



**The Natural Environment
Research Council**

**Institute of Terrestrial Ecology
Report for 1985/86**

Contents

- 4-60 **The Natural Environment Research Council**
Report of the Council for the Period 1 April 1985 - 31 March 1986
Removed from this version
- 61-146 **Institute of Terrestrial Ecology**
Report for 1985/86
- 147-170 **Annexes**
- i-xxx **NERC Appendices**
Removed from this version

Listed by Programmes

1. **Forest and woodland ecology**, the integrated effects (botanical and zoological) of woodland and forest management practices

Programme Leader: FT Last

Core Group: D Jenkins, ED Ford, AHF Brown (Sec)

Project nos.			Programme nos.
9	Monitoring at Stonechest	JM Sykes	1
90	Effects of birch on moorland soil & vegetation	J Miles	(1) 12
137	Population ecology of sparrowhawks	I Newton	(18) 10
367	The Gisburn experiment	AHF Brown	(1) 12
389	Management effect in lowland coppices	AHF Brown	1
417	Silvicultural systems - N Ireland experiment	AHF Brown	1
454	Monitoring of woodlands	JM Sykes	1
479	Deer in production forests	BW Staines	1 (10)
512	Birch gene-bank	J Pelham	(1,7) 9
517	Primary productivity in woodlands	JNR Jeffers	1
528	Red deer populations in woodland habitats	B Mitchell	1 (10)
568	Subcortical fauna in oak	MG Yates	(1,11) 10
574	Potential for fuel cropping in upland Wales	DI Thomas	1
606	Grey squirrel damage and management	RE Kenward	1 (10)
625	Effects of clear-felling in upland forests	MO Hill	(1) 12
636	Song bird density and woodland diversity	D Jenkins	(1) 11
692	Goshawk population dynamics	RE Kenward	(1) 10
721	Dry matter in forests: world review	MGR Cannell	1
746	Grazing in woodlands	TW Ashenden	1 (16)
773	Silviculture of respacing Sitka spruce	JD Deans	1
794	Rhododendrons in Snowdonia	MW Shaw	(1) 4
820	Regional aspects of forest dynamics in Europe	P Ineson	1 (12)
832	Operation of the Rivoix field site	R Milne	(1,7) 14
862	Population ecology of pine beauty moth	AD Watt	(1) 10
898	Light use efficiency of coppice	MGR Cannell	(1) 7
910	Physiology of reproduction in trees	KA Longman	(1) 7
933	Succession under birchwoods	AJ Hester	1 (9,12)
936	Trees and wildlife in the Scottish highlands	D Jenkins	1
948	Invertebrate conservation in plantation woods	E Pollard	1
950	Woodland fritillary butterflies	JA Thomas	(1,10) 11
956	Assessment of amenity tree planting scheme	JM Sykes	1
991	Effects of waterlogging on mycorrhizal seeds	J Dighton	1 (12)
996	Spread of Dutch elm disease in Midlothian	J Wilson	1
1003	Quasi-static model for wind overturning	R Milne	1
1005	Large-scale production of mycorrhizal inocula	FT Last	(1,7) 12
1006	Forest decline and atmospheric pollutants	FT Last	1
1008	Conservation/amenity & production forestry	JEG Good	1
1009	Forestry & nature conservation at Newborough	MO Hill	1 (5)
1011	Populn ecology of winter moth in Sitka spruce	AD Watt	(1) 10
1025	Hardwood consultancy: Ivory Coast (SODEFOR)	FT Last	1 (7)
1031	Cameroon forestry and forest ecology	FT Last	1

2. **Freshwater ecology**, with special reference to synoptic limnology and the interactions between flora and fauna

Programme Leader: JP Dempster

Core Group: I Newton, PS Maitland (Sec), IR Smith

117	Freshwater survey of Great Britain	PS Maitland	2 (5)
124	Distribution & biology of fish in GB	PS Maitland	(2) 5
289	Residues and effects of pollutants	F Moriarty	(2) 8
481	Monitoring & chemistry of aquatic pollutants	KR Bull	2 (8)
527	Long-term changes in zooplankton	L May	2 (11)
577	Predation of freshwater zooplankton	DH Jones	2 (11)

584	Loch Leven phytoplankton, nutrients & grazing	A E Bailey-Watts	2 (5,11,16)
586	Freshwater phytoplankton periodicity	A E Bailey-Watts	2
609	Biological classification of UK rivers	D Moss	2 (5)
644	Breeding success & survival in the common toad	C J Reading	(2) 10
676	Ecology of lampreys in Loch Lomond	PS Maitland	(2) 10
694	Zooplankton communities in freshwater lakes	DH Jones	2 (11)
698	Zooplankton population dynamics	L May	2 (11)
739	Life history of the common frog	CP Cummins	(2 10) 8
765	Ecology of the heron	M Marquiss	(2 8) 10
837	Fish populations and acid precipitation	PS Maitland	(2) 6
847	Hydroclimate services	IR Smith	2
863	4th international rotifer symposium	L May	2
866	Aerial remote sensing of Lochs Leven, Lomond, Tay	AA Lyle	2 (5)
870	Mixing and spatial variation in lakes	IR Smith	2
871	River condition scale	IR Smith	2
886	Organizing 2 symposia at Brathens	D Jenkins	2
903	Morphometric studies of British lampreys	KH Morris	2 (15)
923	Acidification of waters in Wales	M Hornung	(2,6) 12
926	Loch Leven phosphorus loading	A E Bailey-Watts	2 (16)
942	Silage effluent and fish toxicity	DH Jones	2
947	Metals in freshwater animals	PET Douben	(2) 8
959	Acid deposition and groundwater chemistry	BG Bell	(2,12) 6
965	Phragmites-root zone method for sewage treatment	G Lawson	(2) 12
966	Coldingham Loch	A E Bailey-Watts	2
967	Acidification & freshwater plants & invertebrates	KH Morris	2 (6)
986	Rotifer resting eggs to indicate acidification	L May	2 (6)
995	Crustacean remains in sediment cores	DH Jones	2 (6)
1016	Classification of river & lake catchments	KR Bull	(2) 6
1017	Aluminium concentrations during storm events	KR Bull	(2) 6

3. Rehabilitation of disturbed ecosystems, and creation of biologically rich habitats from scratch

Programme Leader: JP Dempster

Core Group: BNK Davis (Sec), TCE Wells

360	Tree planting on opencast sites	JE Good	3
500	Recolonization by spiders on Hartland Moor	P Merrett	(3 4) 11
567	Coastal dune management guide	DS Ranwell	3
690	Plant succession in a limestone quarry	BNK Davis	3
693	Plant species establishment in grassland	LA Boorman	3 (4)
707	Plant establishment in woodland	LA Boorman	3 (4)
819	Creation of butterfly habitats on landfill site	BNK Davis	3
834	Revegetation after disturbance	J Miles	3
848	Mosses & indigenous plant litter in bare ground	NG Bayfield	3
859	Restoration of heathland	NR Webb	3
887	Creating attractive grasslands	TCE Wells	3 (9)
889	Monitoring floristic changes	TCE Wells	3 (9)
907	Bracken and heathland studies	JE Lowday	(3) 4
921	The use of grass on reinforced dam spillways	LA Boorman	3
1014	Highcliffe stabilization & rehabilitation	AJ Gray	3 (4)
1018	Restoration expts for New Forest gas pipeline	NRC Webb	3
1020	Winfrith creative conservation study	SB Chapman	3
1028	Experimental propagation of reed	LA Boorman	3

4. Management of natural and man-made habitats, but excluding forests and disturbed sites, effects of management, including grazing, cutting ... on plants, animals and soils

Programme Leader: FT Last

Core Group: MG Morris, MD Hooper (Sec), C Milner

78	Management of sand dunes in Wales	DG Hewett	4
92	Effects of grazing on <i>Nardus</i> & <i>Calluna</i> moorland	D Welch	4 (16)
228	Effect of cutting on chalk grassland	TCE Wells	4
230	Grassland management - invertebrates	MG Morris	4 (11)
243	Scrub succession at Aston Rowant NNR	LK Ward	4
296	Scrub management at Castor Hanglands	LK Ward	4
374	Sand dune ecology in East Anglia	LA Boorman	4
467	Roadside studies	TW Parr	4
500	Recolonization by spiders on Hartland Moor	P Merrett	(3 4) 11
599	Heathland management research	RH Marrs	4
602	Modelling sports turf wear	TW Parr	4 (15)
634	Field plot survey - Monks Wood	R Cox	4
650	Amenity grass irrigation	MD Hooper	4
674	Plant species for energy in Great Britain	TV Callaghan	4 (7)
693	Plant species establishment in grassland	LA Boorman	(4) 3
703	Vegetation change at Dungeness and Orfordness	RM Fuller	4
707	Plant establishment in woodland	LA Boorman	(4) 3
718	Impact of land drainage on wildlife	JO Mountford	(4) 16
743	Railway resource monitoring	CM Sargent	4
744	Effects of grazing in Snowdonia	MO Hill	4 (16)

772	Japanese knotweed control	R Scott	4
776	Long-term studies of vegn change at Moor House	RH Marrs	4
794	Rhododendrons in Snowdonia	M W Shaw	4 (1)
796	Poole harbour salt marshes	A J Gray	4
835	ITE/UCL EIA Lake Ichkeul: plant vegn dynamics	T W Parr	(4 15) 9
836	ITE/UCL EIA Lake Ichkeul: remote sensing survey	RM Fuller	(4) 5
875	Structure & dynamics of motorway vegetation	CM Sargent	(4,5) 9
878	Use of remote sensing for mapping rhododendron	RJ Parsell	(4,5) 13
896	Assessment & mapping of wetland vegn in Tunisia	JO Mountford	(4) 5
901	Environmental advice to Halcrows	MD Hooper	4
907	Bracken and heathland studies	JE Lowday	4 (3)
908	<i>Spartina</i> population ecology	A J Gray	(4) 9
912	Rangeland mapping from remote sensing	BK Wyatt	(4) 5
914	Somerset water resources study	MD Hooper	4
922	Ecological aspects of different routes for A34	MD Hooper	4
934	Vegetation dynamics and soils	J Miles	(4) 12
940	A survey of sand dunes in relation to grazing	L A Boorman	(4,16) 5
946	Design and environmental management in ski areas	NG Bayfield	4
968	Bristol-Avon Water Division Study	MD Hooper	4
981	Nitrogen fertilizer exp. in the Somerset Levels	RM Fuller	4 (16)
982	Management plan for Cairngorm Estate	GR Miller	4
994	Channel Tunnel: ecological advice to MHA	MD Hooper	4
1014	Highcliffe stabilization & rehabilitation	A J Gray	(4) 3

5. Survey and monitoring of plant and animal distributions and abundance

Programme Leader: JP Dempster

Core Group: PS Maitland, MO Hill, GL Radford (Sec)

117	Freshwater survey of Great Britain	PS Maitland	(5) 2
124	Distribution & biology of fish in GB	PS Maitland	5 (2)
132	Monitoring in the Cairngorms	A Watson	5
181	Birds and pollution	I Newton	(5,16) 8
204	Butterfly monitoring schemes	E Pollard	(5) 10
208	BRC: botanical recording schemes	CD Preston	5
	BRC: Vertebrate recording schemes	H. R. Arnold	5
209	Phytophagous insect data bank	LK Ward	(5) 11
340	Survey of Scottish coasts	MW Shaw	5
405	Fauna of pasture woodlands	PT Harding	(5) 11
406	Distribution & ecology of non-marine Isopoda	PT Harding	5
424	Ecological survey of Britain	RGH Bunce	(5) 13
529	BRC: data bank	DM Greene	5
534	National land characteristics & classification	DF Ball	(5,16) 13
557	BRC: terrestrial & freshwater invert recording	PT Harding	5
584	Loch Leven phytoplankton, nutrients & grazing	A E Bailey-Watts	(5,11,16) 2
609	Biological classification of UK rivers	D Moss	(5) 2
615	Heathland invertebrates	NR Webb	(5) 11
656	BRC: marine invertebrate recording schemes	HR Arnold	5
657	Biological Records Centre - general	PT Harding	5
751	National survey of fluoride in predatory birds	DC Seel	(5) 6
761	EEC remote sensing	BK Wyatt	(5) 13
771	Chemical data bank (Monks Wood)	KR Bull	(5 8) 14
774	Long-term trends in upland vegetation	J Dale	5
795	Standard procedures for recording data	DM Greene	5 (15)
836	ITE/UCL EIA Lake Ichkeul: remote sensing survey	RM Fuller	5 (4)
866	Aerial remote sensing of Lochs Leven, Lomond, Tay	A A Lyle	(5) 2
875	Structure & dynamics of motorway vegetation	CM Sargent	(4,5) 9
878	Use of remote sensing for mapping rhododendron	RJ Parsell	(4,5) 13
896	Assessment & mapping of wetland vegn in Tunisia	JO Mountford	5 (4)
899	Rural land cover and landscape change	DF Ball	(5 16) 13
900	Air photo assessment of landscape change	DF Ball	(5) 13
906	Ecological data unit	GL Radford	5 (15)
909	Changes in the rural environment	CJ Barr	(5,16) 13
912	Rangeland mapping from remote sensing	BK Wyatt	5 (4)
927	BBC Domesday project	DF Ball	(5) 13
932	Local applications of remote sensing	RE Daniels	5
938	Agricultural EIA from ground, air and space	RM Fuller	(5) 16
940	A survey of sand dunes in relation to grazing	L A Boorman	5 (4,16)
945	Ecological studies at Hinkley Point	RE Daniels	5
951	Use of remote sensing in grazing studies	BK Wyatt	(5) 13
952	EEC Programme CORINE - Project biotopes	BK Wyatt	(5) 13
964	Furzey Island: saltmarsh and mudflats monitoring	A J Gray	5
972	Survey and consultancy for EEC Ltd	NR Webb	5
974	Wytch Farm saltmarsh survey	A J Gray	5
987	Correlation of Hunting/FC sample sites	DF Ball	(5) 13

992	Field boundaries in lowland Wales	D C Seel	5
998	Rural O ₃ , NO and NO _x concentrations	D Fowler	(1,5) 9
1001	Tree survey in Northern Corries, Cairngorm	GR Miller	5
1004	Dungeness airphoto production	RM Fuller	5
1007	Preliminary survey of oil pipeline route	SB Chapman	5
1009	Forestry & nature conservation at Newborough	MO Hill	(5) 1
1015	Work on seabirds	MP Harris	5 (10)
1021	Wallis Downs relief road survey	NR Webb	5

6. **Airborne pollutants, including radionuclides**, their pathways through and effects on terrestrial ecosystems

Programme Leader: FT Last

Core Group: SE Allen, MH Unsworth, IA Nicholson, DF Perkins (Sec)

