

# Forest Condition in Europe

## The 2024 Assessment

### Online Supplementary Material

ICP Forests Technical Report under the UNECE Convention  
on Long-range Transboundary Air Pollution (Air Convention)

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# CONTENTS

## S1 TREE CROWN CONDITION AND DAMAGE CAUSES – ADDITIONAL TABLES AND MAPS

S1-1	Mean plot defoliation of main tree species in 2023.....	4
S1-2	Trends in mean plot defoliation of the main tree species 2014–2023.....	13
S1-3	Damage from various damaging agent groups reported in 2023.....	21

## S2 RESULTS OF THE NATIONAL CROWN CONDITION SURVEYS

S2-1	Information on the monitoring design for the national crown condition surveys in the participating countries in 2023.....	27
S2-2	Tree defoliation (%) in different defoliation classes from national crown condition surveys in 2023.....	28
S2-3	Percentage of moderately to severely defoliated trees (defoliation classes 2–4) between 2014 and 2023 – All species.....	32
S2-4	Percentage of moderately to severely defoliated trees (defoliation classes 2–4) between 2014 and 2023 – Conifers.....	33
S2-5	Percentage of moderately to severely defoliated trees (defoliation classes 2–4) between 2014 and 2023 – Broadleaves.....	34
S2-6	Change of tree defoliation over time (1990–2023) per country.....	35

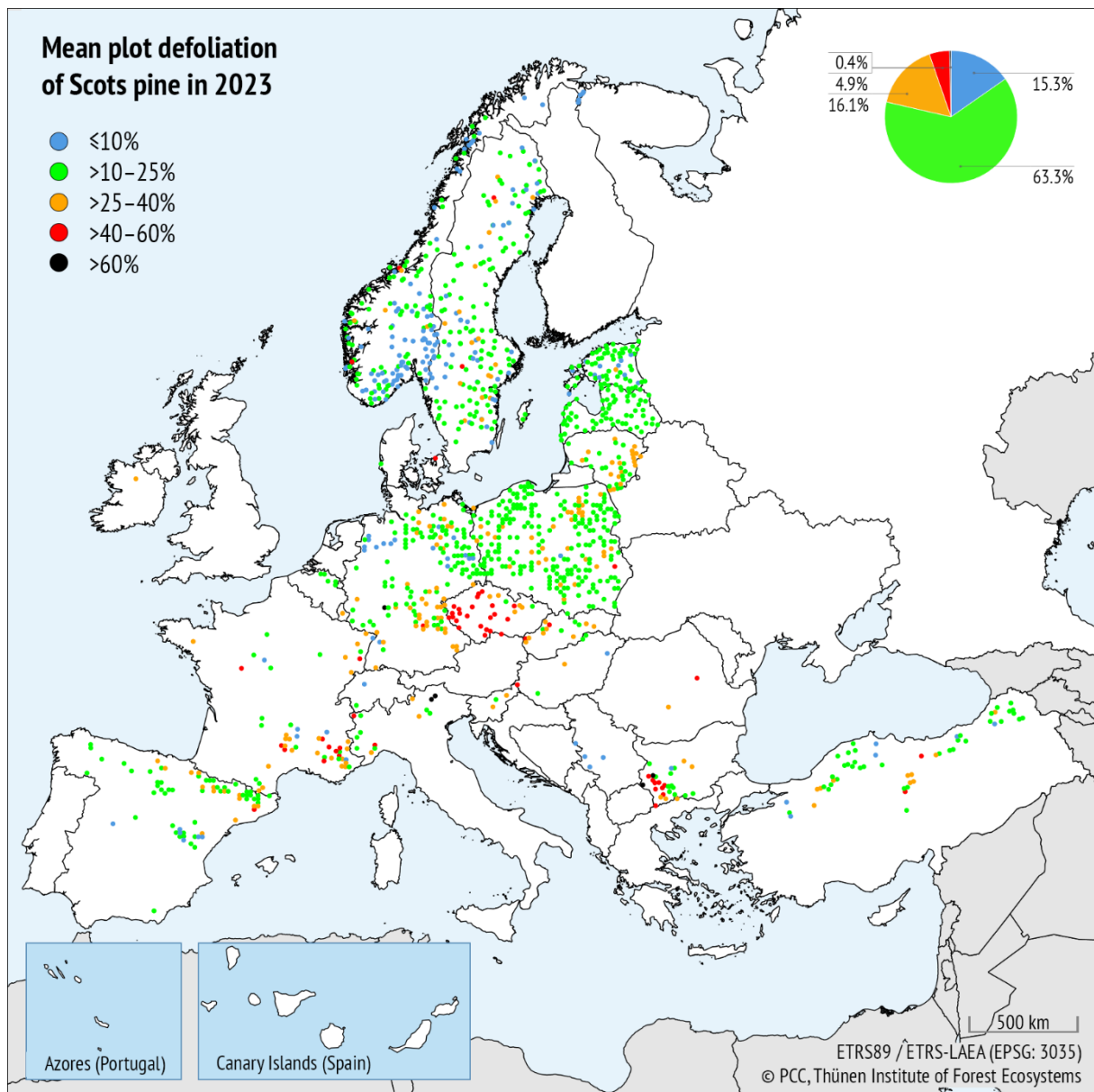
# S1 TREE CROWN CONDITION AND DAMAGE CAUSES – ADDITIONAL TABLES AND MAPS

## S1-1 Mean plot defoliation of main tree species in 2023

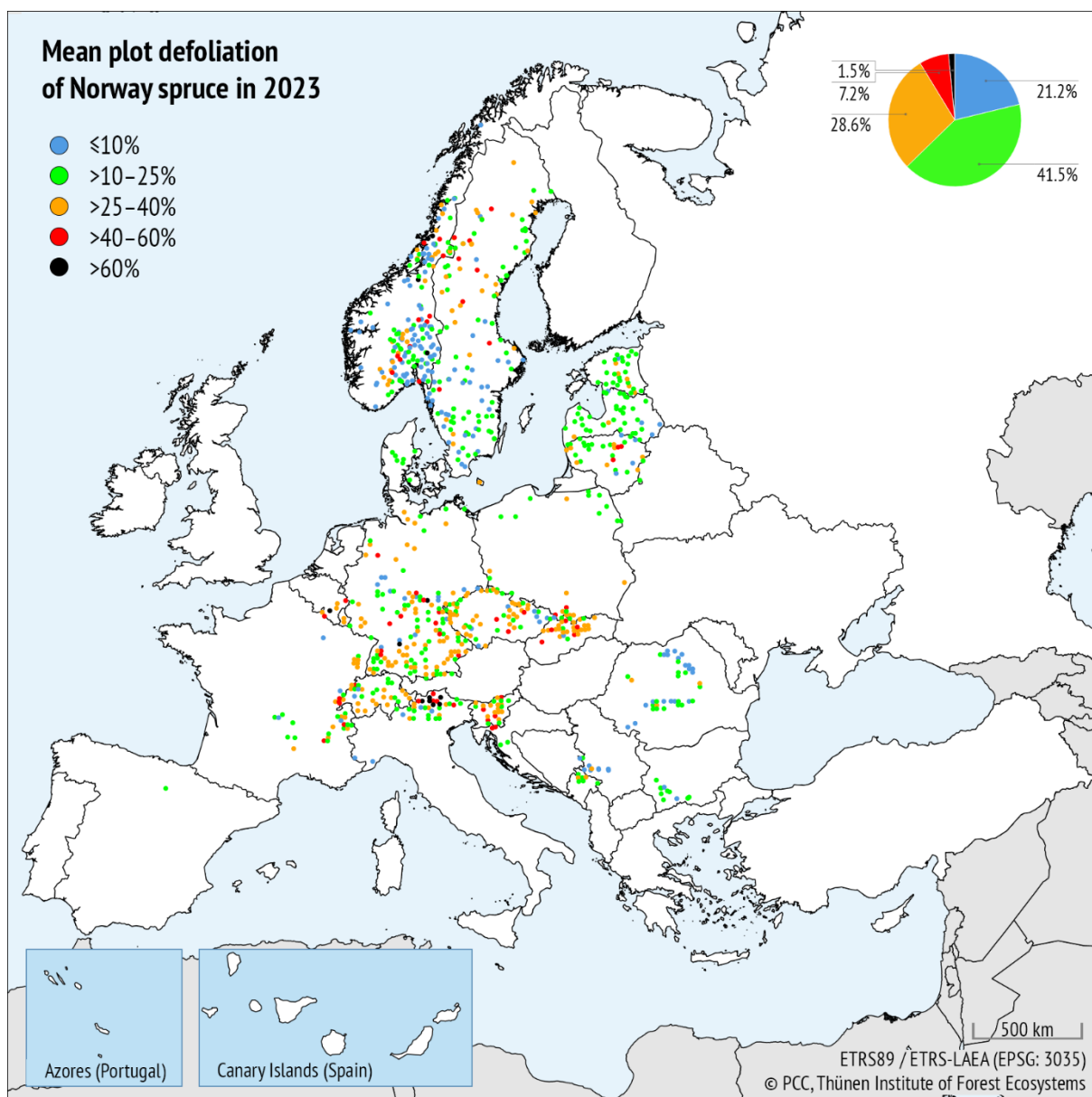
**Table S1-1: Percentage of plots with mean plot defoliation in defoliation classes 0-3 (class 2 subdivided) for the main species or species groups (n trees pr. plot ≥ 3) and the number of plots in each group in 2023. Dead trees are not included.**

Main species or species groups	Class 0 0-10%	Class 1 >10-25%	Class 2-1 >25-40%	Class 2-2 >40-60%	Class 3 >60%	No. of plots
Scots pine ( <i>Pinus sylvestris</i> )	15.3	63.3	16.1	4.9	0.4	1183
Norway spruce ( <i>Picea abies</i> )	21.2	41.5	28.6	7.2	1.5	860
Austrian pine ( <i>Pinus nigra</i> )	9.8	57.2	22.5	8.4	2.1	285
Mediterranean lowland pines	3.2	59.9	29.8	5.4	1.7	406
Common beech ( <i>Fagus sylvatica</i> )	22.7	40.9	22.7	10.3	3.4	727
Deciduous temperate oaks	7.8	37.5	33.6	17.6	3.4	669
Dec. (sub-) Mediterranean oaks	14.7	47.9	21.2	12.9	3.2	495
Evergreen oaks	1.2	45.7	40.9	10.9	1.2	247

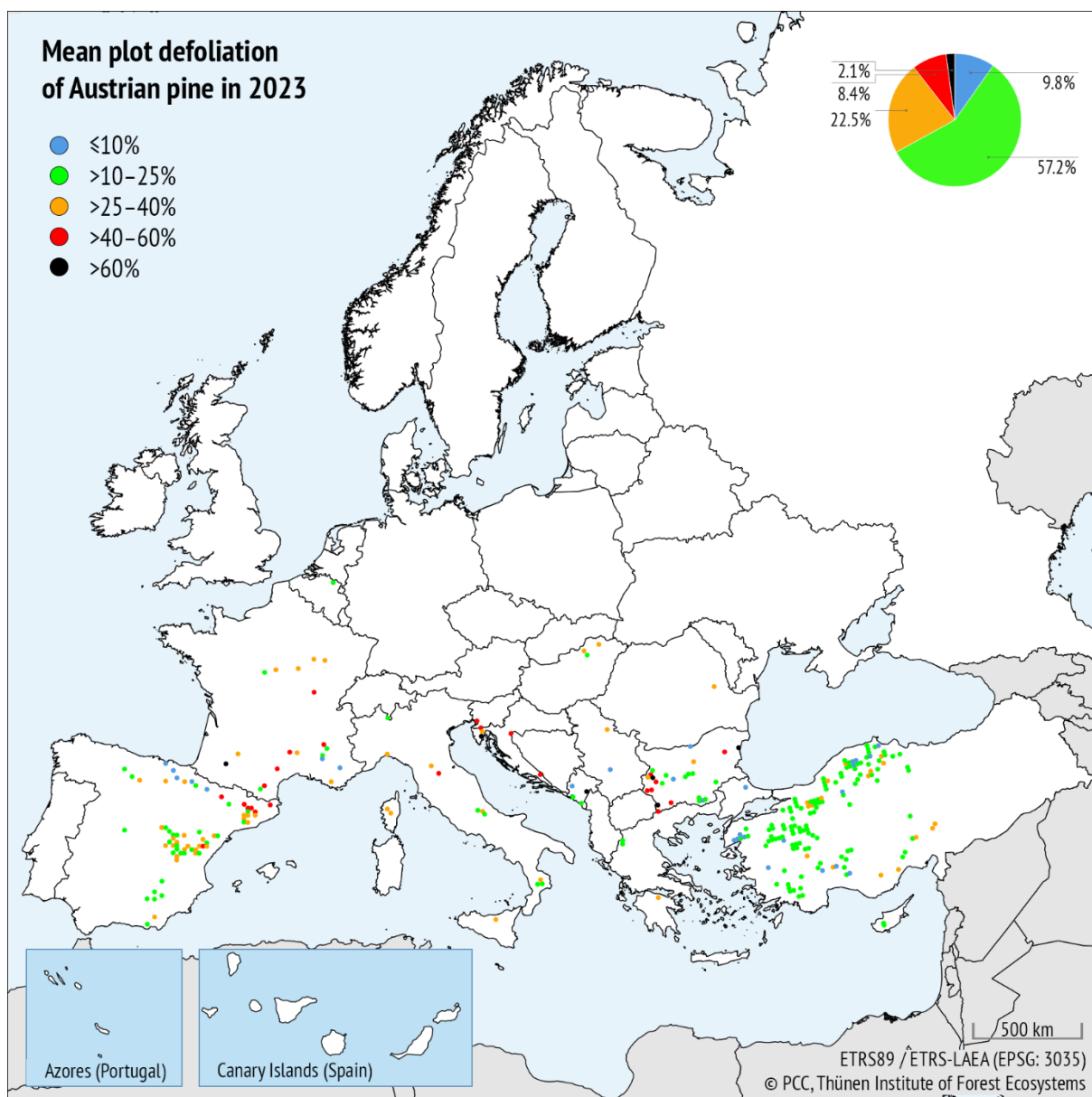




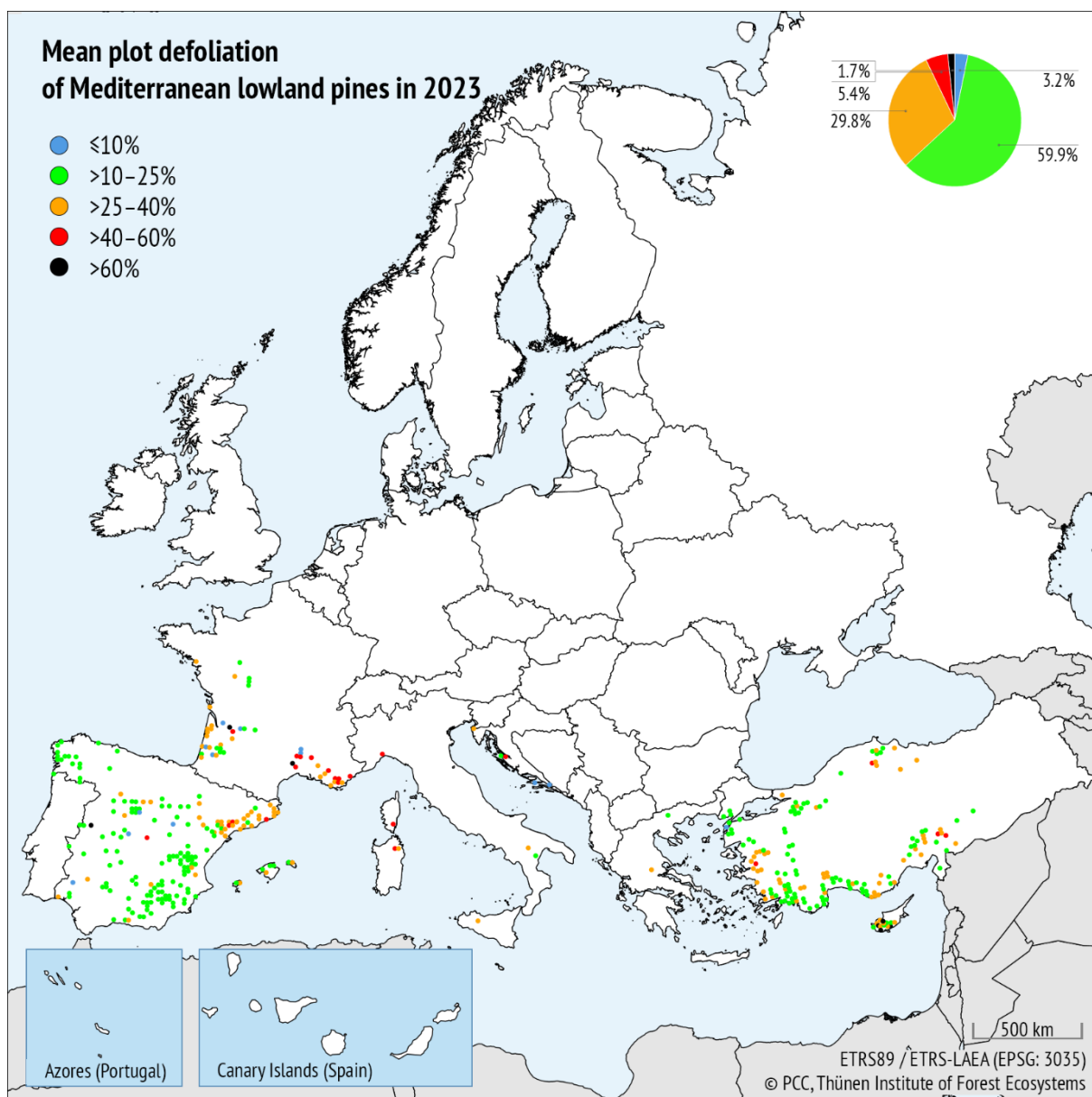
**Figure S1-1: Mean plot defoliation of Scots pine (*Pinus sylvestris*) in 2023.** Dead trees are not included. The legend (top left) indicates the degree of defoliation (defoliation class) ranging from none (blue), slight (green), moderate (orange and red), to severe (black). The percentages refer to the needle/leaf loss in the crown compared to a reference tree. The pie chart (top right) indicates the percentage of plots per defoliation class.



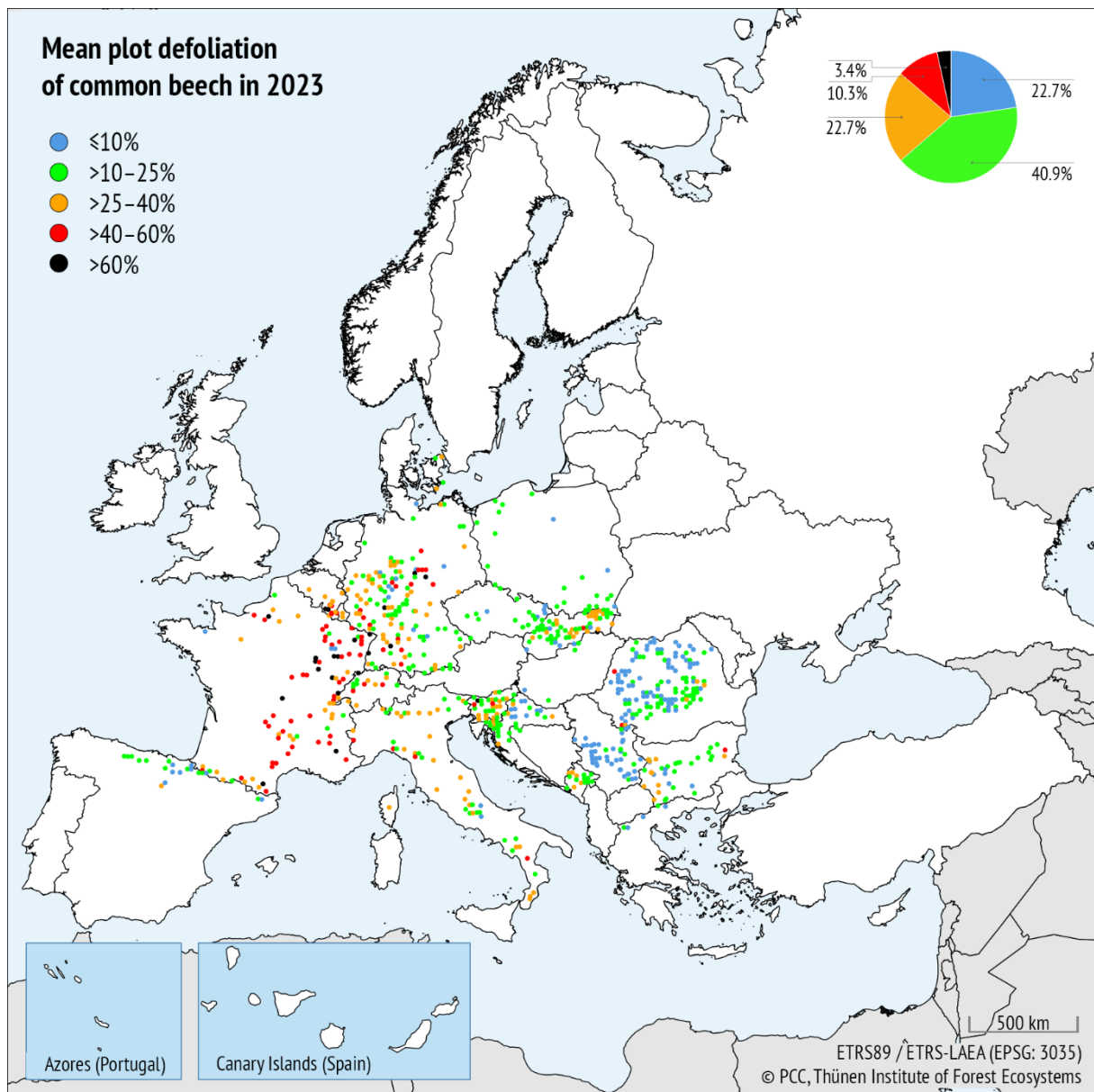
**Figure S1-2: Mean plot defoliation of Norway spruce (*Picea abies*) in 2023.** Dead trees are not included. The legend (top left) indicates the degree of defoliation (defoliation class) ranging from none (blue), slight (green), moderate (orange and red), to severe (black). The percentages refer to the needle/leaf loss in the crown compared to a reference tree. The pie chart (top right) indicates the percentage of plots per defoliation class.



