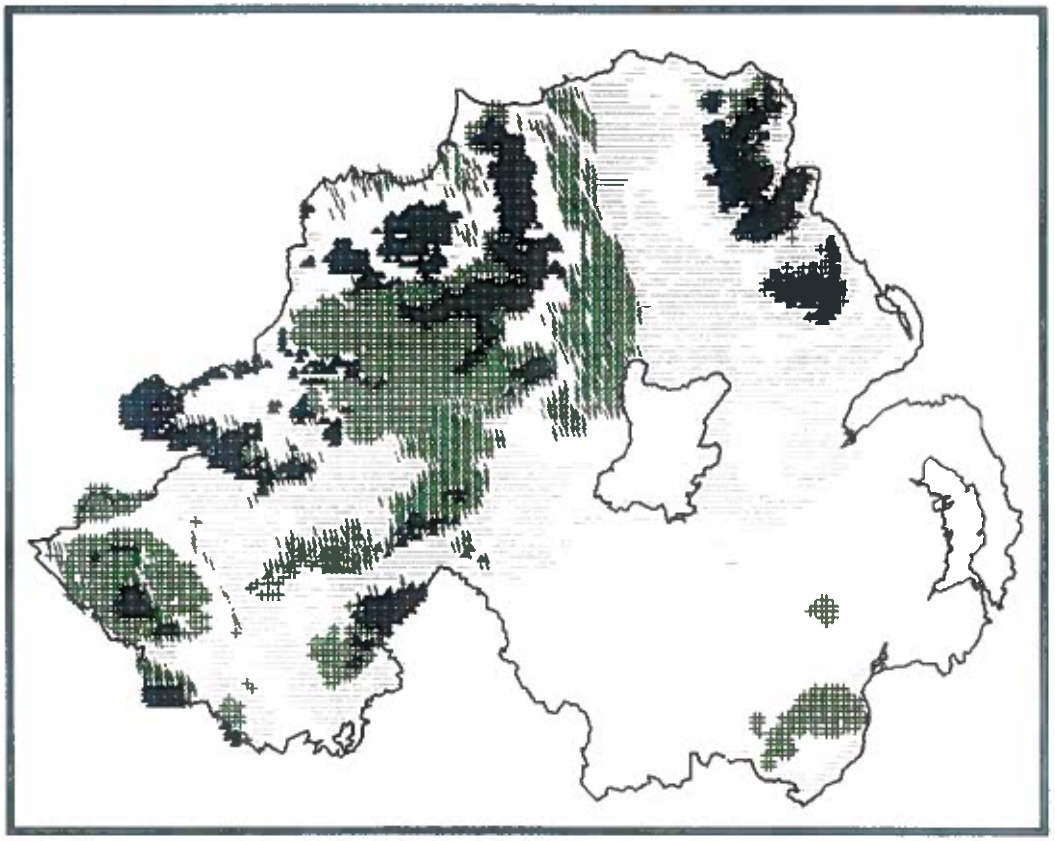
Northern Ireland

Countryside Survey 2000



Summary Report on *Broad Habitats*

ENVIRONMENT AND HERITAGE SERVICE

THE NORTHERN IRELAND COUNTRYSIDE SURVEY 2000

Summary Report on *Broad Habitats*

November 2000

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Front cover: Distribution map of peatland habitat derived from the Northern Ireland Countryside Survey

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SUMMARY

Because of their species composition, the types and relative amounts of land cover such as woodland, bog, wetland, grassland and crops are key determinants of biodiversity at the landscape scale. The *Northern Ireland Countryside Survey 2000 (NICS2000)* estimates the current stock of land cover and reports on how it has changed over the past decade.

For reporting at the Northern Ireland scale and to facilitate comparison with other parts of the United Kingdom, the primary land cover and field boundary types recorded have been aggregated into *Broad Habitats*. These represent a classification of the terrestrial environment developed for the *UK Biodiversity Action Plan*.

The most widespread Broad Habitats in Northern Ireland are *Improved Grassland*, *Neutral Grassland* and *Bog*. In a UK context, Northern Ireland holds a large proportion of the *Neutral Grassland* and *Fen Marsh and Swamp* resource and an important part of the *Boundary and Linear Feature* Broad Habitat resource.

The main net changes in Broad Habitat cover were an increase in the area of *Improved Grassland* and a decrease in the area of *Neutral Grassland* indicating an overall land use intensification. There were also net decreases in the area of *Fen Marsh and Swamp*, *Bog* and *Calcareous Grassland* Broad Habitats, representing a net decline in habitat biodiversity at the landscape scale.

There was an overall net loss of *Boundary and Linear Feature* Broad Habitat, comprising mainly *Hedges* and *Earthbanks*. The area of *Broadleaved Mixed and Yew Woodland* Broad Habitat showed a net increase, a function of extensification processes and woodland planting. Field boundaries showing the greatest net increase were *Fences*.

Broad Habitats with the smallest proportional loss of original stock, signalling relative stability, were *Maritime*, *Broadleaved Mixed and Yew Woodland*, *Supralittoral Sediment*, *Calcareous Grassland* and *Bog*. These Broad Habitats represent much of the biodiversity of the Northern Ireland countryside, ranging from high quality, critical natural assets such as oak woodland and active bog, to common habitats such as gorse scrub and cut-over blanket bog. Important transfers between Broad Habitats, involving land use extensification, were gains in *Dwarf Shrub Heath*, *Fen Marsh and Swamp* and *Broadleaved Mixed and Yew Woodland*.

This study is relevant primarily to the sustainable management of Broad Habitats at the regional Northern Ireland and United Kingdom scales. To maintain landscape-scale habitat biodiversity, management strategies should be directed towards upland *Bog*, *Neutral Grassland* and *Fen Marsh and Swamp* Broad Habitats in the farmed countryside, *Hedges* and *Earthbanks*.