160	Fluorine pollution studies	DF Perkins	6
380	Monitoring atmospheric SO ₂ and NO _x at Devilla	IA Nicholson	6
426	Review of sulphur cycle	IA Nicholson	6
453	SO ₂ dry deposition in Scots pine forest	D Fowler	6
491	Radiochemical development	FR Livens	6
524	Fluoride in predatory mammals	KC Walton	6
526	Biological monitoring in Forth Valley	BG Bell	6
556	Estimation in acid rain	KH Lakhani	6
669	Interaction of grazing & air pollution	TW Ashenden	6
710	Airborne pollutants & Scots pine	JN Cape	6
751	National survey of fluoride in predatory birds	D C Seel	6 (5)
753	Fluoride and magpies	D C Seel	6 (10)
756	Fluoride pathways in invertebrates	A Buse	6
790	Effects of polluted atmospheres on crops	IA Nicholson	6
791	Effect of acid rain on Sitka spruce	D Fowler	6
809	Fluoride toxicology	D Osborn	(6) 8
830	Rainfall acidity and gas transport & exchange	JN Cape	6
837	Fish populations and acid precipitation	PS Maitland	6 (2)
841	Throughfall & stemflow under different trees	IA Nicholson	6
845	Effects of acid rain on vegetation in Wales	TW Ashenden	6
849	Distribution of radionuclides in soils	FR Livens	6
873	Effect of land use on radionuclides in W Cumbria	AD Horrill	6
874	Transfer of radionuclides to coastal sheep	BJ Howard	6
880	Radionuclides in the food of coastal birds	VP W Lowe	6
884	Dynamics of americium in coastal Cumbria	AD Horrill	6
888	NO _x , O ₃ and NH ₃ dry deposition	MH Unsworth	6 (12)
893	Effects of acid rain on forest trees	J Dighton	6 (12)
895	Chemical composition of rainfall	IA Nicholson	6
923	Acidification of waters in Wales	M Hornung	(2,6) 12
924	Acid mist and tree injury	A Crossley	6
925	Variation of acidic deposition with altitude	D Fowler	6
944	Air pollutants and decomposition processes	PA Wookey	6 (12)
959	Acid deposition and groundwater chemistry	BG Bell	6 (2,12)
960	Atmospheric emissions of hydrochloric acid	PJ Lightowlers	6
961	Fluoride in millipedes	A Buse	6 (8)
962	Shoot death on Sitka spruce: autumn hardening	MGR Cannell	6
967	Acidification & freshwater plants & invertebrates	KH Morris	(6) 2
976	Sheep feeding trials	BJ Howard	6
986	Rotifer resting eggs to indicate acidification	L May	(6) 2
988	Environmental impact study at Dounreay	SE Allen	6
995	Crustacean remains in sediment cores	DH Jones	(6) 2
1016	Classification of river & lake catchments	KR Bull	6 (2)
1017	Aluminium concentrations during storm events	KR Bull	6 (2)

7. **Plant physiology and genetics**, responses of native and introduced species to environmental factors

Programme Leader: FT Last

Core Group: MH Unsworth (Sec), TV Callaghan

266	Root dynamics and nutrient modelling	SB Chapman	(7) 12
447	Freshwater and marine amoebae	FC Page	7
449	Preservation of cultures	GJ Morris	7
512	Birch gene-bank	J Pelham	(7) 9
674	Plant species for energy in Great Britain	TV Callaghan	(7) 4
702	Selection of frost-hardy trees	MGR Cannell	7
717	Birch variation & environmental differences	J Pelham	7 (9)
748	Temperature limits of growth for <i>Chlamydomonas</i>	E A Leeson	7
750	Domestication of tropical hardwoods	RRB Leakey	7
767	Formation of cones by lodgepole pine	KA Longman	7
770	Evaluation of conifer clones and progenies	MGR Cannell	7
785	Cultivation of freshwater algae	A Asher	7
786	Cultivation of marine algae	A Asher	7
787	Cultivation of free-living protozoa	JP Cann	7
801	Radial growth of Sitka spruce roots	JD Deans	7

805	Effects of mycorrhizas on assimilation	E J White	7
816	IUFRO Conference 1984: trees as crop plants	MGR Cannell	7
831	Modelling of transpiration in Sitka spruce	R Milne	7
832	Operation of the Rivoix field site	R Milne	(1,7) 14
842	The physiology of <i>Pinus contorta</i> buds	CJ Couper	7
851	Viability & stability of micro-organisms	GJ Morris	7
861	Characterization of sheathing mycorrhizas	A Crossley	7
865	Mycorrhizal toadstools in coniferous plantings	J Wilson	(7) 12
872	Effect of mycorrhizas on metal uptake in <i>Betula</i>	HJ Denny	7 (12)
879	Energy plantations - review	MGR Cannell	7
881	Ecology of rock-colonizing mosses in Britain	PJ Lightowlers	7
882	Cone initiation in lodgepole pine	JP Dick	7
898	Light use efficiency of coppice	MGR Cannell	7 (1)
910	Physiology of reproduction in trees	K A Longman	7 (1)
916	Saline-tolerant <i>Petalomonas</i>	JP Cann	7
931	Screening algal cells for industry	GJ Morris	7
935	Evaluation of red alder	LJ Sheppard	7
941	Climatic warming & spring phenology	MGR Cannell	7
955	West African regional project preparatory phase	RB Leakey	7
978	Domestication of tropical trees by in vitro culture	P Mathias	7
983	Tea research in Malawi	MGR Cannell	7
985	Plant response to stress at high altitudes	TV Callaghan	7 (9)
997	Seed production & tree improvement in Cameroon	RB Leakey	7
999	Selection of conifer genotypes	A Crossley	7
1005	Large-scale production of mycorrhizal inocula	FT Last	(1,7) 12
1029	World Bank forestry project-EFT & ONAREF	RRB Leakey	7
1032	Mechanics of windthrow in commercial forests	R Milne	7

8. Ecophysiology and pollution in animals, covering broadly the same fields as the former Subdivision of Animal Ecology

Programme Leader: JP Dempster
Core Group: I Newton (Sec), R Moss

129	Red grouse and ptarmigan populations	A Watson	(8) 10
137	Population ecology of sparrowhawks	I Newton	(1 8) 10
181	Birds and pollution	I Newton	8 (5,16)
255	Social biology of <i>Myrmica</i> species	G W Elmes	(8 10) 11
256	Protein electrophoresis	B Pearson	8
289	Residues and effects of pollutants	F Moriarty	8 (2)
455	Interrelationships of metals and protein in birds	D Osborn	8
461	Puffins and pollutants	MP Harris	8 (10)
481	Monitoring & chemistry of aquatic pollutants	KR Bull	(8) 2
559	Ecology of reproduction in the wild rabbit	IL Boyd	8
624	Population genetics	PJ Bacon	(8) 10
630	Stress in birds	A Dawson	8
728	Kestrels in farmland	A Village	(8) 10
737	Population genetics of <i>Pardosa monticola</i> spiders	RG Snazell	8
739	Life history of the common frog	CP Cummins	8 (2 10)
759	Chemicals in the terrestrial environment	S Dobson	8 (16)
763	Data profiles on chemicals	S Dobson	8 (16)
765	Ecology of the heron	M Marquiss	(2 8) 10
771	Chemical data bank (Monks Wood)	KR Bull	(5 8) 14
809	Fluoride toxicology	D Osborn	8 (6)
810	Lead poisoning in birds	MC French	8
811	Foraging & reserve storage in red & grey squirrel	RE Kenward	8 (11)
812	Grouse aviary	R Moss	8 (10)
947	Metals in freshwater animals	PET Douben	8 (2)
961	Fluoride in millipedes	A Buse	(8)
984	Autopsies and analyses of otters	HM Hanson	8
993	Safety evaluation of agrochemicals	D Osborn	8
1019	Mercury levels in Mersey birds	D Osborn	8
1026	Heavy metals & PCBs in Shetland otters	H Kruuk	8
1027	Devlpmt of data profiles on chemicals	S Dobson	8 (15)

9. Plant population ecology: the biology of individuals and populations, including a consideration of gene flow

Programme Leader: FT Last
Core Group: SB Chapman, AJ Gray (Sec)

82	Seed produced by montane plants	GR Miller	9
225	Population studies on orchids	TCE Wells	9
269	Autecology of the marsh gentian	SB Chapman	9
295	Survey of juniper in N England	LK Ward	9
346	Genecology of grass species	AJ Gray	9
508	Botanical variation in elm	JNR Jeffers	9
512	Birch gene-bank	J Pelham	9 (7)
576	Isoenzyme studies in <i>Sphagnum</i>	RE Daniels	9
649	Demographic genetics of <i>Agrostis curtisii</i>	AJ Gray	9

717	Birch variation & environmental differences	J Pelham	(9) 7
742	Population fluctuations in annual legumes	CD Preston	9
775	Ecology of Arctic alpins in Snowdonia	C Milner	9
783	Interactions between mosses & vascular plants	NG Bayfield	9
793	Ecotypic variation in oak	MW Shaw	9
835	ITE/UCL EIA Lake Ichkeul: plant vegn dynamics	T W Parr	9 (4 15)
846	Influence of events on population growth	IR Smith	(9 10) 15
875	Structure & dynamics of motorway vegetation	CM Sargent	9 (4,5)
887	Creating attractive grasslands	TCE Wells	(9) 3
889	Monitoring floristic changes	TCE Wells	(9) 3
908	<i>Spartina</i> population ecology	AJ Gray	9 (4)
911	Taxonomy of bryophytes	BG Bell	9
933	Succession under birchwoods	AJ Hester	(9,12) 1
985	Plant response to stress at high altitudes	TV Callaghan	(9) 7
990	Pollution study in Wales	TW Ashenden	9

10. **Autecology of animals**, with particular reference to population management for conservation and pest control

Programme Leader: JP Dempster

Core Group: I Newton, E Pollard (Sec), A Watson

54	Ecology of red deer on the Isle of Rhum	VPW Lowe	10
104	Distribution and segregation of red deer	BW Staines	10
111	Population dynamics of red deer at Glen Feshie	B Mitchell	10
129	Red grouse and ptarmigan populations	A Watson	10 (8)
131	Golden plover populations	RA Parr	10
137	Population ecology of sparrowhawks	I Newton	10 (1 8)
202	The population ecology of the Roman snail	E Pollard	10
204	Butterfly monitoring schemes	E Pollard	10(5)
255	Social biology of <i>Myrmica</i> species	GW Elmes	(8 10) 11
291	Population ecology of bats	RE Stebbings	10
292	Specialist advice on bats	RE Stebbings	10
386	Behaviour and dispersion of badgers	H Kruuk	10
400	The conservation of the large blue butterfly	JA Thomas/Elmes	10 (11)
403	The black hairstreak butterfly	JA Thomas	10
404	The brown hairstreak butterfly	JA Thomas	10
441	Oystercatcher and shellfish interaction	JD Goss Custard	(10) 11
442	Ecology of capercaillie	R Moss	10
461	Puffins and pollutants	MP Harris	(10) 8
479	Deer in production forests	BW Staines	(10) 1
499	Taxonomic studies for mammalian autecology	VPW Lowe	10
509	Wood white butterfly population ecology	E Pollard	10
528	Red deer populations in woodland habitats	B Mitchell	(10) 1
568	Subcortical fauna in oak	MG Yates	10 (1,11)
606	Grey squirrel damage and management	RE Kenward	(10) 1
624	Population genetics	PJ Bacon	10 (8)
644	Breeding success & survival in the common toad	CJ Reading	10 (2)
660	Adonis blue populations	JA Thomas	10
676	Ecology of lampreys in Loch Lomond	PS Maitland	10 (2)
692	Goshawk population dynamics	RE Kenward	10 (1)
715	Monitoring otters in Shetland	JWH Conroy	10
722	The ecology of the spider <i>Eresus niger</i>	P Merrett	10
728	Kestrels in farmland	A Village	10 (8)
734	Estimation of seabird numbers	MP Harris	10
739	Life history of the common frog	CP Cummins	(2 10) 8
753	Fluoride and magpies	DC Seel	(10) 6
764	Habitat requirements of black grouse	N Picozzi	10
765	Ecology of the heron	M Marquiss	10 (2 8)
777	Estimation of population parameters	KH Lakhani	(10) 15
789	Food resource limitation in orange-tip butterfly	JP Dempster	10
808	Effect of food availability on otter behaviour	H Kruuk	10
812	Grouse aviary	R Moss	(10) 8
818	Increasing guillemot populations	MP Harris	10
846	Influence of events on population growth	IR Smith	(9 10) 15
860	Resource limitation of 2 tephritid flies	NA Straw	10 (11)
862	Population ecology of pine beauty moth	AD Watt	10 (1)
891	Winter feeding of young oystercatchers on Exe	JD Goss-Custard	10 (11)
892	Habitat, etc, of waders: feasibility study	JD Goss-Custard	10 (11)
950	Woodland fritillary butterflies	JA Thomas	(1,10) 11
975	<i>Myrmica</i> ants and large blue butterflies	JA Thomas	(10) 11
980	Populn ecology & adaptive speciation of <i>Myrmica</i>	GW Elmes	(10) 11
1011	Populn ecology of winter moth in Sitka spruce	AD Watt	10 (1)
1015	Work on seabirds	MP Harris	(10) 5

11. **Animal species interactions and communities**, including studies of the interactions between species (eg competition, predator/prey) and between fauna and their habitats (eg effect of area and isolation)

Programme Leader: JP Dempster

Core Group: MG Morris, JD Goss-Custard, D Jenkins, JR Baker (Sec)

230	Grassland management - invertebrates	MG Morris	(11) 4
252	Hartland Moor NNR Survey	A Abbott	11
255	Social biology of <i>Myrmica</i> species	G W Elmes	11 (8 10)
270	Distributional studies on spiders	P Merrett	11
309	Phytophagous insect data bank	L K Ward	11 (5)
400	The conservation of the large blue butterfly	J A Thomas/Elmes	(11) 10
405	Fauna of pasture woodlands	P T Harding	11 (5)
407	British Staphylinidae (Coleoptera)	RC Welch	11
441	Oystercatcher and shellfish interaction	JD Goss-Custard	11 (10)
500	Recolonization by spiders on Hartland Moor	P Merrett	11 (3 4)
527	Long-term changes in zooplankton	L May	(11) 2
568	Subcortical fauna in oak	MG Yates	(1 11) 10
569	Insect fauna of <i>Helianthemum</i> & <i>Genista</i>	BNK Davis	11
577	Predation of freshwater zooplankton	DH Jones	(11) 2
584	Loch Leven phytoplankton, nutrients & grazing	A E Bailey-Watts	(5,11,16) 2
612	Analysis of Common Birds Census	MD Mountford	11
615	Heathland invertebrates	NR Webb	11 (5)
636	Song bird density and woodland diversity	D Jenkins	11 (1)
694	Zooplankton communities in freshwater lakes	DH Jones	(11) 2
698	Zooplankton population dynamics	L May	(11) 2
724	Protozoan parasites of wild British animals	JR Baker	11
811	Foraging & reserve storage in red & grey squirrel	RE Kenward	(11) 8
821	Modern agriculture and wildlife	T Parish	(11) 16
826	Fauna of native and introduced trees	RC Welch	11
827	Weevil studies	MG Morris	11
854	Competn between red and roe deer in forests	M Hinge	11
860	Resource limitation of 2 tephritid flies	NA Straw	(11) 10
891	Winter feeding of young oystercatchers on Exe	JD Goss-Custard	(11) 10
892	Habitat, etc, of waders: feasibility study	JD Goss-Custard	(11) 10
920	Irian jaya butterfly consultancy	MG Morris	11
943	European insect fauna of <i>Urtica</i> species	BNK Davis	11
950	Woodland fritillary butterflies	J A Thomas	11 (1,10)
969	Wash birds and invertebrates	JD Goss-Custard	11
975	<i>Myrmica</i> ants and large blue butterflies	J A Thomas	11 (10)
980	Populn ecology & adaptive speciation of <i>Myrmica</i>	G W Elmes	11 (10)
1024	Effects of reduced feeding time on waders	JD Goss-Custard	11 4 (11) 16

