Consequences of climate change for conserving leafy vegetable CWR in Europe CCLEAFY

Appendices to the Activity Report

APPENDICES

Appendix 1. Overview of the lettuce genepool and the native distribution area of the crop wild relatives.

Species	Europe	Asia	Africa	N-America
Primary genepool				
Lactuca sativa L.				
Lactuca aculeata Boiss. & Kotschy		ARM; IRN; IRQ; ISR; JOR; SYR; TUR		
Lactuca altaica Fisch. & C.A. Mey.	RUS	CHN; KAZ; KGZ; TJK; TKM; RUS		
Lactuca azerbaijanica Rech f.		IRN		
Lactuca dregeana DC.			ZAF	
Lactuca georgica Grossh.		ARM; AZE; GEO; RUS; TKM; TUR		
Lactuca scarioloides Boiss.		AFG; IRN; IRQ; TUR		
Lactuca serriola L.	ALB; AUT; BEL; BGR; BIH; BLR; CHE; CZE; DEN; DEU; ESP; FRA; GBR; GRC; HRV; HUN; ITA; MDA; MKD; MNE; NLD; PRT; ROU; RUS; SRB; SVK; SVN; UKR	AFG; ARM; AZE; CHN; CYP; EGY; GEO; IND; IRN; IRQ; ISR; JOR; KAZ; KGZ; LBN; RUS; SAU; SYR; TJK; TKM; TUR; UZB	ALG; EGY; ETH; MAR; TUN	
Secondary genepool				
Lactuca saligna L.	ALB; AUT; BEL; BGR; BIH; CHE; HRV; CZE; DEU; ESP; FRA; GBR; GRC; HUN; ITA; MDA; MKD; MNE; NLD; PRT; ROU; RUS; SRB; SVK; SVN; UKR	AZE; CYP; EGY; GEO; IRQ; ISR; JOR; LBN; RUS; SAU; SYR; TUR	ALG; EGY; MAR; TUN	
Tertiary genepool				
Lactuca acanthifolia (Willd.) Boiss.	GRC	TUR		
Lactuca alpestris (Gand.) Rech. f.	GRC			
Lactuca aurea (Vis. & Pancic) Stebbins	BGR; BIH; GRC; HRV; MKD; MNE; ROU; SRB	TUR		
Lactuca longidentata Moris ex DC.	ITA			
Lactuca orientalis (Boiss.) Boiss.		AFG; ARM; AZE; IND; IRN; IRQ; ISR; JOR; KGZ; LBN; PAK; SAU; SYR; TJK; TKM; UZB	EGY	
Lactuca quercina L.	ALB; AUT; BGR; BIH; BLR; CZE; DEU; FRA; GRC; HRV; HUN; ITA; MDA; MKD; MNE; ROU; RUS; SRB; SVK; SVN; SWE; UKR	ARM; AZE; GEO; IND; RUS; TUR		
Lactuca quercina L. ssp. *quercina* L.	ALB; AUT; BGR; BIH; BLR; CZE; DEU; FRA; GRC; HRV; HUN; ITA; MDA; MKD; MNE; ROU; RUS; SRB; SVK; SVN; SWE; UKR	ARM; AZE; GEO; IND; RUS; TUR		
Lactuca quercina L. ssp. *wilhelmsiana* (Fisch. & C.A. Mey. ex DC) Ferakova	ALB; BGR; MNE; ROU; UKR	ARM; AZE; GEO; IRN		
Lactuca sibirica (L.) Benth. ex Maxim.	EST; FIN; NOR; RUS; SWE; UKR	CHN; JAP; MNG; RUS		
Lactuca tatarica (L.) C.A. Mey.	BGR; BLR; LTU; LVA; NOR; POL; ROU; RUS; SVK; SWE; UKR	AFG; ARM; AZE; CHN; GEO; IND; IRN; KAZ; KGZ; MNG; PAK; RUS; TJK; TKM; TUR; UZB		CAN; USA
Lactuca tatarica (L.) C.A. Mey. ssp. *pulchella* (Pursh) Stebbins				CAN; USA
Lactuca tatarica (L.) C.A. Mey. ssp. *tatarica* (L.) C.A. Mey.	BGR; BLR; MDA; ROU; RUS; UKR	AFG; ARM; AZE; CHN; GEO; IND; IRN; KAZ; KGZ; MNG; PAK; RUS; TJK; TKM; TUR; UZB		
Lactuca viminea (L.) J. Presl & C. Presl	ALB; AUT; BGR; BIH; CHE; CZE; DEU; ESP; FRA; GRC; HRV; HUN; ITA; MDA; MKD; MNE; PRT; ROU; RUS; SRB; SVK; SVN; UKR	ARM; AZE; CYP; GEO; IRN; IRQ; ISR; LBN; RUS; SYR; TKM; TUR	DZA; MAR; TUN	
Lactuca viminea (L.) J. Presl & C. Presl ssp. *chondrilliflora* (Boreau) St.-Lag.	ESP; FRA; HRV; ITA; PRT		DZA; MAR; TUN	
Lactuca viminea (L.) J. Presl & C. Presl ssp. *ramosissima* (All.) Arcang.	ALB; ESP; FRA; GRC; HRV; ITA		MAR	
Lactuca viminea (L.) J. Presl & C. Presl ssp. *viminea* (L.) J. Presl & C. Presl	ALB; AUT; BGR; BIH; CHE; CZE; DEU; ESP; FRA; GRC; HRV; HUN; ITA; MDA; MKD; MNE; PRT; ROU; RUS; SRB; SVK; SVN; UKR	ARM; AZE; CYP; GEO; IRN; IRQ; ISR; LBN; RUS; SYR; TKM; TUR	DZA; MAR; TUN	
Lactuca virosa L.	AUT; BEL; CHE; DEU; ESP; FRA; GRC; ITA; MKD; PRT; ROU; SVN		DZA; MAR	
Lactuca virosa L. ssp. *cornigera* (Pau & Font Quer) Emb. & Maire			MAR	
Lactuca virosa L. ssp. *livida* (Boiss. & Reut.) Ladero & A. Velasco	ESP			
Lactuca virosa L. ssp. *virosa* L.	AUT; BEL; CHE; DEU; ESP; FRA; GRC; ITA; MKD; NLD; PRT; ROU; SVN		DZA; MAR	
Lactuca watsoniana Trel.	PRT			
Lactuca winkleri Kirp.		TJK		

Appendix 2. Overview of the spinach genepool and the native distribution area of the crop wild relatives.

Species	Europe	Asia	Africa	N-America	Australasia
Primary genepool					
Spinacia oleracea L.					
Spinacia tetranda Steven ex M. Bieb.		ARM; AZE; IRN; IRQ; JOR; SYR; TUR			
Spinacia turkestanica Iljin		IRN; KAZ; TKM			
Tertiary genepool					
Blitum asiaticum (Fisch. & C.A. Mey.) S. Fuentes et al.		RUS			
Blitum atriplicinum F. Muell.					AUS
Blitum bonus-henricus (L.) Rchb.	ALB; AUT; BGR; BIH; BLR; CHE; CZE; DEU; ESP; EST; FRA; GRC; HRV; HUN; ITA; LTU; LVA; MKD; MNE; NOR; POL; ROU; RUS; SRB; SVK; SVN; SWE; UKR				
Blitum californicum S. Watson				CAN; MEX; USA	
Blitum capitatum L.				CAN; USA	
Blitum hastatum Rydb.				USA	
Blitum korshinsky Litv.		TJK			
Blitum litwinowii (Paulsen) S. Fuentes et al.		AFG; TJK			
Blitum nuttallianum Schult.				CAN; MEX; USA	
Blitum petiolare Link	ESP; PRT		DZA; MAR; TUN		
Blitum spathulatum (A. Gray) S. Fuentes et al.				MEX; USA	
Blitum virgatum L.	ALB; AUT; BGR; CHE; ESP; FRA; GRC; ITA; MDA; MKD; MNE; ROU; SRB; UKR	AFG; ARM; AZE; CYP; GEO; IRN; IRQ; LBN; PAK; RUS; TUR			

Appendix 3. Overview of the endive/chicory genepool and the native distribution area of the crop wild relatives.

Species	Europe	Asia	Africa
Primary genepool			
Cichorium endivia L.			
Cichorium endivia L. ssp. *endivia*			
Cichorium endivia L. ssp. *pumilum* (Jacq.) Cout.	ALB; BGR; ESP; FRA; GRC; HRV; ITA; MNE; PRT	ARM; AZE; CYP; IRN; IRQ; ISR; JOR; LBN; SYR; TUR	EGY; LBY; MAR; TUN
Cichorium calvum Sch. Bip.		IRQ; ISR; PAK	EGY
Secondary genepool			
Cichorium intybus L.	ALB; AUT; BEL; BGR; BIH; CHE; CZE; DEN; DEU; ESP; EST; FRA; GBR; GRC; HRV; HUN; ITA; LTU; LVA; MKD; MNE; NLD; POL; ROU; SRB; SVK; SVN; SWE; UKR	AFG; ARM; AZE; CYP; GEO; IND; IRN; IRQ; JOR; KAZ; KGZ; LBN; PAK; RUS; SYR; TJK; TKM; TUR; UZB	TUN
Cichorium intybus L. var. *intybus*			
Cichorium intybus L. var. *foliosum* Hegi			
Cichorium intybus L. var. *sativum* (Bisch.) Janch.			
Cichorium spinosum Jacq.	ESP; GRC; ITA; MLT	CYP; TUR	LBY
Tertiary genepool			
Cichorium bottae De Flers		SAU; YEM	

Appendix 4. Overview of the annual wall rocket genepool and the native distribution area of the crop wild relatives.

Species	Europe	Asia	Africa
Primary genepool			
Diplotaxis muralis (L.) DC.	ALB; AUT; BEL; BGR; BIH; CHE; CZE; DEU; ESP; FRA; GRC; HRV; HUN; ITA; MKD; MLT; MNE; NLD; POL; PRT; ROU; RUS; SRB; SVK; SVN; UKR	GEO; RUS; TUR	DZA; LBY; MAR; TUN
Secondary genepool			
Brassica juncea (L.) Czern.			
Brassica napus L.			
Brassica rapa L.			
Tertiary genepool			
Diplotaxis harra (Forssk.) Boiss.	ESP; ITA	AFG; ARE; BHR; EGY; IRN; IRQ; ISR; JOR; KWT; OMN; PAK; SAU; SYR; YEM	DZA; EGY; LBY; MAR; TUN
Erucastrum gallicum (Willd.) O.E. Schulz	AUT; CHE; CZE; DEU; ESP; FRA; HUN; ITA; MNE; NLD; SRB; SVN; UKR		

Appendix 5. Overview of the artichoke genepool and the native distribution area of the crop wild relatives.

Species	Europe	Asia	Africa
Primary genepool			
Cynara cardunculus L.	ALB; ESP; FRA; GRC; HRV; ITA; PRT		DZA; LBY; MAR; TUN
Cynara cardunculus L. ssp. *cardunculus* L.	ALB; ESP; FRA; GRC; HRV; ITA		
Cynara cardunculus L. ssp. *flavescens* Wiklund	ESP; FRA; ITA; PRT		DZA; LBY; MAR; TUN
Secondary genepool			
Cynara algarbiensis Cosson	ESP; PRT		
Cynara auranitica Post		IRN; IRQ; ISR; JOR; LBN; SYR; TUR	
Cynara baetica (Spreng.) Pau	ESP		MAR
Cynara baetica (Spreng.) Pau ssp. *baetica* (Spreng.) Pau	ESP		
Cynara baetica (Spreng.) Pau ssp. *maroccana* Wiklund			MAR
Cynara humilis L.	ESP; PRT		DZA; MAR; MRT
Cynara syriaca Boiss.		LBN; SYR	
Cynara tournefortii Boiss. et Reuter	ESP; PRT		MAR
Tertiary genepool			
Cynara cornigera Lindley	GRC	CYP; TUR	EGY; LBY
Cynara cyrenaica Maire et Weiller	GRC		LBY
Cynara makrisii Hand & Hadjik.		CYP	

Appendix 6. Overview of the asparagus genepool and the native distribution area of the crop wild relatives.

Species	Europe	Asia	Africa
Primary genepool			
Asparagus officinalis L.	ALB; AUT; BEL; BLR; BGR; CHE; CZE; DEN; DEU; ESP; FRA; GRC; HUN; ITA; MDA; MNE; NLD; POL; PRT; ROU; SRB; UKR	AFG; ARM; AZE; CHN; GEO; IRN; KAZ; LBN; MNG; RUS; SYR; TUR	DZA; MAR; TUN
Secondary genepool			
Asparagus aphyllus L.	ESP; GRC; ITA; PRT	ISR; JOR; LBN; SYR; TUR	EGY; LBY; MAR
Asparagus brachyphyllus Turcz.	ROU	CHN; KAZ; KGZ; KOR; MNG; RUS; TJK; TKM; UZB	
Asparagus dauricus Fisch. ex Link		CHN; KOR; MNG; RUS	
Asparagus inderiensis Blume ex Ledeb.	UKR	KAZ	
Asparagus kiusianus Makino		JAP	
Asparagus maritimus (L.) Miller	ALB; ESP; FRA; GRC; ITA; MNE; SRB; UKR		MAR
Asparagus oligoclonos Maxim.		CHN; JAP; KOR; MNG; RUS	
Asparagus prostratus Dumort.	BEL; DEN; DEU; ESP; FRA; GBR; IRL; NLD		
Asparagus pseudoscaber Grecescu	MNE; ROU; UKR; SRB		
Asparagus schoberioides Kunth		CHN; JAP; MNG; RUS	
Asparagus tenuifolius Lam.	AUT; BGR; CHE; FRA; ITA; MNE; ROU; SRB	TUR	
Tertiary genepool			
Asparagus acutifolius L.	ALB; ESP; FRA; GRC; ITA; MNE; SRB	CYP; ISR; TUR	DZA; LBY; MAR; TUN
Asparagus albus L.	ESP; FRA; ITA; PRT		DZA; LBY; MAR; TUN
Asparagus asparagoides L.			ETH; LSO; NAM; SWZ; ZAF
Asparagus cochinchinensis (Lour.) Merr.		CHN; JAP; LAO; PHL; TWN; VNM	
Asparagus densiflorus (Kunth) Jessop			LSO; SWZ; ZAF
Asparagus denudatus (Kunth) Baker			LSO; ZAF
Asparagus drepanophyllus Welw. ex Baker			CAF; CMR; GNQ
Asparagus filicinus Hamilton ex D.Don		BTN; CHN; IND; MMR; NPL; THA	
Asparagus horridus L.	ESP; GRC; ITA; PRT	ARE; BHR; CYP; ISR; JOR; LBN; QAT; SAU; SYR	DZA; EGY; LBY; MAR; TUN
Asparagus lycopodineus Wall. ex Baker		BTN; CHN; IND; MMR	
Asparagus macowanii Baker			MOZ; ZAF
Asparagus scandens Thunb.			ZAF
Asparagus verticillatus L.	BGR; GRC; MNE; ROU; SRB; UKR	ARM; AZE; GEO; IRN; IRQ; TKM; TUR; RUS	
Asparagus virgatus Baker		YEM	MOZ; NAM; SWZ; TZA; ZAF; ZMB

Appendix 7. Overview of the garden cress genepool and the native distribution area of the crop wild relatives.

Species	Europe	Asia	Africa
Primary genepool			
Lepidium sativum L.		AFG; ARE; IRN; IRQ; ISR; JOR; KWT; LBN; OMN; PAK; SAU; SYR; TUR; YEM	EGY; ETH
Lepidium spinescens DC.			
Lepidium spinosum Ard.	GRC	ISR; LBN; SYR; TUR	

Appendix 8. Overview of the perennial wall rocket genepool and the native distribution area of the crop wild relatives.

Species	Europe	Asia	Africa
Primary genepool			
Diplotaxis tenuifolia (L.) DC.	ALB; AUT; BEL; BGR; BIH; CHE; CZE; DEU; ESP; FRA; GRC; HRV; HUN; ITA; MDA; MKD; MNE; NLD; ROU; SRB; SVK; SVN; UKR	ARM; GEO; SYR; TUR	
Secondary genepool			
Brassica juncea (L.) Czern.			
Brassica nigra (L.) W.D.J. Koch	ALB; AUT; BEL; BGR; BIH; BLR; CHE; CZE; DEN; DEU; ESP; EST; FRA; GBR; GRC; HRV; HUN; IRL; ITA; LTU; LVA; MDA; MKD; MNE; NLD; NOR; POL; PRT; ROU; RUS; SRB; SVK; SVN; SWE; UKR	AFG; ARM; CHN; CYP; IND; IRN; IRQ; ISR; KAZ; LBN; NPL; PAK; RUS; SYR; TUR	DZA; EGY; ERI; ETH; LBY; MAR; TUN
Brassica rapa L.			
Tertiary genepool			
Brassica elongata Ehrh.	AUT; BGR; BIH; CZE; HRV; HUN; MDA; MKD; ROU; RUS; SRB; SVK; SVN; UKR	AFG; ARM; AZE; CHN; GEO; IRN; KAZ; RUS; TJK; TKM; TUR; UZB	MAR
Brassica oleracea L.	DEU; ESP; FRA; GBR		
Erucastrum virgatum C. Presl	ESP; ITA		

Appendix 9. Overview of the Peruvian ginseng/maca genepool and the native distribution area of the crop wild relatives.

Species	S-America
Primary genepool	
Lepidium meyenii Walp.	PER
Secondary genepool	
Lepidium bipinnatifidum Desv.	
Lepidium bonariense L.	ARG; BRA; CHL; PRY; URY
Lepidium quitense Turcz.	

Appendix 10. Overview of the rhubarb genepool and the native distribution area of the crop wild relatives.

Species	Asia
Primary genepool	
Rheum rhabarbarum L.	
Secondary genepool	
Rheum alexandrae Batalin	CHN
Rheum compactum L.	CHN; KAZ; MNG; RUS
Rheum hotaoense C.Y. Cheng & T.C. Kao	CHN
Rheum lhasaense A.J. Li & P.K. Hsiao	CHN
Rheum likiangense Sam.	CHN
Rheum nanum J.F.E. Siev.	CHN; KAZ; MNG
Rheum palmatum L.	CHN
Rheum tanguticum (Maxim. ex Regel) Maxim. ex Balf.	CHN
Rheum undulatum L.	CHN; KOR; MNG; RUS
Rheum wittrockii C.E. Lundstr.	CHN; KGZ; PAK; TJK

Appendix 11. Overview of the rocket salad genepool and the native distribution area of the crop wild relatives.

