

Riparian and Paperbark Forests



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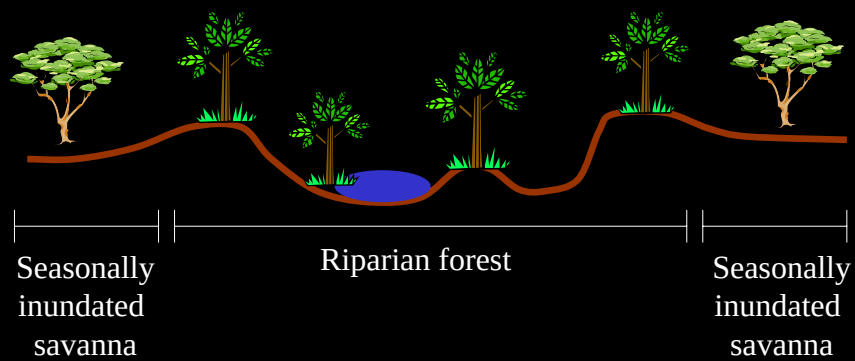


Riparian communities





What is a riparian area?



Paperbarks: “the flooded forest”

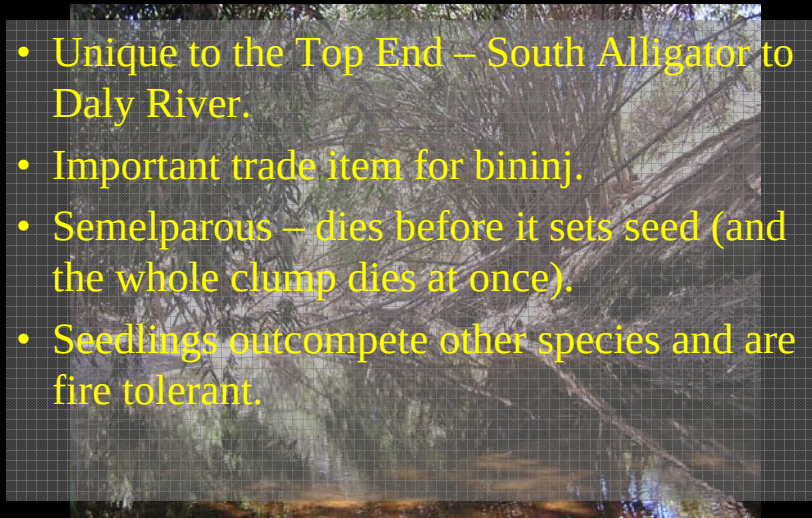
% frequency

Species	tidal	floodplain	swamp	stream	hill	n
M. argentea	0	0	0	100	0	29
M. cajuputi	0	32	53	12	4	78
M. dealbata	0	26	55	10	10	31
M. leucadendra	1	11	30	58	0	100
M. viridiflora	1	33	53	10	3	94

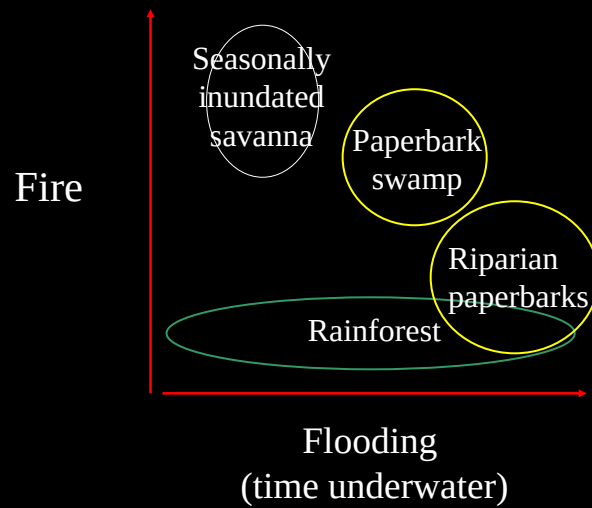
Data from Franklin D. C., et al. in press. Niche differentiation and regeneration in the seasonally flooded *Melaleuca* forests of northern Australia. *Journal of Tropical Ecology*.

