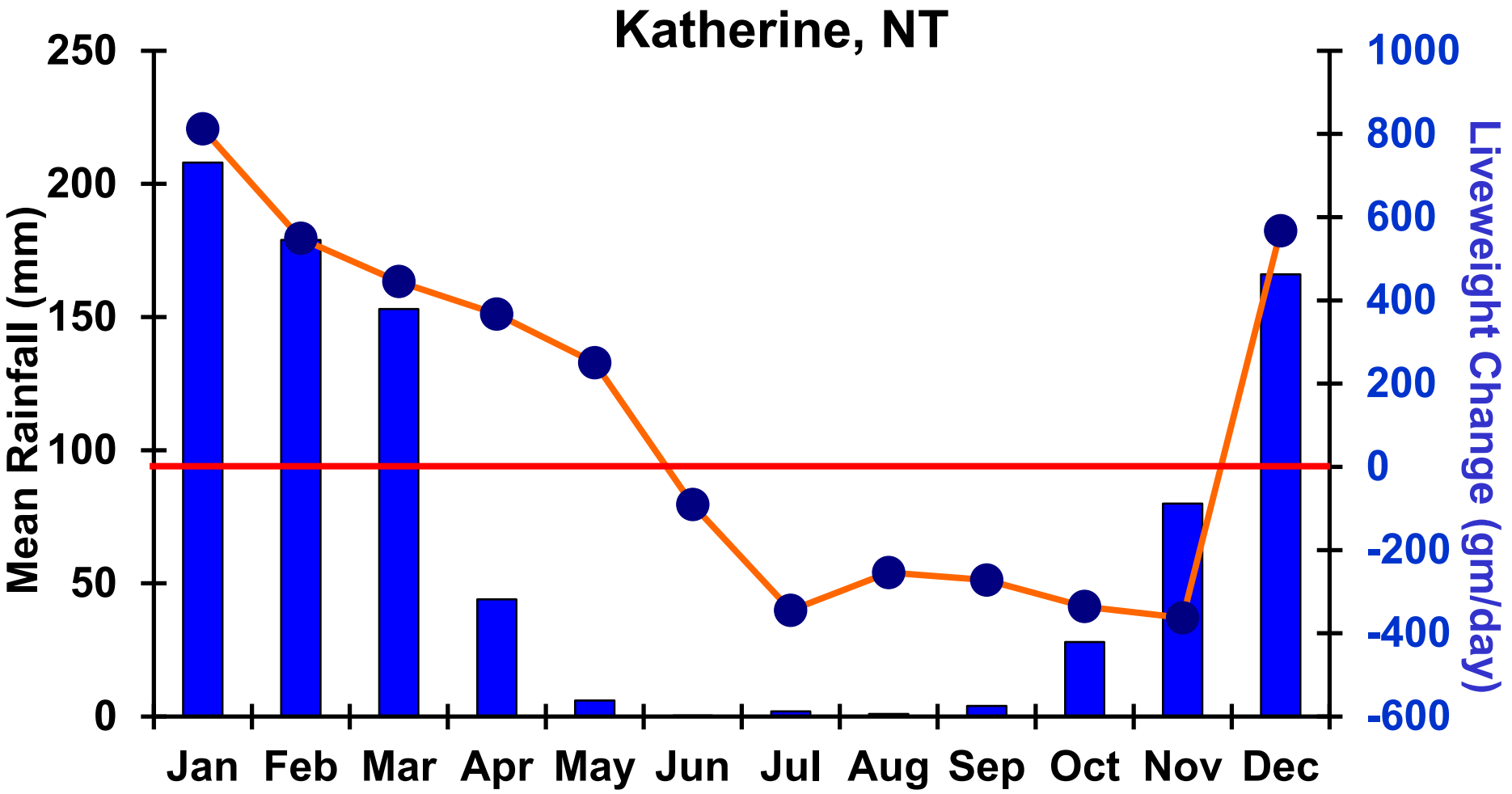
Why so many species of pastoral origin?



Why so many species of pastoral origin?



Norman (1966)

Characters required in an effective pasture plant for tropical Australia

- Establish from seed with little seedbed preparation
- Disperse from and establish away from the place where they were sown
- Persist under harsh environmental conditions
- Must be palatable but not too palatable and produce a good body of quality feed

CHARACTERS SHARED BY MANY WEEDS

QLD:

NT:

WA: s11

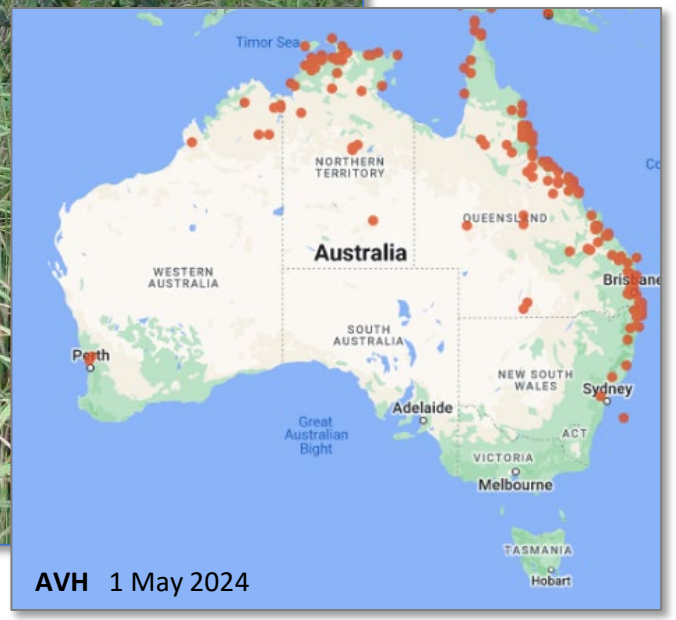
Guinea grass (*Megathyrsus maximus*)

1867

QLD:

NT:

WA: s11



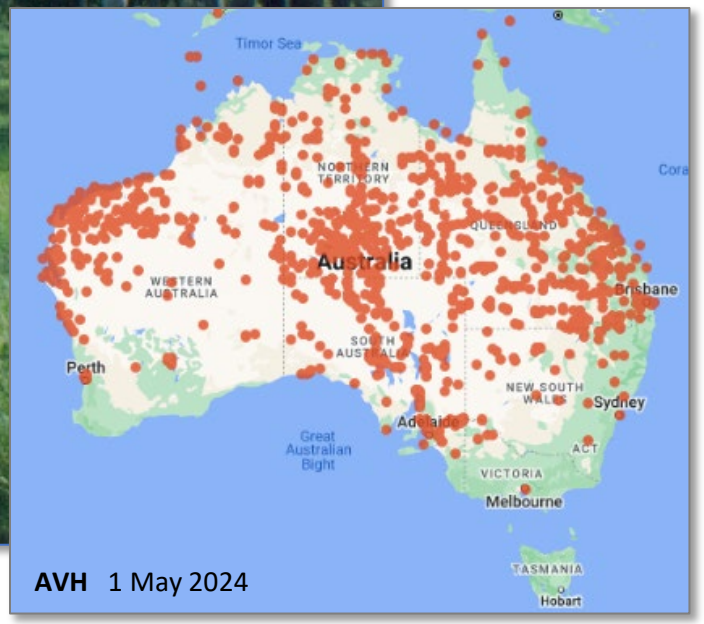
Para grass (*Urochloa mutica*)

1880s

QLD:

NT:

WA: s11



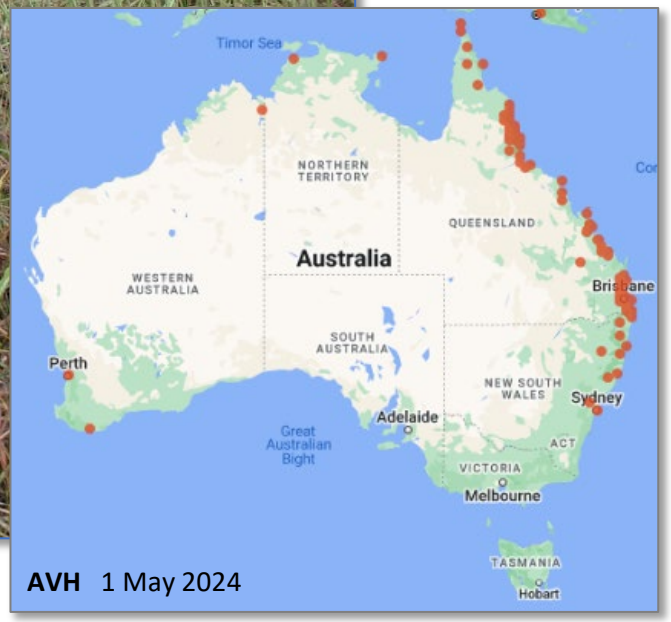
Buffel Grass (Cenchrus *ciliaris*)

Pre 1914

QLD:

NT:

WA:



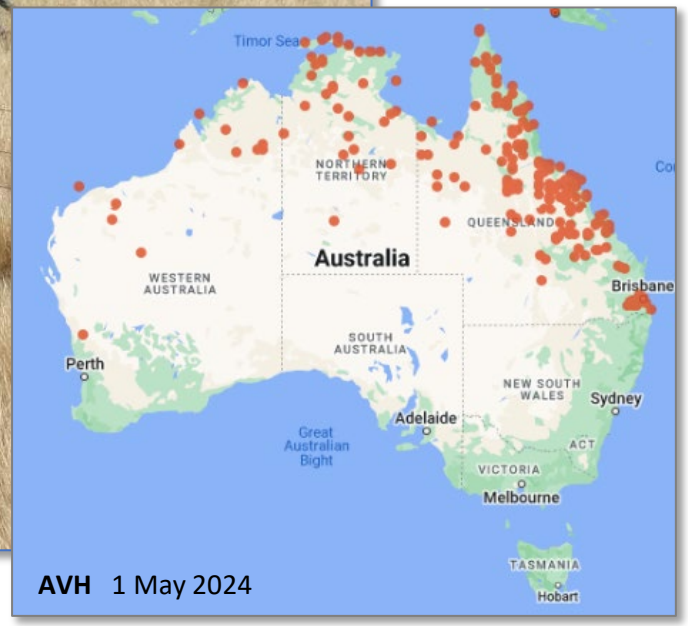
Molasses grass (*Melinis minutiflora*)

Pre 1914

QLD:

NT:

WA: s11



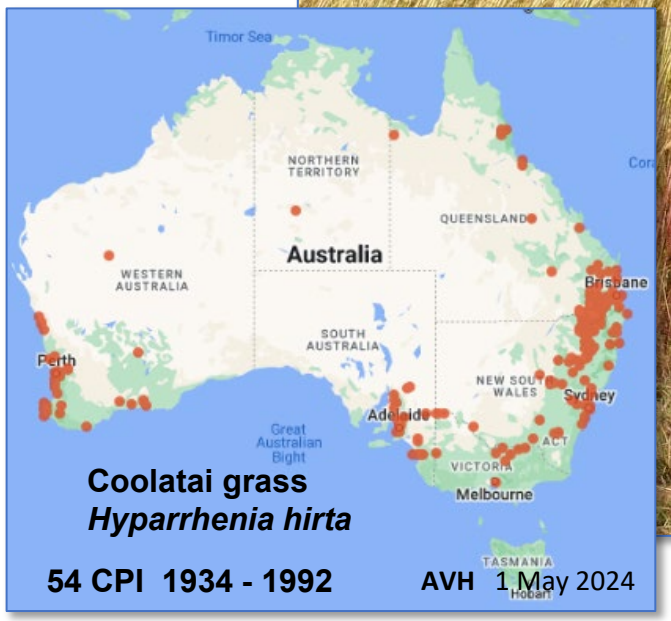
Indian Couch (*Bothriochloa pertusa)*

20 CPI 1930 - 1990

QLD:

NT: A

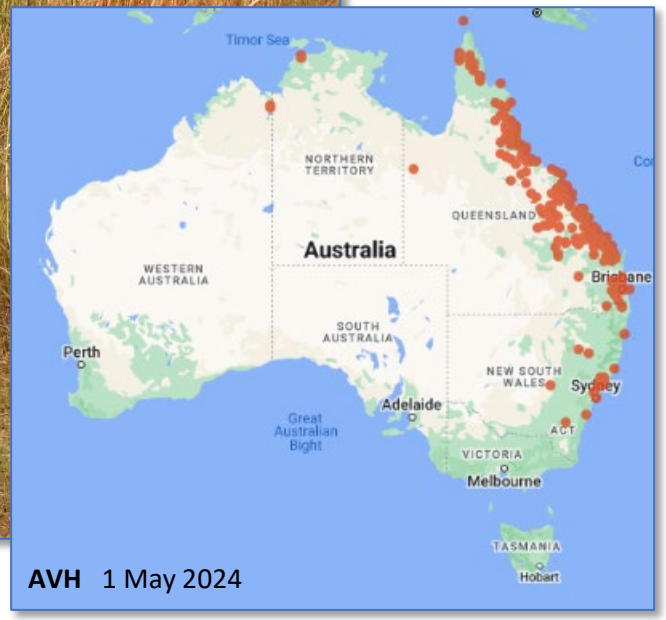
WA:



Coolatai grass
Hyparrhenia hirta

54 CPI 1934 - 1992 **AVH** 1 May 2024

Thatch grass (*Hyparrhenia rufa*)



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34 CPI 1930 - 1980

QLD:

NT:

WA: s12 C1

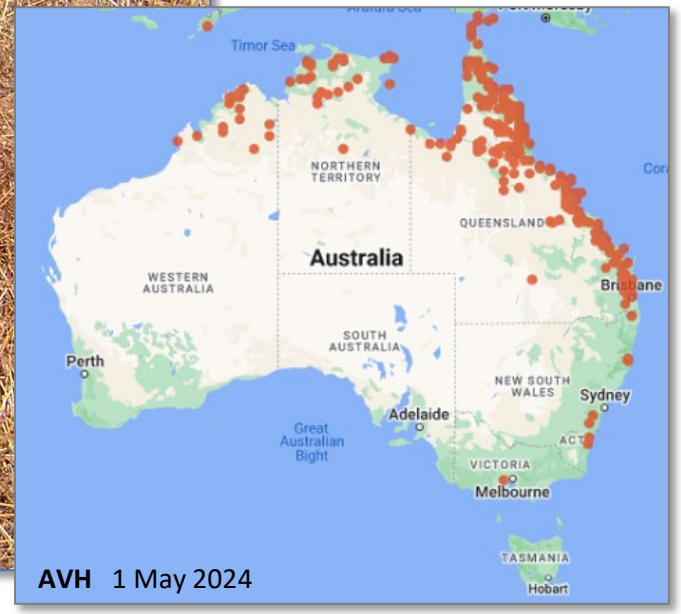
Mission grass (*Cenchrus polystachyios*)

16 CPI 1931 - 1972

QLD:

NT: B

WA: s22(2)



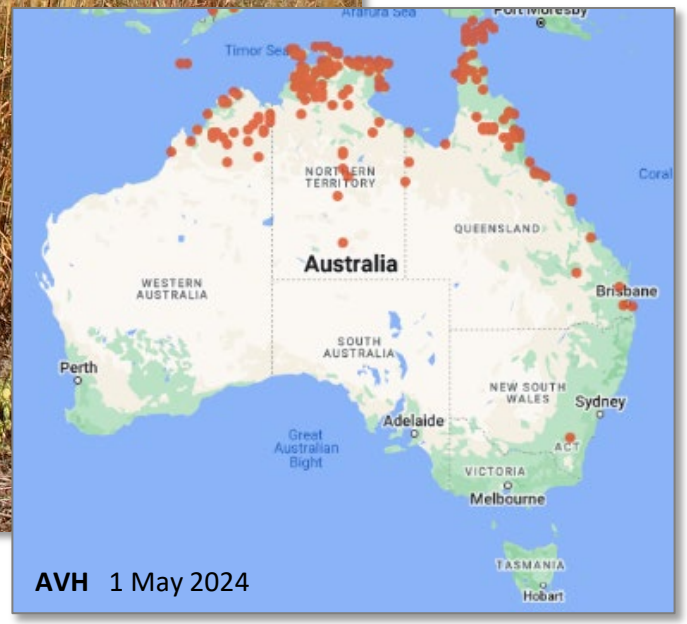
Grader Grass (*Themeda quadrivalvis*)

ca 1935, 5 CPI 1955 - 1957

QLD:

NT:

WA: s11



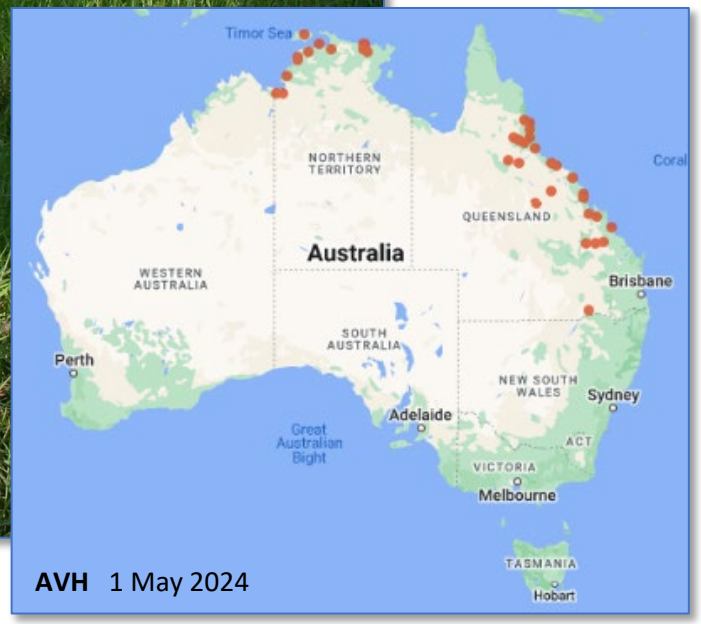
Annual mission grass (Cenchrus *pedicellatus*)

10 CPI 1940 - 1983

QLD:

NT:

WA:



Aleman grass (*Echinochloa polystachya*)

7 CPI 1950-1983. 1973

QLD: R Cat 3

NT: B

WA: s12 C1

WONS

Olive Hymenachne (*Hymenachne amplexicaulis*)

