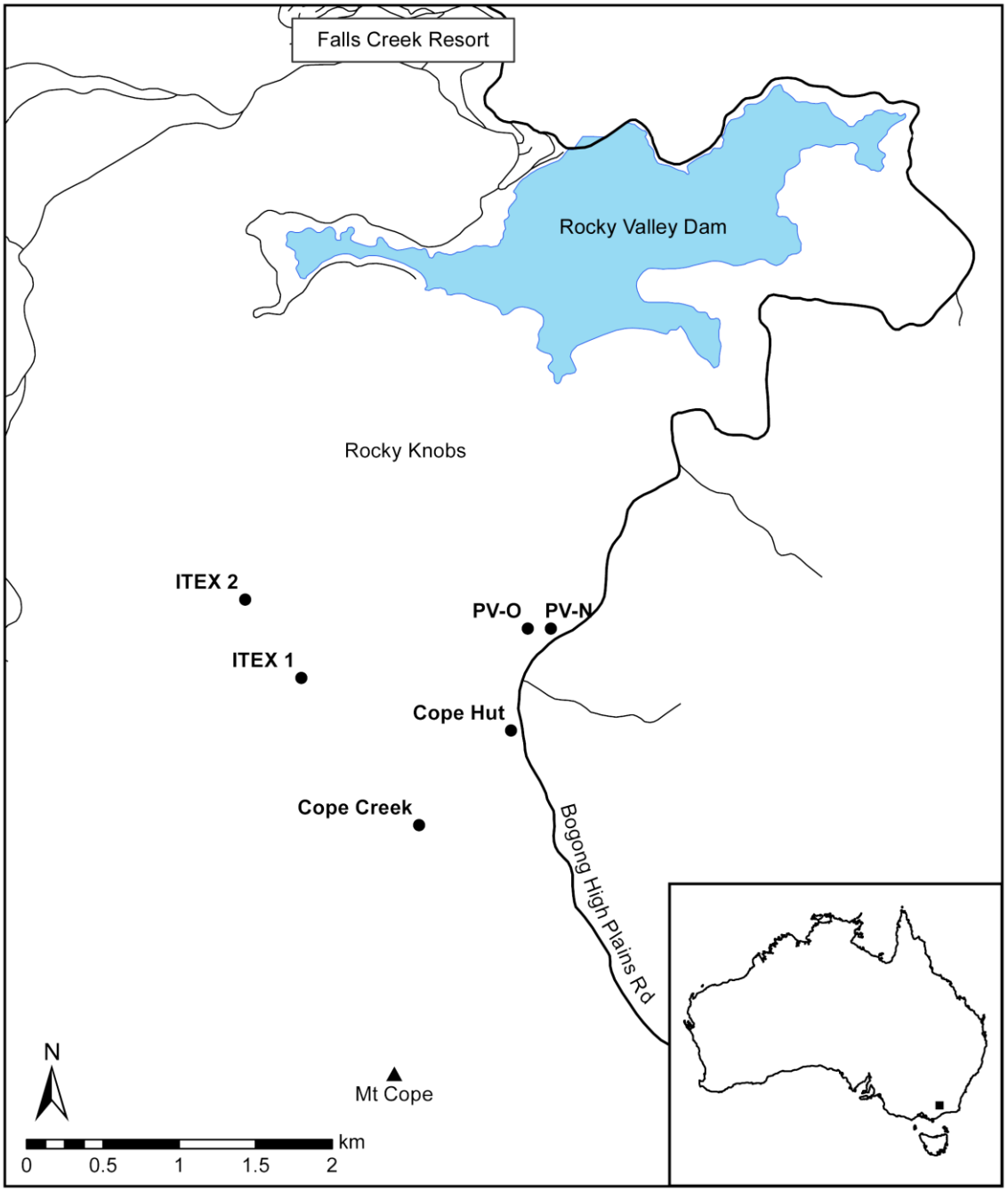
10.1071/BT12234_AC
Australian Journal of Botany, 2013, **61**, 36–51

Supplementary material



10.1071/BT12234_AC
Australian Journal of Botany, 2013, **61**, 36–51

Fig. S1. Location of sampling sites. The ITEX sites are marked as ITEX 1 and ITEX 2. The four long-term monitoring sites are Cope Hut, Cope Creek, PV-O and PV-N. See also Table 1 of the main text.

