FARMLAND

SEPA

FARMLAND IN PERTHSHIRE

Farming, the only thing of which I know anything, and Heaven above knows, but little do I understand even of that.

ROBERT BURNS

Tayside Biodiversity Partnership

BIODIVERSITY
THE VARIETY OF LIFE

FARMLAND

Introduction

The vast majority of Tayside - stretching from the mountains, hills and glens, through the fertile valleys and straths to the carselands of the coastal plains and estuaries - could be correctly classified as 'agricultural land'. Totalling around 700,000 hectares, this entire area has been influenced by man over thousands of years. From the earliest forms of settled subsistence agriculture around 6,000 years ago to the present day natural habitats have been moulded and modified by the many people who have lived in this rich and varied land.

The area covers the gamut of farm enterprises seen in Scotland: from extensive upland sheep grazing units on semi-natural grasslands all the way through to the highly intensive vegetable and crop growing on the best quality lower land. The Farmland Habitat Action Plans will address the cultivated portion of this land - that which falls under cropping and rotational grasslands; hill and mountain grazings are addressed in the Upland section.

Accounting for just over 200,000 ha., arable land provides the patchwork of fields, hedges, dykes, veteran trees and farm buildings we generally associate with land under cultivation. Combinable crops (malting barley, winter wheat, oats and oilseed rape) are the mainstay of the area's agriculture. The majority of Tayside farms still have a portion of their land down to rotational grassland, used either for grazing sheep and cattle or producing hay or silage for winter feeding. This crop in all its diverse forms - from semi-natural meadows to intensively harvested silage cropping - covers a further 86,000 ha. of land. Other major crops include potatoes (11,000 ha.), vegetables for human consumption (3,500 ha.) and over 1,500 ha of raspberries and strawberries - Tayside has traditionally been the home of the soft fruit industry in Scotland.

Although the overall number of farm units has remained fairly constant there has been a marked change in structure in recent years with the national trend towards larger scale farming operations being offset by an increase in the number of smaller hobby farms. A traditional patchwork of different crop types may still prevail in much of Tayside, but the move towards more intensive management has seen a decline in many habitat types and a wide range of species numbers. Changes from hay to silage as the main means of conserving grass, the liming and fertilising of "unimproved" grasslands and greater use of sprays and fertilisers on cropped land have all reduced the diversity of plant species and with it the habitat range for some animal species.

This trend has been encouraged by UK and EU farm policies which have directly stimulated production whilst indirectly acting as a disincentive to maintain biodiversity. A small change in emphasis has, however, seen the launch of several agri-environmental schemes which have sought to protect and enhance habitats. Farmers have proved keen to become involved in such projects and a large number have come forward for the Environmentally Sensitive Area and the Rural Stewardship Schemes; only the limited funds made available for the Schemes have caused many of the projects to remain unfulfilled.

Managed and cultivated farmland in Tayside forms a very important and distinct complex habitat of its own. It acts as a haven for some of the UK's rarer species - Brown hare, Skylark, Tree sparrow and Grey partridge, as well as locally important species such as Lapwing, the Common frog and Barn owl. Worthwhile populations of these and many other species still exist in farmland habitats across the area - and it is the aim of the Habitat Action Plans to enhance and promote their conservation.

Calcareous and Base-Rich Grassland F1

LORNE GILL/SNH

VALE OF ATHOLL

INTRODUCTION

Calcareous grasslands are found on shallow lime-rich soils, derived from lime-rich bedrocks. Although this Habitat Action Plan primarily covers calcareous grasslands on both in-bye and hill ground, it also covers grasslands overlying base-rich substrates. These grasslands are generally botanically diverse and can support many uncommon plants. Tayside, particularly Perthshire, contains significant areas of these types of grassland. The calcareous and base-rich grasslands are generally managed as grazing land.

In addition, there are a number of small exposures of Limestone Pavement and Granular Limestone. Limestone pavements were exposed by the scouring of ice sheets during the last ice age. Subsequent erosion has formed a complex pattern of crevices (grikes) between massive blocks of limestone (clints). Granular limestone occurs as small friable areas of limestone associated with pavement.

DEFINITION

The UK Biodiversity Steering Group defines calcareous grassland as National Vegetation Communities CG1-14 and divides calcareous grassland into Lowland Calcareous Grassland and Upland Calcareous Grassland. Of these community types, the Lowland grasslands (CG1-9) do not occur in Scotland. As such all the calcareous grassland in Tayside is considered to be Upland Calcareous Grassland at whatever altitude it occurs.

The grasslands over-lying the base-rich rocks and soils are a poor fit into the NVC Communities CG10 and CG11, but they do have similarities in the species they support. Although less species-rich than the official CG10 and CG11, many of the more common species are found. Such calcareous grasslands found in Tayside are defined as CG10: ***Festuca ovina - Agrostis capillaris - Thymus praecox***; CG11: ***Festuca ovina - Agrostis capillaris - Alchemilla alpina***; CG12: ***Festuca ovina - Alchemilla alpina - Silene aucaulis*** (montane grassland); and CG14: ***Dryas octopetala – Silene aucaulis*** (cliff ledges).

This habitat comprises a diversity of grassland characterised by the prominence of calcicolous (calcium-loving) grasses and herbs. Swards tend to be more species-rich than grasslands on more acidic soils and may contain over 60 species per $4m^2$. The montane forms of calcareous grassland are often enriched by a distinctive assemblage of Arctic-alpine plants such as Alpine lady's mantle ***Alchemilla alpina***, Alpine bistort ***Persicaria viviparum***, Moss campion ***Silene acaulis***, Yellow saxifrage ***Saxifraga aizoides***, Purple saxifrage ***Saxifraga oppositofolia*** and Lesser club moss ***Selagainella selaginoides***.

F1 Calcareous and Base-Rich Grassland

KEY SITES

The main areas noted in the biodiversity audit for Tayside are:

Ben Lawers NNR, Beinn a'Ghlo SSSI, Ben Vrackie SSSI and Caenlochan NNR (Glen Doll and Glen Fee). Tulach Hill and Glenfender Meadow SSSIs are partly on Dalradian limestone and include calcareous grassland.

In addition to the SSSI's, there are numerous areas of calcareous grassland located within the Breadalbane area of Highland Perthshire.

SWT have identified Wildlife Sites containing calcareous / base-rich grasslands:

Tigh An Eilein, Glenshee	Edintian Bog, Glen Fincastle
Loch Kinardochy and Tomphubil Limekiln, Tummel Bridge	Creag Mhor, Loch Tummel
Kiltyrie Meadows, Loch Tayside	Gleann Taitneach
Grandtully Meadow, Strathtay	Auchleeks
Gleann Beag, Glenshee	Tonguey Faulds

SWT have also designated the following Wildlife Sites for their Limestone Pavement/Granular Limestone:

Allean Forest Limestone, Loch Tummel	Meall Ban
Trinafour	Lassintulloch

CURRENT STATUS AND EXTENT OF HABITAT

Only a small proportion of the region overlies limestone, but a broader band of mica-schist and calcareous grasslands (NVC CG10 and CG11) is quite widespread in the north and west of Tayside; base-rich igneous rocks occur in the Sidlaw and Ochil hills. At present there is no figure available for the total area of calcareous and base-rich grasslands in Tayside.

Limestone Pavement

Limestone pavement is one of Britain's most threatened habitats and is a scarce and non-renewable resource.

The total area in the UK is less than 3,000 ha. with only a small proportion occurring in Scotland. Such pavements are of both geological and biological importance. The vegetation, often containing unusual combinations, is rich in plants, bryophytes and lichens. It will vary according to geographical location, altitude, rock type and the presence or absence of grazing animals.

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Calcareous and Base-Rich Grassland F1

Calcareous/base-rich grasslands are scattered throughout Tayside wherever there are outcrops of base-rich rocks. The majority of these appear to be in upland areas. Breadalbane has been identified in the UK BAP as one of the three most important areas in the UK for Upland Calcareous Grassland.

There has been no comprehensive survey of grasslands in Tayside and it is therefore not possible to determine their exact status. In addition to the Breadalbane area where these grasslands are relatively widespread there are substantial areas in Atholl and Glenshee, along with pockets in the Ochil and Sidlaw Hills and the Angus Glens, several sites in coastal Angus and in river shingle and well-drained alluvial soils and riverbanks along the rivers Tay and Tummel.

Limestone pavement is a rare habitat in the UK with only a total area of 3,000 ha. widely scattered in Wales, northern England, Northern Ireland and Scotland. The largest areas are found in North Yorkshire and Cumbria. Elsewhere in the UK pavements are found on Carboniferous limestone whereas in Scotland, including the limestone in Tayside, such pavements are found on much older Dalradian limestone.