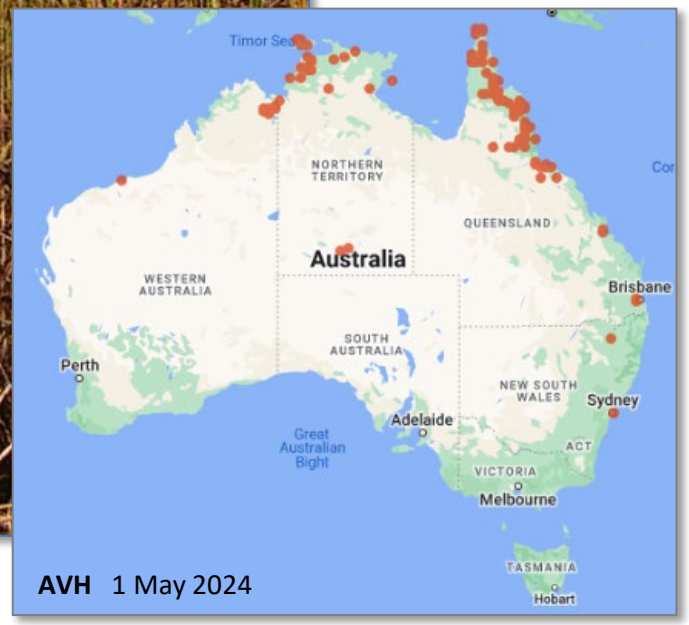
3 CPI 1934, 1973, 1983

QLD: R Cat 3

NT: A/B

WA: s12 C2

WONS



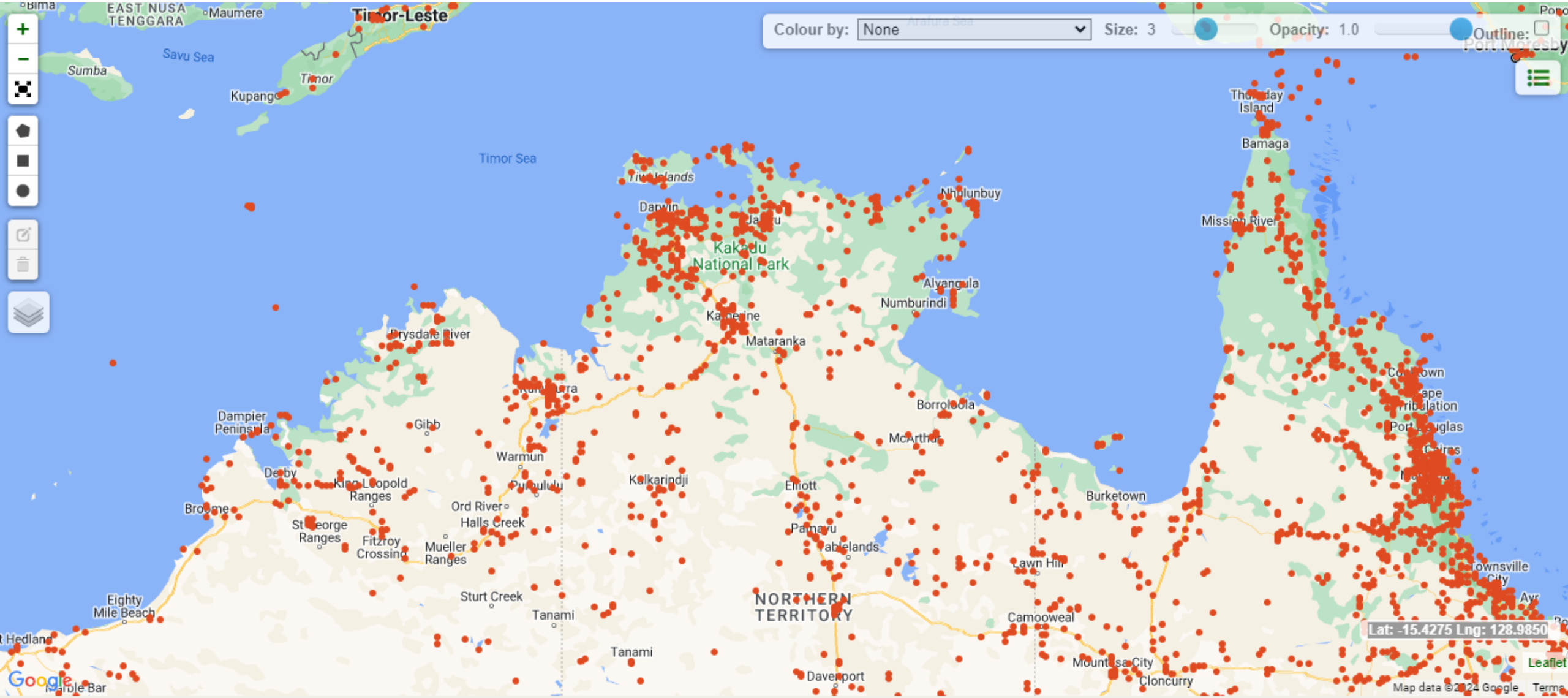
Gamba Grass (*Andropogon gayanus*)

85 CPI 1931 - 1992

Main Species of Concern

Gamba grass	*Andropogon gayanus*
Buffel grass	Cenchrus *ciliaris*
Thatch grass/Coolatai grass	*Hyparrhenia* rufa, *H. hirta*
Guinea grass	*Megathyrsus maximus*
Indian couch	*Bothriochloa pertusa*
Perennial mission grass	*Cenchrus polystachios*
Molasses grass	*Melinis minutiflora*
Grader grass	*Themeda quadrivalvis*
Annual mission grass	*Cenchrus pedicellatus*
Olive hymenachne	*Hymenachne amplexicaulis*
Aleman grass	*Echinochloa polystachya*
Para grass	*Urochloa mutica*

“The Dirty Dozen”



AVH 1 May 2024

Additional Species of Concern

Giant rat's tail grasses	*Sporololus* spp.
Elephant grass	Cenchrus *purpureus*
Signal grass	*Brachiaria decumbens*
Humidicola (Koronivia grass)	*Brachiaria humidicola*
Mossman River grass	*Cenchrus echinatus*
Red Natal	*Melinis repens*
Fountain grass	*Cenchrus setaceaus*
Bahia grass	*Paspalum notatum*
Sheda grass	*Dichanthium annulatum*
Broad-leaved Paspalum	*Paspalum mandiocanum*
Palm-leaved Setaria	*Setaria palmifolia*
.....	.....
.....	.....