10.1071/BT12234_AC
Australian Journal of Botany, 2013, **61**, 36–51

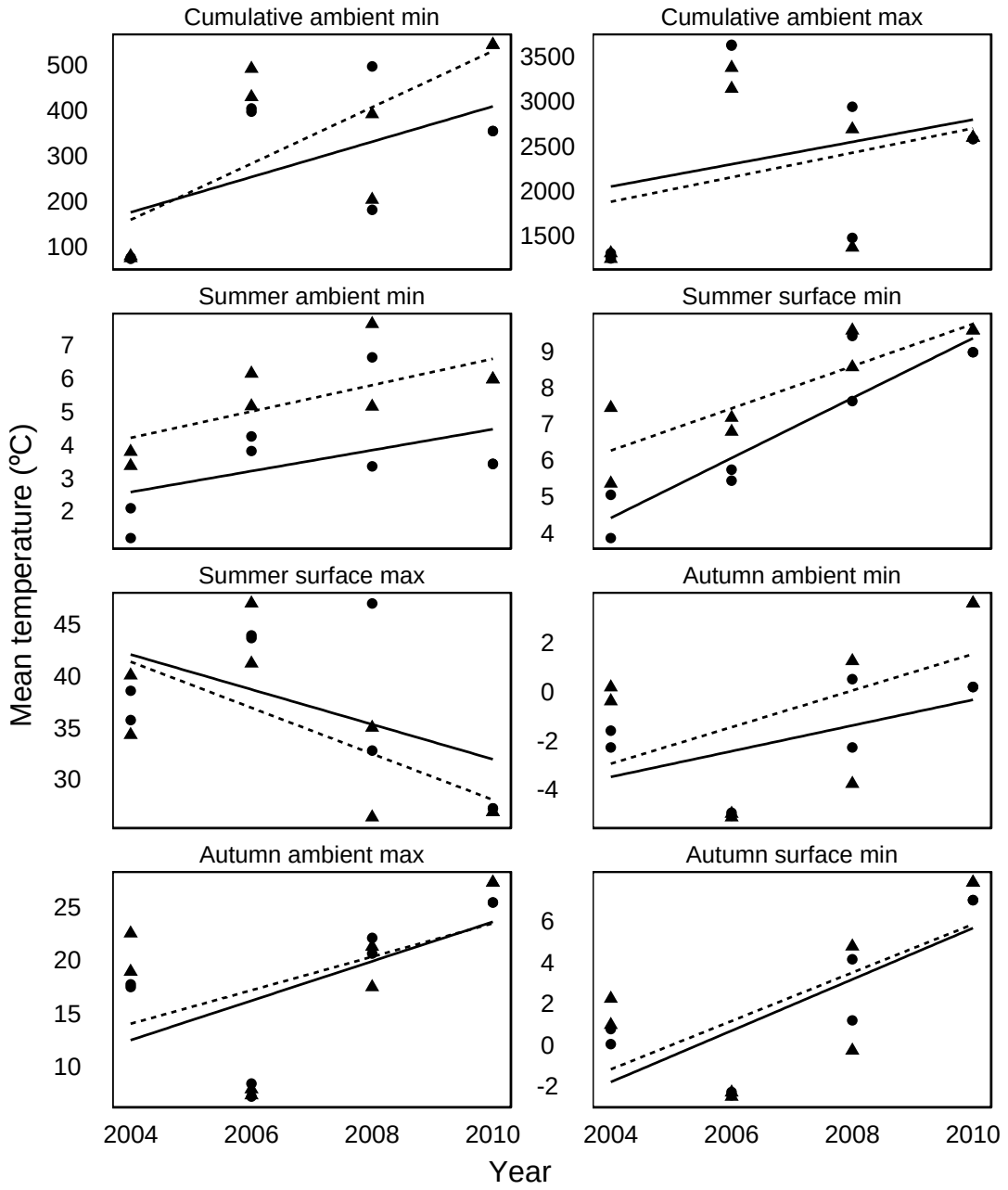


Fig. S2. Mean plot temperatures at ITEX site 1 and 2 (2004-2010), with linear smoothers for controls (●, ——) and OTCs (▲, – –). min: minimum; max: maximum. Significant (P<0.05) linear models: minimum Summer surface temperatures for both controls and OTCs, and cumulative ambient minimum temperatures for OTCs. Ambient temperatures were at 5 cm above the soil surface.

10.1071/BT12234_AC
Australian Journal of Botany, 2013, **61**, 36–51

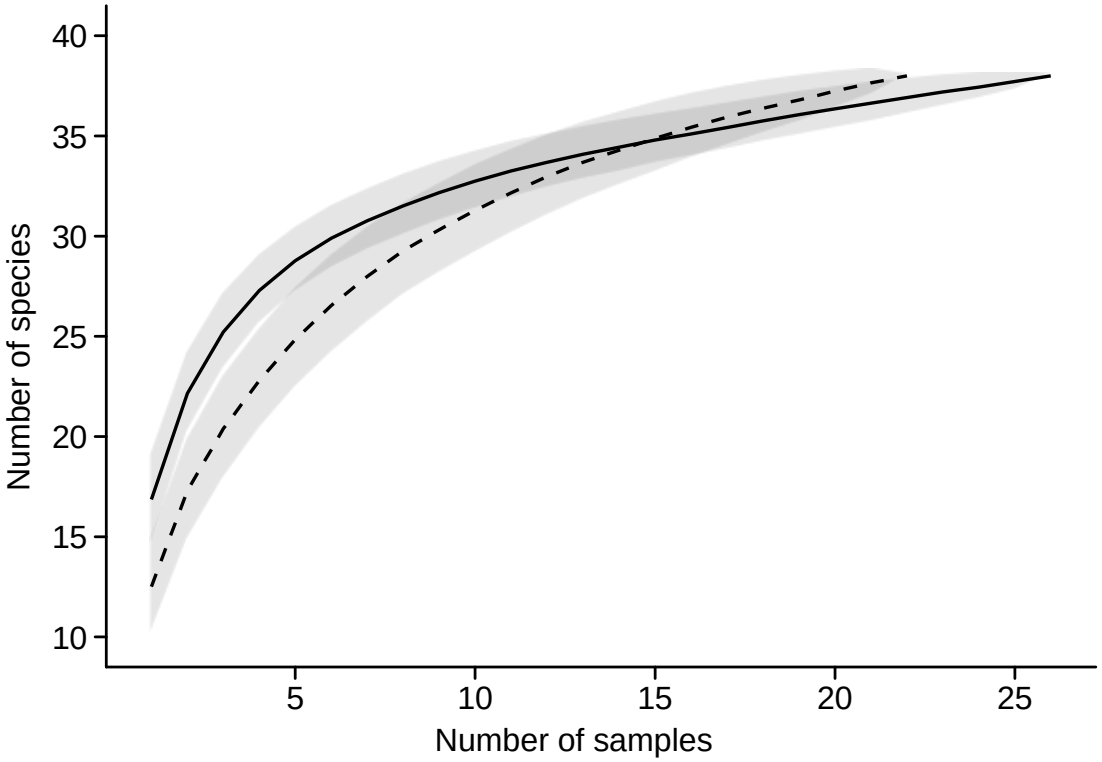


Fig. S3. Species accumulation curves based on 2010 point-quadrat data from the ITEX control plots (—) and non-TEX sites (---), with 95% bootstrap confidence bands. Curves produced by random re-sampling of the data. These results suggest that at least 10 samples would be needed per site, which was the minimum used for the non-ITEX sites.

10.1071/BT12234_AC
Australian Journal of Botany, 2013, **61**, 36–51

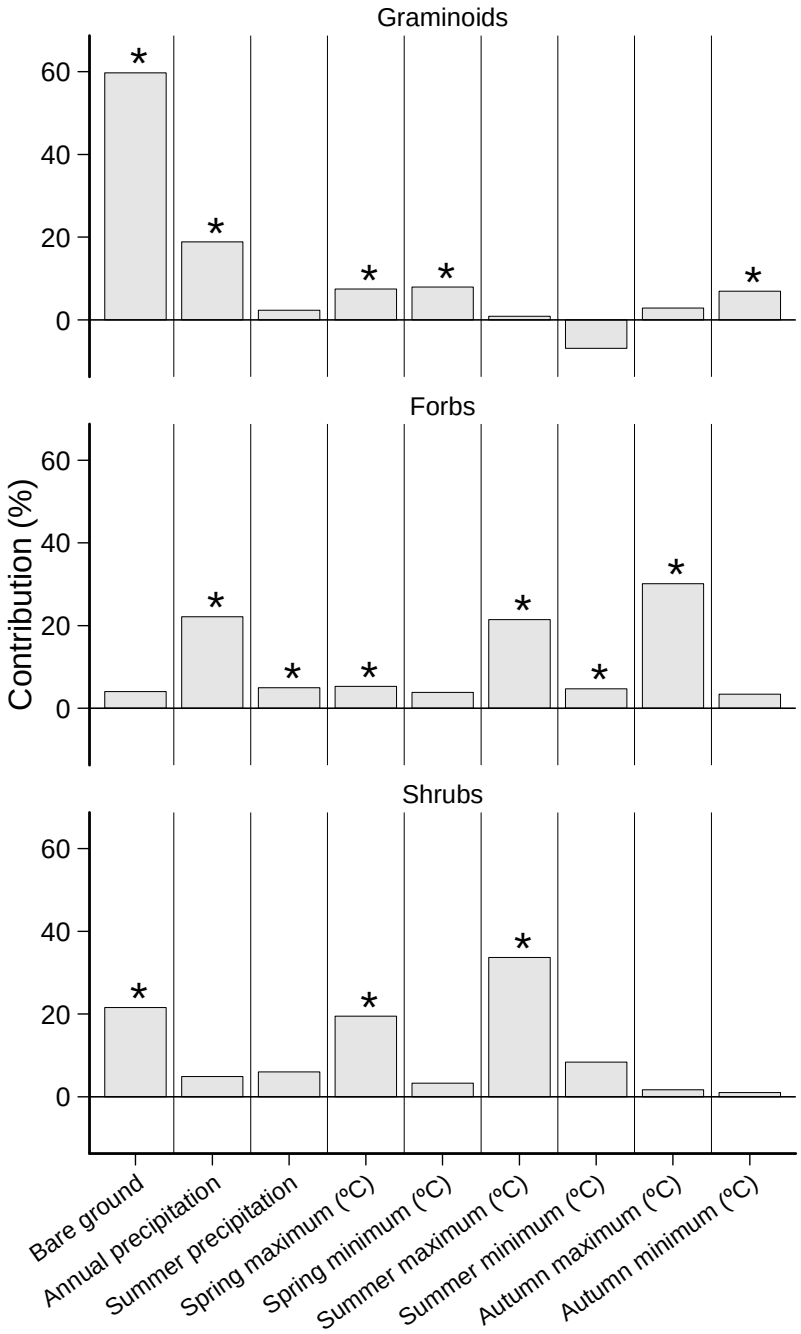


Fig. S4. Independent contributions (%) of environmental variables to the cover of the main growth forms, based on data from controls of the two ITEX sites (2004-2010) and four non-ITEX sites (1979-2010). Analysis based on hierarchical partitioning. Asterisks indicate significant ($P<0.05$) contributions.