Bamboo (*Bambusa Arnhemica*)

- Unique to the Top End – South Alligator to Daly River.
- Important trade item for bininj.
- Semelparous – dies before it sets seed (and the whole clump dies at once).
- Seedlings outcompete other species and are fire tolerant.



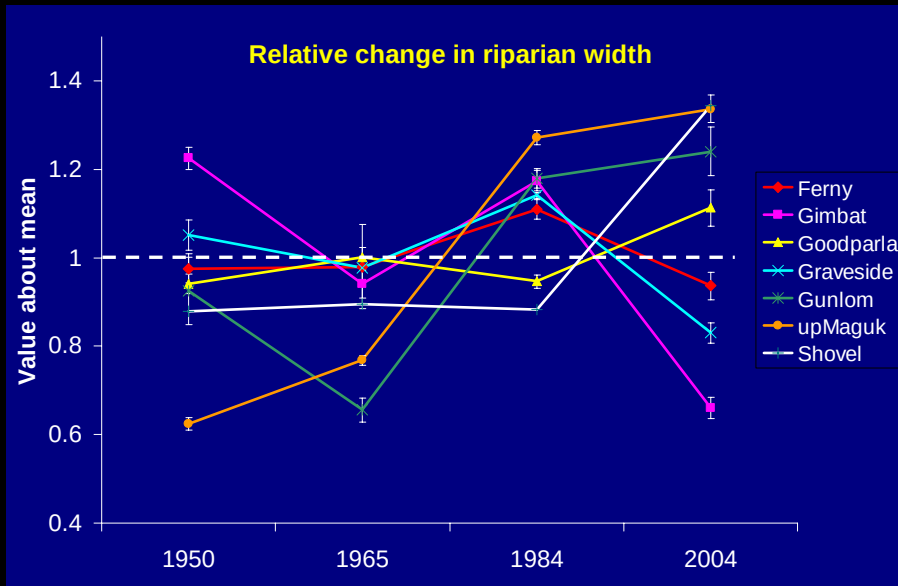
Plant communities



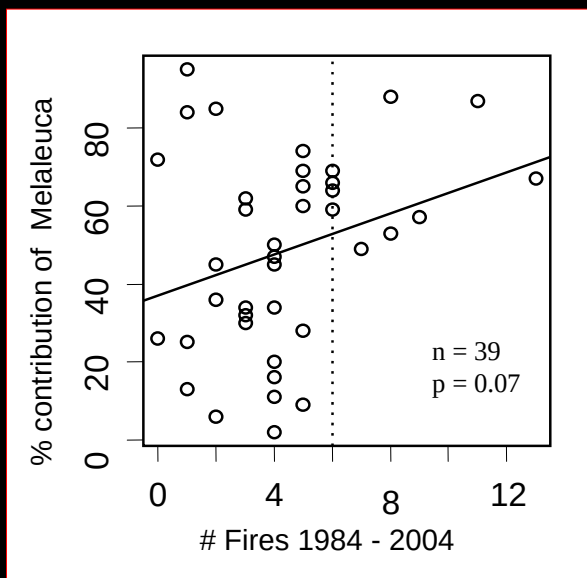
Agents of change

- Fire
- Feral animals
 - Pigs
 - Buffalo
- Weeds
 - Para grass

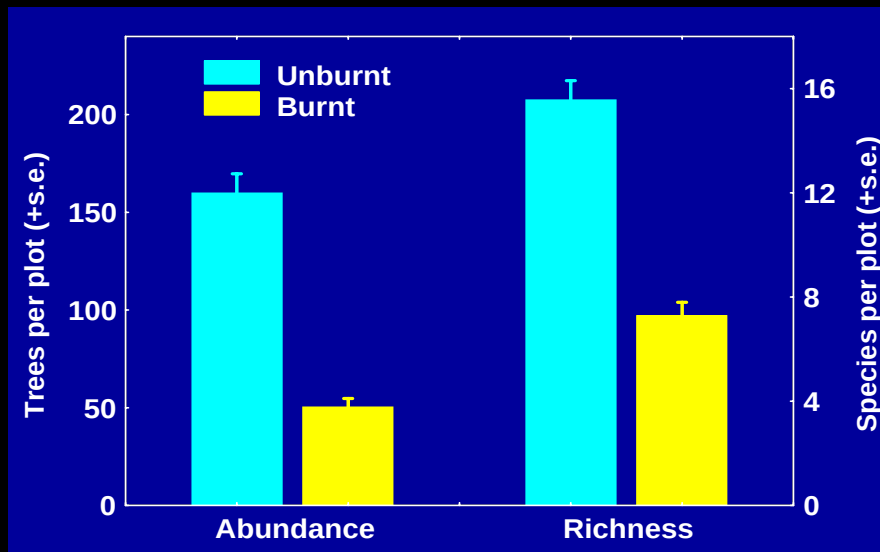
Change in riparian forest



Fire in riparian forests



Fire effects on small stream vegetation



