National Environmental Research Program

NORTHERN AUSTRALIA hub

North Australian pastoralists and graziers are ready for contractual biodiversity conservation

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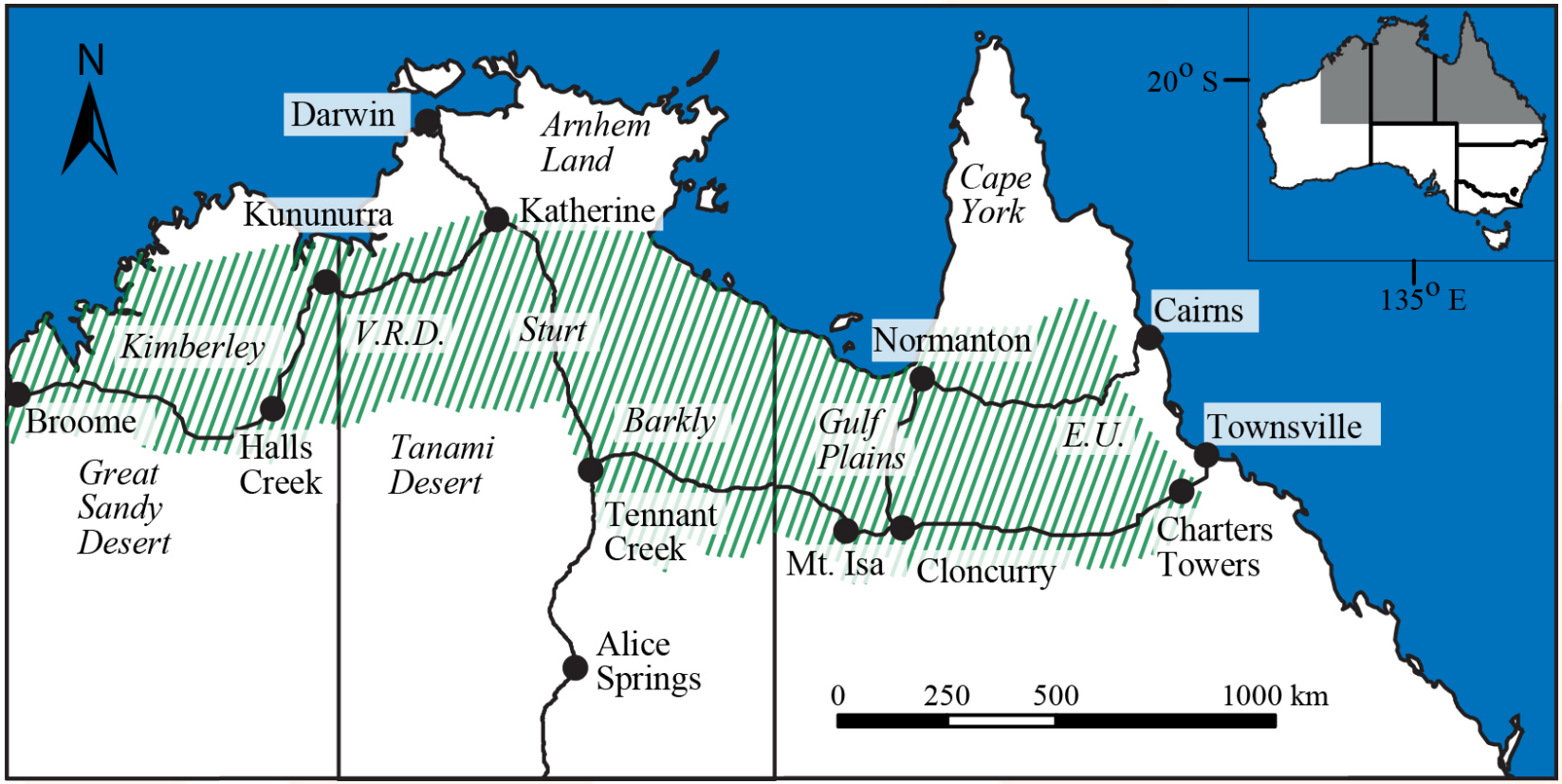
All photographs taken by the presenter unless otherwise attributed

Purpose of the research

- Develop a grazing industry perspective:
  Snapshot of what graziers and pastoralists think.
  Conservation for enterprise/income diversification?
  What conservation models would work? Where? How?
  What are preferred contractual conditions?
- Establish foundation for a strategic industry position on potential supply of environmental services.
- Enhance the ability of potential investors to understand the needs of pastoralists.
- Support market formation and negotiations about the provision of contractual biodiversity conservation by pastoralists.