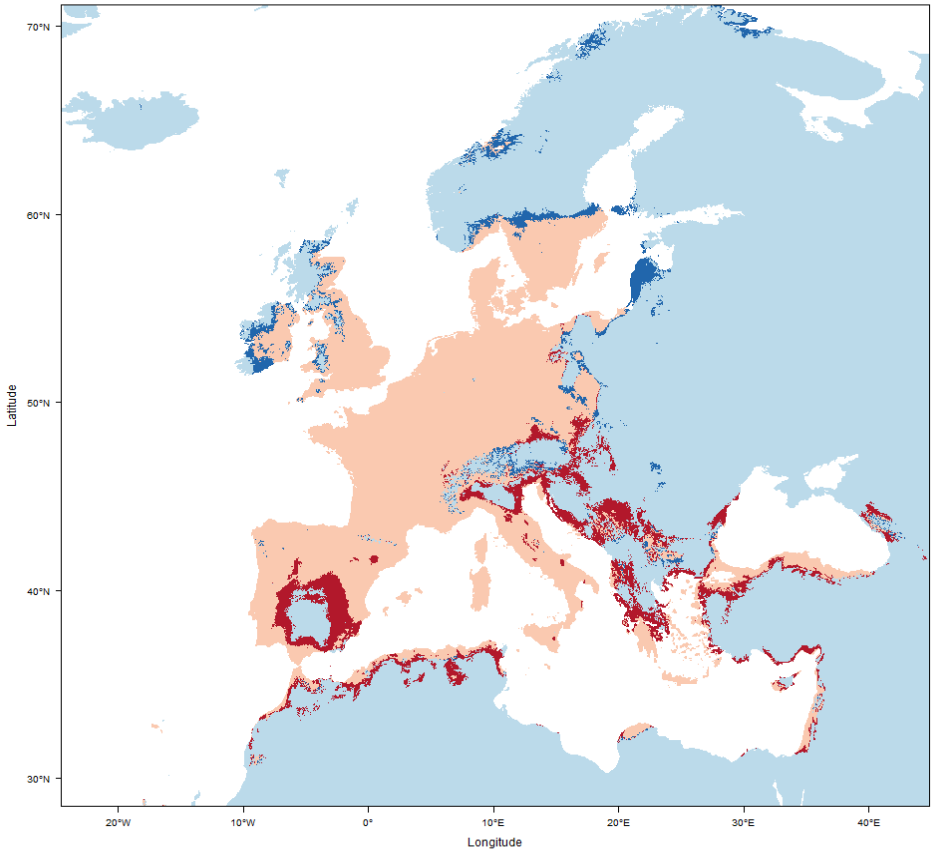
Species	Europe	Asia	Africa
Primary genepool			
Eruca vesicaria (L.) Cav.	BGR; ESP; FRA; GRC; ITA; PRT; ROU; SRB; UKR	AFG; ARM; AZE; CYP; IRN; IRQ; ISR; JOR; LBN; PAK; RUS; SYR; TKM; TUR	DZA; EGY; LBY; MAR; TCD; TUN
Eruca vesicaria (L.) Cav. ssp. *pinnatifida* (Desf.) Thell.	ESP		DZA; MAR; TUN
Eruca vesicaria (L.) Cav. ssp. *sativa* (Mill.) Thell.	BGR; ESP; FRA; GRC; ITA; PRT; ROU; SRB; UKR	AFG; ARM; AZE; CHN; CYP; IRN; IRQ; ISR; JOR; LBN; MNG; PAK; RUS; SYR; TKM; TUR	DZA; EGY; LBY; MAR; TCD; TUN
Eruca vesicaria (L.) Cav. ssp. *vesicaria* (L.) Cav.	ESP		DZA; MAR
Secondary genepool			
Diplotaxis simplex (Viv.) Spr.			DZA; EGY; LBY; TUN
Diplotaxis tenuifolia (L.) DC.	ALB; AUT; BEL; BGR; BIH; CHE; CZE; DEU; ESP; FRA; GRC; HRV; HUN; ITA; MDA; MKD; MNE; NLD; ROU; SRB; SVK; SVN; UKR	ARM; GEO; SYR; TUR	
Diplotaxis tenuifolia (L.) DC. ssp. *cretacea* (Kotov) Sobrino-Vesperinas	UKR		
Diplotaxis tenuifolia (L.) DC. ssp. *tenuifolia* (L.) DC.	ALB; AUT; BEL; BGR; BIH; CHE; CZE; DEU; ESP; FRA; GRC; HRV; HUN; ITA; MKD; MNE; NLD; SRB; SVK; SVN	ARM; GEO; SYR; TUR	
Tertiary genepool			
Brassica juncea (L.) Czern.			
Brassica napus L.			
Brassica oleracea L.	DEU; ESP; FRA; GBR		
Brassica rapa L.			
Brassica repanda (Willd.) DC.	ESP; FRA; ITA		DZA; MAR
Raphanus sativus L.			

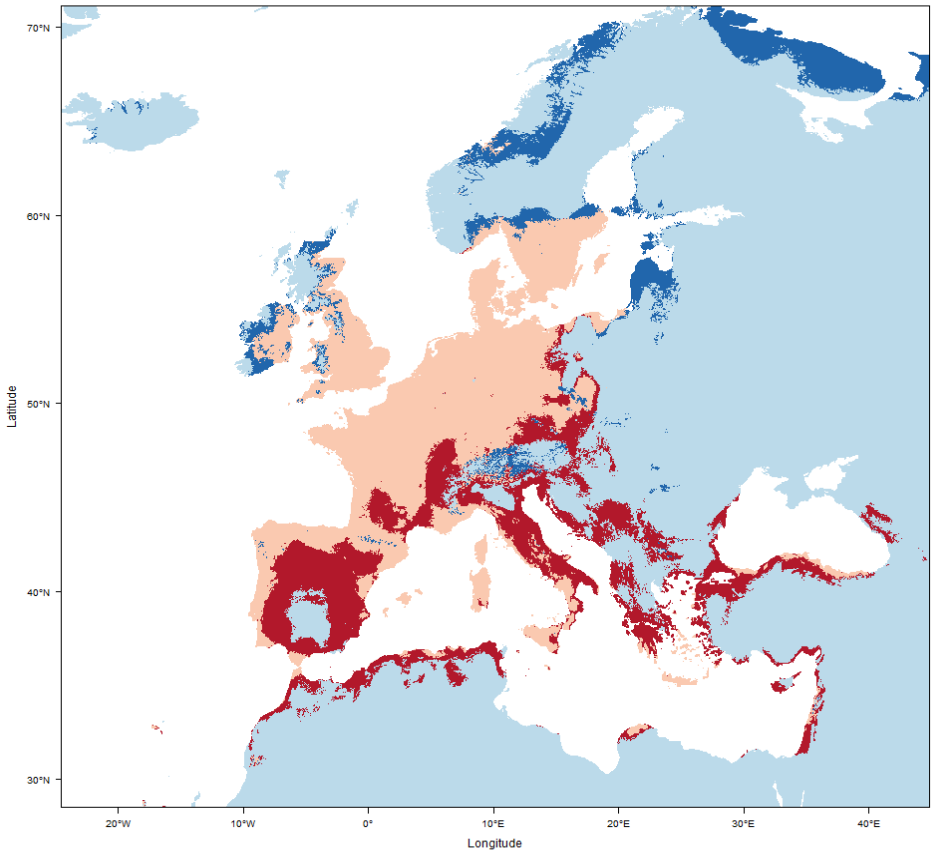
Appendix 12. Taxon group 1 species of eight leafy vegetables crops and their native distribution areas.

Species	Europe	Asia	Africa	Australasia
Corn salad; Lamb's lettuce				
Valerianella locusta (L.) Laterr.	ALB; AUT; BEL; BGR; BLR; CHE; CZE; DEN; DEU; ESP; FIN; FRA; GBR; GRC; HUN; IRL; ITA; MDA; MNE; NLD; NOR; POL; PRT; ROU; RUS; SRB; SWE; UKR	AZE; GEO; RUS; SYR; TUR	DZA; MAR	
Dandelion; Lion's tooth				
Taraxacum officinale (L.) Weber ex F.H. Wigg.	ALB; AUT; BEL; BGR; BIH; BLR; CHE; CZE; DEN; DEU; ESP; EST; FIN; FRA; FRO; GBR; GRC; HRV; HUN; IRL; ISL; ITA; LTU; LVA; MDA; MKD; MNE; NLD; NOR; POL; PRT; ROU; RUS; SRB; SVK; SVN; SWE; UKR	ARM; AZE; GEO; IND; KAZ; KGZ; LBN; MNG; RUS; SYR; TJK; TKM; TUR	MAR	
French spinach; Garden orache				
Atriplex hortensis L.				
Garland chrysanthemum				
Glebionis coronaria (L.) Cass. ex Spach	BIH; ESP; FRA; GRC; ITA; PRT	CYP; IRN; ISR; JOR; LBN; PAK; SYR; TUR	DZA; EGY; LBY; MAR; TUN	
Good king Henry; Mercury				
Blitum bonus-henricus (L.) Rchb.	ALB; AUT; BGR; BIH; BLR; CHE; CZE; DEU; ESP; EST; FRA; GRC; HRV; HUN; ITA; LTU; LVA; MKD; MNE; NOR; POL; ROU; RUS; SRB; SVK; SVN; SWE; UKR			
New Zealand spinach				
Tetragonia tetragonioides (Pall.) Kunze		CHN; JAP; TWN		AUS; NZL
Purslane				
Portulaca oleracea L.				
Sorrel dock; Sour dock				
Rumex acetosa L.	ALB; AUT; BEL; BIH; BGR; BLR; CHE; CZE; DEN; DEU; ESP; FIN; FRA; GBR; HRV; HUN; IRL; ITA; MDA; MKD; MNE; NLD; NOR; POL; PRT; ROU; RUS; SJM; SRB; SVK; SVN; SWE; UKR	AFG; ARM; AZE; CHN; GEO; IND; IRN; JAP; KAZ; KOR; NPL; PAK; RUS; TUR; TWN	MAR	AUS
Rumex acetosa ssp. *acetosa*	ALB; AUT; BEL; BIH; BGR; BLR; CHE; CZE; DEN; DEU; ESP; FIN; FRA; GBR; HRV; HUN; IRL; ITA; MDA; MKD; MNE; NLD; NOR; POL; PRT; ROU; RUS; SJM; SRB; SVK; SVN; SWE; UKR	AFG; ARM; AZE; CHN; GEO; IND; IRN; JAP; KAZ; KOR; NPL; PAK; RUS; TUR; TWN	MAR	AUS
Rumex acetosa ssp. *hibernicus* (Rech. f.) Akeroyd	GBR; IRL			
Rumex acetosa ssp. *vinealis* (Timb.-Lagr. & Jeanb.) O. Bolòs & Vigo				

Appendix 13. Predicted distribution of *Lactuca serriola* for 2070 according to climate change scenario RCP 2.6 (top) and RCP 8.5 (bottom) as compared to predictions for the present time.

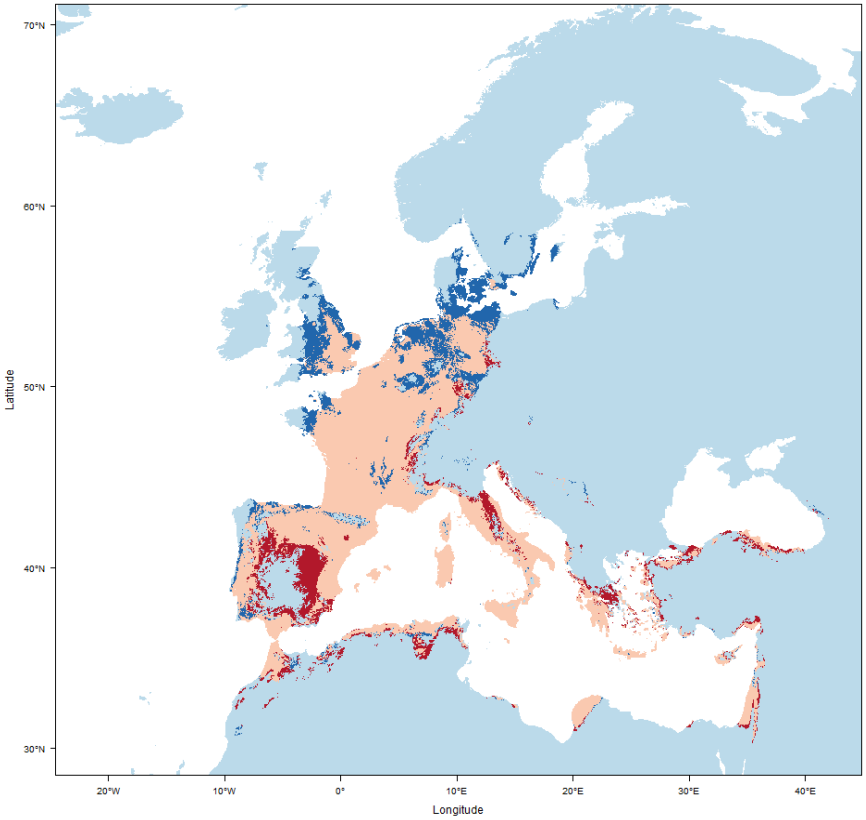
Colours: light blue = stable absence, dark blue = range expansion, orange = stable presence, red = range reduction.

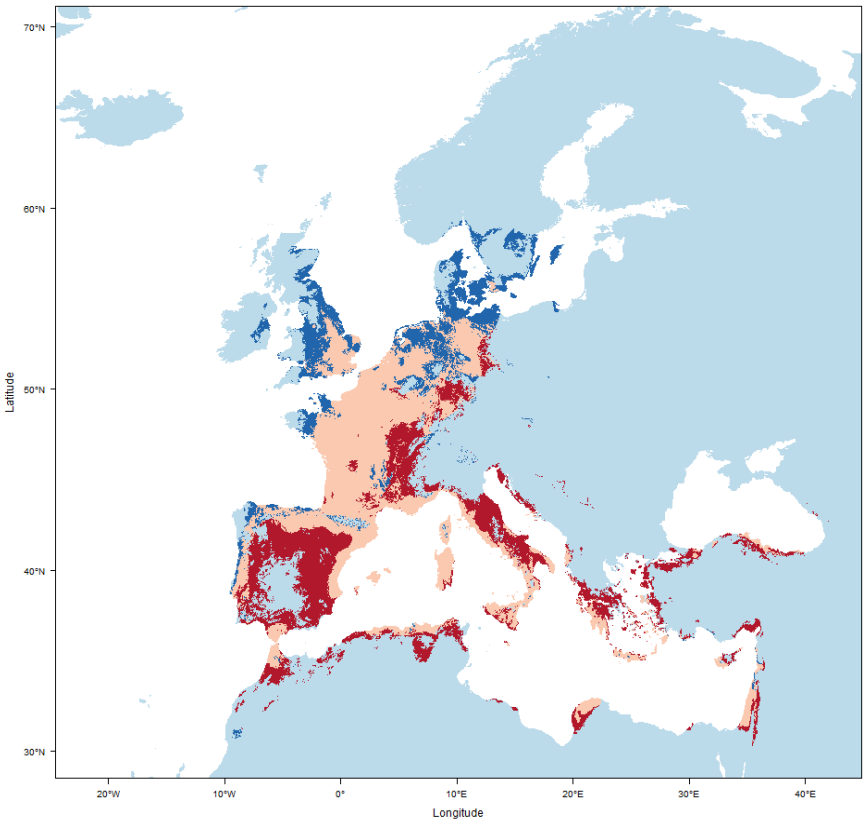




Appendix 14. Predicted distribution of *Lactuca saligna* for 2070 according to climate change scenario RCP 2.6 (top) and RCP 8.5 (bottom) as compared to predictions for the present time.

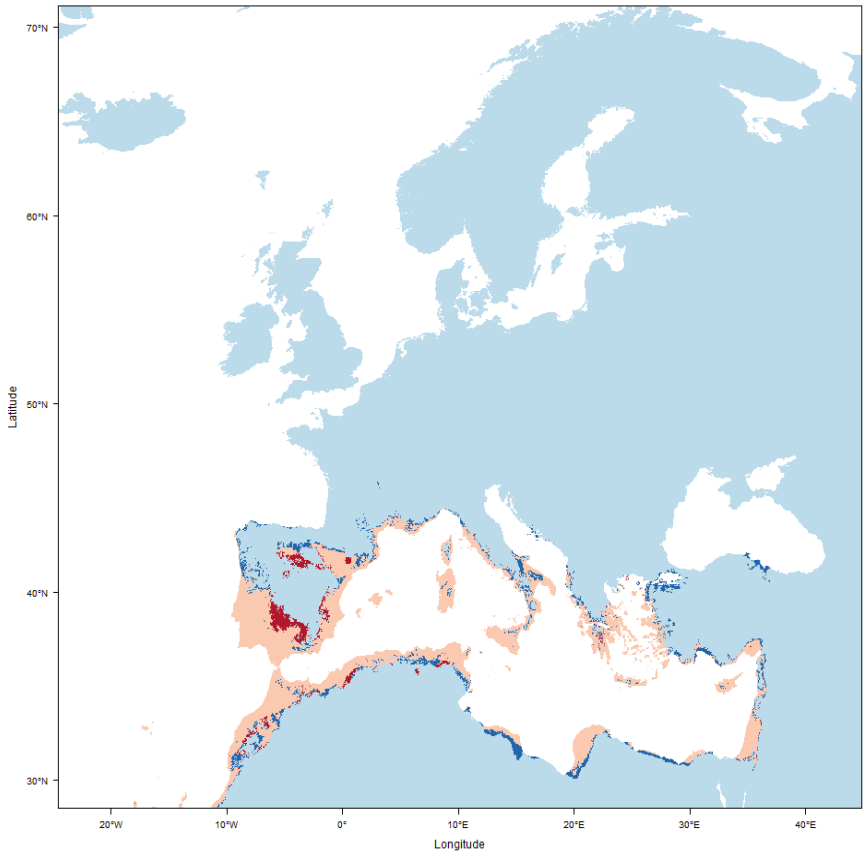
Colours: light blue = stable absence, dark blue = range expansion, orange = stable presence, red = range reduction.

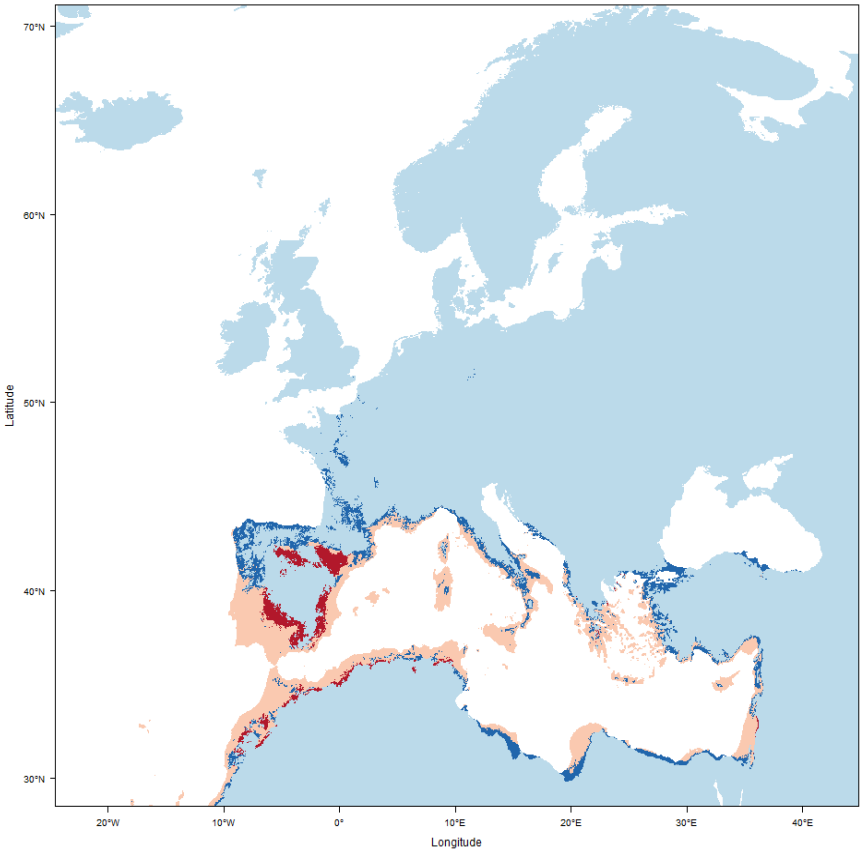




Appendix 15. Predicted distribution of *Cichorium pumilum* for 2070 according to climate change scenario RCP 2.6 (top) and RCP 8.5 (bottom) as compared to predictions for the present time.