10.1071/BT12234_AC
Australian Journal of Botany, 2013, **61**, 36–51

Analytical Methods

Here we present two fully worked examples that show the steps used to develop the optimal linear models. The examples are based on the ITEX data and assess the effects of warming and time on **(1)** graminoid cover and **(2)** overall canopy height. The steps described here were followed in all other analyses of cover, canopy height and diversity, including analyses of the complete data set, which comprised both the ITEX and non-ITEX data. The form of final models follow the examples.

1. Graminoid cover at the ITEX sites

The dependent (or response) variable was cover of graminoids (*C*) and the independent (or explanatory) variables were Warming (*W*) and Time (*T*). We began with a saturated linear regression model, here called ***M1***: $C_{ijk} \sim \alpha + \beta_1 W_{ijk} + \beta_2 T_{ijk} + \beta_3 W_{ijk}{:}T_{ijk} + e_{ijk}$, where C_{ijk} represents mean graminoid cover in plot *i* of site *j* at time *k*; β is the slope coefficient; and e_{ijk} is the unexplained error representing within-group variation, which is assumed to be independently normally distributed with a mean of zero and variance σ^2 (i.e. $e_{ijk} \sim N(0, \sigma^2)$.

Step 1: Assessing the random part of model M1.

Figure S5 shows residual diagnostics for model M1, which suggests non-normality and heteroscedasticity: the spread of residuals clearly decrease with higher fitted values and variance increases with time (Figs. S5 and S6). Given that the same plots were sampled over time another potential problem was lack of independence (temporal autocorrelation). We began with within-group variability by including *Time* as a variance covariate in the residuals (model M1.1), the only change to M1 being the error term: $e_{ijk} \sim N(0, \sigma^2_k)$. In models M1.2 to M1.4 we used both *Time*

10.1071/BT12234_AC
Australian Journal of Botany, 2013, **61**, 36–51

and *Warming* as variance covariates and tried three different variance functions: allowing spread of variance covariates to vary by warming treatment (M1.2), imposing a power structure (M1.3), and taking the exponential of the variance covariate by warming treatment (M1.4). We next addressed independence by allowing intercepts to vary first by *Site* (M1.5) and then by *Plot* within *Site* (M1.6). We also imposed a correlation structure on residuals (M1.7), using the auto-regressive model of order 1 (Pinheiro & Bates 2009): $\mathrm{cor}(e_k, e_t) = \{1 \text{ if } k=t \text{ , else } \phi^{|t-k|}\}$, where ϕ is the estimated correlation parameter and ranges from –1 to 1, k represents the time series of plot i within site j and $t = k + 1$.

Comparing models M1 to M1.7:

Model	No.	df	AIC	BIC	logLik	Test	L.Ratio	P-value
M1	1	5	1654.955	1671.545	-822.4775			
M1.1	2	5	1654.955	1671.545	-822.4775			
M1.2	3	6	1650.415	1670.324	-819.2075	2 vs 3	6.54001	0.0105
M1.3	4	6	1598.348	1618.257	-793.1742			
M1.4	5	7	1591.364	1614.591	-788.6822	4 vs 5	8.98406	0.0027
M1.5	6	8	1593.364	1619.909	-788.6822	5 vs 6	0.00000	0.9996
M1.6	**7**	**9**	**1522.284**	**1552.147**	**-752.1418**	**6 vs 7**	**73.08084**	**<0.0001**
M1.7	8	8	1549.567	1576.112	-766.7836	7 vs 8	29.28360	<0.0001

Models can be compared using the Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC, also called the Schwarz criterion) or, where models are nested, the log likelihood ratio test for which P-values are given. The AIC and BIC are generally preferred and there is little difference between them, except that BIC tends to be selected with simpler models (Johnson & Omland 2004; Zuur et al. 2009). We used AIC throughout and in the above table the best model is

10.1071/BT12234_AC
Australian Journal of Botany, 2013, **61**, 36–51

M1.6: $C_{ijk} = \alpha + a_j + a_{i|j} + \alpha + \beta_1 W_{ijk} + \beta_2 T_{ijk} + \beta_3 W_{ijk}{:}T_{ijk} + e_{ijk}$, where residuals $e_{ijk} \sim N(0, \sigma^2 \text{ x } exp(2\delta W_{ij})$. The parameter δ is estimated and is unrestricted, which means this function can allow for increasing or decreasing spread in the variance covariates (Pinheiro & Bates 2009; Pinheiro et al. 2011). Note that where $\delta=0$, the model is a linear regression (M1). Comparing models with and without an induced correlation structure showed that lack of temporal independence was a problem. This was best accounted for using a random intercept model that allowed for correlation between plot observations within site. Hence, a_j: random intercept allowing for variation among sites; $a_{i|j}$: random intercept allowing for variation among plots within site. Model diagnostics showed that M1.6 met assumptions (Fig. S7).

Step 2: Determining the optimal fixed component of M1

We began with a saturated model, M2: Graminoid cover (*C*) ~ *W* + *T* + *W:T* + *error*, using the residual error structure from M1.6: $e_{ijk} \sim N(0, \sigma^2 \text{ x } exp(2\delta W_{ij})$. The saturated model was then compared with a reduced model, without the interaction term (M2.1):

Model	No.	df	AIC	BIC	logLik	Test	L.Ratio	P-value
M2	1	9	1526.486	1556.524	-754.2429			
M2.1	2	8	1525.824	1552.524	-754.9119	1 vs 2	1.338047	0.2474

The AIC values are very similar and the log likelihood ratio test non-significant; hence, the interaction term can be dropped. Next, the new full model, M2.2 (*C* ~ *W* + *T* + *error*), was compared with a model without the main effect of Warming (M2.3) and then a model without the main effect of Time (M2.4):

Model	No.	df	AIC	BIC	logLik	Test	L.Ratio	p-value
M2.2	1	7	1553.667	1577.029	-769.8333			
M2.3	2	6	1552.010	1572.035	-770.0051	1 vs 2	0.34351	0.5578

10.1071/BT12234_AC
Australian Journal of Botany, 2013, **61**, 36–51

M2.4	**3**	**6**	**1581.940**	**1601.965**	**-784.9701**	**1 vs 3**	**30.27355**	**<0.0001**

Results show that *Warming* can be dropped (M2.2 vs M2.3 is non-significant) but not *Time*. Final model: $C_{ijk} = \alpha + a_j + a_{i|j} + \alpha + \beta T_{ijk} + e_{ijk}$, where $e_{ijk} \sim N(0, \sigma^2 \text{ x } exp(2\delta W_{ij})$.