Research area



Bioregions as per colloquial reference but aligned with interim biogeographic regionalisation for Australia, version 7 (DE, 2013); E.U.='Einasleigh Uplands'; V.R.D.='Victoria River District'. 'Einasleigh Uplands' also includes directly adjacent areas of Cape York and Desert Uplands; 'Gulf Plains' also includes Mount Isa Inlier and parts of Mitchell Grass Downs; 'Barkly' comprises western parts of Mitchell Grass Downs, Davenport Murchison Ranges and eastern parts of Tanami; 'Sturt' also includes western parts of Gulf Falls and Uplands; Victoria River District' comprises Ord Victoria Plain and Victoria Bonaparte; 'Kimberley' comprises Northern Kimberley, Central Kimberley and Dampierland.

Survey response

	Total (n=104)	QLD (n=61)	NT (n=25)	WA (n=18)
Property size (km^2)				
Average	2411	1010 [a]	5150 [b]	3354 [b]
Total	250750	61610	128738	60368
Herd size (head)				
Average	15925	10302 [a]	29872 [b]	15259 [a,b]
Total	1656200	628422	746800	274659

Different superscripts indicate statistically significant differences (Unequal N HSD test, $p<0.05$)

Survey respondents

	Total (n=104)	QLD (n=61)	NT (n=25)	WA (n=18)
Respondent's role on the property (% of respondents)				
Owner-Manager	62%	77%	40%	44%
(Co-)Owner of company	1%	0%	0%	6%
Employed manager	26%	15%	48%	33%
Family member	4%	3%	4%	6%
Other	7%	5%	8%	11%
Gender of primary respondent (% of resondents)				
male	82%	83%	84%	78%
Age of primary respondent (years; % of respondents)				
<30	6%	7%	8%	0%
30-39	24%	13%	44%	33%
40-49	26%	30%	16%	28%
50-59	25%	28%	24%	17%
60+	18%	22%	8%	22%

Survey with choice experiment

- Stated preference technique.
- Systematically explores the decision making process of people in a particular context.
- Typically used to estimate the uptake and potential market share of new products (demand).
- In this context used to establish potential supply:
  (a) willingness by pastoralists to participate in contractual biodiversity conservation;
  (b) area they are willing to supply.

Example of a choice task (discrete component only)

Block B Choice Situation 2	Option A	Option B	Option C	None
Conservation requirements	Cattle exclusion for prolonged periods; up to 50% loss of cattle production	Total exclusion of cattle + managing for biodiversity outcomes	Total exclusion of cattle + managing for biodiversity outcomes	
Annual payment ($/ha)	$ 8 / ha	$ 32 / ha	$ 16 / ha	
Contract length (years)	10 years	40 years	5 years	
Flexibility of conditions	Flexibility	No flexibility	No flexibility	
Monitoring conducted	Self (25% random spot-checks)	Self (25% random spot-checks)	External	
Q1: Which option would you choose?	○	○	○	○
Q2: Which is your least preferred option?	○	○	○	○
Q3: Which is your 2nd preferred option?	○	○	○	○

Willingness to participate in contractual biodiversity conservation

- General responses
  - 4 protest votes (3.8% of respondents)
  - 92 respondents found at least one conservation contract option that would fit within their business context
- Factors that did explain willingness to participate
  - Contract attributes
  - Land productivity
  - Attitudes towards biodiversity and financial incentives
- Factors that did not explain willingness to participate
  - Enterprise size and location
  - Profitability
  - Ownership structure
  - Age of respondent
  - Previous participation in conservation programs

Latent class model results (1st preference)