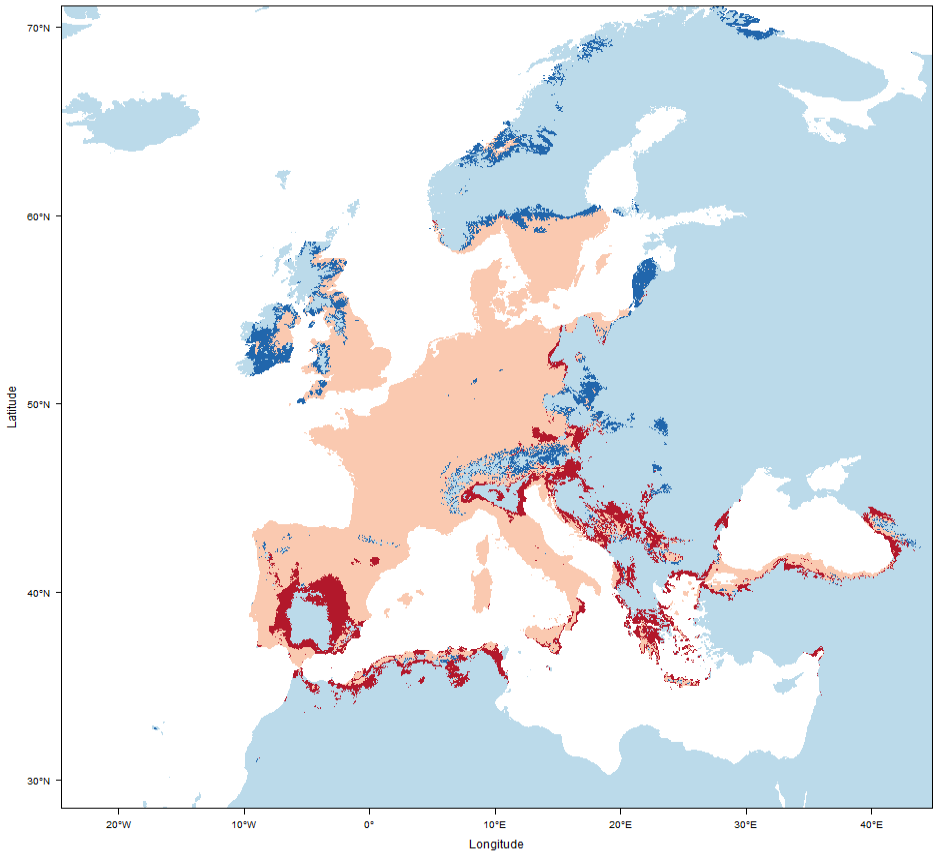
Colours: light blue = stable absence, dark blue = range expansion, orange = stable presence, red = range reduction.

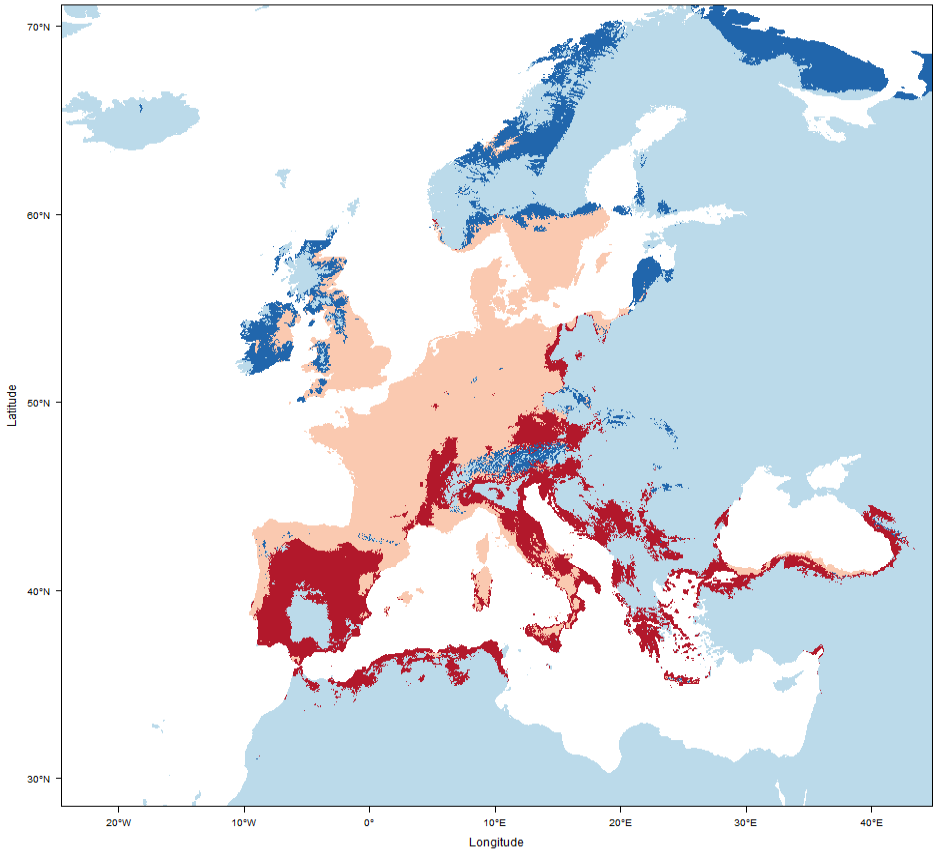




Appendix 16. Predicted distribution of *Cichorium intybus* for 2070 according to climate change scenario RCP 2.6 (top) and RCP 8.5 (bottom) as compared to predictions for the present time.

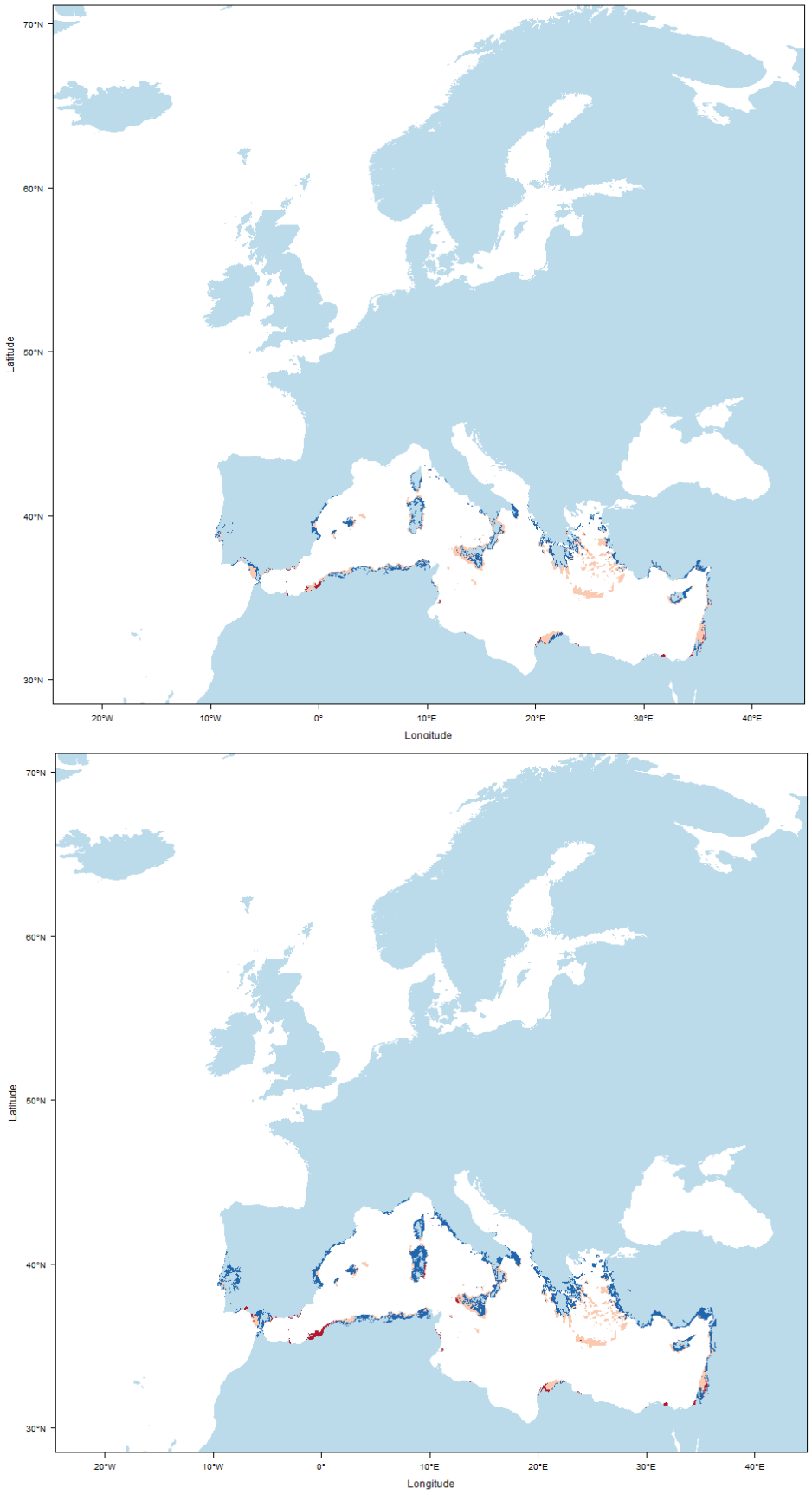
Colours: light blue = stable absence, dark blue = range expansion, orange = stable presence, red = range reduction.





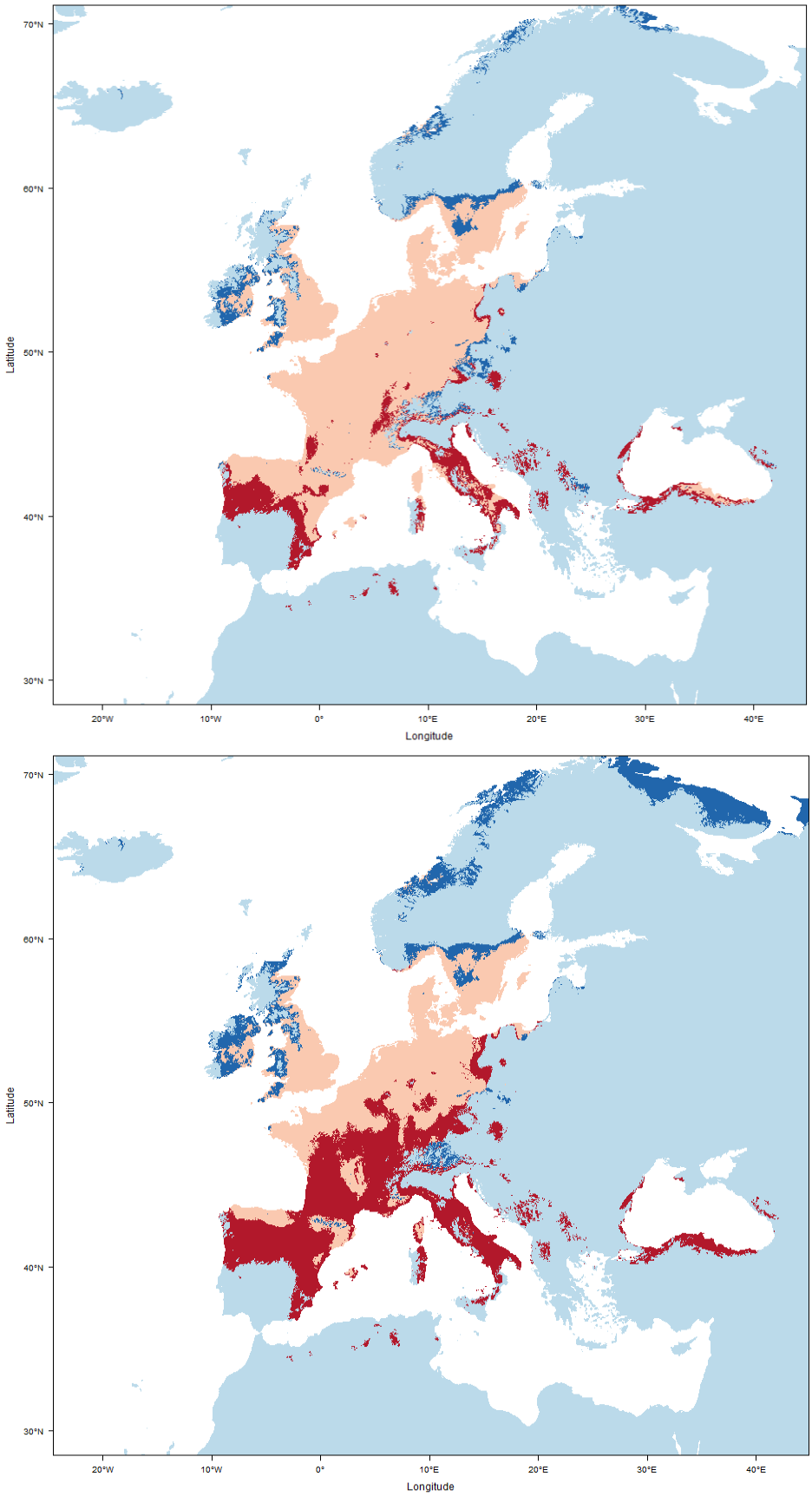
Appendix 17. Predicted distribution of *Cichorium spinosum* for 2070 according to climate change scenario RCP 2.6 (top) and RCP 8.5 (bottom) as compared to predictions for the present time.

Colours: light blue = stable absence, dark blue = range expansion, orange = stable presence, red = range reduction.



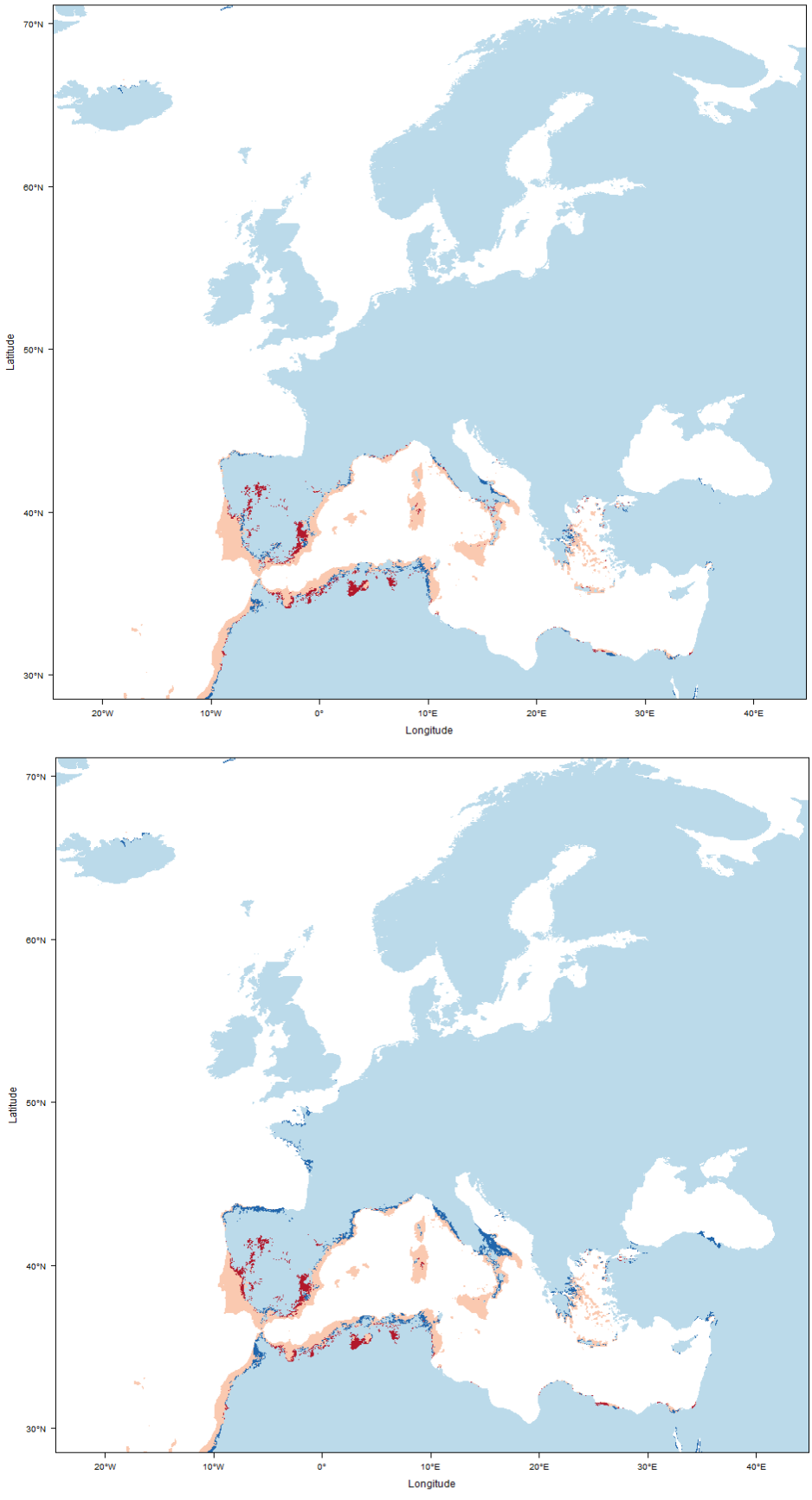
Appendix 18. Predicted distribution of *Diplotaxis muralis* for 2070 according to climate change scenario RCP 2.6 (top) and RCP 8.5 (bottom) as compared to predictions for the present time.

Colours: light blue = stable absence, dark blue = range expansion, orange = stable presence, red = range reduction.



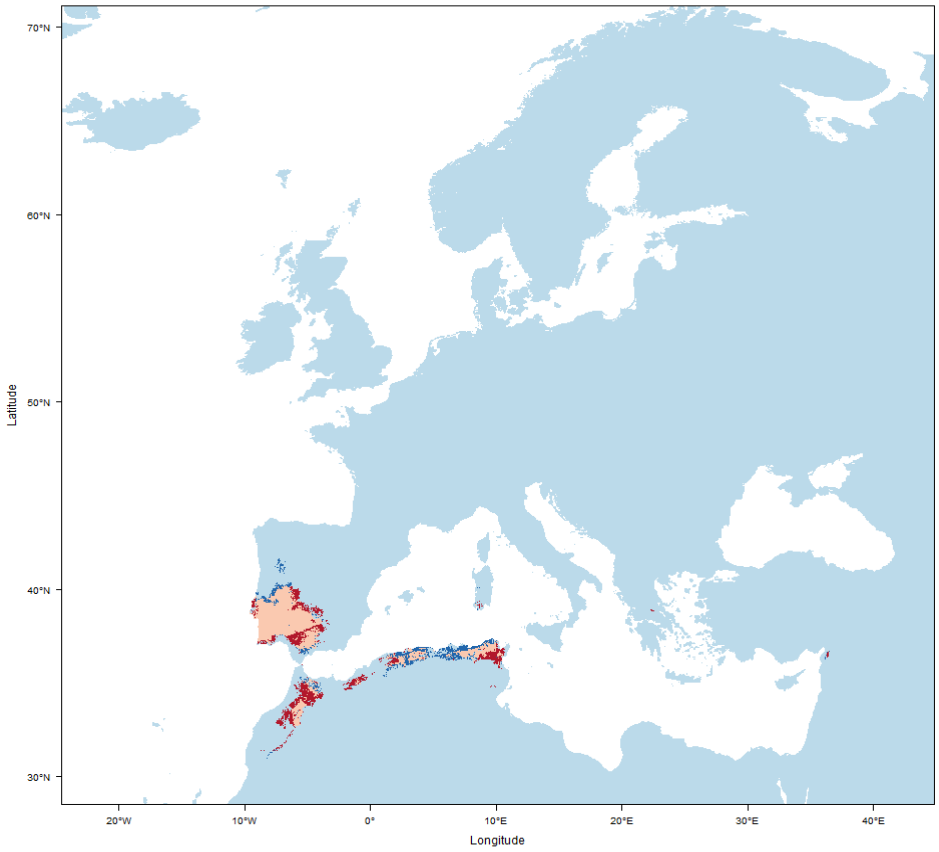
Appendix 19. Predicted distribution of *Cynara cardunculus* ssp. *cardunculus* for 2070 according to climate change scenario RCP 2.6 (top) and RCP 8.5 (bottom) as compared to predictions for the present time.

