



Plant

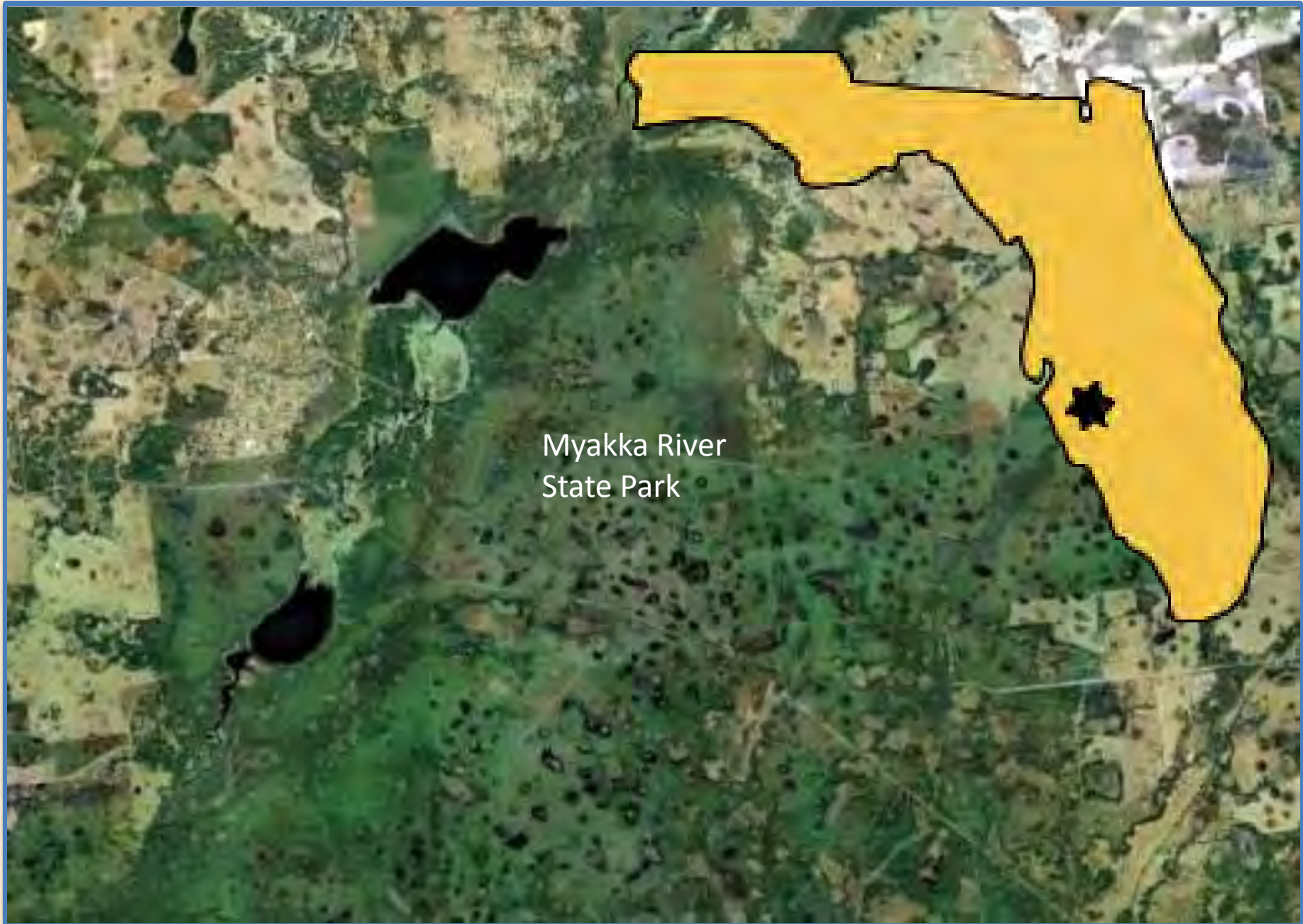
Wars

**Is West Indian Marsh Grass
(*Hymenachne amplexicaulis*)
Poised to take over Freshwater Wetlands of the Southeast?**



Paula Benschhoff, Suncoast CISMA

Jean Huffman, Louisiana State University



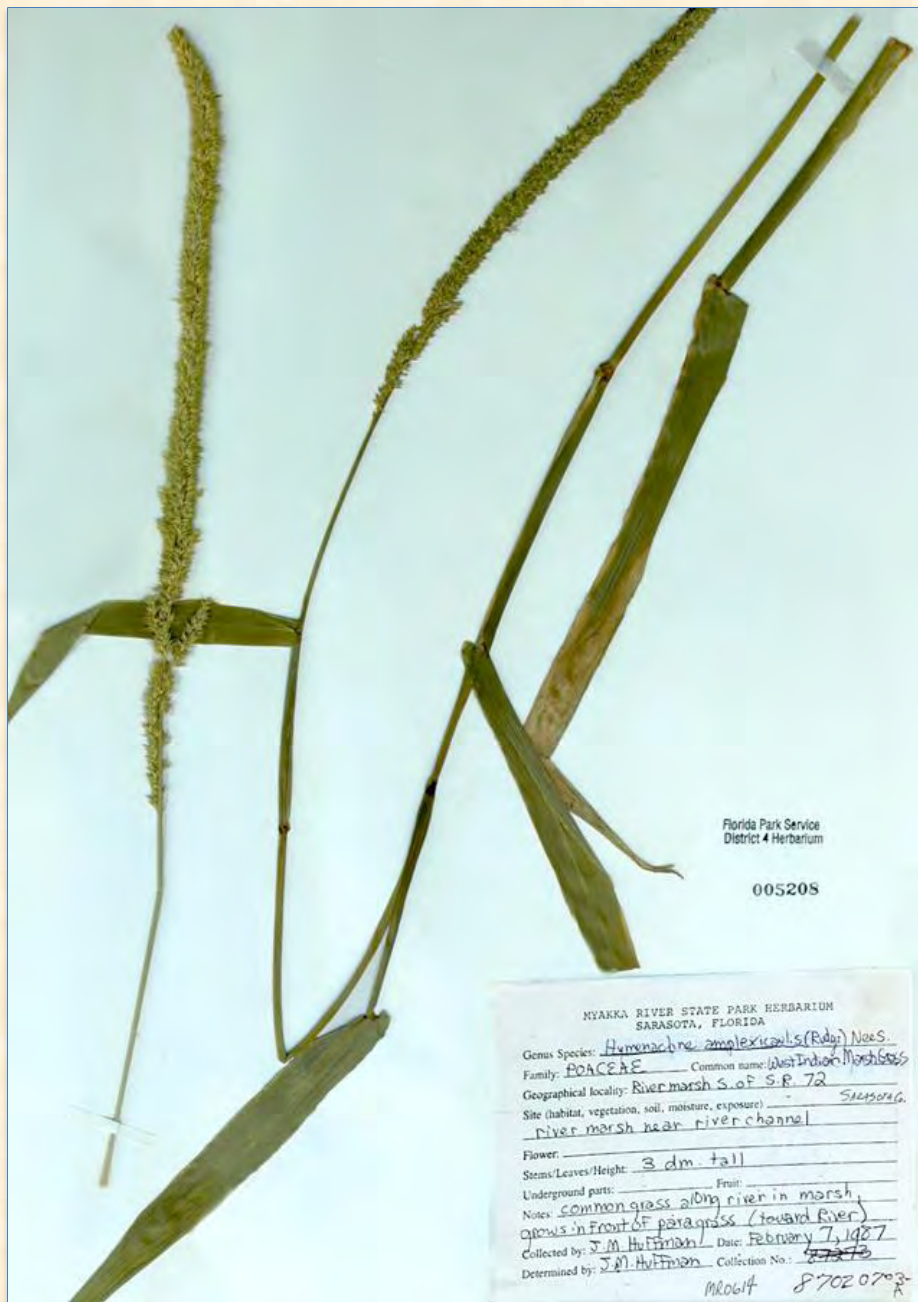
Myakka River
State Park



Image U.S. Geological Survey

2/7/1987

Collected from River Marsh
south of State Road 72.



GUIDE TO
THE VASCULAR PLANTS
OF
CENTRAL FLORIDA

Richard P. Wunderlin



A University of South Florida Book
University Presses of Florida
Tampa St. Petersburg
Fort Myers Sarasota

41. **Hymenachne** Beauv.

1. **H. amplexicaulis** (Rudge) Nees.

Wet pastures. Rare; southern cos.

Native to West Indies. Fall.

September, 13, 1988

Hymenachne amplexicaulis, a grass native to the West Indies, is by far the dominant grass to be seen in the marshes at the park bridge at this time. While I noticed some large patches last year, this year it's everywhere.



Big Flats—floodplain marsh along the Myakka River dominated by West Indian Marsh Grass, *Hymenachne amplexicaulis*



If only we had
known how
invasive this plant
was....

Limpo grass and hymenachne grown on flatwoods range pond margins

ROB KALMBACHER, JEFF MULLAHEY, AND KEVIN HILL

Authors are professor, Range Cattle Research and Education Center, Ona, Fla 33865 and assoc. professor, Southwest Florida Research and Education Center, Immokalee, Fla. 34143, and extension agent II, Naples, Fla. 33964. University of Florida Journal Series No. R-05498.

Abstract