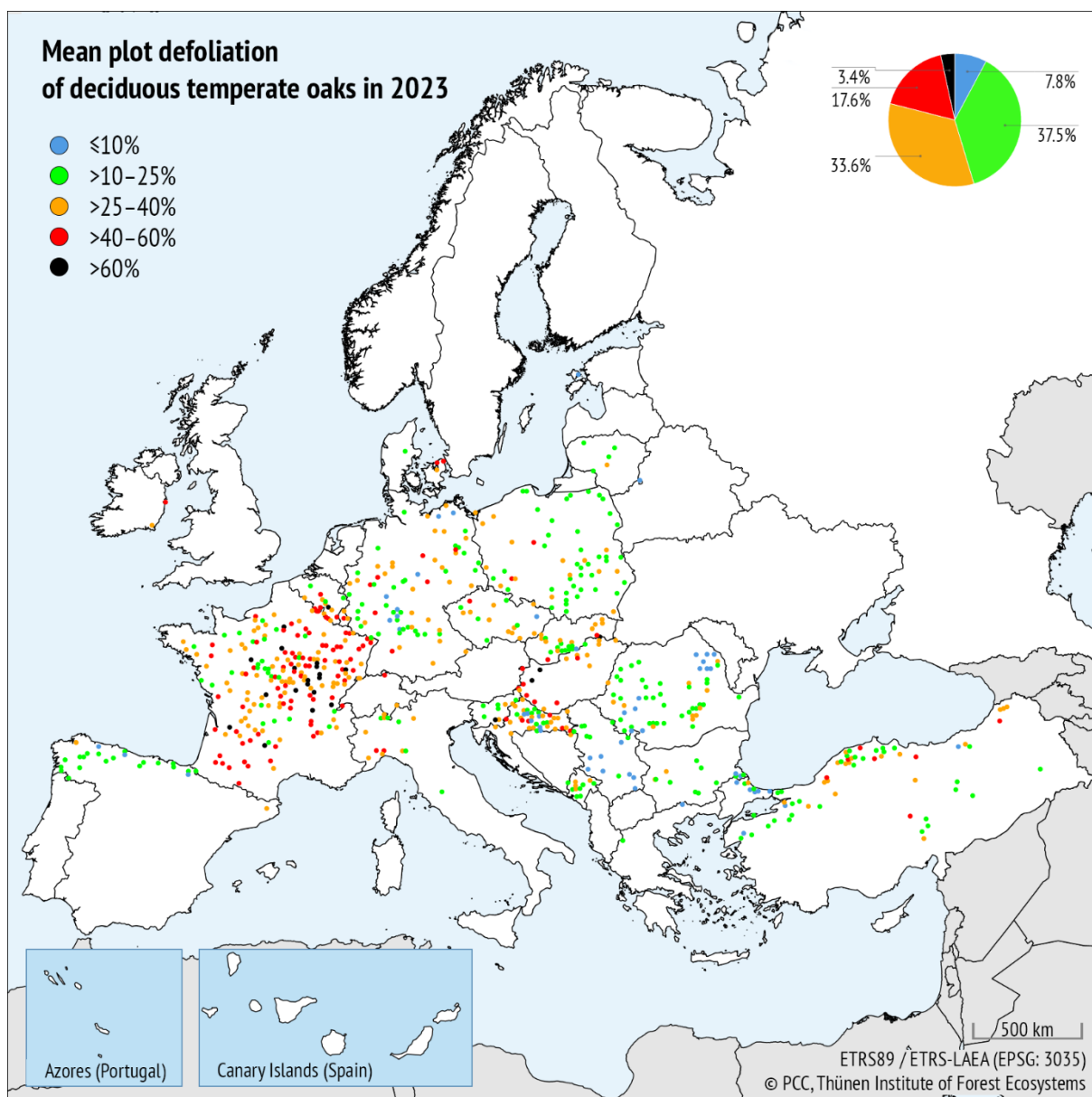
**Figure S1-3: Mean plot defoliation of Austrian pine (*Pinus nigra*) in 2023.** Dead trees are not included. The legend (top left) indicates the degree of defoliation (defoliation class) ranging from none (blue), slight (green), moderate (orange and red), to severe (black). The percentages refer to the needle/leaf loss in the crown compared to a reference tree. The pie chart (top right) indicates the percentage of plots per defoliation class.



**Figure S1-4: Mean plot defoliation of Mediterranean lowland pines (*Pinus halepensis*, *P. pinaster*, *P. pinea*, *P. brutia*) in 2023.** Dead trees are not included. The legend (top left) indicates the degree of defoliation (defoliation class) ranging from none (blue), slight (green), moderate (orange and red), to severe (black). The percentages refer to the needle/leaf loss in the crown compared to a reference tree. The pie chart (top right) indicates the percentage of plots per defoliation class.

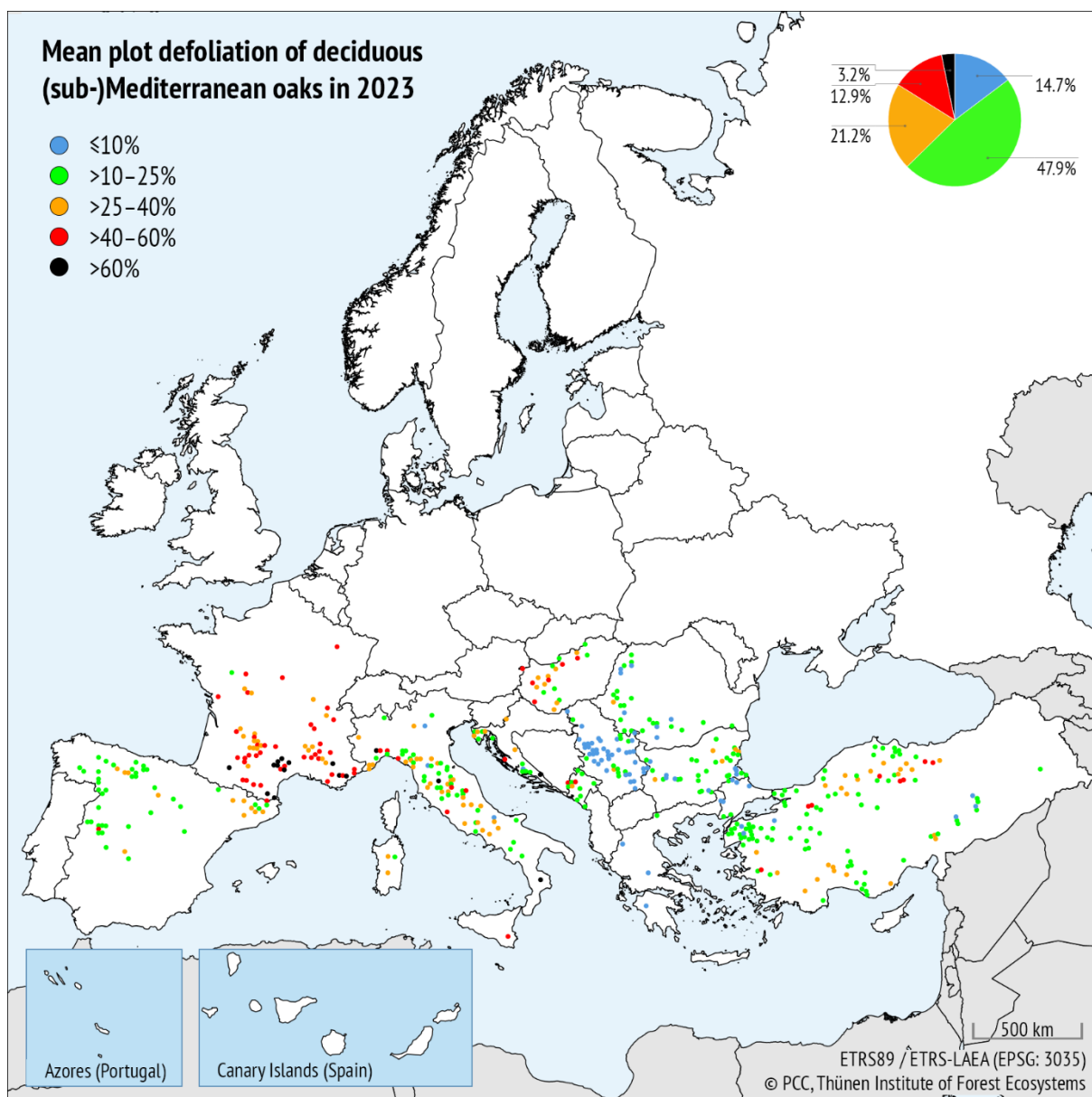


**Figure S1-5: Mean plot defoliation of common beech (*Fagus sylvatica*) in 2023.** Dead trees are not included. The legend (top left) indicates the degree of defoliation (defoliation class) ranging from none (blue), slight (green), moderate (orange and red), to severe (black). The percentages refer to the needle/leaf loss in the crown compared to a reference tree. The pie chart (top right) indicates the percentage of plots per defoliation class.

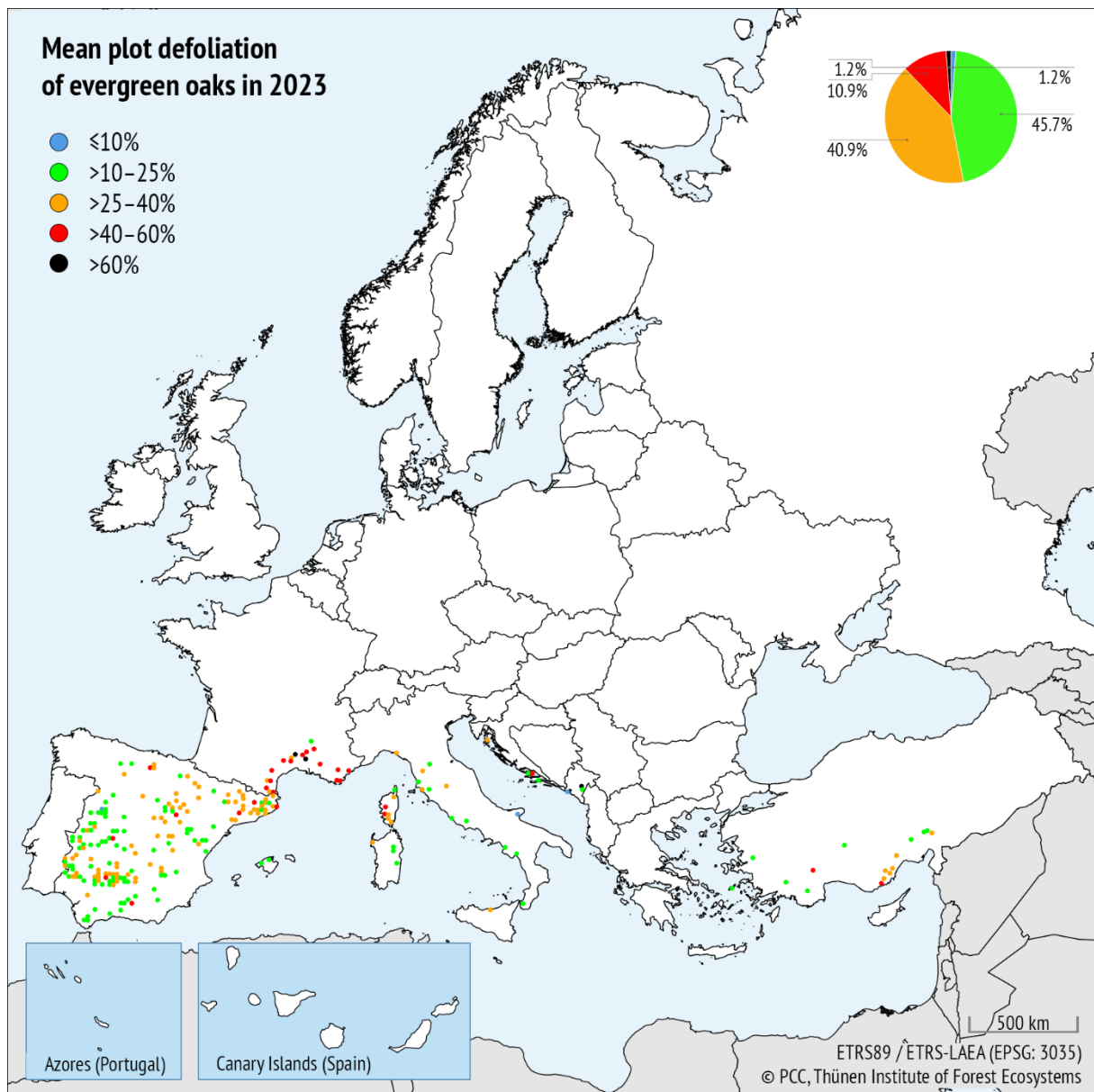


**Figure S1-6: Mean plot defoliation of deciduous temperate oaks (*Quercus robur* and *Q. petraea*) in 2023.** Dead trees are not included. The legend (top left) indicates the degree of defoliation (defoliation class) ranging from none (blue), slight (green), moderate (orange and red), to severe (black). The percentages refer to the needle/leaf loss in the crown compared to a reference tree. The pie chart (top right) indicates the percentage of plots per defoliation class.





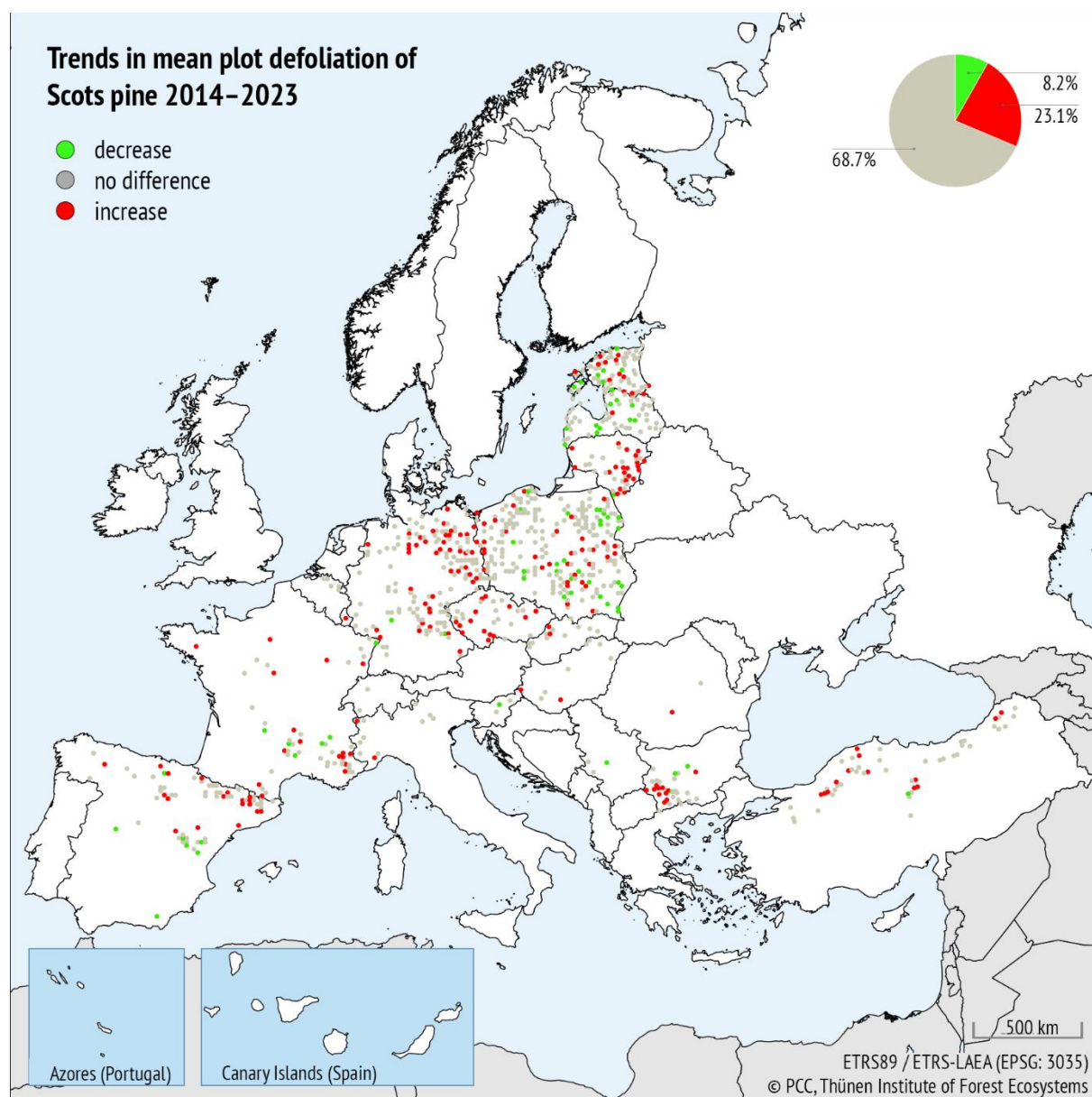
**Figure S1-7: Mean plot defoliation of deciduous (sub-) Mediterranean oaks (*Quercus cerris*, *Q. frainetto*, *Q. pubescens*, *Q. pyrenaica*) in 2023.** Dead trees are not included. The legend (top left) indicates the degree of defoliation (defoliation class) ranging from none (blue), slight (green), moderate (orange and red), to severe (black). The percentages refer to the needle/leaf loss in the crown compared to a reference tree. The pie chart (top right) indicates the percentage of plots per defoliation class.



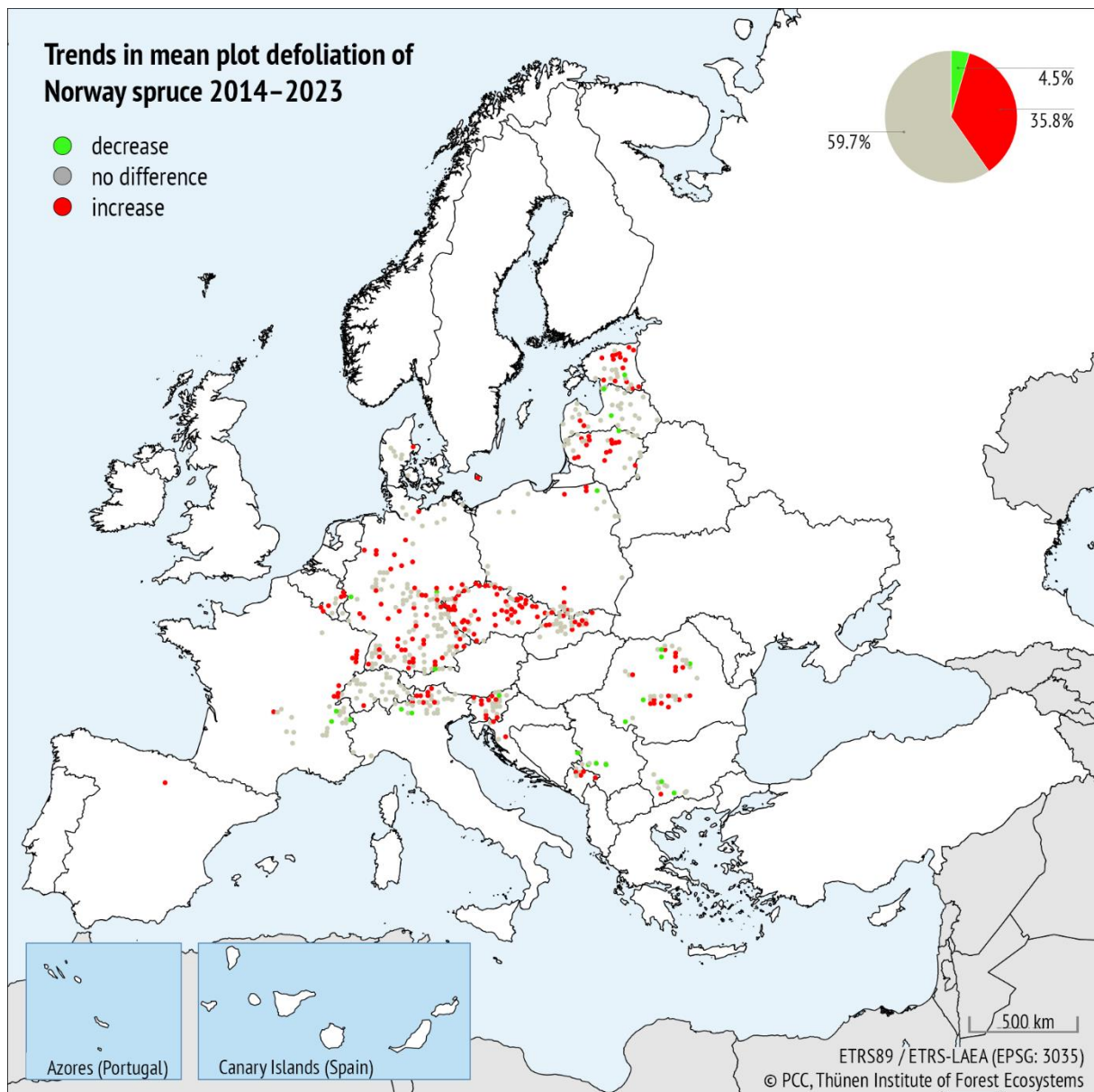
**Figure S1-8: Mean plot defoliation of evergreen oaks (*Quercus coccifera*, *Q. ilex*, *Q. rotundifolia*, *Q. suber*) in 2023.** Dead trees are not included. The legend (top left) indicates the degree of defoliation (defoliation class) ranging from none (blue), slight (green), moderate (orange and red), to severe (black). The percentages refer to the needle/leaf loss in the crown compared to a reference tree. The pie chart (top right) indicates the percentage of plots per defoliation class.



