

Supplementary Material

Appendix S1. List of New Zealand fern species for which data were compiled. Biostatus was one of three categories: endemic (e), native (n) or introduced (i). Conservation Status from de Lange et al. (2013) unless otherwise stated as NZPCN (New Zealand Plant Conservation Network: <http://www.nzpcn.org.nz/>, accessed 6 May 2014). Lower sections show species classed as “casuals”, and species which occurred only on outlying islands and were not included in this study. The symbol ‘-’ indicates that data on conservation status were unavailable. * *Asplenium decurrens* is a recent name change from *A. northlandicum* (Brownsey & Perrie 2016a). ** *Hymenophyllum nephrophyllum* is a recent name change from *Cardiomanes reniforme* (Brownsey & Perrie 2016b).

Species	Biostatus	Conservation Status	Family
<i>Adiantum aethiopicum</i>	n	Not threatened	PTERIDACEAE
<i>Adiantum capillus-veneris</i>	i	-	PTERIDACEAE
<i>Adiantum cunninghamii</i>	e	Not threatened	PTERIDACEAE
<i>Adiantum diaphanum</i>	n	Not threatened	PTERIDACEAE
<i>Adiantum formosum</i>	n	At risk, declining	PTERIDACEAE
<i>Adiantum fulvum</i>	e	Not threatened	PTERIDACEAE
<i>Adiantum hispidulum</i>	n	Not threatened	PTERIDACEAE
<i>Adiantum raddianum</i>	i	-	PTERIDACEAE
<i>Adiantum viridescens</i>	e	Not threatened	PTERIDACEAE
<i>Anogramma leptophylla</i>	n	Threatened, nationally vulnerable	PTERIDACEAE
<i>Arthropteris tenella</i>	n	Not threatened	TECTARIACEAE
<i>Asplenium appendiculatum</i> subsp. <i>appendiculatum</i>	e	Not threatened	ASPENIACEAE
<i>Asplenium appendiculatum</i> subsp. <i>maritimum</i>	n	Not threatened	ASPENIACEAE
<i>Asplenium bulbiferum</i>	e	Not threatened	ASPENIACEAE
<i>Asplenium cimmericum</i>	e	At risk, naturally uncommon	ASPENIACEAE
<i>Asplenium flabellifolium</i>	n	Not threatened	ASPENIACEAE
<i>Asplenium flaccidum</i>	n	Not threatened	ASPENIACEAE
<i>Asplenium flaccidum</i> subsp. <i>aurakiense</i>	e	Not threatened	ASPENIACEAE
<i>Asplenium gracillimum</i>	n	Not threatened	ASPENIACEAE
<i>Asplenium hookerianum</i>	n	Not threatened	ASPENIACEAE
<i>Asplenium lamprophyllum</i>	e	Not threatened	ASPENIACEAE
<i>Asplenium lyallii</i>	e	Not threatened	ASPENIACEAE
<i>Asplenium decurrens</i> *	n	Not threatened	ASPENIACEAE
<i>Asplenium oblongifolium</i>	e	Not threatened	ASPENIACEAE
<i>Asplenium obtusatum</i>	n	Not threatened	ASPENIACEAE
<i>Asplenium polyodon</i>	n	Not threatened	ASPENIACEAE
<i>Asplenium richardii</i>	e	Not threatened	ASPENIACEAE
<i>Asplenium scleroprium</i>	e	At risk, naturally uncommon	ASPENIACEAE
<i>Asplenium trichomanes</i>	n	Not threatened	ASPENIACEAE
<i>Athyrium filix-femina</i>	i	-	ATHYRIACEAE
<i>Azolla pinnata</i>	i	-	SALVINIACEAE
<i>Azolla rubra</i>	n	Not threatened	SALVINIACEAE
<i>Blechnum blechnoides</i>	n	Not threatened	BLECHNACEAE
<i>Blechnum chambersii</i>	n	Not threatened	BLECHNACEAE
<i>Blechnum colensoi</i>	e	Not threatened	BLECHNACEAE
<i>Blechnum discolor</i>	e	Not threatened	BLECHNACEAE
<i>Blechnum durum</i>	e	Not threatened	BLECHNACEAE
<i>Blechnum filiforme</i>	e	Not threatened	BLECHNACEAE
<i>Blechnum fluviatile</i>	n	Not threatened	BLECHNACEAE
<i>Blechnum fraseri</i>	n	Not threatened	BLECHNACEAE
<i>Blechnum membranaceum</i>	e	Not threatened	BLECHNACEAE
<i>Blechnum minus</i>	n	Not threatened	BLECHNACEAE
<i>Blechnum molle</i>	e	At risk, naturally uncommon (NZPCN)	BLECHNACEAE
<i>Blechnum montanum</i>	e	Not threatened	BLECHNACEAE
<i>Blechnum nigrum</i>	e	Not threatened	BLECHNACEAE
<i>Blechnum norfolkianum</i>	n	At risk, naturally uncommon	BLECHNACEAE
<i>Blechnum novae-zealandiae</i>	e	Not threatened	BLECHNACEAE
<i>Blechnum parrisiae</i>	n	No information found	BLECHNACEAE
<i>Blechnum penna-marina</i>	n	Not threatened	BLECHNACEAE
<i>Blechnum procerum</i>	e	Not threatened	BLECHNACEAE
<i>Blechnum triangularifolium</i>	e	Not threatened	BLECHNACEAE
<i>Blechnum vulcanicum</i>	n	Not threatened	BLECHNACEAE
<i>Blechnum zealandicum</i>	e	At risk, naturally uncommon (NZPCN)	BLECHNACEAE
<i>Botrychium australe</i>	n	At risk, naturally uncommon	OPHIOGLOSSACEAE
<i>Botrychium bifforme</i>	e	Not threatened	OPHIOGLOSSACEAE
<i>Botrychium lunaria</i>	n	Threatened, nationally critical	OPHIOGLOSSACEAE
<i>Cheilanthes distans</i>	n	Not threatened	PTERIDACEAE
<i>Cheilanthes sieberi</i>	n	Not threatened	PTERIDACEAE
<i>Christella dentata</i>	n	At risk, naturally uncommon	THELYPTERIDACEAE

Appendix S1. Continued.