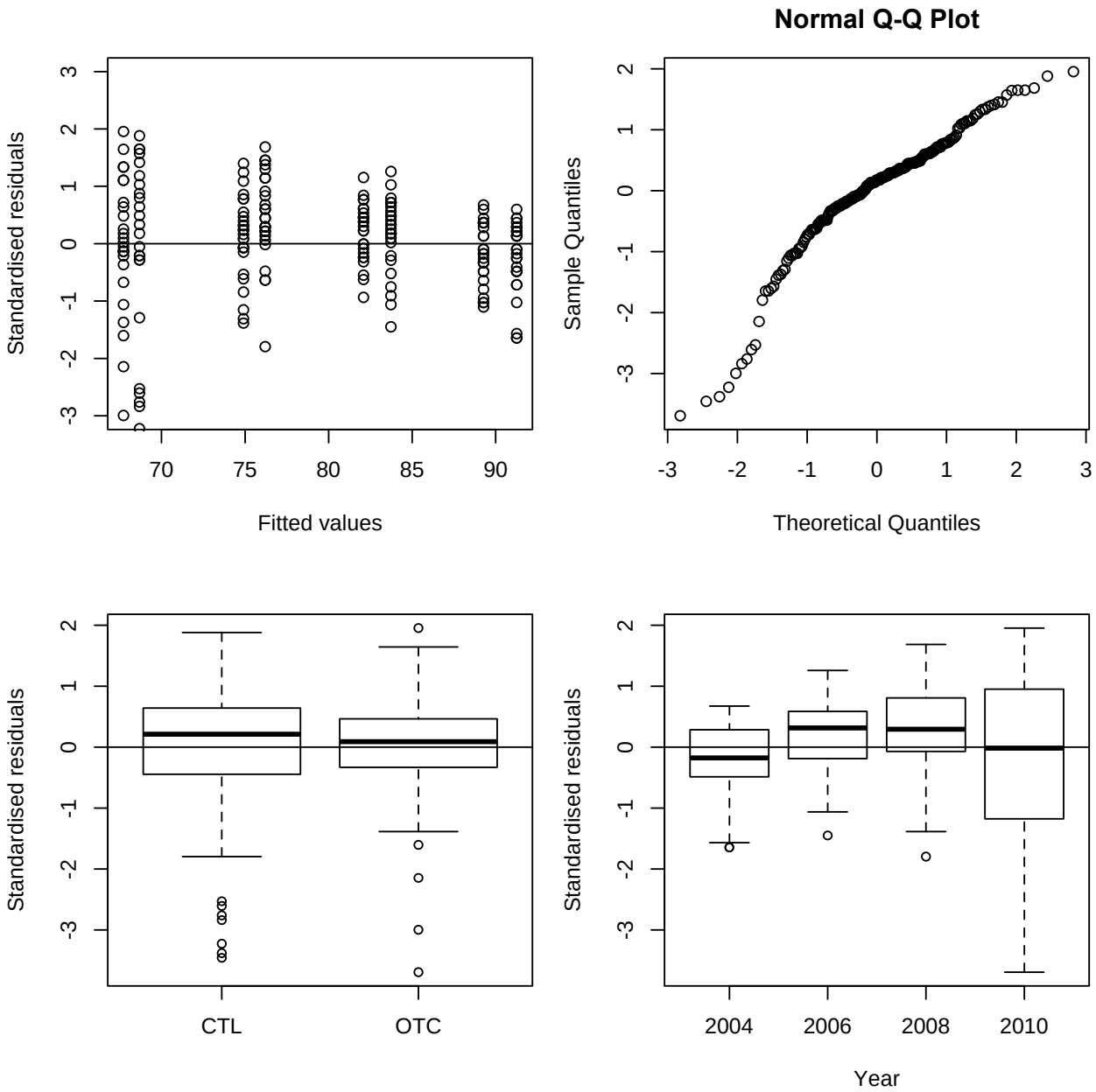


Fig. S5. Residuals from model M1 (simple linear regression) plotted against fitted values, a normal quantile-quantile plot to assess normality, and boxplots of residuals plotted against each

10.1071/BT12234_AC
Australian Journal of Botany, 2013, **61**, 36–51

independent variable. These results show some evidence of non-normality and clear heteroscedasticity. Note the large spread of residuals for 2010.

10.1071/BT12234_AC
Australian Journal of Botany, 2013, **61**, 36–51

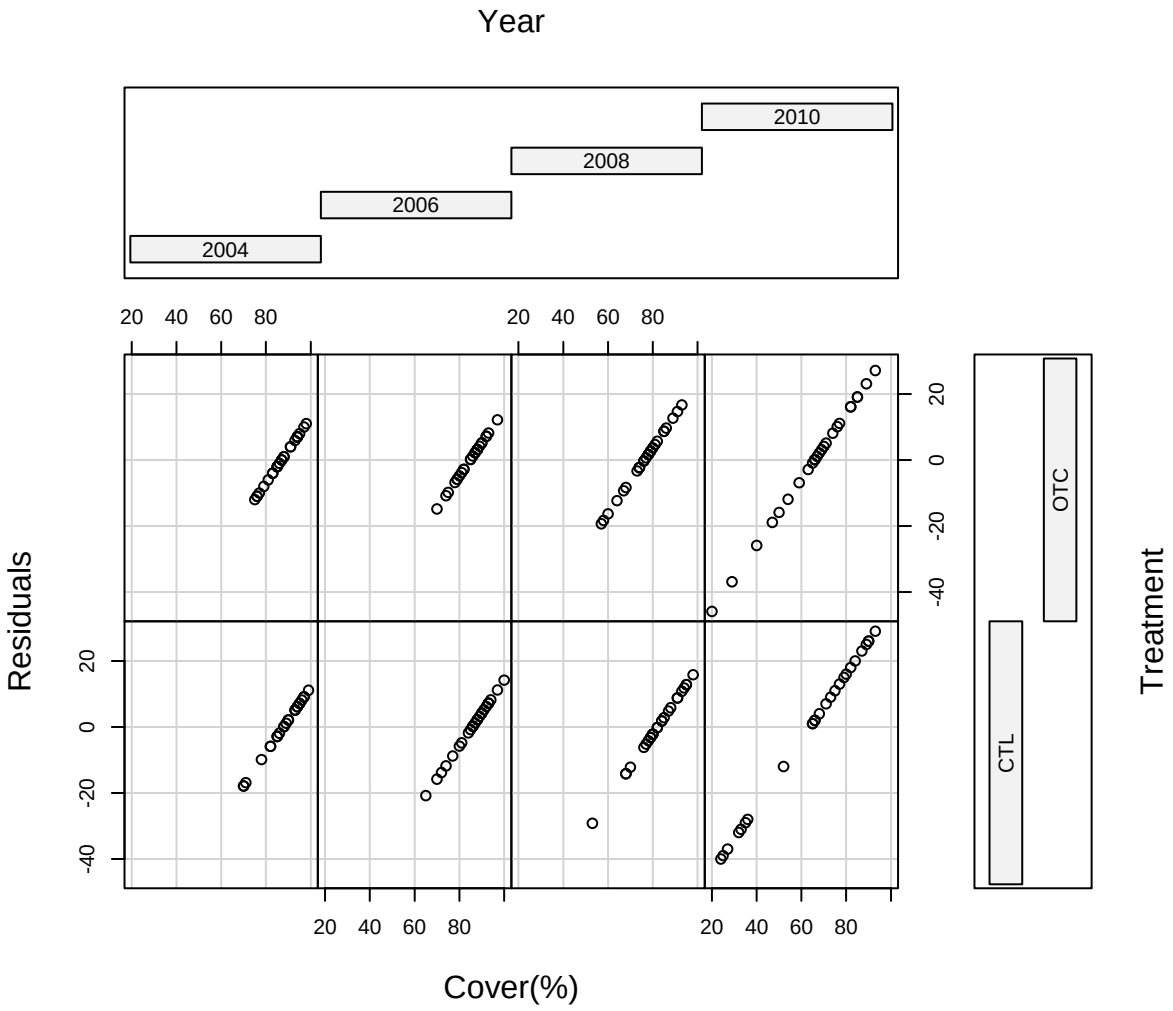


Fig. S6. Co-plot of ordinary residuals from model M1, plotted against the cover of graminoids conditional on year and treatment. OTC: open-topped chambers (warmed treatment); CTL: controls.

