Weed analysis

Craig Simpkins

Impact of weeds

Ran model for 1000 steps for 15 repeats with ground weeds on and off. Weed parameters were randomly selected based on initial settings and only testing the clustered scenario. The parameter values were:

- trad-init-cover = 0.150
- trad-spread-local = 0.20
- trad-spread-long = 0.025
- trad-growth = 1.0
- smother-f = 0.20

Impact of weed parameters (i.e. sensitivity)

Sensitivity analysis model runs were run for 1000 steps, repeated six times (due to time constraints) for every parameter value combination. Note that parameter values were altered by 100% above and below baseline levels, e.g., if baseline was 0.5 runs were conducted at 0 and 1. This high degree of change was done to allow for analysis of impact of extreme changes in addition to sensitivity.
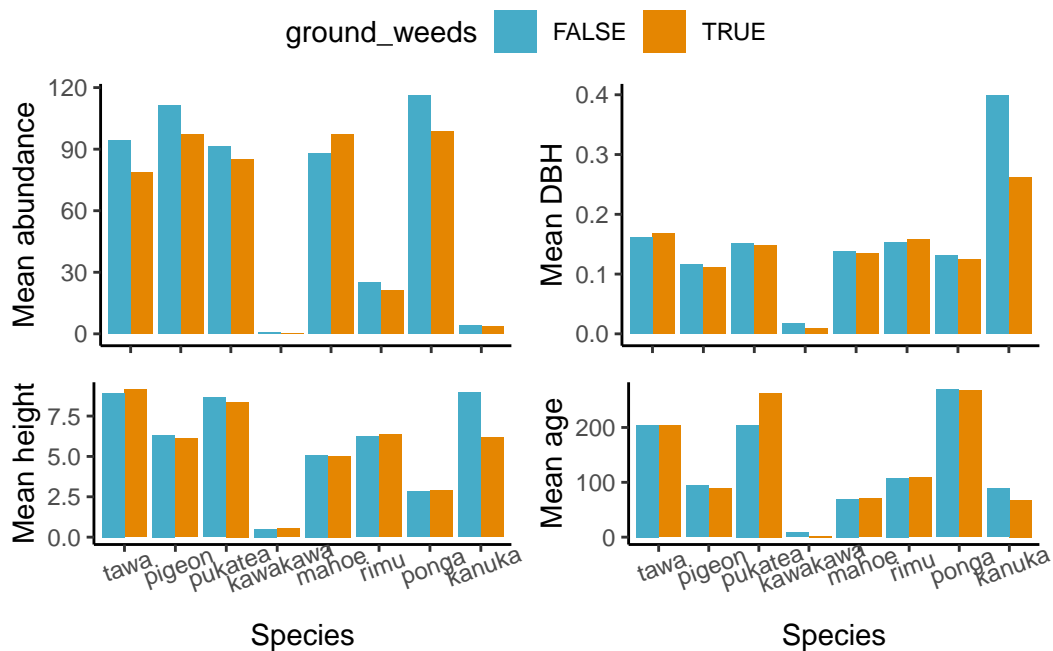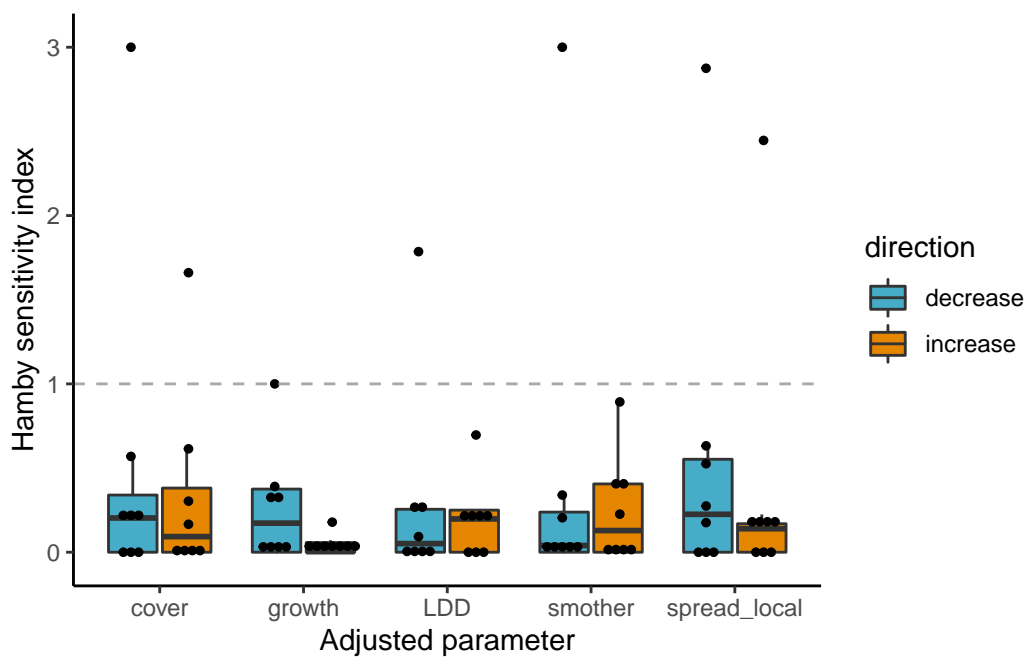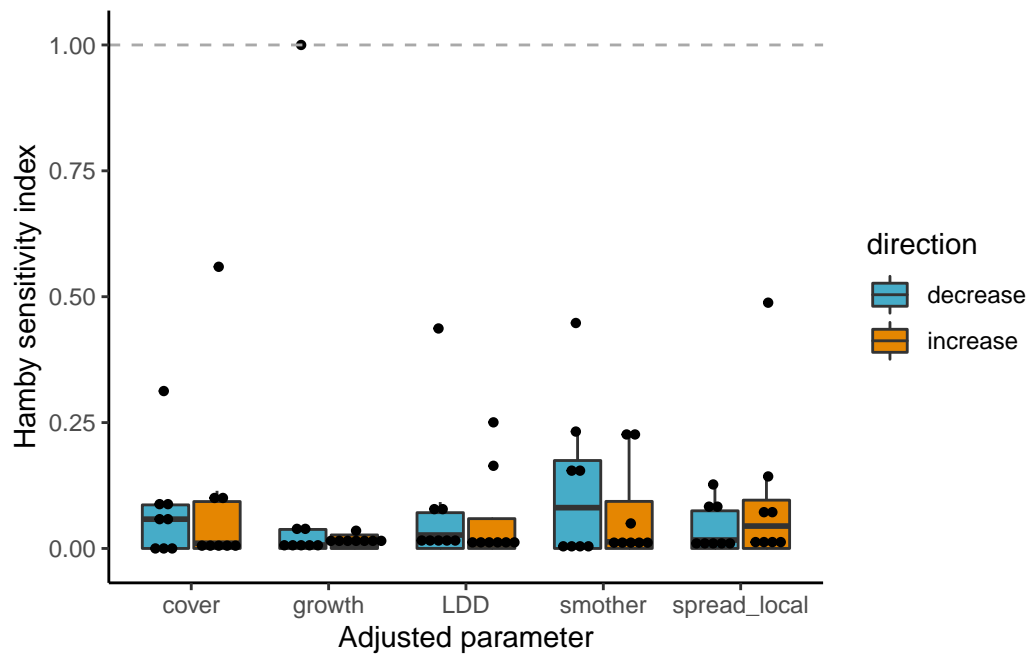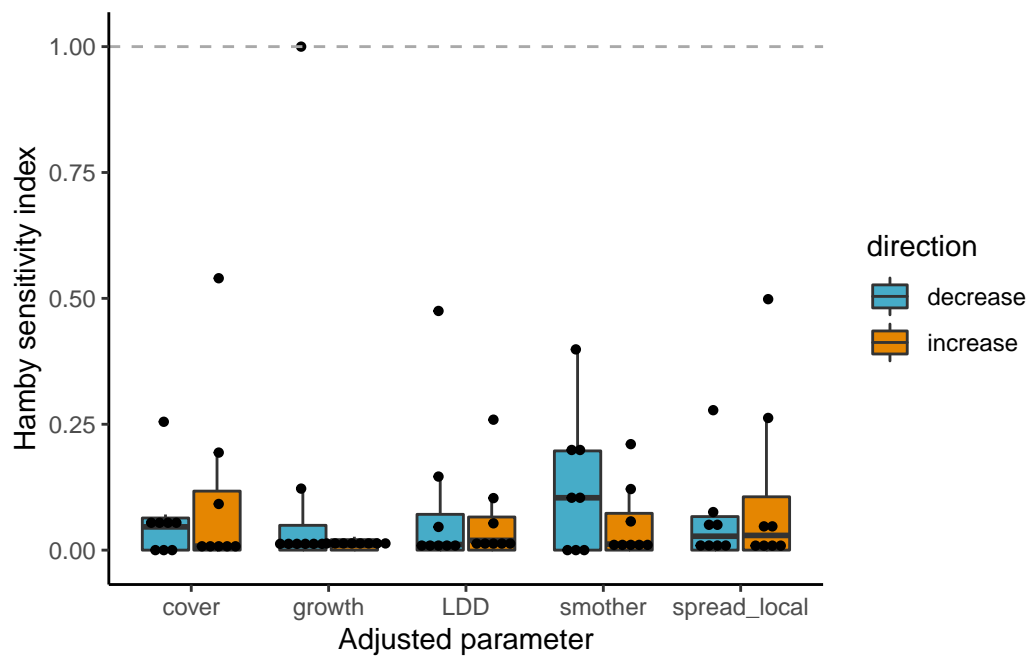
Abundance