"Functional Group"

What are the problems with these grasses?

Exotic

Invasive

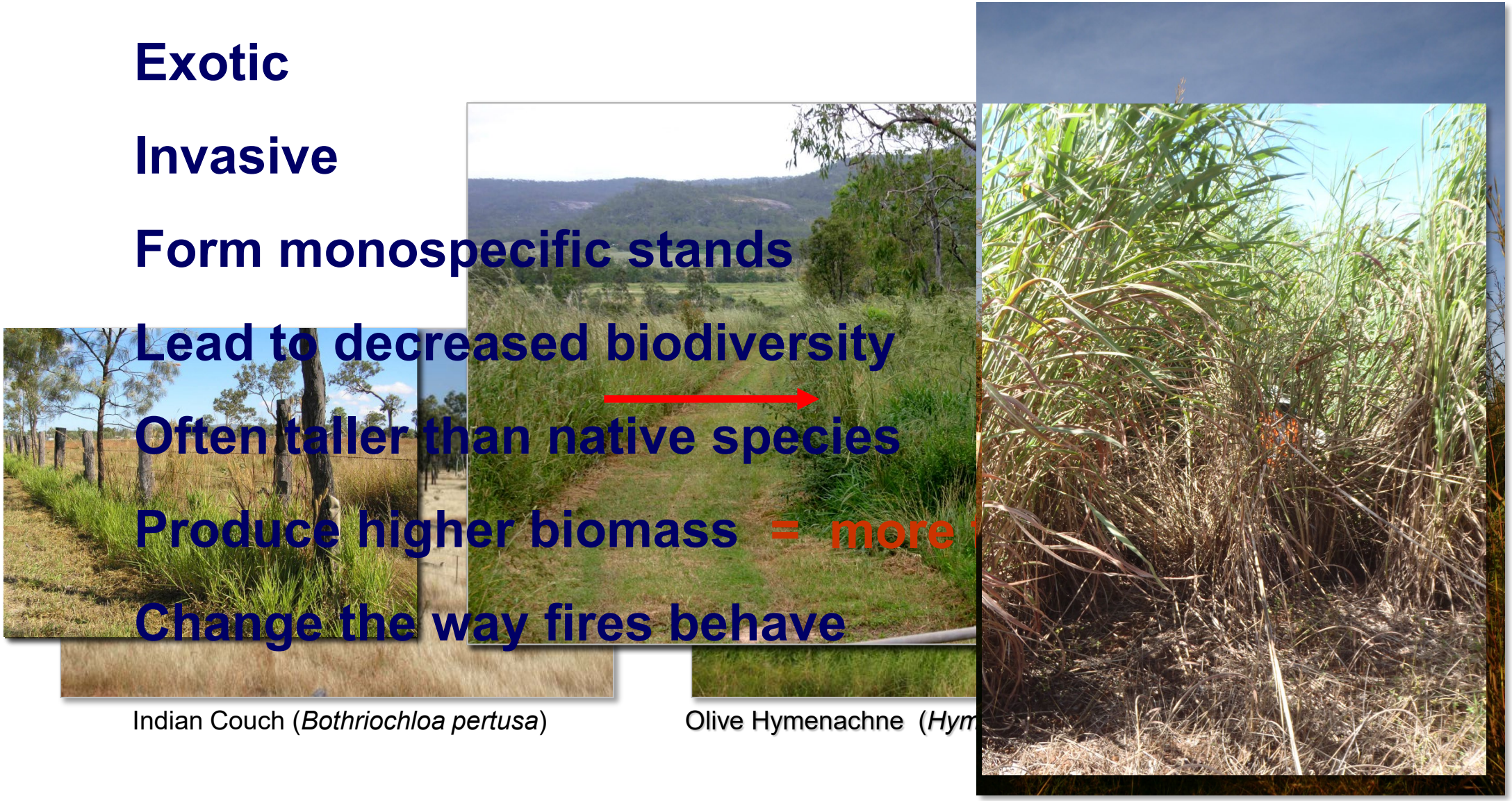
Form monospecific stands

Lead to decreased biodiversity

Often taller than native species

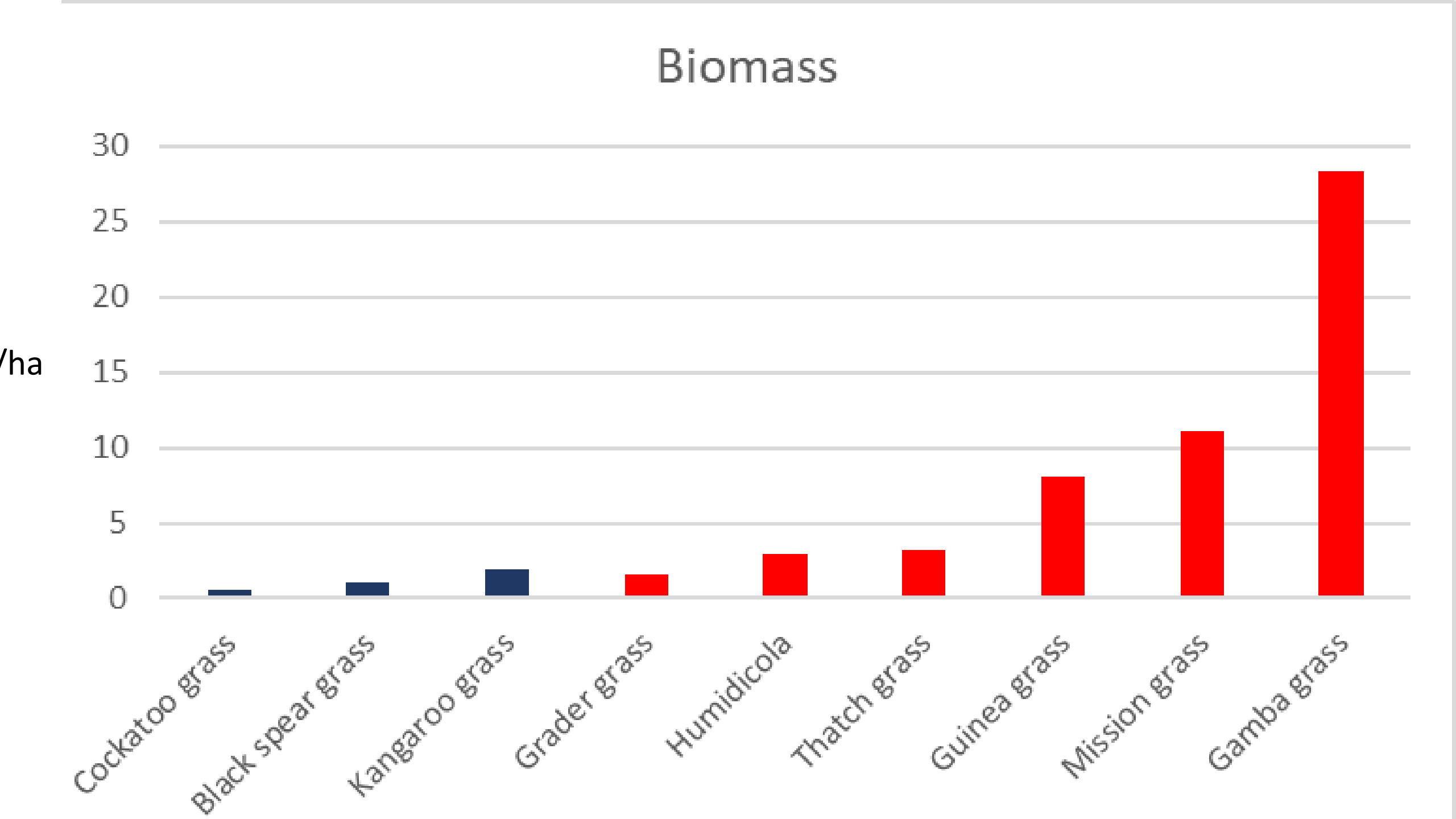
Produce higher biomass = more f

Change the way fires behave