Limpo grass (*Hemarthria altissima* [Poir] Stapf and C.E. Hubb) and hymenachne (*Hymenachne amplexicaulis* [Rudge] Nees) may reduce weight loss of cows grazing Florida range from September to March. These grasses were grown on maidencane (*Panicum hemitomon* Schult) pond margins and were evaluated as stockpiled forage (ungrazed 6-10 months) at 2 locations over 4 years. Floralta limpo grass received 0 or 3,000 kg dolomite ha (2 whole plots) and N-P-K fertilizer (5 subplots): 50-25-50, 50-25-0, 50-0-50, 50-0-0, 0-0-0 kg/ha. Hymenachne was grown without dolomite, N, P, or K. Hymenachne failed to establish at Ona in central Florida, but persisted for 1 year at Immokalee near the Everglades where dry matter production in October to January was 1,540, 2,160, and 2,910 kg/ha at 35, 70, and 105 days after N fertilization, respectively. Crude protein (56 g/kg) was highest at 70 days and IVOMD (47.4%) was highest at 105 days. Limpo grass established without dolomite, N, P, or K fertilization, and forage available for winter grazing often exceeded 7,000 kg/ha. Application of 50 kg N/ha to stockpiled limpo grass increased yield (compared to no N) in 1 of 4 years at Ona and in both years at Immokalee. Applying N to stockpiled limpo grass always increased crude protein and IVOMD above that of grass receiving no N, but increases were slight (10 g crude protein/kg). Crude protein seldom exceeded 50 g/kg with 50 kg N/ha applied in late August at Ona or in October at Immokalee. In vitro organic matter digestion often exceeded 45%, which could help limit weight loss of cows grazing range in winter. Neither grass was observed to be invasive, as growth was confined to plots after 5 and 8 years at Immokalee and Ona, respectively.

Key Words: *Hemarthria altissima*, *Hymenachne amplexicaulis*, supplementation, fertilization