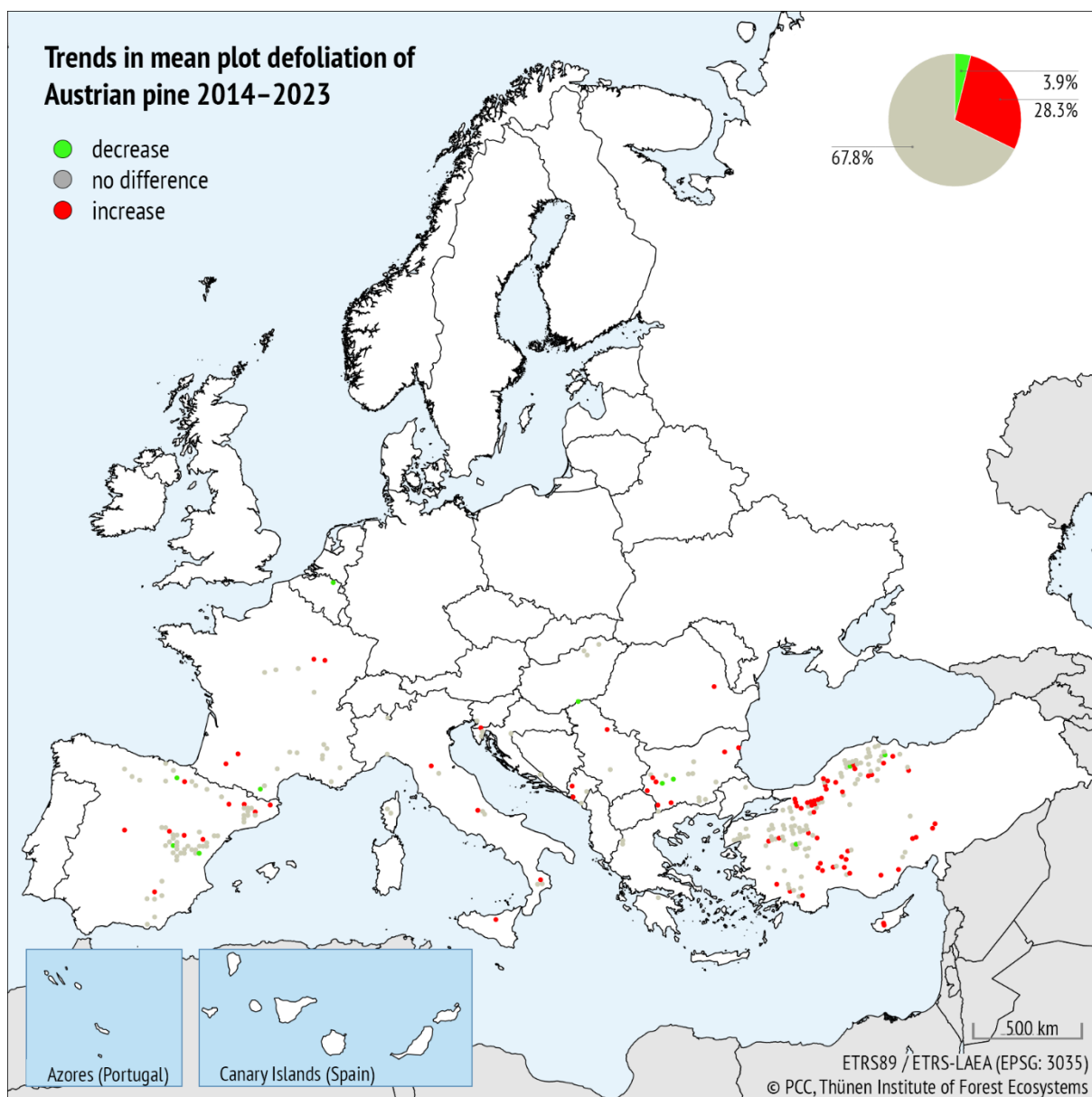
## S1-2 Trends in mean plot defoliation of the main tree species 2014–2023



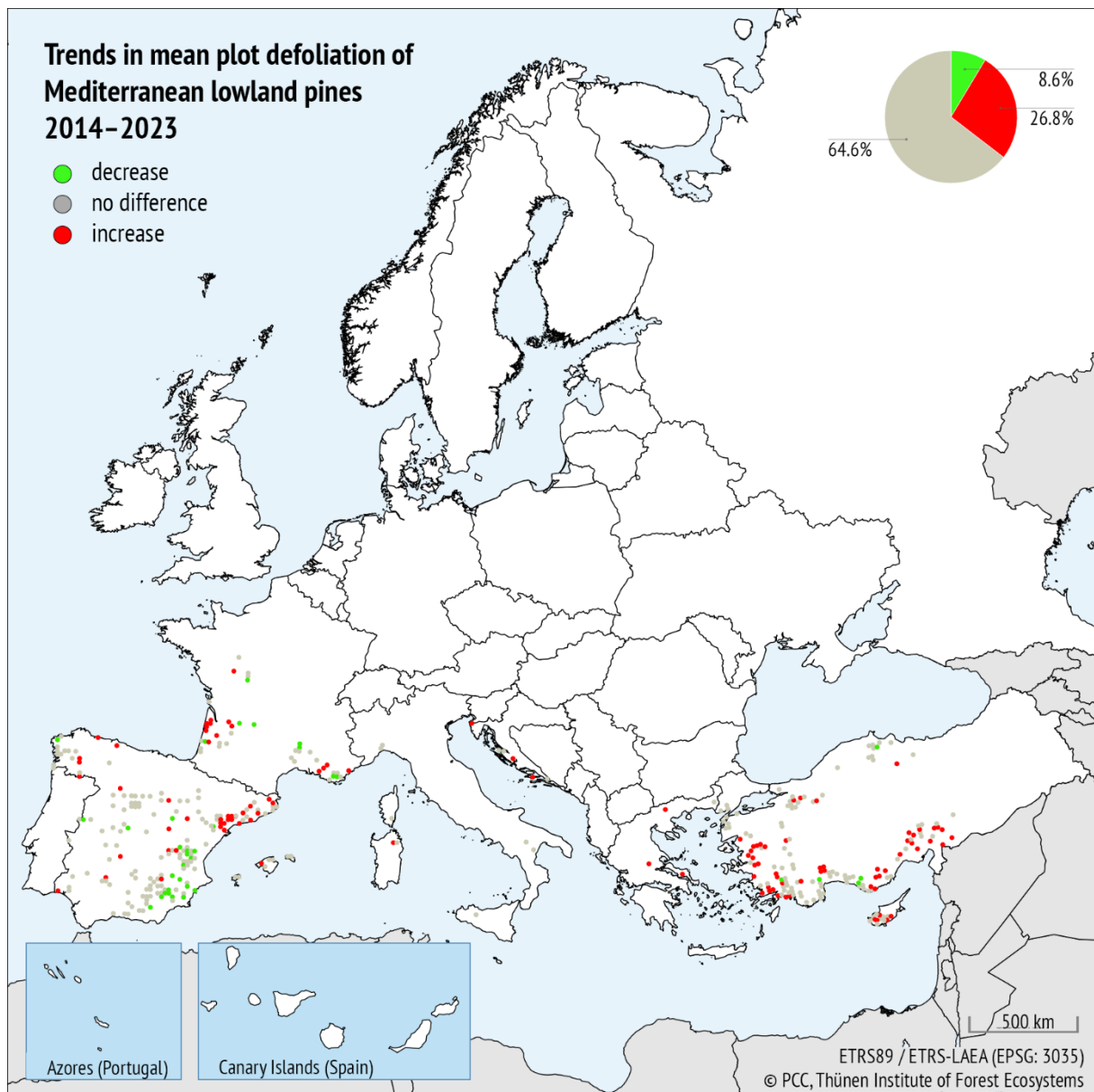
**Figure S1-9: Trends in mean plot defoliation of Scots pine (*Pinus sylvestris*) between 2014 and 2023.** Plots were included if assessments were available for at least 80% of the period. The legend (top left) indicates whether mean plot defoliation over all decreased, stayed the same or increased within the given period. The pie chart (top right) indicates the respective percentage of plots per trend direction.



**Figure S1-10: Trends in mean plot defoliation of Norway spruce (*Picea abies*) between 2014 and 2023.** Plots were included if assessments were available for at least 80% of the period. The legend (top left) indicates whether mean plot defoliation overall decreased, stayed the same or increased within the given period. The pie chart (top right) indicates the respective percentage of plots per trend direction.

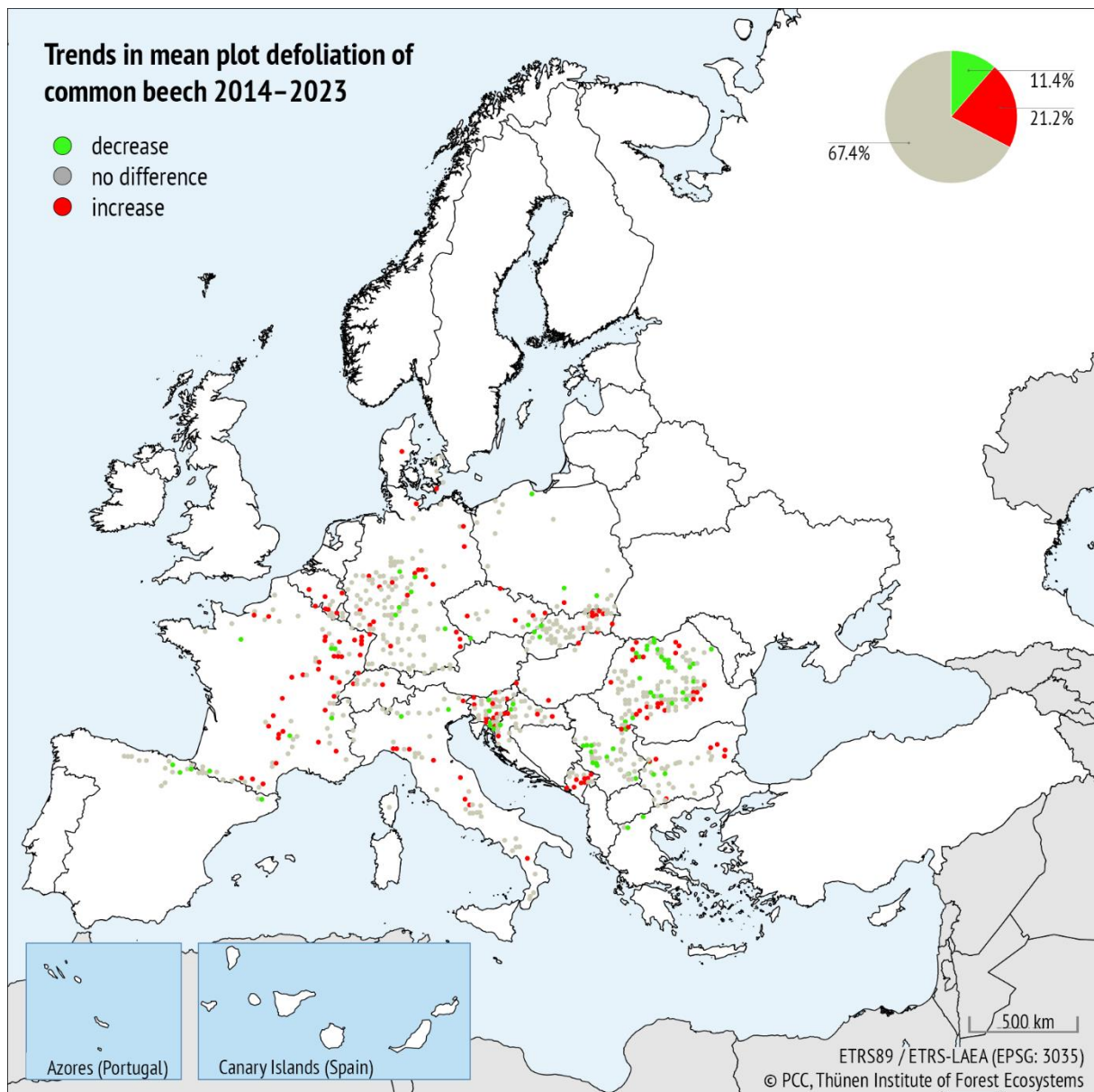


**Figure S1-11: Trends in mean plot defoliation of Austrian pine (*Pinus nigra*) between 2014 and 2023.** Plots were included if assessments were available for at least 80% of the period. The legend (top left) indicates whether mean plot defoliation overall decreased, stayed the same or increased within the given period. The pie chart (top right) indicates the respective percentage of plots per trend direction.

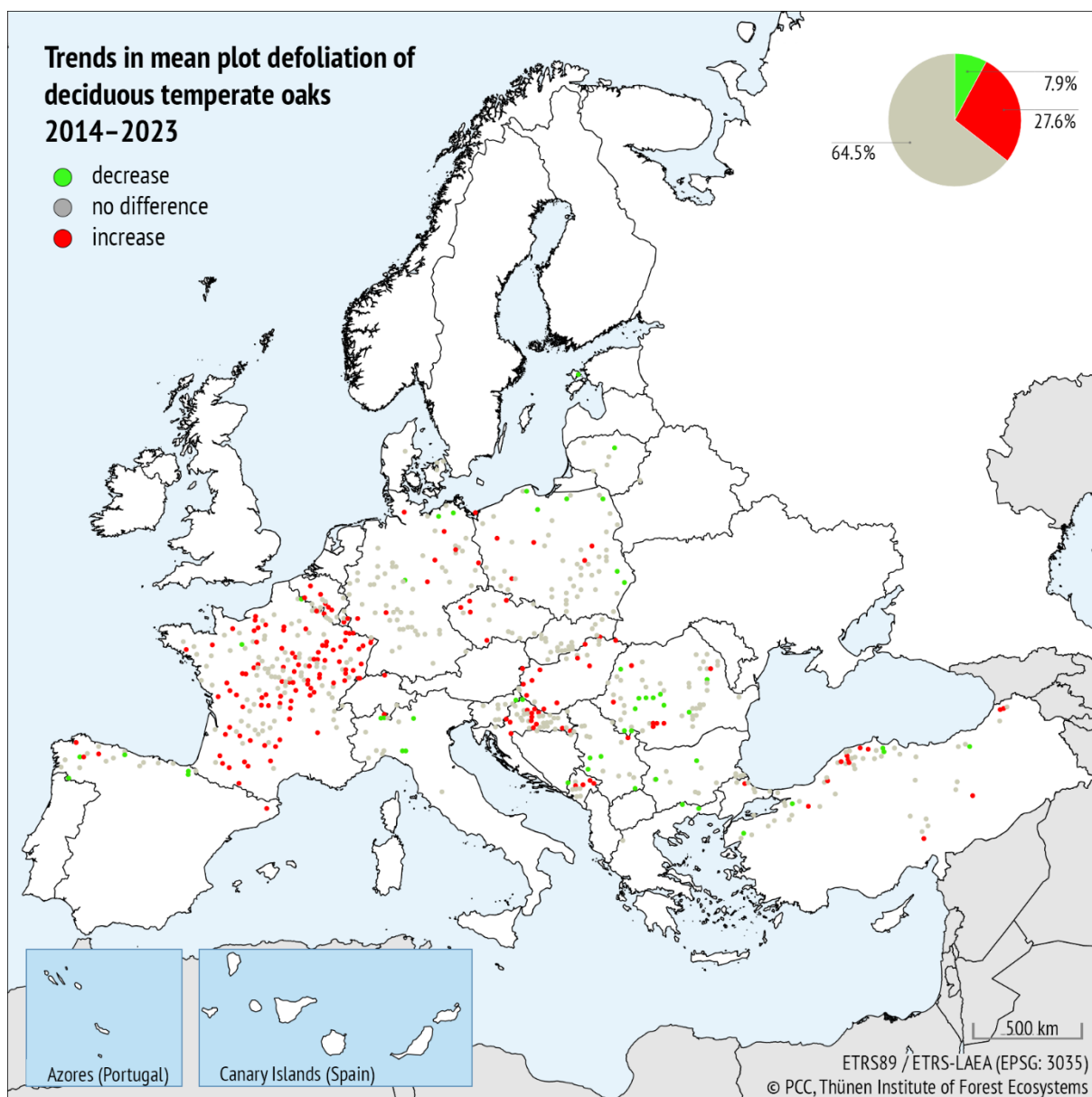


**Figure S1-12: Trends in mean plot defoliation of Mediterranean lowland pines (*Pinus brutia*, *P. halepensis*, *P. pinaster*, *P. pinea*) between 2014 and 2023.** Plots were included if assessments were available for at least 80% of the period. The legend (top left) indicates whether mean plot defoliation overall decreased, stayed the same or increased within the given period. The pie chart (top right) indicates the respective percentage of plots per trend direction.

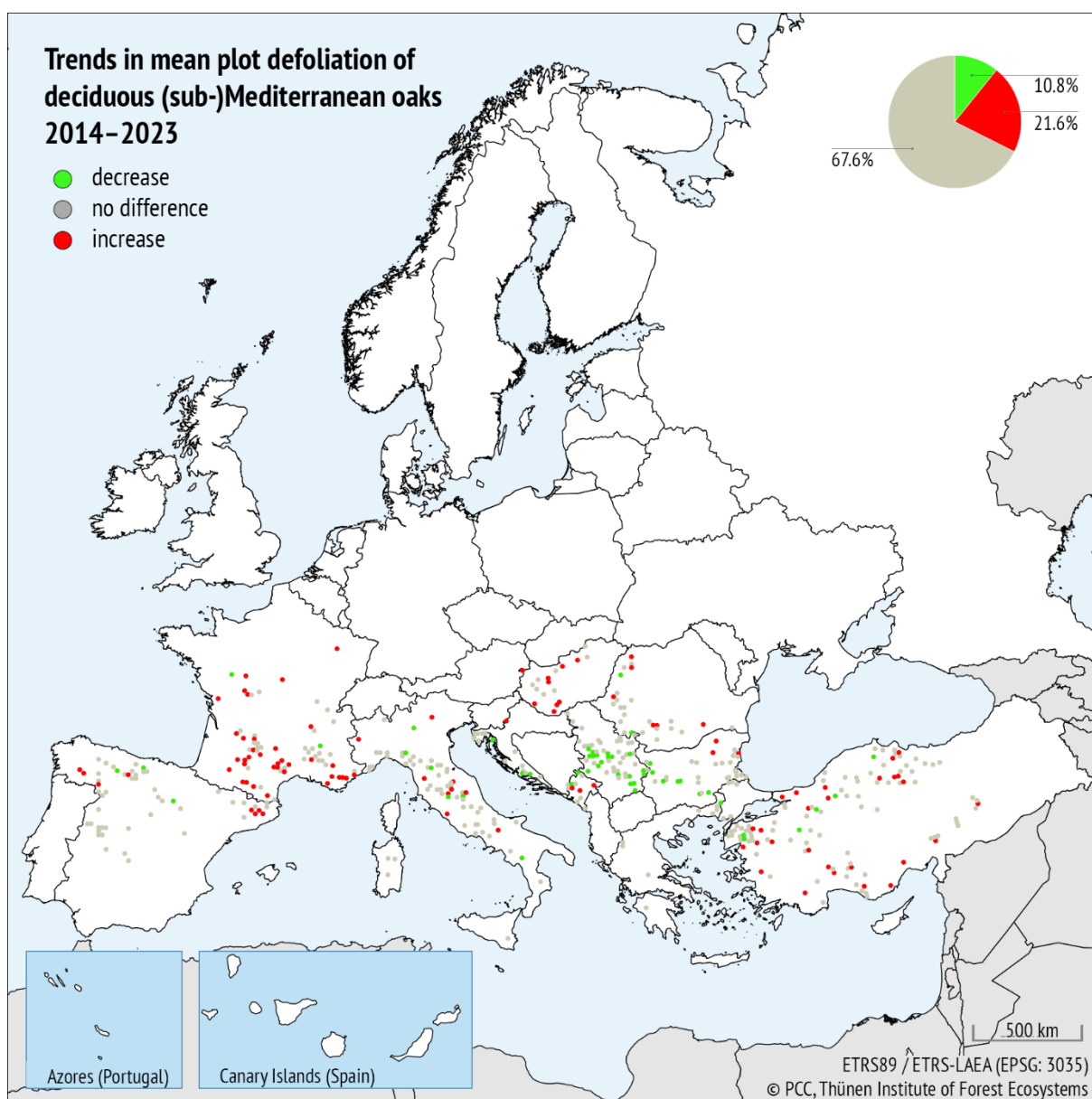




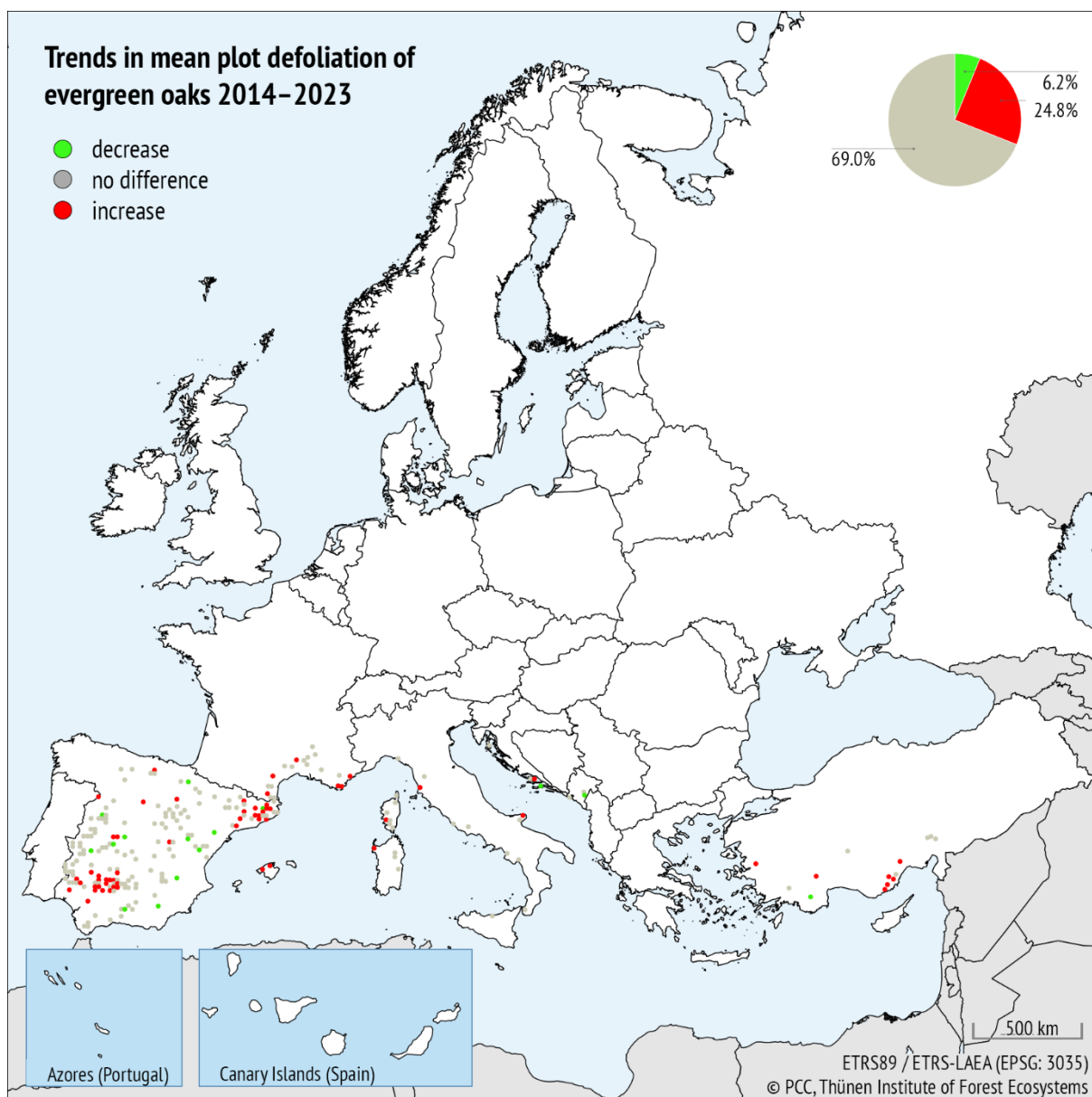
**Figure S1-13: Trends in mean plot defoliation of common beech (*Fagus sylvatica*) between 2014 and 2023.** Plots were included if assessments were available for at least 80% of the period. The legend (top left) indicates whether mean plot defoliation overall decreased, stayed the same or increased within the given period. The pie chart (top right) indicates the respective percentage of plots per trend direction.