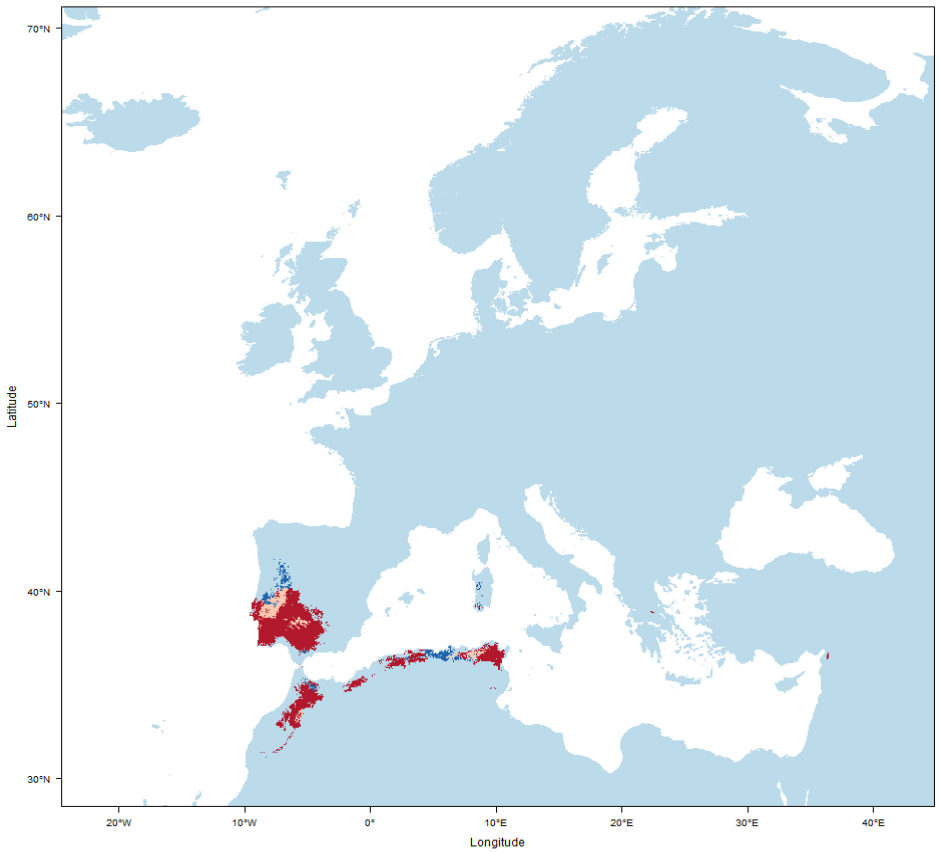
Colours: light blue = stable absence, dark blue = range expansion, orange = stable presence, red = range reduction.



Appendix 20. Predicted distribution of *Cynara cardunculus* ssp. *flavescens* for 2070 according to climate change scenario RCP 2.6 (top) and RCP 8.5 (bottom) as compared to predictions for the present time.

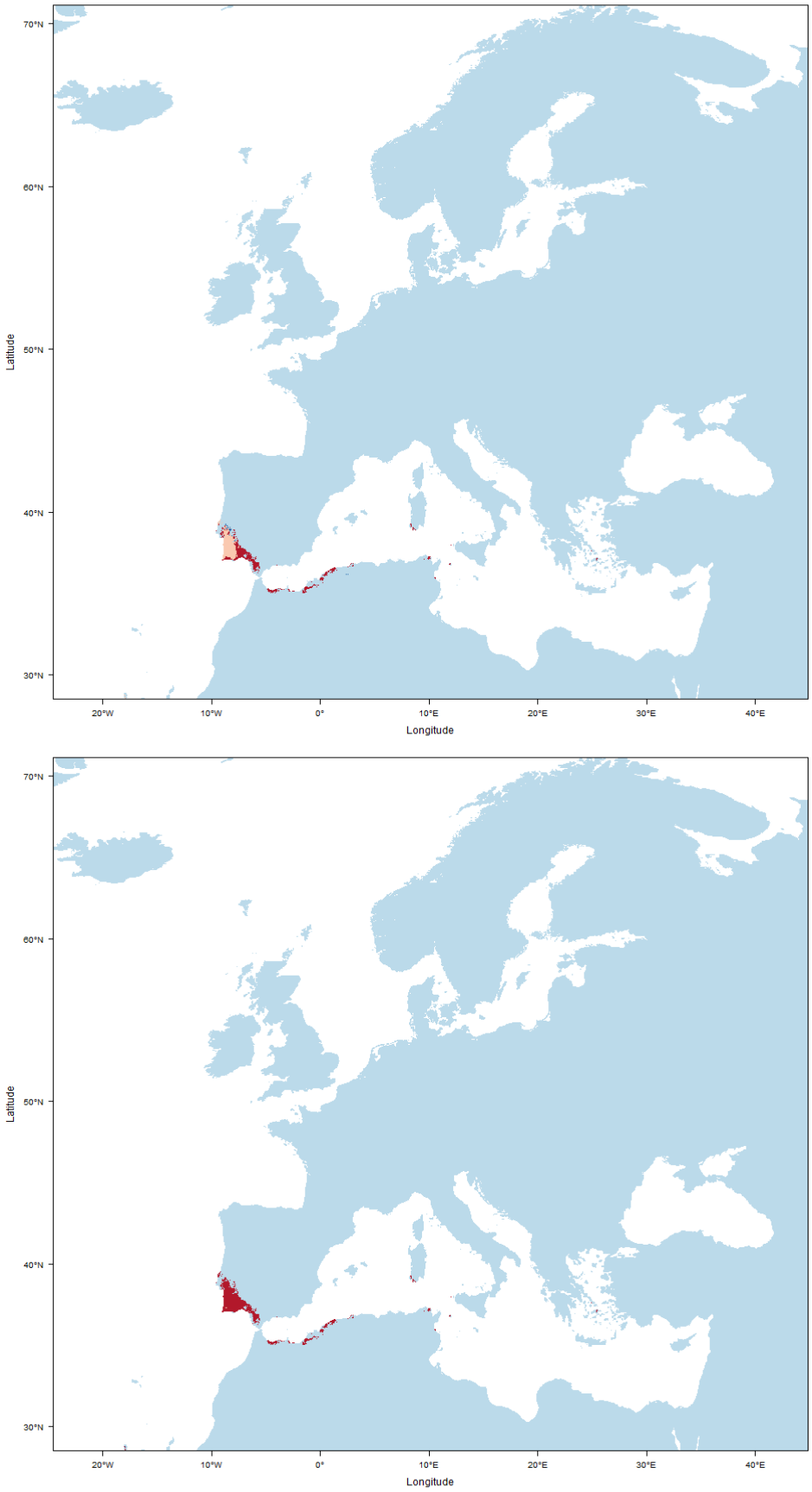
Colours: light blue = stable absence, dark blue = range expansion, orange = stable presence, red = range reduction.





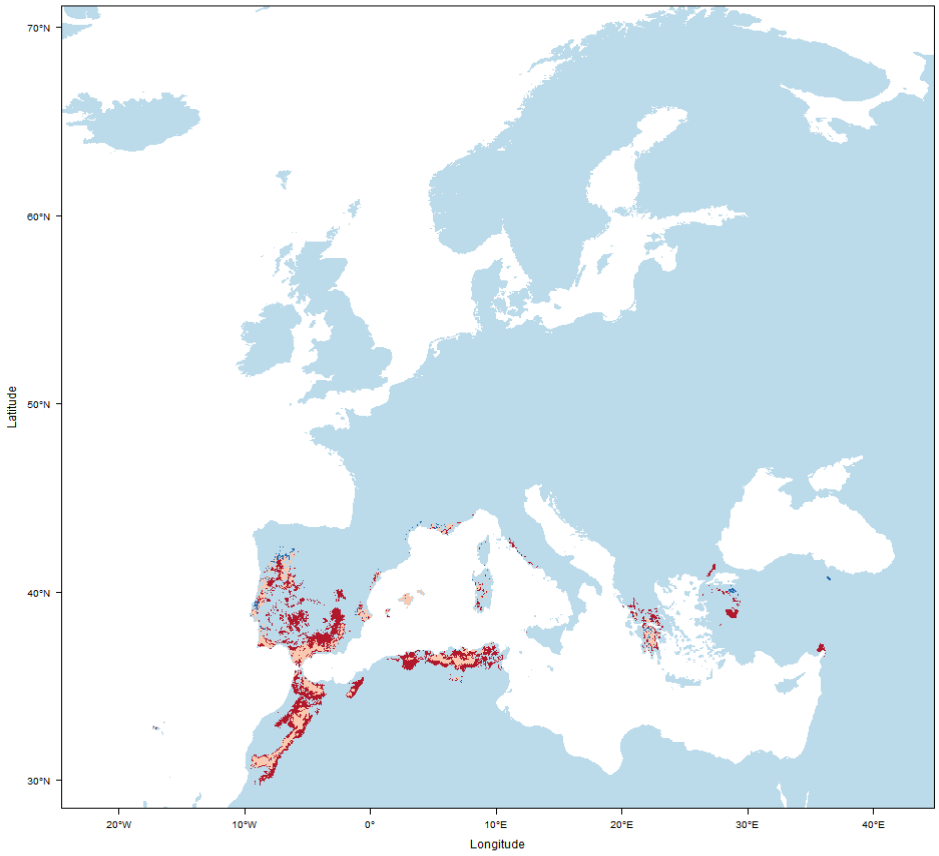
Appendix 21. Predicted distribution of *Cynara algarbiensis* for 2070 according to climate change scenario RCP 2.6 (top) and RCP 8.5 (bottom) as compared to predictions for the present time.

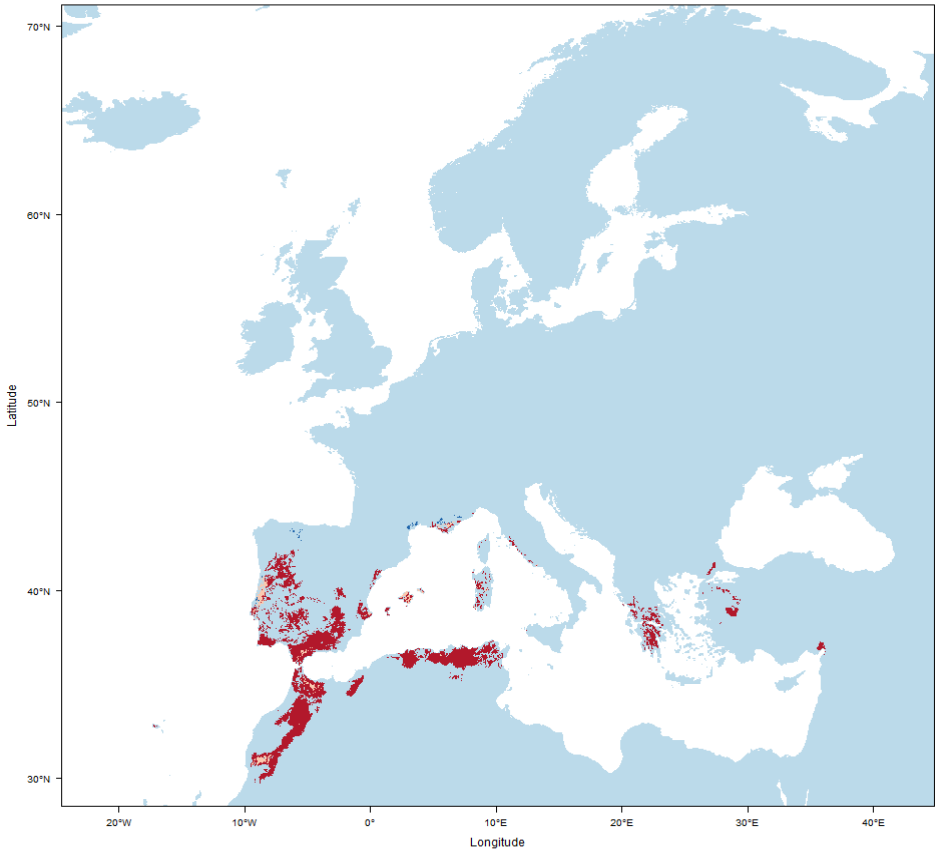
Colours: light blue = stable absence, dark blue = range expansion, orange = stable presence, red = range reduction.



Appendix 22. Predicted distribution of *Cynara baetica* for 2070 according to climate change scenario RCP 2.6 (top) and RCP 8.5 (bottom) as compared to predictions for the present time.

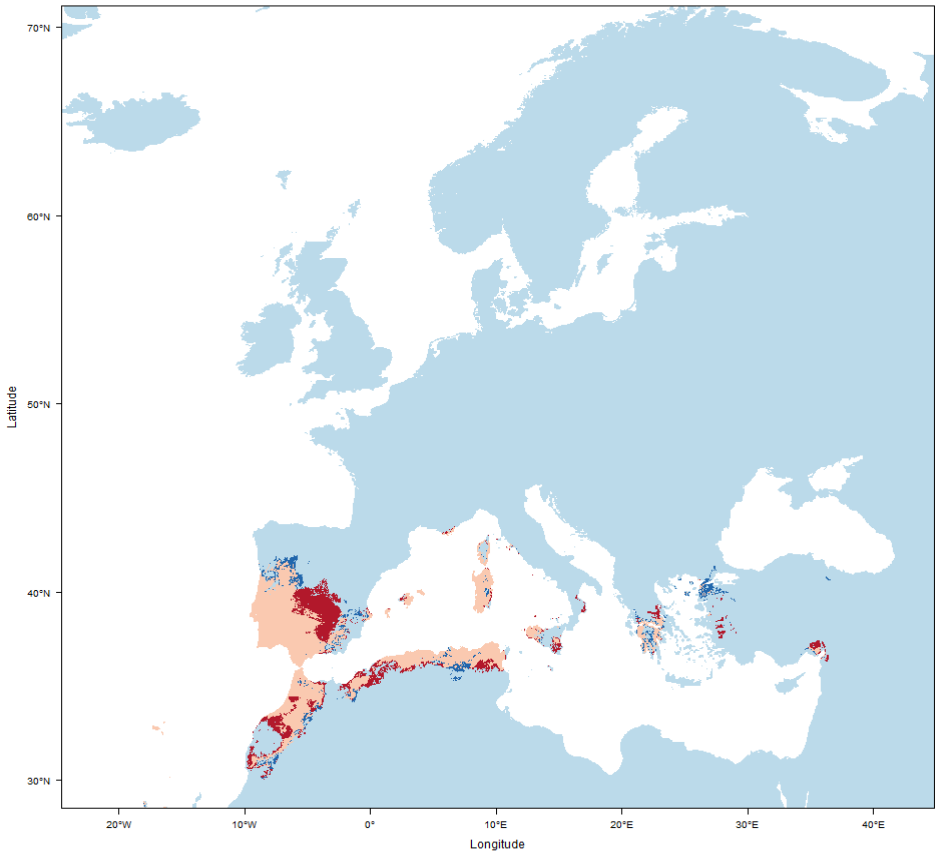
Colours: light blue = stable absence, dark blue = range expansion, orange = stable presence, red = range reduction.

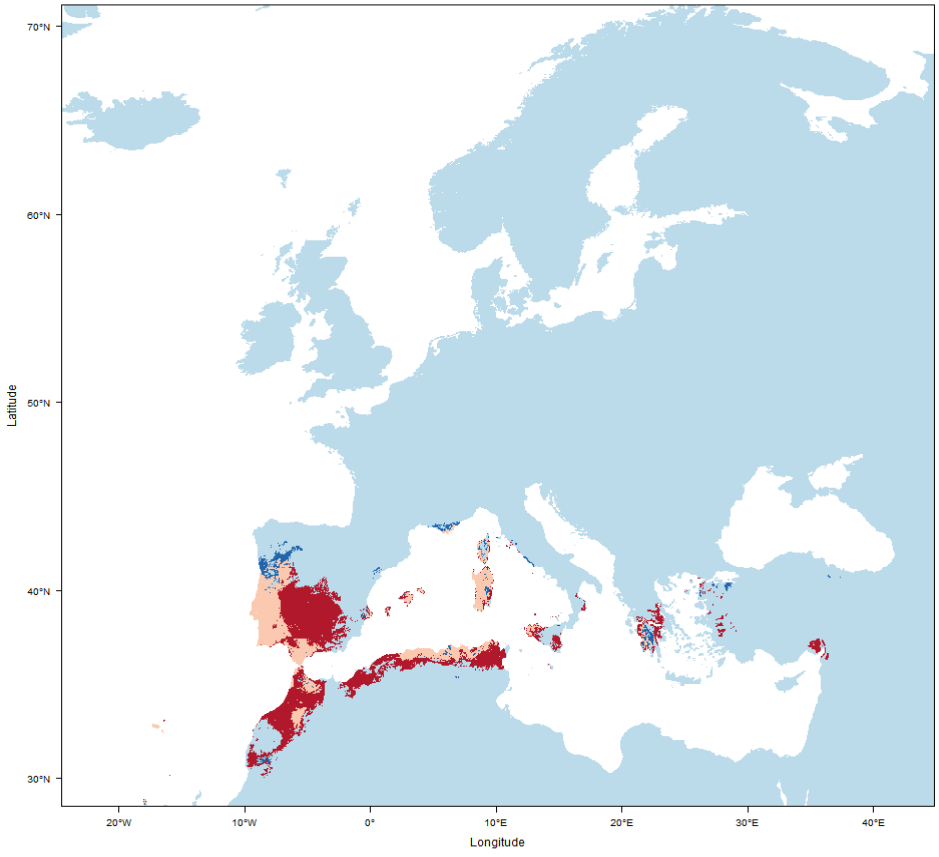




Appendix 23. Predicted distribution of *Cynara humilis* for 2070 according to climate change scenario RCP 2.6 (top) and RCP 8.5 (bottom) as compared to predictions for the present time.

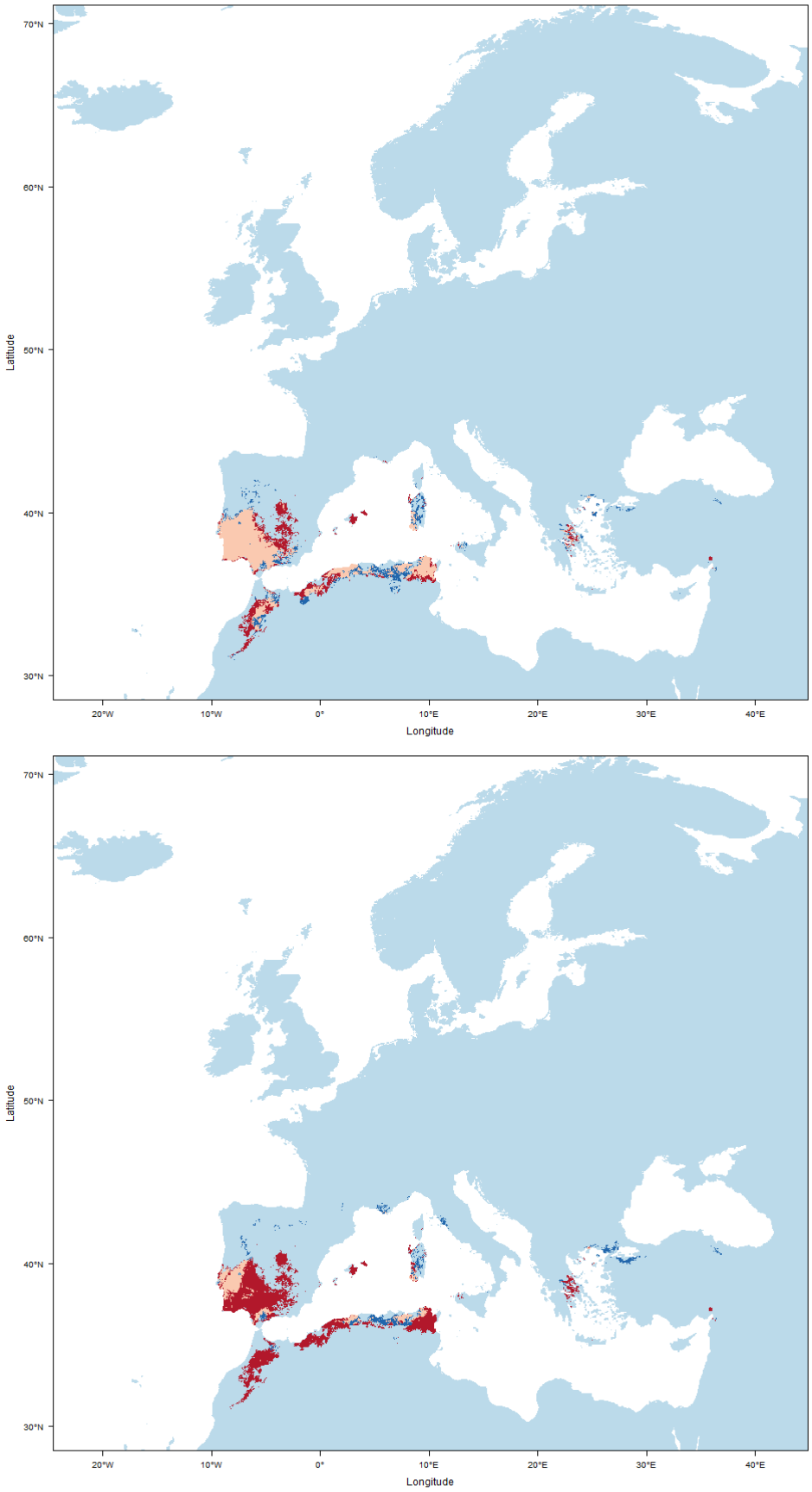
Colours: light blue = stable absence, dark blue = range expansion, orange = stable presence, red = range reduction.





