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Supplement of

Improved simulation of fire–vegetation interactions in the Land surface Processes and eXchanges dynamic global vegetation model (LPX-Mv1)

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Supplementary Information

Table S1 provides information on the allocation of species to plant functional types and to resprouting and non-resprouting classes, as used in the bark thickness analyses. Table S2 provides a summary of the studies about post-fire recruitment rates and Table S3 provides information used to calculate recovery rates. Benchmarking scores in the main text are a summary of skill scores obtained using the Kelley et al. (2013) benchmarking system. Tables S4 and S5 give the full set of scores for comparisons against all datasets, split into individual parameterisations and the combination of all parameterisations with and without resprouting (LPX-Mv1-nr and LPX-Mv1-rs respectively). Fig. S1 shows simulated burnt area for each individual parameterisation, and Fig. S2 shows where resprouting (RS) has a competitive advantage over non-resprouting (NR) PFTs in climate space. Fig S3 shows the results of the sensitivity test to including ignitions on wet days. Table S6 provides the benchmarking metrics for this sensitivity test. Eq. S1-S4 describes the derivation of the ratio of NDVI from tree and grass used in Eq. 36 in the main text. We also provide a complete list of references for the data used to parameterize adaptive bark thickness.

Table S1. Allocation of species to plant functional type (PFT) and to aerial resprouting (RS) and non-resprouting (NR) and other resprouting/unknown resprouting type (other) categories for the bark thickness analyses. All species listed (RS, NR and other) for each PFT were used for the parametrisation of bark thickness (BT) in LPX-Mv1-nr; RS species were used to parameterise BT for LPX-Mv1-rs RS PFTs; and NR for LPX-Mv1-rs NR PFTs. The taxon names are given as in the original source, and have not been changed for taxonomic correctness.

PFT	Type	Species
TBE	RS	<i>Acacia lamprocarpa</i> , <i>Alstonia actinophylla</i> , <i>Banksia</i> sp., <i>B. dentata</i> , <i>Corymbia bella</i> , <i>Eucalyptus miniata</i> , <i>E. phoenicea</i> , <i>E. tectifera</i> , <i>E. tetradonta</i> , <i>Gardenia megasperma</i> , <i>Lophostemon lactifluus</i> , <i>Melaleuca</i> sp., <i>M. nervosa</i> , <i>M. viridiflora</i> , <i>Persoonia falcata</i> , <i>Syzygium eucalyptoides</i> subsp. <i>bleeseri</i> , <i>S. suborbiculare</i> , <i>Xanthostemon paradoxus</i>
	NR	<i>Abarema jupunba</i> , <i>A. mataybifolia</i> , <i>Acacia auriculiformis</i> , <i>Agonandra silvatica</i> , <i>Aiouea longipetiolata</i> , <i>Alexa wachenheimii</i> , <i>Amaioua corymbosa</i> , <i>A. guianensis</i> , <i>Ambelania acida</i> , <i>Amblygonocarpus obtusangulus</i> , <i>Amburana cearensis</i> , <i>Amherstia nobilis</i> , <i>Amphirrhox longifolia</i> , <i>Anacardium spruceanum</i> , <i>Anartia meyeri</i> , <i>Aniba guianensis</i> , <i>A. hostmanniana</i> , <i>A. panurensis</i> , <i>A. terminalis</i> , <i>A. williamsii</i> , <i>Annona prevostiae</i> , <i>Antonia ovata</i> , <i>Arachidendron kunstleri</i> , <i>Aspidosperma album</i> , <i>A. cruentum</i> , <i>A. marcgravianum</i> , <i>A. oblongum</i> , <i>A. spruceanum</i> , <i>Astronium lecointei</i> , <i>A. ulei</i> , <i>Bagassa guianensis</i> , <i>Baikiaea insignis</i> subsp. <i>minor</i> , <i>Balizia pedicellaris</i> , <i>Bauhinia aculeata</i> , <i>B. blakeana</i> , <i>B. monandra</i> , <i>B. tomentosa</i> , <i>Bocoa alterna</i> , <i>B. prouacensis</i> , <i>Bonafousia undulata</i> , <i>Brosimum guianense</i> , <i>B. rubescens</i> , <i>B. utile</i> , <i>Brownea ariza</i> , <i>B. latifolia</i> , <i>Buchenavia</i> sp., <i>B. grandis</i> , <i>B. guianensis</i> , <i>B. tetraphylla</i> , <i>Bunchosia</i> sp., <i>Caesalpinia calycina</i> , <i>C. echinata</i> , <i>C. ferrea</i> , <i>C. nicaraguensis</i> , <i>C. pluviosa</i> , <i>C. pulcherrima</i> , <i>C. sappan</i> , <i>C. vesicaria</i> , <i>Calliandra sancti-pauli</i> , <i>Calyptanthus speciosa</i> , <i>Capirona decorticans</i> , <i>Carapa procera</i> , <i>Casearia</i> sp., <i>C. decandra</i> , <i>C. javitensis</i> , <i>C. sylvestris</i> , <i>Cassipourea guianensis</i> , <i>Castanospermum australe</i> , <i>Cathedra acuminata</i> , <i>Catostemma fragrans</i> , <i>Cecropia obtusa</i> , <i>Chaetocarpus</i> sp., <i>C. schomburgkianus</i> , <i>Chaunochiton kappleri</i> , <i>Cheiloclinium cognatum</i> , <i>Chimarrhis turbinata</i> , <i>Chloroleucon mangense</i> , <i>Coccoloba mollis</i> , <i>Cojoba filicifolia</i> , <i>Conceveiba guianensis</i> , <i>Couratari calycina</i> , <i>C. gloriosa</i> , <i>C. guianensis</i> , <i>C. multiflora</i> , <i>C. oblongifolia</i> , <i>Crepidospermum goudotianum</i> , <i>Cupania diphylla</i> , <i>C. rubiginosa</i> , <i>C. scrobiculata</i> , <i>C. scrobiculata</i> var. <i>guianensis</i> , <i>Cupaniopsis anacardioides</i> , <i>Cyrtolopsis paraensis</i> , <i>Dacryodes cuspidata</i> , <i>D. nitens</i> , <i>Dalbergia ferruginea</i> , <i>D. frutescens</i> , <i>D. glandulosa</i> , <i>D. monetaria</i> , <i>D. nigra</i> , <i>D. polyphylla</i> , <i>D. riparia</i> , <i>D. villosa</i> , <i>Dendrobangia boliviana</i> , <i>Dicorynia guianensis</i> , <i>Diospyros calycantha</i> , <i>D. capreifolia</i> , <i>D. carbonaria</i> , <i>D. cavalcantei</i> , <i>D. dichroa</i> , <i>Diploon cuspidatum</i> , <i>Diplostropis purpurea</i> , <i>D. brachypetala</i> , <i>Dipteryx odorata</i> , <i>D. punctata</i> , <i>Discophora guianensis</i> , <i>Drypetes deplonchei</i> , <i>Duguetia calycina</i> , <i>D. surinamensis</i> , <i>Dulacia guianensis</i> , <i>Duroia aquatica</i> , <i>D. eriopila</i> , <i>D. longiflora</i> , <i>Ecclinusa lanceolata</i> , <i>E. ramiflora</i> , <i>Ecuadendron acosta-solisianum</i> , <i>Elaeoluma</i> sp., <i>E. nuda</i> , <i>Emmotum fagifolium</i> , <i>Endlicheria melinonii</i> , <i>Enterolobium schomburgkii</i> , <i>Eperua falcata</i> , <i>E. grandiflora</i> , <i>Erisma floribundum</i> , <i>E. uncinatum</i> , <i>Eschweilera apiculata</i> , <i>E. chartaceifolia</i> , <i>E. congestiflora</i> , <i>E. coriacea</i> , <i>E. decolorans</i> , <i>E. grandiflora</i> , <i>E. micrantha</i> , <i>E. parviflora</i> , <i>E. pedicellata</i> , <i>E. praeclara</i> , <i>E. sagotiana</i> , <i>E. simiorum</i> , <i>E. squamata</i> , <i>Eugenia</i> sp., <i>E. coffeifolia</i> , <i>E. cucullata</i> , <i>E. cupulata</i> , <i>E. macrocalyx</i> , <i>E. patrisii</i> , <i>E. pseudopsidium</i> , <i>E. tapacumensis</i> , <i>E. tetramera</i> , <i>Euterpe oleracea</i> , <i>Exellodendron barbatum</i> , <i>Exocarpus latifolius</i> , <i>Faramea pedunculata</i> , <i>Ferdinandusa paraensis</i> , <i>Fusaea longifolia</i> , <i>Geissospermum laeve</i> , <i>Grevillea</i> sp., <i>G. pteridifolia</i> , <i>G. costata</i> , <i>G. grandifolia</i> , <i>G. guidonia</i> , <i>G. scabra</i> , <i>G. silvatica</i> , <i>Gutteria anthracina</i> , <i>G. guianensis</i> , <i>G. wachenheimii</i> , <i>Guibourtia copallifera</i> , <i>Gustavia hexapetala</i> , <i>Haematoxylum campechianum</i> , <i>H. campeshianum</i> , <i>Hebepetalum humirifolium</i> , <i>Heisteria densifrons</i> , <i>Helicostylis pedunculata</i> , <i>H. tomentosa</i> , <i>Henriettella flavescens</i> , <i>Hevea guianensis</i> , <i>Holocalyx glaziovii</i> , <i>Hortia excelsa</i> , <i>Humiriastrum subcrenatum</i> , <i>Hyeronima alchorneoides</i> , <i>Ilex arnhemensis</i> , <i>Inga</i> sp.,