Resumen

El pasto limpo (*Hemarthria altissima* [Poir] Stapf and C.E. Hubb) and paja de agua (*Hymenachne amplexicaulis* [Rudge] Nees) puede reducir la pérdida de peso de las vacas pastando praderas nativas en la Florida de Septiembre a Marzo. Estos pastos crecieron en los márgenes de las lagunas o pantanos donde estaba establecido maidencane (*Panicum hemitomon* Schult) y fueron evaluados como heno en pie (sin pastorear 6-10 meses) en dos localidades por más de 4 años. El pasto limpo recibió 0 o 3,000 kg dolomita/ha (2 parcelas completas) y se fertilizó con N-P-K (5 subparcelas): 50-25-50, 50-25-0, 50-0-50, 50-0-0, 0-0-0 kg/ha. Paja de agua creció sin dolomita, N, P, o K. Paja de agua no creció en Ona, localizada en la parte central de la Florida, pero persistió por 1 año en Immokalee cerca de los Everglades donde la producción de materia seca de Octubre a Enero fue de 1,540, 2,160, y 2,910 kg/ha en 35, 70, y 105 días después de ser fertilizada con N. La proteína cruda (56g/kg) fue más alta a los 70 días y DMOIV (47%) fue más alta a los 105 días. El pasto limpo se estableció sin fertilización con dolomita, N, P, K y el forraje disponible para el pastoreo en invierno a menudo excedió 7,000 kg/ha. La aplicación de 50kg N/ha al pasto limpo como heno en pie incrementó el rendimiento (al compararlo sin N) en 1 de los 4 años en Ona y en ambos años en Immokalee. Aplicando N al pasto limpo como heno en pie siempre incrementó la proteína cruda y DMOIV por encima de los pastos que no recibieron N, pero los incrementos fueron ligeros (10g proteína cruda/kg). La proteína cruda raras veces excedió 50g/kg para 50kgN/ha aplicado a finales de Agosto en Ona o en Octubre en Immokalee. La digestión de materia orgánica in vitro a menudo excedió el 45%, lo cual podría ayudar a limitar la pérdida de peso en las vacas pastando durante el invierno. Ningún pasto observado fue invasivo, su crecimiento de mantuvo en parcelas durante 5 y 8 años en Immokalee y Ona, respectivamente.

“Neither grass was observed to be invasive, as growth was confined to plots after 5 & 8 years at Immokalee and Ona, respectively.”





In Australia they call it Olive Hymenachne.

Impacts

Invades:

- sugarcane
- water storages
- irrigation channels
- waterways
- wetlands



Darryl Assenbruck



Peter van Haaren



Brodie Akacich

- Blocks waterways causing flooding
- Threatens drinking water supplies
- Limits access to bush tucker resources (native food) for Aboriginal people
- Impedes drainage and agricultural irrigation channels
- Threatens fish habitat and nursery areas

- Alters fire regimes
- Changes soil properties and hydrology
- Reduces biodiversity
- Impacts water quality
- Detrimental to tourist trade that relies on the appeal of untouched wilderness



Cuba, Mexico, Columbia, Venezuela, & West Indies



Stem fragments carried by water, animals, & vehicles.



A single node can produce a plant.



A single spike can produce more than 4,000 seeds.



Germination rates of 20-65% in 4-year old seeds.



Magpie geese spread seeds in Australia.



Can withstand prolonged dry seasons or water 3'-deep.



Roots in soils, but stems float out into deep water.



Thrives with high nutrient influx from upstream agriculture.



Stems grow rapidly in response to rising water.

Hymenachne amplexicaulis – a Weed of National Significance

Rob Cobon
National Coordinator – Hymenachne and Pond Apple



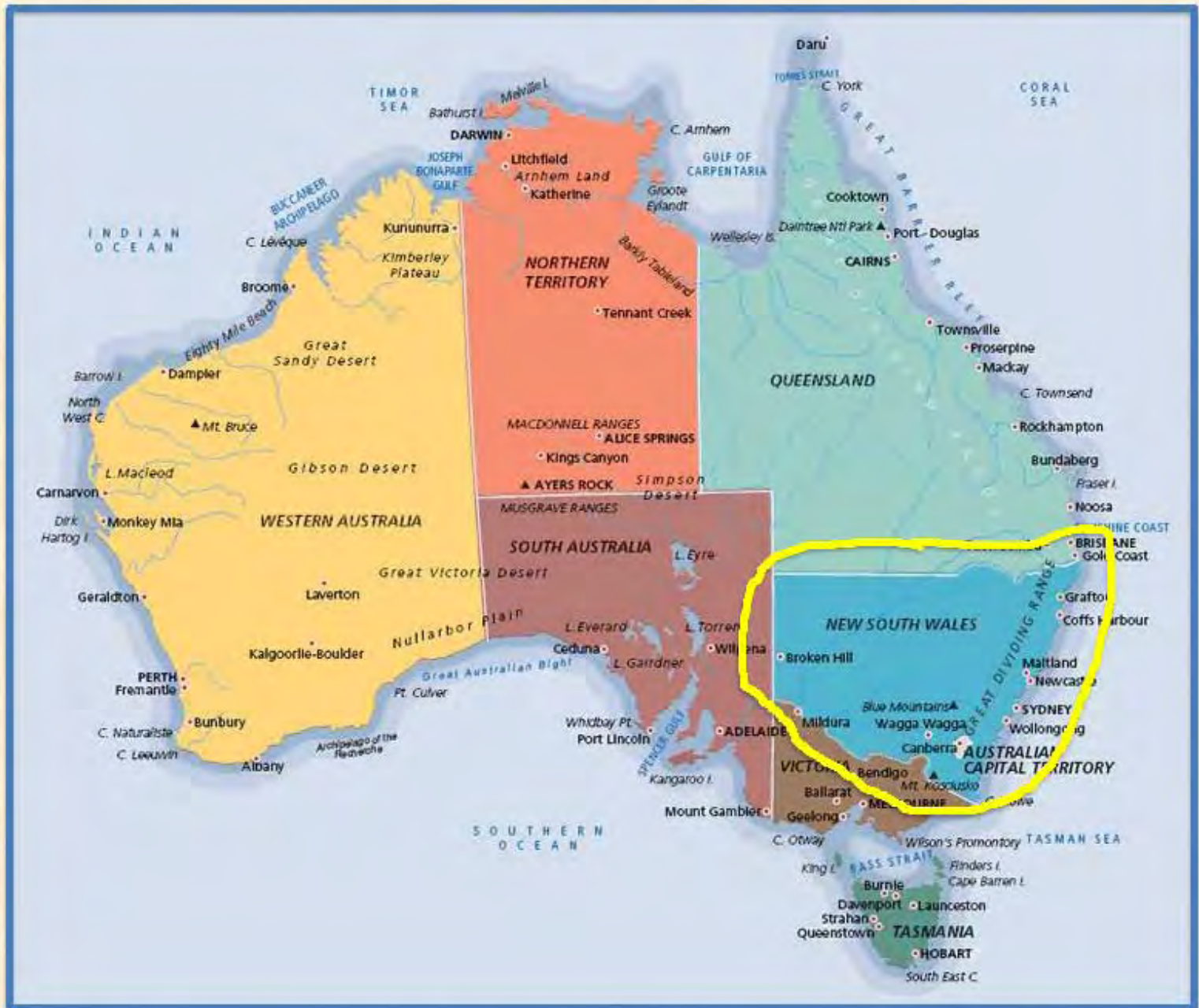
Australian Government



**Queensland
Government**

Department of
**Primary Industries
and Fisheries**





Strategic Plan

- Released 2001
- Implemented by National Hymenachne Management Group (NHMG) and state/territory stakeholders - 2004.
- NHMG Chairperson – Nick Stipis, Canegrower, Tully
- Distribution – Northern NSW, Qld and NT.