Species	Biostatus	Conservation Status	Family
<i>Cyathea colensoi</i>	e	Not threatened	CYATHEACEAE
<i>Cyathea cunninghamii</i>	n	Not threatened	CYATHEACEAE
<i>Cyathea dealbata</i>		Not threatened	CYATHEACEAE
<i>Cyathea medullaris</i>	n	Not threatened	CYATHEACEAE
<i>Cyathea smithii</i>	e	Not threatened	CYATHEACEAE
<i>Cyclosorus interruptus</i>	n	At risk, declining	THELYPTERIDACEAE
<i>Cyrtomium falcatum</i>	i	-	DRYOPTERIDACEAE
<i>Cystopteris fragilis</i>	i	-	CYSTOPTERIDACEAE
<i>Cystopteris tasmanica</i>	n	Not threatened	CYSTOPTERIDACEAE
<i>Davallia tasmanii</i> subsp. <i>crystata</i>	e	Threatened, nationally critical.	DAVALLIACEAE
<i>Davallia tasmanii</i> subsp. <i>tasmanii</i>	e	At risk, naturally uncommon.	DAVALLIACEAE
<i>Deparia petersenii</i>	n	Not threatened	ATHYRIACEAE
<i>Deparia tenuifolia</i>	e	Not listed	ATHYRIACEAE
<i>Dicksonia fibrosa</i>	e	Not threatened	DICKSONIACEAE
<i>Dicksonia lanata</i> subsp. <i>hispida</i>	e	Not threatened	DICKSONIACEAE
<i>Dicksonia lanata</i> subsp. <i>lanata</i>	e	Not threatened	DICKSONIACEAE
<i>Dicksonia squarrosa</i>	e	Not threatened	DICKSONIACEAE
<i>Dicranopteris linearis</i>	n	At risk, naturally uncommon	GLEICHENIACEAE
<i>Diplazium australe</i>	n	Not threatened	ATHYRIACEAE
<i>Dryopteris affinis</i>	i	-	DRYOPTERIDACEAE
<i>Dryopteris dilatata</i>	i	-	DRYOPTERIDACEAE
<i>Dryopteris filix-mas</i>	i	-	DRYOPTERIDACEAE
<i>Equisetum arvense</i>	i	-	EQUISETACEAE
<i>Gleichenia alpina</i>	n	Not threatened	GLEICHENIACEAE
<i>Gleichenia dicarpa</i>	n	Not threatened	GLEICHENIACEAE
<i>Gleichenia inclusisora</i>	e	At risk, naturally uncommon	GLEICHENIACEAE
<i>Gleichenia microphylla</i>	n	Not threatened	GLEICHENIACEAE
<i>Histiopteris incisa</i>	n	Not threatened	DENNSTAEDTIACEAE
<i>Huperzia australiana</i>	n	Not threatened	LYCOPODIACEAE
<i>Huperzia varia</i>	n	Not threatened	LYCOPODIACEAE
<i>Hymenophyllum armstrongii</i>	e	Not threatened	HYMENOPHYLLACEAE
<i>Hymenophyllum atrovirens</i>	n	At risk, naturally uncommon	HYMENOPHYLLACEAE
<i>Hymenophyllum bivalve</i>	n	Not threatened	HYMENOPHYLLACEAE
<i>Hymenophyllum cupressiforme</i>	n	Not threatened	HYMENOPHYLLACEAE
<i>Hymenophyllum demissum</i>	e	Not threatened	HYMENOPHYLLACEAE
<i>Hymenophyllum dilatatum</i>	e	Not threatened	HYMENOPHYLLACEAE
<i>Hymenophyllum flabellatum</i>	n	Not threatened	HYMENOPHYLLACEAE
<i>Hymenophyllum flexuosum</i>	e	Not threatened	HYMENOPHYLLACEAE
<i>Hymenophyllum frankliniae</i>	n	Not threatened	HYMENOPHYLLACEAE
<i>Hymenophyllum lyallii</i>	n	Not threatened	HYMENOPHYLLACEAE
<i>Hymenophyllum malingii</i>	e	Not threatened	HYMENOPHYLLACEAE
<i>Hymenophyllum minimum</i>	e	Not threatened	HYMENOPHYLLACEAE
<i>Hymenophyllum multifidum</i>	n	Not threatened	HYMENOPHYLLACEAE
<i>Hymenophyllum nephrophyllum</i> **	e	Not threatened	HYMENOPHYLLACEAE
<i>Hymenophyllum peltatum</i>	n	Not threatened	HYMENOPHYLLACEAE
<i>Hymenophyllum pluviatile</i>	e	At risk, naturally uncommon (NZPCN)	HYMENOPHYLLACEAE
<i>Hymenophyllum pulcherrimum</i>	e	Not threatened	HYMENOPHYLLACEAE
<i>Hymenophyllum rarum</i>	n	Not threatened	HYMENOPHYLLACEAE
<i>Hymenophyllum revolutum</i>	e	Not threatened	HYMENOPHYLLACEAE
<i>Hymenophyllum rufescens</i>	e	Not threatened	HYMENOPHYLLACEAE
<i>Hymenophyllum sanguinolentum</i>	n	Not threatened	HYMENOPHYLLACEAE
<i>Hymenophyllum scabrum</i>	e	Not threatened	HYMENOPHYLLACEAE
<i>Hymenophyllum villosum</i>	e	Not threatened	HYMENOPHYLLACEAE
<i>Hypolepis amaurorachis</i>	n	At risk, naturally uncommon	DENNSTAEDTIACEAE
<i>Hypolepis ambigua</i>	e	Not threatened	DENNSTAEDTIACEAE
<i>Hypolepis dicksonioides</i>	n	At risk, naturally uncommon	DENNSTAEDTIACEAE
<i>Hypolepis distans</i>	n	Not threatened	DENNSTAEDTIACEAE
<i>Hypolepis lactea</i>	e	Not threatened	DENNSTAEDTIACEAE
<i>Hypolepis millefolium</i>	e	Not threatened	DENNSTAEDTIACEAE
<i>Hypolepis rufobarbata</i>	e	Not threatened	DENNSTAEDTIACEAE
<i>Isoetes alpina</i>	e	Not threatened	ISOETACEAE
<i>Isoetes kirkii</i>	e	At risk, declining	ISOETACEAE
<i>Lastreopsis glabella</i>	e	Not threatened	DRYOPTERIDACEAE
<i>Lastreopsis hispida</i>	n	Not threatened	DRYOPTERIDACEAE
<i>Lastreopsis microsora</i>	n	Not threatened	DRYOPTERIDACEAE
<i>Lastreopsis velutina</i>	e	Not threatened	DRYOPTERIDACEAE
<i>Leptolepia novae-zelandiae</i>	e	Not threatened	DENNSTAEDTIACEAE
<i>Leptopteris hymenophylloides</i>	e	Not threatened	OSMUNDACEAE
<i>Leptopteris superba</i>	e	Not threatened	OSMUNDACEAE