10.1071/BT12234_AC
Australian Journal of Botany, 2013, **61**, 36–51

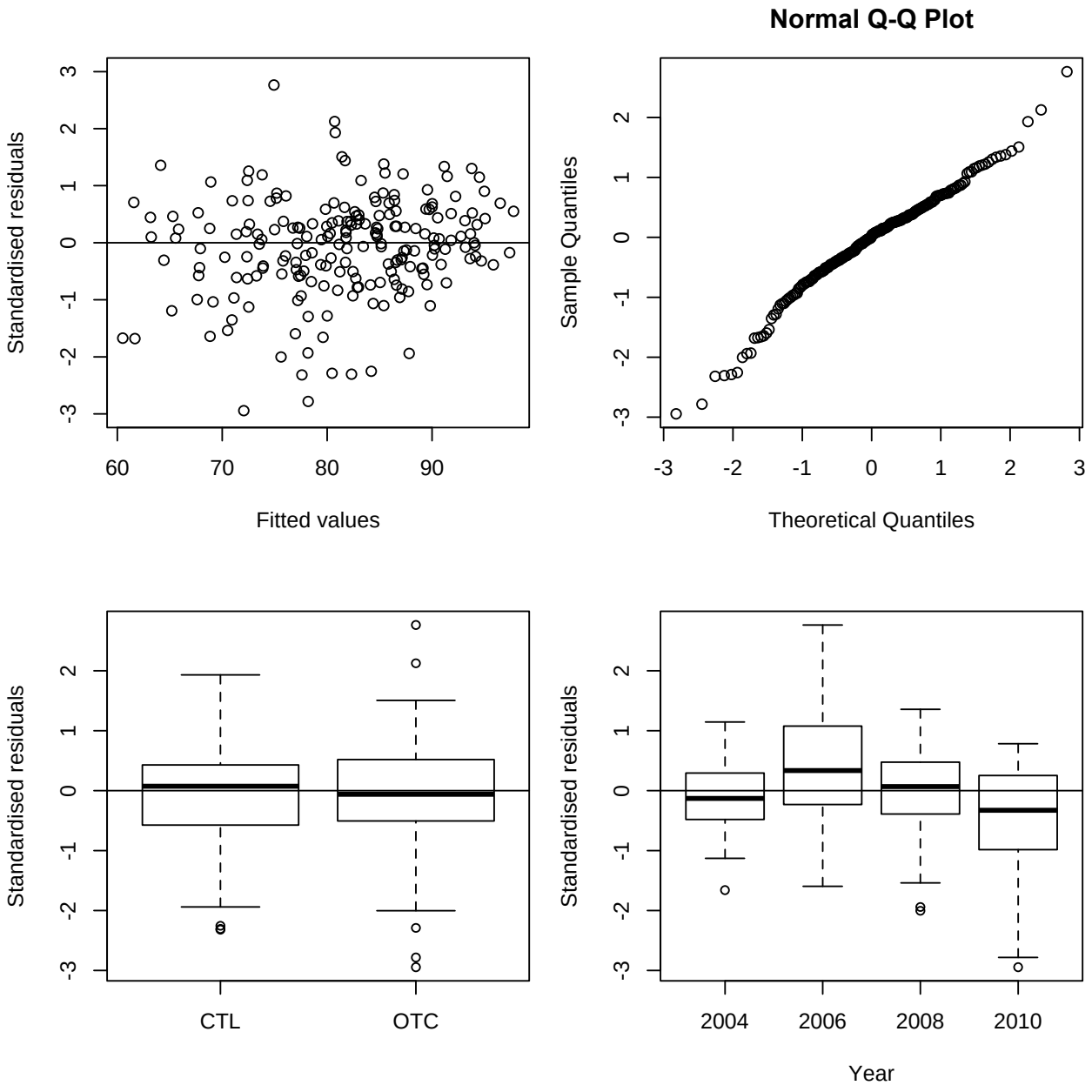


Fig. S7. Diagnostic plots of the final linear mixed-effects model (M1.6) used to assess effect of warming on graminoid cover. Residuals plotted against fitted values, a normal quantile-quantile plot to assess normality, and boxplots of residuals plotted against each independent variable.

10.1071/BT12234_AC
Australian Journal of Botany, 2013, **61**, 36–51

2. Overall canopy height at the ITEX sites

Analysis of canopy height followed the same procedure as for graminoid cover (above), but linear models failed to remove patterns in the residuals (diagnostic plots not shown, but of similar form to Fig. S5). A plot of canopy height by time (Fig. S8) suggested a non-linear relationship might be more appropriate. An additive model was therefore tried and showed that the non-linear smoother was highly significant. As for graminoid cover, we began with the random component and again tried different variance functions on the variance covariates (G1.1 to G1.3 below), which showed that the exponential for the warming variance covariate was best (G1.3, lowest AIC). The potential problem of independence was dealt with by imposing a correlation structure on residuals, using the auto-regressive correlation of order 1 (G1.3). A random intercept model was also tried (G1.4, which was an additive mixed-effects model), but produced a higher AIC:

Model	No.	df	AIC	BIC	logLik	Test	L.Ratio	P-value
G1.1	1	9	-30.06948	-0.031638	24.03474			
G1.2	2	9	-28.01957	2.018269	23.00979			
G1.3	**3**	**10**	**-47.66182**	**-14.286439**	**33.83091**	**2 vs 3**	**21.64225**	**<0.0001**
G1.4	4	11	-25.00314	11.70978	23.50157	1 vs 3	20.65868	<0.0001

Final model: Canopy $Ht_{ijk} \sim W_{jk} + f(T_k) + e_{ijk}$, where $e_{ijk} \sim N(0, \sigma^2 \text{ x } exp(2\delta W_{ij})$ and imposed correlation structure was $cor(e_k, e_t) = \{1 \text{ if } k=t \text{ , else } \phi^{|t-k|}\}$ (see above and Pinheiro and Bates, 2009). Figure S9 shows diagnostic plots, which suggest that assumptions were met.