12. **Cycling of nutrients**: the movement and utilization of nutrients

Programme Leader: FT Last

Core Group: O W Heal, M Hornung, J Miles (Sec)

90	Effects of birch on moorland soil & vegetation	J Miles	12 (1)
266	Root dynamics and nutrient modelling	SB Chapman	12 (7)
367	The Gisburn experiment	AHF Brown	12 (1)
438	Nutrient cycling by fungi	JC Frankland	12
561	Soil fertility	AF Harrison	12
589	Microbial characteristics in soils	PM Latter	12
594	Geochemical cycling in the uplands	M Hornung	12
625	Effects of clear-felling in upland forests	MO Hill	12 (1)
645	Effects of soil chemistry on decomposition	DD French	12
654	Status of mycorrhizas in the soil ecosystem	J Dighton	12
695	Effects of mycorrhiza on tree growth	FT Last	12
714	Role of forest vegetation in pedogenesis	PJA Howard	12
820	Regional aspects of forest dynamics in Europe	P Ineson	(12) 1
824	Cycling of key nutrients in forest soils	AF Harrison	12
865	Mycorrhizal toadstools in coniferous plantings	J Wilson	12 (7)
872	Effect of mycorrhizas on metal uptake in <i>Betula</i>	HJ Denny	(12) 7
888	NO _x , O ₃ and NH ₃ dry deposition	MH Unsworth	(12) 6
893	Effects of acid rain on forest trees	J Dighton	(12) 6
923	Acidification of waters in Wales	M Hornung	12 (2,6)
929	Effects of altitude on nitrogen mineralization	RH Marrs	12
933	Succession under birchwoods	AJ Hester	(9,12) 1
934	Vegetation dynamics and soils	J Miles	12 (4)
939	Liming and earthworm inoculation in forests	AF Harrison	12
944	Air pollutants and decomposition processes	PA Wookey	(12) 6
959	Acid deposition and groundwater chemistry	BG Bell	(2,12) 6
965	Phragmites-root zone method for sewage treatment	G Lawson	12 (2)
971	Nitrogen metabolism of decomposer fungi	RA Johnston	12
991	Effects of waterlogging on mycorrhizal seeds	J Dighton	(12) 1
1005	Large-scale production of mycorrhizal inocula	FT Last	12 (1,7)
1012	Cellulose decomposition in sub-Antarctica	DD French	12

13. **Land resources and land uses**, habitat characteristics, their interrelations and value in site assessments and resource management

Programme Leader: FT Last

Core Group: JNR Jeffers, OW Heal, DF Ball (Sec)

4	Soil classification methods	PJA Howard	13
377	Historical aspects of environmental perception	J Sheail	13
424	Ecological survey of Britain	RGH Bunce	13 (5)
534	National land characteristics & classification	DF Ball	13 (5,16)
700	Ecological guidelines for locational strategies	GL Radford	13 (16)
761	EEC remote sensing	BK Wyatt	13 (5)
844	Potential wood production on the Culm Measures	RGH Bunce	13
878	Use of remote sensing for mapping rhododendron	RJ Parsell	13 (4,5)
894	Publication - the land in Britain	DF Ball	13
899	Rural land cover and landscape change	DF Ball	13 (5 16)
900	Air photo assessment of landscape change	DF Ball	13 (5)
909	Changes in the rural environment	CJ Barr	13 (5,16)
927	BBC Domesday project	DF Ball	13 (5)
951	Use of remote sensing in grazing studies	BK Wyatt	13 (5)
952	EEC Programme CORINE - Project biotopes	BK Wyatt	13 (5)
973	Environmental and socioeconomic effects of CAP	M Bell	13 (16)
987	Correlation of Hunting/FC sample sites	DF Ball	13 (5)

14. **Chemical and technical sciences**, as a service to ITE

Programme Leader: JNR Jeffers

Core Group: SE Allen (Sec), M Hornung, IH Rorison

485	Chemical support studies	SE Allen	14
486	Engineering development	CH Owen	14
487	Microprocessor development studies	CR Rafarel	14
489	Glasshouse and nursery: support & development	RF Ottley	14
490	Photographic development	PG Ainsworth	14
771	Chemical data bank (Monks Wood)	KR Bull	14 (5 8)
788	Electron microscopy of algae and protozoa	KJ Clarke	14
804	Effect of changing environment on plant growth	EJ White	14
832	Operation of the Rivox field site	R Milne	14 (1,7)
869	Graphics for general publications	C Benefield	14
885	NERC mass spectrometer service	C Quarmby	14
902	Utilization of STATUS in ITE libraries	SM Adair	14
915	Landscaping the new extension at Bush	RF Ottley	14
1002	Supply of rain gauge equipment	M Hornung	14
1033	Landscaping at IRI Elphinstone	RF Ottley	14

15. **Systems analysis and biometrics**

Programme Leader: JNR Jeffers

Core Group: C Milner, MD Mountford (Sec), ED Ford

503	Development of systems analysis	JNR Jeffers	15
518	UNESCO MAB Information System	JNR Jeffers	15
602	Modelling sports turf wear	TW Parr	(15) 4
610	Computerization of CCAP records	DF Spalding	15
613	Computerization of ITE/NERC costing procedure	MD Mountford	15
663	Estimation of abundance of populations	MD Mountford	15
754	Devpt of bilateral link with IES Khartoum	DK Lindley	15
777	Estimation of population parameters	KH Lakhani	15 (10)
795	Standard procedures for recording data	DM Greene	(15) 5
825	Statistical consultancy in ITE	MD Mountford	15
835	ITE/UCL EIA Lake Ichkeul: plant vegn dynamics	TW Parr	(4 15) 9
846	Influence of events on population growth	IR Smith	15 (9 10)
868	Training in computing and statistics for Chinese	DK Lindley	15
877	Image analysis support services	RJ Parsell	15
903	Morphometric studies of British lampreys	KH Morris	(15) 2
906	Ecological data unit	GL Radford	(15) 5
957	Biometrical & modelling support - Merlewood	DK Lindley	15
958	Remote sensing & image analysis support service	BK Wyatt	15
963	Digital cartographic services	C Milner	15
979	Inventory & monitoring of Sahelian ecosystems	RI Smith	15
1027	Devlpmt of data profiles on chemicals	S Dobson	(15) 8

16. Agriculture and the environment

Programme Leader: JP Dempster

Core Group: FT Last, MD Hooper, D Jenkins (Sec)

92	Effects of grazing on <i>Nardus</i> & <i>Calluna</i> moorland	D Welch	(16) 4
181	Birds and pollution	I Newton	(5, 16) 8
534	National land characteristics & classification	DF Ball	(5,16) 13
584	Loch Leven phytoplankton, nutrients & grazing	AE Bailey-Watts	(5,11,16) 2
700	Ecological guidelines for locational strategies	GL Radford	(16) 13
718	Impact of land drainage on wildlife	JO Mountford	(4) 16
744	Effects of grazing in Snowdonia	MO Hill	(16) 4
746	Grazing in woodlands	TW Ashenden	(16) 1
759	Chemicals in the terrestrial environment	S Dobson	(16) 8
763	Data profiles on chemicals	S Dobson	(16) 8
821	Modern agriculture and wildlife	T Parish	(11) 16
899	Rural land cover and landscape change	DF Ball	(5 16) 13
909	Changes in the rural environment	CJ Barr	(5 16) 13
926	Loch Leven phosphorus loading	AE Bailey-Watts	(16) 2
938	Agricultural EIA from ground, air and space	RM Fuller	(5) 16
940	A survey of sand dunes in relation to grazing	LA Boorman	(4,16) 5
970	Hedgerow survey	MD Hooper	16
973	Environmental and socioeconomic effects of CAP	M Bell	(16) 13
981	Nitrogen fertilizer exp. in the Somerset Levels	RM Fuller	16 (4)
989	Experimental assessment of novel biomass systems	TV Callaghan	16
1010	Countryside implications of changes in CAP	RGH Bunce	16
1013	Applicn of expert systems to ecological patterns	RGH Bunce	16

Staff List 31 December 1985

Institute of Terrestrial Ecology Directorate

Director
 CSO Mr Jeffers, JNR Merlewood Research Station
 EO Mrs Ward, P A Grange-over-Sands
 PS Mrs Delve, J Cumbria
 LA11 6JU
 044 84 2264-6, 3826

Assistant Director
 DCSO Prof Last, FT Bush Estate
 PS Mrs Hogg, A H Penicuik
 Midlothian
 EH26 0QP
 031 445 4343-6

Assistant Director
 DCSO Dr Dempster, JP Monks Wood Experimental Station
 PS Mrs Stocker, B J Abbots Ripton
 Huntingdon
 PE17 2LS
 048 73 381-8

Institute Secretary
 PRIN Mr Brown, E J Administrative Headquarters
 Monks Wood Experimental Station
 Abbots Ripton
 Huntingdon
 PE17 2LS
 048 73 381-8

**Institute of Terrestrial Ecology
 Administrative Headquarters
 Monks Wood Experimental Station
 Abbots Ripton
 Huntingdon
 PE17 2LS
 048 73 (Abbots Ripton) 381-8
 Telex 32416**

Institute Secretary
 Prin Mr Brown, E J

Administration
 SEO Mr Bond, P J
 HEO Mr Clapp, E C J
 EO Miss Booth, J
 EO Mrs Harvey, C L
 EO Mrs Wood, H M
 CO Mrs Cowan, E
 CO Miss Dickerson, A S
 CO Mrs Lockey, A (PT)
 CO Mrs Rigden, C F
 SP/T Miss Lackie, S

**Thematic Technology Services
 Natural Environment Research Council
 Holbrook House
 Station Road
 Swindon
 SN1 1DE
 0793 (Swindon) 40101**

Scientific
 HSO Mr Parsell, R J

**Monks Wood Experimental Station
 Abbots Ripton
 Huntingdon
 PE17 2LS
 048 73 (Abbots Ripton) 381-8
 Telex 32416**

Head of Station
 SPSO Dr Hooper, M D
 PS Mrs Couch, T E

Administration
 EO Miss Atkinson, L M
 CO Mrs Green, J (PT)
 CO Mrs Purdy, M I

CA Miss Morris, D
 SP/T Miss Abblitt, J M
 SP/T Miss Allen, D A
 SP/T Miss Stapleford, S
 CLNR Mrs Bell, K C J (PT)
 CLNR Mrs Chance, M E (PT)
 CLNR Mrs Ennis, S (PT)
 CLNR Mrs McDowell, J (PT)
 CLNR Mrs Schietzel, P E (PT)
 BAND10 Mr Farrington, T F
 BAND8 Mrs Wade, E E C (PT)
 BAND4 Mr White, W F (PT)
 H/KPR Miss Lindstrom, I S

Scientific
 SPSO Dr Newton, I
 PSO Dr Boorman, L A
 PSO Dr Davis, B N K
 PSO Mr Lakhani, K H
 PSO Dr Moriarty, F
 PSO Mr Mountford, M D
 PSO Dr Pollard, E
 PSO Dr Sheail, J
 PSO Dr Stebbings, R E
 PSO Dr Welch, R C
 PSO Mr Wells, T C E
 SSO Dr Bull, K R
 SSO Dr Dawson, A S
 SSO Dr Dobson, S
 SSO Mr French, M C

SSO Mr Fuller, RM
SSO Mrs Greene, DM
SSO Mr Harding, PT
SSO Dr Marrs, RH
SSO Dr Osborn, D
SSO Dr Parr, TW
SSO Dr Sargent, CM
SSO Dr Village, A
SSO Mr Westwood, NJ
HSO Mr Arnold, HR
HSO Dr Boyd, IL
HSO Mr Cummins, CP
HSO Mr Freestone, P
HSO Mr Frost, AJ
HSO Mrs Hall, ML
HSO Ms Hanson, HM
HSO Mr Lowday, JE
HSO Mr Mountford, JO
HSO Mr Parish, T
HSO Mr Preston, CD
HSO Mr Wyllie, I
HSO Mr Yates, MG
SO Miss Cox, R
SO Mr Eversham, BC
SO Mrs Gore, D
SO Mr Creatorex-Davies, JN
SO Mr Haas, MB (PT)
SO Mr Plant, R
ASO Mrs Bibby, TJ
ASO Miss Hall, JR
ASO Mr Howe, PD
ASO Mr Leach, DV
ASO Mr Myhill, DG
S/PHCR Mr Ainsworth, PC
P&TO3 Mr Snapes, VW
ALIB Mrs King, J

Merlewood Research Station
Grange-over-Sands

Cumbria
LA11 6JU
044 84 (Grange-over-Sands) 2264-6
Telex 65102

Head of Station

SPSO Mr Allen, SE

Administration

HEO Mrs Foster, E
PS Miss Duncan, HR
CO Mrs Coward, PM
CO Mrs Holgate, A (PT)
SP/T Miss Cottam, JM
SP/T Mrs Wilson, M (PT)
TYP Miss Benson, C
TYP Mrs Kay, CG (PT)
TYP Mrs Whittaker, D
CLNR Mrs Pearson, V (PT)
BAND8 Mr Lethbridge, R

Scientific

PSO Mr Brown, AHF
PSO Dr Bunce, RGH
PSO Dr Callaghan, TV
PSO Dr Harrison, AF
PSO Dr Horrill, AD
PSO Mr Howard, PJA
PSO Mr Lindley, DK
PSO Mr Lowe, VPW
PSO Mr Sykes, JM
SSO Dr Bacon, PJ
SSO Dr Dighton, J
SSO Mr Grimshaw, HM
SSO Dr Howard, BJ
SSO Dr Ineson, P (Research Fellow)
SSO Miss Latter, PM
SSO Mr Millar, A
SSO Mr Parkinson, JA
SSO Mr Quarmby, C
SSO Mr Roberts, JD
HSO Mr Adamson, JK
HSO Mr Barr, CJ

HSO Mr Benefield, CB
HSO Mr Benham, DG
HSO Dr Dighton, J
HSO Dr Howard, BJ
HSO Mrs Howard, DM
HSO Mrs Howson, G (PT)
HSO Mr Lawson, GJ
HSO Mr Livens, F
HSO Mr Rowland, AP
HSO Mr Scott, R
SO Mr Coward, PA
SO Mrs Kennedy, VH (PT)
SO Mrs Ridsdale, HA
SO Miss Robertson, SMC
SO Mrs Shaw, FJ
SO Mrs Whittaker, M
ASO Mr Beresford, NA
ASO Mr Briggs, DR
ASO Miss Hodgson, AL
ASO Miss Jewell, SE
ASO Mrs McClure, C
ASO Mrs Poskitt, J (PT)
ASO Mr Woods, C
LIB Mr Beckett, J
Dr Frankland, JC (C/T PT)
Dr Jones, HE (C/T PT)

Furzebrook Research Station
Wareham
Dorset
BH20 5AS
09295 (Wareham) 51518-9, 51491
Telex 418326