THE NORTHERN IRELAND COUNTRYSIDE SURVEY 2000

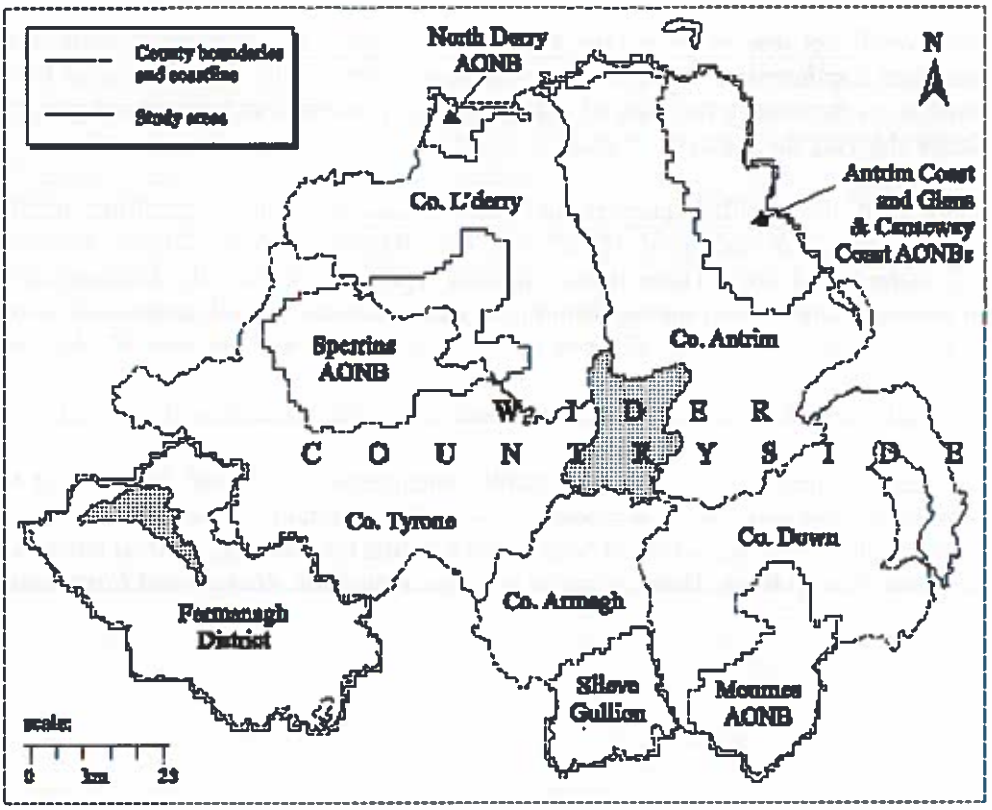
1. Introduction

Because of their species composition, the types and relative amounts of land cover such as woodland, bog, wetland, grassland and agricultural crops are key determinants of biodiversity at the landscape scale. Land uses such as farming, building, forestry and mineral extraction drive change and also influence biodiversity. For planning land use and ecosystem sustainability, it is important to know how much of each land cover type there currently is, what is the distribution of land cover in the landscape and what changes occur with time. The *Northern Ireland Countryside Survey 2000* was carried out to determine the current stock of land cover and field boundaries and to report on how they have changed over the past decade.

2. Northern Ireland Countryside Survey

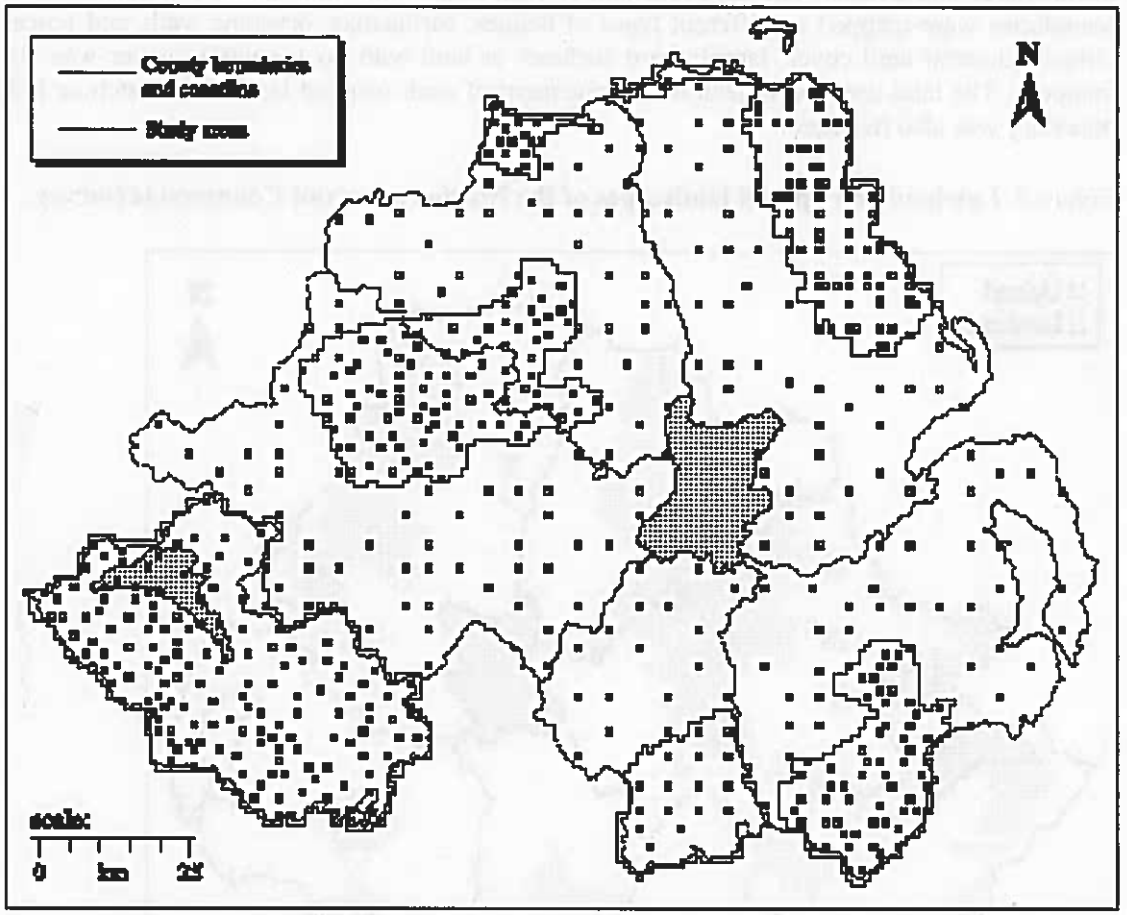
The *Northern Ireland Countryside Survey (NICS)* estimated the stock of land cover to provide a baseline database against which future change could be assessed (Cooper *et al.* 1997). It drew together the results from a series of studies carried out between 1986 and 1991 in study areas across Northern Ireland (Fig. 1). Data were derived from 628 quarter kilometre sample squares, covering 1.1% of the land area (Fig. 2), in which land cover and field boundaries were mapped.

Figure 1. **Study areas of the Northern Ireland Countryside Survey.**



The grid square sampling frame was based on the *Northern Ireland Land Classification*. This allocates every km^2 grid square in Northern Ireland to one of 23 classes characterised uniquely by its climate, elevation, topography, vegetation, hydrology, geology, soils and settlement pattern. Land classes 1 – 16 represent lowland enclosed landscapes generally below 150m elevation, covering about two-thirds of Northern Ireland (Fig. 3). Land classes 17 – 23 represent the main mountain blocks and the upland margins. Each land class was sampled separately so that field survey was representative of the full range of landscape variation.