**Figure S1-14: Trends in mean plot defoliation of deciduous temperate oaks (*Quercus robur* and *Q. petraea*) between 2014 and 2023.** Plots were included if assessments were available for at least 80% of the period. The legend (top left) indicates whether mean plot defoliation overall decreased, stayed the same or increased within the given period. The pie chart (top right) indicates the respective percentage of plots per trend direction.



**Figure S1-15: Trends in mean plot defoliation of deciduous (sub-) Mediterranean oaks (*Quercus cerris*, *Q. frainetto*, *Q. pubescens*, *Q. pyrenaica*) between 2014 and 2023.** Plots were included if assessments were available for at least 80% of the period. The legend (top left) indicates whether mean plot defoliation overall decreased, stayed the same or increased within the given period. The pie chart (top right) indicates the respective percentage of plots per trend direction.



**Figure S1-16: Trends in mean plot defoliation of evergreen oaks (*Quercus coccifera*, *Q. ilex*, *Q. rotundifolia*, *Q. suber*) between 2014 and 2023.** Plots were included if assessments were available for at least 80% of the period. The legend (top left) indicates whether mean plot defoliation overall decreased, stayed the same or increased within the given period. The pie chart (top right) indicates the respective percentage of plots per trend direction.



### S1-3 Damage from various damaging agent groups reported in 2023

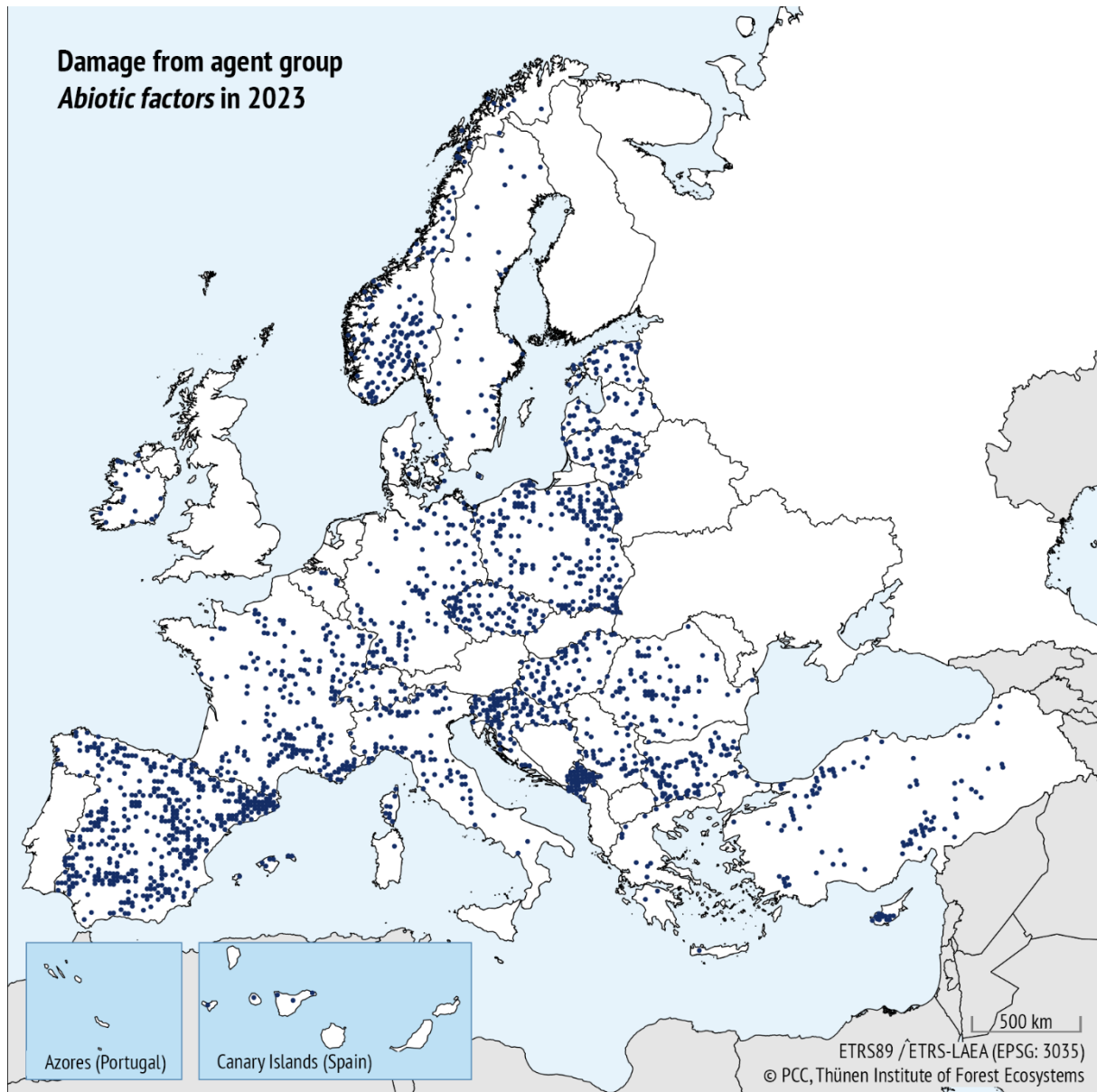


Figure S1-17: Damage from agent group **Abiotic factors** reported in 2023. Both fresh and old damage is shown.

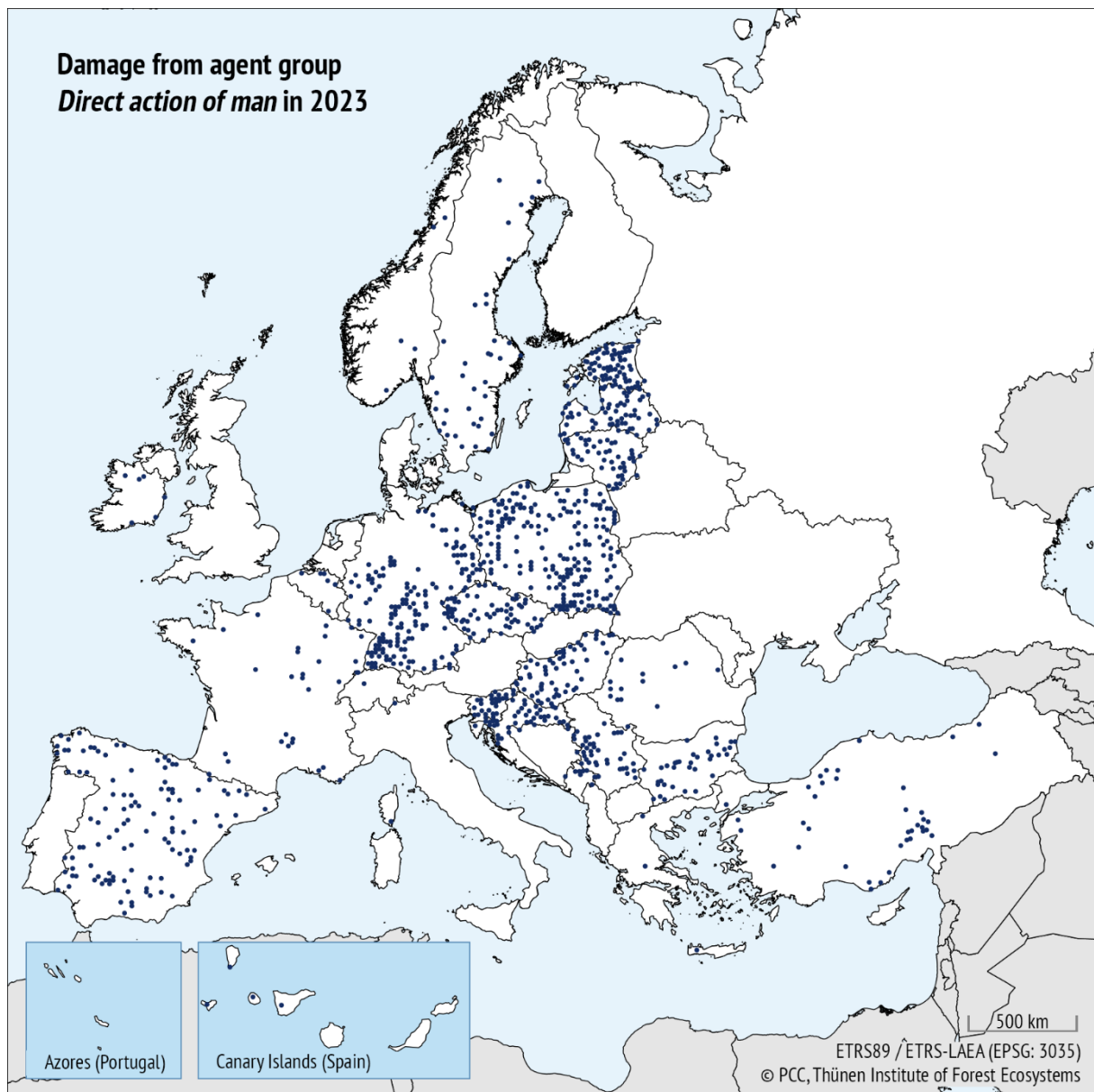


Figure S1-18: Damage from agent group **Direct action of man** reported in 2023. Both fresh and old damage is shown.



Figure S1-19: Damage from agent group **Fire** reported in 2023. Both fresh and old damage is shown.

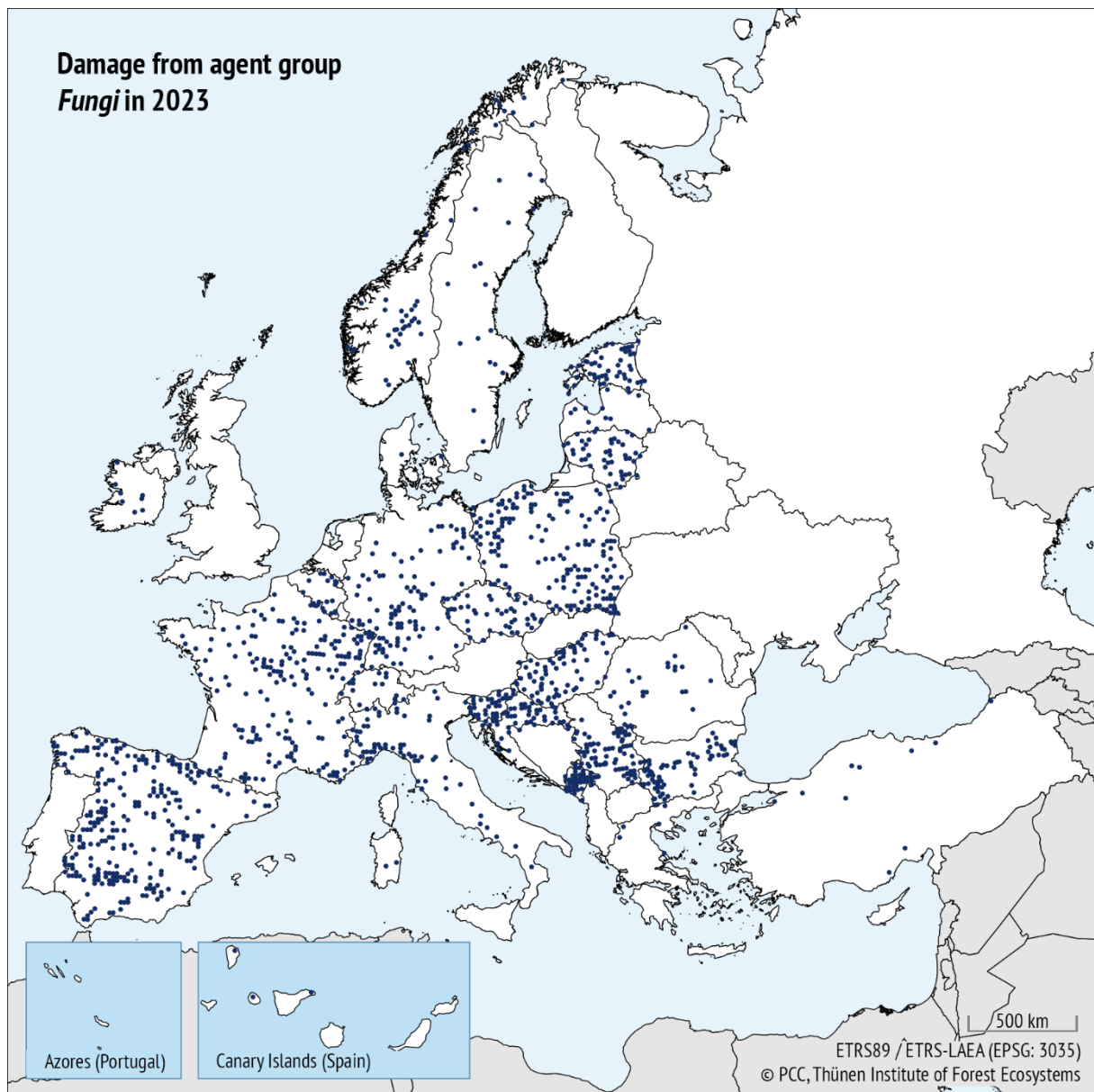
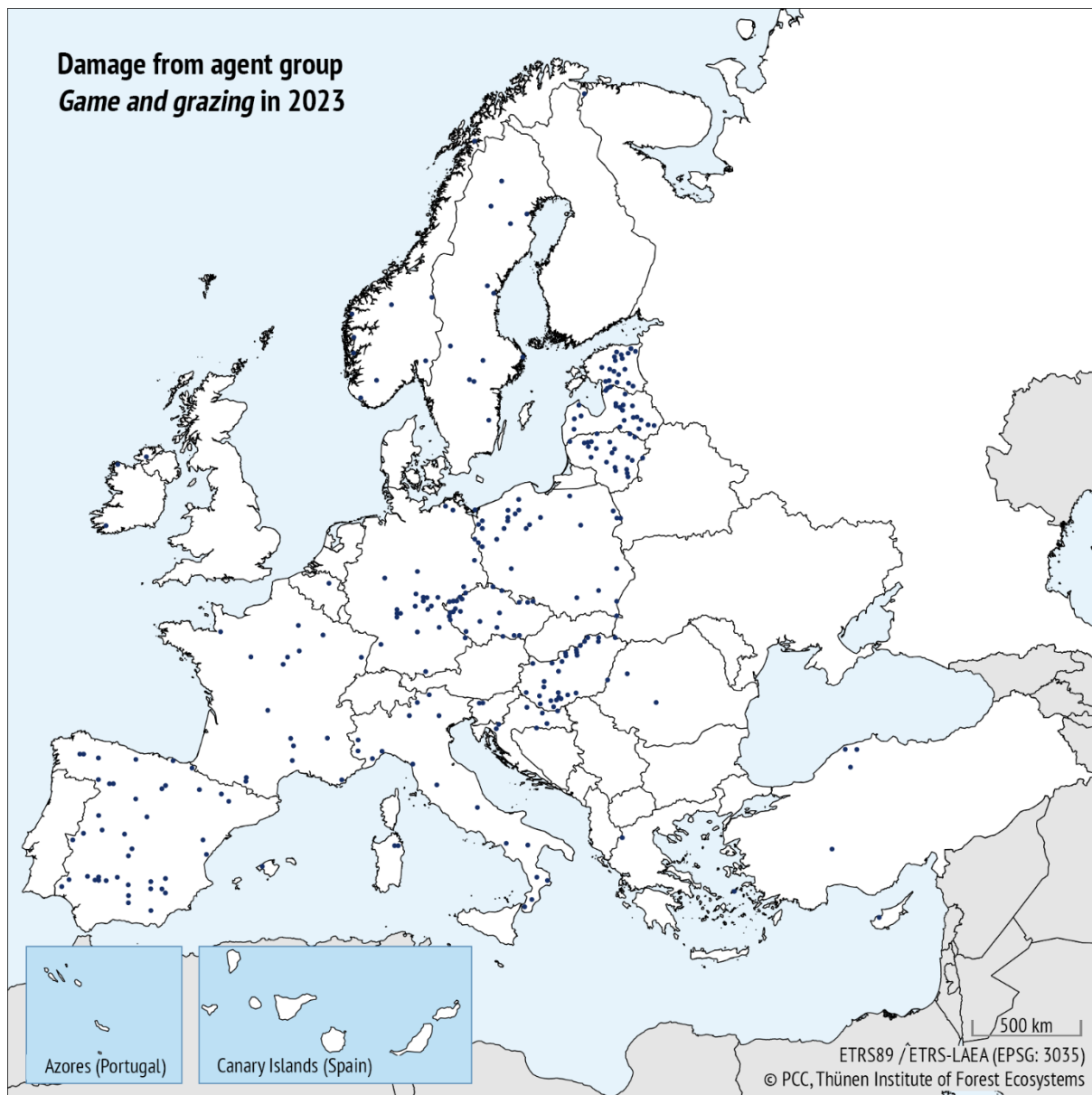


Figure S1-20: Damage from agent group **Fungi** reported in 2023. Both fresh and old damage is shown.



**Figure S1-21: Damage from agent group **Game and grazing** reported in 2023. Both fresh and old damage is shown.**

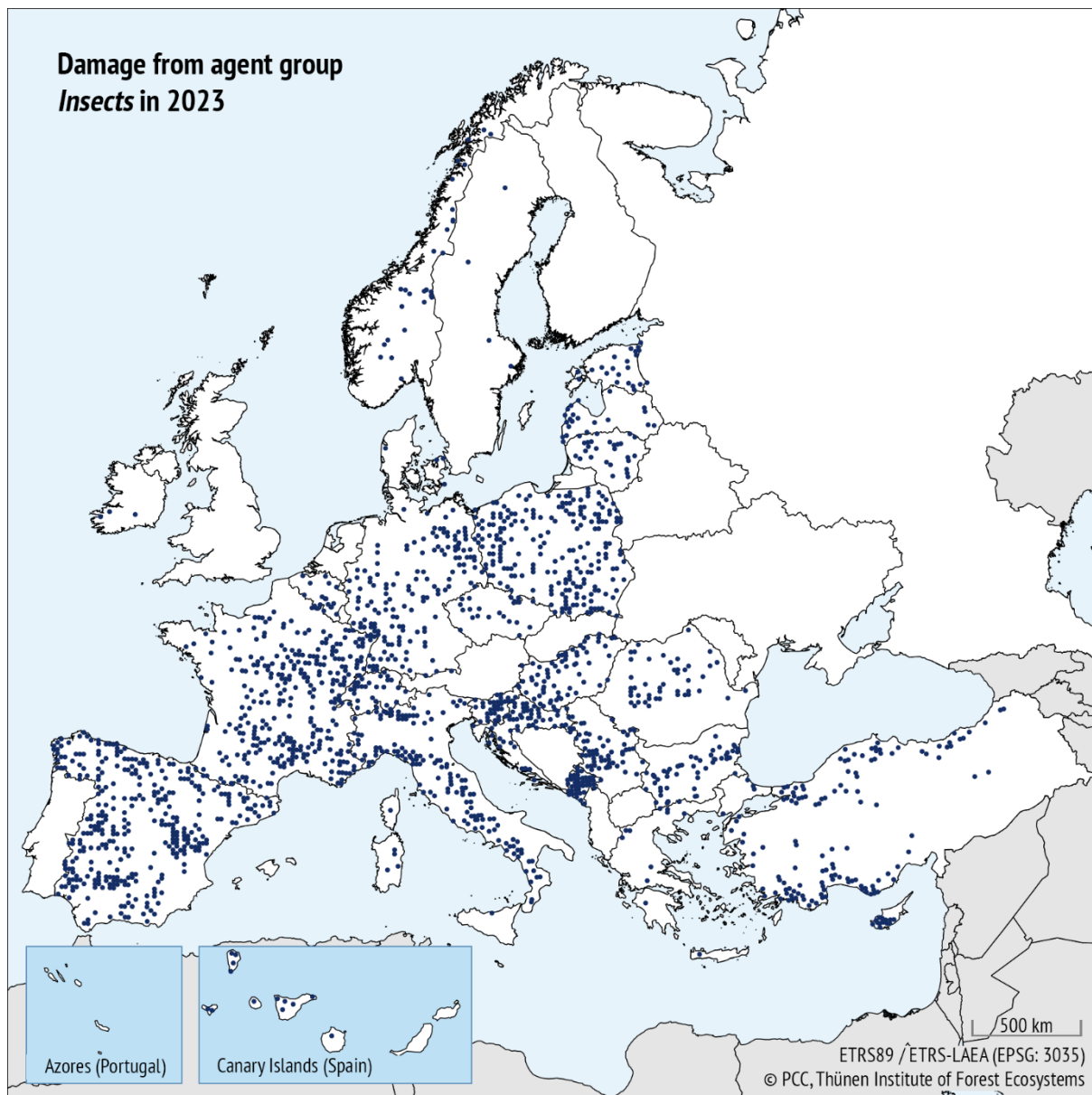


Figure S1-22: Damage from agent group **Insects** reported in 2023. Both fresh and old damage is shown.