Head of Station

SPSO Dr Morris, MG
PS Mrs Perkins, MK

Administration

EO Mrs Jones, MC
SP/T Miss Weller, RA
CLNR Mrs Fooks, NM (PT)
CLNR Mrs Parker, I (PT)
BAND8 Mr Parker, BD

Scientific

PSO Dr Chapman, SB
PSO Dr Elmes, GW
PSO Dr Goss-Custard, JD
PSO Dr Gray, AJ
PSO Dr Merrett, P
PSO Dr Thomas, JA
PSO Dr Ward, LK
PSO Dr Webb, NRC
SSO Mr Clarke, RT
SSO Dr Daniels, RE
SSO Dr Kenward, RE
SSO Dr McGrorty, S
HSO Mr Abbott, AM
HSO Mr Pearson, B
HSO Dr Reading, CJ
HSO Mr Snazell, RG
SO Mrs Le Vavesseur dit Durell, SE A
SO Mr Rispin, WE
SO Mrs Wardlaw, JC (PT)
ASO Ms Benham, PEM
ASO Mr Rose, RJ

Bush Estate
Penicuik
Midlothian
EH26 0QP
031 445 4343-6
Telex 72579

Head of Station

SPSO Dr Unsworth, MH
PS Miss Aitchison, C

Administration

HEO Mr Smith, IC

CO Mrs Campbell, AM (PT)
CO Mrs Shields, SE (PT)
SP/T Mrs Lawrie, EC (PT)
SP/T Mrs Thompson, M (PT)
SP/T Mrs Wilson, E (PT)
TYP Mrs Howie, H (PT)
CLNR Mrs Mowat, EAM
BAND4 Mrs Innes, DS (PT)

Scientific

PSO Dr Booth, MA
PSO Dr Cannell, MGR
PSO Dr Fowler, D
PSO Dr Leakey, RRB
PSO Dr Longman, KA
PSO Dr Maitland, PS
PSO Mr Pelham, J
PSO Mr Smith, IR
SSO Dr Bailey-Watts, AE
SSO Mr Bell, BG
SSO Dr Cape, JN
SSO Mr Deans, JD
SSO Mr East, K
SSO Mr Jones, DH
SSO Dr Marquiss, M
SSO Dr Mason, PA
SSO Dr Milne, R
SSO Dr Watt, AD
SSO Mr White, EJ
HSO Dr Crossley, A
HSO Dr Lightowlers, PJ
HSO Dr May, L
HSO Mr Murray, TD
HSO Mr Ottley, RF
HSO Dr Sheppard, LJ
HSO Mr Smith, RI
HSO Dr Wilson, J
SO Dr Campbell, RNB
SO Miss Dick, JM
SO Mr Harvey, FJ
SO Mr Ingleby, K
SO Mr Kirika, A
SO Mr Leith, ID
SO Mr Lyle, AA
SO Mr Morris, KH
SO Mr Munro, RC
SO Mr Wilson, RHF
ASO Mr Mullock, SG
ASO Mrs Murray, M
ASO Mr Storeton-West, RL
P&TO4 Elphinstone, GB
P&TO4 Mr McCormack, JW
ALIB Miss Scoular, LM
ALIB Mrs Adair, SM

Banchory Research Station
Hill of Brathens

Glasel
Banchory
Kincardineshire
AB3 4BY
033 02 (Banchory) 3434
Telex 739396

Head of Station

SPSO Dr Jenkins, D
SP/T Mrs Burnett, LM (PT)

Administration

EO Mrs Oliver, S
TYP Mrs Allan, EJP
TYP Mrs Andrews, PA
BAND8 Mr Littlejohn, AD
BAND8 Mr Robertson, AC

Scientific

SPSO Dr Watson, A
PSO Dr Harris, MP
PSO Dr Kruuk, H
PSO Dr Miles, J
PSO Dr Miller, GR
PSO Dr Moss, R

PSO Mr Nicholson, I A
PSO Dr Staines, B W
SSO Dr Bayfield, N G
SSO Mr French, D D
SSO Mr McCowan, D
SSO Mr Parr, R A
SSO Mr Paterson, I S
SSO Mr Picozzi, N
SSO Mr Welch, D
HSO Mr Conroy, J W H
HSO Mr Cummins, R P
HSO Mr Young, W F
SO Mr Catt, D C
SO Mr Scott, D
ASO Mr Trenholm, I B
P&TO4 Mr Morris, J A

Bangor Research Station
Penrhos Road
Bangor
Gwynedd
LL57 2LQ
0248 (Bangor) 364001-5
Telex 61224

Head of Station

SPSO Dr Milner, C
PS Mrs Lloyd, A C

Administration

EO Mrs Owen, B J
CO Miss Owen, D E
CO Mrs Pritchard, J E (PT)
SP/T Miss Jones, H A
TYP Miss Roberts, M E
CLNR Mrs Jones, J F (PT)
CLNR Mrs Stedmond, L A
BAND4 Mr Wilson, J N

Scientific

PSO Dr Ball, D F
PSO Dr Hill, M O
PSO Dr Hornung, M
PSO Dr Perkins, D F
PSO Mr Radford, G L
PSO Mr Shaw, M W
PSO Dr Wyatt, B K
SSO Dr Ashenden, T W
SSO Dr Buse, A
SSO Mr Dale, J
SSO Dr Diaz, B M
SSO Mr Evans, D F
SSO Dr Good, J E G
SSO Mr Hewett, D G
SSO Mrs Jones, V
SSO Dr Moss, D
SSO Mr Owen, G H
SSO Mr Rafarel, C R
SSO D Reynolds, B
SSO Dr Seel, D C
SSO Mr Thomas, D I
SSO Mr Walton, K C
HSO Mr Bell, A A
HSO Mr Brown, N J
HSO Mr Millar, R O
HSO Mrs Neep, P
HSO Mr Stevens, P A
HSO Mr Thomson, A G
HSO Mr Williams, W M
SO Mrs Bell, S A
ASO Mr Hughes, S
ASO Mr Norris, D A
ASO Mr Williams, T G
P&TO4 Mr Hughes, G

Culture Centre of Algae and Protozoa
36 Storey's Way
Cambridge
CB3 0DT
0223 (Cambridge) 61378

Head of Station

PSO Dr Baker, J R

Administration

EO Miss Moxham, M J
CO Mrs Day, G M (PT)
SP/T Mrs Curry, M E (PT)
C/TKR Mr Yorke, D A
CLNR Mrs Yorke, M J (PT)

Scientific

SPSO Dr Page, F C
PSO Dr Morris, G J
SSO Mr Clarke, K J
SSO Mr Spalding, D F
HSO Mrs Leeson, E A
SO Mrs Asher, A (PT)
SO Mr Cann, J P
SO Mrs Coulson, G E
ASO Mrs Cann, S F
ASO Miss Steward, H J

Annex 3

COMMISSIONED RESEARCH CONTRACTS UNDERTAKEN DURING 1985

<i>Customer</i>	<i>Project number</i>	<i>Project title</i>
Nature Conservancy Council	181, 461	Birds and pollution
	204	Butterfly monitoring scheme
	208/9/529, 557, 656, 657	Recording of data on individual species
	291/292	Population ecology of bats
	718	Impact of land drainage
	950	Ecology of woodland fritillary butterflies
	948	Butterflies: management in woodlands
	967	Acidification effects on freshwater plants and invertebrates
	160 (pt)	Effects of fluoride on lichens
	940	Sand dune grazing
	887	Creating attractive grasslands
	981	Effects on nitrogen on species diversity
	1055	Changes in lowland grassland
	926	Loch Leven phosphorus loading
	988	Environmental impact study at Dounreay
	966	Coldingham Loch
	Department of the Environment	759
790, 837, 841, 888		Effects of acidic deposition on plants and soils
874		Sheep grazing studies
873		Distribution and dynamics of radionuclides in the terrestrial environment
923		Effects of afforestation and land management of acidity in 5 catchment areas in Wales
925		Effects of altitude and occult precipitation on acid deposition at Great Dun Fell, Cumbria
797		Effects of acid rain on freshwater ecosystems in North West England
625		Upland management and water quality – Phase II
969		Wash birds and invertebrates
998		Monitoring of nitrogen oxides and ozone in Scotland and analysis of past UK data
880		Radionuclide concentrations in bird tissues, their foods and feeding areas near Ravenglass
851		Effects of long term preservation on micro-organisms
976		Cumbrian sheep feeding studies
Department of Industry Ministry of Agriculture Fisheries and Food Ministry of Defence European Commission		834
	924	Acid mist and tree injury
	841	Effects of canopies of different tree species on chemistry of throughfall and stemflow
	837	Effects of acid precipitation on fish and other biota in freshwater in Scotland
	955	West African Hardwoods
	160 pt	The fate and effects of pollutant fluoride in the terrestrial ecosystem
	952	EC information system on the state of the environment: Biotopes
	912	Desert encroachment of the Sahara
	959	Acid deposition on groundwater
	739	Effects of acidification on natural waters upon amphibia
	999	Selection of conifer genotypes
	888	Atmosphere surface exchange of oxides of nitrogen, ozone and ammonia
	1031	Cameroon hardwoods – high performance genotypes
Welsh Office	594	Geochemical cycling
	845, 990	Acid rain in Wales
	594, 625	Upland management and water quality

<i>Customer</i>	<i>Project number</i>	<i>Project title</i>
Scottish Development Department	926	Loch Leven phosphorus loading
Tayside Regional Council	926	Loch Leven phosphorus loading
Department of Agriculture and Fisheries for Scotland	926	Loch Leven phosphorus loading
Forestry Commission	1009	Conservation survey project: Newborough Forest
Countryside Commission	956	Assessment of amenity tree planting scheme
	1010	Countryside implications of changes in the Common Agricultural policy
Central Electricity Generating Board	94	Ecological studies at Winfrith Heath
	945	Ecological survey at Hinkley Point
	893	Tree root and mycorrhizal studies at Liphook
Essex County Council	819	St Osyth conservation scheme
Rofe, Kennard and Lapworth	921	CIRIA reinforced grass dam spillways
World Pheasant Association	764	Black grouse studies
World Health Organisation	763	Data profiles on chemicals
UNESCO	518	MAB project inventory
East Scotland College of Agriculture	942	Toxicity of silage effluent to fish
British Broadcasting Corporation	927	Domesday project
United Nations	979	Inventory and monitoring of Sahelian ecosystems
English China Clay Company	972	Survey and consultancy for ECC Ltd
World Wildlife Fund	808	Effects of food availability on otter behaviour
	400	Large blue butterfly studies
Dartington Trust	844	Potential for Wood production on the Culm Measures
Water Research Centre	965	Phragmites – root zone method for sewage treatment
Inveresk Research International	1033	Landscaping at Elphinstone Research Centre
British Petroleum	919	Poole Harbour ecological study
	974	Wyth Farm saltmarsh survey
	964	Furzey Island Saltmarsh and mudflats monitoring
	1007	Preliminary survey of oil pipeline route
	1000	Ecological survey of access road to Wyth Farm Gathering Station
	1054	Ecological Survey of Ashdown Forest Well site
	1068	Oil well sites in East Sussex
Mott, Hay & Anderson	905	A3 Liphook to Petersfield – Public Inquiry
	922	A34 Newbury bypass
	994	Channel Tunnel: ecological advice
Laurence Gould Consultants	968	Bristol-Avon Water Divison Study
	953	Review of financial guidelines in respect of the Wildlife and Countryside Act 1981
ICI	931	Screening algal cells for industry
	993	Safety evaluation of agrochemicals
	960	Atmospheric emissions of hydrochloric acid
Anderson Semens Houston	946	Design and environmental management in ski areas
	982	Management plan for Cairngorm Estate
Association of Plastics Manufacturers in Europe	1030	Hydrochloric emissions from PVC waste
Halcrow Water	914	Water resources in Somerset
Tea Research Foundation	983	Tea research in Malawi
Vincent Wildlife Trust	984	Autopsies and analyses of otters
Hunting Technical Services Ltd	987	Correlation of Hunting/FC sample sites
ONAREF	997	Seed production and tree improvement in Cameroon
Welsh Water Authority	1002	Supply of rain gauge equipment
Agricultural Genetics Company Ltd	1005	Large-scale production of mycorrhizal inocula
North West Water Authority	1019	Mercury levels in Mersey birds
Societe pour le Development des Plantations Forestieres (SODEFOR)	105	Hardwood consultancy: Ivory Coast
Christchurch Borough Council	1014	Highcliffe Cliffs stabilization

Expected level of income from commissioned work for the financial year 1985/86

	(£1000)
Nature Conservancy Council	323
Department of the Environment	478
Commission of the European Communities	213
Other Government Departments	96
Public bodies and other organisations	209
	<u>1,319</u>