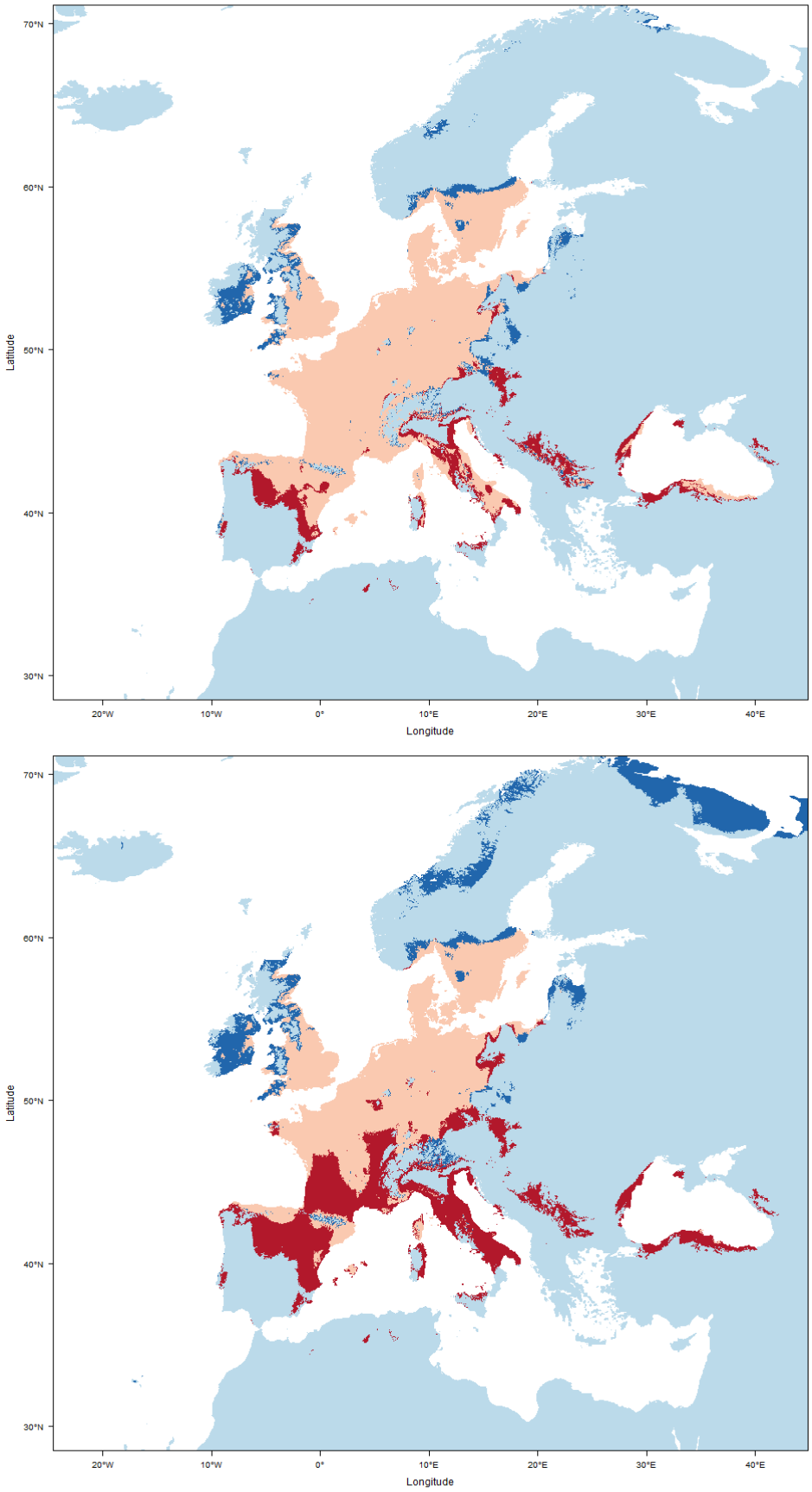
Appendix 24. Predicted distribution of *Cynara tournefortii* for 2070 according to climate change scenario RCP 2.6 (top) and RCP 8.5 (bottom) as compared to predictions for the present time.

Colours: light blue = stable absence, dark blue = range expansion, orange = stable presence, red = range reduction.



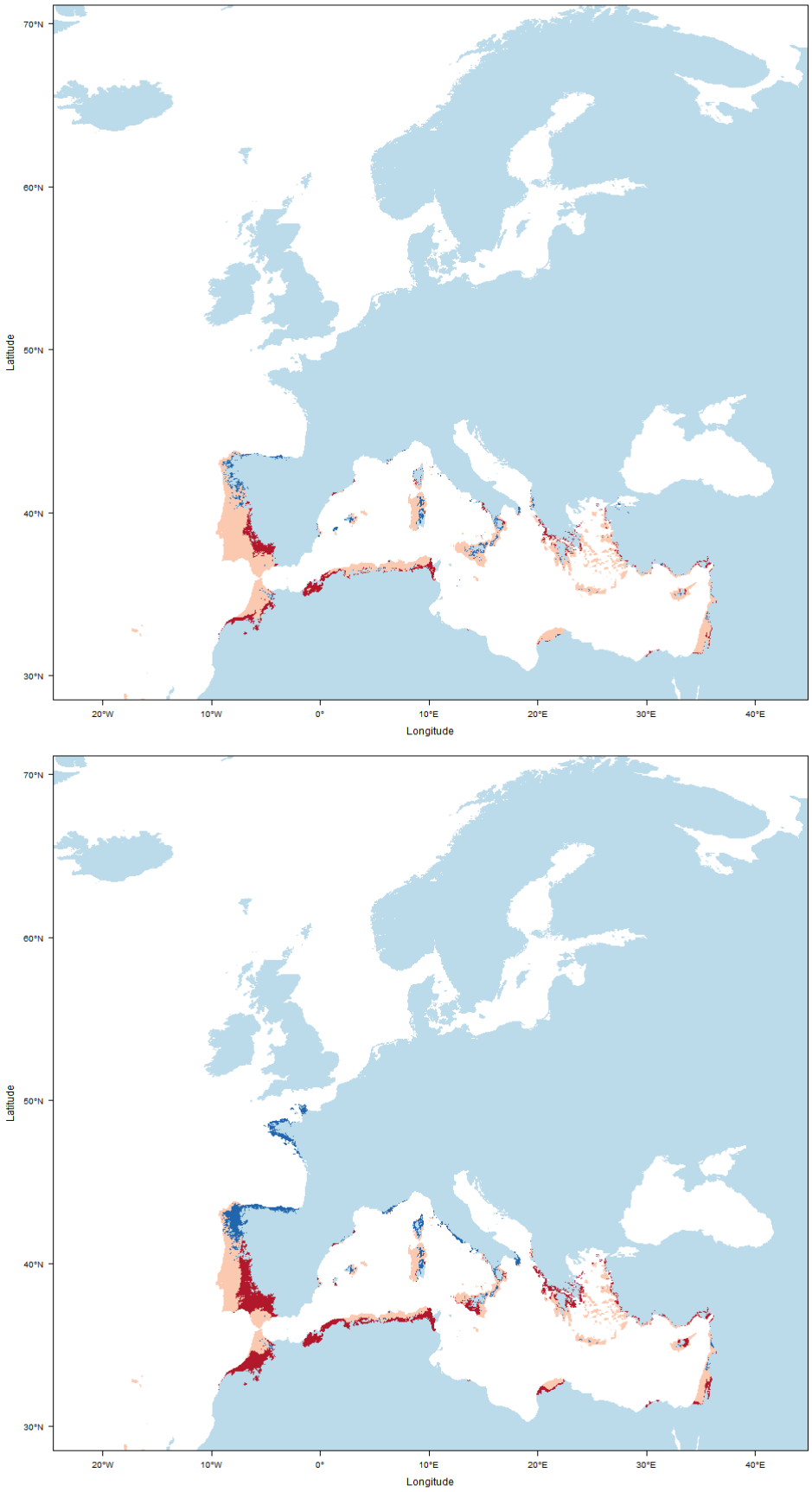
Appendix 25. Predicted distribution of *Asparagus officinalis* for 2070 according to climate change scenario RCP 2.6 (top) and RCP 8.5 (bottom) as compared to predictions for the present time.

Colours: light blue = stable absence, dark blue = range expansion, orange = stable presence, red = range reduction.



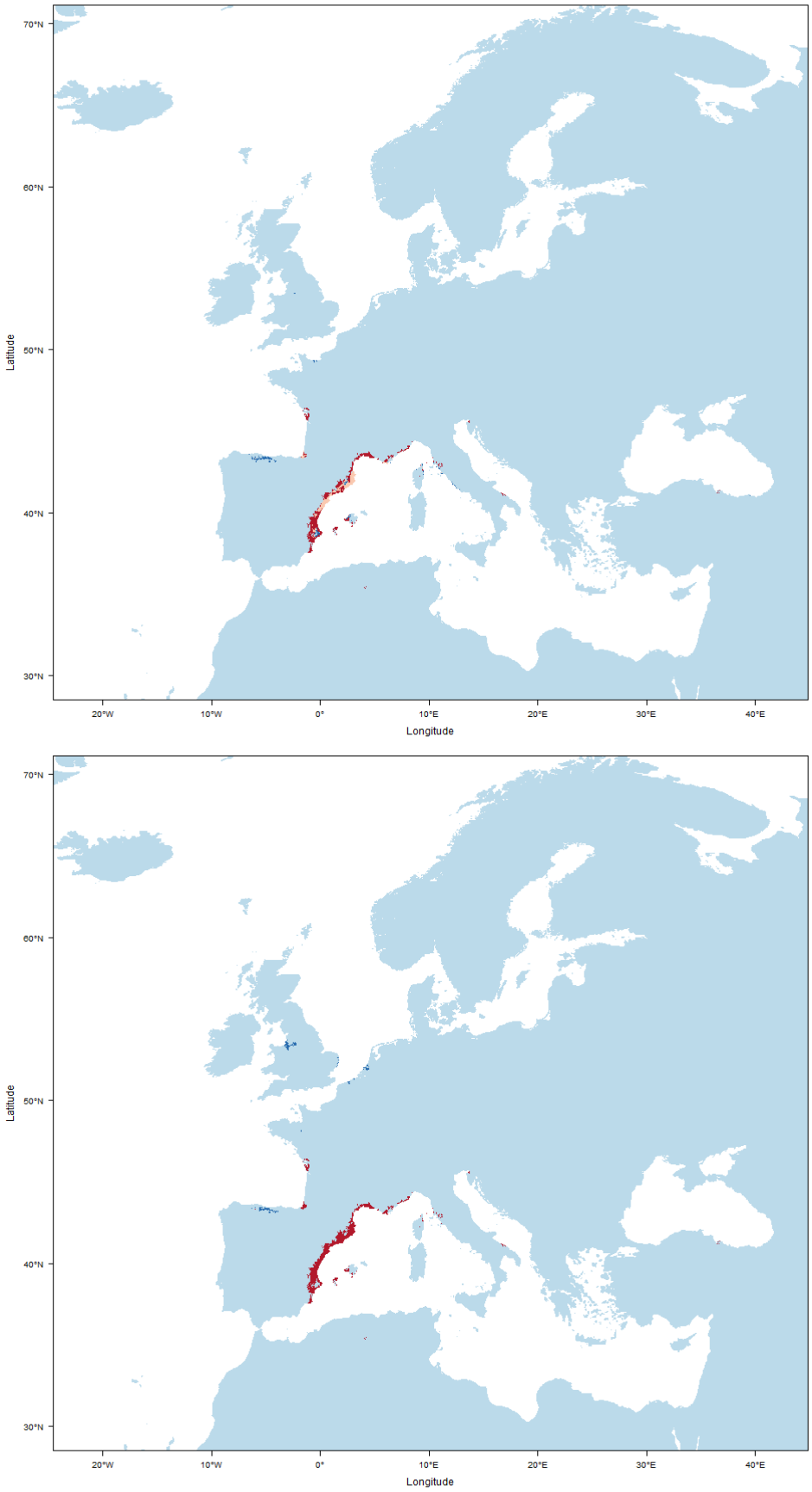
Appendix 26. Predicted distribution of *Asparagus aphyllus* for 2070 according to climate change scenario RCP 2.6 (top) and RCP 8.5 (bottom) as compared to predictions for the present time.

Colours: light blue = stable absence, dark blue = range expansion, orange = stable presence, red = range reduction.



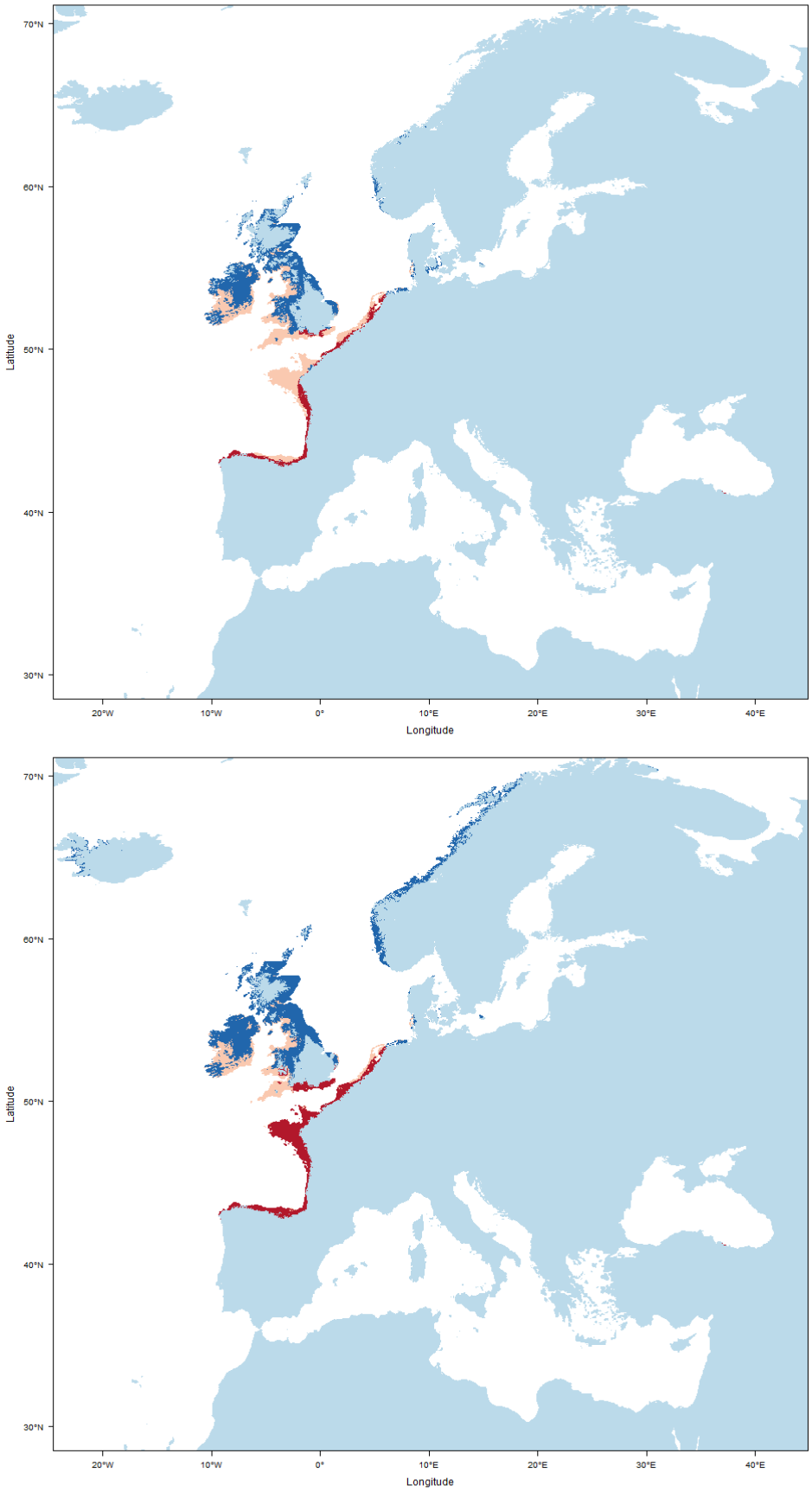
Appendix 27. Predicted distribution of *Asparagus maritimus* for 2070 according to climate change scenario RCP 2.6 (top) and RCP 8.5 (bottom) as compared to predictions for the present time.

Colours: light blue = stable absence, dark blue = range expansion, orange = stable presence, red = range reduction.



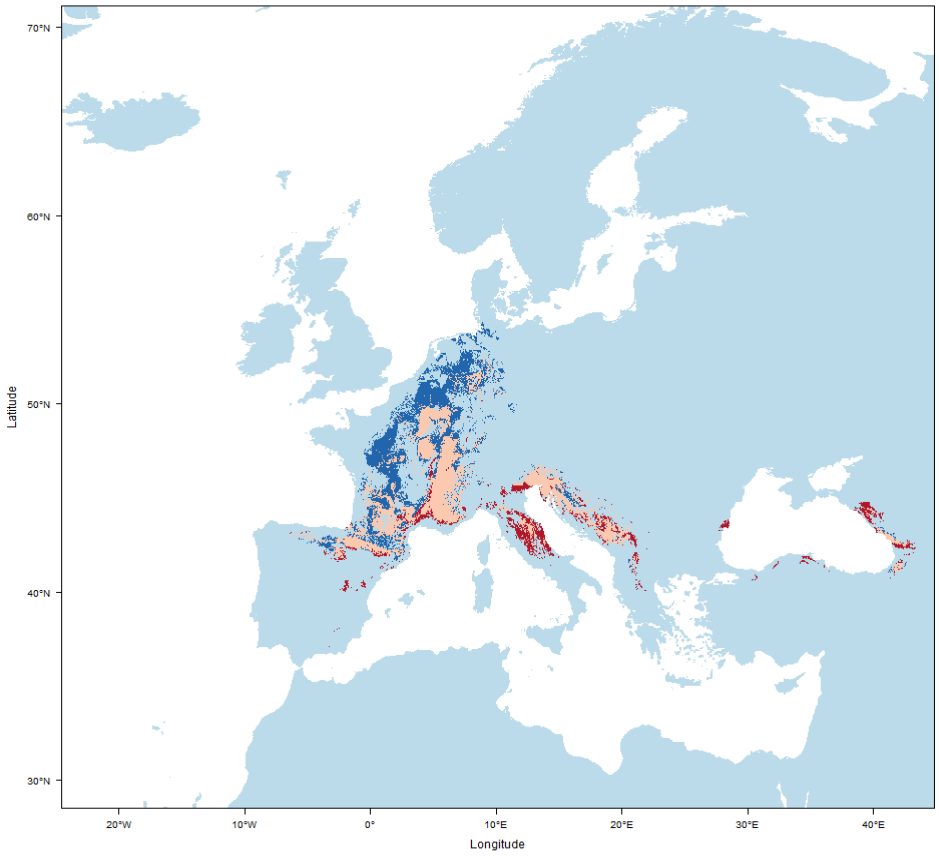
Appendix 28. Predicted distribution of *Asparagus prostratus* for 2070 according to climate change scenario RCP 2.6 (top) and RCP 8.5 (bottom) as compared to predictions for the present time.