VISION

- The adverse impact of Hymenachne is reduced to a minimum.
- Four primary goals:
 1. The spread is prevented.
 2. The adverse impacts minimised.
 3. National commitment to management is established and maintained.
 4. Ensure strategy does not trigger introduction and use of additional species of non-indigenous ponded pasture species.

Successes – awareness, containment, research/ knowledge, strategic control, coordination.

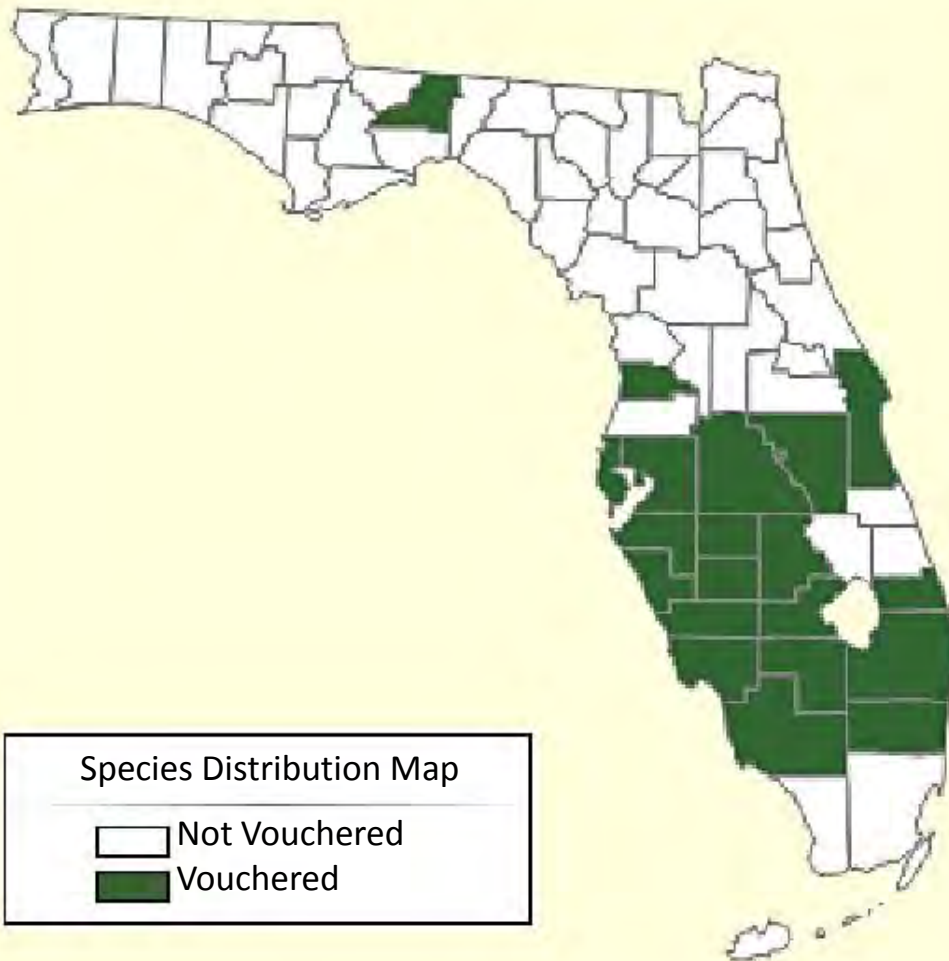


Funding, research, education, legislation, surveys



Atlas of Florida Vascular Plants

Institute for Systematic Botany

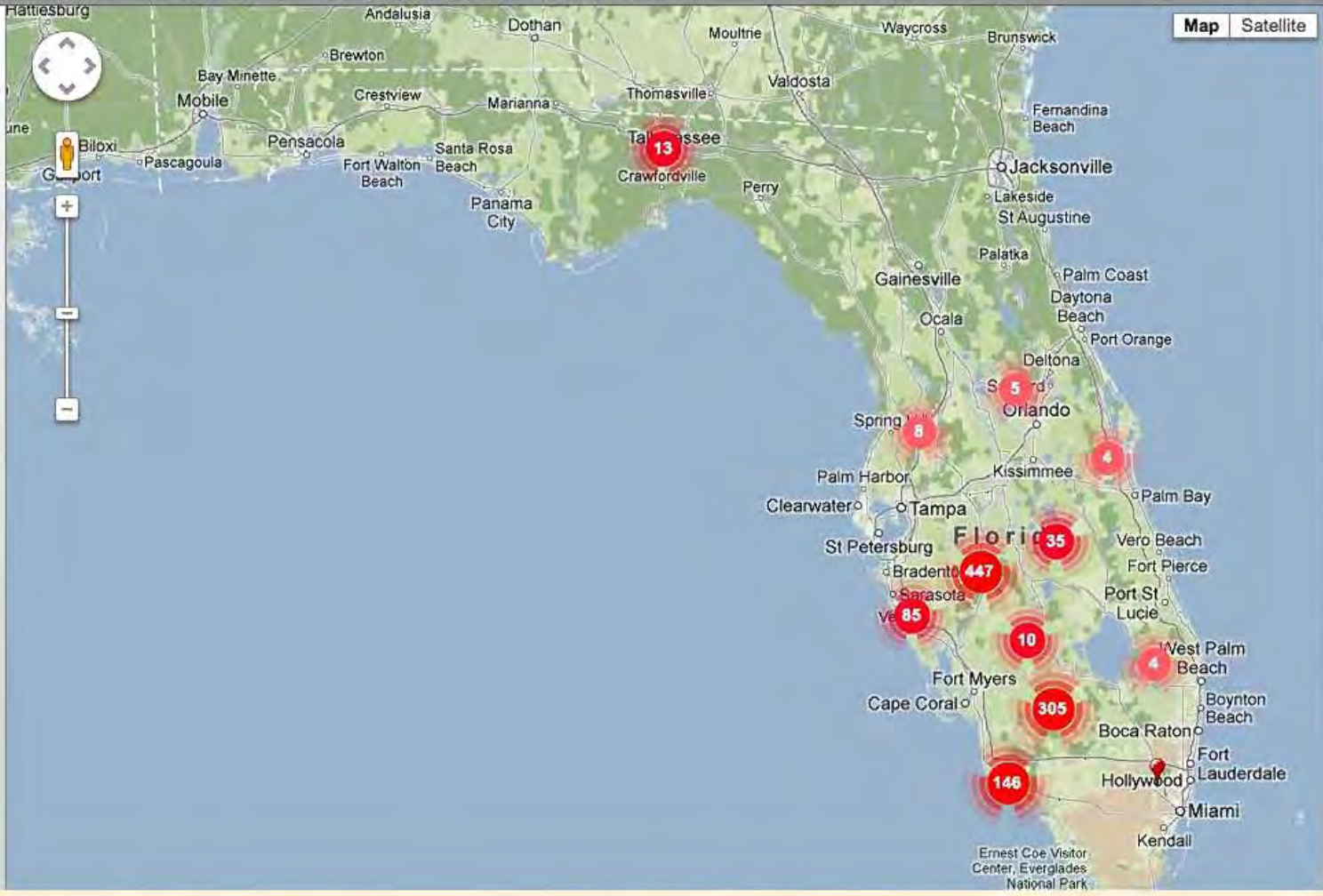


West Indian marsh grass (*Hymenachne amplexicaulis*) - EDDMapS Florida Distribution

http://www.eddmaps.org/florida/distribution/viewmap.cfm?sub=5733

hymenachne amplexicaulis common name

ISB: Atlas of ...lar Plants Hotmail Google Maps Wikipedia News Popular





American Cupscale
(*Sacciolepis striata*)



Maidencane
(*Panicum hemitomom*)



UF-IFAS Invasive Plant Management Plans

- [Abrus precatorius](#) - rosary pea
- [Aleurites fordii](#) (syn. *Vernicia fordii*) - tung tree
- [Albizia julibrissin](#) - mimosa
- [Antigonon leptopus](#) - coral vine
- [Ardisia crenata](#) - coral ardisia
- [Aristolochia littoralis](#) (syn. *A. elegans*) - calico flower
- [Asparagus densiflorus](#) (syn. *A. sprengeri*) - asparagus fern
- [Begonia cucullata](#) - begonia
- [Brachiaria mutica](#) (syn. *Urochloa mutica*) - paragrass
- [Broussonetia papyrifera](#) - paper mulberry
- [Cinnamomum camphora](#) - camphor tree
- [Colocasia esculenta](#) - taro
- [Dioscorea bulbifera](#) - air potato
- [Elaeagnus pungens](#) - silverthorn
- [Imperata cylindrica](#) - cogongrass
- [Koeleria elegans](#) - golden rain tree
- [Lantana species](#) - lantana
- [Leucaena leucocephala](#) - lead tree
- [Ligustrum lucidum](#) - glossy privet
- [Ligustrum sinense](#) - Chinese privet
- [Lonicera japonica](#) - Japanese honeysuckle
- [Lygodium japonicum](#) - Japanese climbing fern
