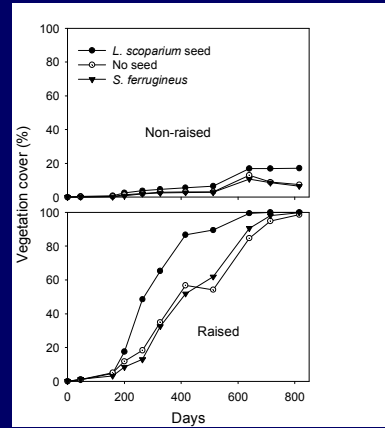


Restoration experiment 1998

Method

- Fully factorial field experiment
- 4 fertiliser applications (N, P, N+P, 0)
- 3 seed applications (*Leptospermum*, *Sporadanthus*, 0)
- 2 cultivation/water table treatments (raised, 0)



Adaptations for whole mine restoration

- 'islands' of processed peat scattered over mined surface
- Seeded with 1-2 branches of *Leptospermum*
- Rationale: vegetated islands become a seed source for further species spread onto surrounding bare surface



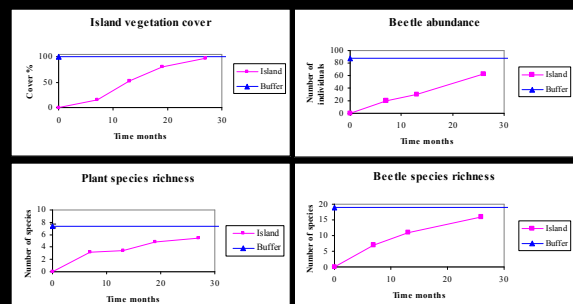
Island monitoring



6 years



Island monitoring: plants and invertebrates



Restoration techniques

- Do nothing
- Raised peat islands
- Raised peat islands seeded with *Leptospermum*
- Islands of translocated peatland community



Restoration technique comparisons: 28 mths

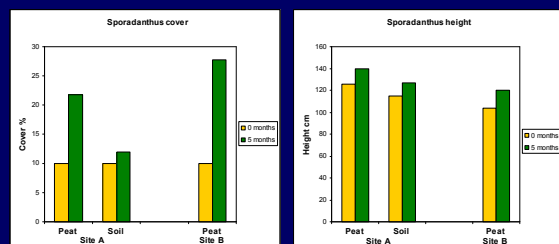
Restoration technique	Plant species in common with buffer	Beetle spp in common with buffer	Cost per island	Cost per hectare
Do nothing	24%	0%	\$0	\$0
Peat islands	35%	12%	\$265	\$2915
Peat islands & <i>Leptospermum</i>	65%	54%	\$325	\$3575
Translocated wetland community	88%	88%	\$1050	\$11,550
Buffer	100%	100%	N/A	N/A

Recreation of restiad bog type

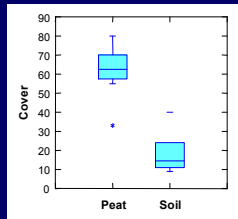
- Issues: no intact bog nearby, much higher fertility
- 2 sites: Lake Serpentine Lake Komakorau
- Experiments:
 - 2 substrates: peat and soil
 - 2 plant species: *Sporadanthus*, *Sporadanthus + Empodisma*
 - 2 management regimes: weeded and non-weeded
- Multi-organisational and community collaboration



Sporadanthus growth after 5 months



Sporadanthus cover after 12 months



Evaluating Success¹

Indicator	Lake Serpentine		Lake Komakorau	
	t = 0 yrs	t = 10 yrs	t = 0 yrs	t = 10 yrs
Δ hydrology	2.5	3	2	3
Δ physicochemistry	2	2.5	2	3
Δ intactness	1	1	1	1
Δ animal impacts	1	5	3	5
Δ native plant cover	1.5	4.5	2	5
Total (BCI) /25	8	16	10	17

¹ using Biodiversity Condition Index (BCI) in wetland monitoring handbook available at www.landcareresearch.co.nz/research/biocons/restoration/docs/handbook2004.pdf

Outcome

- Fully functioning self-sustainable restiad bog ecosystem
- Representative of original wetlands of the region
- Appreciated and valued by members of the public



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