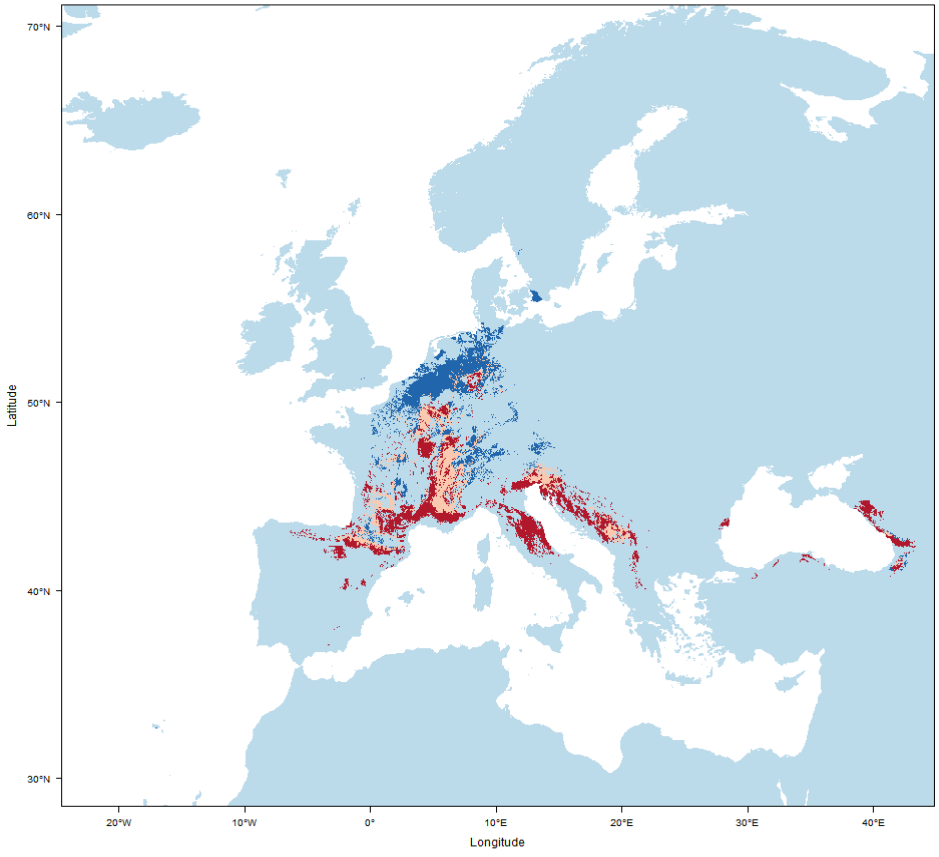
Colours: light blue = stable absence, dark blue = range expansion, orange = stable presence, red = range reduction.



Appendix 29. Predicted distribution of *Asparagus tenuifolius* for 2070 according to climate change scenario RCP 2.6 (top) and RCP 8.5 (bottom) as compared to predictions for the present time.

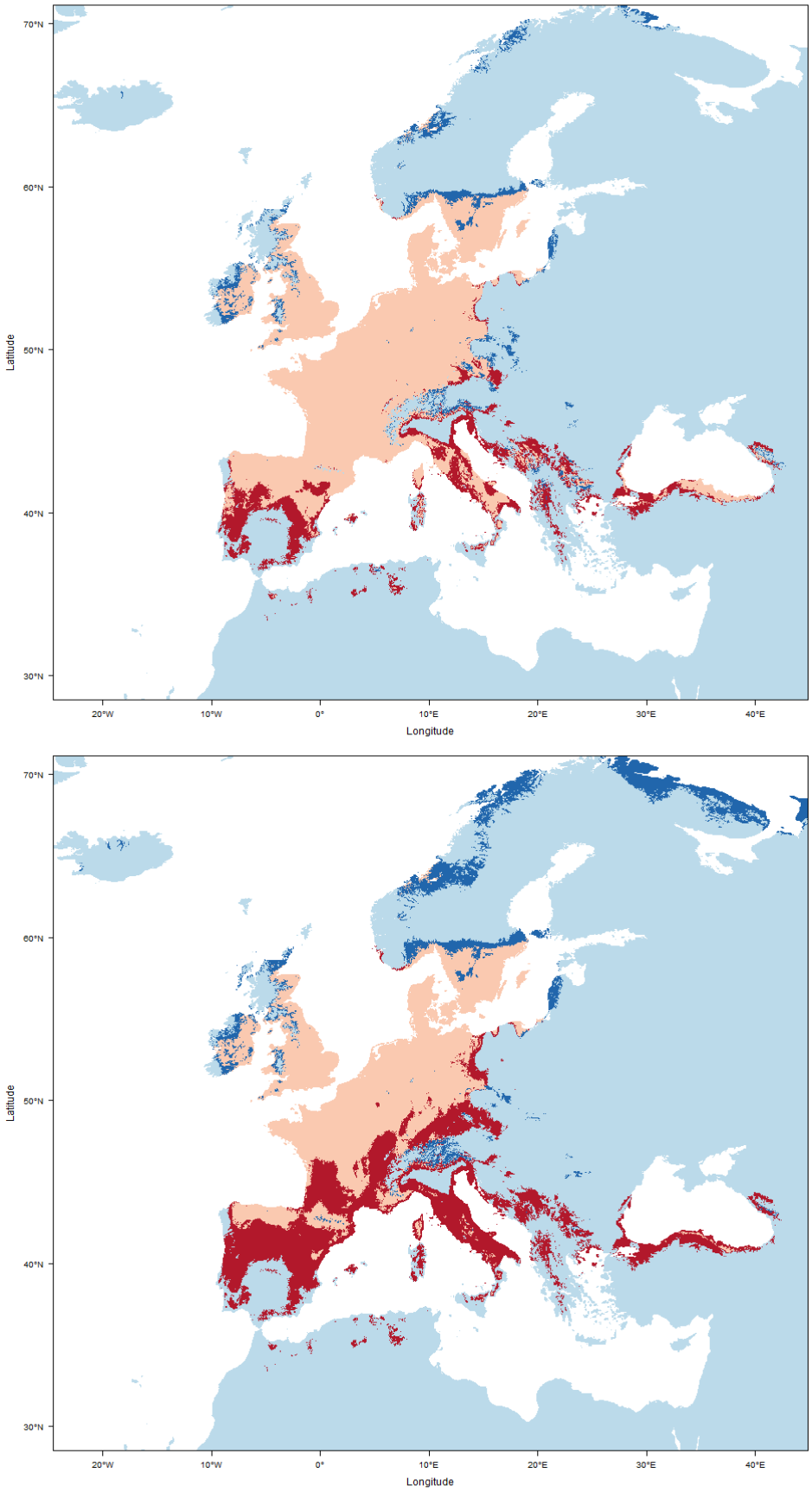
Colours: light blue = stable absence, dark blue = range expansion, orange = stable presence, red = range reduction.





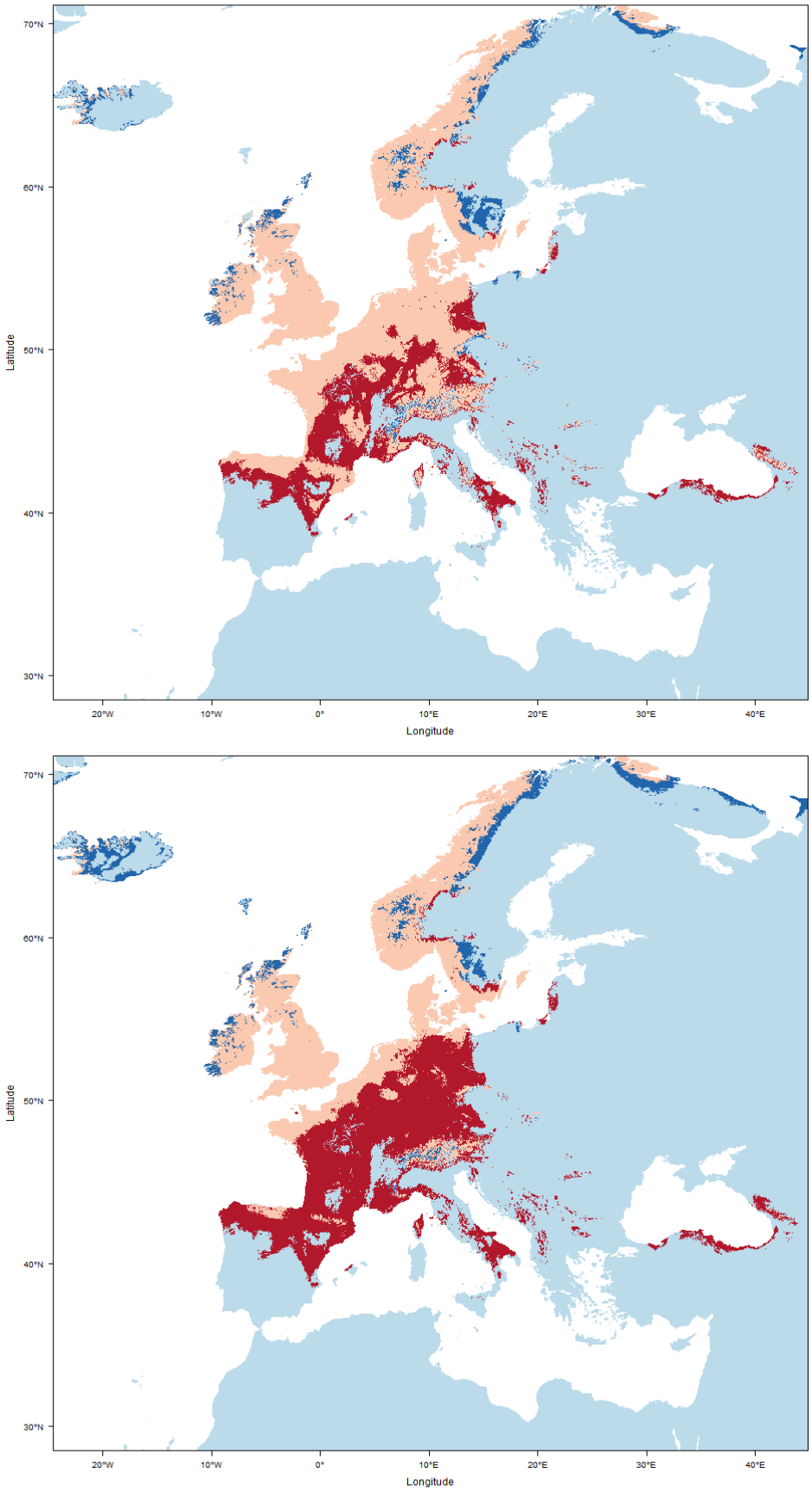
Appendix 30. Predicted distribution of *Valerianella locusta* for 2070 according to climate change scenario RCP 2.6 (top) and RCP 8.5 (bottom) as compared to predictions for the present time.

Colours: light blue = stable absence, dark blue = range expansion, orange = stable presence, red = range reduction.



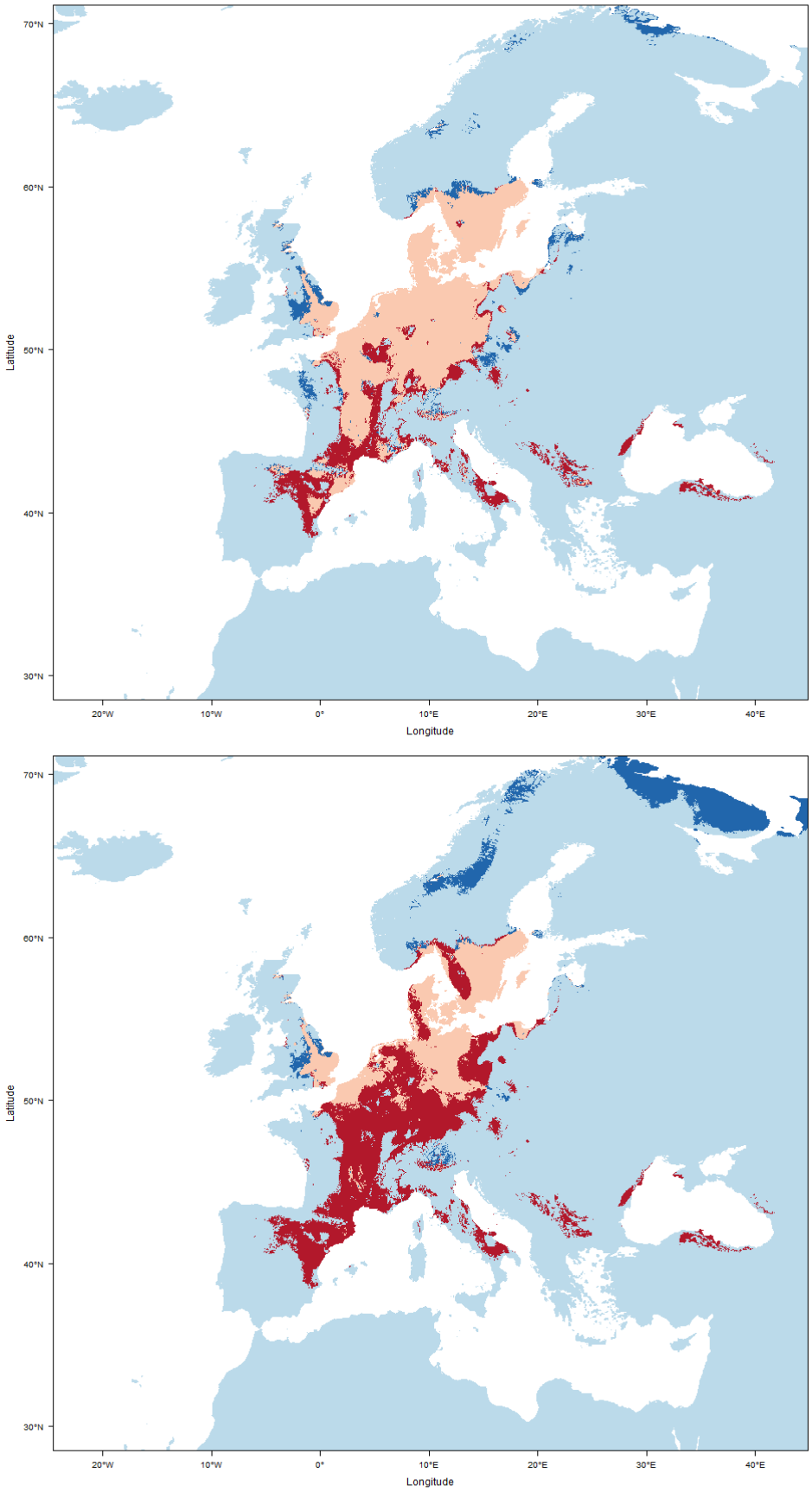
Appendix 31. Predicted distribution of *Taraxacum officinale* for 2070 according to climate change scenario RCP 2.6 (top) and RCP 8.5 (bottom) as compared to predictions for the present time.

Colours: light blue = stable absence, dark blue = range expansion, orange = stable presence, red = range reduction.



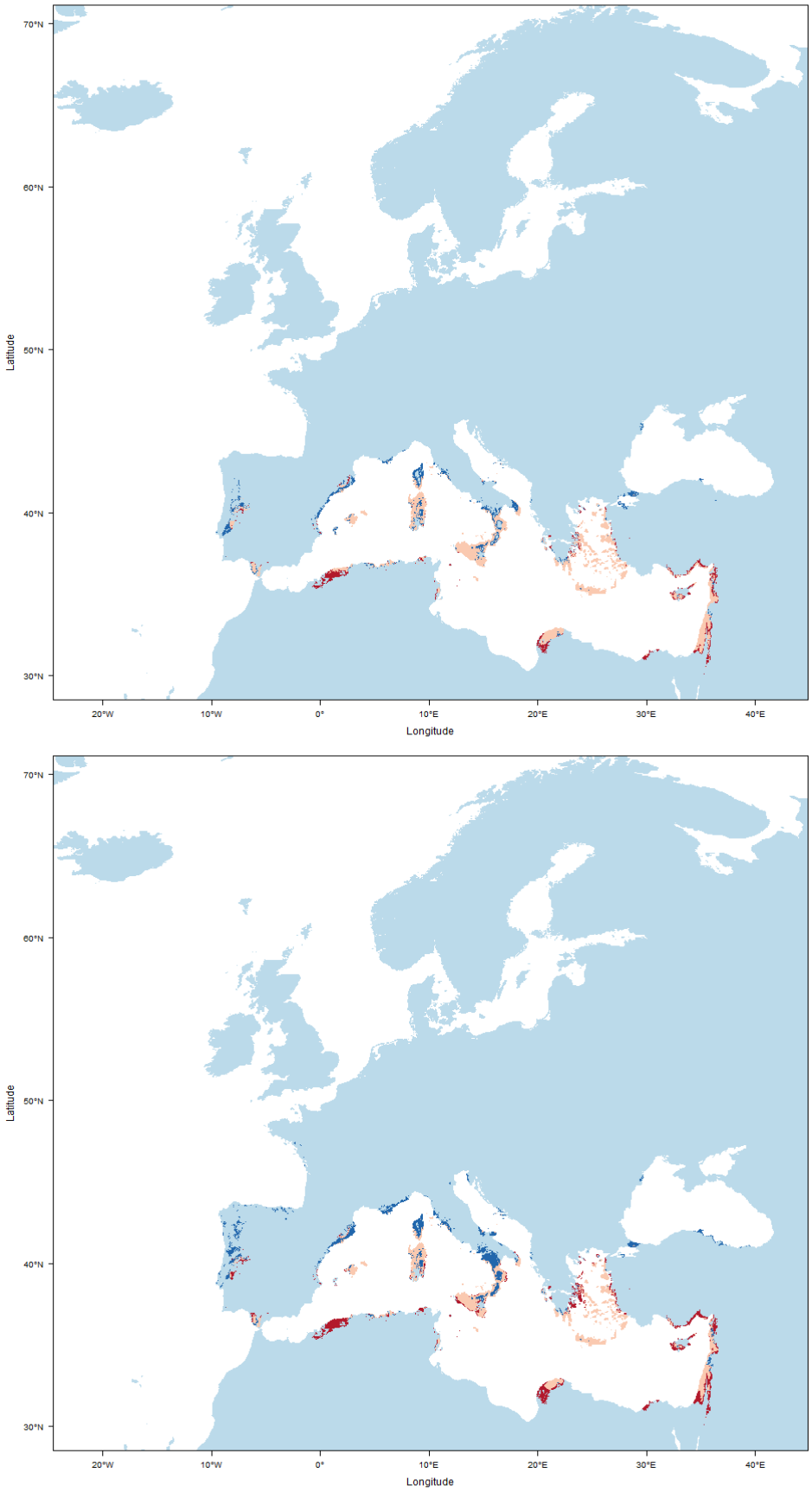
Appendix 32. Predicted distribution of *Atriplex hortensis* for 2070 according to climate change scenario RCP 2.6 (top) and RCP 8.5 (bottom) as compared to predictions for the present time.

Colours: light blue = stable absence, dark blue = range expansion, orange = stable presence, red = range reduction.