Figure 1: Composition measures for each species taken at 1000 time steps (years) with and with out ground weed cover, presented as the mean of the 15 model repeats.
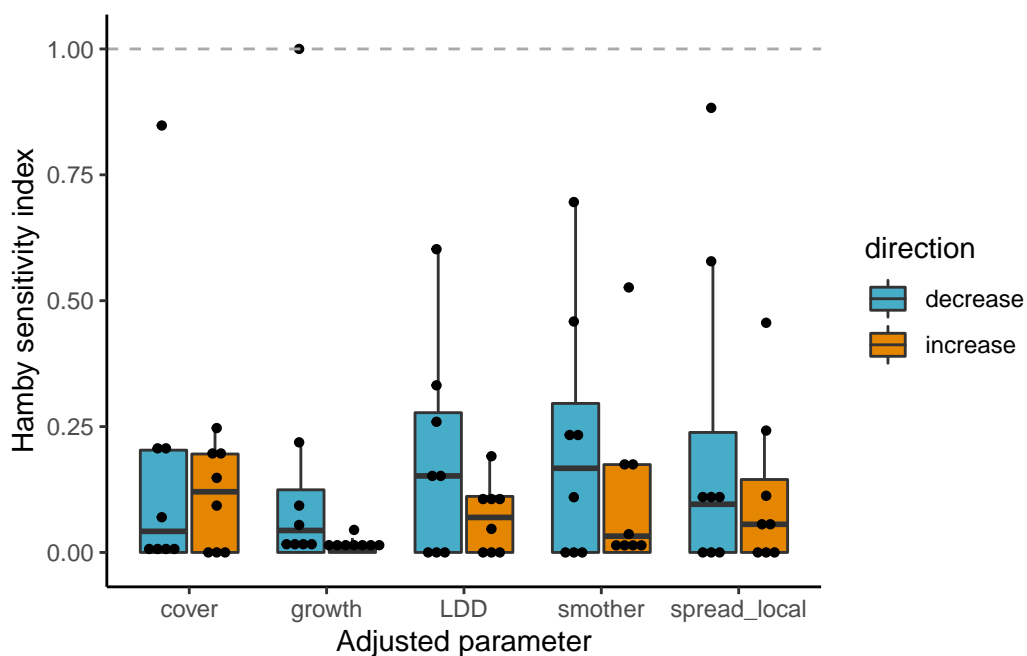
DBH

Height

Age

Resilience to extreme parameter values

Selected the parameter settings which had the largest percentage change compared to the no ground weed runs.