PFT	Type	Species
TBE	NR	<p> <i>I. acreana</i>, <i>I. acrocephala</i>, <i>I. alba</i>, <i>I. albicoria</i>, <i>I. brachystachys</i>, <i>I. calderonii</i>, <i>I. densiflora</i>, <i>I. edulis</i>, <i>I. fanchoniana</i>, <i>I. gracilifolia</i>, <i>I. huberi</i>, <i>I. leiocalycina</i>, <i>I. longipedunculata</i>, <i>I. loubryana</i>, <i>I. marginata</i>, <i>I. melinonis</i>, <i>I. nobilis</i>, <i>I. nouraguensis</i>, <i>I. nuda</i>, <i>I. oerstediana</i>, <i>I. paraensis</i>, <i>I. pezizifera</i>, <i>I. punctata</i>, <i>I. rubiginosa</i>, <i>I. sarmentosa</i>, <i>I. sessilis</i>, <i>I. spectabilis</i>, <i>I. stipularis</i>, <i>I. subnuda</i>, <i>I. tenuistipula</i>, <i>Iryanthera hostmannii</i>, <i>I. sagotiana</i>, <i>Jessenia bataua</i>, <i>Lacistema grandifolium</i>, <i>Lacmellea aculeata</i>, <i>Lacunaria crenata</i>, <i>L. jenmanii</i>, <i>Lecythis chartacea</i>, <i>L. corrugata</i>, <i>L. holcogyne</i>, <i>L. idatimon</i>, <i>L. persistens</i>, <i>L. poiteaui</i>, <i>L. zabucajo</i>, <i>Leonia glycyarpa</i>, <i>Licania</i> sp., <i>L. alba</i>, <i>L. canescens</i>, <i>L. glabriflora</i>, <i>L. heteromorpha</i>, <i>L. kunthiana</i>, <i>L. laevigata</i>, <i>L. latistipula</i>, <i>L. laxiflora</i>, <i>L. licaniiflora</i>, <i>L. majuscula</i>, <i>L. membranacea</i>, <i>L. micrantha</i>, <i>L. minutiflora</i>, <i>L. octandra</i>, <i>L. ovalifolia</i>, <i>L. sprucei</i>, <i>Licaria cannella</i>, <i>L. chrysophylla</i>, <i>L. guianensis</i>, <i>Loreya arborescens</i>, <i>Lueheopsis rugosa</i>, <i>Mabea</i> sp., <i>M. piriri</i>, <i>M. speciosa</i>, <i>Machaerium acaciaefolium</i>, <i>M. inundatum</i>, <i>M. stipitatum</i>, <i>Macoubea guianensis</i>, <i>Mallotus phillipensis</i>, <i>Malouetia guianensis</i>, <i>Manilkara bidentata</i>, <i>M. huberi</i>, <i>Maprounea guianensis</i>, <i>Maquira calophylla</i>, <i>M. guianensis</i>, <i>Maytenus guyanensis</i>, <i>M. myrsinoides</i>, <i>M. oblongata</i>, <i>Melicoccus pedicellaris</i>, <i>Mezoneuron hildebrandtii</i>, <i>Miconia</i> sp., <i>M. acuminata</i>, <i>M. chartacea</i>, <i>M. cuspidata</i>, <i>M. fragilis</i>, <i>M. punctata</i>, <i>M. tschudyoides</i>, <i>Micropholis</i> sp., <i>M. cayennensis</i>, <i>M. egenesis</i>, <i>M. guyanensis</i>, <i>M. longipedicellata</i>, <i>M. melinoniana</i>, <i>M. mensalis</i>, <i>M. obscura</i>, <i>M. porphyrocarpa</i>, <i>M. sanctae-rosae</i>, <i>M. venulosa</i>, <i>Minguartia guianensis</i>, <i>Moronobea coccinea</i>, <i>Mouriri crassifolia</i>, <i>M. huberi</i>, <i>M. sagotiana</i>, <i>Moutabea guianensis</i>, <i>Myrcia</i> sp., <i>M. decorticans</i>, <i>M. fallax</i>, <i>Myrciaria floribunda</i>, <i>Myroxylon balsamum</i>, <i>Neea floribunda</i>, <i>Ocotea</i> sp., <i>O. amazonica</i>, <i>O. argyrophylla</i>, <i>O. cinerea</i>, <i>O. indirectinervia</i>, <i>O. percurrans</i>, <i>O. schomburgkiana</i>, <i>O. subterminalis</i>, <i>O. tomentella</i>, <i>Oenocarpus bacaba</i>, <i>Ormosia coccinea</i>, <i>O. flava</i>, <i>O. pachycarpa</i>, <i>O. stipularis</i>, <i>Osteophloeum platyspermum</i>, <i>Oxandra asbeckii</i>, <i>Pachira dolichocalyx</i>, <i>Palicourea guianensis</i>, <i>Parahancornia fasciculata</i>, <i>Parkia decussata</i>, <i>P. nitida</i>, <i>P. ulei</i>, <i>Parkinsonia aculeata</i>, <i>Perebea guianensis</i>, <i>P. rubra</i>, <i>Pithecellobium pruinatum</i>, <i>P. unguis-cati</i>, <i>Platonia insignis</i>, <i>Poecilanthus effusus</i>, <i>P. parviflora</i>, <i>Pogonophora schomburgkiana</i>, <i>Polyalthia australis</i>, <i>Poraqueiba guianensis</i>, <i>Posoqueria latifolia</i>, <i>Pourouma bicolor</i>, <i>P. minor</i>, <i>P. tomentosa</i>, <i>Pouteria</i> sp., <i>P. ambelaniifolia</i>, <i>P. bangii</i>, <i>P. benai</i>, <i>P. bilocularis</i>, <i>P. cladantha</i>, <i>P. cuspidata</i>, <i>P. decorticans</i>, <i>P. durlandii</i>, <i>P. egregia</i>, <i>P. engleri</i>, <i>P. eugeniifolia</i>, <i>P. filipes</i>, <i>P. fimbriata</i>, <i>P. flavilata</i>, <i>P. glomerata</i>, <i>P. gonggrijpii</i>, <i>P. grandis</i>, <i>P. guianensis</i>, <i>P. hispida</i>, <i>P. jariensis</i>, <i>P. laevigata</i>, <i>P. macrocarpa</i>, <i>P. macrophylla</i>, <i>P. maxima</i>, <i>P. melanopoda</i>, <i>P. petiolata</i>, <i>P. putamen-ovi</i>, <i>P. reticulata</i>, <i>P. retinervis</i>, <i>P. rodriguesiana</i>, <i>P. singularis</i>, <i>P. torta</i>, <i>Pradosia</i> sp., <i>P. cochlearia</i>, <i>P. ptychandra</i>, <i>Prosopis articulata</i>, <i>P. juliflora</i>, <i>P. palmeri</i>, <i>Protium</i> sp., <i>P. apiculatum</i>, <i>P. cuneatum</i>, <i>P. decandrum</i>, <i>P. demerarensis</i>, <i>P. gallicum</i>, <i>P. giganteum</i>, <i>P. guianense</i>, <i>P. morii</i>, <i>P. opacum</i>, <i>P. pallidum</i>, <i>P. plagiocarpum</i>, <i>P. sagotianum</i>, <i>P. subserratum</i>, <i>P. tenuifolium</i>, <i>P. trifoliolatum</i>, <i>Pseudopiptadenia psilostachya</i>, <i>P. suaveolens</i>, <i>Pseudoxandra cuspidata</i>, <i>Psychotria ficigemma</i>, <i>P. mapourioides</i>, <i>Pterolobium lacerans</i>, <i>P. stellatum</i>, <i>Ptychopetalum olacoides</i>, <i>Qualea</i> sp., <i>Q. rosea</i>, <i>Quararibea duckei</i>, <i>Q. spatulata</i>, <i>Quiina</i> sp., <i>Q. guianensis</i>, <i>Q. obovata</i>, <i>Recordoxylon speciosum</i>, <i>Rhabdodendron amazonicum</i>, <i>Rheedia madruno</i>, <i>Rhodostemonodaphne grandis</i>, <i>R. kunthiana</i>, <i>R. praeclara</i>, <i>R. rufovirgata</i>, <i>Rinorea</i> sp., <i>Rollinia elliptica</i>, <i>Ruizterania albiflora</i>, <i>Sacoglottis</i> sp., <i>S. cydonioides</i>, <i>S. guianensis</i>, <i>Salacia elliptica</i>, <i>Sandwithia guianensis</i>, <i>Saraca indica</i>, <i>Schefflera decaphylla</i>, <i>S. morototoni</i>, <i>Schotia humboldtioides</i>, <i>Sextonia rubra</i>, <i>Simaba cedron</i>, <i>S. morettii</i>, <i>S. polyphylla</i>, <i>Simarouba amara</i>, <i>Siparuna cristata</i>, <i>S. decipiens</i>, <i>S. pachyantha</i>, <i>Sloanea</i> sp., <i>S. brevipes</i>, <i>S. echinocarpa</i>, <i>S. eichleri</i>, <i>S. garckeana</i>, <i>S. guianensis</i>, <i>S. latifolia</i>, <i>Stachyarrhena acuminata</i>, <i>Sterculia frondosa</i>, <i>S. lisae</i>, <i>S. multiovula</i>, <i>S. parviflora</i>, <i>Symphonia</i> sp., <i>S. globulifera</i>, <i>Symplocos martinicensis</i>, <i>Tachigali bracteolata</i>, <i>T. guianensis</i>, <i>T. melinonii</i>, <i>T. paniculata</i>, <i>T. paraensis</i>, <i>Talisia</i> sp., <i>T. clathrata</i>, <i>T. hexaphylla</i>, <i>T. microphylla</i>, <i>T. praealta</i>, <i>T. simaboides</i>, <i>Tamarindus indica</i>, <i>Tapirira bethanniana</i>, <i>T. guianensis</i>, <i>T. obtusa</i>, <i>Tapura amazonica</i>, <i>T. capitulifera</i>, <i>T.</i> </p>