10.1071/BT12234_AC
Australian Journal of Botany, 2013, **61**, 36–51

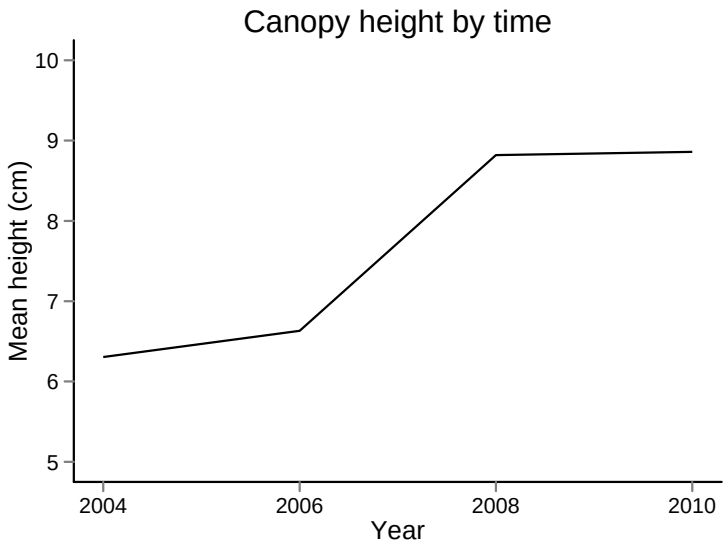


Fig. S8. Overall mean canopy height by year for the ITEX sites.

10.1071/BT12234_AC
Australian Journal of Botany, 2013, **61**, 36–51

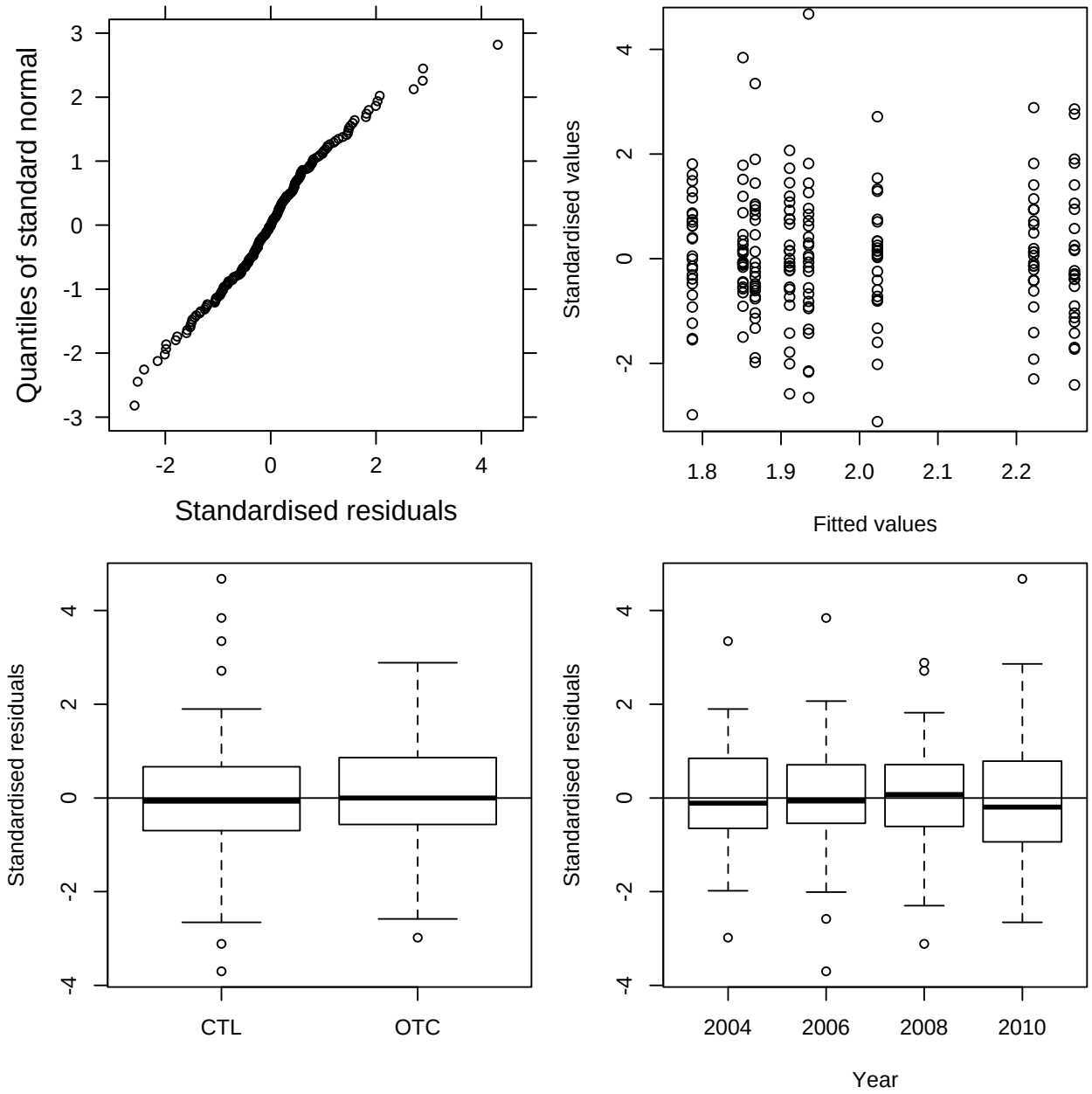


Fig. S9. Diagnostic plots of the final additive model (M1.6) assessing effects of warming on overall canopy height. A normal quantile-quantile plot to assess normality, plot of residuals against fitted values, and boxplots of residuals plotted against each independent variable.

10.1071/BT12234_AC
Australian Journal of Botany, 2013, **61**, 36–51

Final models

The final models assessing effects of warming and time on cover were similar to the model for graminoids (above). *Forbs*: $C_{ijk} = \alpha + \beta_1 W_{ij} + \beta_2 T_k + e_{ijk}$; $e_{ijk} \sim N(0, \sigma^2)$; *Shrubs*: $C_{ijk} = \alpha + a_j + a_{i|j} + \beta_1 W_{jk} + \beta_2 T_k + \beta_3 W_{jk}{:}T_k + e_{ijk}$; $e_{ijk} \sim N(0, \sigma^2_{ij})$.

The additive model for overall canopy height was the most appropriate model for both graminoids and forbs, but for shrub height a linear model was optimal: $ShrubHt_{ijk} \sim \alpha + \beta_1 W_{ij} + \beta_2 T_k + e_{ijk}$, where $ShrubHt_{ijk}$ is mean shrub height in plot *i* of site *j* in year *k*; $e_{ijk} \sim N(0, \sigma^2_{ij})$.

10.1071/BT12234_AC
Australian Journal of Botany, 2013, **61**, 36–51

Supplementary table S1 Mean cover (%) of common (≥2% cover) species and ground cover at the two ITEX sites. Treatments, CTL: control; OTC: open-topped chamber.