PJ Bond
Senior Administration Officer

Publications

- (Anderson, J M, Leonard, M A), Ineson, P & (Huish, S). 1985. Faunal biomass: a key component of a general model of nitrogen mineralization. *Soil Biol. Biochem.*, **17**, 735-737.
- (Anderson, J M, Huish, S A), Ineson, P, (Leonard, M A & Splatt, P R). 1985. Interactions of invertebrates, microorganisms and tree roots in nitrogen and mineral element fluxes in deciduous woodland soils. In: *Ecological interactions in soil: plants, microbes and animals*, edited by A H Fitter, 377-391. (British Ecological Society special publication no. 4) Oxford: Blackwell Scientific.
- Arnold, H R & (Jefferies, D J). 1985. Mammal report for 1984. *Rep. Huntingdon. Fauna Flora Soc.*, *37th*, 1984, 25-36.
- Bacon, P J. 1985. Discrete time temporal models of rabies. In: *Population dynamics of rabies in wildlife*, edited by P J Bacon, 147-196. London: Academic Press.
- Bacon, P J. 1985. Grebes. In: *The encyclopaedia of birds*, edited by C M Perrins & A L A Middleton, 42-43. London: Allen & Unwin.
- Bacon, P J, ed. 1985. *Population dynamics of rabies in wildlife*. London: Academic Press.
- Bacon, P J. 1985. Roosting. In: *A dictionary of birds*, edited by B Campbell & E Lack, 517-519. Calton: Poyser.
- Bacon, P J. 1985. Sensitivity coefficients - a reply to Huson. *Ecol. Model.*, **27**, 153-160.
- Bacon, P J. 1985. A systems analysis of wildlife rabies epizootics. In: *Population dynamics of rabies in wildlife*, edited by P J Bacon, 109-130. London: Academic Press.
- Bailey-Watts, A E. (1985). Land-use, chemicals and freshwater ecology. *Edinburgh Centre for Rural Economy. Ann. Rep. 1985*, pp 1-4.
- Bailey-Watts, A E, Kristiansen, J & Rott, E. (1985). Report of the Fifth Workshop of the International Association of Phytoplankton Ecology and Taxonomy (IAP), Stirling, Scotland, 1-12 September 1984. *Schweiz. Z. Hydrol.*, **47**, 225-227
- Bailey-Watts, A E & Maitland, P S (1984). Eutrophication and fisheries in Loch Leven. *Proceedings of the 1984 Study Conference of the Institute of Fisheries Management*. (11-13 September 1984).
- Baker, J R. 1985. Bat trypanosome models for *Trypanosoma cruzi*. *Parasitol. Today*, **1**, 111-113.
- Ball, D F. 1984. Report on the discussions of the syndicate on lowlands. In: *Agriculture and the environment*, edited by D Jenkins, 183-185. (ITE symposium No. 13). Cambridge: Institute of Terrestrial Ecology.
- Ball, D F. 1984. Studies by ITE on the impact of agriculture on wildlife and semi-natural habitats in the uplands. In: *Agriculture and the environment*, edited by D Jenkins, 155-162. (ITE symposium no. 13). Cambridge: Institute of Terrestrial Ecology.
- (Ball, F G) & Bacon, P J. 1984. *Rabies Working Party: Workshop meeting to assess the 'Ontario' model*. (Merlewood research and development paper no. 99). Grange-over-Sands: Institute of Terrestrial Ecology.
- (Batty, P M, Batty, B D) & Miller, G R. 1984. Population size and reproduction of *Gentiana nivalis* L. at Ben Lawers NNR. *Trans. bot. Soc. Edinb.*, **44**, 269-280.
- Bayfield, N G & (Barrow, G C), eds. 1985. *The ecological impacts of outdoor recreation on mountain areas in Europe and North America*. (RERG report no. 9). Wye: Recreation Ecology Research Group.
- Bayfield, N G. 1985. Effects of extended use on footpaths in mountain areas of Britain. In: *The ecological impacts of outdoor recreation on mountain areas in Europe and North America*, edited by N G Bayfield & G C Barrow, 100-111. (RERG report no. 9). Wye: Recreation Ecology Research Group.
- Beckett, J, Jeffers, J N R & (Nelson, A), comps. 1985. *Mathematical ecology: a bibliography of publications by ITE staff*. (Merlewood research and development paper no. 104). Grange-over-Sands: Institute of Terrestrial Ecology.
- Beckett, J & (Nelson, A), comps. 1985. *Merlewood publications 1974-1984*. (Merlewood research and development paper no. 93). Grange-over-Sands: Institute of Terrestrial Ecology.
- Belcher, J H & Swale, E M F. 1984. Unusual and surprising algae from a Cambridge roof. *Microscopy*, **35**, 136-143.
- Bell, M & (Elliott, H). 1985. Changing agricultural policy and the countryside: for better or worse? In: *Environmental issues, Seminar D, 13th Summer Annual Meeting*, 1-9. (Publication P261). London: Planning and Transportation Research and Computation Ltd (PTRC).
- Bell, M. 1985. *Farm diversification in the EEC: report of the Rural Life Conference 1984*. London: National Council for Voluntary Organisations.
- Bell, M. 1985. Look to the land. *Fmrs' Wkly*, **103(6)**, 79.
- Bell, M. 1985. New CAP angles from the EEC. *Chart. Surv. Wkly*, **12**, 373-374.
- Benham, D G. 1985. A freeze concentrator for dewatering aqueous samples. *Lab. Pract.*, **34(9)**, 126-128.
- (Bogan, J A) & Newton, I. 1983. The effects of organochlorine compounds on British birds-of-prey. *Vet. Res. Commun.*, **7**, 119-124.
- Boyd, I L. 1984. The occurrence of hilar rete glands in the ovaries of grey seals (*Halichoerus grypus*). *J. Zool.*, **204**, 585-588.
- Boyd, I L. 1985. Effect of photoperiod and melatonin on testis development and regression in wild European rabbits (*Oryctolagus cuniculus*). *Biol. Reprod.*, **33**, 21-29.
- Boyd, I L. 1985. Investment in growth by pregnant wild rabbits in relation to litter size and sex of the offspring. *J. Anim. Ecol.*, **54**, 137-147.
- Boyd, I L. 1985. Pregnancy and ovulation rates in two stocks of grey seals on the British coast. *J. Zool.*, **205**, 265-272.
- Boyd, I L. 1985. Rabbit reproductive rates in relation to length of the breeding season. In: *Population dynamics and epidemiology of territorial animals*, edited by D Mollison & P Bacon, 23-24. (Merlewood research and development paper no. 106). Grange-over-Sands: Institute of Terrestrial Ecology.

- Bunce, RGH, (Tranter, RB, Thompson, AMM, Mitchell, CP) & Barr, CJ. 1984. Models for predicting changes in rural land use in Great Britain. In: *Agriculture and the environment*, edited by D Jenkins, 37-44. (ITE symposium no. 13). Cambridge: Institute of Terrestrial Ecology.
- Bunce, RGH. 1985. The Lune Valley - a study in contrast. *Cumbria*, **35**, 413-415.
- Bunce, RGH. 1985. Tramp, tramp, trample, trample. *Guardian*, 30 March, 21.
- Callaghan, TV, Lawson, GJ, Mainwaring, AM & Scott, R. 1985. The effect of nutrient application in plant and soil nutrient content in relation to biomass testing. In: *Energy from biomass*, edited by W Palz, J Cocks & DO Hall, 412-416. (3rd E.C. Conference, Venice, 1984). London: Elsevier Applied Science.
- Callaghan, TV, Bacon, PJ, Lindley, DK & (Moghraby, A I el). 1985. The energy crisis in the Sudan: alternative supplies of biomass. *Biomass*, **8**, 217-232.
- Callaghan, TV. 1985. Plants and primary production - are we making the most of our resources? *Agric. Prog.*, **60**, 14-20.
- Callaghan, TV & (Emanuelsson, U). 1985. Population structure and processes of tundra plants and vegetation. In: *The population structure of vegetation*, edited by J White, 399-439. Dordrecht: Junk.
- Callaghan, TV, Lawson, GJ & Scott, R. 1985. The potential of natural vegetation as a source of biomass energy. In: *Energy from biomass*, edited by W Palz, J Coombs & DO Hall, 109-116. (3rd E.C. Conference, Venice, 1984). London: Elsevier Applied Science.
- Callaghan, TV & (Sheffield, E). 1985. *Pteridium aquilinum*: weed or resource? *Proc. R. Soc. Edinb.*, **86B**, 461.
- Campbell, RNB. 1985. Comparison of the drift of live and dead *Baetis* nymphs in a weakening water current. *Hydrobiologia*, **126**, 229-236.
- Cannell, MGR & (Jackson, JE), eds. 1985. *Attributes of trees as crop plants*. Abbots Ripton, Huntingdon: Institute of Terrestrial Ecology.
- Cannell, MGR. 1985. Autumn frost damage on young *Picea sitchensis*. 1. Occurrence of autumn frosts in Scotland compared with western North America. *Forestry*, **58**, 131-143.
- Cannell, MGR, Sheppard, LJ, Smith, RI & Murray, MB. 1985. Autumn frost damage on young *Picea sitchensis*. 2. Shoot frost hardening, and the probability of frost damage in Scotland. *Forestry*, **58**, 145-166.
- Cannell, MGR. 1985. Dry matter partitioning in tree crops. In: *Attributes of trees as crop plants*, edited by MGR Cannell & JE Jackson, 160-193. Abbots Ripton, Huntingdon: Institute of Terrestrial Ecology.
- Cannell, MGR, Murray, MB & Sheppard, LJ. 1985. Frost avoidance by selection or late budburst in *Picea sitchensis*. *J. appl. Ecol.*, **22**, 931-932.
- Cannell, MGR, Sheppard, LJ, Smith, RI & Murray, MB. 1985. Probability of frost damage on Sitka spruce. *Annu. Rep. Inst. terr. Ecol.* 1984, 65-71.
- (Chard, JM, Gray, TRG) & Frankland, JC. 1985. Purification of an antigen characteristic for *Mycena galopus*. *Trans. Br. mycol. Soc.*, **84**, 235-241.
- (Chard, JM, Gray, TRG) & Frankland, JC. 1985. Use of an anti-*Mycena galopus* serum as an immunofluorescence reagent. *Trans. Br. mycol. Soc.*, **84**, 243-249.
- (Collins, NM) & Morris, MG. 1985. *Threatened swallowtail butterflies of the world*. (IUCN red data book). Gland: IUCN.
- (Collins, NM) & Thomas, JA. 1985. Why this decline [in numbers of insects]? *Naturopa*, no. 49, 23-27.
- (Copp, CJT) & Harding, PT, eds. 1985. *Biological recording Forum 1985*. (BCG special report no. 4). Bolton: Biology Curators' Group.
- Daniels, RE & (Eddy, A). 1985. *Handbook of European Sphagna*. Abbots Ripton, Huntingdon: Institute of Terrestrial Ecology.
- Daniels, RE. 1985. Major lines of variation in the vegetation of British peatlands. *Aquilo, Ser. Bot.*, **21**, 61-67.
- Daniels, RE. 1985. Studies in the growth of *Pteridium aquilinum* (L.) Kuhn. (bracken). 1. Regeneration of rhizome segments. *Weed Res.*, **25**, 381-388.
- Daniels, RE. 1985. An unusual form of *Sphagnum auriculatum* Schimp. from the Sierra de Gredos, Spain. *J. Bryol.*, **13**, 337-344.
- Davis, BNK, Lakhani, KH, Brown, MC & (Park, DG). 1985. Early seral communities in a limestone quarry: an experimental study of treatment effects on cover and richness of vegetation. *J. appl. Ecol.*, **22**, 473-490.
- Dawson, A, (Goldsmith, AR & Nicholls, TJ). 1985. Development of photorefractoriness in intact and castrated male starlings (*Sturnus vulgaris*) exposed to different periods of long-day lengths. *Physiol. Zool.*, **58**, 253-261.
- Dawson, A, (Follett, BK, Goldsmith, AR & Nicholls, TJ). 1985. Hypothalamic gonadotrophin-releasing hormone and pituitary and plasma FSH and prolactin during photostimulation and photorefractoriness in intact and thyroidectomized starlings (*Sturnus vulgaris*). *J. Endocr.*, **105**, 71-77.
- Dawson, A & (Goldsmith, AR). 1985. Modulation of gonadotrophin and prolactin secretion by daylength and breeding behaviour in free-living starlings, *Sturnus vulgaris*. *J. Zool.*, **206**, 241-252.
- Dawson, A, (Goldsmith, AR & Nicholls, TJ). 1985. Thyroidectomy results in termination of photorefractoriness in starlings (*Sturnus vulgaris*) kept in long daylengths. *J. Reprod. Fert.*, **74**, 527-533.
- Dick, JMcP & Longman, KA. 1985. Techniques for injecting chemicals into trees. *Arboric. J.*, **9**, 211-214.
- Dighton, J & Mason, PA. 1985. Mycorrhizal dynamics during forest tree development. In: *Developmental biology of higher fungi*, edited by D Moore and others, 117-139. Cambridge: Cambridge University Press.
- Dobson, S. 1985. Methods for measuring the effects of chemicals on terrestrial animals as indicators of ecological hazard. In: *Methods for estimating risk of chemical injury: human and non-human biota and ecosystems*, edited by VB Vouk and others, 537-548.
- (Elena-Rossello, R) & Bunce, RGH. 1984. Aplicacion del metodo ITE a la Peninsula Iberica: consideraciones metodologicas y utilidad en la estimacion de la productividad forestal. *An. Inst. nac. Invest. agr. Ser. for.*, **8**, 45-62.
- (Elena-Rossello, R), Bunce, RGH & Barr, CJ. 1984. *A study of the effects of the changes in data structure on a preliminary land classification of the Iberian peninsula*. (Merlewood research and development paper no. 98). Grange-over-Sands: Institute of Terrestrial Ecology.
- Elmes, GW & Thomas, JA. 1985. Morphometrics as a tool in identification: a case study of a *Myrmica* in France (Hymenoptera, Formicidae). *Actes Coll. Insectes Soc.*, **2**, 97-108.
- Ford, ED. 1985. Branching, crown structure and the control of timber production. In: *Attributes of trees as crop plants*, edited by MGR Cannell & JE Jackson, 228-252. Abbots Ripton, Huntingdon: Institute of Terrestrial Ecology.
- Ford, ED. 1985. Increasing forest productivity and value by exploiting climatic variability. In: *Forest potentials, productivity and value*, 75-99. (Weyerhaeuser science symposium 4). Weyerhaeuser.
- Ford, ED & Deans, JD. 1985. The influence of thinning and spacing on growing timber for the market. In: *Growing timber for the market*, edited by PS Savill, 74-86. Edinburgh: Institute of Chartered Foresters.