## S2 RESULTS OF THE NATIONAL CROWN CONDITION SURVEYS

### S2-1 Information on the monitoring design for the national crown condition surveys in the participating countries in 2023

Country	Total area (1000 ha)	Forest area (1000 ha)	Grid size (km x km)	No. of sample plots	No. of sample trees
Andorra	47	18	4x4	12	290
Belgium-Flanders	1351	146	4x4	78	1473
Belgium-Wallonia	1684	555	varying	45	492
Bulgaria	11100	3921	4x4/16x16	160	5598
Croatia	5659	2795	16x16	97	2328
Cyprus	925	298	16x16	15	360
Czechia	7887	2618	16x16	117	4033
Denmark	4300	643	4x4/16x16	20	513
Estonia	4534	2325	16x16	92	2108
France	54883	17300	16x16	556	11389
Germany	35721	11419	16x16	402	9688
Greece	13205	6513	16x16	27	629
Hungary	9300	1956	16x16	78	1859
Ireland	7117	808	16x16	35	622
Italy	30128	10967	16x16	255	4971
Latvia	6459	3223	16x16	115	1728
Lithuania	6529	2210	4x4/16x16	1061	6507
Luxembourg	259	91	4x4	51	1176
Moldova, Rep. of	3384	419	16x16	9	218
Montenegro	1381	827	16x16	49	1176
Norway	32381	12210	3x3	1864	10660
Poland	31268	9275	8x8	2071	41420
Romania	23840	7046	16x16	239	5623
Serbia	8836	2360	16x16	130	2879
Slovakia	4904	2014	16x16	101	3760
Slovenia	2027	1197	16x16	44	1026
Spain	49880	18289	16x16	620	14880
Sweden	40727	27898	varying	4340	7621
Switzerland	4129	1279	16x16	49	962
Türkiye	78005	22900	16x16	584	13412
<b>Total</b>				<b>13 316</b>	<b>159 401</b>



## Tree defoliation (%) in different defoliation classes from national crown condition surveys in 2023

Participating country	No. of sample trees	Defoliation classes					
		0 none (%)	1 slight (%)	2 moderate (%)	3 severe (%)	4 dead (%)	2-4 mod.-dead (%)
<b>Andorra</b>							
Broadleaves	5	0.0	40.0	60.0	0.0	0.0	60.0
Conifers	285	9.5	42.7	45.3	1.8	0.7	47.8
All trees	290	9.3	42.7	45.5	1.8	0.7	48.0
<b>Belgium-Flanders</b>							
Broadleaves	860	14.2	59.3	25.3	1.0	0.2	26.5
Conifers	613	9.0	74.0	16.7	0.0	0.3	17.0
All trees	1473	12.0	65.4	21.7	0.6	0.2	22.5
<b>Belgium-Wallonia</b>							
Broadleaves	197	6.6	12.7	62.4	17.8	0.5	80.7
Conifers	295	2.7	18.0	63.1	14.9	1.4	79.3
All trees	492	4.3	15.9	62.8	16.1	1.0	79.9
<b>Bulgaria</b>							
Broadleaves	3169	32.6	46.0	18.5	2.2	0.8	21.5
Conifers	2429	29.6	23.6	33.7	9.6	3.5	46.8
All trees	5598	31.3	36.3	25.1	5.4	1.9	32.5
<b>Croatia</b>							
Broadleaves	1990	30.3	39.4	24.5	3.4	2.5	30.4
Conifers	338	24.3	24.9	40.2	10.1	0.6	50.9
All trees	2328	29.4	37.3	26.8	4.3	2.2	33.3
<b>Cyprus</b>							
Broadleaves	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Conifers	360	2.5	44.5	32.2	20.8	0.0	53.1
All trees	360	2.5	44.5	32.2	20.8	0.0	53.1
<b>Czechia</b>							
Broadleaves	1188	20.0	42.7	35.0	1.7	0.6	37.3
Conifers	2845	10.4	23.9	60.3	4.7	0.7	65.7
All trees	4033	13.2	29.4	52.9	3.8	0.7	57.3
<b>Denmark</b>							
Broadleaves	229	17.5	35.4	46.7	0.4	0.0	47.2
Conifers	284	31.3	44.0	23.9	0.7	0.0	24.6
All trees	513	25.2	40.2	34.1	0.6	0.0	34.7
<b>Estonia</b>							
Broadleaves	266	49.0	41.0	7.0	3.0	0.0	10.0
Conifers	1842	42.0	48.0	8.0	1.0	1.0	10.0
All trees	2108	42.9	47.1	7.9	1.3	0.9	10.0



Participating country	No. of sample trees	Defoliation classes					
		0 none (%)	1 slight (%)	2 moderate (%)	3 severe (%)	4 dead (%)	2-4 mod.-dead (%)
<b>France</b>							
Broadleaves	7279	1.8	15.2	53.1	29.4	0.5	83.0
Conifers	4110	7.8	29.9	44.2	17.0	1.2	62.4
All trees	11389	3.9	20.5	49.9	25.0	0.8	75.6
<b>Germany</b>							
Broadleaves	4249	18.7	40.7	35.0	4.1	1.5	40.6
Conifers	5439	21.8	46.6	27.5	1.4	2.7	31.6
All trees	9688	20.4	44.0	30.8	2.6	2.2	35.5
<b>Greece</b>							
Broadleaves	388	48.2	34.8	5.4	1.5	10.1	17.0
Conifers	241	23.2	44.4	23.7	6.6	2.1	32.4
All trees	629	38.6	38.5	12.4	3.5	7.0	22.9
<b>Hungary</b>							
Broadleaves	1704	21.3	32.1	33.5	10.5	2.6	46.7
Conifers	155	20.2	36.1	24.5	7.7	11.6	43.8
All trees	1859	21.2	32.4	32.8	10.3	3.3	46.4
<b>Ireland</b>							
Broadleaves	162	12.0	37.0	24.0	12.0	15.0	51.0
Conifers	460	63.5	20.2	12.0	3.0	1.3	16.3
All trees	622	50.1	24.6	15.1	5.3	4.9	25.3
<b>Italy</b>							
Broadleaves	3622	16.1	38.7	39.0	5.4	0.8	45.2
Conifers	1349	23.3	31.6	31.0	12.8	1.3	45.1
All trees	4971	18.1	36.8	36.8	7.4	0.9	45.2
<b>Latvia</b>							
Broadleaves	492	6.5	91.1	2.4	0.0	0.0	2.4
Conifers	1236	12.9	81.2	5.6	0.1	0.2	5.9
All trees	1728	11.1	84.0	4.7	0.1	0.1	4.9
<b>Lithuania</b>							
Broadleaves	2400	22.1	63.2	12.5	0.8	1.4	14.7
Conifers	4107	12.3	62.4	23.7	0.9	0.7	25.3
All trees	6507	15.9	62.7	19.6	0.9	1.0	21.4
<b>Luxembourg</b>							
Broadleaves	832	6.1	14.1	67.8	10.6	1.4	79.8
Conifers	344	34.6	28.2	24.1	3.2	9.9	37.2
All trees	1176	14.5	18.2	55.0	8.4	3.9	67.3
<b>Moldova, Rep. of</b>							
Broadleaves	218	57.8	24.3	13.3	0.5	4.1	17.9
Conifers	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All trees	218	57.8	24.3	13.3	0.5	4.1	17.9

Participating country	No. of sample trees	Defoliation classes					
		0 none (%)	1 slight (%)	2 moderate (%)	3 severe (%)	4 dead (%)	2-4 mod.-dead (%)
<b>Montenegro</b>							
Broadleaves	888	19.9	49.4	28.0	2.6	0.0	30.6
Conifers	288	26.7	46.5	16.3	10.4	0.0	26.7
All trees	1176	21.6	48.7	25.2	4.5	0.0	29.7
<b>Norway</b>							
Broadleaves	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Conifers	10660	45.8	36.4	14.6	3.0	0.3	17.9
All trees	10660	45.8	36.4	14.6	3.0	0.3	17.9
<b>Poland</b>							
Broadleaves	15886	14.2	68.6	15.4	1.2	0.6	17.2
Conifers	25534	8.5	75.4	14.7	0.9	0.5	16.1
All trees	41420	10.7	72.8	15.0	1.0	0.5	16.5
<b>Romania</b>							
Broadleaves	4720	50.7	37.5	9.6	1.4	0.8	11.8
Conifers	903	60.6	27.8	9.3	1.3	1.0	11.6
All trees	5623	52.3	35.9	9.6	1.4	0.8	11.8
<b>Serbia</b>							
Broadleaves	2538	82.5	11.0	4.4	1.2	0.9	6.5
Conifers	341	87.4	4.7	2.0	4.4	1.5	7.9
All trees	2879	83.1	10.3	4.1	1.6	1.0	6.7
<b>Slovakia</b>							
Broadleaves	2435	24.2	46.0	26.4	2.9	0.5	29.8
Conifers	1325	6.5	42.9	46.0	3.8	0.8	50.6
All trees	3760	18.0	44.9	33.3	3.2	0.6	37.1
<b>Slovenia</b>							
Broadleaves	689	9.6	52.7	26.3	9.6	1.9	37.7
Conifers	337	16.6	36.2	37.7	8.6	0.9	47.2
All trees	1026	11.9	47.3	30.0	9.3	1.6	40.8
<b>Spain</b>							
Broadleaves	7556	19.2	57.9	18.5	2.9	1.5	23.0
Conifers	7324	17.7	61.6	16.4	2.1	2.3	20.8
All trees	14880	18.4	59.7	17.5	2.5	1.9	21.9
<b>Sweden</b>							
Broadleaves	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Conifers	7621	54.0	30.0	13.0	2.0	0.0	15.0
All trees	7621	54.0	30.0	13.0	2.0	0.0	15.0
<b>Switzerland</b>							
Broadleaves	262	13.7	54.8	9.9	6.6	15.0	31.5
Conifers	700	19.6	53.0	17.3	0.8	9.3	27.4
All trees	962	18.0	53.5	15.3	2.4	10.8	28.5

Participating country	No. of sample trees	Defoliation classes					
		0 none (%)	1 slight (%)	2 moderate (%)	3 severe (%)	4 dead (%)	2-4 mod.-dead (%)
<b>Türkiye</b>							
Broadleaves	5343	34.0	46.8	17.0	2.0	0.2	19.2
Conifers	8069	25.0	53.0	21.0	0.7	0.3	22.0
All trees	13412	28.6	50.5	19.4	1.2	0.3	20.9

## S2-2 Percentage of moderately to severely defoliated trees (defoliation classes 2–4) between 2014 and 2023 – All species

Participating countries	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Change % points 2022/23
<b>Andorra</b>	5.3	4.5	3.4	7.0	5.6		21.6	20.8	42.5	48.0	<b>+5.5</b>
<b>Belgium</b>	27.5	26.4	26.1	26.6	27.7	31.7	33.9	30.7	34.8	33.8	<b>-1.0</b>
<b>Bulgaria</b>	26.0	26.2	29.9	27.7	31.9	31.2	34.3	33.5	35.1	32.5	<b>-2.6</b>
<b>Croatia</b>	31.5	29.7	28.5	25.6	30.8	30.3	29.4	32.7	34.0	33.3	<b>-0.7</b>
<b>Cyprus</b>	13.3	12.5	35.0	23.6	33.5	29.6	26.0	29.9	31.9	53.1	<b>+21.2</b>
<b>Czechia</b>		52.0	54.3	53.6	56.4	57.4	56.7	57.2	58.0	57.3	<b>-0.7</b>
<b>Denmark</b>	7.0	8.7	14.8	12.9	21.4	32.3	24.0	13.9	16.7	34.7	<b>+18.0</b>
<b>Estonia</b>	6.7	6.7	6.4	5.2	8.5	5.7	6.0	8.1	9.1	10.0	<b>+0.9</b>
<b>France</b>	42.8	43.4	48.6	48.8	52.2	55.1	57.4	59.5	60.7	75.6	<b>+14.9</b>
<b>Germany</b>	26.2	23.8	28.0	22.7	28.7	36.4	37.5	34.8	34.9	35.5	<b>+0.6</b>
<b>Greece</b>	24.8	20.2		20.2	18.4	20.7	20.0	16.7	19.5	22.9	<b>+3.4</b>
<b>Hungary</b>	24.2	24.0	34.6	41.0	47.3	35.1	36.7	47.5	66.4	46.4	<b>-20.0</b>
<b>Ireland</b>							20.8	23.2	24.1	25.3	<b>+1.2</b>
<b>Italy</b>	30.8	29.8	34.7	39.0	39.0	36.0	36.2	42.0	44.6	45.2	<b>+0.6</b>
<b>Latvia</b>	5.1	4.4	5.7	5.3	5.1	5.5	3.5	4.0	4.7	4.9	<b>+0.2</b>
<b>Lithuania</b>	21.7	23.8	21.0	21.1	18.5	19.2	18.9	19.9	23.3	21.4	<b>-1.9</b>
<b>Luxembourg</b>		32.6	38.2	30.3	31.3	50.1	54.0	54.6	61.7	67.3	<b>+5.6</b>
<b>Moldova, Rep. of</b>	19.9	26.1	26.5	28.7		28.0	38.9	29.1	30.0	17.9	<b>-12.1</b>
<b>Montenegro</b>		25.4	27.3	26.6	33.6		37.6	32.4	32.7	29.7	<b>-3.0</b>
<b>Norway</b>	15.9	16.5	15.5	19.0	15.5	16.5	17.2	14.9	16.7	17.9	<b>+1.2</b>
<b>Poland</b>	18.9	16.7	19.5	20.2	18.6	21.2	19.4	17.1	15.5	16.5	<b>+1.0</b>
<b>Romania</b>	13.5	13.1	13.4	14.5	14.8	11.6	12.9	12.1	13.1	11.8	<b>-1.3</b>
<b>Serbia</b>	12.4	10.7	11.3	11.8	11.9	8.9	7.1	6.1	5.9	6.7	<b>+0.8</b>
<b>Slovakia</b>		34.5	40.3	32.6	42.7	38.8	40.4	37.7	46.8	37.1	<b>-9.7</b>
<b>Slovenia</b>	38.3	37.8	33.9	37.0	36.0	37.7	38.1	42.2	45.5	40.8	<b>-4.7</b>
<b>Spain</b>	14.9		21.9	27.8	22.7	26.9	21.9	21.2	21.9	21.9	<b>0.0</b>
<b>Sweden</b>		19.8	16.4	18.2	17.6	17.1	17.8	21.1	18.7	15.0	<b>-3.7</b>
<b>Switzerland</b>	30.6	24.8	25.2	33.7	23.5	33.5	26.4	26.9	27.0	28.5	<b>+1.5</b>
<b>Türkiye</b>	11.0	9.5	9.8	8.8	10.5	12.1	11.9	13.9	19.5	20.9	<b>+1.4</b>
<b>Ukraine</b>	6.0	7.1									<b>N/A</b>

Please note that some differences in the level of defoliation between participating countries may be at least partly due to differences in standards used. This restriction, however, does not affect the reliability of the trends over time. In some countries there has been a change in the monitoring design at different points in time.

## S2-3 Percentage of moderately to severely defoliated trees (defoliation classes 2–4) between 2014 and 2023 – Conifers

Participating countries	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Change % points 2022/23
<b>Andorra</b>	5.4	4.3	3.5	7.1	5.6		21.6	20.8	42.5	47.8	<b>+5.3</b>
<b>Belgium</b>	22.8	27.9	24.6	26.8	27.7	33.5	33.9	28.9	33.9	29.7	<b>-4.2</b>
<b>Bulgaria</b>	34.1	40.1	39.9	37.0	45.0	45.4	48.1	46.8	47.6	46.8	<b>-0.8</b>
<b>Croatia</b>	49.7	56.0	51.0	35.0	47.0	53.6	48.7	46.0	45.3	50.9	<b>+5.6</b>
<b>Cyprus</b>	13.3	12.5	35.0	23.6	33.5	29.6	26.0	29.9	31.9	53.1	<b>+21.2</b>
<b>Czechia</b>		57.8	60.3	60.3	63.0	64.3	64.2	65.4	68.0	65.7	<b>-2.3</b>
<b>Denmark</b>	5.3	7.4	11.3	11.8	15.2	22.0	21.9	13.0	10.9	24.6	<b>+13.7</b>
<b>Estonia</b>	6.9	6.5	6.7	5.5	9.3	5.8	6.0	8.0	10.0	10.0	<b>0.0</b>
<b>France</b>	36.6	38.0	39.3	38.8	40.0	42.0	42.4	43.4	47.7	62.4	<b>+14.7</b>
<b>Germany</b>	19.7	20.3	22.3	19.5	22.8	31.2	33.5	33.1	32.5	31.6	<b>-0.9</b>
<b>Greece</b>	26.7	27.2		32.1	26.2	28.7	29.1	22.0	21.7	32.4	<b>+10.7</b>
<b>Hungary</b>	30.7	46.5	52.8	44.9	52.3	43.2	48.0	47.4	47.1	43.8	<b>-3.3</b>
<b>Ireland</b>							9.8	13.0	14.7	16.3	<b>+1.6</b>
<b>Italy</b>	24.0	22.6	19.6	21.8	28.1	28.8	26.9	43.2	44.4	45.1	<b>+0.7</b>
<b>Latvia</b>	4.8	4.4	4.9	5.3	3.9	4.6	3.3	5.0	5.6	5.9	<b>+0.3</b>
<b>Lithuania</b>	21.1	25.0	21.7	23.5	21.1	21.7	21.0	22.3	25.9	25.3	<b>-0.6</b>
<b>Luxembourg</b>	93.3	18.7	17.4	17.7	16.2	35.5	36.2	36.2	41.1	37.2	<b>-3.9</b>
<b>Moldova, Rep. of</b>	29.4		21.6	19.6		19.2	17.0	14.3	21.0	NA	<b>NA</b>
<b>Montenegro</b>		26.1	28.1	23.6	30.9		38.2	33.3	31.6	26.7	<b>-4.9</b>
<b>Norway</b>	15.9	16.5	15.5	19.0	15.5	16.5	17.2	14.9	16.7	17.9	<b>+1.2</b>
<b>Poland</b>	17.2	15.7	17.1	18.4	17.2	19.6	17.5	16.6	14.2	16.1	<b>+1.9</b>
<b>Romania</b>	13.7	8.0	10.4	10.7	10.3	13.7	17.4	16.4	16.7	11.6	<b>-5.1</b>
<b>Serbia</b>	14.6	14.5	13.5	12.0	10.2	9.8	8.7	8.6	4.8	7.9	<b>+3.1</b>
<b>Slovakia</b>		49.4	45.6	41.6	49.7	45.3	51.3	54.0	58.0	50.6	<b>-7.4</b>
<b>Slovenia</b>	38.1	41.0	38.6	40.6	40.3	42.7	41.1	44.1	48.6	47.2	<b>-1.4</b>
<b>Spain</b>	11.4		20.9	26.2	23.1	26.7	20.8	18.3	20.8	20.8	<b>0.0</b>
<b>Sweden</b>	18.8	19.8	16.4	18.2	17.6	17.1	17.8	17.5	18.7	15.0	<b>-3.7</b>
<b>Switzerland</b>	31.7	24.0	24.9	33.4	22.1	33.6	23.3	27.7	25.4	27.4	<b>+2.0</b>
<b>Türkiye</b>	7.2	8.6	9.1	8.2	10.2	11.4	11.7	14.1	18.8	22.0	<b>+3.2</b>
<b>Ukraine</b>	6.8	7.9									<b>N/A</b>

Please note that some differences in the level of defoliation between participating countries may be at least partly due to differences in standards used. This restriction, however, does not affect the reliability of the trends over time. In some countries there has been a change in the monitoring design at different points in time.

## S2-4 Percentage of moderately to severely defoliated trees (defoliation classes 2–4) between 2014 and 2023 – Broadleaves

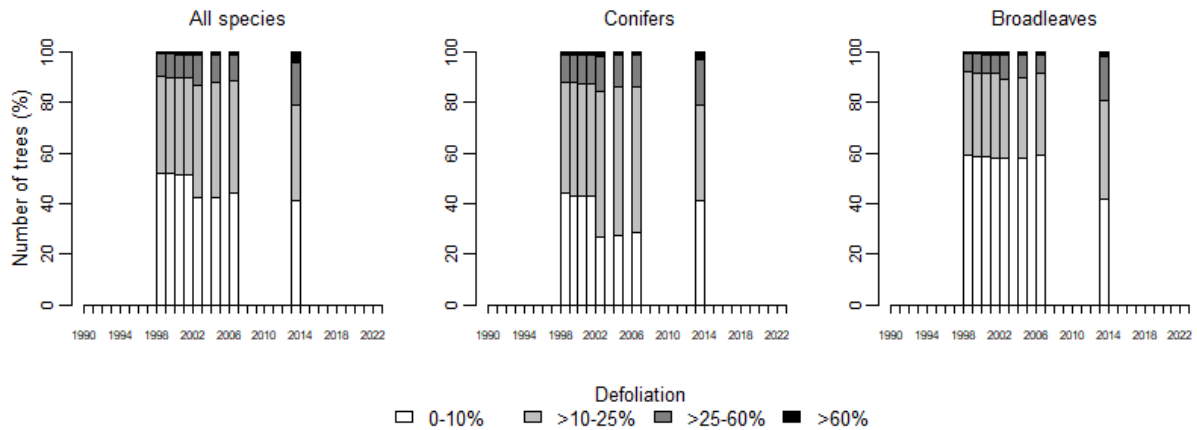
Participating country	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Change % points 2022/23
<b>Andorra</b>	20.0	16.7	0.0	0.0	0.0		16.7	20.0	40.0	60.0	<b>+20.0</b>
<b>Belgium</b>	31.4	25.1	27.4	26.2	27.7	30.2	33.7	32.0	35.4	36.8	<b>+1.4</b>
<b>Bulgaria</b>	20.0	15.6	22.3	20.5	21.8	20.3	23.7	23.2	25.5	21.5	<b>-4.0</b>
<b>Croatia</b>	28.1	25.3	24.7	24.0	27.8	26.4	26.0	30.4	31.9	30.4	<b>-1.5</b>
<b>Cyprus</b>			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<b>N/A</b>
<b>Czechia</b>		32.7	34.7	31.6	35.6	37.5	36.3	35.6	34.8	37.3	<b>+2.5</b>
<b>Denmark</b>	9.0	10.8	19.7	14.4	30.0	46.0	26.1	15.2	23.0	47.2	<b>+24.2</b>
<b>Estonia</b>	5.7	8.0	5.2	3.3	4.1	5.1	6.0	9.0	3.0	10.0	<b>+7.0</b>
<b>France</b>	46.1	47.0	53.5	54.2	58.8	62.2	65.4	68.2	67.6	83.0	<b>+15.4</b>
<b>Germany</b>	36.1	29.0	35.7	27.5	37.1	43.6	43.2	37.0	38.0	40.6	<b>+2.6</b>
<b>Greece</b>	16.7	11.3		14.6	14.4	15.5	12.9	13.0	14.2	17.0	<b>+2.8</b>
<b>Hungary</b>	23.3	21.4	32.5	40.6	46.8	34.3	35.5	47.5	68.3	46.7	<b>-21.6</b>
<b>Ireland</b>							53.4	52.0	50.3	51.0	<b>+0.7</b>
<b>Italy</b>	33.4	32.1	39.5	45.0	43.4	38.1	39.6	41.6	44.6	45.2	<b>+0.6</b>
<b>Latvia</b>	6.1	4.2	8.3	5.2	8.8	8.1	3.8	1.1	2.4	2.4	<b>0.0</b>
<b>Lithuania</b>	22.5	21.9	20.0	17.8	14.2	15.2	15.4	15.9	19.2	14.7	<b>-4.5</b>
<b>Luxembourg</b>	34.6	40.3	49.0	37.2	39.7	57.4	62.8	62.6	70.7	79.8	<b>+9.1</b>
<b>Moldova, Rep. of</b>	19.9	26.1	26.5	28.7	N/A	28.0	39.0	29.1	30.0	17.9	<b>-12.1</b>
<b>Montenegro</b>		25.2	27.1	27.6	34.8		37.4	32.1	33.1	30.6	<b>-2.5</b>
<b>Norway</b>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<b>N/A</b>
<b>Poland</b>	21.9	18.4	24.0	23.3	21.1	23.9	22.6	17.9	17.6	17.2	<b>-0.4</b>
<b>Romania</b>	13.0	13.9	14.2	15.3	15.8	11.2	12.1	11.2	12.4	11.8	<b>-0.6</b>
<b>Serbia</b>	12.1	10.1	11.0	11.8	12.1	8.7	6.9	5.8	6.0	6.5	<b>0.5</b>
<b>Slovakia</b>	43.5	24.3	36.5	26.7	38.4	34.8	33.8	28.1	40.2	29.8	<b>-10.4</b>
<b>Slovenia</b>	38.4	35.9	31.1	35.1	33.7	35.1	36.6	41.3	44.0	37.7	<b>-6.3</b>
<b>Spain</b>	18.4		22.7	29.3	22.4	27.0	23.0	24.0	23.0	23.0	<b>0.0</b>
<b>Sweden</b>				N/A	N/A	N/A	N/A	N/A	N/A	N/A	<b>N/A</b>
<b>Switzerland</b>	28.0	26.4	25.9	34.7	26.6	33.2	34.5	24.7	31.3	31.5	<b>+0.2</b>
<b>Türkiye</b>	17.2	10.8	11.0	9.8	11.0	13.1	12.2	13.5	20.6	19.2	<b>-1.4</b>
<b>Ukraine</b>	5.5	6.3									

Please note that some differences in the level of defoliation between participating countries may be at least partly due to differences in standards used. This restriction, however, does not affect the reliability of the trends over time. In some countries there has been a change in the monitoring design at different points in time.