Figure 2. **Distribution of sample grid squares in the Northern Ireland Countryside Survey.**



3. Biodiversity reporting

The United Kingdom government signed the *Convention on Biological Diversity* at the United Nations Earth Summit meeting in Rio de Janeiro in 1992. The *UK Biodiversity Action Plan* followed in 1994, establishing the "environment" as a central consideration in national and local government policies. In response to this, a Northern Ireland cross-sectoral group has recently presented the Northern Ireland Assembly with *Biodiversity in Northern Ireland - Recommendations to Government for a Biodiversity Strategy.*

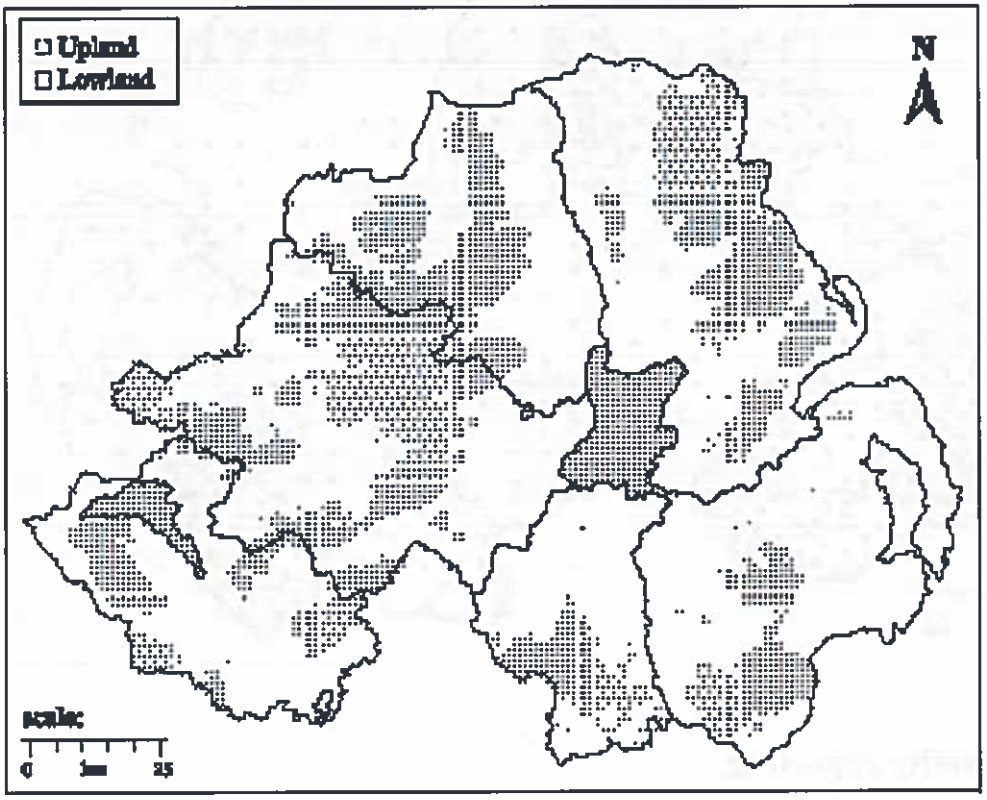
Results from the *Northern Ireland Countryside Survey 2000* are timely because they will contribute to a report on the state of the environment in the UK: the *Millennium Report to the Convention on Biodiversity*. Here, Northern Ireland data are presented separately from the combined UK figures. Changes in the amount and distribution of scarce land cover types of high conservation value such as raised bog or lowland heath, and widely distributed land cover

types such as grassland or crops are reported. Relative changes in the amounts of these land cover types with time is an important biodiversity issue.

4. Baseline survey

The baseline *Northern Ireland Countryside Survey* study was carried out by a team of professional botanists trained in the recording procedures used. The land cover and field boundaries of each sample grid square were mapped using a vegetation classification based on plant species composition, vegetation structure and environment. Over 60 types of vegetation were mapped, including woodland, scrub, species-rich wet and dry grasslands, fen meadow, heath, mire, and coastal, tall herb/fern and ruderal vegetation, grasslands and crops. Field boundaries were mapped as different types of hedges, earthbanks, drystone walls and fences. Urban/industrial land cover, largely hard surfaces or land with no vegetation cover was also mapped. The land use and vegetation management of each mapped land cover patch or field boundary was also recorded.

Figure 3. **Lowland and upland landscapes of the Northern Ireland Countryside Survey.**



5. Northern Ireland Countryside Survey 2000

5.1. Resurvey method

The *Northern Ireland Countryside Survey 2000 (NICS2000)* resurveyed the baseline sample grid squares in 1998, using the same detailed methods, to determine what changes had taken place. Field mapping was carried out without reference to the baseline data except that land cover outlines and the location of field boundaries were provided. If field surveyors identified changes, these were recorded by editing the baseline map. After mapping was completed, land cover records were compared in the field with the baseline data to determine the processes driving change. An independent 9-point grid, quality assurance programme was implemented by the *Centre for Ecology and Hydrology* to estimate the reliability of field records and to maintain standard field recording procedures between surveyors.

5.2. Measuring change

Changes in land cover area and field boundary length in each sample grid square were determined from field maps of the sample grid squares using a Geographical Information System. Statistical analysis of change was carried out on a database of land cover parcels and field boundaries in which change had occurred. Estimates of land cover change were derived from the database and standard error statistics were determined to define confidence limits. Transfers from one land cover type to another were also calculated, together with their statistical significance. The test that an estimate must be more than two standard errors above zero cannot be strictly applied, however, because frequency distributions for some land cover types are skewed.

5.3. Analysing change

Analysis of change is important because it informs strategic land use decisions. Since the land cover types and field boundaries recorded in the field are described in terms of their vegetation composition, they can be used as an indicator of biodiversity change. Land cover comprising semi-natural vegetation, for example, is a major source of species biodiversity. It is an important part of the natural heritage and asset-base and of Northern Ireland.

Here, analysis is based on quantitative, explicit data and is defined statistically. It should be recognised, however, that analysis of change is not solely a statistical matter and that it involves making informed judgements about the environmental significance of the change.

Interpreting change also involves considering the processes driving change, inferred from field data on land use, vegetation management and vegetation composition or structure. Records of physical land use activity and the abundance of agriculturally preferred grasses or species characteristic of semi-natural vegetation types that are environmental indicators, are important in this respect.

Activities such as forestry, building and peat-cutting are self-explanatory, but others are more complex. Agricultural management, for example, is here categorised into either intensification, representing increased inputs, or extensification, representing decreased inputs. Intensive transfers between land cover types are exemplified by change from species-rich grassland to ryegrass, or from heath to grass/heath mosaics. Extensive transfers are exemplified by change from ryegrass to neutral grassland or from rush-dominated grassland to species-rich wet grassland.

6. Broad Habitats

To facilitate comparison with other parts of the United Kingdom, the primary land cover and field boundary types recorded by *NICS2000* field surveyors have been aggregated into *Broad Habitats* (Table 1). These represent a classification of the terrestrial environment developed for the *UK Biodiversity Action Plan*. Here, Broad Habitat data are presented for Northern Ireland as a whole. Analysis of the separate study areas (Fig. 1), the main land classes (Fig. 3), and the primary land cover types (Table 1), will be presented later in a technical report due for publication in 2001. Current Broad Habitat *stock* is presented here together with change statistics described as *gain* (transfer into a Broad Habitat), *loss* (transfer out of a Broad Habitat) and *net change* (the sum of losses and gains).