- Ford, ED & (Renshaw, E).** 1985. Two-dimensional spectral analysis of spatial patterns in vegetation. *Annu. rep. Inst. terr. Ecol.* 1984, 147-150.
- Fowler, D.** 1984. Aspects of acid precipitation and dry deposition. In: *Forestry and pollution. Proc. 12th International Students Forestry Symposium*, 52-60. Edinburgh: Department of Forestry & Natural Resources, University of Edinburgh.
- Fowler, D & Cape, JN.** 1985. Acid inputs from the atmosphere in the United Kingdom. *Soil Use & Manage.*, 1, 3-5.
- Fowler, D.** 1985. Deposition of SO₂ onto plant canopies. In: *Sulphur dioxide and vegetation: physiology, ecology and policy issues*, edited by WE Winner, HA Mooney & RA Goldstein, Stanford: Stanford University Press.
- Fowler, D & Cape, JN.** 1985. How is acid-rain formed and where does it fall? In: *Report of the Acid Rain Inquiry*, 30-45. Edinburgh: Scottish Wildlife Trust.
- Frankland, JC & Harrison, AF.** 1985. Mycorrhizal infection of *Betula pendula* and *Acer pseudoplatanus*: relationships with seedling growth and soil factors. *New Phytol.*, 101, 133-151.
- French, DD & (Smith, VR).** 1985. A comparison between northern and southern hemisphere tundras and related ecosystems. *Polar Biol.*, 5, 5-21.
- Fuller, RM.** 1985. An assessment of damage to the shingle beaches and their vegetation. In: *Dungeness ecology and conservation*, edited by B Ferry & S Waters, 25-41. (Focus on nature conservation no. 12). Peterborough: Nature Conservancy Council.
- (Gibson, RM) & Bacon, PJ.** 1985. Nightjars drinking in flight. *Br. Birds*, 78, 596.
- Good, JEG, Williams, TG & Moss, D.** 1985. Survival and growth of selected clones of birch and willow on restored opencast coal sites. *J. appl. Ecol.*, 22, 995-1008
- Good, JEG & Williams, TG.** 1985. Tolerant native trees for opencast coal site revegetation. *Annu. Rep. Inst. terr. Ecol.* 1984, 41-46.
- (Gorman, ML), Kruuk, H & (Leitch, A).** 1984. Social functions of the sub-caudal scent gland secretion of the European badger *Meles meles* (Carnivora: Mustelidae). *J. Zool.*, 203, 549-559.
- Goss-Custard, JD.** 1985. Foraging behaviour of wading birds and the carrying capacity of estuaries. In: *Behavioural ecology: ecological consequences of adaptive behaviour*, edited by RM Sibly & RH Smith, 169-188. Oxford: Blackwell Scientific.
- Gray, AJ.** 1985. Adaptation in perennial coastal plants - with particular reference to heritable variation in *Puccinellia maritima* and *Ammophila arenaria*. *Vegetatio*, 61, 179-188.
- Gray, AJ, (Stephens, D & Ambrosen, H).** 1985. Demographic genetics of the perennial heathland grass *Agrostis curtisii*. *Annu. Rep. Inst. terr. Ecol.* 1984, 96-100.
- Gray, AJ.** 1985. *Poole Harbour: ecological sensitivity analysis of the shoreline*. Abbots Ripton, Huntingdon: Institute of Terrestrial Ecology.
- Hall, ML.** 1985. *Butterflies on the farm*. Sandy: Farming and Wildlife Advisory Group.
- Harding, PT.** 1984. The Biological Records Centre. *MDA Inf.*, 8, 102-106.
- Harding, PT.** 1984. Recent records of *Thalassiosobates littoralis* (Silvestri). *Bull. Br. Myriapod Group*, no. 2, 6-7.
- Harding, PT.** 1985. *Biological Records Centre: a national data bank*. Abbots Ripton, Huntingdon: Institute of Terrestrial Ecology.
- Harding, PT, comp.** 1985. *Current atlases of the flora and fauna of the British Isles 1985*. Abbots Ripton, Huntingdon: Institute of Terrestrial Ecology.
- Harding, PT.** 1985. The role of the national biological records Centre: *Newsl. Biol. Curators' Group*, 4(2) Suppl., 10-14.
- Harding, PT.** 1985. What is a biological record? - the minimum standards for a record. In: *Biological Recording Forum 1985*, edited by CJT Copp & PT Harding, 7 Bolton: Biology Curators'
- Harding, PT & (Sutton, SL).** 1985. *Woodlice in Britain and Ireland: distribution and habitat*. Abbots Ripton, Huntingdon: Institute of Terrestrial Ecology.
- Harris, MP & (Wanless, S).** 1985. Fish fed to young guillemots, *Uria aalge*, and used in display on the Isle of May, Scotland. *J. Zool. A*, 207, 441-458.
- Harris, MP.** 1985. Morphology and breeding of puffins at Isle of May and St Kilda, Scotland. *Biol. Conserv.*, 32, 81-97.
- Harris, MP & Rothery, P.** 1985. The post-fledging survival of young puffins *Fratercula arctica* in relation to hatching date and growth. *Ibis*, 127, 243-250.
- Harris, MP, (Wanless, S & Rothery, P).** 1985. Review of British and Irish guillemot monitoring studies. In: *Population and monitoring studies of seabirds*, edited by ML Tasker, 21-22. (Proc. 2nd int. Conf. Seabird Group).
- Harris, MP.** 1985. Shearwaters. In: *The encyclopaedia of birds*, edited by CM Perrins & A LA Middleton, 46-49. London: Allen & Unwin.
- Harris, MP.** 1985. Storm petrels. In: *The encyclopaedia of birds*, edited by CM Perrins & A LA Middleton, 49-50. London: Allen & Unwin.
- Harris, MP.** 1985. Tropicbirds. In: *The encyclopaedia of birds*, edited by CM Perrins & A LA Middleton, 59-60. London: Allen & Unwin.
- Harrison, AF.** 1985. Effects of environment and management on phosphorus cycling in terrestrial ecosystems. *J. environ. Manage.*, 20, 163-179.
- (Headley, AD), Callaghan, TV & (Lee, JA).** 1985. The phosphorus economy of the evergreen tundra plant, *Lycopodium annotinum*. *Oikos*, 45, 235-245.
- Heal, OW.** 1984. Report on the discussions of the syndicate on uplands. In: *Agriculture and the environment*, edited by D Jenkins, 185-188. (ITE symposium no. 13). Cambridge: Institute of Terrestrial Ecology.
- Heal, OW & Dighton, J.** 1985. Resource quality and trophic structure in the soil system. In: *Ecological interactions in soil: plants, microbes and animals*, edited by A Bitter, 339-354. Oxford: Blackwell Scientific.
- Hewett, DG.** 1985. Grazing and mowing as management tools on dunes. *Vegetatio*, 62, 441-447.
- (Hewlett, HWM), Boorman, LA, (Bramley, ME & Whitehead, E).** 1985. *Reinforcement of steep grassed motorways: review and preliminary design recommendation*. (Technical note 120). London: Construction Industry Research and Information Association.
- Hibberd, DJ & (Norris, RE).** 1984. Cytology and ultrastructure of *Chlorarachnion reptans* (Chlorarachniophyta divisio nova, Chlorarachniophyceae classis nova). *J. Phycol.*, 20, 310-330.
- Hibberd, DJ.** 1985. Observations on the ultrastructure of new species of *Pseudodendromonas bourrely* (*P. operculifera* and *P. insignis*) and *Cyathobodo peterson* and *C. hansen* (*C. peltatus* and *C. gemmatus*), Pseudodendromonadida ord. nov. *Arch. Protistenk.*, 129, 3-11.
- Hill, MO.** 1985. New vice-county records and amendments to the Census Catalogues: Musci. *Bull. Br. bryol. Soc.*, no. 46, 22-28.
- Hill, MO, Latter, PM & (Bancroft, G).** 1985. A standard curve for inter-site comparison of cellulose degradation using the cotton strip method. *Can. J. Soil Sci.*, 65, 605-619.
- (Hislop, JRG) & Harris, MP.** 1985. Recent changes in the food of young puffins *Fratercula arctica* in relation to fish stocks. *Ibis*, 127, 234-239.
- Hooper, MD.** 1984. What are the main recent impacts of agriculture on wildlife? Could they have been predicted, and what

- can be predicted for the future? In: *Agriculture and the environment*, edited by D Jenkins, 33–36. (ITE symposium no. 13). Cambridge: Institute of Terrestrial Ecology.
- Hornung, M.** 1984. The impact of upland pasture improvement on solute outputs in surface waters. In: *Agriculture and the environment*, edited by D Jenkins, 150–155. (ITE symposium no. 13). Cambridge: Institute of Terrestrial Ecology.
- Hornung, M.** 1985. Acidification of soils by trees and forests. *Soil Use Manage.*, **1**, 24–28.
- Hornung, M, Reynolds, B & Hatton, A A.** 1985. Land management, geological and soil effects on streamwater chemistry in upland mid-Wales. *Ann. Geogr. (Sevenoaks)*, **5**, 71–80.
- Hornung, M & Reynolds, B.** 1985. Where do the solutes in upland streams come from? *Annu. Rep. Inst. terr. Ecol. 1984*, 126–130.
- Howard, B.J.** 1985. Aspects of the uptake of radionuclides by sheep grazing on an estuarine saltmarsh. 1. The influence of grazing behaviour and environmental variability on daily intake. *J. environ. Radioact.*, **2**, 183–198.
- Howard, B.J & Lindley, D.K.** 1985. Aspects of the uptake of radionuclides by sheep grazing on an estuarine saltmarsh. 2. Radio-nuclides in sheep tissues. *J. environ. Radioact.*, **2**, 199–213.
- Howard, P.J.A & Howard, D.M.** 1985. The application of riddit analysis to phenological observations. *J. appl. Statist.*, **12**, 29–35.
- Howard, P.J.A & Howard, D.M.** 1985. *Numerical analysis of soil physiological data.* (Merlewood research and development paper no. 105). Grange-over-Sands: Institute of Terrestrial Ecology.
- (Hudson, P) & Watson, A.** 1985. The red grouse. (Exploited animals). *Biologist*, **32**, 13–18.
- Ineson, P & (Anderson, J.M).** 1985. Aerobically isolated bacteria associated with the gut and faeces of the litter feeding macroarthropods *Oniscus asellus* and *Glomeris marginata*. *Soil Biol. Biochem.*, **17**, 843–849.
- Ingleby, K, Last, F.T & Mason, P.A.** 1985. Vertical distribution and temperature relations of sheathing mycorrhizas of *Betula* spp. growing on coal spoil. *For. Ecol. Manage.*, **12**, 279–285.
- (Jefferies, D.J) & Freestone, P.** 1984. Chemical analysis of some coarse fish from a Suffolk river carried out as part of the preparation for the first release of captive-bred otters. *Otters*, **1(8)**, 17–22.
- Jeffers, J.N.R.** 1984. *Design of experiments. 2nd ed.* (Statistical checklist 1). Cambridge: Institute of Terrestrial Ecology.
- Jeffers, J.N.R.** 1984. The role of ecosystem theory in the management of National Parks. In: *Management of National Parks and other protected areas*, 178–189. Athens, Greece: Ministry of Agriculture.
- Jeffers, J.N.R.** 1985. Data logging in the biological sciences. *J. appl. Statist.*, **12**, 107–112.
- Jeffers, J.N.R.** 1985. Norway lakes: acid precipitation and its effects on small lake chemistry. In: *Data analysis in real life environment: ins and outs of solving problems*, edited by J.A. Marcotrchino, J.M. Proth & J. Janssen, 229–245. Amsterdam: North-Holland.
- Jenkins, D, ed.** 1984. *Agriculture and the environment.* (ITE symposium no. 13). Cambridge: Institute of Terrestrial Ecology.
- Jenkins, D & (Matthew, E.M).** 1984. The wildlife resource and its conservation. In: *World Conservation Strategy Grampian Region: report of the Braemar Workshop*, edited by J.A. Foster, 83–97. Aberdeen: Grampian Regional Council.
- Jones, H.E & Bunce, R.G.H.** 1985. A preliminary classification of the climate of Europe from temperature and precipitation records. *J. environ. Manage.*, **20**, 17–29.
- (Jones, P.H, Barrett, C.F, Mudge, G.P) & Harris, M.P.** 1985. Examination of corpses of auks beached on east British coasts in February 1983. *Seabird*, **8**, 9–14.
- Kenward, R.E, (Karlborn, M & Marcstrom, V).** 1983. The price of success in goshawk trapping. *Raptor Res.*, **17**, 84–91.
- Kenward, R.E.** 1985. Ranging behaviour and population dynamics in grey squirrels. In: *Behavioural ecology: ecological consequences of adaptive behaviour*, edited by R.M. Sibly & R.H. Smith, 319–330. Oxford: Blackwell Scientific.
- Kenward, R.E.** 1985. Raptor radio tracking and radio telemetry. *Tech. Bull. Int. Cncl Bird Pres.*, **5**, 409–420.
- Kenward, R.E.** 1985. Why do grey squirrels strip bark? In: *The encyclopaedia of mammals*, edited by D.W. Macdonald, vol. 2, 626–627. London: Allen & Unwin.
- Kruuk, H & (Mills, M.G.L).** 1983. Notes on food and foraging of the honey badger *Mellivora capensis* in the Kalahari Gemsbok National Park. *Koedoe*, **26**, 153–157.
- Kruuk, H.** 1984. A new view of the hyaena. In: *The understanding of animals*, edited by G. Ferry, 35–41. Oxford: Martin Robertson.
- Kruuk, H, (Gorman, M & Leitch, A).** 1984. Scent-marking with the subcaudal gland by the European badger, *Meles meles* L. *Anim. Behav.*, **32**, 899–907.
- Kruuk, H.** 1984. The urge to kill. In: *The understanding of animals*, edited by G. Ferry, 206–211. Oxford: Martin Robert.
- Kruuk, H & Parish, T.** 1985. Food, food availability and weight of badgers (*Meles meles*) in relation to agricultural changes. *J. appl. Ecol.*, **22**, 705–715.
- Kruuk, H & (Macdonald, D).** Group territories of carnivores: empires and enclaves. In: *Behavioural ecology: ecological consequences of adaptive behaviour*, edited by R.M. Sibly & R.H. Smith, 521–536. Oxford: Blackwell Scientific.
- Lakhani, K.H.** 1985. Inherent difficulties in estimating age-specific bird survival rates from ring recoveries. In: *Statistics in ornithology*, edited by B.J.T. Morgan & P.M. North, 311–321. Berlin: Springer.
- Last, F.T.** 1984. Atmospheric pollutants and the rural environment: an introduction. In: *Forestry and pollution. Proc. 12th International Students Forestry Symposium*, 1–38. Edinburgh: Department of Forestry & Natural Resources, University of Edinburgh.
- Last, F.T & Leakey, R.R.B.** 1985. Better trees to fight deforestation. *Spectrum (COI)*, no. 191, 2–4.
- Last, F.T.** 1985. Commentary. In: *Woodlands, weather and water*, edited by D.J.L. Harding & J.K. Fawell, 87–92. London: Institute of Biology.
- Last, F.T, Fowler, D & (Freer-Smith, P.H).** 1985. *Effects of air pollutants on agricultural crops.* Abbots Ripton, Huntingdon: Institute of Terrestrial Ecology.
- Last, F.T, Mason, P.A, Wilson, J, Ingleby, K, Munro, R.C, (Fleming, L.V & Deacon, J.W).** 1985. 'Epidemiology' of sheathing (ecto-) mycorrhizas in unsterile soils: a case study of *Betula pendula*. *Proc. R. Soc. Edinb.*, **85B**, 299–315.
- Last, F.T & (Fleming, L.V).** 1985. Factors affecting the occurrence of fruitbodies of fungi forming sheathing (ecto-)mycorrhizas with roots of trees. *Proc. Indian Acad. Sci. (Plant Sci.)*, **94**, 111–127.
- Latter, P.M.** 1984. The use of wood veneer in decomposition experiments. *Appl. Biochem. Biotechnol.*, **9**, 371.
- Lawson, G.J.** 1985. Decomposition and nutrient cycling in *Rostkovia magellanica* from two contrasting bogs on South Georgia. In: *Antarctic nutrient cycles and food webs*, edited by W.R. Siegfried and others, 211–220. Berlin: Springer.
- Leakey, R.R.B.** 1985. The capacity for vegetative propagation in trees. In: *Attributes of trees as crop plants*, edited by M.G.R. Cannell & J.E. Jackson, 110–133. Abbots Ripton, Huntingdon: Institute of Terrestrial Ecology.
- Leakey, R.R.B & (Mohammed, H.R.S).** 1985. The effects of stem length on root initiation in sequential single-node cuttings of *Triplochiton scleroxylon* K. Schum. *J. hort. Sci.*, **60**, 431–437.