- [Macfadyena unguis-cati](#) - cat's claw vine
- [Melia azedarach](#) - Chinaberry
- [Nandina domestica](#) - nandina
- [Nephrolepis cordifolia](#) - tuberous sword fern
- [Paederia foetida](#) - skunk vine
- [Panicum repens](#) - torpedograss
- [Phyllostachys aurea](#) - golden bamboo
- [Pteris vittata](#) - Chinese brake fern
- [Pueraria montana](#) - kudzu
- [Rhynchelytrum repens](#) (syn. *Melinis repens*) - Natal grass
- [Ruellia brittoniana](#) (syn. *R. tweediana*) - Mexican petunia
- [Sapium sebiferum](#) - Chinese tallow
- [Schinus terebinthifolius](#) - Brazilian pepper-tree
- [Sesbania punicea](#) - rattlebox
- [Solanum viarum](#) - tropical soda apple
- [Tradescantia fluminensis](#) - White flowering wandering jew
- [Tribulus cistoides](#) - puncture vine
- [Urena lobata](#) - Caesar's weed
- [Wedelia trilobata](#) (syn. *Sphagneticola trilobata*) - wedelia
- [Wisteria](#) - wisteria
- [Xanthosoma sagittifolium](#) - elephant ear

Website developed by the University of Georgia - Gen
with support from The Nature Conservancy - Flori

Last updated on Monday, Janua

Publications

- [Wildland Weeds](#)
- [Quarterly Newsletters](#)
- [Identification and Biology of Non-Native Plants in Florida's Natural Areas](#)
- [Identification and Biology of Non-Native Plants in Florida's Natural Areas, Second Edition](#) by K.A. Langeland, H.M. Cherry, C.M. McCormick, and K.A. Craddock Burks (2008)
UF/IFAS Publication # SP 257
- [Invasive Instinct - Prohibited plants: Beware of the company you keep. - NEW](#)
- [Help Protect Florida's Natural Areas from Non-Native Invasive Plants](#) by K.A. Langeland
- [Florida FWC Invasive Plant Research & Outreach Program Newsletter](#)

Management Plans

- [Air Potato Management Plan](#) - NEW!
- [Lygodium Management Plan](#) - Second Edition (2006)
- [Lygodium Management Plan](#) - First Edition (2001)
- [Brazilian Pepper Management Plan](#) - Second Edition (2006)
- [Melaleuca Management Plan](#)
- [Chinese Tallow Management Plan](#)
- [Colubrina asiatica- Lather Leaf Management Plan](#)