KEY SPECIES

P = UK Priority Species **C** = UK species of conservation concern

Birds	Black grouse	*Tetrao tetrix*	**P**
Invertebrates	a mason bee	*Osmia inermis*	**P**
	Cuckoo wasp	*Chrysura hirsuta*	**P**
	Northern brown argus	*Aricia artaxerxes*	**P**
	Small blue butterfly	*Cupido minimus*	**C**
	Mountain ringlet	*Erebia epiphron*	**C**
	a micro-moth	*Ancylis tineana*	**C**
	a leaf beetle	*Cryptocephalus primarius*	**P**
	Bumble bees	*Bombus spp.*	
Molluscs	Round-mouth whorl snail	*Vertigo genesii*	**P**
	Geyer's whorl snail	*Vertigo geyeri*	**P**
Plants	Purple colt's foot	*Homogyne alpina*	**C**
	Purple oxytropis	*Oxytropis haller*	**C**
	Alpine fleabane	*Erigeron borealis*	**C**
	Common rockrose	*Helianthemum nummularium*	
	Wild thyme	*Thymus praecox*	
	Alpine lady's mantle	*Alchemilla alpina*	
	Quaking grass	*Briza media*	
	Autumn gentian	*Gentianella amarella*	
	Kidney vetch	*Anthyllis vulneraria*	
	Hair sedge	*Carex capillaris*	
Fungi	Date-coloured waxcap	*Hygrocybe spadicea*	**P**

The calcareous grasslands of the area are important for several rare plant species and Ben Lawers and Caenlochan Glen are among the top sites for alpine plants in the UK. These include Purple colt's foot ***Homogyne alpina*** at Caenlochan NNR, Alpine fleabane ***Erigeron borealis*** on Ben Lawers and Caenlochan and Purple oxytropis ***Oxytropis halleri*** on Ben Vrackie.

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In addition to these rare alpine plants, other plants associated with calcareous/ base-rich grasslands include Rock rose ***Helianthemum nummularium***, Wild thyme ***Thymus praecox***, Alpine lady's mantle ***Alchemilla alpina***, Quaking grass ***Briza media*** and Autumn gentian ***Gentianella amarella***. Another UK priority species is the fungus Date-coloured waxcap ***Hygrocybe spadicea***.

On the limestone pavement Hair sedge ***Carex capillaris*** (a BSBI national scarcity) and Kidney vetch ***Anthyllis vulneraria*** are found.

The flower-rich grassland supports a wide range of insects. Several of these are listed as priority species within the UK BAP - the Mason bee ***Osmia inermis***, for instance, is found only on base-rich upland grasslands and limestone pavement - including a south-facing limestone escarpment near Blair Atholl. A parasite of the mason bee, a Ruby-tailed wasp ***Chrysura hirsuta*** and the Northern brown argus butterfly ***Aricia artaxerxes*** are also found in Tayside.

LORNE GILL/SNH

LORNE GILL/SNH

COMMON ROCKROSE

DAVID WHITAKER

NORTHERN BROWN ARGUS

Wild thyme grows, often in mats, in short limestone turf or even directly on the rock on dry south-facing slopes. Seen here with the low-growing Eyebright *Euphrasia spp.*, Wild Thyme is much appreciated by butterflies and bumblebees. In the Highlands thyme tea used to be popular as an everyday beverage.

The Northern brown argus is a UK BAP Priority Species. Found in scattered colonies across Scotland and Northern England strong populations have been recorded in Highland Perthshire and the Sidlaw Hills where the sulphur-yellow Common rockrose grows. Although the butterfly uses other plants such as Common Storksbill *Erodium cicutarium* and Knapweed *Centaurea spp.* it is dependent upon Common Rockrose as it is the main foodplant for its caterpillars. Single eggs are laid on the upperside of the plant's leaves.

The butterfly's overall decline is due not just to the loss and fragmentation of habitats but also to a change in grassland management practices. It benefits from its habitat undergoing light grazing either by livestock or rabbits to ensure open sward conditions. The species has, however, been recorded as absent from many heavily grazed sites even when there is an abundance of its foodplant.

Other species associated with calcareous grasslands include the Small blue butterfly ***Cupido minimus*** in coastal areas and the Mountain ringlet ***Erebia epiphron*** on upland mica schist. Various Vertigo species of snail are found on calcareous habitats: two UK BAP species are known in Tayside - the Round mouth whorl snail ***Vertigo genesii*** and Geyer's whorl snail ***Vertigo geyeri***.

Calcareous and Base-Rich Grassland F1

NATURE CONSERVATION IMPORTANCE

Calcareous grasslands contain an exceptional diversity of plants, many of which are uncommon or rare.

Base-rich grasslands, although not as diverse as calcareous grasslands, still support a diverse range of plants, which in turn provide feeding and breeding areas for a wide range of insects (including numerous butterfly species), birds such as Black grouse *Tetrao tetrix* and small mammals.

It is estimated there is approximately 55,000 - 66,000 ha. calcareous grassland in the UK (including 31,000 - 41,000 ha. of lowland calcareous grassland which does not occur in Scotland). Approximately 10,000 - 13,000 ha. occurs in Scotland, the most important area being Breadalbane and Atholl in Highland Perthshire. It is not known, however, the true extent of the habitat in Tayside.

NATIONAL BIODIVERSITY CONTEXT

Calcareous Grassland - there is a Broad Habitat Statement in the UK Biodiversity Action Plan for Calcareous Grassland which has the following objective:

> ***"Maintain calcareous grasslands in all parts of the UK where it occurs, and to restore degraded grasslands buffering and linking small, vulnerable and discontinuous sites."***

Measures to be considered further include:

- Protect from inappropriate changes in land use and management;
- Encourage appropriate grazing in lowland areas and reduce the grazing in upland areas without encouraging scrub encroachment;
- Consider how existing measures (ESA's, RSS) might establish links between fragmented sites;
- Provide management advice and encourage appropriate technological and other innovation.

Although written specifically for Calcareous Grassland, the above Objective and Measures are also appropriate to base-rich grasslands.

Limestone Pavement is also a Key Habitat in the UK Biodiversity Action Plan. The objectives of the UK Habitat Action Plan for Limestone Pavement are:

- Ensure that there is no further loss to the extent of limestone pavement areas;
- Ensure that there is no further deterioration in the quality of existing limestone pavement areas;
- Maintain features of geological importance;
- Restore and maintain a characteristic assemblage of native plant species.

CURRENT FACTORS CAUSING LOSS OR DECLINE

A number of factors are adversely affecting the upland calcareous grassland, reducing the extent of the habitat as well as diminishing the quality of the vegetation:

- Agricultural intensification in the form of fertiliser applications, herbicide applications, ploughing and re-seeding are likely to still be damaging and destroying some of the calcareous grasslands. The majority of the calcareous grassland located within the Breadalbane ESA should be protected from such damage by the General Protection Measures;

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- Heavy grazing by sheep, cattle and horses can adversely affect species-richness and structural diversity, with the loss of tall herbs in particular. Invertebrates such as the Northern brown argus are also at risk from heavy grazing. Deer can be a problem in some areas through grazing, trampling and nutrient enrichment. Some rare plants are now confined to inaccessible ledges;
- Supplementary feeding may result in poaching and enrichment of the grasslands, encouraging ruderals such as Creeping thistle *Cirsium arvense*, Dock species *Rumex spp*. and Nettle *Urtica dioica*;
- Very light or absent grazing results in scrub encroachment and the loss of species diversity;
- The spread of Bracken *Pteridium aquilinum* onto calcareous grassland adversely affects species richness and can totally eliminate grasses and herbs;
- Quarrying of limestone at Blair Atholl has resulted in the loss of calcareous grassland, although this is a very localised issue;
- Little information is available about the effects on the habitat by tree planting and woodland regeneration, but it is known that shading by trees, particularly conifers, can adversely affect species richness on both calcareous grassland and limestone pavement;
- Acidification and nitrogen enrichment caused by atmospheric deposition and climate change may have a detrimental effect on calcareous grasslands, but potential impacts have not yet been fully assessed;
- Sites may be vulnerable to damage because of our lack of knowledge regarding current distribution.

