## **Supplementary Information**

Parameter	Estimate	LCI	UCI
Intercept[1]	-2.10	-2.53	-1.68
Intercept[2]	-0.05	-0.46	0.35
Intercept[3]	1.67	1.25	2.08
Intercept[4]	4.89	4.45	5.32
SEV07:LCS	0.15	-0.27	0.56
MCS	0.33	-0.14	0.78
HCS	0.25	-0.25	0.76
CC	0.36	-0.39	1.13
Vegetation: Tall-open forest	-0.16	-0.54	0.21
Weather: SEV	3.11	2.65	3.57
Slope	0.01	-0.06	0.09
Aspect	-0.31	-0.38	-0.24
TPI	0.21	0.15	0.28
SEV07:LCS* Vegetation: Tall- open forest	0.14	-0.23	0.52
MCS* Vegetation: Tall-open forest	0.11	-0.31	0.53
HCS* Vegetation: Tall-open forest	0.28	-0.18	0.74
CC* Vegetation: Tall-open for- est	0.66	-0.09	1.39
Weather: SEV * Vegetation: Tall-open forest	-0.27	-0.57	0.03
SEV07:LCS* Weather: SEV	0.46	0.06	0.87
MCS* Weather: SEV	1.05	0.60	1.50
HCS* Weather: SEV	1.73	1.22	2.24
CC* Weather: SEV	1.52	0.66	2.38
S_xy1	2.87	-0.53	6.24
S_xy2	8.42	5.47	11.38

**Table S1.** Summary of model coefficients and 95% credible intervals from the ordinal regression model testing the effect of the severity patterns of the 2007 fire on the severity of the 2013 fire.



**Figure S1.** The effect of slope, aspect relative to north (ASPN) and TPI on the probability of each fire severity class in open forests. Lines show the mean and error bars are the 95% credible intervals. The severity of the 2007 fire has been held constant at moderate canopy scorch (MCS). Severity codes are: unburnt (UB); low canopy scorch (LCS); moderate canopy scorch (MCS); high canopy scorch (HCS); canopy consumption (CC).



**Figure S2.** The effect of slope, aspect relative to north (ASPN) and TPI on the probability of each fire severity class in tall open forests. Lines show the mean and error bars are the 95% credible intervals. The severity of the 2007 fire has been held constant at moderate canopy scorch (MCS). Severity codes are: unburnt (UB); low canopy scorch (LCS); moderate canopy scorch (MCS); high canopy scorch (HCS); canopy consumption (CC).