Videos

- [Florida Keys - Australian Pines - Waterways - Part 1 - NEW](#)
- [Florida Keys - Australian Pines - Waterways - Part 2 - NEW](#)
- [1-minute Air Potato Video - NEW](#)
- [1-minute Australian Pine Video - NEW](#)

Control Guides

- [Control of Non-native Plants in Natural Areas of Florida](#) by K.A. Langeland and R.K. Stocker
- [Management of Invasive Exotic Plants with Herbicides in Florida](#) (pdf)
- [Weed Control Methods Handbook](#) (TNC):
- [Old World Climbing Fern- Lygodium microphyllum](#)
- [Identification and Control of Non-Native-Invasive Plants in East Central Florida](#)
Brevard County Publication

Brochures

- [Greener Choices - Alternatives to invasive-exotic plants](#)
- [Air Potato Brochure](#)
- [Stormwater Pollution](#)
- [Australian Pine Brochure](#) - "The Wolf in Sheep's Clothing"
- [Tropical Soda Apple Biological Control](#) with *Gratiana boliviana* - NEW

Flyers

- [Lygodium Comparison - NEW](#)
- [Old World Climbing Fern - Find it, Report it, Kill it - NEW](#)
- [Climbing Fern Identification Flyer](#)
- [Old World Climbing Fern \(*Lygodium microphyllum*\) FAQ's](#)

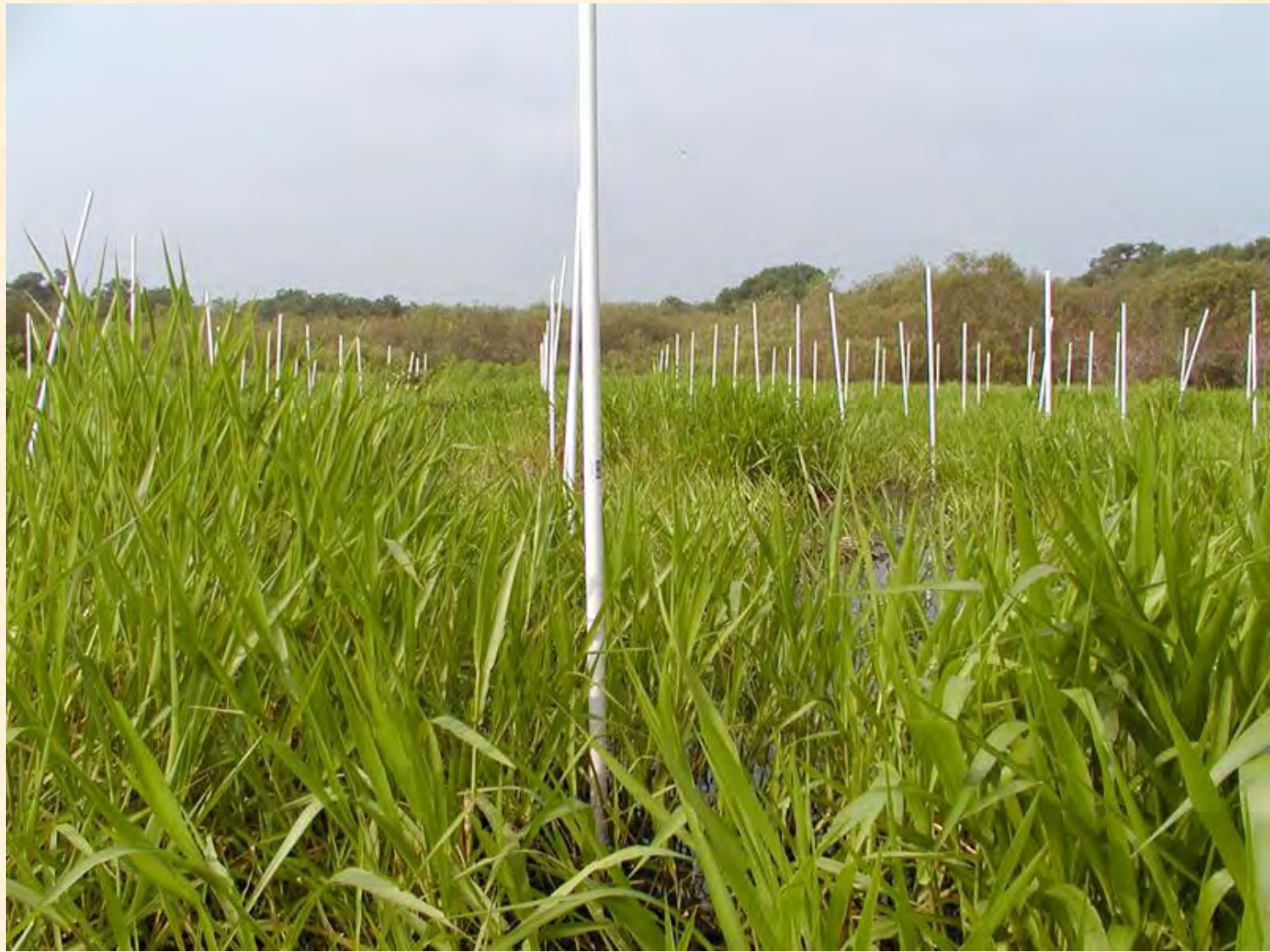
QUICK LINKS

- [FLEPPC List of Invasive Plant Species](#)
- [Invasive Species Management Plans](#)
- [Wildland Weeds](#)
- [Exotic Pest Plant Database](#)
- [Publications](#)
- [FLEPPC ListServ](#)
- [SE-EPPC](#)



- [View Distribution](#)
- [Report Infestations](#)
- [About EDDMapS](#)

No
Management Plan
Public Education
Legislation
Surveys



Myakka study: William Overholt & Rodrigo Diaz









1,841 invertebrates in native sites;
628 in Hymenachne-invaded wetlands



Giant Waterbug



Water boatman



Fishing spider



Dragonfly



Water strider



Florida lost >260,000 acres of wetlands 1985-1996.











The plant is stoloniferous.



It roots at nodes.