MAIN THREATS TO KEY SPECIES

Mason Bee	Loss of herb-rich upland grasslands or moorland with short swards. Inappropriate grazing regimes, including cessation of grazing or grouse-moor management. Direct loss of habitat owing to afforestation. Climate change.	
	UK Importance of Tayside population:	**high** – restricted to one site in Tayside (only one other site known in the UK)
Mountain Ringlet	No obvious threats – population fluctuates widely from natural causes.	
	UK Importance of Tayside population:	**high**
Alpine Fleabane	Grazing pressure from deer and sheep.	
	UK Importance of Tayside population:	**high** – all UK populations are in Tayside
Alpine Gentian	Whilst some grazing is essential, too much, together with trampling by deer and sheep, can be deleterious.	
	UK Importance of Tayside population:	**high** – all UK populations are in Tayside
Purple Coltsfoot	Vigorous competitive vegetation can have serious detrimental effects.	
	UK Importance of Tayside population:	**high**
Purple Oxytropis	Susceptible to over-grazing and trampling.	
	UK Importance of Tayside population:	**high**
Date-coloured Waxcap	Improvement of grassland habitat through ploughing and/or fertiliser application. Reduction of grazing/mowing regimes leading to growth of rank vegetation.	
	UK Importance of Tayside population:	**high**

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OPPORTUNITIES AND CURRENT ACTION

Legal Status

Approximately 4,000 ha. of calcareous grassland in Scotland are protected by SSSI status. Several sites are also found within National Nature Reserves such as Ben Lawers and Caenlochan.

A number of sites in Tayside have also been designated or proposed as Special Areas of Conservation (SACs) under the EC Habitats and Species Directive. These include Tulach Hill and Glenfender Meadows, Ben Lawers, Ben Heasgarnich and Caenlochan.

Breadalbane ESA

A large proportion of the calcareous/base-rich grasslands occurring within the Breadalbane ESA boundary will be protected by the General Protection Measures. In addition individual areas within the in-bye ground will be positively managed with sensitive grazing regimes under the Tier 2 payments.

It is estimated that 2,315 ha. of in-bye herb-rich grassland is protected under the Tier 1 General Protection Measures within the Breadalbane ESA and that 1,470 ha. of in-bye herb-rich grassland receives annual payments for positive management. Although there is no detailed breakdown of grassland communities falling within the "herb-rich grassland" option, it is expected that the majority of these grasslands will be calcareous or base-rich.

Rural Stewardship Scheme/ Countryside Premium Scheme

Areas of calcareous/base rich grassland occurring in Tayside outwith the Breadalbane ESA boundary may be protected and possibly even actively managed under the previous Countryside Premium Scheme (CPS). Figures held by SEERAD cannot be separated into different grassland communities so it is not possible to confirm areas of calcareous/ base-rich grassland protected or managed under CPS.

Incentives are now available through the RSS for the protection and management of calcareous / base-rich grasslands.

Advisory Services

Conservation advisors from SAC and FWAG help farmers identify important habitats on their farm, including calcareous grasslands, and suggest appropriate management.

OBJECTIVES AND TARGETS

	Objectives	Targets
1	To ensure that areas of calcareous, base-rich grassland and limestone pavement are protected from damage, and that where possible areas of this habitat are enhanced, restored and/or extended.	A target of the UK HAP is to achieve favourable condition for at least 75% of (Upland) Calcareous Grassland (i.e. 7,000 - 9,750 ha. in Scotland) through sympathetic management by 2005 or as soon as biologically practical thereafter. A target for Tayside should be between 1,000 ha. and 1,500 ha.
2	Ensure that SAC consultations and designations are concluded.	

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3	Ensure that SSSIs are managed to enhance/extend this habitat.	Ensure that SSSIs containing calcareous grassland are managed sympathetically and where necessary management agreements entered into. A target of the UK HAP is "By 2004, prepare and implement management plans for all SSSI and Natura 2000 sites".
4	Establish the extent and condition of this habitat in Tayside.	Undertake a detailed survey to determine the extent and quality of calcareous grasslands and limestone pavement throughout Tayside.
5	Ensure no losses of this habitat to tree planting or natural regeneration.	Ensure that this rare habitat type is not lost to tree planting or natural regeneration of woodlands.
6	Achieve a target of 75% of calcareous grassland in favourable management by 2006 (1,000 to 1,500 ha. – best estimate).	Maintain calcareous grasslands where they occur in Tayside and attempt to restore or enhance selected areas to buffer and link small, vulnerable and discontinuous sites.
7	Encourage landowners into agri-environment schemes to positively manage calcareous and base-rich grasslands.	Encourage landowners with calcareous grassland to apply for the RSS.
8	Reduce fragmentation of areas of the habitat.	
9	Establish the condition of calcareous grasslands within SSSIs, SACs and agri-environment schemes.	
10	Identify successful techniques to restore degraded sites.	Encourage the restoration of degraded calcareous grasslands and limestone pavements where they buffer or link small or discontinuous sites.
11	Raise awareness of best practice through demonstration sites, farm walks and training days for land managers and advisers.	Encourage the establishment of a demonstration site, with special linkage to agri-environment schemes, to develop and exhibit best practice management techniques.

Stakeholders

- Land owners, managers and advisors, statutory bodies, general public.

Calcareous and Base-Rich Grassland F1

ACTION FOR BIODIVERSITY

		Action - Calcareous and Base-Rich Grassland (inc. Limestone Pavement)	Deliverers		To take place by								Meets Objective No.
			Lead Partners	Partners	02	03	04	05	06	07	11	16	
LBAP Ref.	**A**	**Policy and legislation**											
F1	1	Complete SAC consultation and designation (consultation to be completed by 2004 - designation depends on EU).	SNH				#						i
	B	**Site safeguard and management**											
F1	1	Ensure that SSSIs are managed sympathetically and where necessary Management Agreements entered into - UK HAP target. Natural Care target of 75% under 'assured management' by 2004, and 85% by 2007.	SNH				#			#			ii
F1	2	Maintain grassland survey (to determine the extent and quality of calcareous grasslands throughout Tayside) in the desired survey programme for P&K.	SNH				#	#					iii
F1	3	Liaise with FC when requested to do so to ensure this rare habitat type is not lost to tree planting or natural regeneration of woodlands by ensuring that WGS/FWPS applications are checked against species-rich grasslands identified on the Breadalbane ESA audits (by 2009).	FC	SNH SAC FWAG SWT NTS SNW SEERAD						#			iv
F1	4	Help achieve UK HAP target of favourable condition for at least 75% of calcareous grassland by approving proposals for favourable management under agri-environment schemes.	SNH	SAC FWAG SWT SEERAD			#						v
F1	5	Help encourage the restoration of degraded calcareous grasslands where they buffer or link small or discontinuous sites (by 2009).	SAC FWAG	SEERAD						#			
F1	6	Consider any bid to set up a project to restore a number of degraded sites and monitor restoration projects to identify successful techniques (by 2009).	SNH	SEERAD						#			
	C	**Species management and protection**											
	D	**Advisory**											
F1	1	Encourage landowners with calcareous grassland to apply for RSS and manage the grasslands sympathetically.	SAC FWAG			#	#	#	#	#	#	#	vi
F1	2	Help provide information on the RSS to landowners with calcareous grassland (by 2009).	SAC FWAG	SEERAD						#			
	E	**Research and monitoring**											
F1	1	Provide information on SSSIs and SACs managed under agri-environment schemes (by 2009).	SNH (SSSIs and SACs)	SAC FWAG SEERAD (agri-env schemes)						#			vii
F1	2	Investigate the feasibility of setting up a project to restore a number of degraded sites and monitor restoration projects to identify successful techniques.	SNH	SEERAD SAC FWAG			#	#	#	#	#	#	ix
F1	3	Monitor and review this plan – ensure this plan is being delivered annually and in detail after 5 years.	TBP		#	#	#	#	#	#	#	#	x