Abundance

trad_init_cover	smother_frad	spread_local	trad_spread_long	trad_growth	species	abun_diff	abun_per
0.0	0.0	0.0	0	0.00	kanuka	0.000000	NaN
0.0	0.0	0.0	0	0.00	kawakawa	0.000000	NaN
1.0	1.0	0.0	0	1.25	mahoe	45.600000	130.03802
0.0	0.5	0.5	1	0.00	pigeon	204.400000	127.00911
0.5	0.0	1.0	1	2.50	ponga	63.900000	86.42922
1.0	0.5	1.0	1	1.25	pukatea	-125.133333	74.87036
1.0	1.0	1.0	1	0.00	rimu	2.066667	775.00000
0.0	0.0	0.0	1	0.00	tawa	74.733333	81.58661

DBH

trad_init_cover	smother_f	trad_spread_lot	trad_spread_long	ng_growth	species	dbh_diff	dbh_per
0.0	0.0	0.0	0.0	0.00	kanuka	0.0000000	NaN
0.0	0.0	0.0	0.0	0.00	kawakawa	0.0000000	NaN
0.5	0.5	0.5	0.5	0.00	mahoe	-0.1135333	100.00000
0.5	0.0	0.5	0.5	1.25	pigeon	-0.0541000	44.36851
0.0	0.0	0.5	0.0	2.50	ponga	-0.0608333	42.84038
0.0	0.0	0.5	1.0	2.50	pukatea	-0.0473000	29.59950
1.0	0.0	1.0	0.0	1.25	rimu	0.2867667	727.83418
1.0	0.0	0.5	1.0	0.00	tawa	-0.0617333	39.72544

Height

trad_init_cover	smother_f	trad_spread_lot	trad_spread_long	ng_growth	species	hgt_diff	hgt_per
0.0	0.0	0.0	0.0	0.00	kanuka	0.000000	NaN
0.0	0.0	0.0	0.0	0.00	kawakawa	0.000000	NaN
0.5	0.5	0.5	0.5	0.00	mahoe	-4.287933	100.00000
0.5	0.0	0.5	0.5	1.25	pigeon	-2.601800	40.07619
0.5	0.0	1.0	0.0	0.00	ponga	-1.116867	38.50556
0.0	0.0	0.5	1.0	2.50	pukatea	-2.767367	30.48589
0.0	0.0	0.0	1.0	1.25	rimu	6.348333	676.31392
1.0	0.0	0.5	1.0	0.00	tawa	-3.352833	37.83667

Age

trad_init_cover	smother_f	trad_spread_lot	trad_spread_long	ng_growth	species	age_diff	age_per
0.0	0.0	0.0	0.0	0.00	kanuka	0.00000	NaN
0.0	0.0	0.0	0.0	0.00	kawakawa	0.00000	NaN

trad_init_cover	smother_f	trad_spread_local	trad_spread_long	trad_growth	species	age_diff	age_per
0.5	0.5	0.5	0.5	0.00	mahoe	- 41.00000	100.00000
0.5	1.0	1.0	0.5	0.00	pigeon	66.76667	76.97925
0.5	0.5	0.0	0.5	1.25	ponga	- 88.80000	47.20057
0.5	0.5	0.0	0.0	0.00	pukatea	106.40000	42.57135
1.0	0.0	1.0	0.0	1.25	rimu	121.03333	264.26492
0.0	1.0	0.5	0.5	0.00	tawa	- 108.46667	46.72602