Indian Couch (*Bothriochloa pertusa*)

Olive Hymenachne (*Hym*


Biomass
30
25
20
15
10
5
0
/ha
Cockatoo grass
Black spear grass
Kangaroo grass
Grader grass
Humidicola
Thatch grass
Guinea grass
Mission grass
Gamba grass

Effects other than conservation

Fire – life and property

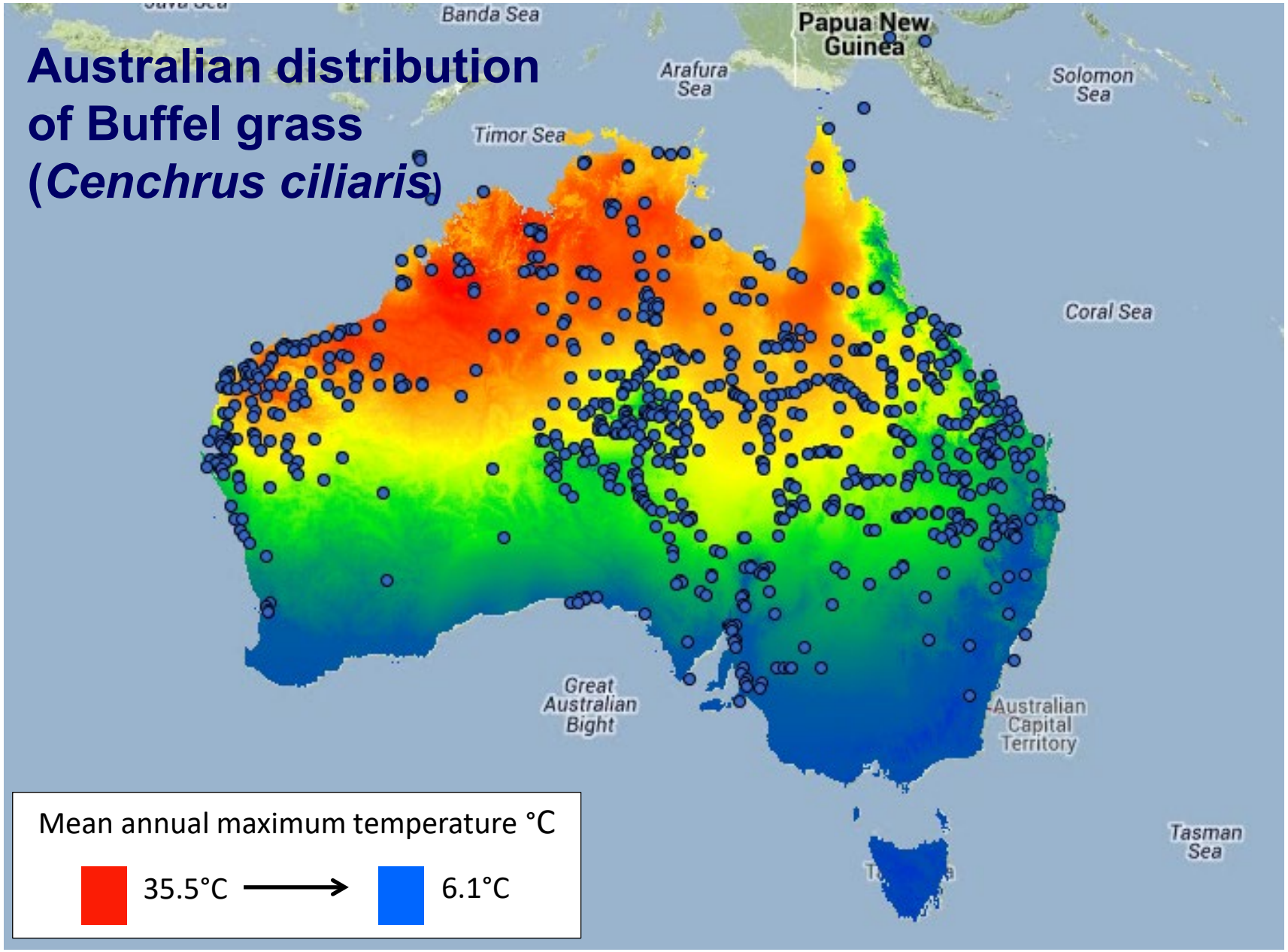
What lies ahead?