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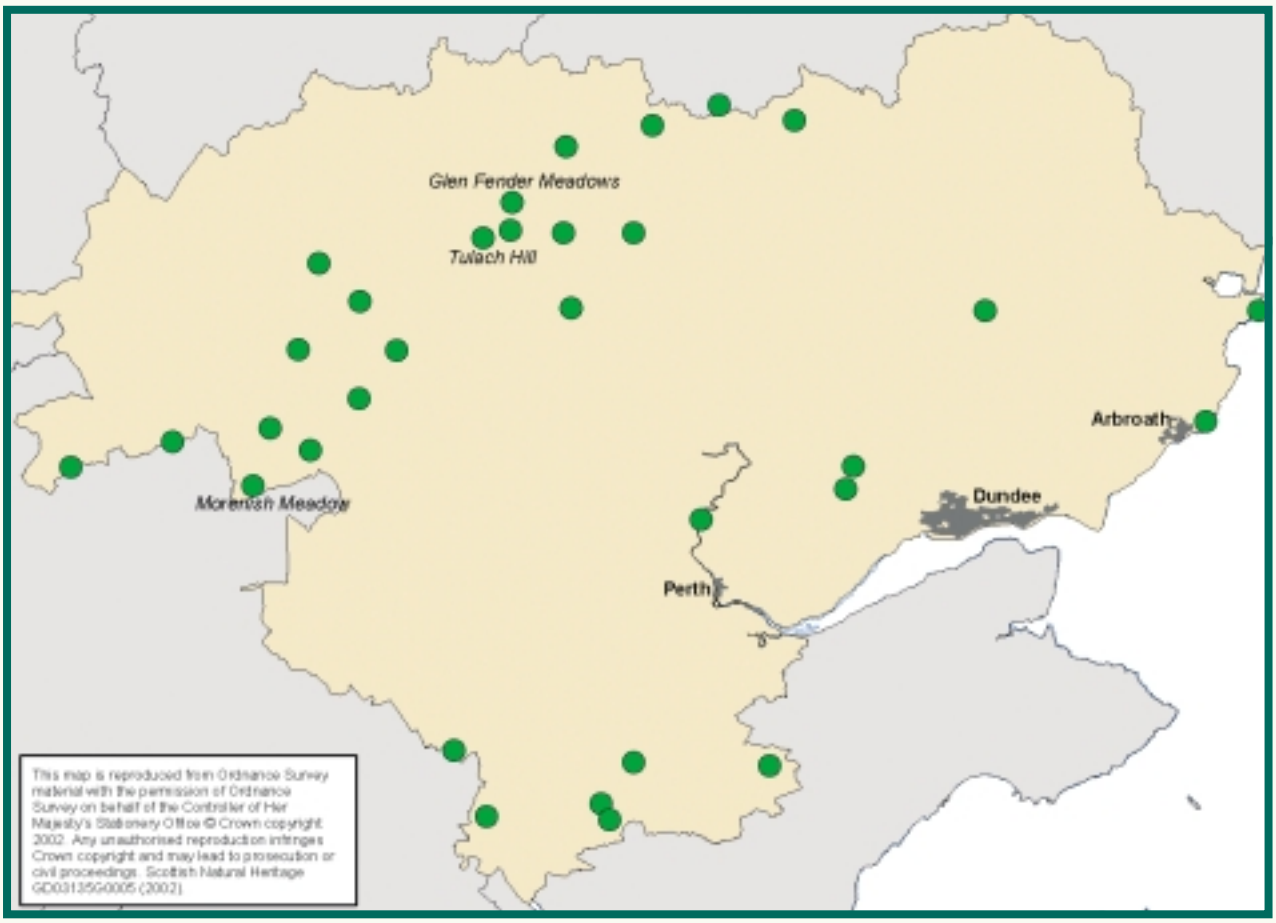
	F	Promotion and Awareness-raising				
F1	1	Work with other organisations to identify and establish a demonstration site, with special linkage to agri-environment schemes, to develop and illustrate best management practice.	SAC	SNH SEERAD FWAG	#	xi
F1	2	Help with the organisation of a series of farm walks/training days for farmers, advisers etc.	SAC FWAG	SEERAD	#	

Calcareous and Base-Rich Grassland

This illustrative map shows a few key examples of the habitat. Please note that many sites of interest are privately owned and owners' permission should be sought for any access.



Farm Buildings F2

LORNE GILL/SNH

NEAR CARGILL, PERTHSHIRE

DEFINITION

Farm buildings are found on almost every farm. They range from old stone and slate steadings to old dwelling houses or modern purpose built metal sheds.

Of particular interest in terms of wildlife conservation are the older steadings and cottages, especially those no longer inhabited, as they can provide both ideal nesting and roosting sites for bats and a wide range of bird species. However, any farm buildings may be utilised if conditions are suitable. Features important to wildlife include eaves, access holes, roof spaces, beams and ledges. Adjacent rough ground, together with nearby trees and hedges are likely to be important for feeding and collecting nest material.

CURRENT STATUS AND EXTENT OF HABITAT

Farm steadings and old cottages are increasingly being renovated, demolished or converted for development purposes. Subsequently, there is a loss of traditional farm buildings on farms. As such there is a loss of suitable shelter and habitat for the bat species and birds such as Barn owl *Tyto alba*, Swift *Apus apus*, House martin *Delichon urbica*, Swallow *Hirundo rustica*, and House sparrow *Passer domesticus*.

Newly constructed farm buildings tend to provide less niches for wildlife. Existing farm buildings are often up-graded in some instances to exclude birds in order to comply with Farm Assurance Schemes, especially where buildings are used for the storage of grain.

As far as is known there is no up-to-date information available on the number or condition of farm buildings in Tayside.

KEY SPECIES

P = UK Priority Species **C** = UK species of conservation concern

Mammals	Pipistrelle bat	*Pipistrellus pipistrellus*	**P**
	Brown long-eared bat	*Plecotus auritus*	**C**
	Natterer's bat	*Myotis nattereri*	**C**
	Daubenton's bat	*Myotis daubentoni*	**C**

F2 Farm Buildings

Birds	Barn owl	*Tyto alba*	**C**
	House martin	*Delichon urbica*	**C**
	Swallow	*Hirundo rustica*	**C**
	Swift	*Apus apus*	
	House sparrow	*Passer domesticus*	

NATURE CONSERVATION IMPORTANCE

Owing to the substantial decline in Barn owl numbers in the past two decades, the key sites for the species in Tayside are probably those which are already in use as roost sites or nest sites, and those within the vicinity of remaining Barn owl populations.

With woodland clearance over the years bats have adapted to, and rely heavily upon, farm buildings for roosting. As many of the species utilising farm buildings are in decline it is important that farm buildings are retained and maintained in a wildlife friendly condition wherever possible.

ECOLOGY AND MANAGEMENT

Species Action Plans will be available for the various species that utilise farm buildings, including Barn owl, Swift and Bats.

Barn Owl

The Barn Owl is a UK Species of Conservation Concern. Although the exact Tayside population is not known, declines have been reported linked to the disappearance of traditional farm buildings and the subsequent loss of nesting and roosting sites. The population decline is also linked to loss of hunting areas and the indiscriminate use of rodentcides around farm buildings.

LORNE GILL/SNH

CURRENT FACTORS CAUSING LOSS OR DECLINE

A number of factors affect the availability and suitability of farm buildings for wildlife:

- Many traditional steadings are no longer suited to modern agricultural purposes and there is no reason to maintain them. Consequently the buildings deteriorate and eventually become unsafe; in many cases this leads to either demolition or conversion to housing;
- Unless traditional farm buildings are classified as Listed Buildings there is no grant assistance available to maintain or restore them;
- Many timber treatments are toxic to bats;
- Building restoration may eliminate essential features such as holes, cracks and lofts used by wildlife;
- Entrances to farm buildings may be deliberately blocked to exclude wildlife in order to comply with Farm Assurance Schemes;
- Rodenticides used in and around farm buildings can be detrimental to owls and other birds of prey, particularly red kites;
- New farm buildings tend not to be wildlife-friendly.

Farm Buildings F2

MAIN THREATS TO KEY SPECIES

Bat spp.	Loss of hibernation sites and maternity roosting sites. Insufficient insect food. Inappropriate use of timber treatment chemicals.	
	UK Importance of Tayside population:	**moderate**
Barn owl	Loss of nest sites. Rodenticide poisoning. Lack of surrounding rough ground or field margins to hunt over.	
	UK Importance of Tayside population:	**moderate**
Swallow	Loss of nest sites Insufficient insect food Lack of building materials (especially mud) from loss of wetland habitats and farm ponds	
	UK Importance of Tayside population:	**moderate**
Swift	Loss of nest sites Insufficient insect food	
	UK Importance of Tayside population:	**moderate**

OPPORTUNITIES AND CURRENT ACTION

Legal Status

Planning permission is required where farm steadings are to be converted for non-agricultural use.

Local authorities also have a legal responsibility to establish the presence of Barn owls, bats and other protected species under the Wildlife and Countryside Act before building work commences and to require mitigation as part of the restoration work.

Any bat roost, whether currently occupied or not, is protected by law. In addition to it being an offence to deliberately kill, injure, sell or possess a bat, it is an offence to disturb a bat whether in a roost or not, damage, destroy or obstruct access to a roost. Repairs, maintenance or alterations to buildings can adversely affect bats and their roosts. Advice must be sought from SNH before any work is carried out that could affect their roosts.

Pipistrelle

Britain's smallest bat, the Pipistrelle, would fit into a matchbox, yet each bat can eat up to 3,000 insects during one night's feeding.

Bats need somewhere cool in the winter so that they can hibernate safely. During the summer females seek out somewhere warm to have their young. These 'maternity roosts' tend to be used for only a short time, but the loss of such a roost can wipe out all the bats over a wide area, so it is vital that these are protected.

RSPB

Barn owls are listed on Schedule 1 of the Wildlife and Countryside Act 1982 affording them special protection from disturbance.

F2 Farm Buildings

Planners can play a significant role in promoting and encouraging awareness of the wildlife that utilises farm buildings. Architects, developers and planners can all encourage specific building designs which retain space for wildlife: for example Barn owl loft windows and landing ledges and Swift nest-bricks.