PFT	Type	Species
TBE	NR	<i>guianensis</i> , <i>Tetragastris altissima</i> , <i>T. panamensis</i> , <i>Theobroma subincanum</i> , <i>T. velutinum</i> , <i>Thyrsodium guianense</i> , <i>T. puberulum</i> , <i>Torresea cearensis</i> , <i>Touroulia guianensis</i> , <i>Tovomita</i> sp., <i>Trachylobium hornemannianum</i> , <i>Trattinnickia</i> sp., <i>Trichilia cipo</i> , <i>T. euneura</i> , <i>T. micrantha</i> , <i>T. pallida</i> , <i>T. schomburgkii</i> , <i>T. surinamensis</i> , <i>Trymatococcus amazonicus</i> , <i>T. oligandrus</i> , <i>Unonopsis perrottetii</i> , <i>U. rufescens</i> , <i>Vatairea erythrocarpa</i> , <i>Vataireopsis surinamensis</i> , <i>Virola kwatae</i> , <i>V. michelii</i> , <i>V. multicostata</i> , <i>Vismia cayennensis</i> , <i>Vitex triflora</i> , <i>Vochysia guianensis</i> , <i>V. tomentosa</i> , <i>Vouacapoua americana</i> , <i>Vouarana guianensis</i> , <i>Xylopi nitida</i> , <i>Xylosma benthamii</i>
	Other	<i>Acacia</i> sp., <i>A. auriculaeformis</i> , <i>Alibertia sessilis</i> , <i>Allophylus angustatus</i> , <i>A. latifolius</i> , <i>Betharocalyx salicifolius</i> , <i>Brosimum gaudichaudii</i> , <i>Buchanania arborescens</i> , <i>B. obovata</i> , <i>Byrsonima laxiflora</i> , <i>Callisthene major</i> , <i>Cassia alata</i> , <i>C. siamea</i> , <i>C. spruceana</i> , <i>Davilla elliptica</i> , <i>Denhamia obscura</i> , <i>Didymopanax macrocarpon</i> , <i>D. morototoni</i> , <i>Drypetes fanshawei</i> , <i>D. variabilis</i> , <i>Eremanthus glomerulatus</i> , <i>Erythroxyllum daphnites</i> , <i>E. suberosum</i> , <i>Grevillea decurrens</i> , <i>Guapira areolata</i> , <i>G. graciflora</i> , <i>Hymenaea courbaril</i> , <i>H. martiana</i> , <i>H. stigonocarpa</i> , <i>Inga laurina</i> , <i>Machaerium acuminata</i> , <i>M. opacum</i> , <i>Matayba guianensis</i> , <i>Maytenus floribunda</i> , <i>Miconia pohliana</i> , <i>Myrcia deflexa</i> , <i>M. rostrata</i> , <i>Myrsine guianensis</i> , <i>M. umbellatum</i> , <i>Ouratea castanaeigolia</i> , <i>O. hexasperma</i> , <i>Piptocarpha macropoda</i> , <i>P. rotundifolia</i> , <i>Pouteria arnhemica</i> , <i>P. sericea</i> , <i>Pseudolmedia</i> cf <i>marginatum</i> , <i>Qualea dichotoma</i> , <i>Salacia crassifolia</i> , <i>Sophora chrysophylla</i> , <i>Styrax camporum</i> , <i>S. ferrugineus</i> , <i>Symplocos lanceolata</i> , <i>S. mosenii</i> , <i>Vochysia tucanorum</i>
TBD	RS	<i>Acosmium bijugum</i> , <i>Alphitonia excelsa</i> , <i>Brachystegia longifolia</i> , <i>B. spicaeformis</i> , <i>B. utilis</i> , <i>Burkea africana</i> , <i>Corymbia foelscheana</i> , <i>C. grandifolia</i> , <i>C. polycarpa</i> , <i>C. porrecta</i> , <i>C. ptychocarpa</i> , <i>Gardenia resinosa</i> , <i>Isoberlinia paniculata</i> , <i>Petalostigma pubescens</i> , <i>Strychnos lucida</i> , <i>Swartzia arborescens</i> , <i>Tabebuia serratifolia</i> , <i>Terminalia carpentariae</i> , <i>T. ferdinandiana</i> , <i>T. latipes</i> , <i>Vitex glabrata</i>
	NR	<i>Adenantha macrocarpa</i> , <i>A. microsperma</i> , <i>A. pavonina</i> , <i>Adenocarpus viscosus</i> , <i>Aeschynomene elaphroxylon</i> , <i>A. pfundii</i> , <i>Affonsea bahiensis</i> , <i>Azelia quanzensis</i> , <i>Andira anthelmia</i> , <i>A. fraxinifolia</i> , <i>A. inermis</i> , <i>A. laurifolia</i> , <i>A. nitida</i> , <i>A. paniculata</i> , <i>Antiaris toxicaria</i> , <i>Apeiba glabra</i> , <i>A. petoumo</i> , <i>Aspidosperma discolor</i> , <i>Bauhinia candicans</i> , <i>B. purpurea</i> , <i>Bombacopsis nervosa</i> , <i>Bombax</i> sp. <i>Butea frondosa</i> , <i>Byrsonima laevigata</i> , <i>Caesalpinia decapetala</i> , <i>C. myabensis</i> , <i>C. velutina</i> , <i>Caryocar glabrum</i> , <i>Cedrelinga cateniformis</i> , <i>Chrysophyllum</i> sp., <i>C. argenteum</i> , <i>C. cuneifolium</i> , <i>C. eximium</i> , <i>C. lucentifolium</i> , <i>C. prieurii</i> , <i>C. sanguinolentum</i> , <i>Clitoria brachystegia</i> , <i>Copaifera trapezifolia</i> , <i>Cordia</i> sp., <i>C. sagotii</i> , <i>Couepia bracteosa</i> , <i>C. caryophylloides</i> , <i>C. guianensis</i> , <i>C. habrantha</i> , <i>C. joaquinae</i> , <i>C. magnoliifolia</i> , <i>C. parillo</i> , <i>Couma guianensis</i> , <i>Cyathostegia matthewsii</i> , <i>Cylista scariosa</i> , <i>Delonix regia</i> , <i>Dialium guianense</i> , <i>Dimorphandra mollis</i> , <i>Dussia discolor</i> , <i>Eriotheca</i> sp., <i>E. longitubulosa</i> , <i>Erythrina aurantiaca</i> , <i>Erythrophleum guineense</i> , <i>E. lasianthum</i> , <i>Glycydendron amazonicum</i> , <i>Goupia glabra</i> , <i>Guettarda acreana</i> , <i>Himatanthus</i> sp., <i>Hirtella bicornis</i> , <i>H. bicornis</i> var <i>bicornis</i> , <i>H. bicornis</i> var <i>pubescens</i> , <i>H. glandistipula</i> , <i>H. glandulosa</i> , <i>H. macrosepala</i> , <i>H. suffulta</i> , <i>Hoffmannseggia intricata</i> , <i>Hymenolobium janeirensis</i> , <i>Isertia spiciformis</i> , <i>Jacaranda copaia</i> , <i>Laetia procera</i> , <i>Lecythis aurantiaca</i> , <i>Lonchocarpus capassa</i> , <i>L. floribundus</i> , <i>L. guatemalensis</i> , <i>L. leucanthus</i> , <i>Macrolobium bifolium</i> , <i>M. latifolium</i> , <i>M. palisoti</i> , <i>M. zenkeri</i> , <i>Matayba inelegans</i> , <i>M. laevigata</i> , <i>Miliusa brahei</i> , <i>Mimosa caesalpiniiifolia</i> , <i>M. scabrella</i> , <i>Myrospermum balsamiferum</i> , <i>M. frutescens</i> , <i>Ormosia nitida</i> , <i>Ostryocarpus riparius</i> , <i>Ouratea melinonii</i> , <i>Parapiptadenia pterosperma</i> , <i>Parinari campestris</i> , <i>P. excelsa</i> , <i>P. montana</i> , <i>Parkia velutina</i> , <i>Peltogyne</i> sp., <i>P. nitens</i> , <i>P. paniculata</i> , <i>Peltophorum africanum</i> , <i>P. pterocarpum</i> , <i>Phylloxylon perrieri</i> , <i>P. spinosa</i> , <i>Piptadenia b Buchananani</i> , <i>P. obliqua</i> , <i>P. viridiflora</i> , <i>Piscidia carthagenensis</i> , <i>Pithecellobium selen</i> , <i>P. dulce</i> , <i>Platymiscium obtusifolium</i> , <i>P. pinnatum</i> , <i>P. zehntneri</i> , <i>Poeppigia procera</i> , <i>P. prosera</i> , <i>Poinciana regia</i> , <i>Pongamia exerocarpa</i> , <i>P. pinnata</i> , <i>Pourouma melinonii</i> , <i>P. villosa</i> , <i>Pterocarpus</i>

PFT	Type	Species
TBD	NR	<i>angolensis</i> , <i>P. marsupium</i> , <i>P. osun</i> , <i>P. rohrii</i> , <i>P. rotundifolius</i> , <i>P. santalinus</i> , <i>Pterodon abruptus</i> , <i>Pterogyne nitens</i> , <i>Rhynchosia clivorum</i> , <i>Sabinea carinalis</i> , <i>Schizolobium parahybum</i> , <i>Senna angulata</i> , <i>S. cana</i> , <i>Sterculia pruriens</i> , <i>S. speciosa</i> , <i>S. villifera</i> , <i>Stryphnodendron moricolor</i> , <i>S. polystachyum</i> , <i>Swartzia</i> sp., <i>S. acutifolia</i> , <i>S. amshoffiana</i> , <i>S. apetala</i> , <i>S. benthamiana</i> , <i>S. canescens</i> , <i>S. grandifolia</i> , <i>S. leblondii</i> , <i>S. oblanceolata</i> , <i>S. panacoco</i> , <i>S. panacoco</i> var. <i>panacoco</i> , <i>S. polyphylla</i> , <i>Tabebuia</i> sp., <i>T. capitata</i> , <i>Tarena australis</i> , <i>Terminalia</i> sp., <i>T. guianensis</i> , <i>T. microcarpa</i> , <i>Tetrapleura thoningii</i> , <i>Tipuana speciosa</i> , <i>Trattinnickia demerarae</i> , <i>Vantanea parviflora</i> , <i>Xylopia frutescens</i> , <i>Zygia racemosa</i> , <i>Z. tetragona</i>
	Other	<i>Acacia kamerunensis</i> , <i>A. pennata</i> , <i>A. picachensis</i> , <i>A. tucumanensis</i> , <i>A. velutina</i> , <i>A. welwitschii</i> , <i>Aegiphila lhotskiana</i> , <i>A. sellowiana</i> , <i>Albizia adianthifolia</i> , <i>A. adinocephala</i> , <i>A. antunesiana</i> , <i>A. caribaea</i> , <i>A. forbesii</i> , <i>A. guachapele</i> , <i>A. petersiana</i> , <i>A. purpusii</i> , <i>A. sinaloensis</i> , <i>A. thompsoni</i> , <i>A. tomentosa</i> , <i>A. benthamiana</i> , <i>Aspidosperma subincanum</i> , <i>A. tomentosum</i> , <i>Astrocaryum rodriguesii</i> , <i>A. sciophilum</i> , <i>Bauhinia cunninghamii</i> , <i>B. forficata</i> , <i>Blepharocarya depauperata</i> , <i>Brachychiton diversifolius</i> , <i>Byrsonima crassa</i> , <i>Canarium australianum</i> , <i>Capparis leprieurii</i> , <i>C. maroniensis</i> , <i>Caryocar brasiliense</i> , <i>Cassia afrofitula</i> , <i>C. emarginata</i> , <i>C. fistula</i> , <i>C. laevigata</i> , <i>C. tomentosa</i> , <i>Centrolobium tomentosum</i> , <i>Dalbergia miscolobium</i> , <i>Eriotheca pubescens</i> , <i>Erythrophleum chlorostachys</i> , <i>Guapira noxia</i> , <i>Guettarda vibrinoides</i> , <i>Hymenolobium</i> sp., <i>Hymenolobium flavum</i> , <i>Leucaena shannonii</i> , <i>Owenia vernicosa</i> , <i>Platypodium elegans</i> , <i>Pouteria ramiflora</i> , <i>Qualea parviflora</i> , <i>Tabebuia impetiginosa</i> , <i>T. ochracea</i> , <i>T. roseo-alba</i>
tNE	N/A	<i>Abies alba</i> , <i>A. balsamea</i> , <i>A. cephalonica</i> , <i>A. cilicica</i> , <i>A. concolor</i> , <i>A. delavayi</i> , <i>A. grandis</i> , <i>A. lasiocarpa</i> , <i>A. lowiana</i> , <i>A. nordmanniana</i> , <i>A. recurvata</i> , <i>A. religiosa</i> , <i>A. sibirica</i> , <i>A. veitchii</i> , <i>Actinostrobus pyramidalis</i> , <i>Agathis australis</i> , <i>Agathis philippinensis</i> , <i>Araucaria angustifolia</i> , <i>A. bidwillii</i> , <i>A. columnaris</i> , <i>A. excelsa</i> , <i>Arthrotaxis cupressoides</i> , <i>Callitris cupressiformis</i> , <i>C. intratropica</i> , <i>C. macleayana</i> , <i>C. preissii</i> , <i>Calocedrus decurrens</i> , <i>Cedrus atlantica</i> , <i>C. deodara</i> , <i>Chamaecyparis lawsoniana</i> , <i>C. pisifera</i> , <i>Cryptomeria japonica</i> , <i>Cupressus arizonica</i> , <i>C. goveniana</i> , <i>C. guadalupensis</i> , <i>Dacrycarpus dacryoides</i> , <i>Dacrydium cupressinum</i> , <i>D. excelsium</i> , <i>Fitzroya cupressoides</i> , <i>Fokienia hodginsii</i> , <i>Glyptostrobus lineatus</i> , <i>Juniperus californica</i> , <i>J. cedrus</i> , <i>J. communis</i> , <i>J. deppeana</i> , <i>J. monosperma</i> , <i>J. occidentalis</i> , <i>J. osteosperma</i> , <i>J. oxycedrus</i> , <i>J. scopulorum</i> , <i>Picea</i> sp., <i>P. engelmannii</i> , <i>P. glauca</i> , <i>P. mariana</i> , <i>Pinus aristata</i> , <i>P. bahamensis</i> , <i>P. banksiana</i> , <i>P. canariensis</i> , <i>P. caribaea</i> , <i>P. coulteri</i> , <i>P. edulis</i> , <i>P. flexilis</i> , <i>P. halepensis</i> , <i>P. inops</i> , <i>P. muricata</i> , <i>P. nigra</i> , <i>P. palustris</i> , <i>P. pinea</i> , <i>P. ponderosa</i> , <i>P. pungens</i> , <i>P. radiata</i> , <i>P. rigida</i> , <i>P. strobiformis</i> , <i>P. strobis</i> , <i>P. tabuliformis</i> , <i>P. taeda</i> , <i>Podocarpus blumei</i> , <i>P. falcata</i> , <i>P. falcatus</i> , <i>P. ferruginea</i> , <i>P. junghuhniana</i> , <i>P. latifolius</i> , <i>P. macrophylla</i> , <i>P. milanijana</i> , <i>P. milanjanus</i> , <i>P. nagi</i> , <i>P. salignus</i> , <i>P. spicatus</i> , <i>P. totara</i> , <i>P. transiens</i> , <i>Prumnopitys ferruginea</i> , <i>P. taxifolia</i> , <i>Pseudolarix amabilis</i> , <i>Pseudotsuga menziesii</i> , <i>Saxegothaea conspicua</i> , <i>Sciadopitys verticillata</i> , <i>Sequoioideae</i> , <i>Sequoiadendron giganteum</i> , <i>Serruria glomerata</i> , <i>Taxodium distichum</i> , <i>Taxus baccata</i> , <i>T. brevifolia</i> , <i>Thuja occidentalis</i> , <i>T. orientalis</i> , <i>T. plicata</i> , <i>T. standishii</i>
tBE	RS	<i>Acacia karroo</i> , <i>A. luederitzii</i> , <i>Corymbia gummifera</i> , <i>Elaeocarpus reticulatus</i> , <i>E. amygdalina</i> , <i>E. bridgesiana</i> , <i>E. prava</i> , <i>E. saligna</i> , <i>E. botryoides</i> , <i>E. cameronii</i> , <i>E. nobilis</i> , <i>Leucospermum conocarpodendron</i> , <i>Mimetes fimbriifolius</i> , <i>Orites excelsa</i> , <i>Protea nitida</i> , <i>Ulex europaeus</i> , <i>Vesselowskyia rubiflora</i>
	NR	<i>Acacia</i> sp., <i>A. baileyana</i> , <i>A. decurrens</i> , <i>A. maidenii</i> , <i>A. verticillata</i> , <i>Ammodendron karelinii</i> , <i>Androstachys johnsonii</i> , <i>Anopterus glandulosus</i> , <i>Aristotelia serrata</i> , <i>Ateleia tomentosa</i> , <i>Aulax umbellata</i> , <i>Banksia integrifolia</i> ssp. <i>monticola</i> , <i>Bauhinia galpinii</i> , <i>Beilschmiedia tawa</i> , <i>Cadia ellisiana</i> , <i>Caesalpinia arenosa</i> , <i>C. cacalaco</i> , <i>C. caladenia</i> , <i>C. californica</i> , <i>C. epifanioi</i> , <i>C. eriostachys</i> , <i>C. exostemma</i>