Appendix S1. Continued.

Species	Biostatus	Conservation Status	Family
<i>Lindsaea linearis</i>	n	Not threatened	LINDSAEACEAE
<i>Lindsaea trichomanoides</i>	n	Not threatened	LINDSAEACEAE
<i>Lindsaea viridis</i>	e	At risk, naturally uncommon	LINDSAEACEAE
<i>Loxogramme dictyopteris</i>	e	Not threatened	POLYPODIACEAE
<i>Loxsoma cunninghamii</i>	e	Not threatened	LOXSOMATACEAE
<i>Lycopodiella cernua</i>	n	Not threatened	LYCOPODIACEAE
<i>Lycopodiella diffusa</i>	n	Not threatened	LYCOPODIACEAE
<i>Lycopodiella lateralis</i>	n	Not threatened	LYCOPODIACEAE
<i>Lycopodiella serpentina</i>	n	Threatened, nationally endangered	LYCOPODIACEAE
<i>Lycopodium deuterodensum</i>	n	Not threatened	LYCOPODIACEAE
<i>Lycopodium fastigiatum</i>	n	Not threatened	LYCOPODIACEAE
<i>Lycopodium scariosum</i>	n	Not threatened	LYCOPODIACEAE
<i>Lycopodium volubile</i>	n	Not threatened	LYCOPODIACEAE
<i>Lygodium articulatum</i>	e	Not threatened	LYGODIACEAE
<i>Macrothelypteris torresiana</i>	n	At risk, naturally uncommon	THELYPTERIDACEAE
<i>Microsorium novae-zealandiae</i>	e	Not threatened	POLYPODIACEAE
<i>Microsorium pustulatum</i>	n	Not threatened	POLYPODIACEAE
<i>Microsorium scandens</i>	n	Not threatened	POLYPODIACEAE
<i>Nephrolepis cordifolia</i>	i	-	LOMARIOPSIDACEAE
<i>Nephrolepis flexuosa</i>	n	At risk, declining	LOMARIOPSIDACEAE
<i>Notogrammitis angustifolia</i> subsp. <i>angustifolia</i>	n	Not threatened	POLYPODIACEAE
<i>Notogrammitis angustifolia</i> subsp. <i>nothofageti</i>	n	Not threatened	POLYPODIACEAE
<i>Notogrammitis billardierei</i>	n	Not threatened	POLYPODIACEAE
<i>Notogrammitis ciliata</i>	e	Not threatened	POLYPODIACEAE
<i>Notogrammitis crassior</i>	n	Not threatened	POLYPODIACEAE
<i>Notogrammitis givenii</i>	e	Not threatened	POLYPODIACEAE
<i>Notogrammitis heterophylla</i>	n	Not threatened	POLYPODIACEAE
<i>Notogrammitis patagonica</i>	n	Not threatened	POLYPODIACEAE
<i>Notogrammitis pseudociliata</i>	n	Not threatened	POLYPODIACEAE
<i>Notogrammitis rawlingsii</i>	e	At risk, naturally uncommon	POLYPODIACEAE
<i>Notogrammitis rigida</i>	e	At risk, naturally uncommon	POLYPODIACEAE
<i>Ophioglossum coriaceum</i>	n	Not threatened	OPHIOGLOSSACEAE
<i>Ophioglossum petiolatum</i>	n	Threatened, nationally critical	OPHIOGLOSSACEAE
<i>Osmunda regalis</i>	i	-	OSMUNDACEAE
<i>Paesia scaberula</i>	e	Not threatened	DENNSTAEDTIACEAE
<i>Pellaea calidirupium</i>	n	Not threatened	PTERIDACEAE
<i>Pellaea falcata</i>	n	At risk, declining	PTERIDACEAE
<i>Pellaea rotundifolia</i>	e	Not threatened	PTERIDACEAE
<i>Phyllitis scolopendrium</i>	i	-	ASPENIACEAE
<i>Phylloglossum drummondii</i>	n	Threatened, nationally critical	LYCOPODIACEAE
<i>Pilularia novae-hollandiae</i>	n	Not threatened	MARSILEACEAE
<i>Pleurosorus rutifolius</i>	n	At risk, naturally uncommon	ASPENIACEAE
<i>Pneumatopteris pennigera</i>	n	Not threatened	THELYPTERIDACEAE
<i>Polypodium vulgare</i>	i	-	POLYPODIACEAE
<i>Polystichum cystostegia</i>	e	Not threatened	DRYOPTERIDACEAE
<i>Polystichum neozelandicum</i> subsp. <i>neozelandicum</i>	e	Not threatened	DRYOPTERIDACEAE
<i>Polystichum neozelandicum</i> subsp. <i>zerophyllum</i>	e	Not threatened	DRYOPTERIDACEAE
<i>Polystichum oculatum</i>	e	Not threatened	DRYOPTERIDACEAE
<i>Polystichum proliferum</i>	i	-	DRYOPTERIDACEAE
<i>Polystichum silvaticum</i>	e	Not threatened	DRYOPTERIDACEAE
<i>Polystichum vestitum</i>	e	Not threatened	DRYOPTERIDACEAE
<i>Polystichum wawranum</i>	e	Not threatened	DRYOPTERIDACEAE
<i>Psilotum nudum</i>	n	Not threatened	PSILOTACEAE
<i>Pteridium esculentum</i>	n	Not threatened	DENNSTAEDTIACEAE
<i>Pteris comans</i>	n	Not threatened	PTERIDACEAE
<i>Pteris cretica</i>	i	-	PTERIDACEAE
<i>Pteris macilenta</i>	e	Not threatened	PTERIDACEAE
<i>Pteris saxatilis</i>	e	Not threatened	PTERIDACEAE
<i>Pteris tremula</i>	n	Not threatened	PTERIDACEAE
<i>Pteris vittata</i>	i	Recently naturalised	PTERIDACEAE
<i>Ptisana salicina</i>	n	At risk, declining	MARATTIACEAE
<i>Pyrrosia eleagnifolia</i>	e	Not threatened	POLYPODIACEAE
<i>Rumohra adiantiformis</i>	n	Not threatened	DRYOPTERIDACEAE
<i>Salvinia molesta</i>	i	-	SALVINIACEAE
<i>Schizaea australis</i>	n	Not threatened	SCHIZAEACEAE
<i>Schizaea bifida</i>	n	Not threatened	SCHIZAEACEAE
<i>Schizaea dichotoma</i>	n	At risk, naturally uncommon	SCHIZAEACEAE
<i>Schizaea fistulosa</i>	n	Not threatened	SCHIZAEACEAE
<i>Selaginella kraussiana</i>	i	-	SELAGINELLACEAE
<i>Sticherus cunninghamii</i>	e	Not threatened	GLEICHENIACEAE