Some farm buildings may be listed and therefore any repairs or renovations have to be agreed by Historic Scotland.

Agri-environment Schemes

Some farm buildings will be protected under the General Environmental Conditions of agri-environment schemes if they have been identified as being of historic interest.

Advisory Services

Conservation advisers from SAC and FWAG work with farmers identifying features on their farms which are of value to wildlife. SNH and local Bat Groups are available to advise on bat issues.

OBJECTIVES

	Objectives
1	Ensure that farm buildings in Tayside continue to provide nesting and roosting opportunities for those species which depend upon them.
2	Ensure that legal protection afforded to wildlife utilising buildings is fully understood by the three local authorities and that legal protection is enforced where protected species are affected by buildings works.
3	Encourage planning departments to have a pro-active approach in promoting building design which encourages wildlife.
4	Encourage new farm buildings to be more wildlife-friendly.
5	Determine which farm buildings are utilised by Barn owls.
6	Investigate the possibility of setting up a grant scheme for maintaining or enhancing farm buildings used by Barn owls.
7	Ensure landowners provide additional or alternative nest/roost sites when building work takes place (i.e. when protected species are not actively utilising the building).
8	Ensure that farm buildings are attractive to wildlife by encouraging the retention or creation of suitable foraging habitat close to the buildings.
9	Ensure that the new Farm Business Development Scheme (FBDS) is not detrimental to wildlife.
10	Increase farmers' and pest control companies' awareness of the potential threats to owls and other birds of prey, posed by the use of rodenticides around farm buildings.
11	Provide winter feeding opportunities for birds traditionally associated with farm steadings.

Stakeholders

- Landowners, managers and advisors; statutory bodies and local authorities; community councils; architects, developers and construction companies; pest controllers, local bat groups, general public.

Farm Buildings F2

ACTION FOR BIODIVERSITY

		Action - Farm Buildings	Deliverers		To take place by								Meets Objective No.
			Lead Partners	Partners	02	03	04	05	06	07	11	16	
LBAP Ref.	**A**	**Policy and legislation**											
F2	1	Work with Angus, Dundee and Perth and Kinross Councils to ensure that legal obligations regarding protected species are met.	SNH	PKC DCC AC RSPB Bat Groups		#	#	#	#	#	#	#	i
F2	2	Develop and run a series of seminars for planners on the legal responsibilities of planning departments and also to encourage building designs which can encourage wildlife.	TBP	SNH NTS RSPB Bat Groups		#	#	#	#				i, ii
F2	3	Encourage wildlife-friendly features to be incorporated into Farm Business Development Scheme (FBDS) applications for the conversion of redundant farm buildings.	FBDS Project Officers	SAC FWAG			#						viii
	B	**Site safeguard and management**											
F2	1	Organise a survey to determine which farm buildings are utilised by Barn owls.	Barn Owl Interest Group	NTS SAC FWAG	#	#	#						iv
F2	2	Investigate the possibility of a grant scheme for maintaining/enhancing farm buildings used by Barn owls.	Barn Owl Interest Group	SNH SAC FWAG RSPB		#	#	#	#				v
F2	3	(i) Encourage landowners to provide alternative roosting sites/nesting sites when building work is being undertaken. (ii) Produce an awareness-raising leaflet.	PKC DCC AC	TBP Bat Groups SNH		#	#	#	#	#	#	#	vi
	C	**Species management and protection**											
F2													
	D	**Advisory**											
F2	1	Provide advice to landowners and encourage them to retain/create suitable foraging habitat close to farm buildings (rough grass, hedges, trees, ponds, puddles, etc.).	SAC FWAG	SWT SNH	#	#	#	#	#	#	#	#	vii
	E	**Research and monitoring**											
F2	1	Monitor the implementation of this plan; ensure this plan is being delivered annually and review in detail after 5 years.	TBP			#	#	#	#	#	#	#	
	F	**Promotion and awareness-raising**											
F2	1	Work with companies constructing new farm buildings (e.g. Knapp, Algo) to incorporate nest sites, ledges etc. into new farm buildings. These could be self contained so as to comply with Farm Assurance Schemes.	SAC	RSPB FWAG SNH		#	#	#	#				iii
F2	2	Develop a project to increase farmers' awareness of the potential threats posed by the use of rodenticides around farm buildings (particularly second generation rodenticides).	SAC FWAG	RSPB SNH		#	#	#					ix
F2	3	Develop a project to encourage farmers to use waste grain/tailings to feed birds during the winter months.	RSPB SAC FWAG			#	#	#	#	#	#		x

Hedgerows and Treelines F3

LORNE GILL/SNH

NEAR CARGILL, PERTHSHIRE

DEFINITION

Hedgerows are generally classified as continuous linear scrub less than 4m high. Within the context of this Habitat Action Plan hedges will include boundary features such as hedgerow trees and treelines. Extended hedges are lengths of hedgerow adjoined by wide grassy margins left unploughed in arable areas and fenced off in areas grazed by livestock.

CURRENT STATUS AND EXTENT OF HABITAT

Hedgerows remain an integral part of the lowland farm landscape in Tayside. Whilst important for cultural and landscape reasons, hedges play a vital part in maintaining the biodiversity of Tayside. Significant lengths of hedgerow exist throughout the region, although the length of hedge lost between 1940 and 1980 was around 1,000km - 25% of the estimated total of 4,000km.

Whilst conservation management techniques for hedgerows are generally well known, neglect and decline in the quality and quantity of hedgerows still occurs in Tayside and throughout the UK.

KEY SPECIES

P = UK Priority Species **C** = UK species of conservation concern

Mammals	Stoat	*Mustela erminae*	**C**
	Weasel	*Mustela nivalis*	**C**
	Common shrew	*Sorex araneaus*	**C**
Birds	Grey partridge	*Perdix perdix*	**P**
	Bullfinch	*Acanthis cannabina*	**P**
	Linnet	*Pyrrhula pyrrhula*	**P**
	Reed bunting	*Emberiza schoeniclus*	**P**
	Song thrush	*Turdus philomelos*	**P**
	Yellowhammer	*Emberzia citrinalla*	**C**
	Tree sparrow	*Passer montanus*	**P**

Invertebrates	Ringlet butterfly	*Aphantopus hyperantus*	
Plants	Oak	*Quercus robur*	
	Ash	*Fraxinus excelsio*	
	Hawthorn	*Crataegus monogyna*	
	Blackthorn	*Prunus spinosa*	
	Common knapweed	*Centaurea nigra*	

NATURE CONSERVATION IMPORTANCE

Lengths of hedgerow play an important role in the maintenance of species diversity. Much of the land in Tayside consists of cultivated arable or intensively managed grassland. These land use types provide only a limited amount of habitat for invertebrate, bird and mammal species. Therefore field boundary features have an extremely important role to play in terms of maintaining farmland biodiversity. Over 600 species of plant, 1,500 of insects, 65 birds and 20 species of mammals have been recorded feeding or living in hedgerows at some point in their life cycle.

Sympathetic management also determines the conservation importance of hedges. Large, wide, bushy hedges support about 19 different species of bird whilst mechanically tidy, frequently cut hedges support only about 8 breeding species.

Hawthorn

Our word for hedge derives directly from the Saxon "haeg"; hawthorn means "hedge-thorn" having been intrinsically part of our hedgerow tradition for well over a millennia. Many plants and animals are eponymously associated with hedges – Hedgehog *Erinaceus europaeus* and Hedge parsley *Torilis spp*. to name but two. There are in fact over forty traditional hedge names used for a wide variety of species throughout the UK including the 'hedge sparrow', a name once commonly used for the Dunnock *Prunella modularis*.

Much planted during the 18th century, the hawthorn is still used as the main shrub in our hedges today as its spiny character deters livestock from straying. Left to grow on, the hawthorn becomes a small bushy tree much loved for its 'may blossom'. There are over 1,000 different species of Hawthorn throughout the world.

LORNE GILL/SNH

"The Bread and Butter" Tree has long been used by man not only to stave off hunger, but since the 19th century it has been widely used on a global scale as a heart tonic to regulate circulation. It also helps lower cholesterol, aids digestion and has a mild sedative action. Over 200 European commercial medicines use hawthorn as their main constituent.

Hedgerows can offer nest sites for UK Biodiversity Action Plan species such as Song thrush ***Turdus philomelos*** and Linnet ***Pyrrhula pyrrhula***, whilst Grey partridge ***Perdix perdix*** and Yellowhammer ***Emberzia citrinalla*** often nest on the ground in the bottom of hedges, particularly where there is a wide grass margin. Yellowhammers and Song thrushes also rely on hedgerow trees as song posts, whilst Kestrels ***Falco tinnunculs*** and Barn owls ***Tyto alba*** often use them for hunting.