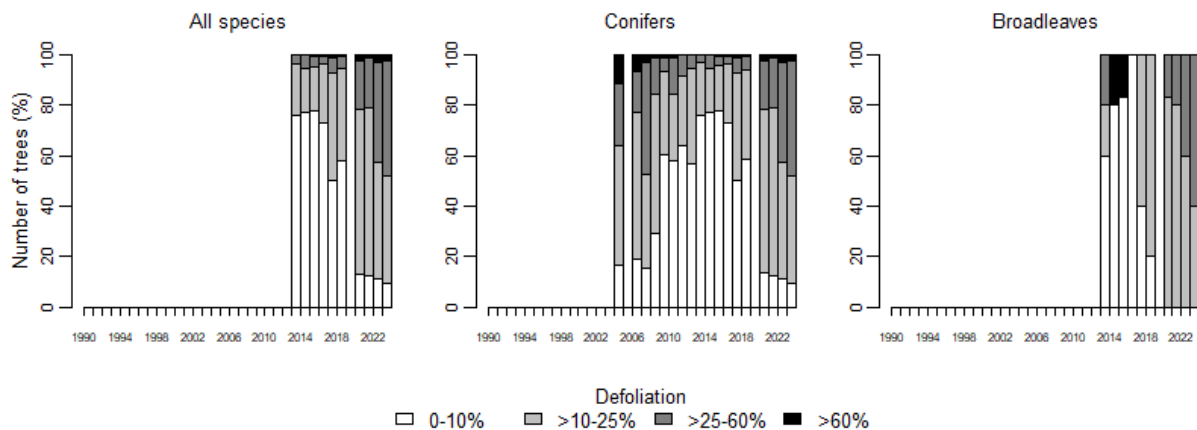
## S2-5 Change of tree defoliation over time (1990–2023) per country

Please note that some countries have changed their monitoring design at different points in time which may explain sudden strong increases or decreases in the number of trees per defoliation category in the figures below. For detailed information, please contact the respective NFCs. Their contact information is given in the Annex of the ICP Forests 2024 Technical Report<sup>1</sup>.

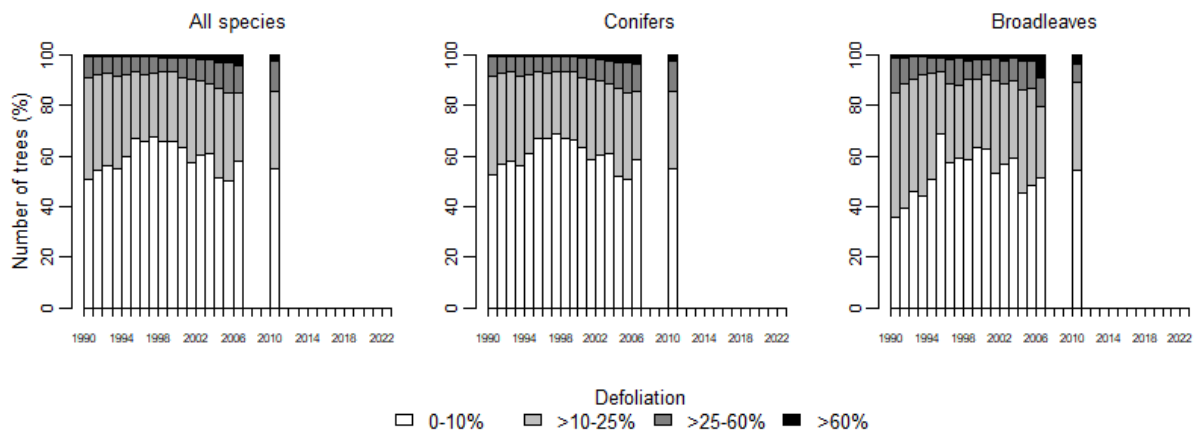
### ALBANIA



### ANDORRA

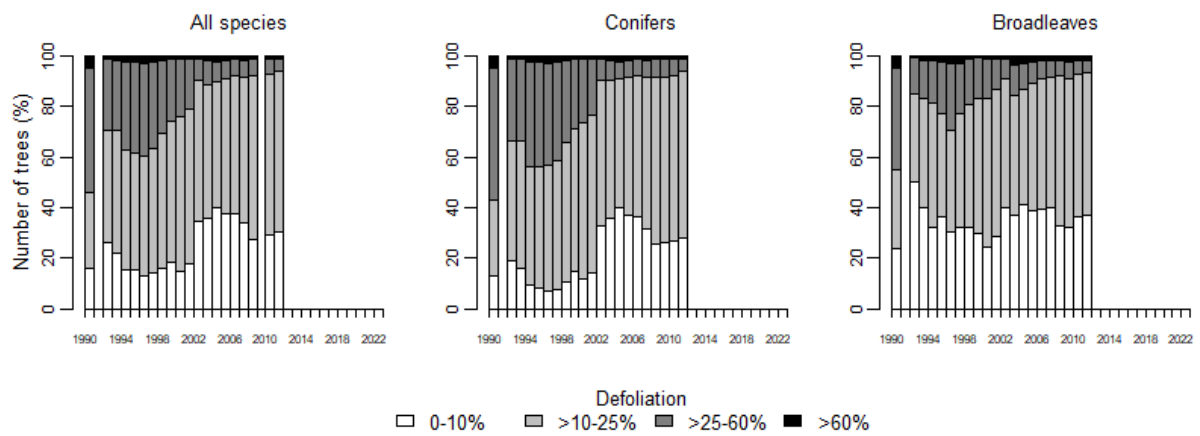


### AUSTRIA

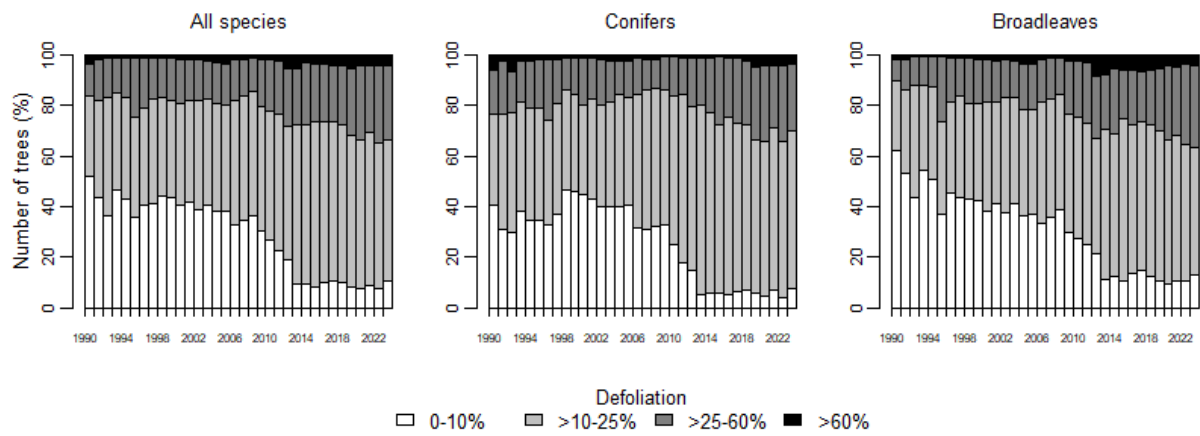


<sup>1</sup> <http://icp-forests.net/page/icp-forests-technical-report>

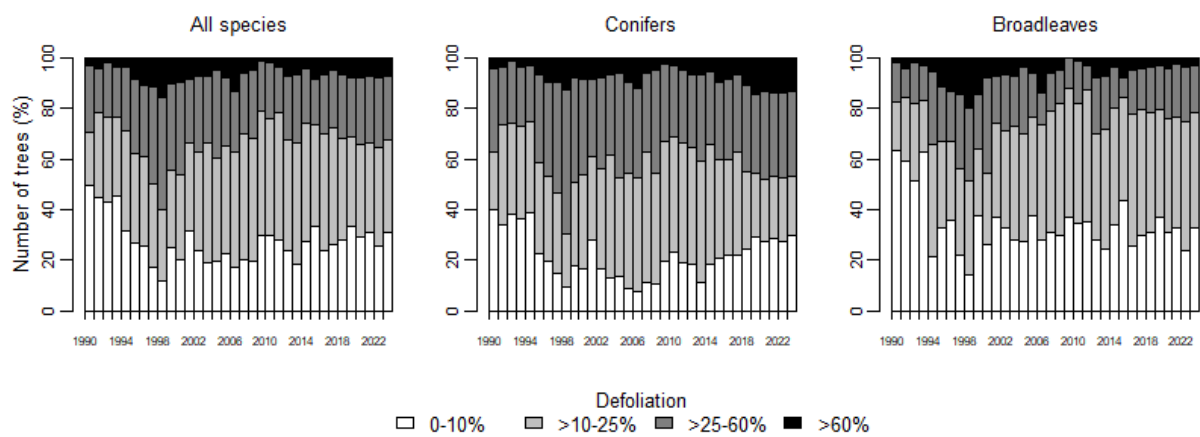
## BELARUS



## BELGIUM

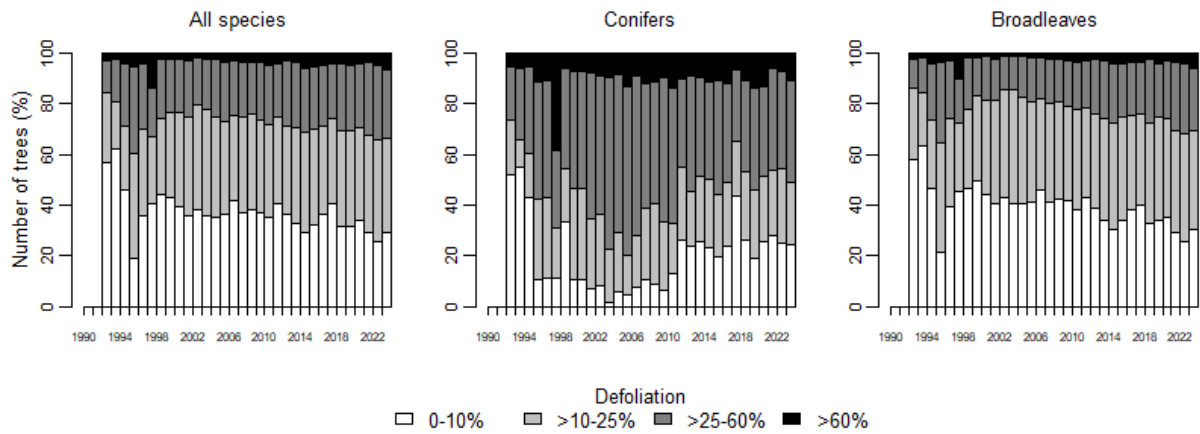


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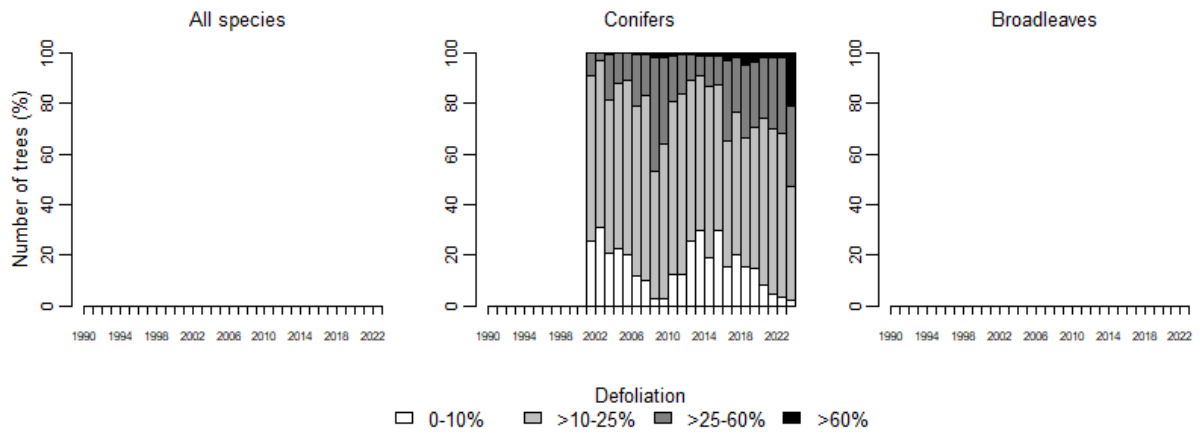




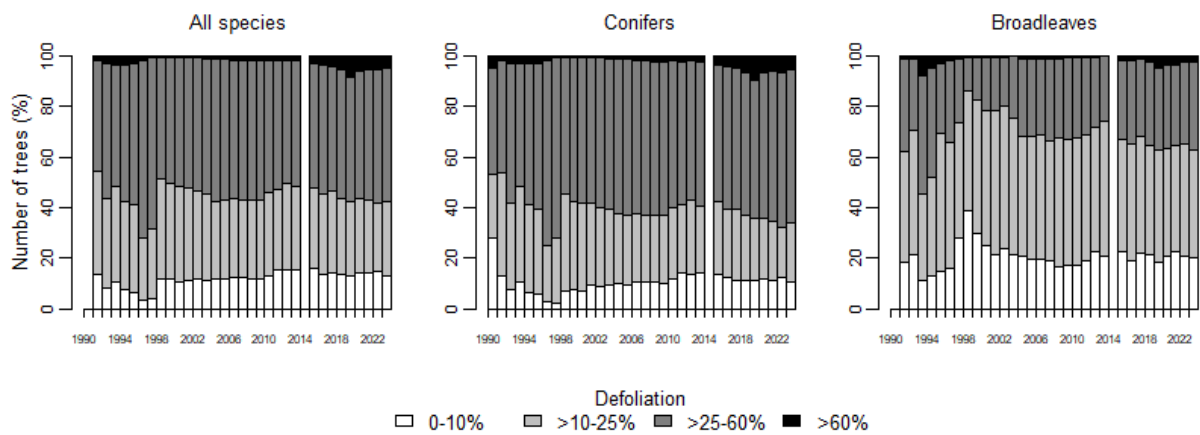
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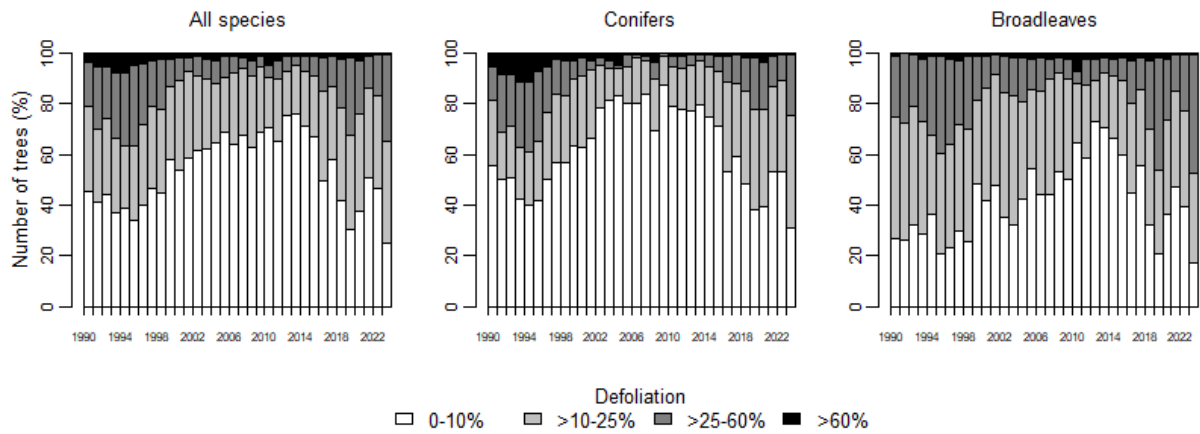
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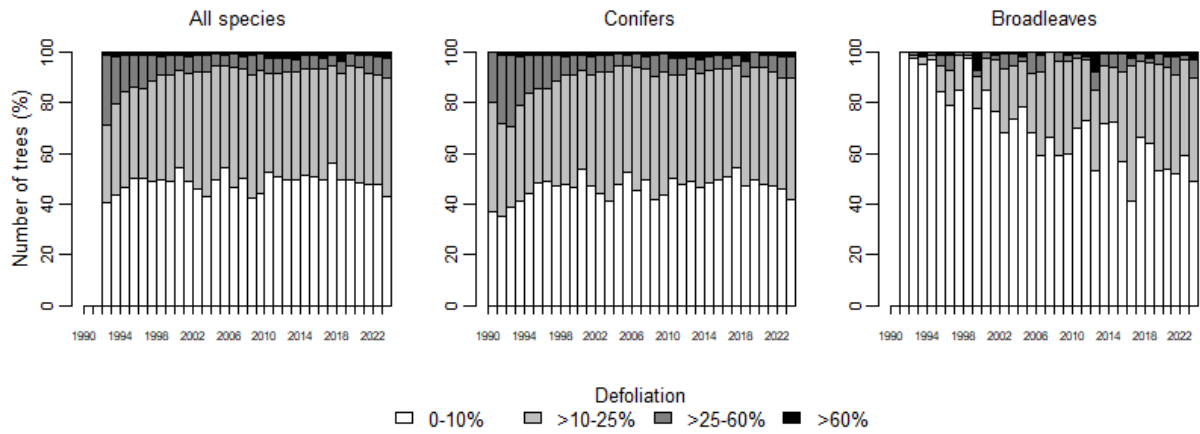
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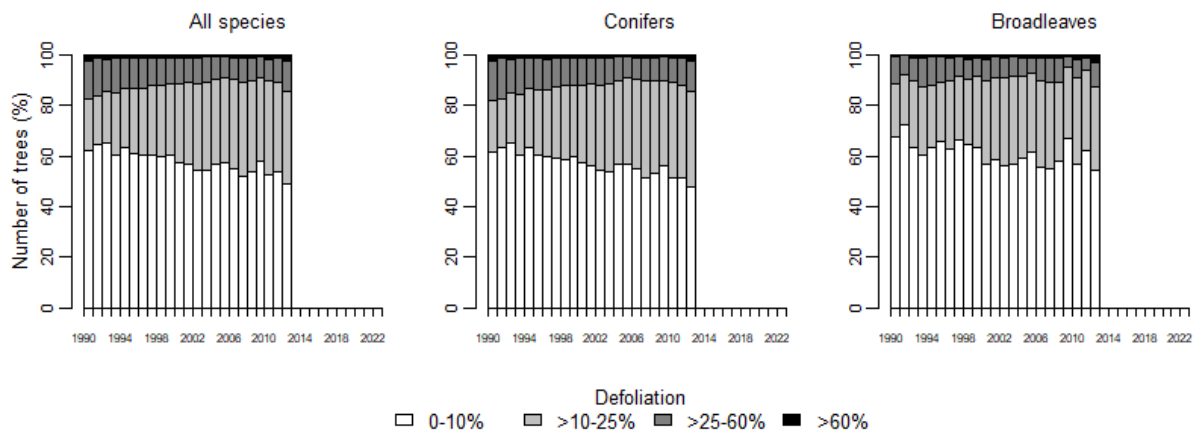
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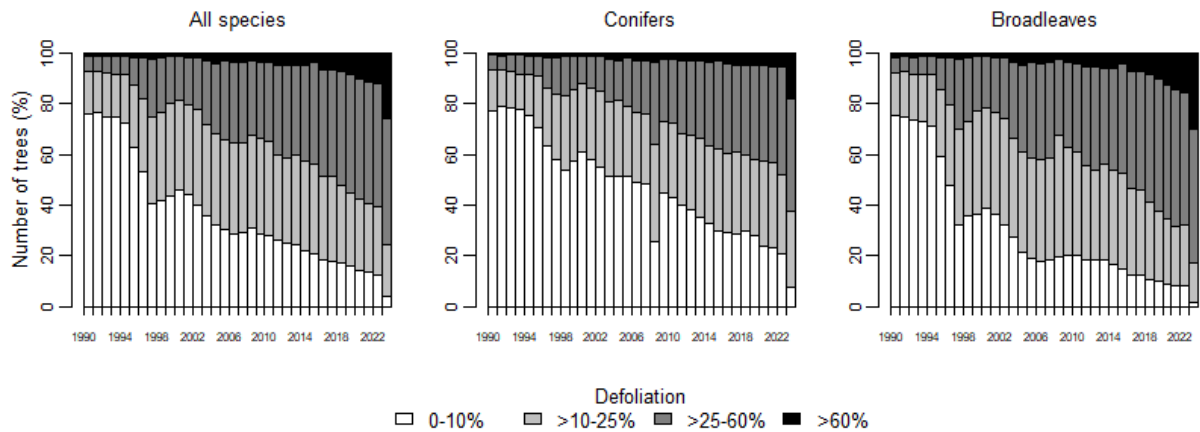
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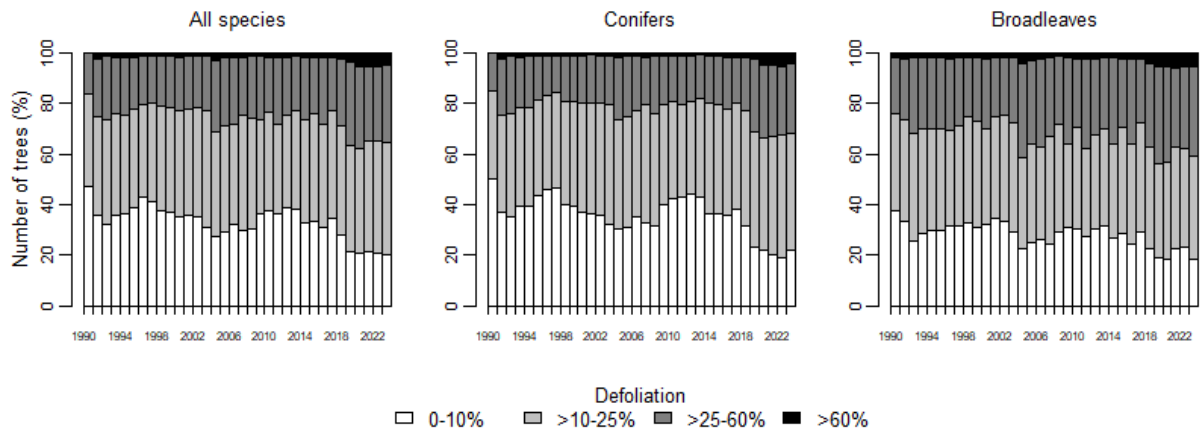
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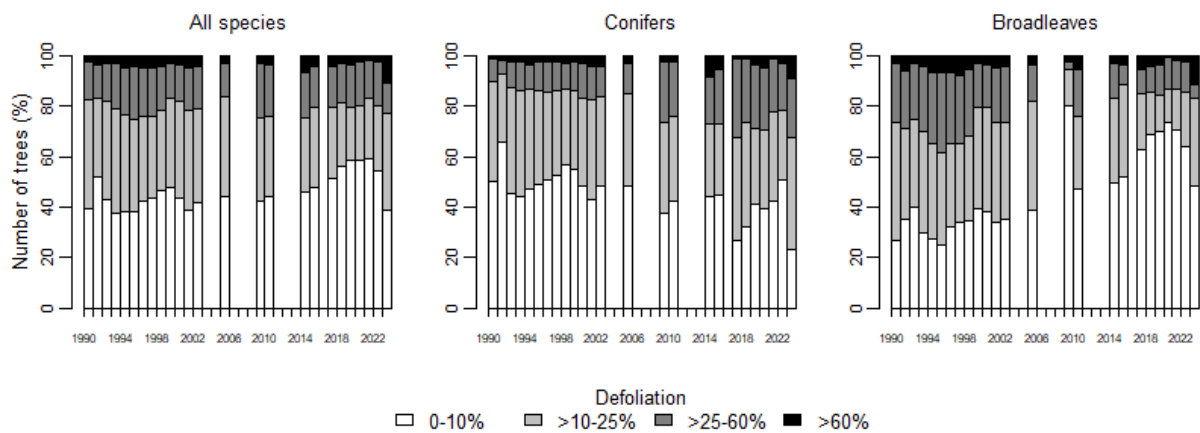
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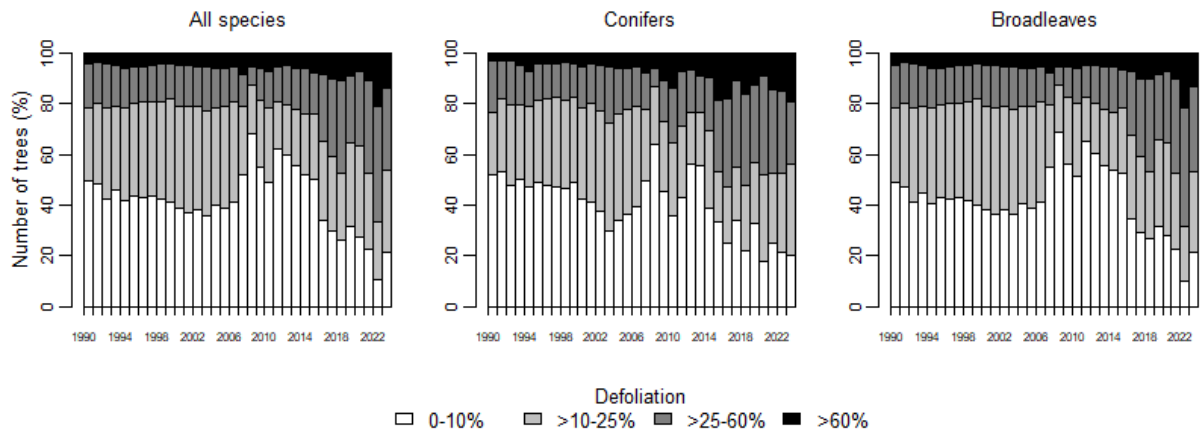
## GERMANY