Site	Treatment	Species/ground cover	2004	2006	2008	2010
ITEX_1	CTL	*Agrostis spp. (mainly A. venusta)*			4	2
ITEX_1	CTL	*Asperula gunnii*			3	9
ITEX_1	CTL	*Asterolasia trymalioides*	3	3	5	7
ITEX_1	CTL	Bare ground	4		3	3
ITEX_1	CTL	*Carex spp. (C. hebes & C. breviculmis)*	5	6	6	7
ITEX_1	CTL	*Celmisia pugioniformis*	24	28	30	33
ITEX_1	CTL	*Craspedia jamesii*			3	3
ITEX_1	CTL	*Deyeuxia spp. (mainly D. modesta)*			2	
ITEX_1	CTL	*Erigeron bellidioides*	5	7	7	7
ITEX_1	CTL	Fixed litter	90	89	68	80
ITEX_1	CTL	*Grevillea australis*			3	5
ITEX_1	CTL	*Leptorhynchos squamatus*	6	10	10	7
ITEX_1	CTL	*Melicytus dentatus*		2		
ITEX_1	CTL	*Pimelea alpina*	2	3	2	3
ITEX_1	CTL	*Poa spp. (mainly P. hiemata)*	85	81	77	76
ITEX_1	CTL	*Ranunculus victoriensis*	3	4	4	4
ITEX_1	CTL	*Rytidosperma nudiflorum*	5	7	7	7
ITEX_1	CTL	*Scleranthus biflorus*	5			
ITEX_1	OTC	*Acetosella vulgaris*			4	4
ITEX_1	OTC	*Agrostis spp. (mainly A. venusta)*			3	
ITEX_1	OTC	*Asperula gunnii*			2	7
ITEX_1	OTC	*Asterolasia trymalioides*	3	4	6	12
ITEX_1	OTC	Bare ground	4	4	4	5

10.1071/BT12234_AC
Australian Journal of Botany, 2013, **61**, 36–51

ITEX_1	OTC	*Carex spp. (C. hebes & C. breviculmis)*	5	9	10	11
ITEX_1	OTC	*Celmisia pugioniformis*	18	20	20	24
ITEX_1	OTC	*Craspedia jamesii*		2	4	5
ITEX_1	OTC	*Erigeron bellidioides*	4	7	9	7
ITEX_1	OTC	Fixed litter	85	85	70	76
ITEX_1	OTC	*Grevillea australis*			3	7
ITEX_1	OTC	*Leptorhynchos squamatus*	4	9	9	6
ITEX_1	OTC	*Melicytus dentatus*	2	2	3	2
ITEX_1	OTC	*Pimelea alpina*	4	5	4	4
ITEX_1	OTC	*Poa spp. (mainly P. hiemata)*	81	82	70	69
ITEX_1	OTC	*Ranunculus victoriensis*	2	3	5	5
ITEX_1	OTC	*Rytidosperma nudiflorum*	5	6	7	9
ITEX_1	OTC	*Scleranthus biflorus*	3			
ITEX_1	OTC	*Senecio pinnatifolius*		3	5	6
ITEX_1	OTC	*Trisetum spicatum*		3		
ITEX_2	CTL	*Agrostis spp. (mainly A. venusta)*			4	
ITEX_2	CTL	*Asperula gunnii*			5	6
ITEX_2	CTL	*Asterolasia trymalioides*			2	5
ITEX_2	CTL	Bare ground	3			3
ITEX_2	CTL	*Brachyscome decipiens*			3	3
ITEX_2	CTL	*Carex spp. (C. hebes & C. breviculmis)*	5	4	5	4
ITEX_2	CTL	*Celmisia pugioniformis*	18	21	24	27
ITEX_2	CTL	*Colobanthus affinis*	2			
ITEX_2	CTL	*Craspedia coolaminica*		2	3	5
ITEX_2	CTL	*Craspedia jamesii*			2	4
ITEX_2	CTL	*Deyeuxia spp. (mainly D. modesta)*		4	5	5
ITEX_2	CTL	*Erigeron bellidioides*				2
ITEX_2	CTL	Fixed litter	75	97	77	81
ITEX_2	CTL	*Leptorhynchos squamatus*	18	26	30	21

10.1071/BT12234_AC
Australian Journal of Botany, 2013, **61**, 36–51

ITEX_2	CTL	*Poa spp. (mainly P. hiemata)*	86	82	72	36
ITEX_2	CTL	*Poranthera microphylla*		3	2	3
ITEX_2	CTL	*Ranunculus victoriensis*	4	5	5	4
ITEX_2	CTL	*Rytidosperma nudiflorum*	4	6	9	4
ITEX_2	CTL	*Scleranthus biflorus*			2	
ITEX_2	CTL	*Senecio pinnatifolius*			2	3
ITEX_2	OTC	*Acetosella vulgaris*			3	4
ITEX_2	OTC	*Agrostis spp. (mainly A. venusta)*			2	
ITEX_2	OTC	*Asperula gunnii*			6	7
ITEX_2	OTC	*Asterolasia trymalioides*			3	9
ITEX_2	OTC	Bare ground	3		3	4
ITEX_2	OTC	*Carex spp. (C. hebes & C. breviculmis)*	5	5	8	6
ITEX_2	OTC	*Celmisia pugioniformis*	18	23	26	30
ITEX_2	OTC	*Craspedia coolaminica*	2	3	5	6
ITEX_2	OTC	*Craspedia jamesii*				3
ITEX_2	OTC	*Deyeuxia spp. (mainly D. modesta)*			3	
ITEX_2	OTC	Fixed litter	79	94	76	81
ITEX_2	OTC	*Leptorhynchos squamatus*	13	19	17	11
ITEX_2	OTC	*Poa spp. (mainly P. hiemata)*	87	79	70	50
ITEX_2	OTC	*Ranunculus victoriensis*	4	3	3	3
ITEX_2	OTC	*Rytidosperma nudiflorum*	4	7	11	6
ITEX_2	OTC	*Senecio pinnatifolius*			2	

10.1071/BT12234_AC
Australian Journal of Botany, 2013, **61**, 36–51

Supplementary table S2 Mean cover (%) of common (≥2% cover) species and ground cover at the four non-ITEX sites. Treatment: CTL.

Site	*Species/ground cover*	1979	1980	1981	1982	1983	1984	1985	1988	1989	1990	1991	1992	1993	1994	1995	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
COPE_CREEK	*Acetosella vulgaris*			5																										
COPE_CREEK	*Acrothamnus spp. (A. montanus & A. hookeri)*	2																												
COPE_CREEK	*Agrostis spp. (mainly A. venusta)*												2	2	4	13								3			3	3		2
COPE_CREEK	*Argyrotegium fordianum*	3													2															
COPE_CREEK	*Asperula gunnii*	15	13	11	5	4			3			5	5	7	8	11	6	5	3	4	4							4	4	6
COPE_CREEK	*Asterolasia trymalioides*	14	13	13	12	15	11		9	13	12	9	7	8	10	11	9	11	10	9	14	12	12	9	8	13	12	14	19	21
COPE_CREEK	*Australopyrum velutinum*		3																2					2		2	3		2	
COPE_CREEK	Bare ground	37	19	30	37	28	30		24	16	24	24	14	15	14	9	9	11	14	11	13	7	13	16	3	5	15	18	17	15
COPE_CREEK	*Carex spp. (mainly C. breviculmis & C. hebes)*	8	7	8	7	5	7		8	7	10	8	8	7	8	13	5	7	11	8	12	6	5	6	6	6	6	10	11	6
COPE_CREEK	*Celmisia pugioniformis*	30	23	25	26	25	17		23	25	32	27	20	20	20	23	22	23	25	29	31	26	27	24	25	32	26	31	34	31
COPE_CREEK	*Craspedia jamesii*					2																						3	4	3
COPE_CREEK	*Craspedia spp. (mainly C. aurantia)*		7	2					2		6	3	3	3	3	3										3				
COPE_CREEK	Fixed litter	51	59	50	37	35	44		47	40	56	36	31	57	54	36	45	56	64	71	65	55	61	63	32	28	64	54	64	58
COPE_CREEK	*Leptorhynchos squamatus*	11	11	12	17	16	10		13	14	18	13	4	8	12	10	8	8	10	16	11	7	4	5	6	9	6	10	8	7
COPE_CREEK	*Luzula sp. (mainly L. modesta)*													2	3	5	5	3												
COPE_CREEK	*Oreomyrrhis eriopoda*														3	2														
COPE_CREEK	*Pimelea alpina*		2	4	3																2									
COPE_CREEK	*Poa hothamensis*												4																	
COPE_CREEK	*Poa spp. (mainly P. hiemata)*	73	78	72	72	75	77		73	78	87	81	81	82	78	88	81	81	82	85	91	85	83	82	84	80	81	77	72	60
COPE_CREEK	*Ranunculus victoriensis*	4	8	7	5	5							4	5	9	7	4	3	5	5	8	4		5		4		4	3	3
COPE_CREEK	*Rytidosperma nudiflorum*	2		5	5	5							5	4	4	5	4	4	6	6	6	3	4	4	5	5	4	6	5	5
COPE_CREEK	*Scleranthus biflorus*	6	6	3	3									3	3	5	4	4	5	3	6	5	3	3						
COPE_CREEK	*Senecio pinnatifolius*													3		2														
COPE_CREEK	*Trisetum spicatum*			2													3				2							2		
COPE_HUT	*Acetosella vulgaris*											2			2															

