and may highlight any immediate danger to the Peninsula's ecostasis. The final report will await identification of the bulk of the specimens, and this will be carried out in England. The report will form part of a socio-economic and ecological study that is being carried out by the Columbus 500 Project, which aims to involve the native inhabitants in planning the sustainable development of the region.

The team are currently fund-raising and finalizing plans for this important project. Advice or assistance of any form would be gratefully appreciated and should be addressed to the undersigned.

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Air Pollution and Forest Damage in Europe: Still Critical but Some Improvements

Air pollution continues to take a heavy toll in Europe, according to a survey of forest health in 26 states coordinated by the United Nations Economic Commission for Europe (ECE). Compared with previous years, several countries reported a further increase in forest damage during 1989 — especially in Eastern Europe — while in other countries the degree of defoliation appears to have stabilized or actually decreased.

The ECE forest damage survey — fourth in a series of annual reports undertaken since 1986 with the assistance of the United Nations Environment Programme — was carried out by an international programme task-force led by the Federal Republic of Germany, in the context of the 'Convention on Long-range Transboundary Air

Table I

*1989 ECE Survey: Coniferous Forests — All Ages — Defoliation by Classes.***

Participating countries etc.	Coniferous forest (1,000 ha)	0 none (%)	1 slight (%)	2 moderate (%)	3 + 4 severe (%)	2 + 3 + 4 (%)
Austria	2,518	76.0	19.9	3.3	0.8	4.1
Belgium (Flanders)	54	35.9	49.1	13.6	1.4	15.0
Belgium (Wallonia)	248	47.6	28.5	20.0	3.9	23.9
Bulgaria	1,172	22.0	45.1	30.6	2.3	32.9
Byelorussian SSR*	4,760	12.0	12.0	68.0	8.0	76.0
Czech & Slovak Fed. Rep.	2,891	27.0	41.0	26.0	6.0	32.0
Denmark	308	55.0	21.0	21.0	3.0	24.0
Finland	18,484	59.3	22.0	16.4	2.3	18.7
France	4,840	75.4	17.4	6.7	0.5	7.2
Germany (East)	2,003	42.8	39.7	14.8	2.7	17.5
Germany (West)	5,078	51.5	35.3	12.3	0.9	13.2
Greece	954	57.8	35.5	5.9	0.8	6.7
Hungary	1,405	64.3	22.4	11.7	1.6	13.3
Ireland	334	47.2	39.6	12.6	0.6	13.2
Italy	1,735	77.0	13.8	7.6	1.6	9.2
Italy (Bolzano)	292	81.6	14.1	3.8	0.5	4.3
Luxembourg	31	74.9	15.6	7.7	1.8	9.5
Netherlands	208	53.2	29.1	15.5	2.2	17.7
Norway	5,925	57.0	28.2	12.5	2.3	14.8
Poland	6,895	17.8	47.7	32.8	1.7	34.5
Portugal	1,315	83.5	6.7	4.9	4.9	9.8
Spain	5,637	78.7	17.8	3.1	0.4	3.5
Sweden	19,400	51.9	35.2	11.3	1.6	12.9
Switzerland	777	53.0	33.0	11.0	3.0	14.0
Ukrainian SSR*	4,159	83.5	15.1	1.4	0.0	1.4
USSR (Estonia)	1,153	38.8	32.7	27.8	0.7	28.5
USSR (Kaliningrad)	123	11.0	46.0	41.0	2.0	43.0
USSR (Lithuania)	1,008	32.0	44.0	22.0	2.0	24.0
United Kingdom	1,550	36.0	30.0	25.0	9.0	34.0
Yugoslavia (Slovenia)	1,210	33.6	27.3	22.9	16.3	39.1

* Selective regional surveys.