- Grows to ~4' tall
- Leaf blades 4-19"
- Leaves ~ 1.5" wide
- Blooms =cylindrical spikes
- At Myakka, blooms in August & September



Foto: Meike Piepenbring

Leaves smooth & shiny, except hairs on lower margins & auriculate clasping.



Native grasses are hollow.



Hymenachne amplexicaulis



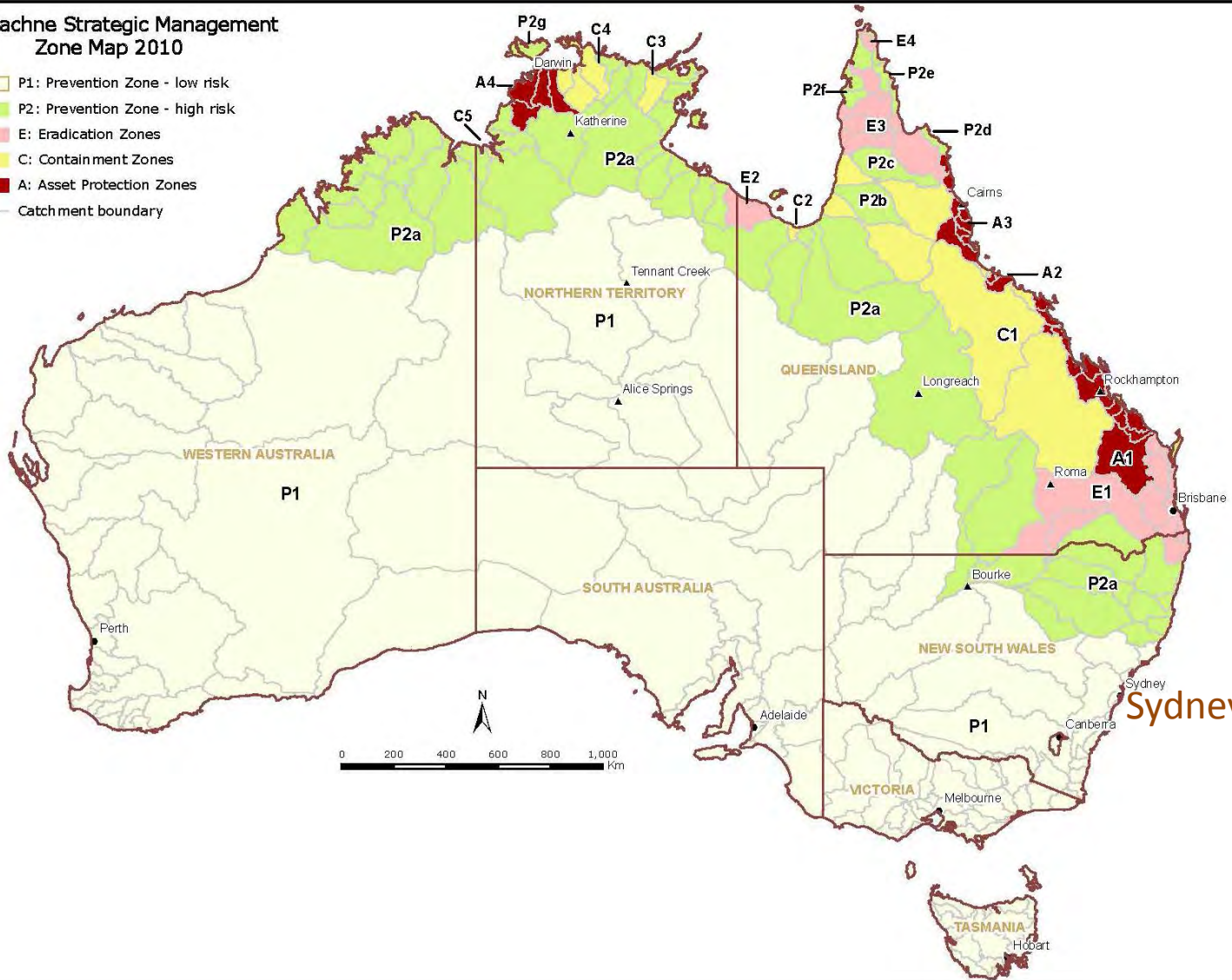
Grows in forested wetlands at Myakka.



Goes into a dormant state during our dry winters.

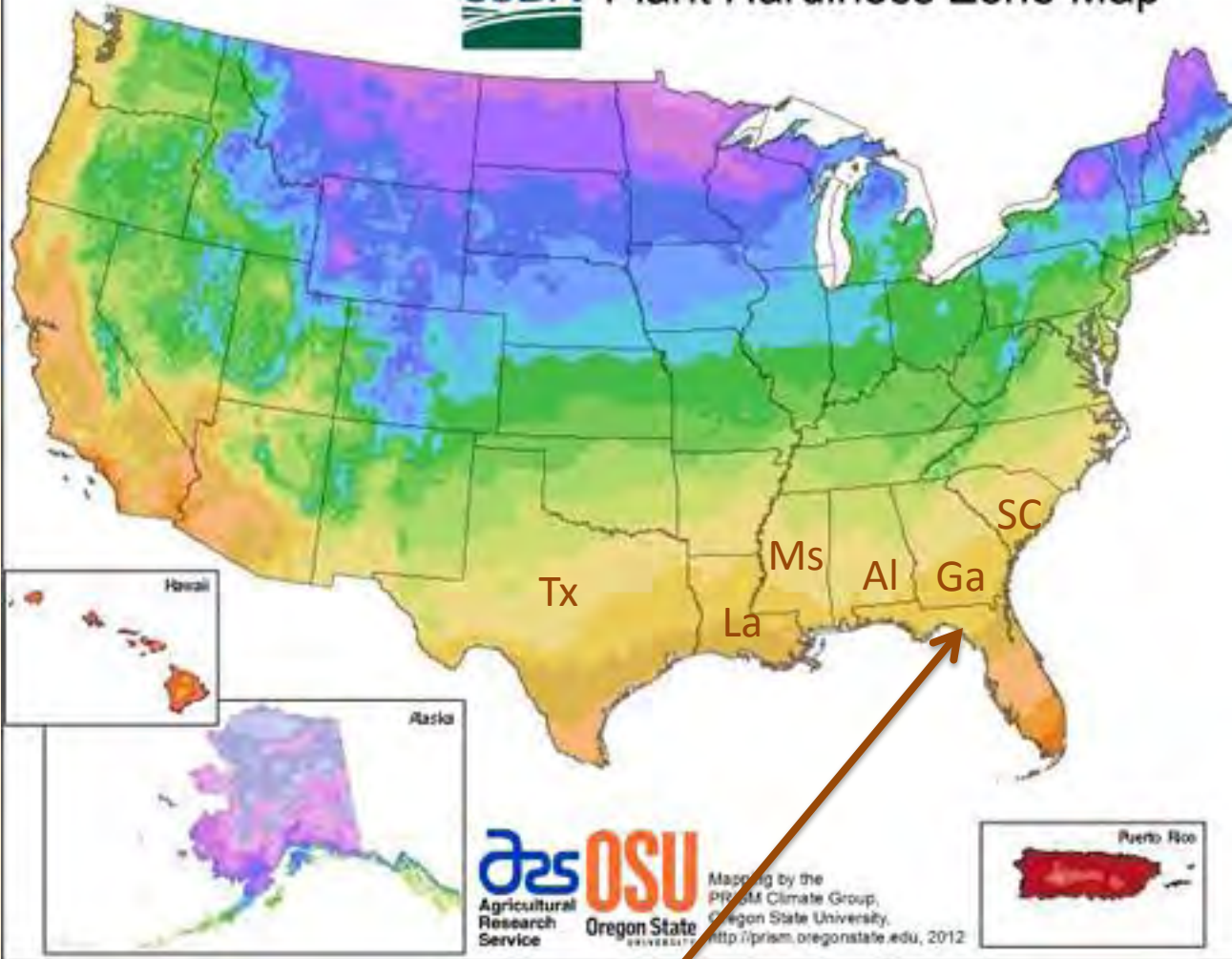
Hymenachne Strategic Management Zone Map 2010