Old trees often found in hedgerows and treelines provide important roost sites for bats such as Pipistrelle ***Pipistrellus pipistrellus***, Natterer's ***Myotis nattereri*** and Daubenton's ***Myotis daubentoni***. Birds, including the Tree sparrow ***Passer montanus***, whose numbers have plummeted to only 11% of their original population, use holes in dead trees for nesting. Many invertebrate, lichen and fungi species are associated with old hedgerow trees, especially oak.

Hedgerows and Treelines F3

Hedges are also excellent ways of linking different wildlife sites providing 'wildlife corridors'. Bats use hedges as navigation aids and prefer flying along hedges and treelines than to flying across large fields. Other species, particularly invertebrates such as spiders, ground beetles and hoverflies are often found in hedge bottoms and tussocky field margins. All these insects are significant in assisting with pest control, the hoverflies also playing an important role as pollinators.

Whilst hedgerow trees and treelines can enhance biodiversity there are some situations where their introduction is less desirable. Ground nesting birds such as the Grey partridge will avoid areas where trees are present. Wading birds such as Lapwing *Vanellus vanellus* and Redshank *Tringa totanus* and songbirds such as Skylark *Alauda arvensis* need open areas for nesting: they avoid wooded areas in order to reduce their risk of nest predation. In areas of Grey partridge habitat hedgerow trees should be no closer than one every 100 metres.

RSPB

Yellowhammer

The Yellowhammer is found on farmland throughout the UK. Slightly larger than a chaffinch it is notable for its yellow head and rusty red rump. It generally nests in hedges, scrub, grassy margins and small plantations and feeds on seeds and berries. Together with the Song Thrush, it relies on mature hedgerow trees which it uses as song posts to reinforce its territory during the breeding season. The population has seen a decline of 5% in the last 25 years.

NATIONAL BIODIVERSITY CONTEXT

"The UK Biodiversity target for hedgerows is to halt all loss of ancient and species-rich hedgerow by 2005. A target has been set for the favourable management of 50% of species-rich and ancient hedgerows by 2005."

ECOLOGY AND MANAGEMENT

Poor management of hedgerows is a contributory factor in the decline of the length and quality of hedgerows in Tayside. A recent survey of farmers in England suggests that hedges are not managed to best effect and anecdotal information suggests the same is true of hedgerows in Tayside. In England 80% of hedges were trimmed annually although most land managers were aware that less frequent trimming is better for wildlife. Only 6% of hedges were trimmed in January / February the recommended month for carrying out work.

The greatest variety of birds will be found in dense hedges at least 2m tall, although for birds to breed successfully hedges need to be 1.4m tall and at least 1.2m wide so that nests can be hidden from predators. A good mix of shrub species will provide winter food for a variety of birds, provided the hedges are trimmed every second year and in late winter. Hedges also provide cover for flocks of finches feeding on winter stubble. Tall roadside hedges on upland habitats and grassland will also deter Barn owls flying into the path of traffic.

CURRENT FACTORS CAUSING LOSS OR DECLINE

- Field enlargement has been the main factor resulting in loss of boundary features.
- Current economic factors in farming mean that the majority of new hedge planting will be carried out only with financial assistance.
- The almost universal use of stock fencing as a means of retaining stock has meant that hedges as stock-proof barriers are no longer necessary and therefore may be lost.

F3 Hedgerows and Treelines

- The majority of farmland hedges are cut on a yearly basis, generally in late summer. This management results in a gradual decline in the quality of hedgerows as well as greatly reducing the number of berries left as food for birds throughout the winter months.
- Farm operations can often have an impact on hedgerows. Spray drift and fertilisers in hedge bottoms can often encourage undesirable species such as Cleavers *Galium aparine*. Ploughing too close to the hedge can damage roots thus weakening plants and hedgerow trees.
- Lack of replacement of fallen hedgerow trees.

Case Study

Cockerstone Farm

Cockerstone Farm is a mixed farm 7 miles north-west of Perth. The 131 hectare farm has a range of livestock and arable crops. It is part of the SNH / Eagle Star Strathord Estate Initiative, a project set up to demonstrate good practice in the creation and management of on-farm habitats for conservation.

It was agreed that the farm would provide an opportunity to demonstrate how an agri-environmental scheme could benefit an average family farm and to test different management options and prescriptions which could inform future replacements for existing schemes. The project, starting in late 2002, will also look at alternative methods and criteria for the payment to farmers for environmental management and any training requirements that may be required to achieve this.

LORNE GILL/SNH

HEDGE PLANTING

One of the aspects the project will focus on is hedgerows and their management. As part of the scheme 360m of old 'gappy' hedge will be coppiced to provide young vigorous stems to rejuvenate the hedge. Other work will include 450m of new hedge planting. Different techniques of establishment and management will be tried and demonstrated.

MAIN THREATS TO KEY SPECIES

Bat spp.	Loss and fragmentation of hedgerows, especially hedge 'flyways' and wildlife corridors. Removal of mature trees used as roosts.	
	UK Importance of Tayside population:	**moderate**
Song thrush	Removal of mature trees leads to loss of song posts and territory boundaries. Reliant on a good source of food throughout the winter, especially insects, berries and fallen fruit.	
	UK Importance of Tayside population:	**moderate**
Linnet	Inappropriate hedge management will remove hedge-top perches the birds use during breeding. Winter flocks rely on ground feeding in fields; during the summer they rely on hedges for insects.	
	UK Importance of Tayside population:	**moderate**

Tree sparrow	Loss of nesting sites when mature trees are removed or hedges over-trimmed. Winter flocks rely on ground feeding in fields; during the summer they rely on hedges for insects.	
	UK Importance of Tayside population:	**moderate**
Native Tree spp. (inc. oak, ash, holly and hawthorn)	Damage to tree roots because of ploughing too close to hedges. Inappropriate hedge management damages health of hedge and destroys young standard trees. Inappropriate removal of standing dead wood or tidying away of fallen trees from field corners.	
	UK Importance of Tayside population:	**small**

OPPORTUNITIES AND CURRENT ACTION

The Rural Stewardship Scheme (RSS) introduced in 2001 to replace the Countryside Premium Scheme includes options for:

- the planting of new hedgerows
- management of existing hedgerows
- management of extended hedges

The Scheme, given adequate funding, provides the best opportunity to improve the amount and quality of hedgerows throughout Tayside.

If agreement holders under the previous Countryside Premium Scheme are given the option of continuing the positive management of options they have already started (including hedgerow creation and management), the biodiversity benefits will continue.

Both FWAG and SAC employ advisers who can provide farmers with advice on how to manage hedgerows for biodiversity. Some of this advice is available free of charge to the farmer or landowner.

OBJECTIVES AND TARGETS

	Objectives	Targets
1	Prevent further decline in the length and quality of hedgerows and treelines in Tayside.	No decline in length and quality of hedgerows after 2010.
2	Identify the true extent and quality of hedgerows in Tayside. Monitor hedgerow loss as well as levels of new planting.	Identify and begin monitoring by 2005.
3	Encourage appropriate management to maintain and enhance hedgerow quality. Inform and educate farmers and land managers as well as providing training to operators carrying out hedge cutting.	Set up regular training courses and a co-ordinated awareness-raising programme by 2003.
4	Aim to have a significant percentage of hedgerows under good management by 2010.	25% of hedgerows under positive management
5	Restore past hedgerow lines and create new hedges to link existing habitat features. Encourage the use of agri-environment schemes to plant new hedges and extended hedges where appropriate.	Aim to have 50% of farms in Tayside entered into an agri-environment scheme containing some new hedgerow creation.

F3 Hedgerows and Treelines

Stakeholders

- Landowners (including commercial landowners), land managers, contractors, road and rail consultants, advisory bodies, government bodies, general public.