Appendix S1. Continued.

Species	Biostatus	Conservation Status	Family
<i>Sticherus flabellatus</i>	n	Not threatened	GLEICHENIACEAE
<i>Sticherus tener</i>	n	Threatened, nationally critical	GLEICHENIACEAE
<i>Sticherus urceolatus</i>	n	Threatened, nationally critical	GLEICHENIACEAE
<i>Thelypteris confluens</i>	n	At risk, naturally uncommon	THELYPTERIDACEAE
<i>Tmesipteris elongata</i>	n	Not threatened	PSILOTACEAE
<i>Tmesipteris horomaka</i>	e	Threatened, nationally critical	PSILOTACEAE
<i>Tmesipteris lanceolata</i>	n	Not threatened	PSILOTACEAE
<i>Tmesipteris sigmatifolia</i>	n	Not threatened	PSILOTACEAE
<i>Tmesipteris tannensis</i>	e	Not threatened	PSILOTACEAE
<i>Todea barbara</i>	n	Threatened, nationally endangered	OSMUNDACEAE
<i>Trichomanes colensoi</i>	e	At risk, naturally uncommon	HYMENOPHYLLACEAE
<i>Trichomanes elongatum</i>	e	Not threatened	HYMENOPHYLLACEAE
<i>Trichomanes endlicherianum</i>	n	Not threatened	HYMENOPHYLLACEAE
<i>Trichomanes strictum</i>	e	Not threatened	HYMENOPHYLLACEAE
<i>Trichomanes venosum</i>	n	Not threatened	HYMENOPHYLLACEAE
“Casual” species			
<i>Asplenium aethiopicum</i>	i	-	ASPENIACEAE
<i>Athyrium otophorum</i>	i	-	ATHYRIACEAE
<i>Blechnum neohollandicum</i>	n	Non-resident native, vagrant	BLECHNACEAE
<i>Blechnum punctulatum</i>	i	-	BLECHNACEAE
<i>Cheilanthes lendigera</i>	i	-	PTERIDACEAE
<i>Cyathea cooperi</i>	i	-	CYATHEACEAE
<i>Davallia griffithiana</i>	i	-	DAVALLIACEAE
<i>Davallia mariesii</i>	i	-	DAVALLIACEAE
<i>Dennstaedtia davallioides</i>	i	-	DENNSTAEDTIACEAE
<i>Dryopteris carthusiana</i>	i	-	DRYOPTERIDACEAE
<i>Dryopteris cycadina</i>	i	-	DRYOPTERIDACEAE
<i>Dryopteris erythrosora</i>	i	-	DRYOPTERIDACEAE
<i>Dryopteris inaequalis</i>	i	-	DRYOPTERIDACEAE
<i>Dryopteris kinkiensis</i>	i	-	DRYOPTERIDACEAE
<i>Dryopteris sieboldii</i>	i	-	DRYOPTERIDACEAE
<i>Dryopteris stewartii</i>	i	-	DRYOPTERIDACEAE
<i>Equisetum fluviatile</i>	i	-	EQUISETACEAE
<i>Equisetum hyemale</i>	i	-	EQUISETACEAE
<i>Marsilea mutica</i>	i	-	MARSILEACEAE
<i>Microlepia strigosa</i>	i	-	DENNSTAEDTIACEAE
<i>Niphidium crassifolium</i>	i	-	POLYPODIACEAE
<i>Odontosoria chinensis</i>	i	-	LINDSAEACEAE
<i>Onoclea sensibilis</i>	i	-	ONOCLEACEAE
<i>Pellaea viridis</i>	i	-	PTERIDACEAE
<i>Platycterium bifurcatum</i>	i	-	POLYPODIACEAE
<i>Polystichum lentum</i>	i	-	DRYOPTERIDACEAE
<i>Polystichum polyblepharum</i>	i	-	DRYOPTERIDACEAE
<i>Polystichum setiferum</i>	i	-	DRYOPTERIDACEAE
<i>Pteris dentata</i>	i	-	PTERIDACEAE
<i>Pteris pacifica</i>	i	-	PTERIDACEAE
<i>Selaginella martensii</i>	i	-	SELAGINELLACEAE
<i>Selaginella moellendorffii</i>	i	-	SELAGINELLACEAE
Species which occur only on offshore islands or are data deficient - not included in this study			
<i>Arachniodes aristata</i>	n	At risk, naturally uncommon	DRYOPTERIDACEAE
<i>Asplenium chathamense</i>	e	At risk, naturally uncommon	ASPENIACEAE
<i>Asplenium pauperequitum</i>	e	Threatened, nationally endangered	ASPENIACEAE
<i>Asplenium shuttleworthianum</i>	n	At risk, naturally uncommon	ASPENIACEAE
<i>Blechnum kermadecense</i>	e	At risk, naturally uncommon (NZPCN)	BLECHNACEAE
<i>Cyathea kermadecensis</i>	e	At risk, naturally uncommon	CYATHEACEAE
<i>Cyathea milnei</i>	e	At risk, naturally uncommon	CYATHEACEAE
<i>Lastreopsis kermadecensis</i>	e	At risk, naturally uncommon	DRYOPTERIDACEAE
<i>Nephrolepis brownii</i>	n	At risk, naturally uncommon	LOMARIOPSIDACEAE
<i>Notogrammitis gunnii</i>	n	Data deficient	POLYPODIACEAE