PFT	Type	Species
tBE	NR	<i>C. gaumeri</i> , <i>C. glabrata</i> , <i>C. gracilis</i> , <i>C. hilderbrandtii</i> , <i>C. hintonii</i> , <i>C. hughesii</i> , <i>C. madagascariensis</i> , <i>C. melanadenia</i> , <i>C. mexicana</i> , <i>C. nipensis</i> , <i>C. palmeri</i> , <i>C. pannosa</i> , <i>C. placida</i> , <i>C. standleyi</i> , <i>C. violacea</i> , <i>C. yucatanensis</i> , <i>Callistachys lanceolata</i> , <i>Carpodetus serratus</i> , <i>Chamaecytisus palmensis</i> , <i>C. proliferus</i> , <i>Chloroleucon confine</i> , <i>Cordeauxia edulis</i> , <i>Cytisus battandieri</i> , <i>Dalbergia hupeana</i> , <i>Dendrochne excelsa</i> , <i>Elaeodendron transvaalense</i> , <i>Eucalyptus regans</i> , <i>Eucalyptus</i> cf. <i>marginata</i> , <i>Gymnocladus dioica</i> , <i>Harpalyce arborescens</i> , <i>Hebestigma cubense</i> , <i>Hoheria</i> cf. <i>sexstylosa</i> , <i>Hybosema ehrenbergii</i> , <i>Laurelia novae-zelandiae</i> , <i>Leucadendron argenteum</i> , <i>L. laureolum</i> , <i>L. xanthoconus</i> , <i>Lonchocarpus acuminatus</i> , <i>Naucleopsis guianensis</i> , <i>Neea</i> sp., <i>Pickeringia montana</i> , <i>Plinia rivularis</i> , <i>Podocarpus elatus</i> , <i>Poralyria calyptrata</i> , <i>Prosopis glandulosa</i> , <i>Prostanthera</i> sp. aff. <i>lasianthos</i> , <i>Protea coronata</i> , <i>P. lepidocarpodendron</i> , <i>P. repens</i> , <i>P. roupelliae</i> , <i>Pseudopanax arboreus</i> , <i>P. crassifolius</i> , <i>Raukawa edgerleyi</i> , <i>Sassafras albidum</i> , <i>Schotia brachypetala</i> , <i>S. capitata</i> , <i>Spartocytisus nubigenus</i> , <i>S. supranubius</i> , <i>Sterculia quadrifida</i> , <i>Styrax pallidus</i> , <i>Syzygium maire</i> , <i>Warburgia salutaris</i> , <i>Weinmannia racemosa</i> , <i>Xanthocercis zambesiaca</i>
	Other	<i>Acacia brandegeana</i> , <i>A. choriophylla</i> , <i>A. coulteri</i> , <i>A. dealbata</i> , <i>A. eburnea</i> , <i>A. ehrenbergiana</i> , <i>A. farnesiana</i> , <i>A. floribunda</i> , <i>A. huarango</i> , <i>A. laeta</i> , <i>A. longifolia</i> , <i>A. macracantha</i> , <i>A. mammifera</i> , <i>A. melanoxylon</i> , <i>A. mellifera</i> , <i>A. neriifolia</i> , <i>A. nubica</i> , <i>A. pataczekii</i> , <i>A. pennivenia</i> , <i>A. pterygocarpa</i> , <i>A. raddiana</i> , <i>A. senegal</i> , <i>A. seyal</i> , <i>A. sieberana</i> , <i>A. sowdenii</i> , <i>A. spirocarpa</i> , <i>A. swazica</i> , <i>A. willardiana</i> , <i>Acmena smithii</i> , <i>Atherosperma moschatum</i> , <i>Aulax pallasia</i> , <i>Caldcluvia paniculata</i> , <i>Callicoma serratifolia</i> , <i>Calycotome villosa</i> , <i>Cassia montana</i> , <i>C. polyantha</i> , <i>C. pringlei</i> , <i>C. skinneri</i> , <i>Cerratopetalum apetaum</i> , <i>Cordyline australis</i> , <i>Cryptocaria nova-anglica</i> , <i>C. meissneriana</i> , <i>Doryphora sassafrass</i> ssp. <i>montane</i> , <i>Elaeocarpus holopetalus</i> , <i>E. dentatus</i> , <i>E. australe</i> , <i>Endiandra sieberi</i> , <i>Eucalyptus coccifera</i> , <i>E. obliqua</i> , <i>E. rubida</i> , <i>E. pauciflora</i> , <i>Eucryphia lucida</i> , <i>Glochidion ferdinandii</i> , <i>Guioa semiglauca</i> , <i>Hedycarya arborea</i> , <i>Indigofera marmorata</i> , <i>I. oblongifolia</i> , <i>I. teysmanni</i> , <i>Kunzea ericoides</i> , <i>Leucadendron salignum</i> , <i>Leucaena diversifolia</i> , <i>Lophostemon confertus</i> , <i>Mimetes cucullatus</i> , <i>Nothofagus cunninghamii</i> , <i>N. moorei</i> , <i>Notolaea</i> sp. aff. <i>venosa</i> , <i>Phyllocladus aspleniifolius</i> , <i>Pittosporum undulatum</i> , <i>Pomaderris apetala</i> , <i>Pomaderris apetala</i> , <i>Protea caffra</i> , <i>P. cynaroides</i> , <i>Quintinia sieberi</i> , <i>Rapanea variabilis</i> , <i>Schizomeria ovata</i> , <i>Sophora affinis</i> , <i>S. microphylla</i> , <i>S. tetraptera</i> , <i>S. tomentosa</i> , <i>Tasmania stipitata</i> , <i>Trichilia emetica</i> , <i>Trochocarpa montana</i>
tBD	RS	<i>Acacia gerrardii</i> , <i>A. grandicornuta</i> , <i>A. nigrescens</i> , <i>A. tortilis</i> , <i>Acer glabrum</i> , <i>A. grandidentatum</i> , <i>Betula papyrifera</i> , <i>Brachystegia boehmii</i> , <i>Cercis siliquastrum</i> , <i>Colophospermum mopane</i> , <i>Corymbia polysciada</i> , <i>Genista acanthoclada</i> , <i>Populus angustifolia</i> , <i>P. balsamifera</i> , <i>P. tremuloides</i> , <i>Sclerocarya birrea</i> , <i>Toona ciliata</i> , <i>Ziziphus mucronata</i>
	NR	<i>Acacia xanthophloea</i> , <i>Acer negundo</i> , <i>Alnus oblongifolia</i> , <i>Apoplanesia paniculata</i> , <i>Balanites maughamii</i> , <i>Bauhinia roxburghiana</i> , <i>B. subrotundifolia</i> , <i>Brya ebenus</i> , <i>Caesalpinia platyloba</i> , <i>C. sclerocarpa</i> , <i>Calliandra houstoniana</i> , <i>Carmichaelia australis</i> , <i>Cercidium floridum</i> ssp. <i>peninsulare</i> , <i>C. microphyllum</i> , <i>C. peninsulare</i> , <i>C. praecox</i> , <i>C. texanum</i> , <i>Colvillea racemosa</i> , <i>Conzattia multiflora</i> , <i>Coursetia glandulosa</i> , <i>Cytisus candicans</i> , <i>C. proliferus</i> , <i>Dalbergia melanoxylon</i> , <i>Desmanthus fruticosus</i> , <i>Desmodium tiliaefolium</i> , <i>Diphysa americana</i> , <i>Elephantorrhiza burkei</i> , <i>Enterolobium contortisiliquum</i> , <i>Enterolobium cyclocarpum</i> , <i>Eysenhardtia amorphoides</i> , <i>Fordia</i> cf. <i>brachybotrys</i> , <i>Fraxinus velutina</i> , <i>Fuchsia excorticata</i> , <i>Genista benehoavensis</i> , <i>G. cinerea</i> , <i>G. virgata</i> , <i>Geoffroea decorticans</i> , <i>Goodia lotifolia</i> , <i>Gymnocladus canadensis</i> , <i>Juglans major</i> , <i>Kirkia acuminata</i> , <i>Lemuropisum edule</i> , <i>Lysiloma aurita</i> , <i>L. candida</i> , <i>Mimosa benthamii</i> , <i>Mimosa falcata</i> , <i>Olneya tesota</i> , <i>Peltophorum dubium</i> , <i>Phyllocarpus septentrionalis</i> , <i>Piscidia mollis</i> , <i>P. piscipula</i> , <i>Pithecellobium glaucum</i> , <i>P. unguis-cati</i> , <i>Platanus wrightii</i> , <i>Populus fremontii</i>