- Many species are still short of their potential distribution

What lies ahead?

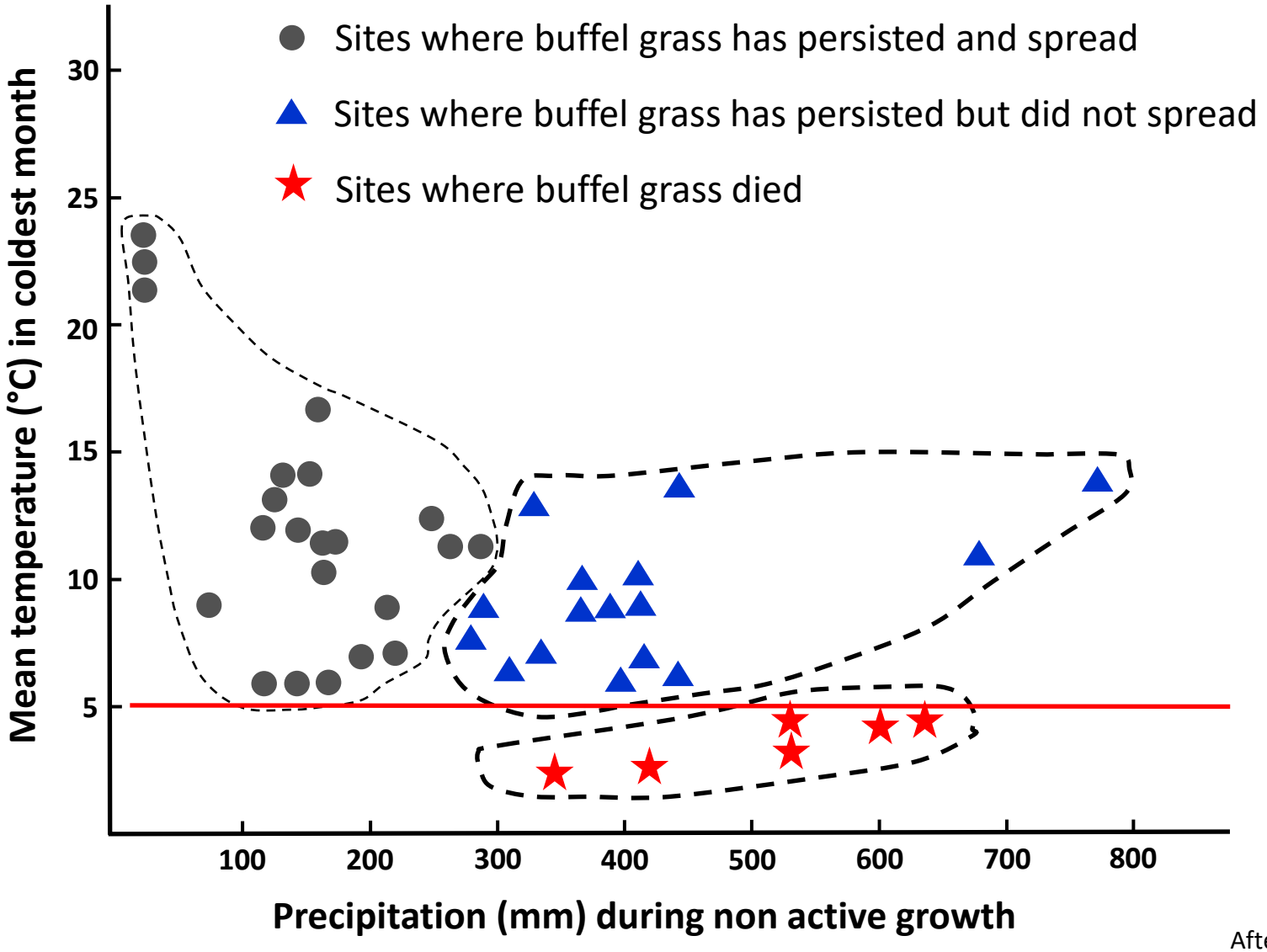
- Many species are still short of their potential distribution

- Will more species be introduced?
  - accidentally
  - deliberately



The Council of Heads of Australasian Herbaria (2013) Australia's Virtual Herbarium.http://avh.chah.org.au

The effect of mean winter temperature and winter precipitation on long-term persistence of buffel grass



After Cox *et al*. (1988)

Pogue
Agri Partners Inc.

Planting for Success One Seed at a Time

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Adaptation: Our Tests indicate with increased cold tolerance, Pecos Buffelgrass® will be adapted 150 miles further north than Common Buffelgrass. This is approximately 150 miles north of I-10 or San Antonio, TX. Pecos performs best on a mixed soil type but performs equally well on sandier and heavier soils with good drainage.

advantage of blight tolerance and improved forage production. Pecos has the same nutritional value as Common Buffelgrass, however has consistently produced over 30% more forage on an annual basis over Common and other commercially available buffelgrass varieties. The added blight tolerance of the new Pecos Buffelgrass® provides a sense of security against the damaging and devastating effects of buffelgrass leaf blight.

Adaptation: Our Tests indicate with increased cold tolerance, Pecos Buffelgrass® will be adapted 150 miles further north than Common Buffelgrass. This is approximately 150 miles north of I-10 or San Antonio, TX. Pecos performs best on a mixed soil type but performs equally well on sandier and heavier soils with good drainage.

Buffelgrass, Common
Buffelgrass, Pecos® Brand
Buffelgrass, Laredo® Brand
Kleingrass, Select 75
Kleingrass, Verde
WW-B Dahl Bluestem
T-587 Old World Bluestem
Medio Bluestem
Sorghum Almum
Johnsongrass
Lovegrass, Wilman

Planting Information: Pecos Buffelgrass® is now available in de-hulled and burr seed. De-hulled seed provides quicker stand establishment, decreased weed competition and is easier to plant. De-hulled seed should be planted at a rate of 1-1 1/2 lbs seed per acre on a well prepared seedbed. Burr seed should be planted at a rate of 3-5 lbs seed per acre. Burr seed can be planted in rougher conditions without extensive seedbed preparation. Both types of seed should be planted at 1/4-1/2 inch deep when soil temps are above 65 degrees F.

