Northern Gulf NRM Plan (2016-2021) - Climate change risk assessment FLORA

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Key				
Probability (**P**)	UC- Uncertain	P- Possible	L- Likely	Almost Certain- A.C
Consequences (**C**)	UK- Unknown	L- Low	Mod- Moderate	M- Major
Risk rating (**R**)	L- Low	Mod- Moderate	H- High	Cr-Critical

Climate Hazard	**Woody thickening**	**Flora species**	**Pasture health**	**Weed spread**
Increased concentration of atmospheric CO_2	Slight enhancement of woody plant growth, including root sucker shoots, c.f. grasses (1, 2, 13) **PCR -** ACLH	Limited effect, possible enhancement of woody saplings over grass cover.	A minor chance of increased woody thickening shading out pasture species. This can be managed by the use of fairly regular fires and post-fire spelling (6) **PCR -** PLL	Possibly greater growth of wood weeds c.f. grass and herbaceous weeds (10) **PCR -** LModH
Increased intensity of high rainfall events (including floods and cyclones)	Increase in woodland thickening - the germination of new woody plants and promoted growth of existing saplings (3, 13). **PCR –** ACLH Rainforest expansion into eucalypt forest and grasslands (13) **PCR -** LModH	Inundation could affect species composition within ecosystems, promoting those that can germinate and grow quickly with brief rainfall events, especially annuals. **PCR -** LModH	Pasture receives the most benefit from a spread of rainfall across a season. High rainfall events may promote erosion over soil moisture retention, opening up bare areas for a change from perennials to annuals. May evolve to an annual based pasture. Decrease in pasture growth of flood effected areas (2) **PCR -** LModH	Floodwater spreads weed seeds into new areas. Intense rainfall events may provide a competitive advantage for annuals (eg. Grader grass) and other weeds that can recruit at high densities (11) **PCR -** ACMCr

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			Decrease in surface cover (2) **PCR -** ACMCr	
Increased storm surge and rising sea levels	Minimal relationship, coastal areas not so effected by woodland thickening **PCR -** UCUKL	Mangrove communities could be at risk of altered inundation **PCR –** LModH Freshwater/ brackish water balance affected. Plants that rely on top layers of sand will be adversely affected **PCR -** LLMod	Salt water inundation damages pasture growth, which could be a localised issue in coastal areas over a small area **PCR -** LLMod	Limited effect, however some possible localised effect through saline-resistant water born weed seeds spreading through flood water into more inundated areas **PCR -** LLMod
Longer dry seasons, including extended droughts	Die back of canopy trees, which is thought to balance woody thickening over a decadal scale (4) **PCR-** PModMod	Changes in abundance of some trees, due to declines from drought-induced dieback; e.g. ironbarks & boxes more susceptible than sub-dominant bloodwoods (5). However, unlikely to completely alter ecosystems because of survival and recruitment of saplings into the canopy. **PCR -** LLMod	Extended dry periods will put greater pressure on pastures (7) **PCR -** ACMCr Some limited changes in the distributions of C3 & C4 grasses (13) **PCR -** LModH Coupled with the possibility of brief intense wet periods, there may be a decline in perennials and increase in annuals. Greater management of stocking rates will be required to	Droughts will result in more bare ground, which provides the opportunity for weed establishment once rains return. The dry periods may also negatively impact on some weed species, through reduced growing season (11) Adjusting to uncertainty about future variability in dry periods requires assessment of weed populations to target appropriate times for control actions (12). **PCR -** LUKMod

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			manage this possible impact (8) **PCR-** ACModH	
Continued warming of temperature, including more hot days	Stress on trees and saplings may cause dieback, or at least stunted growth rates **PCR -** LUKM	A slight increase in hot days is unlikely to impact at an ecosystem level. Decline in plant family richness (13) **PCR -** LModH Decline in distribution of some native species, some possible extinctions (13) **PCR -** ACModH Earlier flowering date of some species (13) **PCR -** ACModH	Increase numbers of hot days will increase the pressure on pastures, as described above.	A slight increase in hot days is unlikely to impact on weeds that already grow in the hot gulf region. It may cause more wilting, and less weed growth. **PCR -** LLMod
Increased incidence of destructive wildfires	An increase in wildfires due to climate changes, such as intense rainfall events followed by extended dry periods would increase the potential of wildfires. This would cause top kill of many saplings (i.e. cause them to coppice form the ground level). It would also cause dense germination of many woody plants, especially wattles, leading to increased subsequent thickening. **PCR -** PMaH	An increased number of wildfires, as a result in insufficient active management of fire, would primarily impact on the condition of an ecosystem, rather than changing its species composition. However, fire-killed Acacia-dominated forests, such as lancewood, could be removed by repeated wildfires. Larger Eucalypts generally resilient to all but intense fires (15)	The response of pastures to repeated wildfires will depend on the conditions during and after the fires. High intensity fires followed by dry conditions can promote the recruitment of some woody species, especially wattles (9). These woody species would compete with pasture grasses and herbs **PCR -** ACMCr Increase in pasture growth (14) **PCR-** LLM	Wildfires will have different effects on different weeds. Some woody, fire sensitive weeds, e.g. rubbervine, will be reduced in abundance/ Other weeds, especially annuals e.g. grader grass, will be promoted by wildfires. **PCR-** LModH

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		PCR- PModH Suppressed recruitment of small eucalypts (15) **PCR -** LLMod Reduction in forest structure (16) **PCR-** LModH	Decrease in surface cover (14) **PCR -** ACMCr	

Climate Change Risk Assessment References

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