PFT	Type	Species
tBD	NR	<i>Prunus emarginata</i> , <i>Retama monosperma</i> , <i>Rhus chirindensis</i> , <i>R. glabra</i> , <i>Robinia x holtii britzensis</i> , <i>Salix</i> sp., <i>S. babylonica</i> , <i>S. bebbiana</i> , <i>Sesbania sesban</i> , <i>Spartium junceum</i> , <i>Teline stenopetala</i>
	Other	<i>Acacia albida</i> , <i>A. angustissima</i> , <i>A. caffra</i> , <i>A. chamelensis</i> , <i>A. davyi</i> , <i>A. exuvialis</i> , <i>A. horrida</i> , <i>A. nilotica</i> , <i>A. robusta</i> , <i>Albizia anthelmintica</i> , <i>A. occidentalis</i> , <i>A. plurijuga</i> , <i>A. versicolor</i> , <i>Calycotome spinosa</i> , <i>Cassia abbreviata</i> , <i>C. wislizenii</i> , <i>Celtis reticulata</i> , <i>Combretum hereroense</i> , <i>C. imberbe</i> , <i>Cytisus scoparius</i> , <i>Dichrostachys cinerea</i> , <i>Gleditsia triacanthos</i> , <i>Laburnum anagyroides</i> , <i>Leucaena confertiflora</i> , <i>L. esculenta</i> , <i>L. esculenta x leucocephala</i> , <i>L. macrophylla</i> , <i>L. pulverulenta</i> , <i>Quercus gambelii</i> , <i>Robinia neomexicana</i> , <i>R. pseudoacacia</i> , <i>Sophora japonica</i> , <i>S. secundiflora</i> , <i>Terminalia prunioides</i> , <i>T. sericea</i>
BNE	N/A	<i>Picea abies</i> , <i>P. jezoensis</i> , <i>P. likiangensis</i> , <i>P. obovata</i> , <i>P. omorica</i> , <i>P. orientalis</i> , <i>P. pungens</i> , <i>P. schrenkiana</i> , <i>P. spinulosa</i> , <i>Pinus cembra</i> , <i>P. cembroides</i> , <i>P. gerardiana</i> , <i>P. koraiensis</i> , <i>P. laticio</i> , <i>P. longifolia</i> , <i>Tsuga canadensis</i> , <i>T. dumosa</i> , <i>T. heterophylla</i>

Table S2: Summary of studies on post-fire recruitment rates used to derive a recruitment penalty for resprouting PFTs in LPX-Mv1. All of the study sites contained resprouting (RS) and non-resprouting (NR) species.

Reference	Measure	Species	Values	Implied recruitment penalty
Vivian et al. (2008)	Ratio of seedlings to pre-basal fire area	<i>Eucalyptus fastigata</i> (RS)	0.05	86 %
		<i>E. delegatensis</i> (NR)	0.35	
Silva-Matos et al. (2005)	Number of seedlings 3 months after fire	<i>Cecropia</i> (RS)	1	100 %
		<i>Trema</i> (NR)	405	
Enright and Goldblum (1999)	Post-fire recruitment and seedling survival	<i>Hakea rostrata</i> (RS)	NS 10× greater recruitment, 7×greater survival	85–90 %
		<i>H. decurrens</i> (NR)		
Biganzoli et al. (2009)	Post-fire seedling recruitment	<i>Eupatorium buniifolium</i> (RS)	<i>E. buniifolium</i> recruitment 6 % of <i>B. dracunculifolia</i>	96 %
		<i>Baccharis dracunculifolia</i> (NR)		
		<i>Banksia attenuate</i> (RS)	5.1, 14.6	
		<i>B. menziesii</i> (RS)	1.1, 1.0	
Enright and Lamont (1989)	Seedling per parent, after fire	<i>B. candolleana</i> (RS)	0.5, 3.2	93 %
		<i>B. hookeriana</i> (NR)	37.3, 73.5	
		<i>B. leptophylla</i> (NR)	185.6, 95.0	

Table S3. Information used to calculate recovery time at sites with different fire-response adaptations. The dominant fire responses (Dominant adaptation) are AR: aerial resprouters (RS), BR: basal RS, OS: obligate seeder, and R: RS of unknown type. NR indicates vegetation with no specific fire adaptation. AR and BR sites are used to represent RS in Fig. 7 while UR, R and OS are grouped together as OS in Fig. 7. Med stands for Mediterranean-type climate. The proportion decrease (%) in the vegetation index of a site after fire is given in Impact. The vegetation indices (Veg Index) are NDVI: Normalised Difference Vegetation Index, NDVI anomalies: the deviation of NDVI from the expected value; EVI: the Enhanced vegetation index; or a site-specific index as described in the original publication. The impact of fire was expressed either with respect to local sites that were not burnt (control) or to pre-fire values at the burnt site (pre-fire), or to the maximum annual cycle value found in pre-fire years (gorgeous years – see Gouveia et al. 2010). The time to recovery is the length of time required before the Veg Index reaches 90% of the pre-fire cover. Where this is based on an extrapolation beyond the years of observation, the number of extrapolated years is given (Extrapolated Years).

Dominant Adaptation	Dominant Species	Location	Climate	Impact (%)	Veg Index	Comparison	Interpolate to recovery (yr)	Time to recovery (yr months)	Reference
AR	<i>Quercus suber</i>	Catalonia, Spain	Med	47	NDVI	control	6	13 yr 6 m	Diaz-Delgado et al. (1998)
	<i>Quercus suber</i>	Catalonia, Spain	Med	44	NDVI	control	0	5 yr 2 m	Diaz-Delgado et al. (1998)
	<i>Quercus suber</i>	Catalonia, Spain	Med	78	NDVI	control	0	7 yr 3 m	Díaz-Delgado et al. (2002)
	<i>Eucalyptus</i> sp.	Portugal	Med	27	NDVI	gorgeous years	8	10 yr 2 m	Gouveia et al. (2010)
	<i>Quercus agrifolia</i>	Jameson catchment, California, USA	Med	69	NDVI	pre-fire	0	4 yr 4 m	Hope et al. (2007)

Dominant Adaptation	Dominant Species	Location	Climate	Impact (%)	Veg Index	Comparison	Interpolate to recovery (yr)	Time to recovery (yr months)	Reference
AR/BR	<i>Adenostoma fasciculatum</i> ; <i>Ceanothus</i> sp.; <i>Arctostaphylos</i> sp.; <i>Quercus dumosa</i> ; <i>Rhus ovata</i> ; <i>Heteromeles arbutifolia</i>	Santa Monica Mountains, California, USA	Med	58	NDVI	control	7	8 yr 3 m	Riaño et al. (2002)
	coastal sage scrub	Santa Monica Mountains, California, USA	Med	43	NDVI	control	0	0 yr 2 m	Riaño et al. (2002)
	<i>Arctostaphylos glauca</i> ; <i>Ceanothus megacarpus</i> ; <i>Cercocarpus betuloides</i> ; <i>Rhamnus ilicifolia</i> ; <i>Eriogonum fasciculatum</i> ; <i>Ceanothus thyrsiflorus</i> ; <i>Adenostoma fasciculatum</i> ; <i>Ceanothus greggii</i> ; <i>Arctostaphylos glandulosa</i> ; <i>Ceanothus crassifolius</i> ; <i>Ceanothus cuneatus</i> ; <i>Ceanothus leucodermis</i> ; <i>Prunus ilicifolia</i> ssp. <i>ilicifolia</i>	Jameson catchment, California, USA	Med	72	NDVI	pre-fire	0	5 yr 10 m	Hope et al. (2007)

Dominant Adaptation	Dominant Species	Location	Climate	Impact (%)	Veg Index	Comparison	Interpolate to recovery (yr)	Time to recovery (yr months)	Reference
AR/BR	<i>Arctostaphylos glauca</i> ; <i>Ceanothus megacarpus</i> ; <i>Cercocarpus betuloides</i> ; <i>Rhamnus ilicifolia</i> ; <i>Eriogonum fasciculatum</i> ; <i>Ceanothus thyrsiflorus</i> ; <i>Adenostoma fasciculatum</i> ; <i>Ceanothus greggii</i> ; <i>Arctostaphylos glandulosa</i> ; <i>Ceanothus crassifolius</i> ; <i>Ceanothus cuneatus</i> ; <i>Ceanothus leucodermis</i> ; <i>Prunus ilicifolia</i> ssp. <i>ilicifolia</i>	Jameson catchment, CA, USA	Med	60	NDVI	pre-fire	0	4 yr 10 m	Hope et al. (2007)
BR	<i>Salvia apiana</i> ; <i>Salvia leucophylla</i> ; <i>Salvia mellifera</i> ; <i>Artemisia californica</i> ; <i>Eriogonum cinereum</i> ; <i>Eriogonum elongatum</i> ; <i>Eriogonum fasciculatum</i> ; <i>Encelia californica</i> ; <i>Lotus</i> sp.; <i>Lupinus</i> sp.; <i>Mimulus</i> sp.	Santa Monica Mountains, California, USA	Med	33	NDVI	control	6	10 yr 0 m	Riaño et al. (2002)

Dominant Adaptation	Dominant Species	Location	Climate	Impact (%)	Veg Index	Comparison	Interpolate to recovery (yr)	Time to recovery (yr months)	Reference
BR	<i>Salvia apiana</i> ; <i>Salvia leucophylla</i> ; <i>Salvia mellifera</i> ; <i>Artemisia californica</i> ; <i>Eriogonum cinereum</i> ; <i>Eriogonum elongatum</i> ; <i>Eriogonum fasciculatum</i> ; <i>Encelia californica</i> ; <i>Lotus</i> sp.; <i>Lupinus</i> sp.; <i>Mimulus</i> sp.	Santa Monica Mountains, California, USA	Med	48	NDVI	control	8	11 yr 7 m	Riaño et al. (2002)
	<i>Quercus ilex</i> ; <i>Pinus halepensis</i>	Catalonia, Spain	Med	46	NDVI	control	6	14 yr 5 m	Diaz-Delgado et al. (1998)
	<i>Adenostoma fasciculatum</i> ; <i>Salvia mellifera</i> ; <i>Salvia apiana</i>	Jameson catchment, CA, USA	Med	70	NDVI	pre-fire	0	5 yr 10 m	Hope et al. (2007)
	<i>Eriogonum fasciculatum</i> ; <i>Salvia apiana</i>	Jameson catchment, CA, USA	Med	67	NDVI	pre-fire	0	7 yr 2 m	Hope et al. (2007)