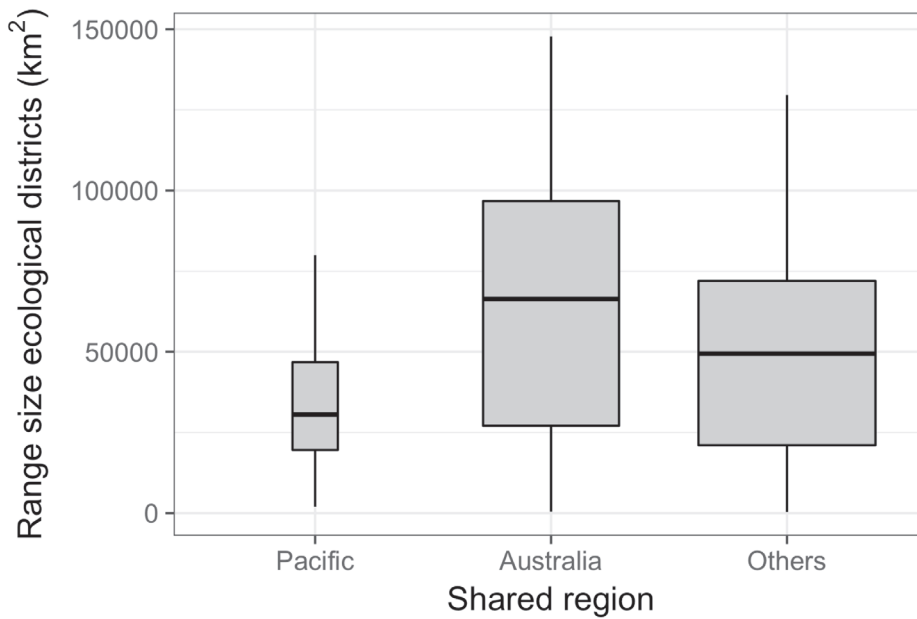
Appendix S2. Descriptions of fern traits and characteristics used in this paper.

Variable	Type of variable	Levels or units	Explanation
Chromosomes			
Ploidy	Categorical	0,1	Polyploids are known to occur (1) or not (0)
Reproduction			
Spore colour	Categorical	0,1	Brown (0) or green (1) (chlorophyllous) spores
Heterospory	Categorical	0,1	Heterosporous (1) or homosporous (0)
Dimorphism	Categorical	0,1	Separate sterile and fertile lamina (1) or only one type of lamina (0)
Indusium	Categorical	0,1	Indusium present (1) or absent (0)
Morphology			
Plant size	Continuous	cm	Maximum stipe length + maximum lamina length
Mean lamina area	Continuous	cm ²	Calculated by assuming an oval shape to calculate area using lamina length and width dimensions
Rhizome and trunk structures			
Rhizome/trunk type	Categorical	1,2,3	Climbing and either long or short creeping (1), erect or short woody (2), tall woody i.e. tree ferns (3)
Habitat			
Specialists	Categorical	0,1	Habitat specialist (1) or generalist (0)
Habitat types			
Forest	Categorical	0,1	Occurs in forest habitat
Open	Categorical	0,1	Occurs in open habitat
Terrestrial	Categorical	0,1	Occurs in terrestrial habitat
Epiphytic	Categorical	0,1	Known to occur epiphytically
Rupestal	Categorical	0,1	Prefers rocky habitat
Distribution			
Global regions	Count	0 - 7	Number of global regions (Australia, Pacific, Africa, North America, South America, Asia, Europe)
Altitudinal zones	Count	1 - 5	Number of the 5 altitudinal zones the species occurs in: Coastal, lowland, montane, subalpine and alpine
Biostatus			
Biostatus	Categorical	n,i,e	Native (n; not endemic), introduced (i), endemic (e)
Years since naturalised	Discrete	years	2014 minus the recorded year naturalised