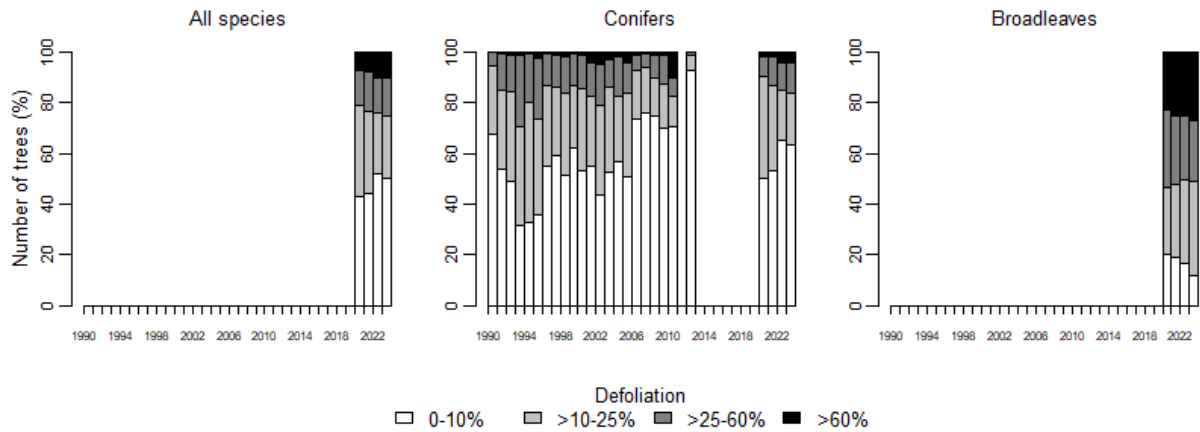
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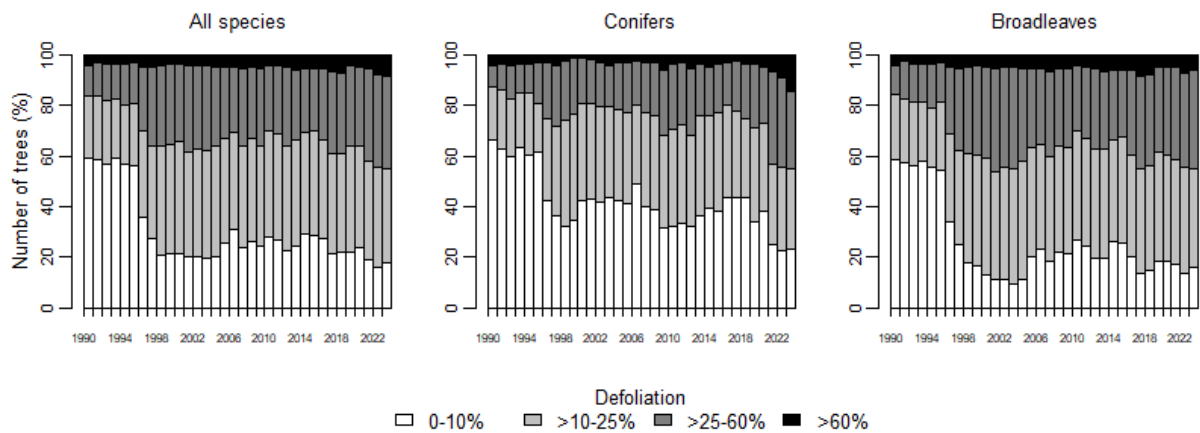
## HUNGARY



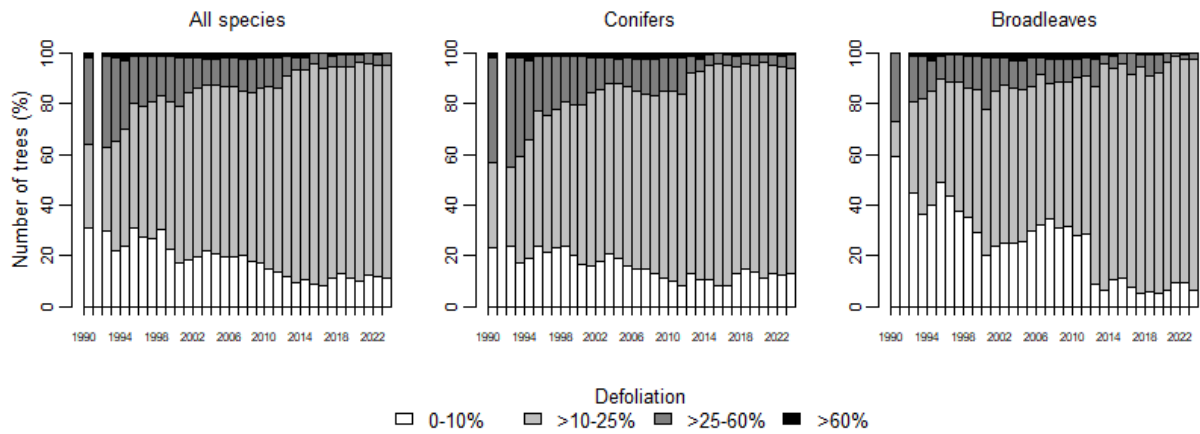
## IRELAND



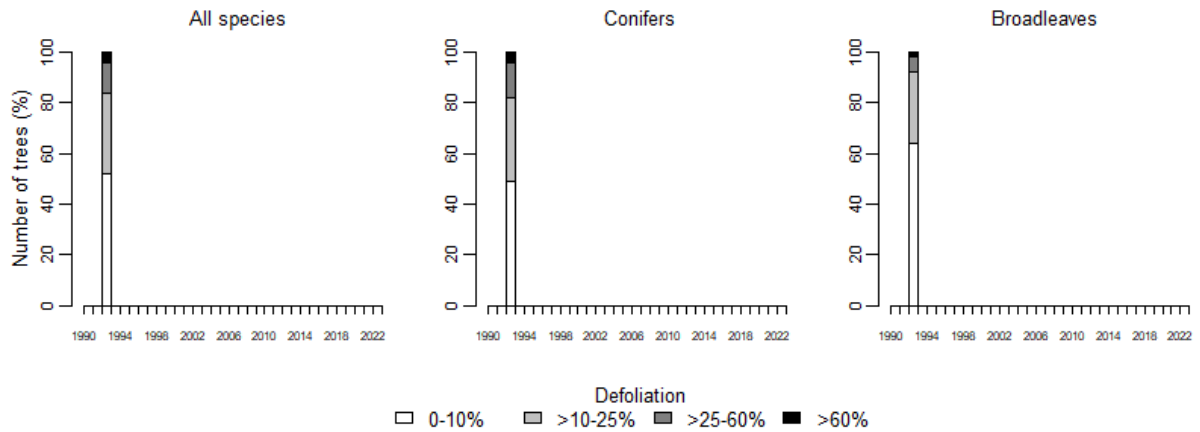
## ITALY



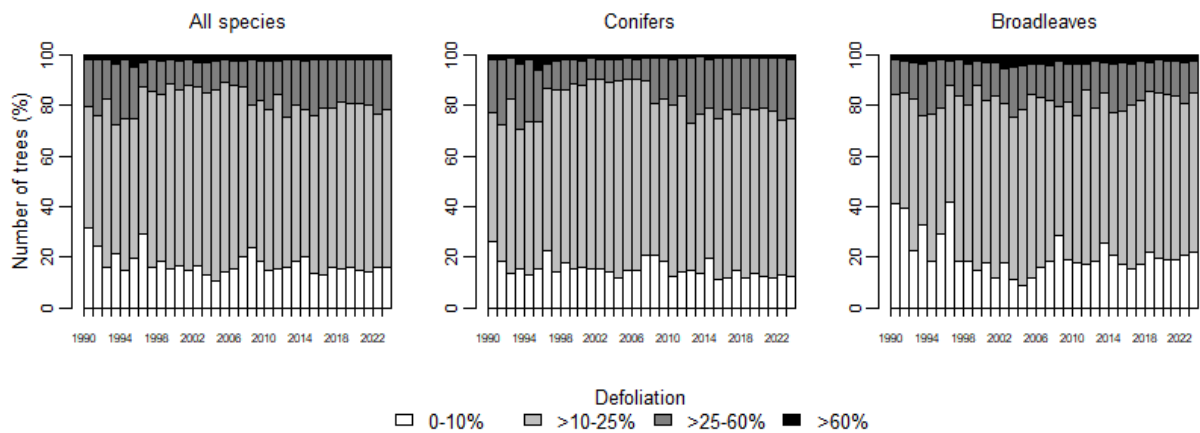
## LATVIA



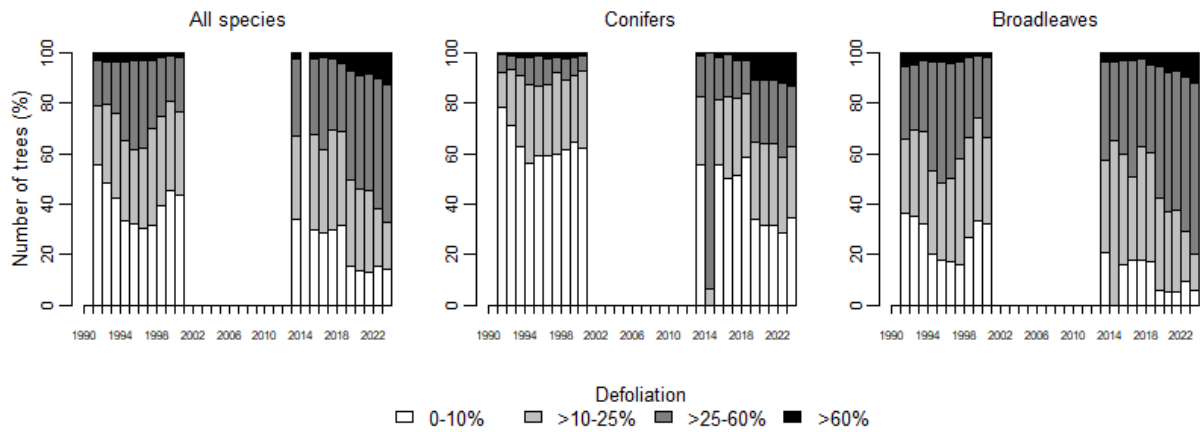
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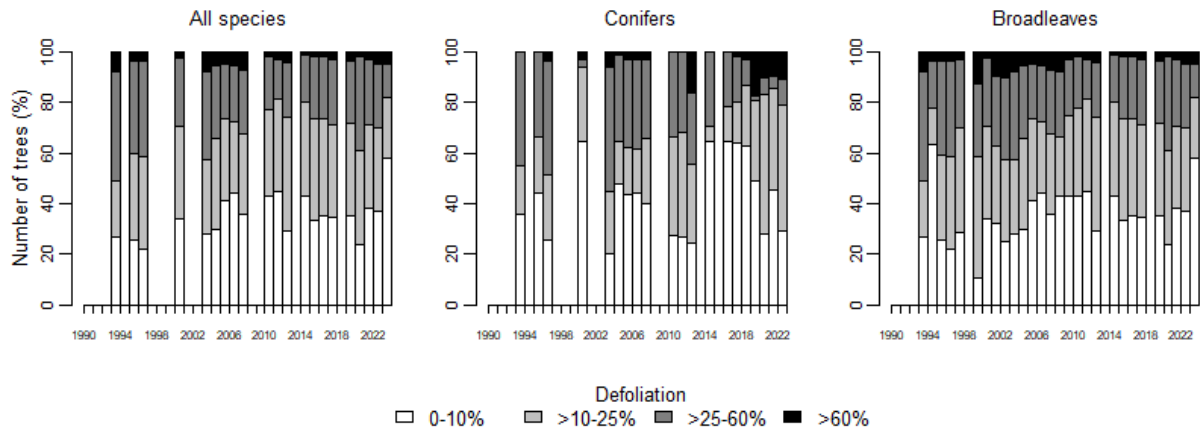
## LITHUANIA



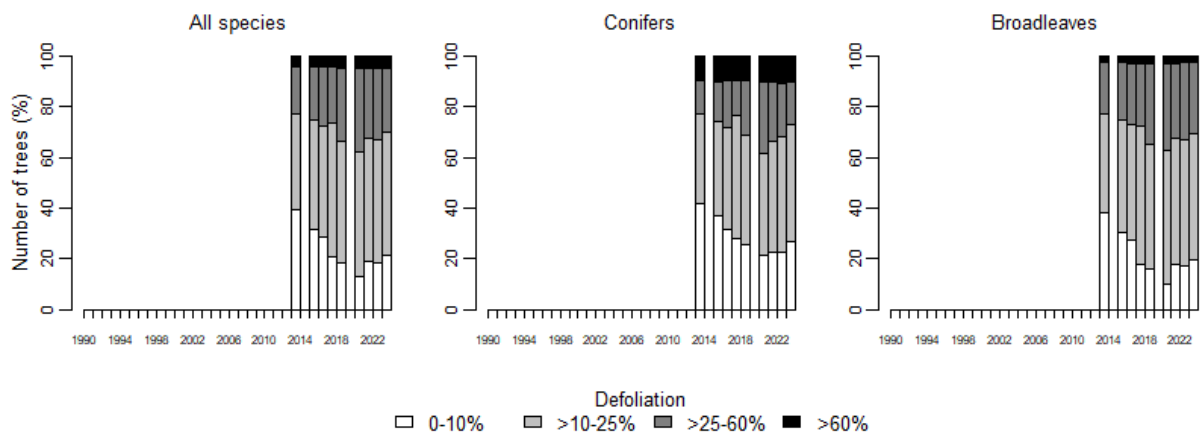
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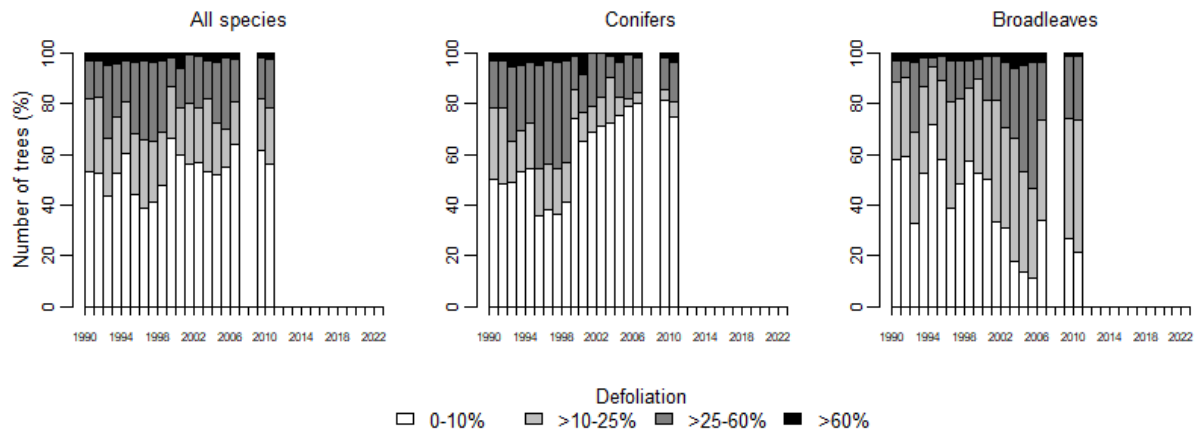
## MOLDOVA, REPUBLIC OF