From: Douglas, M. M. 2001 Tropical Savanna Streams: Their seasonal dynamics and response to disturbance. PhD Thesis, Monash University

Summary of fire effects on small streams

Variable	Richness	Abundance
Riparian vegetation	↓	↓
Macrophytes	↑	↑
Organic matter	—	↑
Invertebrates	↑	n.s.

What about Early fires?

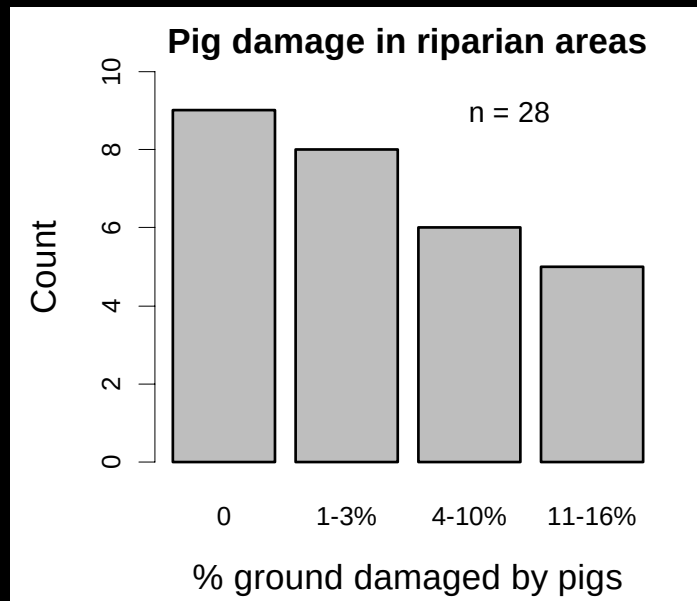
Fire regime

Vegetation feature	Unburnt	Early	Late
Riparian richness	High	Med	Low
Riparian density	High	High	Low
Riparian canopy cover	High	Med	Low
Aquatic plant richness	Low	Low	High
Aquatic plant biomass	Low	Med	High