** *Defoliation classes* (percentage of needles lost): 0 = <10%; 1 = 10–25%; 2 = 25–60%; 3 = >60%; 4 = dead trees.

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TABLE II

*1989 ECE Survey: Broad-leafed Forests — All Ages — Defoliation by Classes.***

Participating countries etc.	Broad-leaf forest (1,000 ha)	No. of sample trees	0 (none)	1 (slight)	2 (moderate)	3 + 4 (severe)	2+3+4
Austria	821	803	64.3	29.0	5.6	1.1	6.7
Belgium (Flanders)	61	547	52.7	39.2	6.2	1.9	8.1
Belgium (Wallonia)	239		66.8	24.1	7.5	1.6	9.1
Bulgaria	2,142	1,736	61.0	22.8	14.4	1.8	16.2
Byelorussian SSR*	2,280	247	26.7	39.9	30.7	2.7	33.4
Czech & Slovak Fed. Rep.	1,600	2,620	22.0	41.0	34.0	3.0	37.0
Denmark	158	567	36.0	34.0	29.0	1.0	30.0
Finland	1,575	510	65.5	22.0	9.8	2.8	12.6
France	9,600	5,837	81.3	13.9	4.1	0.7	4.8
Germany (East)	650	10,650	54.5	32.6	10.6	2.3	12,9
Germany (West)	2,282	21,020	38.2	41.4	19.2	1.2	20.4
Greece	1,080	922	30.8	50.8	16.0	2.4	18.4
Hungary	261	17,366	63.5	24.0	9.4	3.1	12.5
Ireland	46		not assessed				
Italy		4,357	75.3	15.2	8.0	1.5	9.5
Italy (Bolzano)	15	227	81.9	8.6	7.7	1.8	9.5
Luxembourg	57	2,331	55.6	30.5	11.4	2.5	13.9
Netherlands	103	10,800	51.3	35.6	10.2	2.9	13.1
Norway	735		not assessed				
Poland	1,759	4,600	45.4	36.9	16.5	1.2	17.7
Portugal	1,745	2,779	69.5	21.9	7.6	1.0	8.6
Spain	6,155	5,603	77.4	19.4	2.6	0.6	3.2
Sweden	4,300		not assessed				
Switzerland	409	2,969	68.0	26.0	4.0	2.0	6.0
Ukrainian SSR*	4,399	921	88.9	9.7	1.3	0.1	1.4
USSR (Estonia)	649		not assessed				
USSR (Kaliningrad)	144	2,047	33.0	35.0	28.0	4.0	32.0
USSR (Lithuania)	802	7,121	50.0	34.0	14.0	2.0	16.0
United Kingdom	650	679	47.0	32.0	19.0	2.0	21.0
Yugoslavia (Slovenia)	7,915	1,241	83.6	8.2	4.2	4.0	8.2

* Selective regional surveys.
** *Defoliation classes* (percentage of leaves lost): 0 = <10%; 1 = 10–25%; 2 = 25–60%; 3 = >60%; 4 = dead trees.

Pollution'. The results of the survey were presented to the Convention's Working Group on Effects, meeting in Geneva, Switzerland, on 27–29 August 1990.

The 1989 survey covered 116 million hectares, comprising two-thirds of the entire forest area in Europe. For the first time, data on forest damage in the western parts of the USSR (Ukrainian SSR, Byelorussian SSR, and the Kaliningrad region) are included, in addition to the Estonian and Lithuanian SSR which had already reported in previous years.

The survey shows the rate of defoliation (loss of needles and leaves in different species and age-groups of coniferous (Table I) and broad-leafed (Table II) forests, respectively. Spruce (*Picea*), fir (*Abies*), and oak (*Quercus*), are currently the genera most heavily affected. In the age-group of trees of more than 60 years, moderate to severe defoliation affects more than 15% of all spruce trees in 16 countries, of all fir trees in seven countries, and of all oaks in 15 countries. This implies that, in more than half of the participating states, older trees of these species are in a precarious state of health.

In most countries, damage to spruce remained stable or decreased slightly in 1989, although a notable deterioration was recorded in Czechoslovakia, Poland, and the Lithuanian SSR. While the condition of pine (*Pinus* spp., mostly *P. sylvestris* remained generally unchanged, Bulgaria, the Lithuanian SSR, Hungary, Portugal, The Netherlands, the German Democratic Republic, and Switzerland, all showed a negative trend for older trees. The situation of Silver Fir (*Picea alba*) continues to be critical. Defoliation in oaks became significantly more serious, with the exception of recoveries reported from Greece, The Netherlands, and the United Kingdom. Common Beech (*Fagus sylvatica*) improved slightly in most countries, which in some cases is attributed to recovery from earlier insect attacks.

The Programme Task Force emphasized that it is extremely difficult to draw comparisons between the data collected by different countries. The condition of European forests depends on species composition, age structure, site and climatic factors, and traditional forms of damage. The relative importance of these varies between regions, and despite the high level of harmonization in assessment methods that has now been achieved between the participating countries, important differences still remain. Intercalibration will therefore remain a continuous task of the programme. For this purpose, international training courses in forest damage assessment were held in July 1990 in Prachatice (Czechoslovakia) and in Volterra (Italy).

Preparations for the next ECE survey are now under way in all participating countries, together with a major joint assessment of cause–effect relationships between air pollution and forest damage. In submitting the results of its 1989 survey to the Working Group on Effects, the Programme Task Force stated its concern over the continuing decline of forests and continuing acidification of forest soils in Europe, and stressed the need for further action to reduce air pollution.

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