- (Leather, SR), Watt, AD & (Barbour, DA). 1985. The effect of host-plant and delayed mating on the fecundity and lifespan of the pine beauty moth, *Panolis flammea* (Denis & Schiffermuller) (Lepidoptera: Noctuidae). *Bull. ent. Res.*, **75**, 641-651.
- Lightowlers, PJ. 1985. The Summer meeting, 1984, Wooler. *Bull. Br. bryol. Soc.*, np. 45, 4-6.
- Lightowlers, PJ. 1985. A synoptic flora of South Georgian mosses: *Tortula*. *Bull. Br. antarct. Surv.*, no. 67, 41-77.
- Lightowlers, PJ. 1985. Taxonomic notes on New Zealand species of *Tortula*. *J. Bryol.*, **13**, 369-375.
- Longman, KA. 1985. Effects of growth substances on male and female cone initiation in conifers. *Biol. Plant.*, **27**, 402-407.
- Longman, KA. 1985. Tropical forest trees. In: *CRC handbook of flowering*, edited by AH Halevy, vol. 1, 23-39. Boca Raton: CRC Press.
- Longman, KA. 1985. Variability in flower initiation in forest trees. In: *Attributes of trees as crop plants*, edited by MGR Cannell & JE Jackson, 398-408. Abbots Ripton, Huntingdon: Institute of Terrestrial Ecology.
- Lowday, JE. 1985. Asulam applied by rope wick applicator for controlling scattered bracken on a grassland nature reserve. In: *Tests of agrochemicals and cultivars. Ann. appl. Biol.*, **106** (Suppl.) 90-91.
- Lowday, JE. 1985. Restoration of *Calluna* on a lowland heath after control of dense bracken by asulam. *Annu. Rep. Inst. terr. Ecol. 1984*, 39-41.
- Lyle, AA & Britton, RH. 1985. The fresh waters of Shetland: II. Resources and distribution. *Scott. geogr. Mag.*, **101**, 157-164.
- Maitland, PS, East, K & Morris, KH. 1983. Ruffe, *Gymnocephalus cernus* (L.), new to Scotland, in Loch Lomond. *Scott. Nat.*, 7-9.
- Maitland, PS. 1984. The effects of eutrophication on aquatic wildlife. In: *Agriculture and the environment*, edited by D Jenkins, 101-108. (ITE symposium no. 13). Cambridge: Institute of Terrestrial Ecology.
- Maitland, PS. 1985. Criteria for the selection of important sites for freshwater fish in the British Isles. *Biol. Conserv.*, **31**, 335-353.
- Maitland, PS & Britton, RH. 1985. The fresh waters of Shetland: I. The strategy of a synoptic resource analysis. *Scott. geogr. Mag.*, **101**, 150-156.
- Marquiss, M. 1985. Factors associated with the variation in thickness of grey heron eggshells. *Annu. Rep. Inst. terr. Ecol. 1984*, 82-86.
- Marquiss, M, (Ratcliffe, DA & Roxburgh, R). 1985. The numbers, breeding success and diet of golden eagles in southern Scotland in relation to changes in land use. *Biol. Conserv.*, **34**, 121-140.
- Marrs, RH. 1985. Birch control by the treatment of cut stumps with herbicides. *Arboric. J.*, **9**, 173-182.
- Marrs, RH. 1985. The effects of potential bracken and scrub control herbicides on lowland calluna and grass heath communities in East Anglia, U.K. *Biol. Conserv.*, **32**, 13-32.
- Marrs, RH. 1985. The use of Krenite to control birch on lowland heaths. *Biol. Conserv.*, **32**, 149-164.
- May, L. 1985. The use of procaine hydrochloride in the preparation of rotifer samples for counting. *Verh. int. Verein. Limnol.*, **22**, 2987-2990.
- Merrett, P, (Lockett, GH & Millidge, AF). 1985. A check list of British spiders. *Bull. Br. arachnol. Soc.*, **6**, 381-403.
- Merrett, P. 1985. Recolonization of Hartland Moor by spiders. *Annu. Rep. Inst. terr. Ecol. 1984*, 115-120.
- Miles, J. 1985. The ecological background to vegetation management. In: *Vegetation management in northern Britain*, edited by RB Murray, 3-20. (Monograph no. 30). Croydon: British Crop Protection Council.
- Miles, J. 1985. The pedogenic effects of different species and vegetation types and the implications of succession. *J. Soil Sci.*, **36**, 571-584.
- Miles, J. 1985. Soil in the ecosystem. In: *Ecological interactions in the soil environment*, edited by AH Fitter, 407-427. (British Ecological Society special publication no. 4). Oxford: Blackwell Scientific.
- Miles, J, French, DD, (XU, Z-B & Chen, L-Z). 1985. Transition matrix models of succession in a stand of mixed broadleaved-Pinus koraiensis forest in Changbaishan, Kirin Province, north-east China. *J. environ. Manage.*, **20**, 357-375.
- (Mills, CA, Beaumont, WRC) & Clarke, RT. 1985. Sources of variation in the feeding of larval dace *Leuciscus leuciscus* in an English river. *Trans. Am. Fish. Soc.*, **114**, 519-524.
- Milne, R, Deans, JD, Ford, ED, (Jarvis, PG, Leverenz, J & Whitehead, D). 1985. A comparison of two methods of estimating transpiration rates from a Sitka spruce plantation. *Boundary-Layer Meteorol.*, **32**, 155-175.
- Milne, R & (Young, P). 1985. Modelling of water movement in trees. In: *Identification and system parameter estimation*, edited by SA Billings & PC Young, 463-468. Oxford: Pergamon.
- Milner, C. 1984. Some ecological principles underlying hill sheep management. In: *Agriculture and the environment*, edited by D Jenkins, 139-142. (ITE symposium no. 13). Cambridge: Institute of Terrestrial Ecology.
- Mitchell, B, (Rowe, JJ, Ratcliffe, P & Hinge, M). 1985. Defecation in roe deer (*Capreolus capreolus*) in relation to the accumulation of faecal deposits. *J. Zool. A*, **207**, 1-7.
- (Mollison, D) & Bacon, PJ, eds. 1985. *Population dynamics and epidemiology of territorial animals*. (Merlewood research and development paper no. 106). Grange-over-Sands: Institute of Terrestrial Ecology.
- (Moore, D, Casselton, LA, Wood, DA) & Frankland, JC, eds. 1985. *Developmental biology of higher fungi*. (British Mycological Society symposium no. 10). Cambridge: Cambridge University Press.
- Moriarty, F. 1984. Ecotoxicology and pollution. In: *Hommage au Professeur Rene Truhaut*, 786-788. Paris.
- Moriarty, F. 1985. Bioaccumulation in terrestrial food chains. In: *Appraisal of tests to predict the environmental behaviour of chemicals*, edited by P Sheehan and others, 257-284. Chichester: Wiley.
- Moriarty, F. 1985. Toxic pollutants in aquatic and terrestrial ecosystems: similarities and differences. *Vakbl. Biol.*, **65**(13/14), 5-9.
- Morris, GJ, Coulson, GE & Leeson, EA. 1985. Changes in the shape of mitochondria following osmotic stress to the unicellular green alga *Chlamydomonas reinhardtii*. *J. Cell Sci.*, **76**, 145-153.
- Morris, GJ, Clarke, KJ, Leeson, EA, Winters, L & Coulson, GE. 1985. Cryobiology. *NERC News J.*, **3**(5), 10-13.
- Morris, KH. 1984. The food of the bullhead (*Cottus gobio* L.) in the Gogar Burn, Lothian, Scotland. *Forth nat. Hist.*, **7**(1982-83), 31-44.
- Morris, MG. 1983. Abundance of *Larinus planus* (F.) and *Rhinocyllus conicus* (Frohlich) (Col., Curculionidae) in Dorset and adjacent counties. *Entomologist's mon. Mag.*, **119**, 42.
- Morris, MG. 1984. Impacts of agriculture on southern grasslands. In: *Agriculture and the environment*, edited by D Jenkins, 95-97. (ITE symposium no. 13). Cambridge: Institute of Terrestrial Ecology.
- Morris, MG. 1985. *Bagous brevis* Gyllenhal new to Ireland from the Burren, Co. Clare, with a brief review of the Irish Bagoini (Coleoptera: Curculionidae). *Ir. Nat. J.*, **21**, 400-403.
- Moss, D. 1985. An initial classification of 10-km squares in Great Britain from a land characteristic data bank. *Appl. Geogr.*, **5**, 131-150.

- Moss, D.** 1985. Some statistical checks on the BTO common birds census index – 20 years on. In: *Bird census and atlas studies*, edited by K Taylor, R J Fuller & T C Lack, 175–179. Tring: British Trust for Ornithology.
- Moss, R & Watson, A.** 1985. Adaptive value of spacing behaviour in population cycles of red grouse and other animals. In: *Behavioural ecology: ecological consequences of adaptive behaviour*, edited by R M Sibly & R H Smith, 275–294. Oxford: Blackwell Scientific.
- Moss, R, Rothery, P & Trenholm, I B.** 1985. The inheritance of social dominance rank in red grouse (*Lagopus lagopus scoticus*). *Aggress. Behav.*, 11, 253–259.
- Moss, R & (Oswald, J).** 1985. Population dynamics of capercaillie in a north-east Scottish glen. *Ornis scand.*, 16, 229–238.
- Mountford, J O & Sheail, J.** 1984. Effects of drainage on natural vegetation. In: *Agriculture and the environment*, edited by D Jenkins, 98–101. (ITE symposium no. 13). Cambridge: Institute of Terrestrial Ecology.
- Mountford, M D.** 1985. Is grouse disease regulatory? In: *Population dynamics and epidemiology of territorial animals*, edited by D Mollison & P Bacon, 36–38. (Merlewood research and development paper no. 106). Grange-over-Sands: Institute of Terrestrial Ecology.
- Newton, I.** 1983. The effects of DDT and other organochlorine pesticides on bird populations. In: *Plant protection for human welfare. Proc. 10th Int. Congr. Plant Protection, Brighton, 1983*, vol. 2, 720. Croydon: British Crop Protection Council.
- Newton, I.** 1984. Effects of organochlorine pesticides on birds. In: *Proc. 2nd Symp. African Predatory Birds*, edited by J M Mendelsohn & C W Sapsford, 151–159. Durban: Natal Bird Club.
- Newton, I.** 1984. Mortality and population turnover in raptors. In: *Proc. 2nd Symp. African Predatory Birds*, edited by J M Mendelsohn & C W Sapsford, 71–85. Durban: Natal Bird Club.
- Newton, I.** 1984. Report on the discussions of the syndicate on the use of agrochemicals. In: *Agriculture and the environment*, edited by D Jenkins, 188–190. (ITE symposium no. 13). Cambridge: Institute of Terrestrial Ecology.
- Newton, I.** 1984. Uses and effects on bird populations of organochlorine pesticides. In: *Agriculture and the environment*, edited by D Jenkins, 80–88. (ITE symposium no. 13). Cambridge: Institute of Terrestrial Ecology.
- Newton, I.** 1985. Birds of prey – the raptors. In: *The encyclopaedia of birds*, edited by C M Perrins & A L A Middleton, 102–125. London: Allen & Unwin.
- Newton, I.** 1985. Finches. In: *The encyclopaedia of birds*, edited by C M Perrins & A L A Middleton, 416–420. London: Allen & Unwin.
- Newton, I.** 1985. Lifetime reproductive output of female sparrowhawks. *J. Anim. Ecol.*, 54, 241–253.
- (Nicholls, T J, Goldsmith, A R) & Dawson, A.** 1984. Photo-refractoriness in European starlings: associated hypothalamic changes and the involvement of thyroid hormones and prolactin. *J. exp. Zool.*, 232, 567–572.
- (Nicholls, T J, Goldsmith, A R), Dawson, A, (Chakraborty, S & Follett, B K).** 1985. Involvement of the thyroid glands in photo-refractoriness in starlings. In: *The endocrine system and the environment*, edited by B K Follett, S Ishii & A Chandola, 127–135. Berlin: Springer.
- Nicholson, I A.** 1984. Some ecological aspects of production. In: *World Conservation Strategy Grampian Region: report of the Braemar Workshop*, edited by J A Forster, 163–173. Aberdeen: Grampian Regional Council.
- Nicholson, I A.** 1985. Is air pollution important in vegetation management in northern Britain? In: *Vegetation management in northern Britain*, edited by R B Murray, 133–152. (Monograph no. 30). Croydon: British Crop Protection Council.
- Page, F C & (Blanton, R L).** 1985. The Heterolobosea (Sarcodina: Rhizopoda), a new class uniting the Schizopyrenida and the Acrasidae (Acrasida). *Protistologica*, 21, 121–132.
- Perkins, D F.** 1985. Tree health, the direct and indirect effects of fluorine. *Annu. Rep. Inst. terr. Ecol.* 1984, 57–60.
- Picozzi, N & (Watson, J).** 1985. Breeding by an Orkney hen harrier on the Scottish mainland. *Scott. Birds*, 13, 186–187.
- Picozzi, N.** 1985. WPA trek to Pipar, 1985. *WPA News*, no. 10, 21–23.
- Pollard, E, Hall, M L & Bibby, T J.** 1984. The clouded yellow butterfly migration of 1983. *Entomologist's Gaz.*, 35, 227–
- Preston, C D.** 1984. *Ruppia spiralis* L. ex Dumort. In Yorkshire. *Watsonia*, 15, 274–275.
- Preston, C D & (Akeroyd, J B).** 1985. Some coastal ecotypic variants in the British Isles. *Watsonia*, 15, 430.
- Preston, C D.** 1985. The spread of *Epilobium ciliatum* Rafin. in the British Isles. *Watsonia*, 15, 430.
- (Rayner, A D M, Watling, R) & Frankland, J C.** 1985. Resource relations – an overview. In: *Development biology of higher fungi*, edited by D Moore and others, 1–40. Cambridge: Cambridge University Press.
- (Richens, R H) & Jeffers, J N R.** 1985. The elms of Wales. *Forestry*, 58, 9–25.
- (Rihan, J R) & Gray, A J.** 1985. Ecology of the hybrid marram grass × *Calamophila baltica* in Britain. *Vegetatio*, 61, 203–208.
- Rowland, A P & Grimshaw, H M.** 1985. A wet oxidation procedure suitable for total nitrogen and phosphorus in soil. *Commun. Soil. Sci. Pl. Anal.*, 16, 551–560.
- Sargent, C.** 1985. The forests of Bhutan. *Ambio*, 14, 75–80
- Sargent, C.** 1985. On the track of flowers. *Nat. Wild*, no. 14, 16–19.
- Sargent, C.** 1985. Tracking down plants. *Geogr. Mag.*, 57, 4–5.
- Satchell, J E.** 1984. Has vermiculture a future? Implications of current trends in advertising. In: *International Symposium on Agricultural and Environmental prospects in Earthworm Farming, Rome, 1983*, edited by U Tomati & A Grappelli, 15–26. Rome: Consiglio Nazionale delle Ricerche.
- Seel, D C.** 1985. Magpie containing warble-fly insecticide. *Br. Birds*, 78, 302–303.
- Sheail, J.** 1984. Constraints on water-resource development in England and Wales: the concept and management of compensation flows. *J. environ. Manage.*, 19, 351–361.
- Sheail, J.** 1985. Edinburgh, the Upper Tweed, and the question of compensation water. *Scott. Geogr. Mag.*, 101, 66–76.
- Sheail, J.** 1985. Historical records and the management of the natural environment. In: *Scientific and technical public records*, 8pp. (RAD occasional paper no. 9). Kew: Public Record Office.
- Sheail, J.** 1985. Interwar planning in Britain: the wider context. *J. urban Hist.*, 11, 335–351.
- Sheail, J.** 1985. Perspectives on containment: campaigns for separation. In: *The changing countryside*, edited by J Blunden & N Curry, 77–84. London: Croom Helm.
- Sheail, J.** 1985. Perspectives on containment: town and country. In: *The changing countryside*, edited by J Blunden & N Curry, 72–77. London: Croom Helm.
- Sheail, J.** 1985. *Pesticides and nature conservation: the British experience 1950–1975*. Oxford: Oxford University Press.
- Sheail, J.** 1985. South Riding: a portrayal of local government between the wars. *Local Gov. Stud.*, 11, 65–74.
- Sheppard, L J & Cannell, M G R.** 1985. Performance and frost hardiness of *Picea sitchensis* × *Picea glauca* hybrids in Scotland. *Forestry*, 58, 67–74.