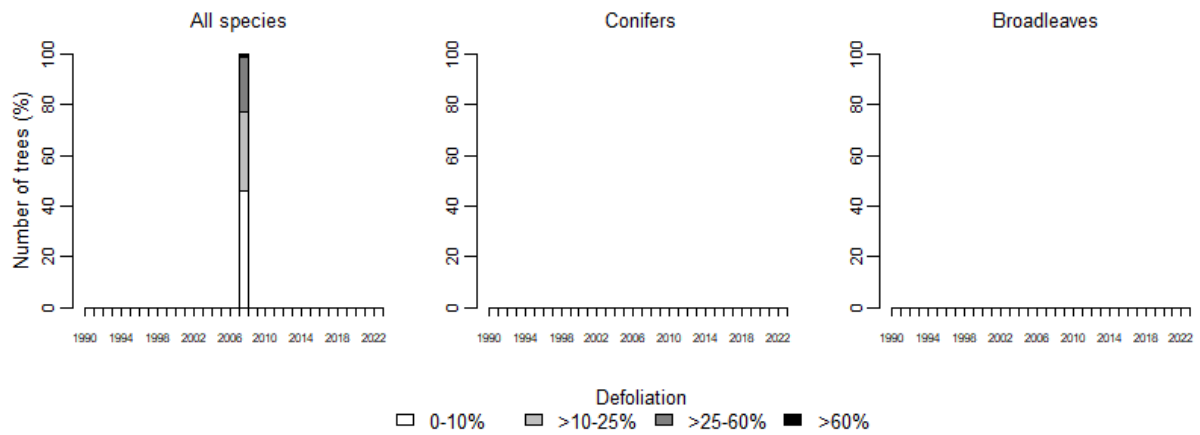
## MONTENEGRO



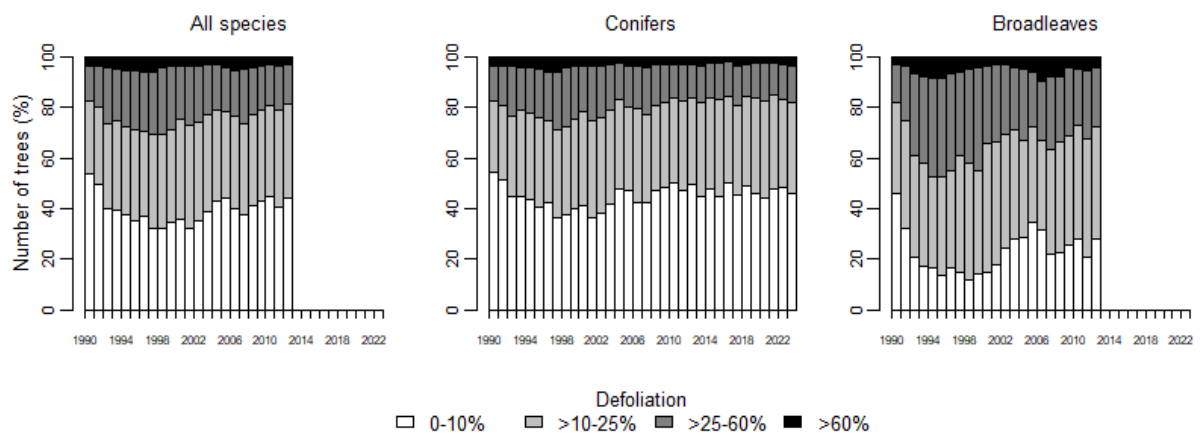
## NETHERLANDS



## NORTH MACEDONIA

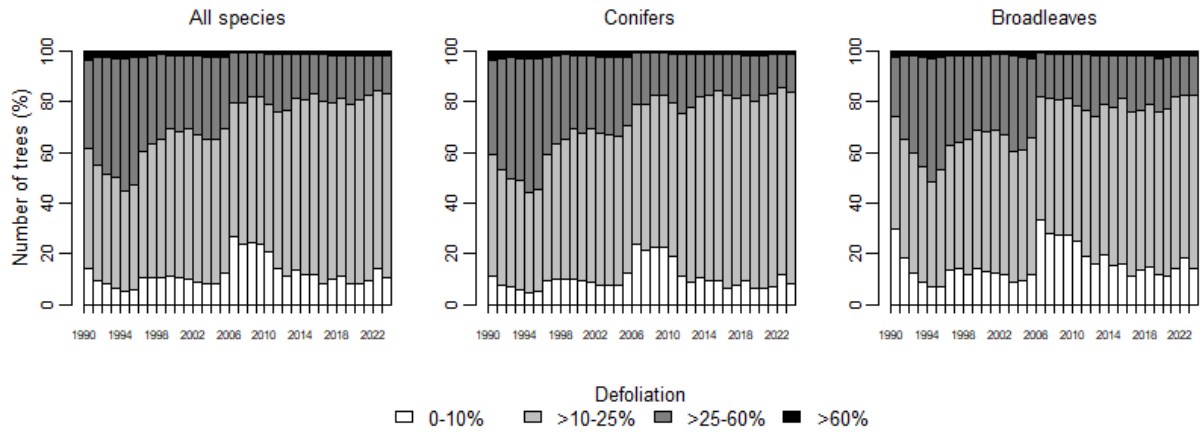


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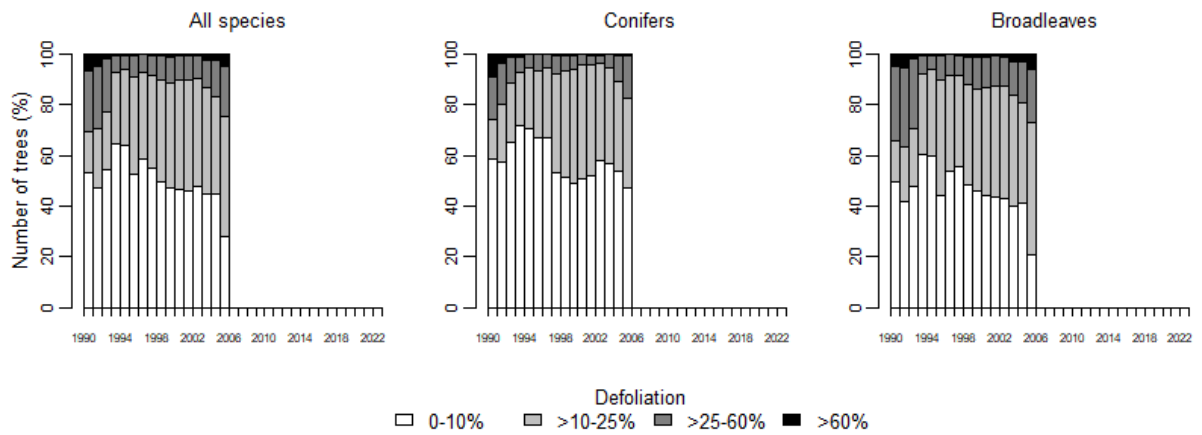




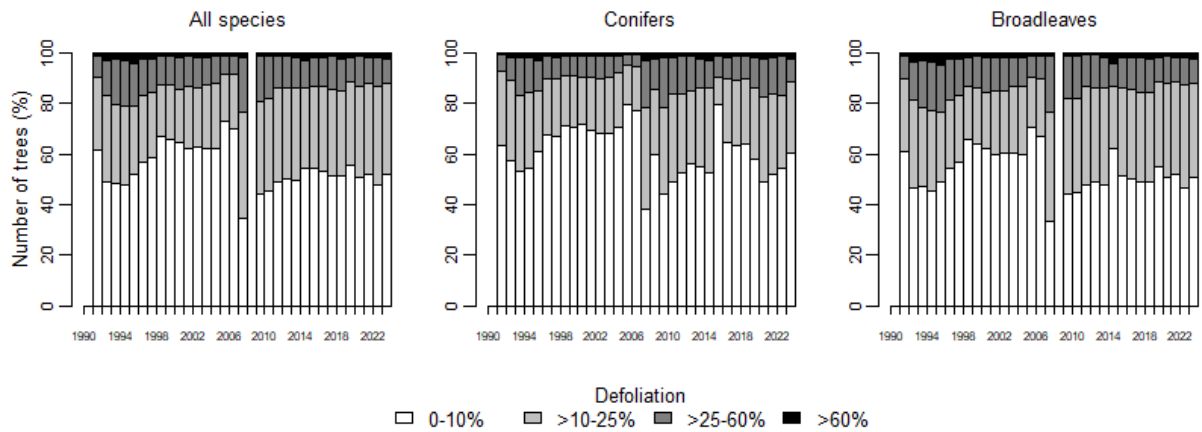
**POLAND**



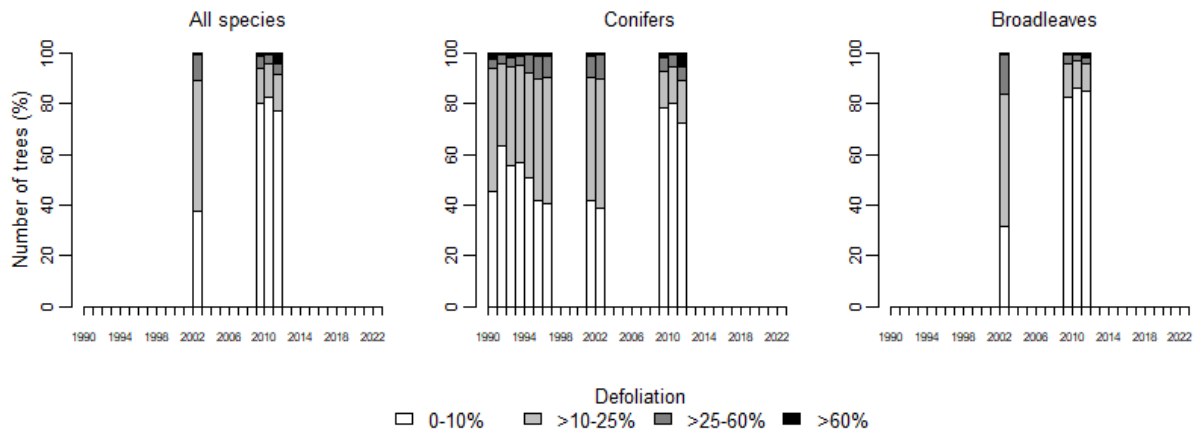
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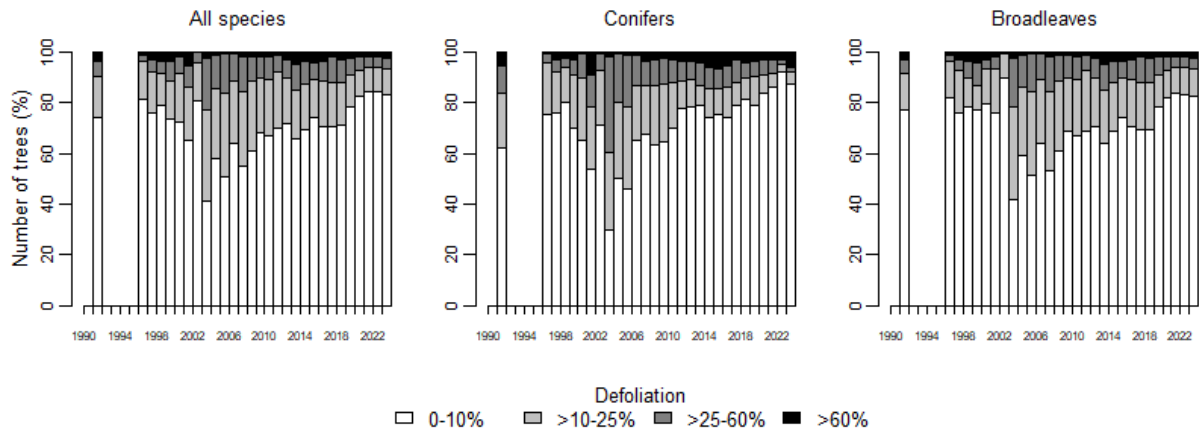
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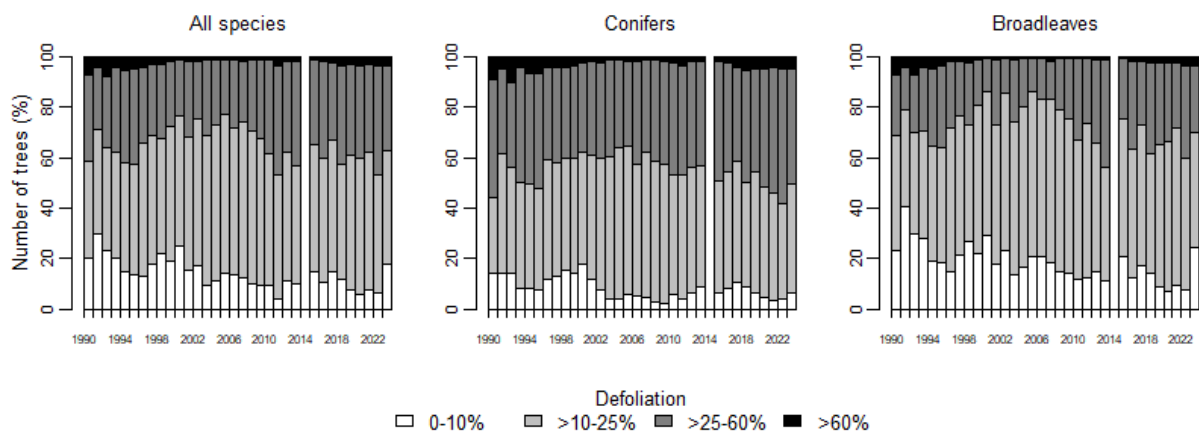
## RUSSIAN FEDERATION



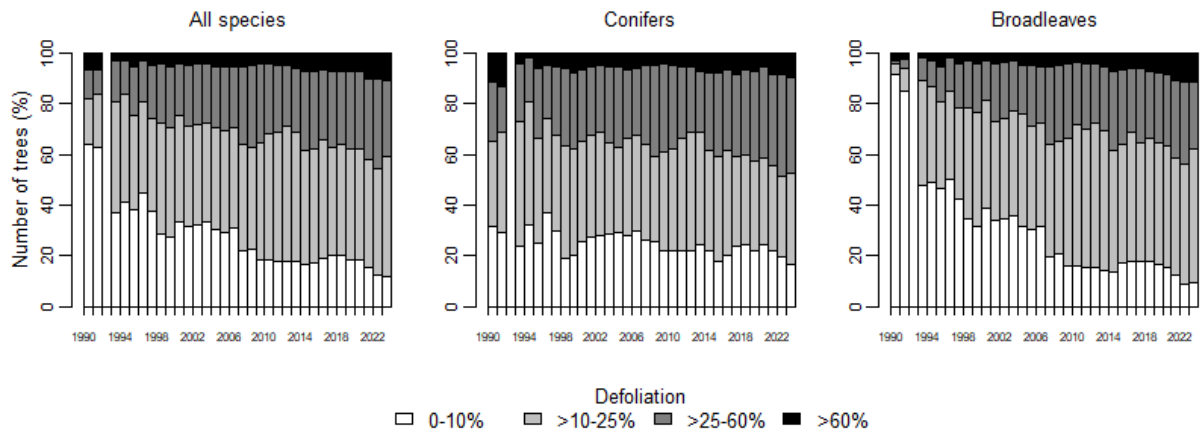
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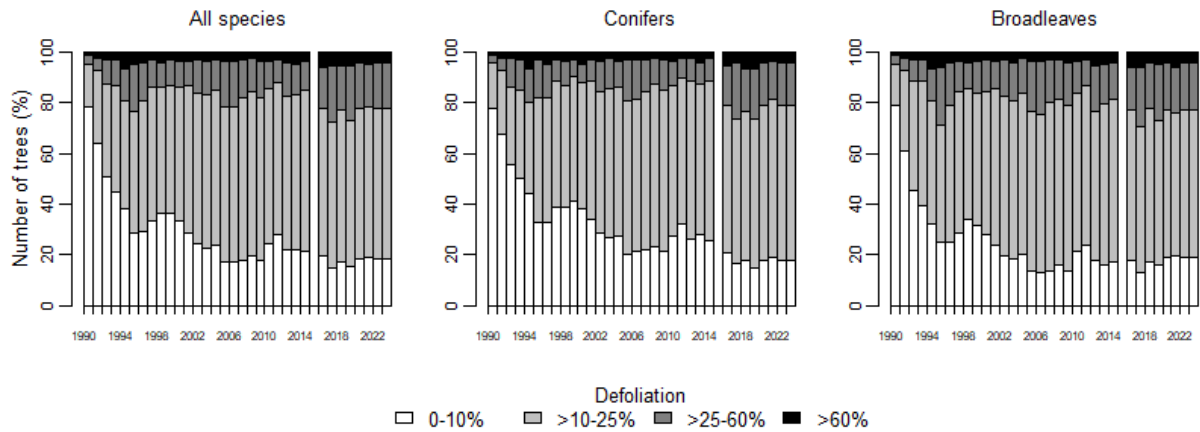
## SLOVAKIA



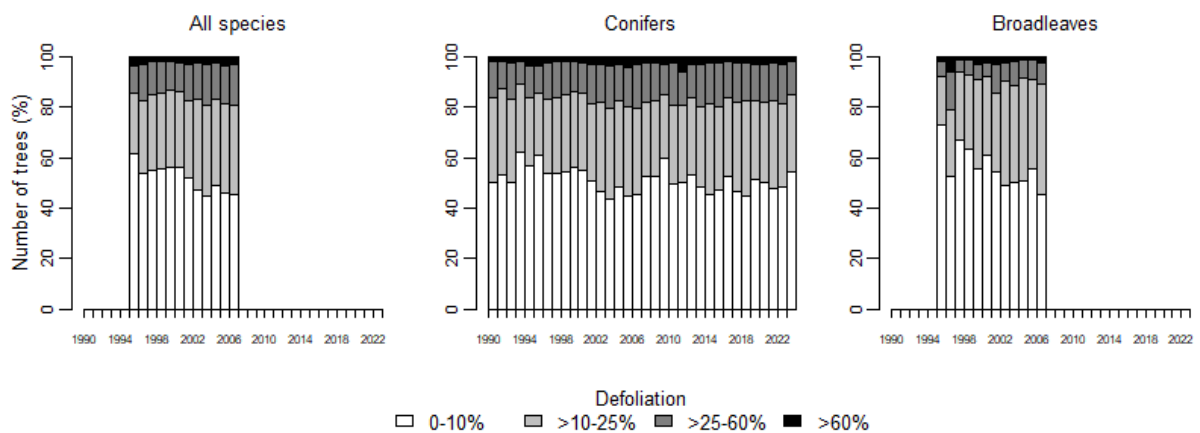
## SLOVENIA



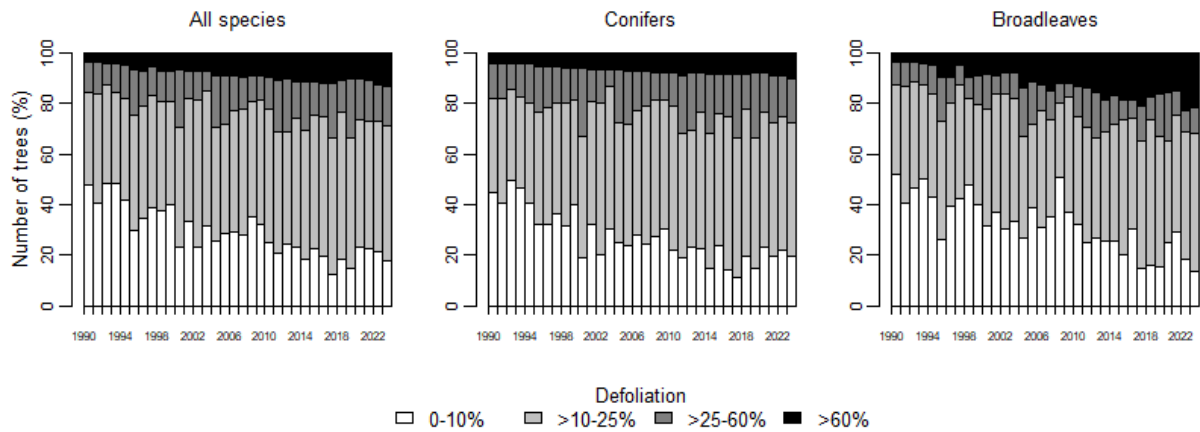
## SPAIN



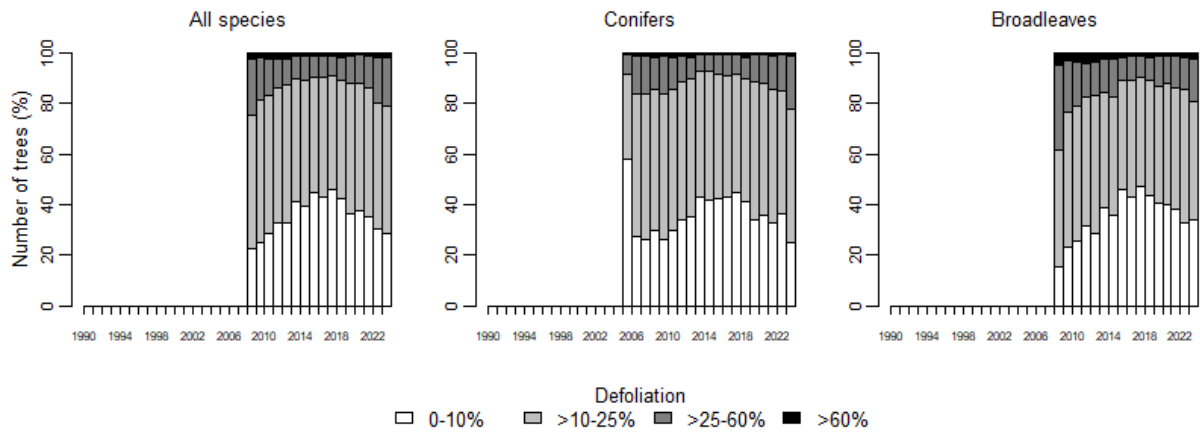
## SWEDEN



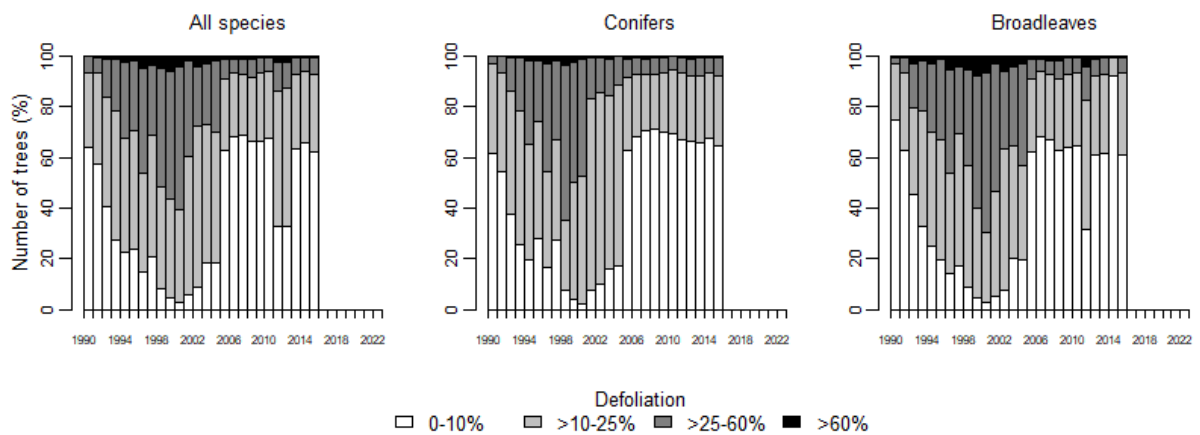
## SWITZERLAND



## TÜRKİYE



## UKRAINE



## UNITED KINGDOM