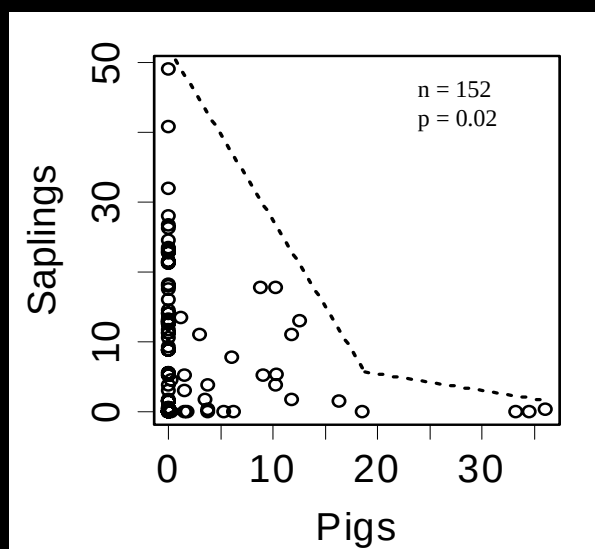
Pigs



Pig damage in 28 riparian sites



Impact of pigs on sapling recruitment



Buffalo

- Known to have heavily impacted riparian areas
 - **Lucas, D. and J. Russell-Smith, editors. 1993.** Traditional Resources of the South Alligator Floodplain: Utilisation and Management. 3 vols. Final Consultancy Report to the Australian Nature Conservation Agency, Canberra.
 - **Russell-Smith, J. 1984.** The status and condition of monsoon vine-forests in the Kakadu region: a management report. Canberra: Australian National Parks and Wildlife Service.
 - **Skeat, Andrew J., T. Jon East, and Laurie K. Corbett. 1996.** Impact of feral water buffalo. In *Landscape and Vegetation Ecology of the Kakadu Region, Northern Australia*, edited by C. M. Finlayson and I. von Oertzen. Dordrecht, Netherlands: Kluwer Academic.

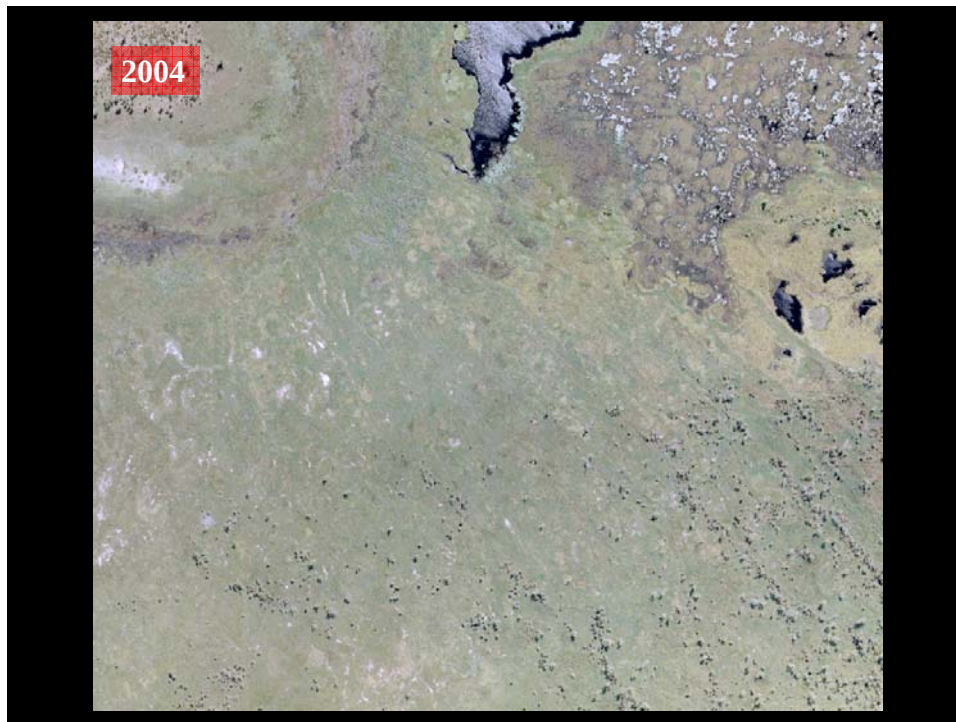
Impact on paperbarks



Localised but extensive die-offs from saltwater intrusion.

Photo by D. Lindner

- *Increased* paperbark cover is associated with buffalo.



Threats

- Fire
 - Mostly a risk for small streams & Seas. In. Savanna
 - E.D.S. fires have less impact
 - Larger streams depends on outcomes:
 - More fire = paperbarks and bamboo
 - Less fire = vine thicket and rainforest
- Feral animals
 - Pigs impact on recruitment.
 - Buffalo had an impact but let's not find out.
- Weeds
 - Para grass is an unknown factor
 - Where it invades riparian areas it will increase fire intensity; threat is unknown
 - Major potential threat for paperbark forests

Known Unknowns

- ✓ Change trends across Park
 - Aerial photos (50 years)
 - Aboriginal depopulation
- Riparian recruitment
- Risk of para grass invasion
- Faunal habitat requirements – do we manage for paperbarks or rainforest?

Management recommendations

- Control program for feral animals, especially pigs.
- The current practice of early season fires is likely optimal for small riparian vegetation.
- Continue to monitor para grass.