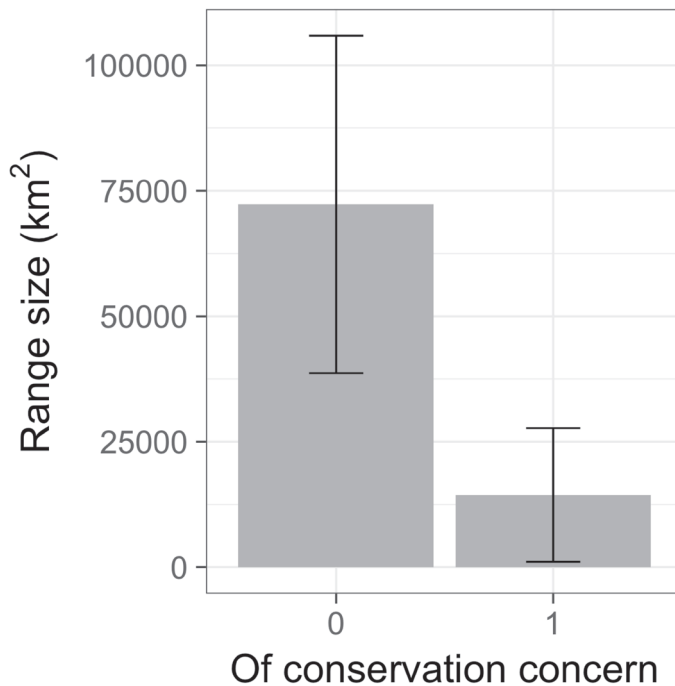
Appendix S3. Linear mixed effects model AICc model comparison statistics showing the relationships between fern range sizes and species' traits, distribution variables and biostatus for 212 species. Delta AICc (Δ AICc) and AICc weights (AICcWt) were calculated in comparison to all other models in the set and an intercept-only model. The number of model parameters (K), the log likelihood of the model fitting the data better than the other models (LL), the variance explained by the fixed effects alone (R^2 fixed) and the fixed and random effects combined (R^2 total) are given.

Model	K	AICc	Δ AICc	AICcWt	Log Lik	R^2 fixed	R^2 total
Full	20	5020.77	0.00	1.00	-2488.19	0.37	0.39
Distribution	6	5031.42	10.64	0.00	-2509.50	0.23	0.25
Habitat	10	5044.85	24.07	0.00	-2511.88	0.21	0.27
Biostatus	6	5066.44	45.66	0.00	-2527.01	0.08	0.11
Intercept-only	4	5079.68	58.91	0.00	-2535.75	0.00	0.08
Trait	11	5080.64	59.89	0.00	-2528.66	0.08	0.10

Appendix S4. Boxplot showing the median and variability in range size measured as area of ecological districts occupied for native species shared only with countries in the Pacific ($n = 4$), only with Australia ($n = 36$), and those shared with other global regions and/or with more than one region ($n = 61$). Box width is proportional to the number of species.