	Class 1		Class 2		Class 3		Class 4	
	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE
Attributes		$/ha/yr		$/ha/yr		$/ha/yr		$/ha/yr
Total exclusion	-2.231 **	9.45	-3.590 **	31.77	-1.695 **	5.09	-0.890	3.38
Rot. grazing system	-1.838 **	7.79	-0.433	3.83	0.398	1.20	-0.172 *	0.65
PAY ($/ha/yr)	0.236 **		0.113 **		0.333 **		0.263 **	
Contract duration (yr)	0.230 **	0.97	0.380 **	3.36	0.145 **	0.44	0.025	0.10
Flexibility	1.774 **	-7.52	1.700 **	-15.04	0.276	-0.83	1.606 **	-6.11
Monitoring	-0.632	2.68	-0.244	2.16	0.310	-0.93	-0.608	2.31
Covariates								
Landproduct. (head/km²)	-0.242 **	1.03	-0.033 **	0.29	-0.362 **	1.09	0.106	-0.40
BIO-ATT	0.272	-1.15	-0.569	5.04	0.352	-1.06	0.932	-3.54
PES-ATT	0.176	-0.75	0.196	-1.73	2.581 **	-7.75	8.000 **	-30.42
ASC	0.540	-2.29	-2.497	22.10	7.911 **	-23.76	8.070 **	-30.68
Membership probability (%)	0.216 ***	0.046	0.272 ***	0.048	0.269 ***	0.056	0.244 ***	0.052
Model statistics								
Observations	598							
Log likelihood	-548							
AIC	1182							
McFadden Pseudo R^2	0.339							
X^2	562							

** ***, ** , * → significant at p < 0.01, <0.05, <0.1 respectively

Key findings

- The north Australian grazing industry has genuine interest in the concept of contractual biodiversity conservation to diversity farm incomes/enterprises and deliver conservation benefits.
- Among contract attributes, the level of stewardship payment is key. Conservation requirement, flexibility and contract duration are also important.
- For about 50% of pastoralists and graziers, engaging in conservation contracts is very much a business decision.
- The other 50% are more reluctant to engage and significantly influenced by other factors, in particular attitudes.

What respondents said

- “If the biodiversity conservation contracts were to be made available, that would be definitely a feasible option to look at. You would be a land manager and still make a living. It would make life on the land a lot more enjoyable. Might keep people on the land and even bring some back.”
- “This is a great idea. If you can get it to happen it’s even better.”
- “This research is good because governments tend to just force things on people. It is good to have input, for the researcher to meet people and talk about these things. Let’s hope that they [government/bureaucrats] take note of the research!”

What do the findings mean?

- Large sections of the north Australian pastoral industry are willing and ready to sign up to voluntary biodiversity conservation and have land to offer into such contracts.
- Contractual options that allow rotational grazing and provide some flexibility in exceptional circumstances are preferred, as are contracts of shorter duration.
- Investors may wish to consider offering a portfolio of conservation contract options to achieve a range of conservation objectives effectively and efficiently.
- Contractual biodiversity conservation could be used to off-set agricultural development.

Process from here

- Data analysis
- Reporting
  - Presentations
  - Research report, scientific papers
- Implementation
  - Potential investors and applications
  - Pilot projects

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Participatory action research

- Research design: Industry consultations in Queensland, NT, WA (Kimberley), NABRC, NTCA, PGA WA, AgForce, NRM groups, Landcare groups, QLD DAFF
- Expert input & review, pilot test of the choice experiment, pretest of survey
- Survey of pastoralists and graziers, including choice experiment: research meetings and stations visits
- Reporting back to industry & stakeholders; discussion of policy relevance of results

WTA estimates (Krinsky & Robb)

Attribute	Summary description	Model 1: 'best-worst'			Model 2: 1st preference		
		Mean WTA	95% confidence interval		Mean WTA	95% confidence interval	
			Lower bound	Upper bound		Lower bound	Upper bound
TOTAL	Adopting a conservation option that requires cattle to be excluded from contract area for the duration of the contract	9.63	6.12	12.86	11.08	7.45	14.47
LONG	Adopting a conservation option whereby the contract area is spelled every year for an extended period of time resulting in up to 50% loss of cattle production from that area	0.95	-1.60	3.21	3.45	0.71	5.95
YEARS	Adding one year to the contract duration	0.40	0.31	0.51	0.41	0.31	0.53
FLEX	Introducing into contracts the possibility that a grazier can negotiate to suspend the contract for no more than 1-in-5 years in 'exceptional circumstances'	-7.37	-10.83	-4.62	-5.90	-8.54	-3.47
MONITOR	Moving from an external monitoring system to monitoring being undertaken by the grazier (with occasional spot-checks)	2.16	0.31	4.20	1.17	-0.52	3.02