- P1: Prevention Zone - low risk
- P2: Prevention Zone - high risk
- E: Eradication Zones
- C: Containment Zones
- A: Asset Protection Zones
- Catchment boundary



Sydney 33.8

USDA Plant Hardiness Zone Map



Average Annual Extreme Minimum Temperature 1976-2005

Temp (F)	Zone	Temp (C)
-60 to -55	1a	-51.1 to -48.3
-55 to -50	1b	-48.3 to -45.6
-50 to -45	2a	-45.6 to -42.8
-45 to -40	2b	-42.8 to -40
-40 to -35	3a	-40 to -37.2
-35 to -30	3b	-37.2 to -34.4
-30 to -25	4a	-34.4 to -31.7
-25 to -20	4b	-31.7 to -28.9
-20 to -15	5a	-28.9 to -26.1
-15 to -10	5b	-26.1 to -23.3
-10 to -5	6a	-23.3 to -20.6
-5 to 0	6b	-20.6 to -17.8
0 to 5	7a	-17.8 to -15
5 to 10	7b	-15 to -12.2
10 to 15	8a	-12.2 to -9.4
15 to 20	8b	-9.4 to -6.7
20 to 25	9a	-6.7 to -3.9
25 to 30	9b	-3.9 to -1.1
30 to 35	10a	-1.1 to 1.7
35 to 40	10b	1.7 to 4.4
40 to 45	11a	4.4 to 7.2
45 to 50	11b	7.2 to 10
50 to 55	12a	10 to 12.8
55 to 60	12b	12.8 to 15.6
60 to 65	13a	15.6 to 18.3
65 to 70	13b	18.3 to 21.1

Tallahassee, FL



We need information, research, to assess invasion, and a plan.



Hymenachne or Olive hymenachne (*Hymenachne amplexicaulis*)

The problem

Hymenachne is a *Weed of National Significance*. It is regarded as one of the worst weeds in Australia because of its invasiveness, potential for spread, and economic and environmental impacts.

Hymenachne is a semi-aquatic grass that was introduced as fodder in ponded pastures of central Queensland. It was subsequently planted in tropical wetlands of northern Queensland and the Northern Territory, and has since escaped from cultivation and seriously threatens northern wetlands.

Hymenachne invades permanent water bodies and seasonally inundated wetlands. It blocks waterways, potentially causing flooding and threatening drinking water.

It infests and blocks drainage and irrigation channels used for sugar cane and contaminates sugar cane crops. Fish habitat and nursery areas are also at risk.

Hymenachne forms dense stands that reduce plant diversity and available habitat for native animals. It can also affect water quality. The potential exists to severely detract from the high conservation and tourism value of natural wetland systems (eg Kakadu National Park).

The weed

Hymenachne is a perennial, robust grass to 2.5 m tall. It can grow above or below water, with its roots in the ground. Although its stems float, they are not hollow and contain white pith. The

stems can form stolons that run along the ground and produce new plants by rooting at the nodes (the joints between sections).

It has long leaves (100–450 mm) and the leaf base may be up to 30 mm wide and covered with long hairs. The upper part of the leaf is narrower and without hairs. The leaf blade is heart-shaped at its base where it clasps around the stem – this is a key characteristic of this species.

Flowers occur as a cylindrical cluster (200–400 mm long) at the end of a spike that is occasionally branched. The flower cluster is made up of numerous spikelets that are short stalked, 3–5 mm long and broadest below the middle (lance-shaped).

Key points

- Previously promoted as pasture, hymenachne is now a serious environmental and crop weed.
- It invades tropical wetlands and waterways and threatens large areas of northern Australia, including national parks, sugar cane plantations and water reservoirs.
- It is a prolific seeder and is also easily spread by plant parts.
- Catchments that are free of hymenachne should be protected from infestation.
- Control is difficult and costly, and is mainly achieved using repeated doses of herbicides.
- Other management techniques, such as burning or hard grazing before flooding, will help control it.



Hymenachne spreads by both seeds and vegetation and quickly takes over wetlands: Harrison Dam near Darwin, NT.
Photo: Colin G. Wilson

Blueprint:
Research
Legislation
Partnerships
Printed literature







Lost a planet, Master
Obi-Wan has.
How embarrassing!