Table 1. **Principle types of vegetation represented in the UK Biodiversity Action Plan Broad Habitats.**

BH01. Broadleaved Mixed and Yew Woodland
Broadleaved seminatural woodland
Broadleaved plantation woodland
Fen carr
Mixed broadleaf/conifer seminatural woodland
Mixed broadleaf/conifer plantation
Dense and scattered scrub

BH02. Coniferous Woodland
Coniferous plantation and seminatural woodland

BH03. Boundary and Linear Features
Hedges and Earthbanks
Dry stone walls
Post and wire fences
Other fences and walls

BH04. Arable and Horticultural
Wheat, barley, oats and potatoes
Ploughed land
Orchards

BH05. Improved Grassland
Italian ryegrass sward
Perennial ryegrass sward

BH06. Neutral Grassland
Species-rich dry grassland
Mixed species grassland
Other agricultural grassland
Tall herb and ruderal vegetation

BH07. Calcareous Grassland

BH08. Acid Grassland
Bent/fescue grassland
Mat-grass hill pasture

BH09. Bracken
Continuous bracken
Scattered bracken

BH10. Dwarf Shrub Heath
Dry heath and dry heath mosaics
Gorse heath and bracken mosaics
Continuous and scattered gorse heath

BH11. Fen Marsh and Swamp
Species-rich wet grassland
Fen meadow
Fen, poor fen, swamp and reed-beds

BH12. Bog
Wet bog
Dry bog
Molinia grassland
Wet heath and wet heath mosaics

BH13. Standing Open Water and Canals
Freshwater vegetation

BH16. Inland Rock
Inland cliff ledge vegetation
Bare soil, peat and mud
Sand and gravel
Boulders and scree

BH17. Urban
Urban areas
Industrial/commercial/public buildings
Agricultural and domestic buildings

BH18. Maritime
Sea cliff/ledge vegetation

BH19. Supralittoral Sediment
Saltmarsh vegetation
Shingle and gravel vegetation
Dune vegetation

Note: Broad Habitats without vegetation, not listed, are: Rivers and Streams (14), Montane (15), Littoral Rock (20) and Littoral Sediment (21).

7. Broad Habitat Stock and Change

7.1. Current Northern Ireland Broad Habitat cover

The most widespread Broad Habitats are *Improved Grassland*, *Neutral Grassland* and *Bog* (Table 2, Fig. 4). There are also large areas of *Coniferous Woodland*, *Arable and Horticultural* and *Fen Marsh and Swamp* Broad Habitats. *Bog*, *Coniferous Woodland* and *Acid Grassland* have a mainly upland distribution (Fig. 4), with *Broadleaved Mixed and Yew Woodland* Broad Habitat located primarily in the lowlands.

Table 2. **Current (1998) estimated stock, standard error (se) and coefficient of variation (cv) of UK Biodiversity Action Plan *Broad Habitat* cover in Northern Ireland.**

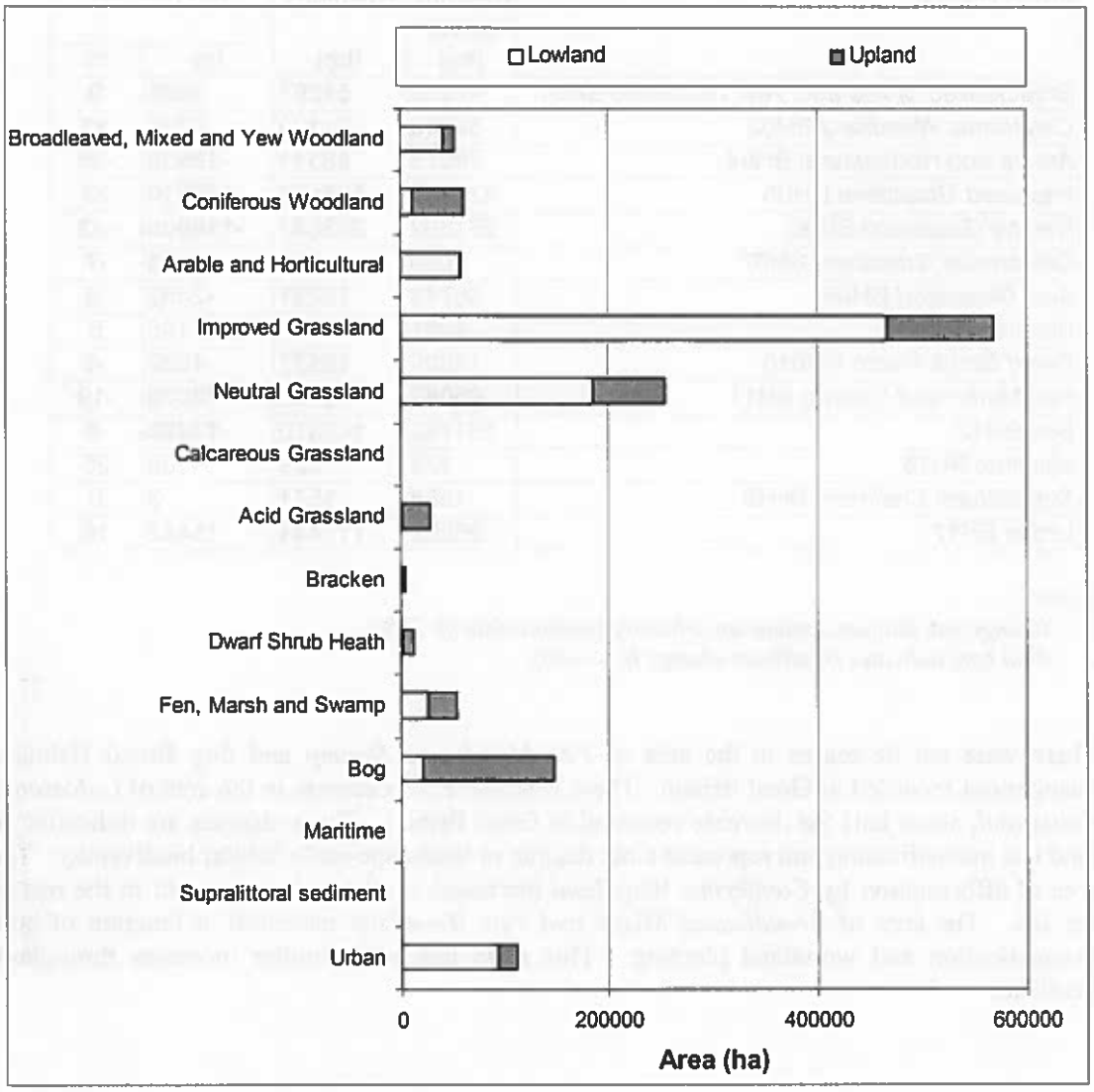
Broad Habitat	NI (ha)	*se (ha)*	NI (%)	*cv (%)*
Broadleaved Mixed and Yew Woodland BH02	51297	*4757*	3.8	*0.3*
Coniferous Woodland BH02	61190	*7532*	4.5	*0.5*
Arable and Horticultural BH04	58541	*7494*	4.3	*0.6*
Improved Grassland BH05	568192	*17651*	42.0	*1.3*
Neutral Grassland BH06	253887	*12673*	18.7	*0.9*
Calcareous Grassland BH07	936	*234*	0.1	*<0.1*
Acid Grassland BH08	28291	*3792*	2.1	*0.3*
Bracken BH09	4426	*835*	0.3	*0.1*
Dwarf Shrub Heath BH10	12577	*2375*	0.9	*0.2*
Fen Marsh and Swamp BH11	53006	*4240*	3.9	*0.3*
Bog BH12	148310	*11682*	11.0	*0.9*
Maritime BH18	529	*270*	0	*0.0*
Supralittoral Sediment BH19	1571	*655*	0.1	*0.0*
Urban BH17	111444	*nc*	8.2	*nc*

Notes:

1. *Boundary and Linear Feature* BH03 is presented in Table 6 as length data.
2. *Montane* BH15 was not recorded in the sample squares.
3. *Standing Open Water and Canals* BH13 was not part of the sample area except for fringing freshwater vegetation.
4. *Rivers and Streams* BH14: rivers >50m wide were not part of the sample area.
5. *Littoral Rock* BH20 and *Littoral Sediment* BH21 without vegetation were not part of the sample area.
6. A large proportion of the *Broadleaved, Mixed and Yew Woodland* BH01 estimate is scrub.
7. *Urban* BH17 was calculated by subtracting land cover estimates from the land area of Northern Ireland (13,542km^2). It currently, therefore, contains some vegetated parcels and bare surfaces. It also currently contains small areas of open water, canals, unvegetated littoral rock and littoral sediment above mean high water. Precise estimates of these areas were not available at the time of publication (*Nc* = not calculated).