Dominant Adaptation	Dominant Species	Location	Climate	Impact (%)	Veg Index	Comparison	Interpolate to recovery (yr)	Time to recovery (yr months)	Reference
OS in Fig. 7									
R/OS	<i>Pinus ponderosa</i> ; <i>Quercus gambelii</i> ; <i>Pinus edulis</i>	<i>Apache-Sitgreaves National Forest, Arizona, USA</i>		81	EVI	pre-fire	5	9 yr 6 m	Casady et al. (2009)
OS	<i>Pinus halepensis</i> ; <i>Rosmarinus officinalis</i> ; <i>Erica multiflora</i> ; <i>Ulex parviflorus</i> ; <i>Brachypodium retusum</i>	<i>Alicante, Spain</i>	dry – subhumid Med	15	NDVI	control	8	15 yr 9 m	van Leeuwen et al. (2010)
	<i>Quercus ilex</i> ; <i>Pinus halepensis</i> ; shrubland	<i>Bigues i Riells, Spain</i>	Med	91	NDVI	control	6	8 yr 6 m	Díaz-Delgado et al. (2003)
	<i>Pinus pinaster</i>	<i>Portugal</i>	Med	31	NDVI	gorgeous years	8	10 yr 1 m	Gouveia et al. (2010)
	<i>Pinus pinaster</i>	<i>Liguria, Northern Italy</i>	Med	63	own index	own index	6	13y11m	Solans Vila and Barbosa (2010)

Dominant Adaptation	Dominant Species	Location	Climate	Impact (%)	Veg Index	Comparison	Interpolate to recovery (yr)	Time to recovery (yr months)	Reference
OS	<i>Pinus ponderosa</i>	<i>Apache-Sitgreaves National Forest, Arizona, USA</i>		63	NDVI	control	7	12 yr 0 m	van Leeuwen (2008)
NR in Fig. 7									
NR	needle-leaf evergreen species	<i>Hayes River Upland; La Grande Hills, Canada</i>	Boreal	28	NDVI anomalies	control	0	6 yr 6 m	Goetz et al. (2006)
	needle-leaf evergreen species	<i>Hayes River Upland; La Grande Hills, Canada</i>	Boreal	36	NDVI anomalies	control	8	15 yr 1 m	Goetz et al. (2006)
	needle-leaf evergreen species	<i>Yukon-Charley Rivers National Preserve,</i>	Boreal	43	NDVI	control	6	21 yr 11 m	Epting and Verbyla (2005)

Alaska, USA

Dominant Adaptation	Dominant Species	Location	Climate	Impact (%)	Veg Index	Comparison	Interpolate to recovery (yr)	Time to recovery (yr months)	Reference
NR	evergreen needle-leaf forest	<i>Central Siberia, Russia</i>	Boreal	18	NDVI	control	8	20 yr 7 m	Cuevas-González et al. (2009)
	deciduous needle-leaf forest	<i>Central Siberia, Russia</i>	Boreal	22	NDVI	control	7	20 yr 0 m	Cuevas-González et al. (2009)

Table S4. Extended version of Table 4 in main text. Scores obtained using the mean of the data (Data mean), and the mean and standard deviation of the scores obtained from bootstrapping experiments (Bootstrap mean, Bootstrap SD). Step 1 is a straight comparison; 2 is a comparison with the influence of the mean removed; 3 is with mean and variance removed. Step 2 and 3 have been included for inter-annual variability (IAV) and Seasonal concentration, and full scores have been included for each burnt area dataset.

Variable	Step	Measure	time period	mean	bootstrap mean	bootstrap SD
fAPAR	1	Annual average	1997-2005	1.00	1.33	0.015
	2			1.00	1.33	0.015
	3			1.00	1.32	0.014
	2	Inter-annual variability		1.00	1.23	0.32
	3			1.00	1.35	0.36
	1	Seasonal concentration		1.00	1.46	0.014
	2			1.00	1.46	0.014
	3			1.00	1.45	0.014
	Veg cover	N/A	Phase		0.30	0.38
N/A		life forms	1992-1993	0.71	0.89	0.0018
N/A		tree cover		0.43	0.54	0.0015
N/A		herb cover		0.49	0.66	0.0017
N/A		bare ground		0.46	0.56	0.0017
N/A		broadleaf		0.83	0.96	0.0041
N/A		evergreen		0.70	0.87	0.0032
fine litter NPP	1	Annual average	1997-2005	1.00	1.44	0.21
	2			1.00	1.44	0.22
	3			1.00	1.43	0.095
Height	1	Annual average	2005	1.00	1.32	0.016
	2			1.00	1.32	0.016
	3			1.00	1.31	0.016

Variable	Step	Measure	time period	Mean	bootstrap mean	bootstrap SD
Fire: GFED3	1	Annual average	1997-2006	1.00	1.25	0.015
	2			1.00	1.26	0.015
	3			1.00	1.28	0.016
	2	Inter-annual variability		1.00	1.31	0.36
	3			1.00	1.25	0.33
	1	Seasonal Conc		1.00	1.36	0.020
	2			1.00	1.36	0.020
	3			1.00	1.36	0.018
	N/A	Phase		0.39	0.44	0.0046
	Fire: GFED3 SE	1		Annual average		1.00
2		1.00	1.19			0.024
3		1.00	1.21			0.024
2		Inter-annual variability	1.00	1.26		0.33
3			1.00	1.41		0.54
1		Seasonal Conc	1.00	1.31		0.053
2			1.00	1.31		0.052
3			1.00	1.31		0.045
N/A		Phase	0.47	0.47		0.011
Fire: GFED4		1	Annual average	1997-2006		1.00
	2	1.00			1.24	0.0037
	3	1.00			1.30	0.0053
	2	Inter-annual variability	1.00		1.50	0.34
	3		1.00		1.28	0.27
	1	Seasonal Conc	1.00		1.32	0.0073
	2		1.00		1.33	0.0071
	3		1.00		1.34	0.0061
	N/A	Phase	0.45		0.47	0.0015

Variable	Step	Measure	time period	mean	bootstrap mean	bootstrap SD
Fire: GFED4 SE	1	Annual average		1.00	1.18	0.024
	2			1.00	1.18	0.024
	3			1.00	1.20	0.025
	2	Inter-annual variability		1.00	1.24	0.34
	3			1.00	1.52	0.67
	1	Seasonal Conc		1.00	1.33	0.043
	2			1.00	1.33	0.043
	3			1.00	1.33	0.038
		N/A	Phase		0.44	0.47
Fire: Ground Observation	1	Annual average	1996.5-2005.5	1.00	1.13	0.026
	2			1.00	1.15	0.027
	3			1.00	1.10	0.025
	2	Inter-annual variability		1.00	1.32	0.37
	3			1.00	1.34	0.36

Table S5. Comparison metric scores for model simulations against observations. Mean and variance rows show mean and variance of simulation for annual average values, by the ratio of the mean/ variance with observed mean or variance. Numbers in bold indicates if the model performs better than the original LPX model. Italic indicates model scores better than the mean of the data score listed in Table S4. Asterisks indicate model scores that are significantly better than randomly resampling listed in Table S4. S1 are step 1 comparisons, S2 are step 2; and S3 are step 3. All metrics defined in Kelley et al. (2013). Lightn column give the scores for lightning parametrisations to LPX; Drying for fuel drying time parametrisation; Roots for deep rooting fraction; Litter for litter decomposition; and Bark for the inclusion of adaptive bark. LPX-M-v1-nr incorporates all parametrisations and LPX-M-v1-rs incorporates resprouting into LPX-Mv1-nr. fAPAR is the fraction of absorbed photosynthetically active radiation, NPP is net primary productivity.

Variable	Metric used	Measure	LPX	Lightn	Drying	Roots	Litter	bark thickness	LPX-Mv1-nr	LPX-Mv1-rs
Burnt area: GFED3	Mean	Annual Average	0.082	0.12	0.084	0.086	0.02	0.003	0.049	0.050
	Mean ratio		1.13	1.64	1.15	1.18	0.28	0.039	0.67	0.69
	Variance		0.047	0.049	0.046	0.047	0.025	0.005	0.041	0.041
	Variance ratio		0.56	0.59	0.54	0.55	0.29	0.061	0.48	0.48
	NME S1	Annual Average	1.00*	1.24*	1.00*	1.00*	0.90*	0.88*	0.89*	0.85*
	NME S2		<i>0.97*</i>	1.06*	<i>0.97*</i>	0.97*	1.03*	1.02*	0.94*	0.93*
	NME S3		1.22*	1.32	1.23*	1.23*	1.22*	1.38	1.12*	1.09*
	NME S2	Inter-annual variability	<i>0.94</i>	1.06	<i>0.97</i>	0.97	0.89	1.00	0.66*	0.68*
	NME S3		<i>0.91</i>	<i>0.97</i>	0.93	0.87	1.09	1.02	0.78	0.83
	NME S1	Seasonal Conc.	1.39	1.30*	1.39	1.41	1.44	1.35*	1.31 *	1.32*
	NME S2		1.36	1.27*	1.37	1.37	1.14*	1.09*	1.29 *	1.32*
	NME S3		1.24*	1.46	1.24*	1.23*	1.33*	1.40	1.31*	1.32*
	MPD	Phase	0.44	0.38*	0.44	0.44	0.57	0.53	0.49	0.49

Variable	Metric used	Measure	LPX	Lightn	Drying	Roots	Litter	bark thickness	LPX-Mv1-nr	LPX-Mv1-rs
Burnt area: GFED3 SE Aus	Mean	Annual Average	0.048	0.099	0.053	0.051	0.012	0.002	0.024	0.024
	Mean ratio		6.69	13.1	7.34	7.02	1.63	0.25	3.33	3.38
	Variance		0.023	0.054	0.041	0.041	0.018	0.003	0.026	0.026
	Variance ratio		2.17	5.05	3.84	3.85	1.66	0.31	2.46	2.49
	NME S1	Annual average	4.03	8.41	4.75	4.64	1.64	0.81*	2.43	2.46
	NME S2		3.58	5.07	3.93	3.97	1.85	1.05*	2.66	2.69
	NME S3		2.07	1.34	1.37	1.38	1.23	1.22*	1.29	1.30
	NME S2	Inter-annual variability	12	14.5	14.1	15.8	5.21	1.52	8.05	8.00
	NME S3		1.74	1.54	1.47	1.46	1.36	1.45	1.47	1.50
	NME S1	Seasonal Conc.	1.15	1.3	1.15	1.14	1.08	1.25	<i>0.95</i>	<i>0.96</i>
	NME S2		1.17	1.10	1.16	1.16	0.98	1.06	<i>0.97</i>	<i>0.98</i>
	NME S3		1.41	1.32	1.33	1.35	1.22	1.44	1.26	1.25
	MPD			0.47	0.52	0.47	0.48	0.52	0.57	0.50
Burnt area: GFED4	Mean	Annual Average	0.083	0.12	0.084	0.086	0.02	0.003	0.049	0.050
	Mean ratio		1.21	1.77	1.24	1.27	0.29	0.043	0.72	0.74
	Variance		0.047	0.049	0.046	0.047	0.025	0.005	0.041	0.041
	Variance ratio		0.60	0.63	0.58	0.6	0.32	0.068	0.53	0.53
	NME S1	Annual average	1.01*	1.29	1.02*	1.02*	0.93*	0.9*	0.88*	0.88*
	NME S2		<i>0.97*</i>	1.09*	<i>0.98*</i>	<i>0.97*</i>	1.04*	1.02*	0.93*	0.93*
	NME S3		1.2*	1.32	1.21*	1.2*	1.23*	1.39	1.10	1.09*
	NME S2	Inter-annual variability	1.05	1.05	1.08	1.17	1.03	1.03	0.91	0.90
NME S3	1.26*		1.21*	1.25*	1.29*	1.33	1.60	1.23	1.25*	