ACTION FOR BIODIVERSITY

		Action - Hedgerows and Treelines	Deliverers		To take place by								Meets Objective No.
			Lead Partners	Partners	02	03	04	05	06	07	11	16	
LBAP Ref.	**A**	**Policy and legislation**											
F3	1	Where appropriate make available information on grant-aid for management, creation and restoration of hedgerows.	FWAG SAC	SEERAD SNH	#	#	#	#	#	#	#	#	
F3	2	Investigate the implementation of legislation to protect hedgerows and prevent further decline in length or quality.	SNH		#	#	#	#					
	B	**Site safeguard and management**											
F3	1	Encourage the use of agri-environment schemes to plant new hedges where appropriate.	NFUS SLF	FWAG SAC SNH	#	#	#	#	#	#	#	#	
F3	2	Encourage appropriate management of hedgerows including less frequent cutting and the restoration of gappy hedges.	FWAG SAC	SLF NFUS	#	#	#	#	#	#	#	#	
	C	**Species management and protection**											
F3													
	D	**Advisory**											
F3	1	Ensure adequate advice is available to all landowners on grants and best practice.	FWAG SAC		#	#	#	#	#	#	#	#	
F3	2	Ensure training and advice is available to farmers, land managers and operators carrying out hedge cutting.	TBP		#	#	#	#	#	#	#	#	
	E	**Research and monitoring**											
F3	1	Identify the true extent and quality of hedgerows in Tayside and monitor hedgerow decline and new planting.	SNH	TBP	#	#	#	#					
F3	2	Monitor and review this plan – ensure this plan is being delivered annually and in detail after 5 years.	TBP		#	#	#	#	#	#	#	#	
	F	**Promotion and awareness-raising**											
F3	1	Promote the importance of hedges and treelines through all advisory groups and interested organisations.	TBP		#	#	#	#	#	#	#	#	

Stone Dykes F4

LORNE GILL/SNH

DRYSTANE DYKE

DEFINITION

Dykes, whether dry stone or mortared, are found throughout Tayside. The great dyke-building period in Scotland was from 1750 -1850 following the Enclosure Acts. Many of these linear features have lasted 200 years. Primarily of landscape and stockholding importance, dykes also have a role to play in terms of wildlife conservation particularly for invertebrates and small mammals. Drystone dykes were, historically, the dominant field boundaries where rocky outcrops, thin soils and climate made the use of hedgerows impractical. Lowland, more fertile regions also contain a significant number of drystone walls.

CURRENT STATUS AND EXTENT OF HABITAT

Many dykes are in poor or very poor condition. Whilst some have the potential to be restored there are many that are beyond repair. In central Scotland it is estimated that only 14% of dykes are in good stockproof condition. 49% are in the advanced stages of dereliction and are unlikely to be rebuilt. The remaining 37% are in poor condition but have the potential to be restored.

KEY SPECIES

P = UK Priority Species **C** = UK species of conservation concern

Mammals	Stoat	*Mustela erminea*	**C**
	Weasel	*Mustela nivalis*	**C**
Birds	Wheatear	*Oenanthe oenanthe*	**C**
	Stonechat	*Saxicola torquata*	**C**
	Whinchat	*Saxicola rubetra*	**C**
Amphibians and Reptiles	Slow-worm	*Anguis fragilis*	**C**
	Common Frog	*Rana temporaria*	**C**
	Common Toad	*Bufo bufo*	**C**
	Common Lizard	*Lacerta vivipera*	**C**

Invertebrates	a mason bee Bumble bees	*Osmia parietina* *Bombus spp*	**P**
Plants	Saxifrage spp. Maidenhair spleenwort Lichen spp. Liverworts and Mosses spp.	*Saxifraga spp* *Asplenium trichomanes*	

NATURE CONSERVATION IMPORTANCE

Dykes contain numerous holes and cracks that provide growth, shelter and nest sites for a variety of plants and animals. Pioneer plants such as lichens and mosses colonise walls in unpolluted areas, these in turn providing rooting for the Saxifrage species and ferns such as Maidenhair spleenwort *Asplenium trichomanes*. Insects (spiders, woodlice, bees and wasps for example) utilise walls and species such as the Stoat *Mustela erminea* can use them as cover and hunting ground. Wheatear *Oenantte oenantte* often nest in dykes.

In terms of nature conservation importance fallen or derelict dykes can often be equally important as standing dykes. This is particularly the case in the more intensively farmed areas where fallen dykes and their associated grassy margins provide cover and habitat for a wide range of species.

LAURIE CAMPBELL

The **Slow Worm** *Anguis fragilis* is a common inhabitant of drystone dykes. Though often mistaken for a snake the slow-worm is, in fact a legless lizard - and it can move quite fast if disturbed. Slow-worms like warmth and live on sunny banks and hillsides where there is good cover such as grass, scrub or stones.

NATIONAL BIODIVERSITY CONTEXT

Although there is no UK Action Plan for dykes the National Habitat Statement suggests that targets similar to those for hedges should be aspired to.

Owing to the specialist knowledge needed to record the many lichen, moss and fern species in Tayside, their distribution and status is not generally known.

There are, however, a number of factors affecting the many species found on stone dykes - air pollution, for instance, especially from diffuse sources such as motor vehicles which raise concentrations of ammonia in the air. This can subsequently result in the decline of the rarer lichens that depend on nutrient-poor conditions. Localised nutrient enrichment can also occur where livestock concentrate in one area or where dung or fertilisers are spread.

LORNE GILL/SNH

Ophioparma sp.

Excess shade from shrubs and trees can affect some mosses and lichens on drystone dykes. Recreational use can also cause local damage, i.e. by indiscriminate climbing on to walls or trampling of lichens and ferns.

ECOLOGY AND MANAGEMENT

The majority of dykes are left unmanaged and any reconstruction of dykes is normally carried out with grant aid from an agri-environment scheme. A large amount of dyke restoration has been carried out as part of the Breadalbane Environmentally Sensitive Area Scheme.

Stone Dykes F4

CURRENT FACTORS CAUSING LOSS OR DECLINE

- Fences have, in most cases, replaced dykes as effective stock-proof barriers.
- Farm and estate sizes have grown with livestock utilising wider tracts of hill ground.
- There has been a decline in the number of people with the necessary skills required for dyke restoration work.
- Cost and time requirements mean dyke restoration is no longer viable without grant aid.
- Removal of dyke material for other uses and sale to garden centres.

MAIN THREATS TO KEY SPECIES

Wheatear	Loss of nest sites	
	UK Importance of Tayside population:	**small**
Spleenwort	Removal of habitat Pollution Climate change	
	UK Importance of Tayside population:	**small**

OPPORTUNITIES AND CURRENT ACTION

Agri-Environment Schemes

Any farm or estate currently entered into an agri-environment scheme (CPS, RSS or ESA) has the dykes on the holding identified in the conservation audit. These dykes are protected under the conditions of the scheme and cannot be removed. Grants are available under the current agri-environment scheme to fund dyke restoration work.

Advice

FWAG and SAC employ advisers who can provide farmers with advice on grants available for dyke restoration. Some of this advice is available free of charge to the farmer.

Case Study

Dry Stone Walling Association

The DSWA is a charitable organisation committed to promote and preserve the art of dry stone walling throughout the UK. The Association has 20 branches nationally, of which five cover Scotland. The Central Scotland Group takes in part of Tayside and consists of 60 members, including both professional and amateur wall builders. The group's main remit is to train new members in the art of dry stone walling, whilst more advanced classes are held for old hands at which members can learn the art of building on steep slopes and that of artistic dry stone walling.

The organisation is involved in local community and conservation projects and works closely with the National Trust for Scotland and Scottish National Heritage. Recent work includes mending walls at Barrie's Birthplace in Kirriemuir, making raised flowerbeds in Blairgowrie and constructing a conservation enclosure at Blair Atholl.

F4 Stone Dykes

OBJECTIVES AND TARGETS

	Objectives	Targets
1	Prevent further decline in the length and quality of dykes in Tayside.	No decline in length and quality of dykes after 2010.
2	Identify the true extent and quality of dykes in Tayside.	Identify by 2005.
3	Promote the importance of dykes in terms of biodiversity, shelter and stockproofing.	
4	Ensure dykes are protected from further destruction and removal.	Prevent further removal and destruction of dykes by 2010.
5	Encourage uptake of agri-environment schemes to ensure the restoration of dykes.	Ensure that 50% of farms with dykes in Tayside are entered into an agri-environment scheme using the dyke restoration grant by 2010.

Stakeholders

- Landowners, farmers, land managers and advisors, DSWA, government bodies, conservation volunteer groups, general public.

ACTION FOR BIODIVERSITY

		Action - Stone Dykes	Deliverers		To take place by	Meets Objective No.
			Lead Partners	Partners	02 03 04 05 06 07 11 16	
LBAP Ref.	**A**	**Policy and legislation**				
F4	1	Where appropriate continue to make available information on grant aid for restoration of dykes.	FWAG SAC	SEERAD SNH	# # # # # # # #	
	B	**Site safeguard and management**				
F4	1	Encourage the use of agri-environment schemes to restore dykes where appropriate.	NFUS SLF	FWAG SAC SNH	# # # # # # # #	
	C	**Species management and protection**				
F4						
	D	**Advisory**				
F4	1	Ensure adequate advice is available to all landowners on grants and best practice.	FWAG SAC	SNH	# # # # # # # #	
	E	**Research and monitoring**				
F4	1	Examine future plans to identify decline in amount of drystone dykes as well as levels of reconstruction.	SNH DSWA		# # # #	
F4	2	Monitor and review this plan – ensure this plan is being delivered annually and in detail after 5 years.	TBP		# # # # # # # #	
	F	**Promotion and awareness-raising**				
F4	1	Promote the importance of stone dykes through advisory groups and interested organisations.	TBP		# # # # # # # #	

Wet Grassland F5

DAVE BELL

WET GRASSLAND

INTRODUCTION

Wet grassland is one of the most rapidly diminishing wetland types in Britain. Our coastal grazing marshes, floodplains, wash lands, water meadows and river valley pastures are part of a traditional farming system. Losses of wet grassland have only been well documented since the Second World War, but in this period there have been dramatic declines in breeding wading bird populations and the other flora and fauna assemblages associated with this habitat.