Neutral Grassland represents 29% of the United Kingdom resource, *Improved Grassland* 9%, and *Bog* 3% (Haines-Young *et al.* 2000). *Fen Marsh and Swamp* Broad Habitat covers only 4% of Northern Ireland but comprises 9% of the UK resource. In terms of UK figures, therefore, Northern Ireland holds an important part of the *Neutral Grassland* and *Fen Marsh and Swamp* resource.

Figure 4. **Current (1998) estimated stock of UK Biodiversity Action Plan *Broad Habitat* cover in the Northern Ireland lowlands and uplands.**



7.2. Net change

The main net changes in Broad Habitat (Table 3, Fig. 5) were an increase in the area of *Improved Grassland* and a decrease in the area of *Neutral Grassland*. These changes indicate an overall land use intensification (*ie.* increased inputs) during the time between baseline and resurvey. There was also a large net decrease in the area of *Arable and Horticultural* Broad Habitat representing a change in the economic incentives for arable farming. Data derived from *Countryside Survey 2000* (Haines-Young *et al.* 2000), carried out in Great Britain, show that in the Highland zone of Scotland there have been similar reductions in *Arable and Horticultural* and *Neutral Grassland* Broad Habitats and a similar large increase in *Improved Grassland.*

Table 3. **Net change in UK Biodiversity Action Plan *Broad Habitat* cover between 1987/91 and 1998.**

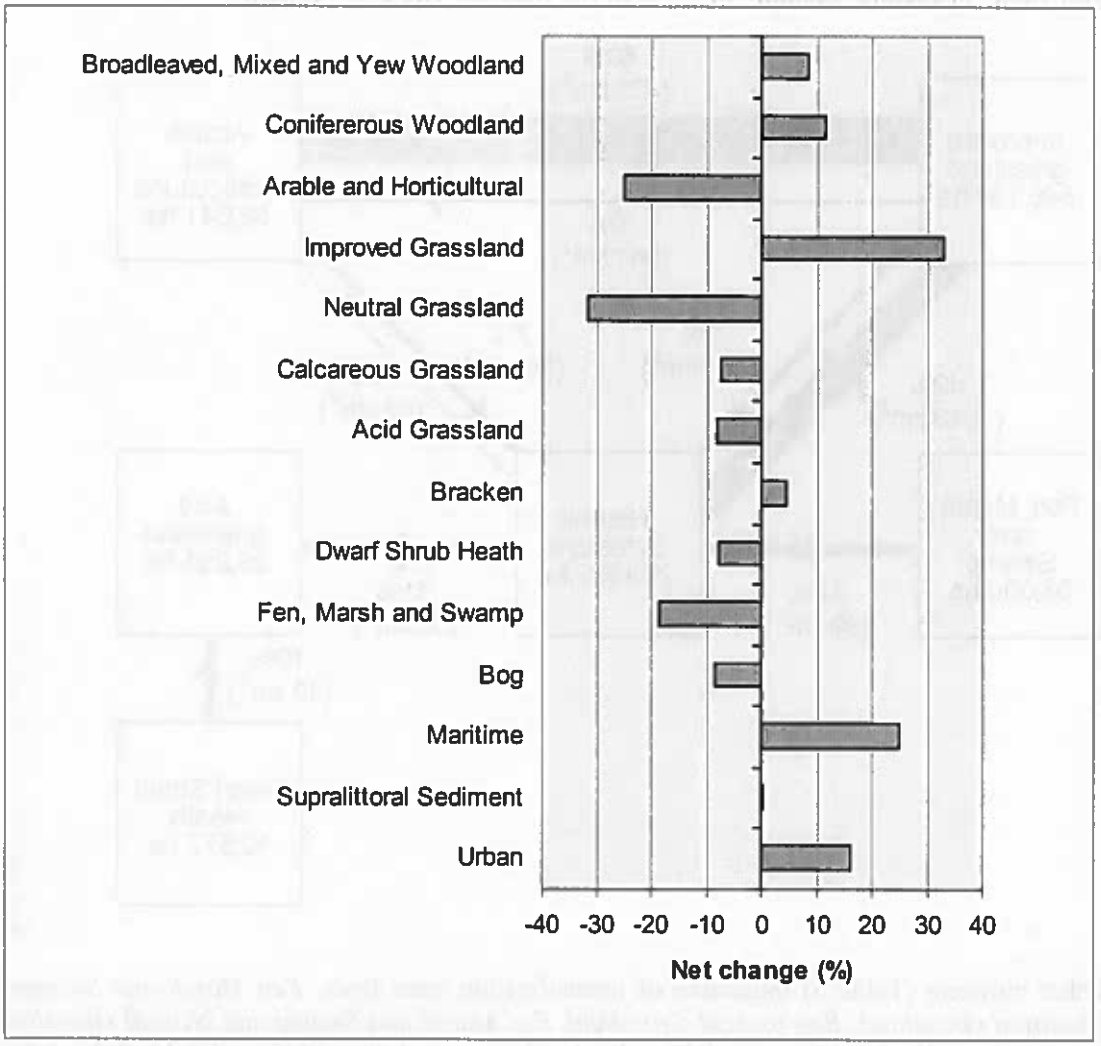
Broad Habitat	Baseline survey (ha)	Resurvey (ha)	Net change	
			ha	%
Broadleaved Mixed and Yew Woodland BH01	47259	51297	**4038**	**9**
Coniferous Woodland BH02	54848	61190	**6342**	**12**
Arable and Horticultural BH04	78079	58541	**-19538**	**-25**
Improved Grassland BH05	427682	568192	**140510**	**33**
Neutral Grassland BH06	371892	253887	**-118005**	**-32**
Calcareous Grassland BH07	1010	936	**-73**	**-7**
Acid Grassland BH08	30743	28291	-2452	-8
Bracken BH09	4231	4426	195	5
Dwarf Shrub Heath BH010	13609	12577	-1032	-8
Fen Marsh and Swamp BH11	65082	53006	**-12076**	**-19**
Bog BH12	161769	148310	**-13460**	**-8**
Maritime BH18	423	529	105	25
Supralittoral Sediment BH19	1568	1571	3	0
Urban BH17	96002	111444	15442	16

Notes:

1. *Change calculations assume an arbitrary baseline date of 1990.*
2. *Bold type indicates significant change ($p < 0.05$).*

There were net decreases in the area of *Fen Marsh and Swamp* and *Bog* Broad Habitats, changes not recorded in Great Britain. There was also a net decrease in the area of *Calcareous Grassland*, about half the decrease recorded in Great Britain. These changes are indicative of land use intensification and represent a net decline in landscape-scale habitat biodiversity. The area of afforestation by *Coniferous Woodland* increased, a change not apparent in the rest of the UK. The area of *Broadleaved Mixed and Yew Woodland* increased, a function of both extensification and woodland planting. This is in line with similar increases throughout Scotland.