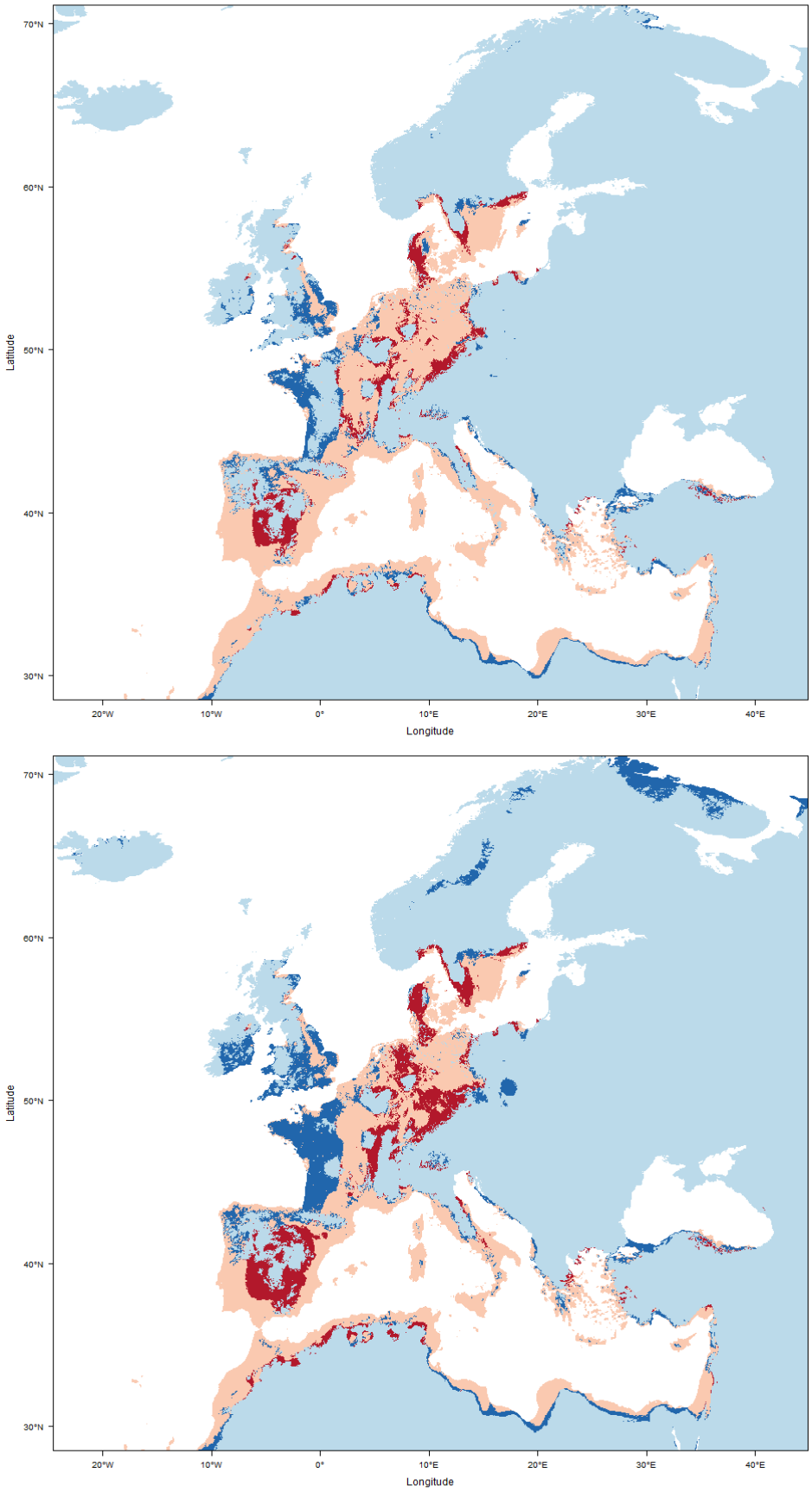
Appendix 33. Predicted distribution of *Lepidium spinosum* for 2070 according to climate change scenario RCP 2.6 (top) and RCP 8.5 (bottom) as compared to predictions for the present time.

Colours: light blue = stable absence, dark blue = range expansion, orange = stable presence, red = range reduction.



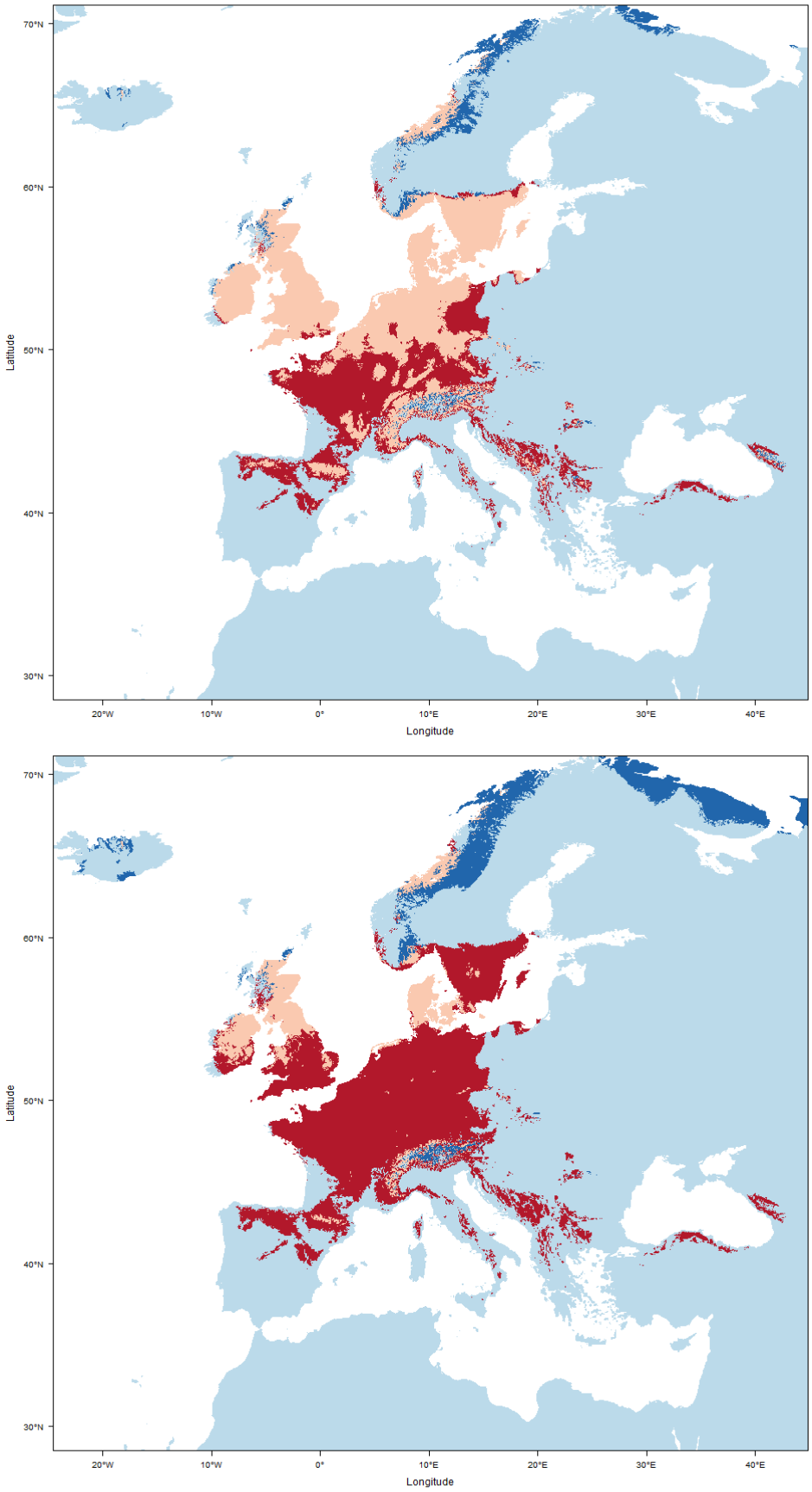
Appendix 34. Predicted distribution of *Glebionis coronaria* for 2070 according to climate change scenario RCP 2.6 (top) and RCP 8.5 (bottom) as compared to predictions for the present time.

Colours: light blue = stable absence, dark blue = range expansion, orange = stable presence, red = range reduction.



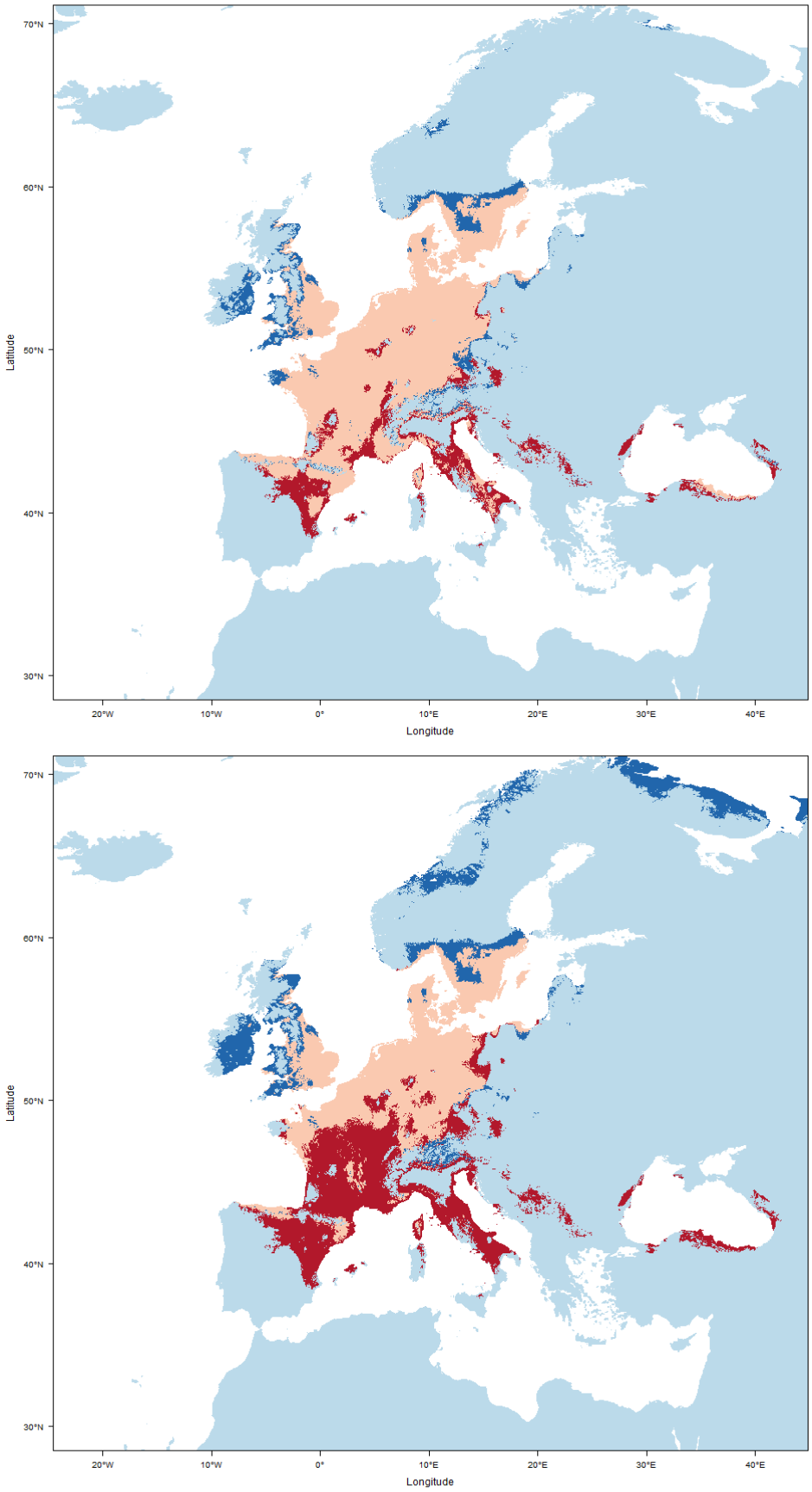
Appendix 35. Predicted distribution of Blitum bonus-henricus for 2070 according to climate change scenario RCP 2.6 (top) and RCP 8.5 (bottom) as compared to predictions for the present time.

Colours: light blue = stable absence, dark blue = range expansion, orange = stable presence, red = range reduction.



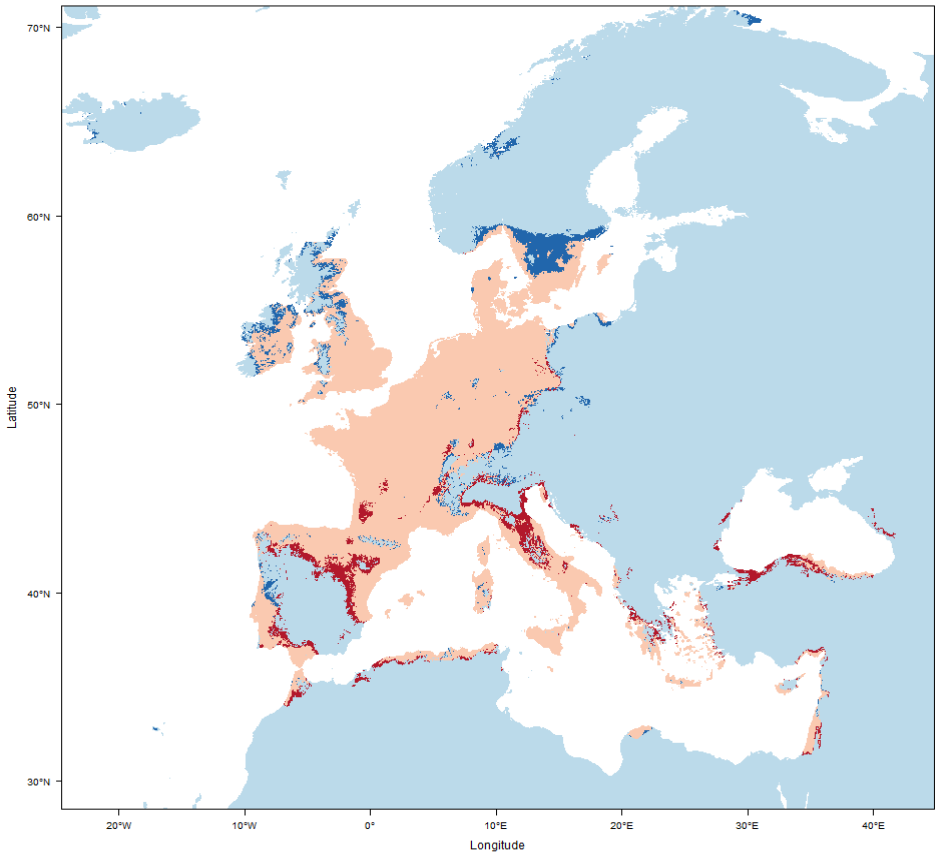
Appendix 36. Predicted distribution of *Diplotaxis tenuifolia* for 2070 according to climate change scenario RCP 2.6 (top) and RCP 8.5 (bottom) as compared to predictions for the present time.

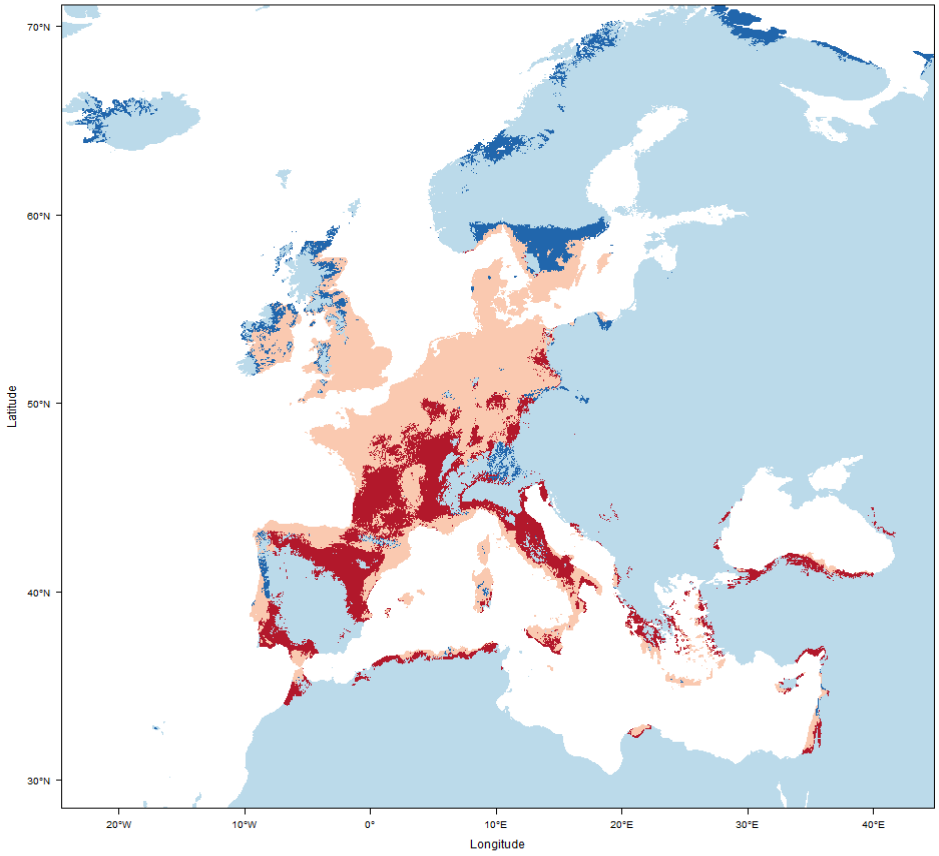
Colours: light blue = stable absence, dark blue = range expansion, orange = stable presence, red = range reduction.



Appendix 37. Predicted distribution of *Brassica nigra* for 2070 according to climate change scenario RCP 2.6 (top) and RCP 8.5 (bottom) as compared to predictions for the present time.

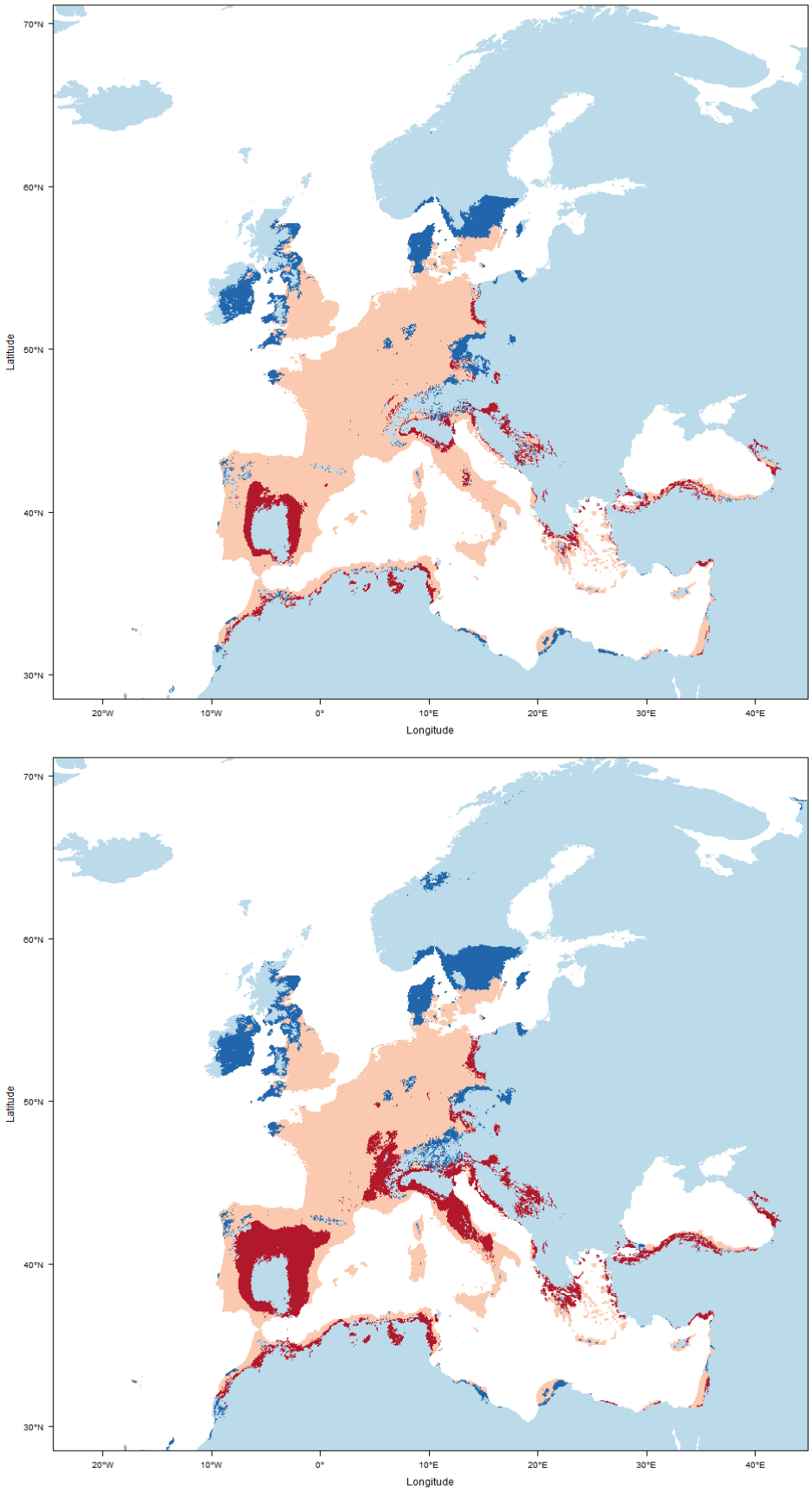
Colours: light blue = stable absence, dark blue = range expansion, orange = stable presence, red = range reduction.