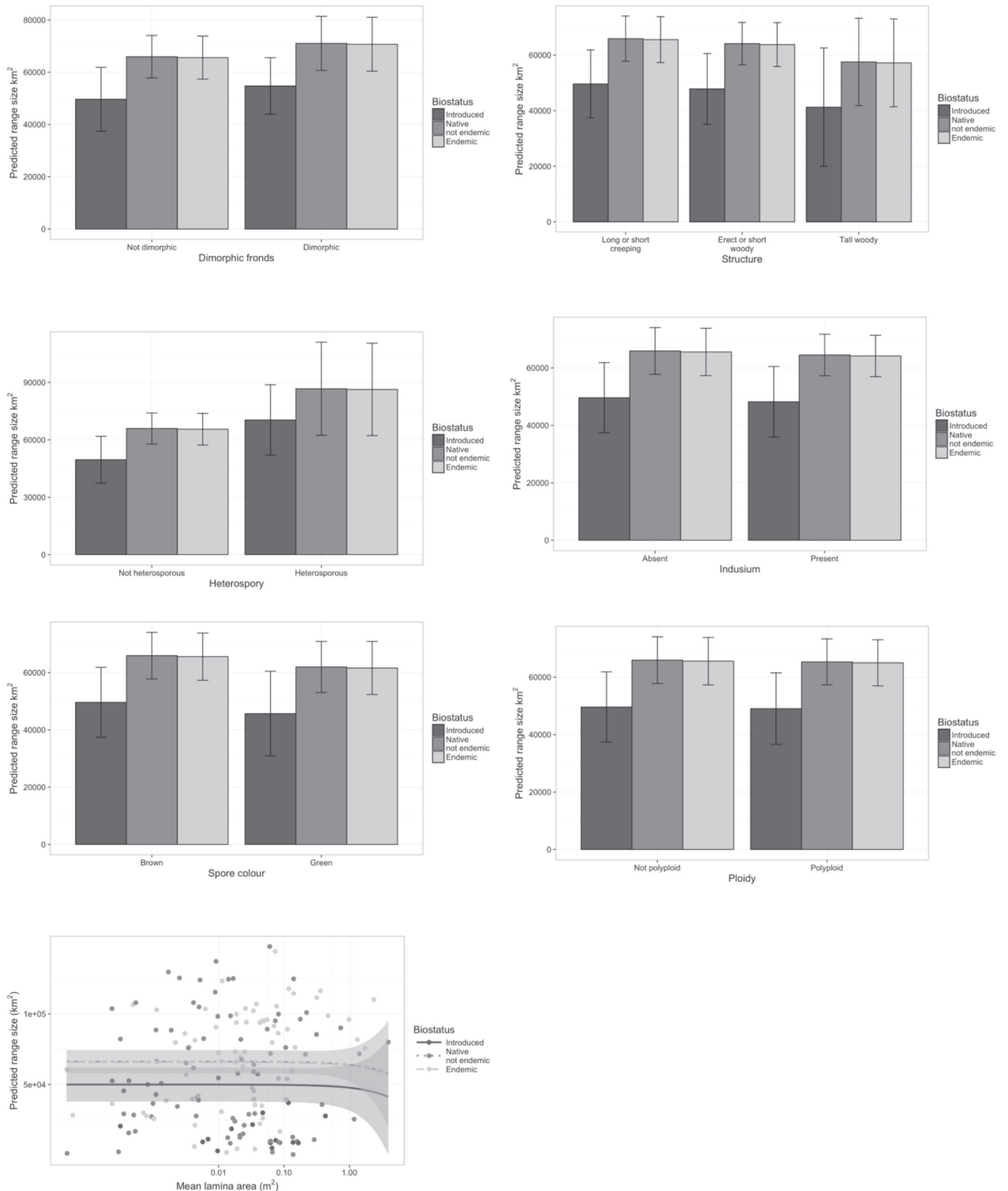


Appendix S5. Bargraph showing the mean range size (\pm standard deviation) for endemic and native species New Zealand fern species classed as 'Of conservation concern' (1; $N = 47$) or not (0; $N = 154$). Species of conservation concern belong to one of the following categories: At risk, declining ($N = 6$); At risk, naturally uncommon ($N = 30$); Threatened, nationally vulnerable ($N = 1$); Threatened, nationally endangered ($N = 3$); Threatened, nationally critical ($N = 7$). The conservation status of fourteen species was unknown or not applicable, e.g., data deficient species. Range size was measured as the area of ecological districts occupied by a species.

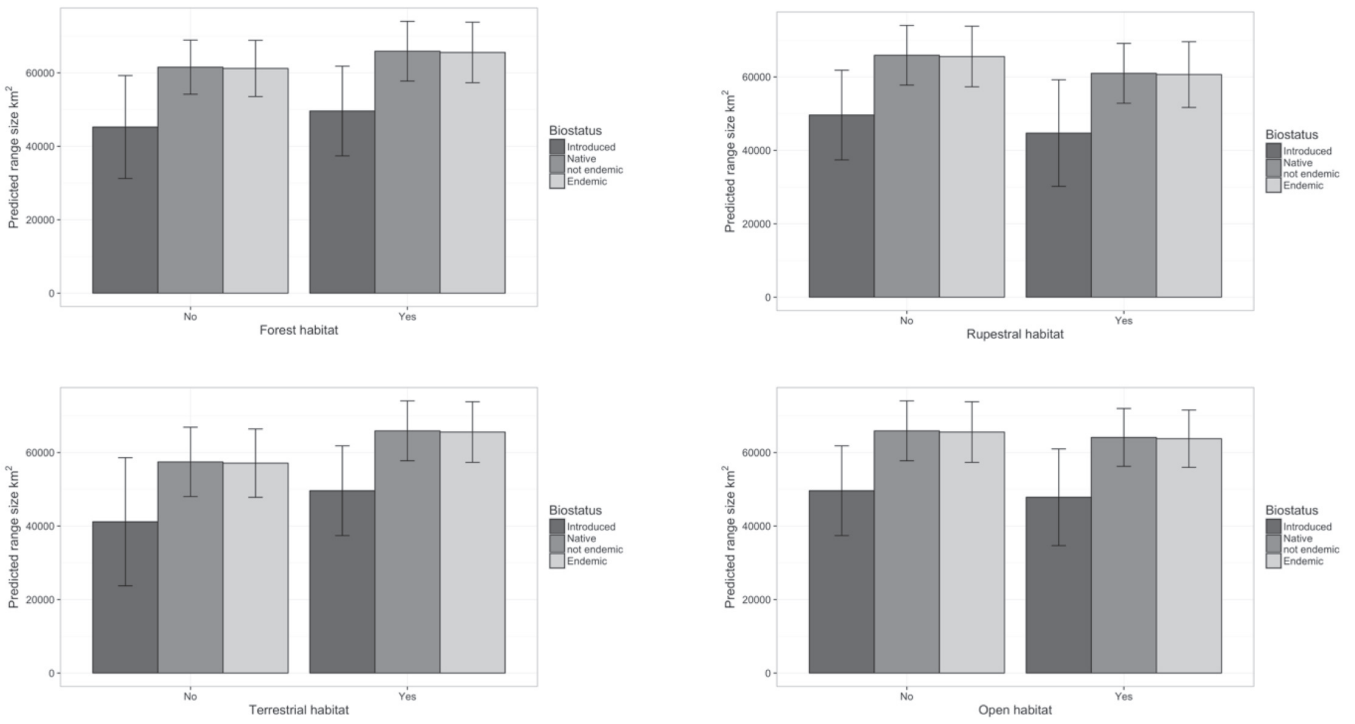


Appendix S6. Predicted relationships for unimportant variables included in the full model for the range sizes of 165 species. Model average predictions and their standard errors representing the effects of model sets (A) traits, (B) habitat, (C) distribution and (D) biostatus on range size (area of ecological districts occupied) for 165 New Zealand fern species. The three species with the largest fronds were: *Cyathea dealbata*, *Ptisana salicina* and *Cyathea medullaris*.