Figure 5. **Net Change in UK Biodiversity Action Plan *Broad Habitat* cover between 1987/91 and 1998.**



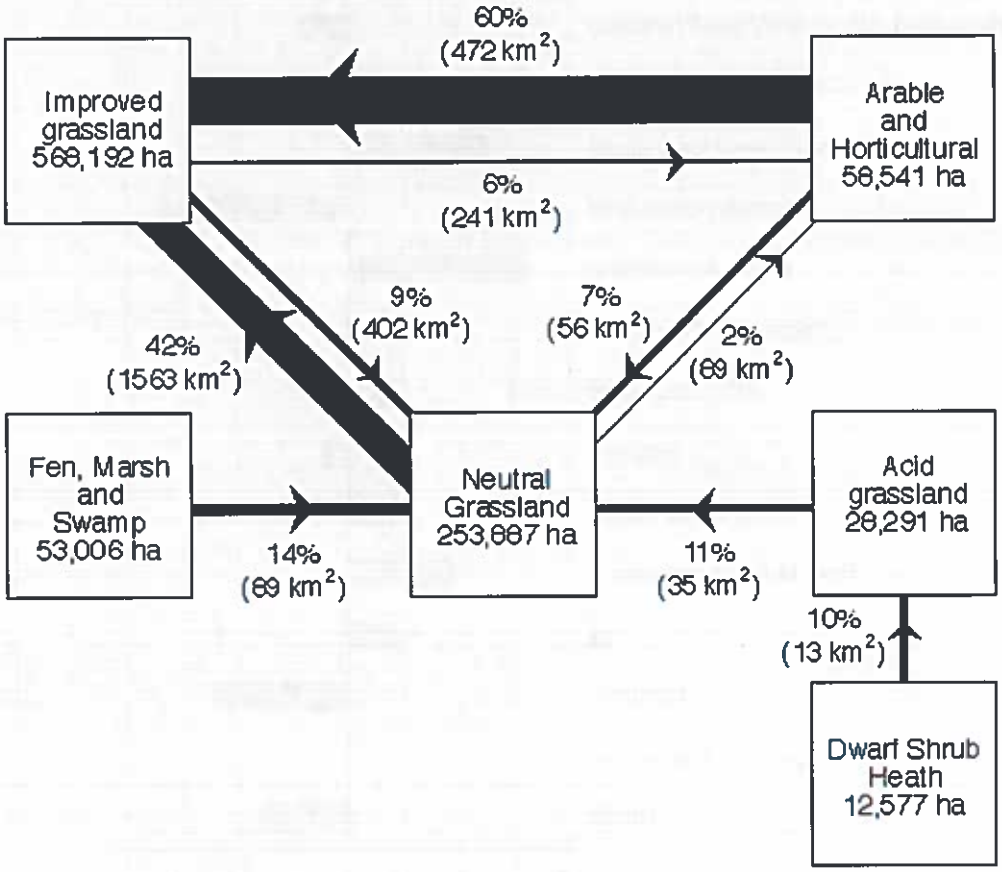
7.3. Stock transfers and turnover

Broad Habitats with the greatest proportion of baseline stock transferring to some other Broad Habitat (Table 4) were *Arable and Horticultural (68%)* and *Neutral Grassland (48%)*. *Fen Marsh and Swamp*, *Dwarf Shrub Heath*, *Acid Grassland* and *Bracken* Broad Habitats were also dynamic, with 21-25% changed to some other type. Broad Habitats with the smallest proportional loss of original stock, signalling relatively stable habitats, were *Maritime* (1%), *Broadleaved Mixed and Yew Woodland* (7%), *Supralittoral Sediment* (8%) *Calcareous Grassland* (9%) and *Bog* (10%). These relatively unchanging Broad Habitats represent much of the biodiversity resource of the Northern Ireland countryside, ranging from high quality, critical natural assets such as oak woodland and active bog, to common habitats such as gorse scrub and cut-over blanket bog.

The main land cover transfers were between *Improved Grassland*, *Arable and Horticultural* and *Neutral Grassland* Broad Habitats (Table 5, Fig. 6), a function of the large area of cultivated land and current farming practices. In particular, large areas of *Arable and Horticultural* and *Neutral Grassland* were converted to *Improved Grassland*. *Fen Marsh and*

Swamp and *Acid Grassland* Broad Habitats were also lost to *Neutral Grassland* and *Dwarf Shrub Heath* Broad Habitat was lost to *Acid Grassland*.

Figure 6. **Main turnover of UK Biodiversity Action Plan *Broad Habitats* between 1987/91 and 1998. Transfers >8000ha or >5% of the baseline stock are shown.**



Other transfers (Table 5) indicative of intensification were from: *Fen Marsh and Swamp* to *Improved Grassland; Bog* to *Acid Grassland, Fen Marsh and Swamp* and *Neutral Grassland; Neutral Grassland* and *Improved Grassland* to *Urban*; and *Neutral Grassland* to *Inland Rock* (largely bare ground). Transfers involving forestry were from *Bog, Fen Marsh and Swamp* and *Neutral Grassland* to *Coniferous Woodland.*

Important transfers involving extensification were *Heath* gain from *Bog, Fen Marsh and Swamp* gain from *Neutral Grassland,* and *Broadleaved Mixed and Yew Woodland* gain from *Neutral Grassland, Improved Grassland* and *Fen Marsh and Swamp.* There was also a significant gain of *Broadleaved Mixed and Yew Woodland* from *Coniferous Woodland.*

Table 4. **UK Biodiversity Action Plan *Broad Habitat* transfers (%) between 1987/91 and 1998.**

Broad Habitat	BH Code	BH Baseline (ha)	BH01 (%)	BH02 (%)	BH04 (%)	BH05 (%)	BH06 (%)	BH07 (%)	BH08 (%)	BH09 (%)	BH10 (%)	BH11 (%)	BH012 (%)	BH16 (%)	BH18 (%)	BH19 (%)	Total loss (%)
Broadleaved Mixed Yew Woodland	BH01	47259	-	<1	<1	2	2	0	<1	<1	<1	<1	<1	<1	0	0	7
Coniferous Woodland	BH02	54848	<1	-	0	<1	<1	0	<1	0	0	<1	<1	0	0	0	1
Arable and Horticultural	BH04	78079	<1	0	-	60	7	0	<1	<1	<1	<1	<1	<1	0	0	68
Improved Grassland	BH05	427682	<1	<1	6	-	9	0	<1	<1	<1	<1	<1	<1	0	0	16
Neutral Grassland	BH06	371892	<1	<1	2	42	-	0	<1	<1	<1	<1	<1	<1	0	0	48
Calcareous Grassland	BH07	1010	3	0	0	2	3	-	<1	<1	0	0	<1	0	0	0	9
Acid Grassland	BH08	30743	<1	<1	<1	3	11	<1	-	2	<1	2	<1	<1	0	0	21
Bracken	BH09	4230	5	<1	0	3	5	0	4	-	3	<1	<1	<1	0	0	21
Dwarf Shrub Heath	BH10	13609	2	<1	<1	2	4	<1	10	1	-	<1	3	<1	0	0	24
Fen Marsh and Swamp	BH11	65082	2	3	<1	4	14	0	<1	<1	<1	-	1	<1	<1	0	25
Bog	BH12	161769	<1	2	<1	<1	<1	<1	1	<1	1	<1	-	2	0	0	10
Inland rock	BH16	105	0	0	0	0	0	0	0	2	0	0	0	-	0	0	2
Maritime	BH18	423	0	0	0	0	0	0	0	<1	0	0	0	0	-	0	<1
Supralittoral Sediment	BH19	1568	<1	0	0	<1	6	0	0	0	0	0	0	2	0	-	8