10.1071/BT12234_AC
Australian Journal of Botany, 2013, **61**, 36–51

COPE_HUT	*Acetosella vulgaris*											2			2															
COPE_HUT	*Agrostis spp. (mainly A. venusta)*												2		9	8		4					2					2		
COPE_HUT	*Argyrotegium nitidulum*	3	2																											
COPE_HUT	*Asperula gunnii*	10	7	6	3							6	7	10	13	13	8	6	6	7	2	3				3		4	3	7
COPE_HUT	*Asterolasia trymalioides*	2	2	2	3		2	3	2	2	2	2			2			2												
COPE_HUT	Bare ground	8	12	10	16	13	11	8	19	9	10	9	5	4	6	6	7	6	7	6			8		3		6	6	9	10
COPE_HUT	*Carex spp. (mainly C. breviculmis & C. hebes)*	17	16	12	10	7	7	5	7	8	9	11	6	9	8	12	12	10	12	8	10	2	5	4	2	4	5	7	6	6
COPE_HUT	*Celmisia pugioniformis*	15	14	15	16	16	16	16	22	20	19	21	21	25	25	27	26	23	31	32	33	33	33	31	28	37	34	36	37	37
COPE_HUT	*Craspedia jamesii*																										2	3	3	6
COPE_HUT	*Empodisma minus*	4	6	4	4								2			2		3	3		2	3	4	2	3		2		3	
COPE_HUT	*Epacris paludosa*																				3									
COPE_HUT	*Epacris spp. (mainly E. celata)*																	2												
COPE_HUT	Fixed litter	76	76	69	62	54	69	55	62	48	61	46	40	62	55	44	47	53	71	77	44	59	71	25	45	37	76	62	66	66
COPE_HUT	*Grevillea australis*								2								2		2	2	3	3	3	3	4	4	4	5	5	4
COPE_HUT	*Leptorhynchos squamatus*	30	26	29	29	26	25	29	27	28	30	23	27	29	34	27	29	20	29	36	31	29	22	20	20	29	26	31	20	19
COPE_HUT	*Luzula sp. (mainly L. modesta)*														2	4	3	4	2											
COPE_HUT	*Oreomyrrhis eriopoda*														3	3														
COPE_HUT	*Pentachondra pumila*	5	5	4	5	5	4						2	5	3	3	2		4	3	3	3	3	4	4	4	4	3	4	3
COPE_HUT	*Pimelea alpina*	2																												
COPE_HUT	*Poa spp. (mainly P. hiemata)*	84	85	83	80	83	77	80	81	83	84	79	77	79	76	84	80	74	77	80	79	76	77	82	82	78	76	77	69	54
COPE_HUT	*Ranunculus victoriensis*	7	4	4	2								5	4	10	8	4	5	6	5	6	8	4	4	3	2	2			3
COPE_HUT	*Rytidosperma nudiflorum*	13	6	8	10	7							6	5	7	9	6	9	7	6	5	4	7	6		7	6	7	6	5
COPE_HUT	*Scleranthus biflorus*																			2		2	3							
COPE_HUT	*Trisetum spicatum*	3																												
PV-N	*Agrostis spp. (mainly A. venusta)*													4	10	5								6				2		
PV-N	*Asperula gunnii*												8	15	10	8		2						4	3	6	4	15	13	22
PV-N	*Australopyrum velutinum*																							3	2	3	3	4	4	2
PV-N	Bare ground												5	6	3	6		5						6			6	6	3	13
PV-N	*Carex spp. (mainly C. breviculmis & C. hebes)*												7	10	7	11		7						4	2	4	4	6	6	4
PV-N	*Celmisia pugioniformis*												4	4	4	6		6						9	10	12	12	16	17	17

10.1071/BT12234_AC
Australian Journal of Botany, 2013, **61**, 36–51

PV-N	*Craspedia jamesii*																	2
PV-N	*Deyeuxia spp. (mainly D. montana)*						3	3					2		5	2	5
PV-N	Fixed litter				31	55	51	45	50			46	35	56	81	70	76	67
PV-N	*Grevillea australis*															2	2
PV-N	*Leptorhynchos squamatus*				30	41	47	39	33			31	31	45	37	45	29	28
PV-N	*Luzula sp. (mainly L. modesta)*						2										
PV-N	*Oreomyrrhis eriopoda*				2		4										
PV-N	*Pimelea alpina*				3	3	2	4								2	
PV-N	*Poa spp. (mainly P. hiemata)*				76	80	80	83	82			85	82	86	81	73	53	54
PV-N	*Ranunculus victoriensis*				4	5	6	4	2			4	2	2		3	2	4
PV-N	*Rytidosperma nudiflorum*				8	8	7	12	10			11	7	19	14	23	9	11
PV-N	*Scleranthus biflorus*							2	2			2			2	3	3	2
PV-O	*Acetosella vulgaris*		3															
PV-O	*Acrothamnus spp. (A. montanus & A. hookeri)*																2	
PV-O	*Agrostis spp. (mainly A. venusta)*						4											
PV-O	*Asperula gunnii*	6	9	6			14		3								2	
PV-O	Bare ground	13	27	14			5		7	7							5	
PV-O	*Carex spp. (mainly C. breviculmis & C. hebes)*	20	14	10			8		9	6							6	
PV-O	*Celmisia pugioniformis*			2			3		3	6							9	
PV-O	Fixed litter		45	56			68		51	54							61	
PV-O	*Goodenia hederaceae*	2																
PV-O	*Grevillea australis*	3	5	6			6		7	10							13	
PV-O	*Hovea montana*	3	3				3		3	4							3	
PV-O	*Kunzea muelleri*						2		3	3							5	
PV-O	*Leptorhynchos squamatus*	33	38	37			37		32	25							23	
PV-O	*Oxylobium ellipticum*									2							4	
PV-O	*Poa spp. (mainly P. hiemata)*	68	73	80			76		77	84							79	
PV-O	*Pranthera microphylla*																3	
PV-O	*Ranunculus victoriensis*	7					5		3								3	
PV-O	*Rytidosperma nudiflorum*	7					11		10	7							7	

10.1071/BT12234_AC
Australian Journal of Botany, 2013, **61**, 36–51

PV-O	*Trisetum spicatum*	3	3

10.1071/BT12234_AC
Australian Journal of Botany, 2013, **61**, 36–51

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