Variable	Metric used	Measure	LPX	Lightn	Drying	Roots	Litter	bark thickness	LPX-Mv1-nr	LPX-Mv1-rs
Burnt area: GFED4	NME S1	Seasonal Conc.	1.43	1.33	1.43	1.44	1.49	1.44	1.32	1.31*
	NME S2		1.41	1.3*	1.42	1.41	1.16*	1.03*	1.31*	1.3*
	NME S3		1.26*	1.47	1.26*	1.24*	1.33*	1.31*	1.29*	1.29*
	MPD	Phase	0.5	0.46	0.5	0.49	0.57	0.59	0.52	0.52
Burnt area: GFED4 SE Aus	Mean	Annual Average	0.048	0.099	0.053	0.051	0.012	0.002	0.024	0.025
	Mean ratio		6.00	12.4	6.68	6.37	1.55	0.27	3.07	3.12
	Variance		0.04	0.056	0.041	0.041	0.019	0.004	0.027	0.027
	Variance ratio		3.43	4.74	3.47	3.48	1.6	0.33	2.28	2.31
	NME S1	Annual average	4.03	7.97	4.35	4.23	1.59	0.83*	2.29	2.33
	NME S2		3.58	4.8	3.6	3.61	1.78	1.05*	2.50	2.53
	NME S3		1.39	1.35	1.37	1.38	1.22	1.21	1.30	1.30
	NME S2	Inter-annual variability	8.59	10.1	9.05	10.1	3.83	1.27	5.56	5.71
	NME S3		1.3	1.32	1.29	1.26	1.20-	1.41	1.17	1.24
	NME S1	Seasonal Conc.	1.29	1.38	1.29	1.25*	1.20*	1.50	1.04*	1.04*
	NME S2		1.29	1.20*	1.28	1.24*	1.08*	0.98*	1.06*	1.05*
	NME S3		1.41	1.39	1.38	1.37	1.29	1.28	1.33	1.32
	MPD	Phase	0.53	0.57	0.52	0.52	0.57	0.62	0.56	0.55
Burnt area: Ground Obs.	Mean	Annual Average	0.048	0.099	0.053	0.051	0.012	0.002	0.029	0.025
	Mean ratio		10.9	22.6	12.2	11.6	2.83	0.49	6.61	5.68
	Variance		0.04	0.056	0.041	0.041	0.019	0.004	0.039	0.027
	Variance ratio		5.96	8.23	6.03	6.05	2.77	0.58	3.12	4.01
	NME S1	Annual average	7.19	14	7.67	7.59	2.4	0.92*	4.27	3.67
	NME S2		6.13	7.91	6.06	6.21	2.99	1.08*	4.75	4.20
	NME S3		1.41	1.23	1.35	1.4	1.25	1.18	1.29	1.28
	NME S2	Inter-annual variability	16.6	19.3	17.5	19.4	7.65	2.33	11.5	11.2
	NME S3		1.88	1.83	1.86	1.88	1.84	1.83	1.78	1.84

Variable	Metric used	Measure	LPX	Lightn	Drying	Roots	Litter	bark thickness	LPX-Mv1-nr	LPX-Mv1-rs
fAPAR	Mean	Annual Average	0.19	0.12	0.19	0.18	0.24	0.26	0.22	0.22
	Mean ratio		1.59	1.02	1.56	1.55	2.02	2.18	1.83	1.87
	Variance		0.076	0.034	0.073	0.074	0.099	0.11	0.11	0.092
	Variance ratio		0.95	0.42	0.91	0.92	1.24	1.35	1.34	1.16
	NME S1	Annual Average	1.11*	0.98*	1.11*	1.07*	1.61	1.8	1.31	1.35
	NME S2		0.69*	0.97*	0.72*	0.68*	0.7*	0.69*	0.61*	0.61*
	NME S3		0.71*	1.21*	0.76*	0.71*	0.57*	0.51*	0.57*	0.54*
	NME S2	Inter-annual variability	1.01	1.11	1.01	0.97	2.44	2.86	1.83	1.85
	NME S3	Inter-annual variability	0.67	1	0.64*	0.63*	0.65*	0.66	0.66	0.74
	NME S1	Seasonal Conc.	1.34*	1.44	1.35*	1.36*	1.31*	1.31*	1.32*	1.33*
	NME S2		1.02*	1.05*	1.03*	1.02*	1.02*	1.03*	1.02*	1.00*
	NME S3		1.23*	1.27*	1.24*	1.23*	1.21*	1.21*	1.21*	1.21*
	MPD	Phase	0.25*	0.25*	0.25*	0.24*	0.25*	0.25*	0.24*	0.24*
Veg cover	Mean	Trees	0.034	0.011	0.022	0.034	0.059	0.075	0.042	0.049
	Mean ratio		0.4	0.13	0.26	0.4	0.69	0.88	0.49	0.58
	Mean	Herb	0.44	0.34	0.45	0.44	0.55	0.57	0.55	0.55
	Mean ratio		0.65	0.5	0.65	0.65	0.81	0.84	0.80	0.81
	Mean	Bare ground	0.52	0.65	0.53	0.52	0.39	0.35	0.41	0.40
	Mean ratio		2.79	3.45	2.83	2.77	2.08	1.88	2.18	2.12
	Mean	Phenology	0.066	0.014	0.042	0.063	0.12	0.15	0.10	0.12
	Mean ratio		0.13	0.026	0.081	0.12	0.23	0.28	0.20	0.22
	Mean	Leaf type	0.055	0.01	0.035	0.056	0.10	0.14	0.096	0.11
	Mean ratio		0.094	0.018	0.059	0.096	0.18	0.24	0.17	0.18
	Variance	Trees	0.066	0.021	0.042	0.066	0.11	0.14	0.11	0.084
	Variance ratio		0.64	0.21	0.41	0.64	1.07	1.33	1.03	0.82
	Variance	Herb	0.26	0.21	0.26	0.25	0.28	0.28	0.28	0.25
	Variance ratio		1.78	1.46	1.77	1.73	1.9	1.94	1.9	1.69
	Variance	Bare ground	0.26	0.21	0.26	0.25	0.26	0.26	0.26	0.24

Variable	Metric used	Measure	LPX	Lightn	Drying	Roots	Litter	bark thickness	LPX-Mv1-nr	LPX-Mv1-rs
Veg cover	Variance ratio		1.8	1.48	1.79	1.74	1.8	1.77	1.76	1.65
	Variance ratio	Phenology	0.062	0.014	0.041	0.06	0.11	0.13	0.099	0.11
	Variance ratio		0.2	0.043	0.13	0.19	0.33	0.41	0.32	0.33
	Variance ratio	Leaf type	0.051	0.01	0.033	0.052	0.092	0.12	0.093	0.1
	Variance ratio		0.15	0.029	0.094	0.15	0.26	0.33	0.27	0.29
	MM	Life Form	0.77*	0.96	0.79*	0.76*	0.59*	0.56*	0.59*	0.58*
		Trees	<i>0.16*</i>	<i>0.17*</i>	<i>0.17*</i>	<i>0.17*</i>	<i>0.17*</i>	<i>0.19*</i>	<i>0.17*</i>	<i>0.17*</i>
		Herb	0.66	0.77	0.67	0.65*	0.53*	0.52*	0.51*	0.51*
	Bare ground	0.72	0.95	0.73	0.71	0.49*	0.42*	0.51*	0.51*	
	Phenology	<i>0.29*</i>	<i>0.33*</i>	0.24*	<i>0.29*</i>	<i>0.61*</i>	0.81*	<i>0.72*</i>	<i>0.46*</i>	
	Leaf type	<i>0.51*</i>	1.01	<i>0.62*</i>	0.46*	0.34*	0.27*	0.15*	0.15*	
Fine NPP	Mean	Annual Average	628	112	192	180	177	176	181	202
	Mean ratio		2.67	0.5	0.85	0.8	0.78	0.80	0.82	0.90
	Variance		270	44.5	53.1	69.2	54.5	29.1	56.9	83.9
	Variance ratio		1.61	0.34	0.4	0.52	0.41	0.22	0.43	0.64
	NME S1	Annual average	2.62	0.96	0.79	0.78	0.82	1.13*	0.80*	0.73*
	NME S2		1.47	0.83	0.79	0.78	0.83	1.22*	0.79*	0.74*
	NME S3		0.97	0.91	1.01	0.89	1.01	2.00	0.99*	0.87*
height	Mean	Annual Average	0.5	0.2	0.29	0.5	0.84	1.03	0.39	0.63
	Mean ratio		0.056	0.022	0.033	0.057	0.096	0.12	0.045	0.072
	Variance		0.91	0.35	0.52	0.92	1.5	1.81	0.94	1.22
	Variance ratio		0.12	0.045	0.067	0.12	0.19	0.23	0.13	0.16
	NME S1	Annual average	1.07*	1.1*	1.09*	1.07*	1.02*	1.01*	1.08*	1.05*
	NME S2		<i>0.94*</i>	<i>0.98*</i>	<i>0.97*</i>	<i>0.94*</i>	0.91*	0.9*	0.96*	0.94*
	NME S3		1.25*	1.39	1.31*	1.26*	1.11*	1.08*	1.18*	1.13*