Notes:

1. *Rows (normal type) show Broad Habitat losses, eg. <1% of Broadleaved Mixed and Yew Woodland was lost to BH02 (Coniferous Woodland).*
2. *Columns (normal type) show Broad Habitat gains, eg. BH05 (Improved Grassland) gained 2% of Broadleaved Mixed and Yew Woodland.*
3. *Significant transfers are in bold type.*
4. *Row total loss to other Broad Habitats: represents percentage change from the original stock (low values equate to stable Broad Habitats).*
5. *Total loss estimates include loss from Urban Broad Habitat.*

Table 5. **UK Biodiversity Action Plan *Broad Habitat* transfers (ha) between 1987/91 and 1998.**

Broad Habitat (BH)	BH code	*BH baseline (ha)*	BH01 (ha)	BH02 (ha)	BH04 (ha)	BH05 (ha)	BH06 (ha)	BH07 (ha)	BH08 (ha)	BH09 (ha)	BH10 (ha)	BH11 (ha)	BH12 (ha)	BH16 (ha)	BH8 (ha)	BH19 (ha)	BH17 (ha)	Total Loss (ha)
Broadleaved Mixed and Yew Woodland	BH01	*47259*	-	70	75	760	988	0	22	1	3	82	300	223	0	0	519	3127
Coniferous Woodland	BH02	*54848*	382	-	0	11	80	0	1	0	0	20	38	0	0	0	127	672
Arable and Horticultural	BH04	*78079*	29	0	-	47186	5604	0	13	11	2	3	25	23	0	0	365	53300
Improved Grassland	BH05	*427682*	1413	250	24107	-	40186	0	0	4	11	20	14	187	0	0	3720	70149
Neutral Grassland	BH06	*371892*	2018	1489	8888	156281	-	0	299	214	88	2906	150	1959	0	0	5122	179913
Calcareous Grassland	BH07	*1010*	29	0	0	16	33	-	4	4	0	0	3	0	0	0	0	90
Acid Grassland	BH08	*30743*	216	191	2	874	3481	2	-	616	266	550	198	148	0	0	35	6608
Bracken	BH09	*4230*	217	2	0	125	200	0	160	-	137	14	1	1	0	0	10	873
Heath	BH10	*13609*	258	77	2	224	503	2	1324	197	-	33	458	99	0	0	30	3211
Fen Marsh and Swamp	BH11	*65082*	1103	2092	411	2741	8879	0	154	24	44	-	768	56	4	0	110	16437
Bog	BH12	*161769*	816	3800	21	1357	1444	12	2394	17	1715	1098	-	3772	0	0	5	16557
Inland Rock	BH16	*105*	0	0	0	0	0	0	0	2	0	0	0	-	0	0	0	2
Maritime	BH18	*423*	0	0	0	0	0	0	0	2	0	0	0	0	-	0	0	2
Supralittoral Sediment	BH19	*1568*	0	0	0	3	89	0	0	0	0	0	0	26	0	-	2	131

Notes:

1. *Rows (normal type) show Broad Habitat losses, eg. 70ha of Broadleaved Mixed and Yew Woodland was lost to BH02 (Coniferous Woodland).*
   Columns (normal type) show Broad Habitat gains, eg. BH01 (Broadleaved Mixed and Yew Woodland) gained 382 ha from Coniferous Woodland.
2. *Urban (BH17) Broad Habitat (hard cover) losses are not presented because baseline stock was unavailable at the time of publication.*
3. *Row-total loss to other Broad Habitats represents all change from the original baseline stock (low values equate to stable habitat).*

8. Field Boundaries

8.1. Current length

There is currently an estimated total length of field boundaries in Northern Ireland of 225,000km (Table 6, Fig.7). This compares with the *Boundary and Linear Feature* Broad Habitat estimated as 1,253,000km for England and Wales and 382,000km for Scotland. Northern Ireland thus holds 13% of the field boundary resource of the UK and has the highest density of field boundaries in the UK at 16.7km per km^2.

Northern Ireland field boundaries consist mainly of *Hedges* (118, 436km), *Earthbanks* (41,051km) and *Fences* (55,026km), with *Drystone walls* (5,568km), *Ruined drystone walls* (3,209km) and *Mortared walls* (2,194km) less common.

Table 6. **Current stock (1998) of UK Biodiversity Action Plan *Boundary and Linear Feature* Broad Habitat.**

	Current stock			
	Length (km)	*Standard error (km)*	Length (km per km^2)	*Coefficient of variation (%)*
Hedge	118436	*3900*	8.8	*3.3*
Drystone Wall	5568	*760*	0.4	*13.7*
Mortared Wall	2194	*357*	0.2	*16.3*
Ruined Drystone Wall	3209	*385*	0.2	*12.0*
Earthbank	41050	*1951*	3.0	*4.8*
Fence	55026	*2016*	4.1	*3.7*
All Field Boundaries	225484	*4263*	16.7	*1.9*

8.2. Net change

There was an overall net loss of 3% of field boundaries from the baseline stock (Table 7, Fig.8). This comprises mainly a 4.5% loss of *Hedges* and a 10.2% loss of *Earthbanks*. Field boundaries showing the main net increase were *Fences* (7.7%). The most important changes in terms of biodiversity are loss of *Hedges* and *Earthbanks*. Changes in the number, length and type of walls and fences impact more on the visual landscape than on wildlife.

Table 7. **Net change (1987/91 to 1998) in UK Biodiversity Action Plan *Boundary and Linear Feature* Broad Habitat.**

	Net change			
	Length (km)	*Standard error*	*Coefficient of variation (%)*	Percent change
Hedge	**-5543**	*551*	*-9.9*	**-4.5**
Drystone Wall	**-423**	*192*	*-45.5*	**-7.1**
Mortared Wall	**241**	*78*	*32.4*	**12.3**
Ruined Drystone Wall	**-453**	*181*	*-40.0*	**-12.4**
Earthbank	**-4681**	*614*	*-13.1*	**-10.2**
Fence	**3924**	*702*	*17.9*	**7.7**
All Field Boundaries	**-6935**	*937*	*-13.5*	**-3.0**

Notes:
1. Urban and rural building curtilage is not shown.
2. Bold type indicates a significant change.

