

Additional file 4: Supplementary information 4.1 Publication bias for the meta-analysis of fire effects across South American ecosystems to determine the role of climate and time since fire. Studies used were published between 1990 and 2019.

To detect the existence of publication bias in our dataset and to estimate how such bias, if it exists, may affect the overall results, we used statistical (rank correlation tests and “trim and fill” procedures), and numerical (Rosenberg’s fail-safe number) methods (Jennions *et al.* 2013). Kendall’s rank correlation (Jennions *et al.* 2013) tests examine the relationship between effect sizes and sample sizes across studies. If publication bias exists, then studies with small or null effect sizes are missing and the correlation tests are significant. The “trim and fill” method recalculates the estimated mean effect size by trimming the smaller studies from one side of the funnel plot and refilling it on the other side of funnel plot until the funnel is fully symmetric. Thus, it provides an estimate of how the overall effect size would change if we were able to incorporate all potential missing studies (Jennions and Moller 2002). On the other hand, the weighted fail-safe number value indicates the number of non-significant, unpublished, or missing studies that would need to be added to a meta-analysis in order to nullify the overall effect sizes. If the calculated fail-safe number is $>5n + 10$, where n is the number of studies, then publication bias may be safely ignored (Rosenberg 2005).

Additional file 4: Table 4.1 Sample size (number of observations) and results of publication bias and hierarchical models testing for each response variable in our meta-analysis of fire effects across South American ecosystems to determine the role of climate and time since fire. Studies used were published between 1990 and 2019. Publication bias was tested using fail-safe number (*i.e.*, Rosenberg method), Kendall’s rank correlation test (z), and “trim and fill” models.

Meta-analysis	n	Fail-safe number	$5n + 10$	Rank correlation		Effect size (lower and upper 95% confidence interval)	
				z	P	“Trim and fill” method*	Original model
Fitness	434	11007	2180	0.1445	0.001	−0.2699 (−0.3735 and −0.1662)	−0.0203 (−0.1133 and 0.0723)
Biodiversity	133	1242	670	0.1013	0.084	−0.1650 (−0.4560 and 0.1264)	−0.1662 (−0.4240 and 0.1247)
Abundance	544	20259	2730	−0.078	0.061	−0.3349 (−0.4392 and −0.2307)	−0.3372 (−0.5475 and −0.1269)
Soil properties	354	3036	1780	−0.0712	0.047	0.1402 (−0.0201 and 0.3006)	−0.1534 (−0.2970 and 0.0098)

* “Trim and fill” method does not run for hierarchical models in the `metafor` package of R (`rma.mv`); this model was based on a random model without hierarchical structure (`rma`).