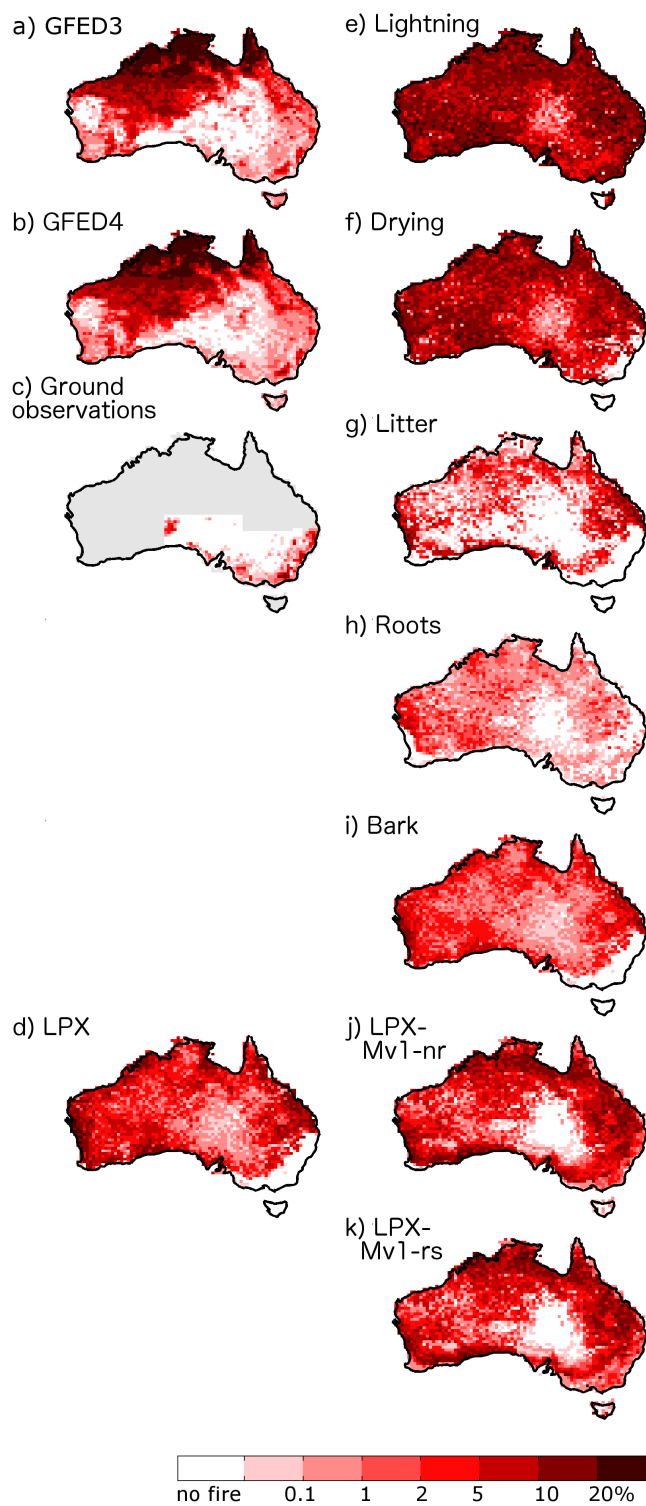


Figure S1. Annual average burnt area between 1997-2006 based on observations from (a) GFED3 (Giglio et al., 2010) ; b) GFED4 (Giglio et al., 2013); c) based on ground data (Bradstock, et al.

2014); and as simulated by d) LPX; and by each new parameterisation: e) lightning described in section 3.1 in the main text; f) fuel drying rates described in section 3.2; g) fuel decomposition rate in section 3.3; h) rooting depth in section 3.4; i) adaptive bark thickness in section 3.5; j) LPX-Mv1--nr; k) LPX-Mv1-rs.

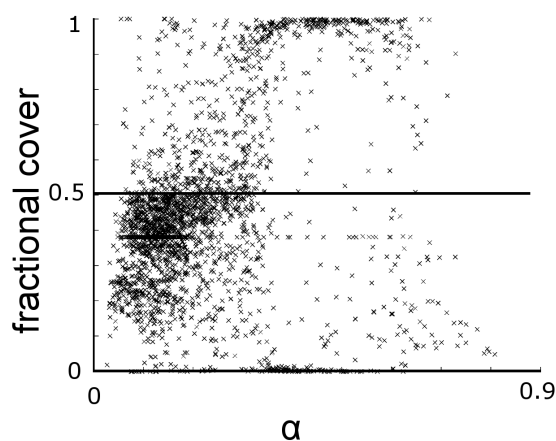


Figure S2. Comparison of the simulated abundance of resprouting (RS) tree PFTs and their non-resprouting (NR) equivalent PFTs along the climatic gradient in moisture, as measured by alpha (x-axis). Y-axis shows ratio of $RS/(RS+NR)$. Values >0.5 are when RS has a competitive advantage over NR and values <0.5 is when NR has a competitive advantage of RS.

Wet day lighting sensitivity analysis

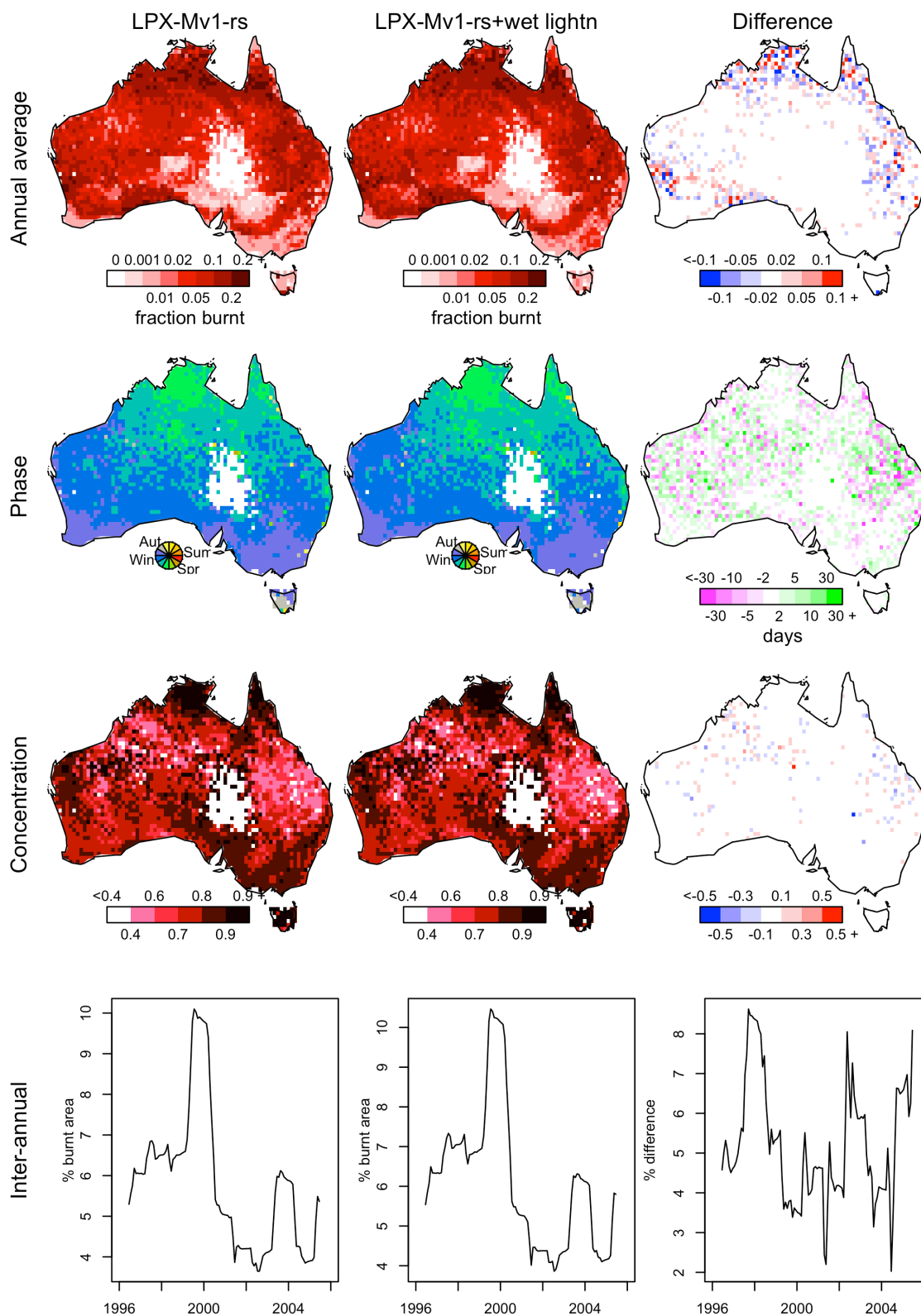


Figure S3. Impact of allowing lightning ignitions on wet days. The first column shows results from the standard LPX-Mv1-rs simulations, while the second column shows simulations when lightning is

allowed to occur on wet days. The third column shows the difference between the two simulations. We show annual average burnt area (first row), seasonal timing (phase) of the fire season (second row) and concentration of the fire season (third row). The final row shows inter-annual changes in burnt area for the whole of Australia.

Table S6. Comparison metric scores for LPX-Mv1-rs and LPX-v1-rs incorporating wet day lighting against burnt area observations taken from GFED4 (Giglio et al. 2013). Mean and variance rows show mean and variance of simulation for annual average burnt area, by the ratio of the mean/ variance with observed mean or variance. Numbers in bold indicates if the model performs better than the original LPX model. Italic indicates model scores better than the mean of the data score listed in Table S4. Asterisks indicate model scores that are significantly better than randomly resampling listed in Table S4. S1 are step 1 comparisons, S2 are step 2; and S3 are step 3. All metrics defined in Kelley et al. (2013).

Measure	Metric used	LPX-Mv1-rs	LPX-Mv1-rs
Annual Average	Mean	0.050	0.052
	Mean ratio	0.74	0.75
	Variance	0.041	0.042
	Variance ratio	0.53	0.55
Annual average	NME S1	0.88*	<i>0.90*</i>
	NME S2	0.93*	<i>0.94*</i>
	NME S3	1.09*	1.09*
Inter-annual variability	NME S2	0.90	0.90
	NME S3	1.25*	1.25*
Seasonal Conc.	NME S1	1.31*	1.30*
	NME S2	1.3*	1.3*
	NME S3	1.29*	1.29*
Phase	MPD	0.52	0.53

Derivation of parameter for grass in Eq. 36

Foliage Projected Cover (*FPC*) can be derived from the Normalised Difference Vegetation Index (*NDVI*) using the following relationship, described in full by Lu & Shuttleworth (2002) and Sellers et al. (1996):

$$FPC \approx LAI_{pft,max} \frac{fAPAR}{fAPAR_{max}} \quad (S1)$$

where:

$$fAPAR \approx \frac{(SR - SR_{pft,min})(fAPAR_{max} - fAPAR_{min})}{(SR_{pft,max} - SR_{pft,min})} \quad (S2)$$

$fAPAR_{max}$ and $fAPAR_{min}$ are the PFT-independent, maximum and minimum possible fraction of absorbed photosynthetic radiation ($fAPAR$), SR is the ‘Simple Ratio’ and $SR_{pft,min}$ and $SR_{pft,max}$ are PFT specific parameters. SR is related to $NDVI$ using the following relationship from Lu & Shuttleworth (2002):

$$SR = (1 + NDVI)/(1 - NDVI) \quad (S3)$$

Here, we are interested in the contribution of grass pfts to $NDVI$ compared to temperate broadleaf evergreen trees (tbe – denoted ‘tree’ in the following equations), the dominant tree pft in the study area. According to Sellers et al. (1996), $SR_{pft,min}$ is the same for tbe and grass. Re-arranging Eq. (S1) and (S2), we get:

$$P_{grass} = \frac{FPC_{grass}}{FPC_{tree}} \approx \frac{LAI_{grass,max}}{LAI_{tree,max}} \frac{(SR_{tree,max} - SR_{min})}{(SR_{grass,max} - SR_{min})} \quad (S4)$$

Using the parameters for biome 1 (tbe) for wood and biome 6-other and 9 (C_3/C_4 grass and cropland) for grass from Sellers et al. (1996) in Eq. (S3) and (S4), we obtain the value of 0.32 used in Eq. 36 in the main manuscript.

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