9. Agri-environment Measures

The *Environmentally Sensitive Area* scheme and the *Countryside Management Scheme* are important agri-environment measures that influence Broad Habitats of the enclosed farm landscape. They aim to maintain and enhance the conservation, landscape and historical value of the countryside. Because *Environmentally Sensitive Areas* were established after the *NICS* baseline survey and the *Countryside Management Scheme* has only recently been initiated, the environmental gains have not been assessed here.

Figure 7. **Current (1998) length of UK Biodiversity Action Plan *Boundary and Linear Feature* Broad Habitat.**

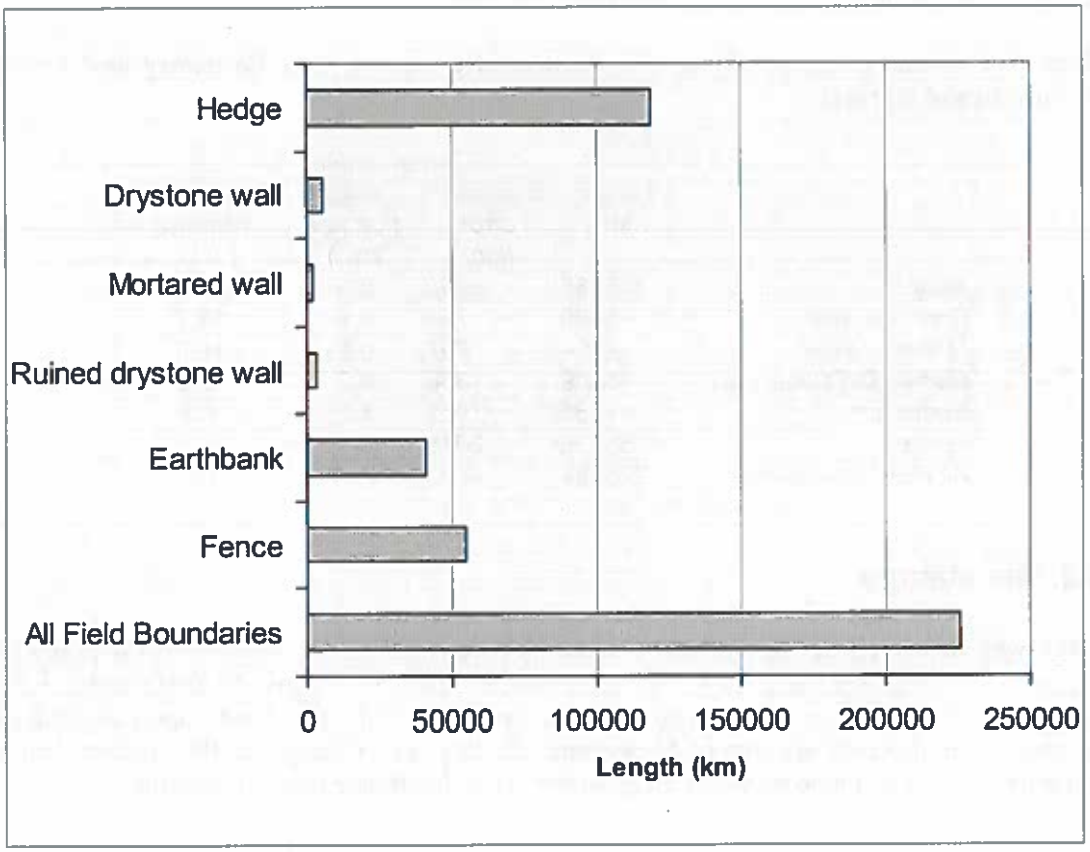
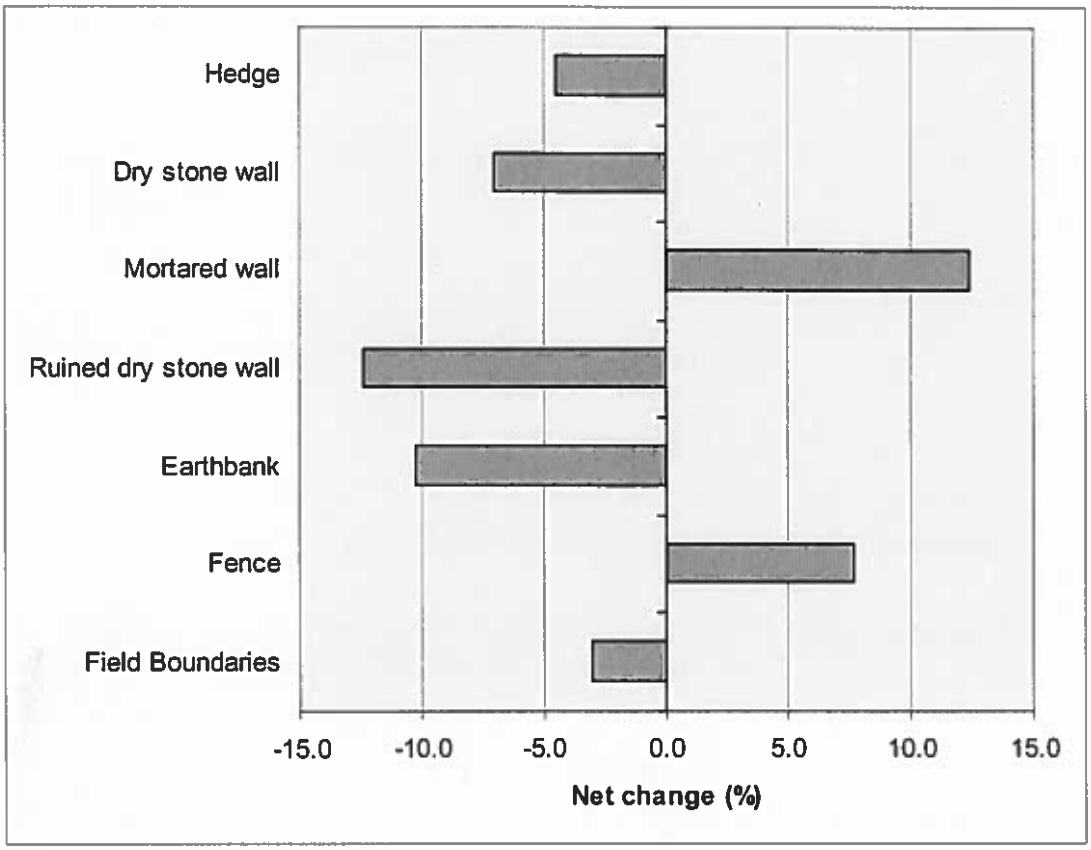


Figure 8. **Significant net change in UK Biodiversity Action Plan *Boundary and Linear feature* Broad habitat between 1987/91 and 1998.**



10. Conclusions

This study is relevant primarily to sustainable management issues involving widespread Broad Habitats at the regional Northern Ireland and United Kingdom scales. Analysis directed at the local scale within Northern Ireland is the subject of a later, more detailed technical report to be published in 2001. To maintain landscape-scale habitat biodiversity, strategies should be directed towards upland *Bog*, *Neutral Grassland* and *Fen Marsh and Swamp* Broad Habitats in the farmed countryside, *Hedges* and *Earthbanks*.

11. References

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