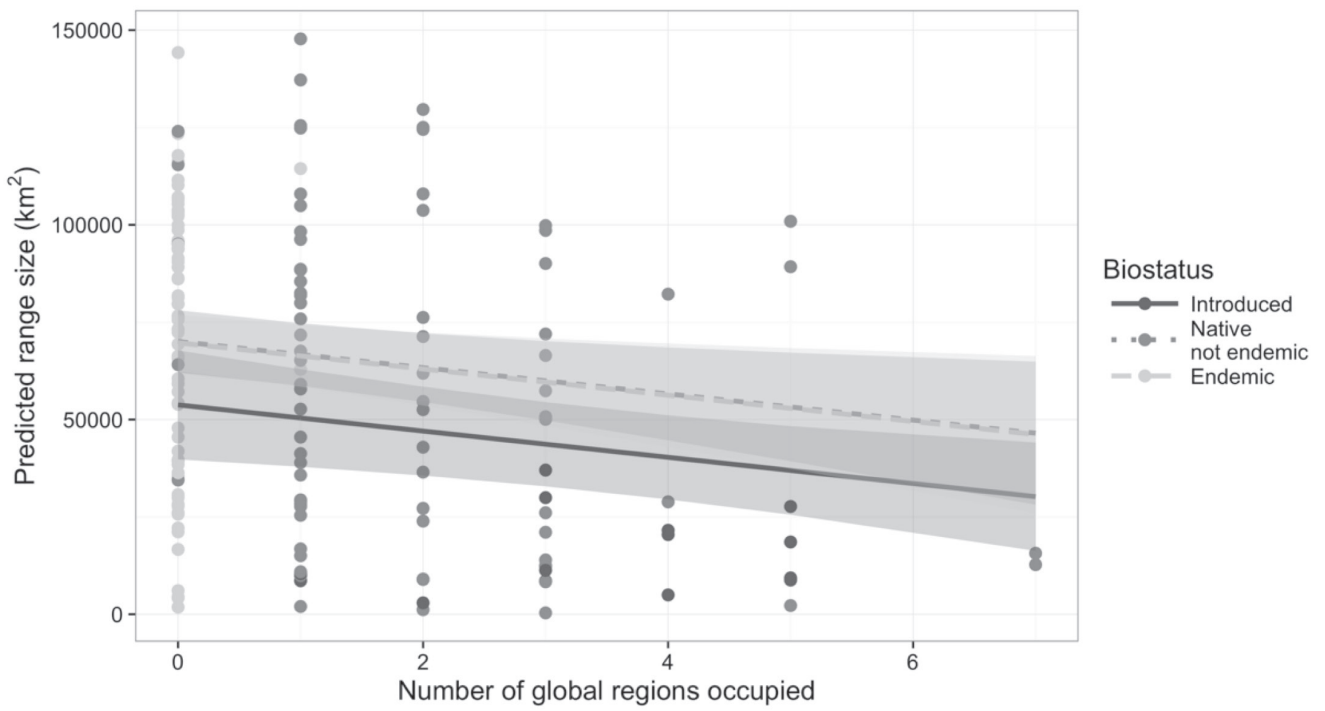
a. Traits



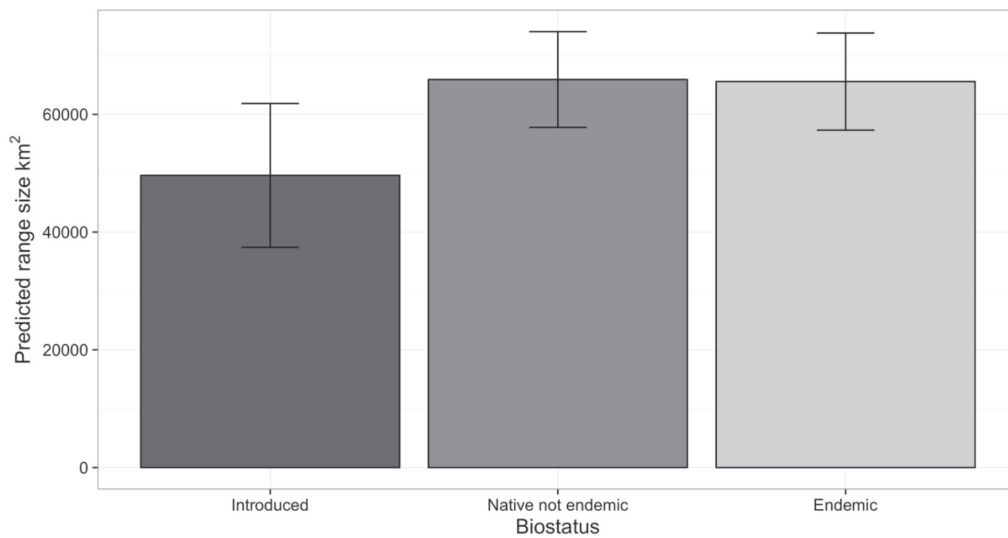
b. Habitat



c. Distribution



d. Biostatus



References

- Brownsey PJ, Perrie LR 2016a. *Asplenium decurrens* Willd., an earlier name for *A. northlandicum* (Brownsey) Ogle. *New Zealand Journal of Botany* 54: 515–519.
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