Fertilization: Buffelgrass does not require as much fertilization as other improved forage grasses, however, it does respond well to fertilizer. Under grazing management, only a maintenance fertility is required. If the Buffelgrass is used for hay production, higher rates of fertilizer are recommended for maximum production.

Disclaimer: Because the past several winters were relatively mild, Pogue Agri Partners makes no claims or gives any warranty as to the survivability of "Pecos" brand Buffelgrass. Pogue Agri Partners does claim that "Pecos" brand Buffelgrass has exhibited better cold tolerance than Common or Nueces Buffelgrass.

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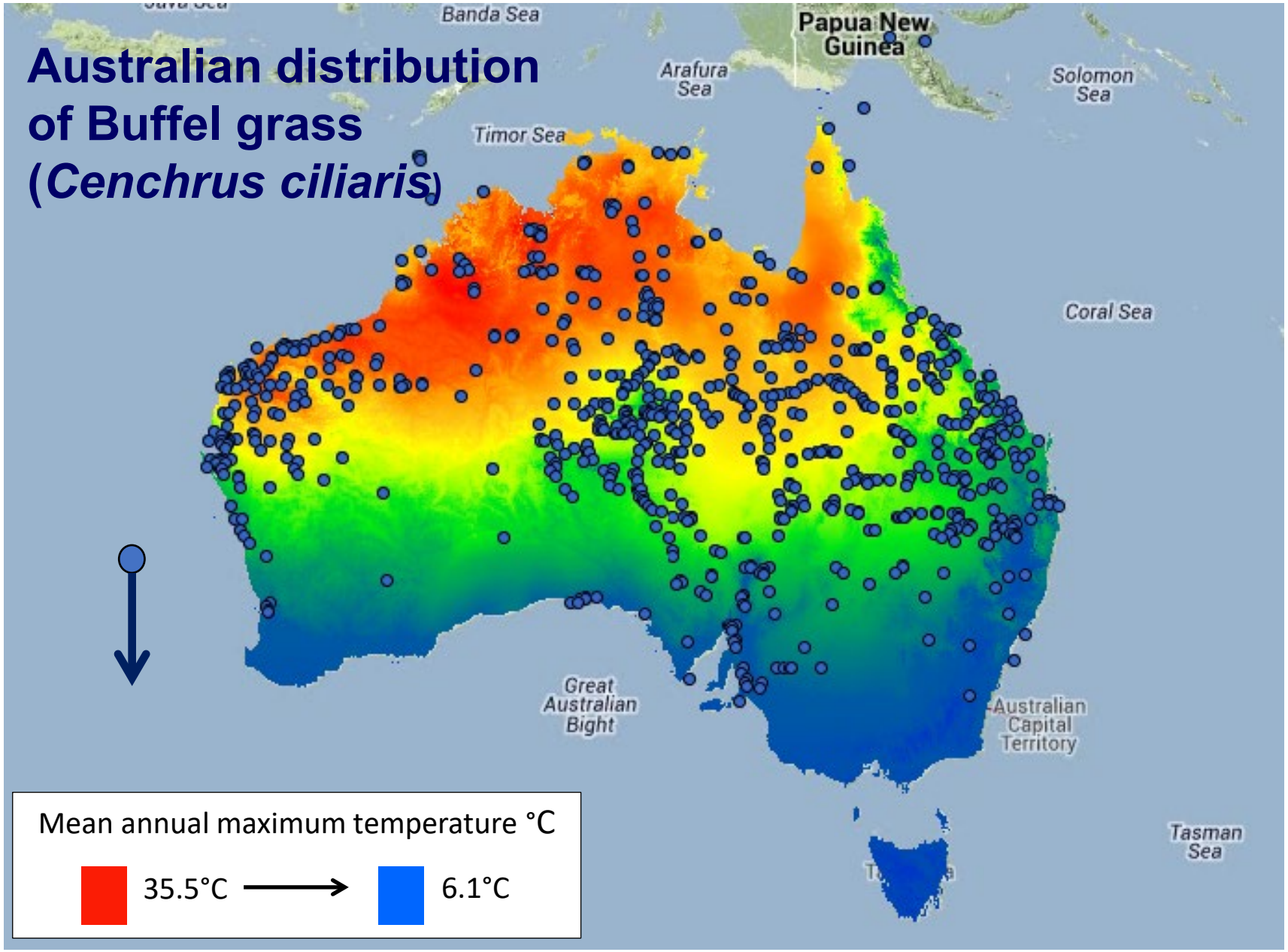
http://apps.daff.gov.au/icon32/asp/ex_casecontent.asp?intNodeId=9013623&intCommodityId=3270&Types=none&WhichQuery=Go+to+full+text&intSearch=1&LogSessionID=0



The Council of Heads of Australasian Herbaria (2013) Australia's Virtual Herbarium.http://avh.chah.org.au

What lies ahead?

- Many species are still short of their potential distribution
- Will more species be introduced?
  - accidentally
  - deliberately
- The potential for more hybridisation

2007

Hymenachne amplexicaulis x *H. acutigluma*

Hymenachne* x *calamitosa

Clarkson *et al*. (2011)

What lies ahead?

- Many species are still short of their potential distribution
- Will more species be introduced?
  - accidentally
  - deliberately
- The potential for more hybridisation
- How will they respond to climate change?

What should we be doing?

- Training and mentoring
  - Awareness of the threat
  - Identification of key species
  - Invasion pathways
  - Altered fire behaviour and how to respond
- Develop best practice guidelines
- Need better herbicides
- Need better understanding of biology of grasses
- Better understanding of the role of fire and grazing

What should we be doing?

- Working more closely with industry
- Better compliance

What should we be doing?

- Working more closely with industry
- Better compliance
- Encourage improvement in point of entry quarantine
- Encourage adoption of the NAPPEC Code of Practice
- Declaration of key species
- Identify champions

Acknowledgements

Tony Grice, CSIRO, Townsville

Many DPI agronomists and pasture scientists

Gamba Grass WoNS National Management Group

Wayne Vogler and Joe Vitelli Biosecurity Queensland

Keith Ferdinands and Piers Barrow, NT Weeds Branch

Olive Hymenachne WoNS National Management Group

Natalie Rossiter-Rachor, Charles Darwin University

Sam Setterfield, University of Western Australia