- Staines, B W, Welch, D, Catt, D C, Scott, D & Hinge, M D C.** 1985. Habitat use and feeding by deer in Sitka spruce plantations. *Annu. Rep. Inst. terr. Ecol.* 1984, 12–16.
- Staines, B W.** 1985. The humane control of deer in rural areas. In: *Humane control of land mammals and birds*, edited by D P Britt, 105–110. Potters Bar: Universities Federation for Animal Welfare.
- Staines, B W.** 1985. Red deer and land-use in the Scottish Highlands. *NERC News J.*, 3(7), 8–10.
- (Stobbs, A R) & Jeffers, J N R.** 1985. *Land use survey of Malawi, 1965–67*. Surbiton: Land Resources Development Centre.
- (Sutherland, W J) & Moss, D.** 1985. The inactivity of animals: influence of stochasticity and prey size. *Behaviour*, 92, 1–8.
- Sykes, J M, Lowe, V P W & Briggs, D R.** 1985. Changes in plants and animals in the first 10 years after upland afforestation. *Annu. Rep. Inst. terr. Ecol.* 1984, 16–21.
- Sykes, J M & Horrill, A S.** 1985. Natural regeneration in a Caledonian pinewood: progress after eight years of enclosure at Coille Coire Chuilc, Perthshire. *Arboric. J.*, 9, 13–24.
- (Taiti, S) & Harding, P T.** 1985. A re-examination of the W E Collinge collection of South African terrestrial Isopoda at the Yorkshire Museum, York, Great Britain. *Crustaceana*, 48, 195–199.
- Thomas, J A.** 1984. Name that grassland butterfly. *Nat. Wild.* no. 12, 22–23.
- Thomas, J A.** 1985. Changes in the status of the adonis blue and Lulworth skipper in Dorset. *Proc. Dorset nat. Hist. archaeol. Soc.*, 106, 93–96.
- Thomas, J A.** 1985. Name that woodland butterfly. *Nat. Wild.* no. 13, 20–21.
- Thomas, J A.** 1985. Recent changes in butterfly populations. *Rep. Southampt. nat. Hist. Soc.* 1984, 6–7.
- Unsworth, M H & Fowler, D.** 1985. Deposition of sulphur in the UK. *J. Sci. Fd Agric.*, 36, 266–267.
- Unsworth, M H & (Harrison, R M).** 1985. Is lead killing German forests? *Nature, Lond.*, 317, 674.
- (Van Cleve, K) & Harrison, A F.** 1985. Bioassay of forest floor phosphorus supply for plant growth. *Can. J. For. Res.*, 15, 156–162.
- Village, A.** 1985. The ecology of kestrels in contrasting habitats. *Annu. Rep. Inst. terr. Ecol.* 1984, 105–110.
- Village, A.** 1985. Spring arrival times and assortative mating of kestrels in south Scotland. *J. Anim. Ecol.*, 54, 857–868.
- Village, A.** 1985. Turnover, age and sex ratios of kestrels (*Falco tinnunculus*) in south Scotland. *J. Zool. A*, 206, 175–189.
- (Villeneuve, D C) & Dobson, S.** 1984. *Chlordane*. (Environmental health criteria 34). Geneva: World Health Organization.
- (Villeneuve, D C) & Dobson, S.** 1984. *Endosulfan*. (Environmental health criteria 40). Geneva: World Health Organization.
- (Villeneuve, D C) & Dobson, S.** 1984. *Heptachlor*. (Environmental health criteria 38). Geneva: World Health Organization.
- (Villeneuve, D C) & Dobson, S.** 1984. *Tecnazene*. (Environmental health criteria 42). Geneva: World Health Organization.
- (Wanless, S) & Harris, M P.** 1985. Counting gulls – a plea for realism. *Ornis scand.*, 16, 75–77.
- (Wanless, S), Harris, M P & Murray, S.** 1985. A progress report on the 1984–5 north Atlantic gannet survey. In: *Population and monitoring studies of seabirds*, edited by M L Tasker, 30. (Proc. 2nd int. Conf. Seabird Group).
- (Wanless, S), Harris, M P & (Morris, J A).** 1985. Radio-monitoring as a method for estimating time budgets of guillemots *Uria aalge*. *Bird Study*, 32, 170–175.
- (Wanless, S) & Harris, M P.** 1985. Two cases of guillemots *Uria aalge* helping to rear neighbours' chicks on the Isle of May. *Seabird*, 8, 5–8.
- Watson, A.** 1984. Paths and people in the Cairngorms. *Scott. Geogr. Mag.*, 100, 151–160.
- Watson, A.** 1985. The growing problem of soil erosion. (Farming focus). *Dundee Courier & Advertiser*, 28 May, 10.
- Watson, A.** 1985. Social class, socially-induced loss, recruitment and breeding of red grouse. *Oecologia*, 67, 493–498.
- Watson, A.** 1985. Soil erosion and vegetation damage near ski lifts at Cairn Gorm, Scotland. *Biol. Conserv.*, 33, 363–381.
- Watson, A, Allan, E & (Fraser, I A).** 1985. A study of the place-names of Upper Deeside. *Nomina*, 8, 6–14.
- Welch, D & Scott, D.** 1985. Further observations on a Callunetum intensively grazed by mountain hares (*Lepus timidus* L.). *Trans. bot. Soc. Edinb.*, 44, 323–333.
- Welch, D.** 1985. Studies in the grazing of heath moorland in north-east Scotland. IV. Seed dispersal plant establishment in dung. *J. appl. Ecol.*, 22, 461–472.
- Welch, R C.** 1985. Coleoptera from a dovecote at Fernrigg Hall, Norfolk. *Entomologist's mon. Mag.*, 121, 34.
- Wells, T C E.** 1985. The botanical and ecological interest of ancient monuments. In: *Archaeology and nature conservation*, edited by G Lambrick, 1–9. Oxford: Oxford University Dept for External Studies.
- Wells, T C E.** 1985. Botanical notes. *Rep. Huntingdon. Fauna Flora Soc.*, 37th, 1984, 4–6.
- Wells, T C E.** 1985. An ecologist's view – floristic possibilities – a scene-setting review. In: *Creating attractive grasslands: diverse swards – the do's and don'ts*, edited by G Taylor, 8–19. (Workshop report no. 5). Bingley: National Turfgrass Council.
- Wilson, J & (Coutts, M P).** 1985. Exploiting tree crop-symbiont specificity. In: *Attributes of trees as crop plants*, edited by M G R Cannell & J E Jackson, 359–379. Abbots Ripton, Huntingdon: Institute of Terrestrial Ecology.
- (Wratten, S D, Holt, J) & Watt, A D.** 1985. Conversion of research models to micro-computer advice on cereal aphid control. In: *British Crop Protection Conference – Pests and diseases*, 1984, vol. 2, 609–614. Croydon: British Crop Protection Council.
- (Wright, J F, Armitage, P D, Furse, M T) & Moss, D.** 1984. The classification of sites on British rivers using macroinvertebrates. *Verh. int. Verein. Limnol.*, 22, 1939–1943.
- (Wright, J F, Armitage, P D, Furse, M T) & Moss, D.** 1985. The classification and prediction of macroinvertebrate communities in British rivers. *Rep. Freshwat. biol. Ass.*, 53rd, 80–93.
- Wyatt, B K.** 1984. The use of remote sensing for monitoring change in agriculture in the uplands and lowlands. In: *Agriculture and the environment*, edited by D Jenkins, 162–168. (ITE symposium no. 13). Cambridge: Institute of Terrestrial Ecology.
- Wyllie, I.** 1985. Post-fledging period and dispersal of young sparrowhawks *Accipiter nisus*. *Bird Study*, 32, 196–198.
- Yates, M G.** 1984. The biology of the oak bark beetle, *Scolytus intricatus* (Ratzeburg) (Coleoptera: Scolytidae), in southern England. *Bull. ent. Res.*, 74, 569–579.

Contract Reports

- Cannell, MGR.** 1985.
Tea research in Malawi: Review of current research. 28pp.
Tea Research Foundation of Central Africa. ITE project 893.
- Chapman, SB.** 1984.
An ecological survey of Winfrith Heath. 118pp.
Central Electricity Generating Board. ITE project 904.
- Chapman, SB.** 1985.
Preliminary survey of proposed oil pipeline route within the perambulation of the New Forest. 5pp.
BP Petroleum Development Ltd. ITE project 1007.
- Conroy, JWH & French, DD.** 1985.
Monitoring otters in Shetland. Final report. 113pp.
Shetland Oil Terminal Environmental Advisory Group. ITE project 715.
- Cummins, CP.** 1985.
Spawn death among common frogs in acid conditions – a preliminary field investigation. 3pp.
Nature Conservancy Council. ITE project 739.
- Cummins, CP & Gore, DJ.** 1985.
Toxicity of *Bacillus thuringiensis* to freshwater animals. 9pp.
Nature Conservancy Council. ITE project 977.
- Davis, BNK.** 1985.
Creation of wildlife habitat with special reference to butterflies. Martin's Farm landfill site, St Osyth.
Report for 1984. 19pp.
Essex County Council. ITE project 819.
- Dighton, J.** 1985.
Effects of acid rain on Scots pine in lysimeters. 34pp.
Central Electricity Generating Board. ITE project 893.
- Fuller, RM, Dale, J & Bell, SA.** 1985.
The effect of nitrogen on species diversity and agricultural production on Somerset Moors: I. A floristic assessment of the proposed experimental site. Preliminary report. 31pp.
Nature Conservancy Council. ITE project 981.
- Harding, PT, Greene, DM, Preston, CD, Arnold, HR & Eversham, BC.** 1985.
Biological Records Centre. Final report. 70pp.
Nature Conservancy Council. ITE projects 208, 209, 529, 557, 656, 657.
- Hooper, MD.** 1985.
An ecological appraisal of alternative routes for the Newbury bypass. 17pp.
Mott, Hay and Anderson. ITC project 922.
- Hooper, MD.** 1985.
Ecological impacts on terrestrial sites affected by Euroroute. 15pp.
Mott, Hay and Anderson. ITE project 994.
- Hornung, M.** 1985.
The effect of land management on geochemical cycling in upland soils. Interim report. 24pp.
European Economic Community. ITE projects 594 & 625.
- Hornung, M.** 1985.
The impact of upland management and land use on water quality. 39pp.
Department of the Environment. ITE projects 594 & 625.
- Horrill, AD & Howard, BJ.** 1985.
Radioactive waste management. Progress report. 50pp.
Department of the Environment. ITE project 873.
- Howard, BJ.** 1985.
Uptake by ewes and lambs of radionuclides from saltmarsh vegetation harvested from the Esk estuary, Cumbria. Progress report. 13pp.
Ministry of Agriculture, Fisheries and Food. ITE project 976.
- Lawson, GJ.** 1985.
Cultivating reeds for root zone treatment of sewage. 65pp. Water Research Centre. ITE project 965.
- Leakey, RRB & (Grison, F).** 1985.
Regional Programme for the Improvement of Tropical Hardwoods – West and Central Africa. Preparatory phase report to European Development Fund.
ITE project 955.
- Lightowlers, PJ & Cape, JN.** 1985.
Hydrochloric acid emissions attributable to incineration of PVC wastes. 35pp.
ICI plc (Petrochemicals and Plastics Division) & Norsk Hydro Polymers Ltd. ITE project 960.

- Lindley, D.K.** 1984.
Multiple regression models for predicting radionuclides in milk produced on west Cumbrian farms. 42pp.
Ministry of Agriculture, Fisheries & Food, ITE project 802.
- Marrs, R H & Griffith, F.M.** 1985.
A handbook for the use of ammonium sulphamate, asulam, fosamine ammonium, glyphosate and triclopyr for nature conservation. 56pp.
Nature Conservancy Council. ITE project 599.
- Miller, G.R.** 1985.
Ecological considerations in the management of Cairngorm Estate. 51pp.
Anderson Semens Houston. ITE project 982.
- Mountford, J O & Sheal, J.** 1985.
Vegetation and changes in farming practice on the Idle/Misson Levels (Nottinghamshire, Humberside and South Yorkshire).
Interim report. 64pp.
Nature Conservancy Council. ITE project 718.
- Newton, I, Bell, A.A, Bull, K.R, Freestone, P, Core, D J, Haas, M.B, Hall, J.R, Hanson, H.M, Harris, M.P, Leach, D V, Osborn, D & Wyllie, I.** 1985.
Birds and pollution. Interim report. 26pp.
Nature Conservancy Council. ITE project 181.
- Nicholson, I A & Last, F T.** 1984.
Effects of acidic deposition on plants and soils.
Interim report. 11pp.
Department of the Environment. ITE project 841.
- Nicholson, I A & Last, F T.** 1984.
Effects of canopies of different tree species on the composition of throughfall and stemflow.
Interim report. 11pp.
Commission of the European Communities. ITE project 841.
- Perkins, D F, Millar, R O & Last, F T.** 1985.
Effects of airborne fluorides on the lichen flora in woodland near an aluminium reduction works. 36pp.
Commission of the European Communities. ITE project 160.
- Picozzi, N.** 1985.
Black grouse research. Interim report. 21pp.
World Pheasant Association. ITE project 764.
- Pollard, E.** 1985.
Butterfly monitoring scheme. Progress report. 9pp.
Nature Conservancy Council. ITE project 204.
- (Ranwell, D S), Boar, R R & Fuller, R.M.** 1985.
Changes in the strandline vegetation and embryo dune formation at Holme Dunes, Norfolk.
31pp.
Anglian Water Authority. ITE project 969.
- Scott, R, Allen, S E, Horrill, A D & Livens, F.R.** 1985.
Dounreay EDRP impact study: Dounreay European Demonstration Fast Reactor Fuel Reprocessing Plant - impact on the wildlife habitats of the north Caithness coast of radionuclides from the proposed plant and recommendations for research. 43pp.
Nature Conservancy Council. ITE project 988.
- Smith, R.I.** 1985.
Inventory and monitoring of Sahelian pastoral ecosystems in Dakar, Senegal. 22pp.
United Nations. ITE project 979.
- Stebbins, R.E.** 1985.
Population ecology and specialist advice on bats 1981/1982.
Interim report. 153pp.
Nature Conservancy Council. ITE projects 291/292.
- Sykes, J.M, Marrs, R H & Mitchell, B.** 1985.
The impact of red deer (*Cervus elaphus* L.) on the vegetation of native Scottish pinewoods: selection of sites for further studies using the faecal accumulation method, and recommendations for sampling vegetation. 60pp.
Nature Conservancy Council. ITE project 852.
- Webb, N.R.** 1985.
Ecological survey of ECC Ball Clays Limited land at Povington, Dorset.
ECC Ball Clays Limited. ITE project 972.
- Webb, N.R.** 1985.
Ecological survey of proposed access road to Wytch Farm Gathering Station. 24pp.
BP Petroleum Development Ltd. ITE project 1000.
- Webb, N.R.** 1985.
Restoration of heathland: progress report. 9pp.
ECC Ball Clays Ltd. ITE project 859.
- Wells, T C.E.** 1985.
Creating attractive grasslands. Interim report. 65pp.
Nature Conservancy Council. ITE project 887.

Published by the
Natural Environment Research Council
Swindon, England

Design Style by Banks & Miles

Printed in England by
Lawrence Allen Limited

ISBN 0901875 783
FEBRUARY 1989

£5.50net