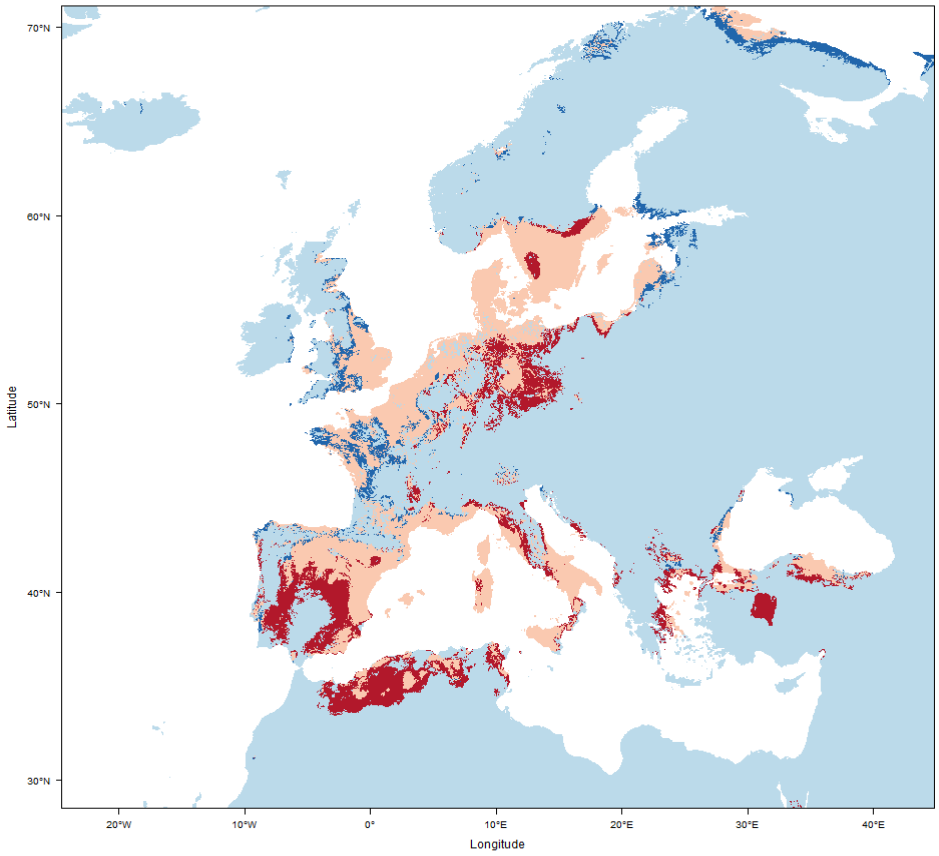
Appendix 38. Predicted distribution of *Portulaca oleracea* for 2070 according to climate change scenario RCP 2.6 (top) and RCP 8.5 (bottom) as compared to predictions for the present time.

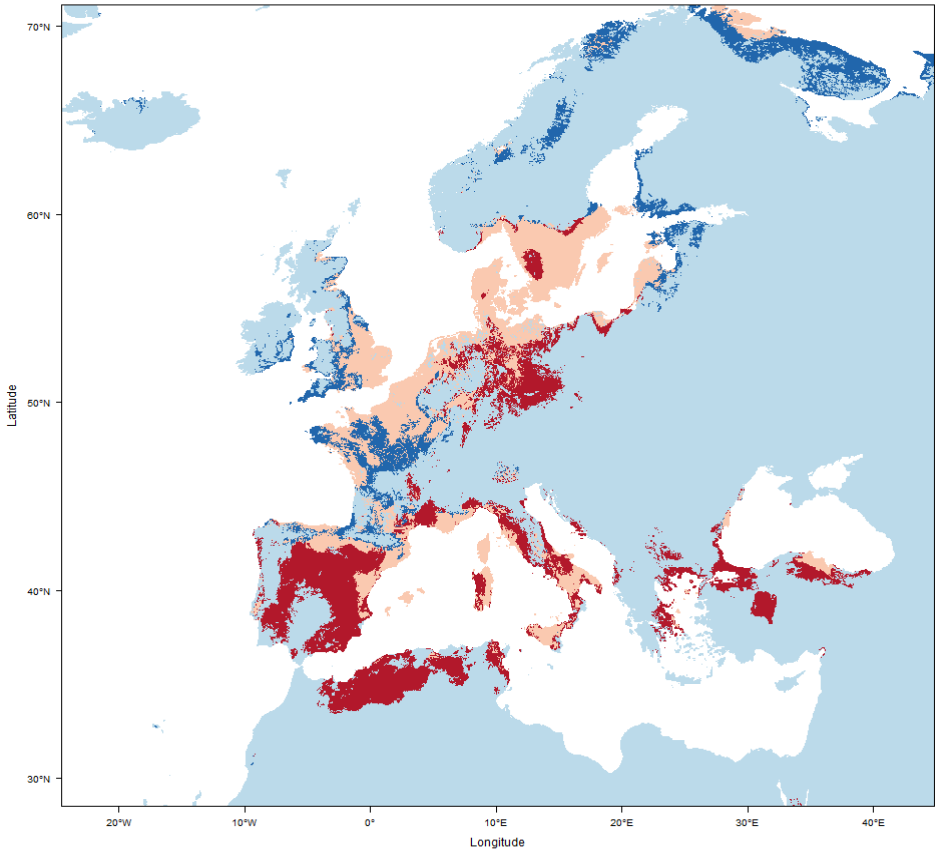
Colours: light blue = stable absence, dark blue = range expansion, orange = stable presence, red = range reduction.



Appendix 39. Predicted distribution of *Eruca vesicaria* ssp. *sativa* for 2070 according to climate change scenario RCP 2.6 (top) and RCP 8.5 (bottom) as compared to predictions for the present time.

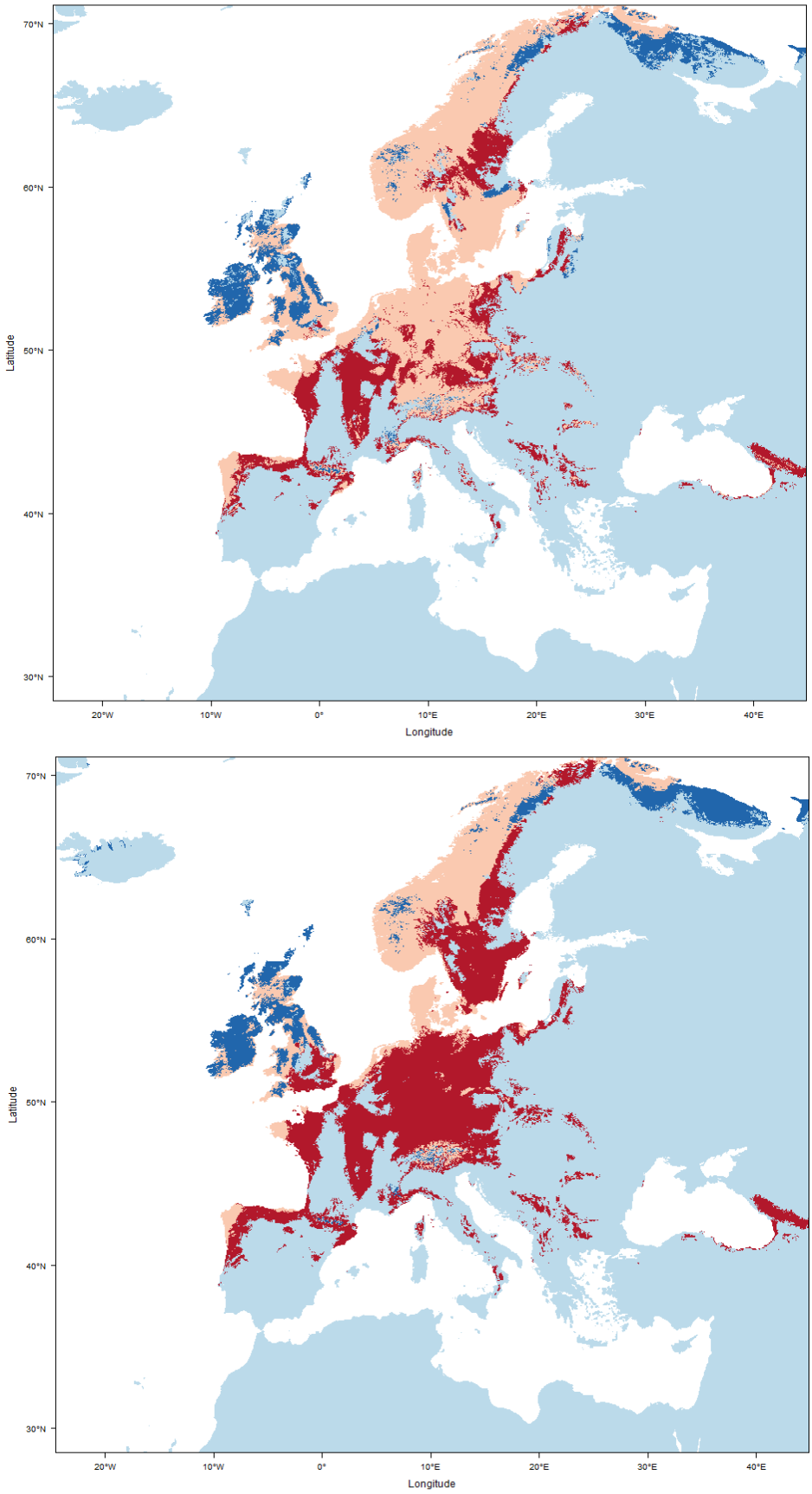
Colours: light blue = stable absence, dark blue = range expansion, orange = stable presence, red = range reduction.





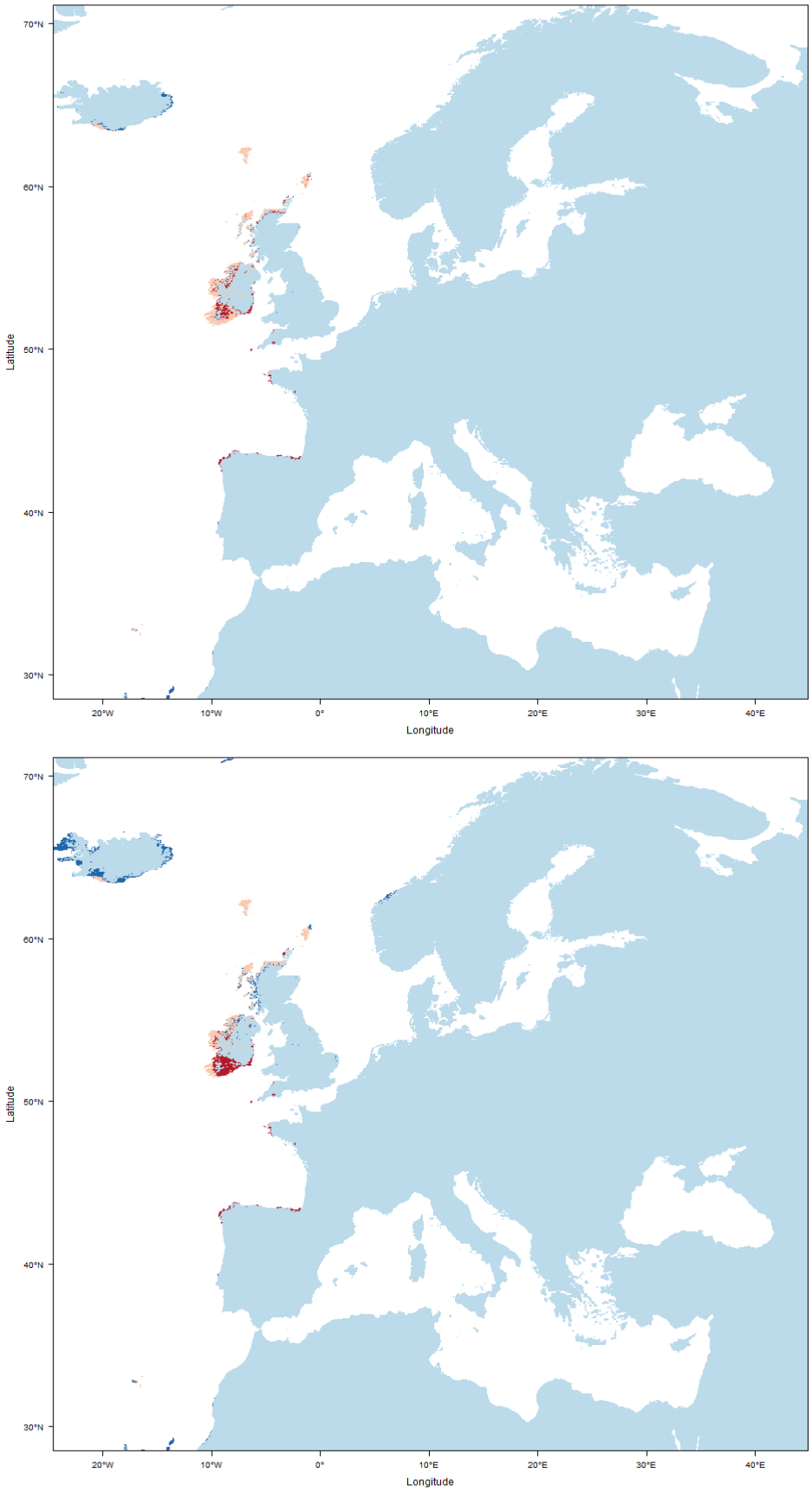
Appendix 40. Predicted distribution of *Rumex acetosa* ssp. *acetosa* for 2070 according to climate change scenario RCP 2.6 (top) and RCP 8.5 (bottom) as compared to predictions for the present time.

Colours: light blue = stable absence, dark blue = range expansion, orange = stable presence, red = range reduction.



Appendix 41. Predicted distribution of *Rumex acetosa* ssp. *hibernicus* for 2070 according to climate change scenario RCP 2.6 (top) and RCP 8.5 (bottom) as compared to predictions for the present time.

Colours: light blue = stable absence, dark blue = range expansion, orange = stable presence, red = range reduction.



Appendix 42. Percentage range change predicted with species distribution modelling for the selected crop wild relatives of leafy vegetables in the European region for the year 2070 according to climate change scenario RCP 2.6 and RCP 8.5. Results for the European region assuming unrestricted migration are compared to those of a model with no migration and to those for the Natura 2000 network of European protected sites.

	RCP 2.6			RCP 8.5		
Species	**EUR unrestricted migration**	**EUR no migration**	**Natura 2000 unrestricted migration**	**EUR unrestricted migration**	**EUR no migration**	**Natura 2000 unrestricted migration**
Asparagus aphyllus	-9.31	-17.64	-4.21	-21.72	-39.85	-13.50
Asparagus maritimus	-58.18	-70.93	-68.96	-87.72	-100.00	-97.01
Asparagus officinalis	-4.47	-15.11	-11.51	-11.62	-38.19	-38.88
Asparagus prostratus	73.49	-22.39	36.18	86.14	-55.66	31.08
Asparagus tenuifolius	42.42	-23.34	57.99	-11.73	-62.87	-40.06
Atriplex hortensis	-14.95	-26.34	-27.84	-37.83	-63.32	-64.41
Blitum bonus-henricus	-30.81	-40.17	-44.77	-59.84	-82.25	-78.02
Brassica nigra	0.01	-9.61	-3.99	-16.26	-33.50	-34.82
Cichorium intybus	-3.22	-15.62	-8.35	-10.02	-36.93	-32.20
Cichorium pumilum	11.58	-7.65	1.80	24.55	-14.30	9.70
Cichorium spinosum	74.98	-5.86	70.17	150.83	-13.25	133.91
Cynara algarbiensis	-55.54	-57.65	-36.84	-99.71	-99.92	-99.78
Cynara baetica	-57.56	-60.88	-57.71	-93.02	-94.16	-95.06
Cynara cardunculus ssp. *cardunculus*	-1.37	-14.75	1.98	13.41	-14.60	17.22
Cynara cardunculus ssp. *flavescens*	-12.67	-31.74	-13.89	-74.43	-85.76	-84.36
Cynara humilis	-15.78	-26.01	-20.88	-56.49	-63.74	-53.07
Cynara tournefortii	-11.45	-32.63	-15.22	-66.74	-81.21	-80.93
Diplotaxis muralis	-7.30	-18.70	-17.62	-23.93	-47.75	-51.01
Diplotaxis tenuifolia	-5.89	-19.08	-18.92	-19.20	-46.03	-50.09
Eruca vesicaria ssp. *sativa*	-17.06	-31.05	-20.19	-19.15	-48.10	-34.26
Glebionis coronaria	4.84	-13.34	-2.50	12.23	-23.68	-3.02
Lactuca saligna	5.41	-15.08	9.04	-17.30	-40.05	-19.22
Lactuca serriola	-8.11	-16.00	-8.65	-17.39	-37.95	-32.58
Lepidium spinosum	6.34	-19.29	43.48	4.91	-34.08	65.14
Portulaca oleracea	4.54	-11.33	-0.64	-8.21	-27.52	-18.16
Rumex acetosa ssp. *acetosa*	-13.46	-30.65	-25.90	-45.70	-64.28	-59.66
Rumex acetosa ssp. *hibernicus*	-12.56	-24.72	-12.05	19.69	-35.63	-6.37
Taraxacum officinale	-19.05	-27.78	-29.76	-38.66	-50.82	-59.71
Valerianella locusta	-9.70	-18.74	-17.89	-22.99	-42.42	-45.08

Appendix 43. Number of accessions (wild, weedy or landrace) of the selected crop wild relatives of leafy vegetables, originating from countries within the European region and included in the EURISCO database.

	Asparagus aphyllus	*Asparagus maritimus*	*Asparagus officinalis*	*Asparagus prostratus*	*Asparagus tenuifolius*	*Atriplex hortensis*	*Brassica nigra*	*Chenopodium bonus-henricus*	*Cichorium intybus*	*Cynara cardunculus*	*Cynara humilis*	*Cynara tournefortii*	*Diplotaxis muralis*	*Diplotaxis tenuifolia*	*Eruca vesicaria/ Eruca sativa*	*Glebionis coronaria/ Chrysanthemum coronarium*	*Lactuca saligna*	*Lactuca serriola*	*Lepidium spinosum*	*Portulaca oleracea*	*Rumex acetosa*	*Taraxacum officinale*	*Valerianella locusta*	Total
ALB						9			3						3			1			1			17
ARM			5														4	20			1			30
AUT			3			7		1	1									4		2				18
AZE			3			1			18									6		1	9			38
BEL							1							1				12						14
BGR					1	1	10							1	1		3	13			1	1		32
BIH									1													1		2
CHE																		6						6
CYP															9	1		1		1				12
CZE									4									135						139
DEU			12			7	4		66				2					92		7	48		8	246
DNK			10			1	4	1	9					1				8						34
DZA													8											8
EGY																		10						10
ESP		1	20			12	7	4	21	98		1	1	2	114		5	3	31		3	7	13		343
FIN								1																1
FRA							10		5				2		1			4	88					110
GBR			1															3	28					32
GEO						2			1									1	9					13
GRC							23		2	1					3			3	23			1		56
HRV						1	2		32						4				4		1	14	20	4	82
HUN			8			25	3		2										66			27			131
IRL				4			4																	8
ISR	8						30								42	16	61	167	1					325
ITA	2		1		3	1	16	1	88	33			3	10	23		32	71						284
LBY															3					2				5
MAR							1								7									8
MDA						1																		1
MKD						1																		1
MLT																		1						1
NLD							2											31					1	34
NOR			3						1									3						7
POL						1	1		5									7			9			23
PRT			2				5		12	4	2				1		3	11		7				47
ROU						33		1	1									5		1	1	6		48
RUS			1				3						1				2	24			4			35
SRB														1										1
SVK			9			1											1	13			1			25
SVN																		9						9
SWE			3						3				1					82						89
SYR									1						1			6		5				13
TUN													1		4									5
TUR							5							3	1	2	3	27	1					42
UKR			3			1	3		5						3			3		1	15	1		35
YUG						1	2																	3