The value of the wet grassland habitat is becoming increasingly recognised beyond the benefits it provides over and above its conservation value. Flood alleviation, nutrient and pollution absorption and groundwater recharge are all additional benefits being utilised. The management of existing wet grassland and the possibility of its restoration or creation should all aim to take advantage of these functional values. A wider vision of the value of wetlands within floodplains and catchments should also be developed.

DEFINITION

Wet Grassland is, for the purpose of this Habitat Action Plan, defined as periodically inundated pasture or meadow with ditches which maintain the water levels containing standing brackish or fresh water. Almost all areas are grazed and some areas are cut for hay. Sites may contain seasonal water-filled hollows and permanent ponds with tall fen species such as reeds, but not extensive areas.

This is comparable with the definitions used by the Biodiversity Steering Group for Coastal and Floodplain Grazing Marsh and by The Wet Grassland Guide. This definition includes the following broad wetland types:

- **Semi-natural floodplain grassland**

  This occurs where floodplains are subjected to a semi-natural hydrological regime. Insh Marshes in Strathspey is an excellent example of this. Naturally functioning floodplains are rare in the UK where most rivers are intensely regulated and engineered.

- **Water meadows**

  In some areas deliberate controlled flooding was used to boost fertility, raise hay yields and enable grazing earlier in the year.

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- **Wet grassland with intensive water level management on drained soils**

  Many wetlands on both peat and alluvial soils have been converted to productive agricultural grassland (for example some areas of Montrose Basin). These areas now have artificial highly regulated water regimes. The grass mixture is frequently improved. However, some areas still contain significant botanical interest within field areas and drainage ditches.

- **Lochside wet grassland**

  These are areas of wet grassland around the margins of lochs which may be temporarily inundated owing to seasonal water level increases, for example Loch Kinnordy.

Other areas to consider for conversion or re-instatement could well include land currently under intensive grassland or even cereal production.

Sites/ Site Distribution

Parts of: Strathallan
Strathmore
Loch Freuchie Meadows (SSSI)
Glen Clova
Tay/Isla Valley
Montrose Basin

CURRENT STATUS AND EXTENT OF HABITAT

There is an estimated 300,000 hectares of grazing marsh in the UK which includes wet grassland and coastal marshes. Scotland's allocation of this total is believed to be in the region of 40,000 ha. Only a small proportion of this overall figure is semi-natural, supporting a high diversity of native plant species (2,500 ha in Scotland, Ireland and Wales).

Although no full estimate for the extent of wet grassland is currently available for Scotland, Newson estimated around 3,000 km^2 as having potential. Wet grassland (or land with the potential to be so) in Tayside is largely distributed along the main straths and glens, but exists in varying size of area throughout the region. While there are some excellent examples, overall the region's wet grassland is greatly reduced as most potential areas are intensively farmed.

NATURE CONSERVATION IMPORTANCE

Wet grassland is important for breeding waders and wintering waterfowl. Farmland birds, including Skylark *Alauda avensis*, are also important species of this habitat. Wet grassland can provide significant hunting territory for Barn owl *Tyto alba* and Short-eared owl *Asio flammeus*, as well as Merlin *Falco columbaris* and Peregrine falcon *Falco peregrinus*. This habitat is typically diverse in plant species and supports many different invertebrate species.

KEY SPECIES

P = UK Priority Species **C** = UK species of conservation concern

Mammals	Otter	*Lutra lutra*	**P**
	Water vole	*Arvicola terrestris*	**P**
	Pipistrelle bat	*Pipistrelle pipistrellus*	**P**

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Birds	Redshank	*Tringa totanus*	**C**
	Lapwing	*Vanellus vanellus*	**C**
	Snipe	*Gallinago gallinago*	**C**
	Curlew	*Numenius arquata*	**C**
	Wigeon	*Anas penelope*	**C**
	Teal	*Anas crecca*	**C**
	Skylark	*Alauda arvensis*	**C**
	Barn owl	*Tyto alba*	**C**
	Short-eared owl	*Asio flammeus*	**C**
	Merlin	*Falco columbaris*	**C**
	Peregrine falcon	*Falco peregrinus*	**C**
Amphibians	Common Frog	*Rana temporaria*	**C**
	Common Toad	*Bufo bufo*	**C**
Invertebrates	Small pearl-bordered fritillary	*Boloria selene*	**C**
	Sword Grass moth	*Xylena exsoleta*	**P**
	Damselfly spp.		
	Grasshopper spp.		
	Hoverfly spp.		
Plants	Brackish water-crowfoot	*Ranunculus baudotii*	
	Pillwort	*Pilularia globulifera*	**P**
	Ragged Robin	*Lychnis flos-cuculi*	
	Selfheal	*Prunella vulgaris*	
	Yellow rattle	*Rhianthus minor*	
	Greater Birdsfoot trefoil	*Lotus uliginosis*	
	Globe flower	*Trollius europeaeus*	
	Jointed Rush	*Juncus articulatus*	
	Northern Marsh Orchid	*Dactylorhiza purpurella*	
	Fungus spp.		

Lapwing

Over the past 25 years there has been a dramatic UK decline in the lapwing population, but its numbers in Tayside seem to remain optimistically constant.

The species will nest on open farmland as well as wet grassland. They prefer to nest in large fields with good all-round visibility. Pairs will often nest nearby to increase their protection from predators. Although they feed on a wide range of invertebrates, earthworms are a particularly important part of their diet.

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NATIONAL BIODIVERSITY CONTEXT

There is a UK Habitat Action Plan for Lowland Wet Grassland. Its main objectives are:

- Maintain existing diversity, distribution and extent. Evaluate other habitat types fully.
- Maintain and, where technically and ecologically practicable, enhance the extent and distribution of wet grazing levels.
- Re-establish nationally important assemblages of plants, invertebrates, breeding wading birds and nationally important concentrations of wintering waterfowl.
- Restore wet grassland from drier, semi-improved or improved grassland or arable land over the next five years.

LORNE GILL/SNH

Globe flower

These distinctive plants with their large buttercup-like flowers grow in wet upland pastures. The effects of global warming are being widely researched and it is species such as the Globe flower, which prefers a cool northerly climate, that are under increasing scrutiny.

CURRENT FACTORS CAUSING LOSS OR DECLINE

Drainage of land for agriculture, alteration of flooding regimes, lowering of water levels, nutrient loading, inappropriate grazing or cutting and abandonment all affect wet grassland habitats. Further factors may be classified as follows:

Widespread effects

- Agricultural intensification, including drainage and re-seeding
- Neglect and decline of traditional management
- Declines in the national cattle herd

Possible localised effects

- Industrialisation and urbanisation
- Salt water flooding due to sea level rise

MAIN THREATS TO KEY SPECIES

Otter	incidental mortality, primarily by road deaths	
	UK Importance of Tayside population:	**moderate**
Redshank	loss of habitat, especially through wetland drainage disturbance of nesting sites afforestation	
	UK Importance of Tayside population:	**moderate**
Curlew	loss of habitat disturbance of nesting sites	
	UK Importance of Tayside population:	**moderate**

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Snipe	loss of habitat, especially through wetland drainage	
	UK Importance of Tayside population:	**unknown**
Skylark	loss of habitat changes in farming practices	
	UK Importance of Tayside population:	**high**
Short-eared Owl	loss of habitat lack of prey	
	UK Importance of Tayside population:	**unknown**
Common Frog	loss of habitat, especially through wetland drainage	
	UK Importance of Tayside population:	**unknown**
Brackish water crow-foot	loss of habitat	
	UK Importance of Tayside population:	**unknown**
Pillwort	loss of habitat, especially through drainage of wetland and ponds	
	UK Importance of Tayside population:	**moderate**

OPPORTUNITIES AND CURRENT ACTION

Legislation and designation

- Areas may be notified as SSSI, SPA, SAC, RAMSAR sites.
- The Scottish Environment Protection Agency and Scottish Water have some conservation duties inherited from predecessor organisations. These bodies have statutory responsibilities for pollution control and prevention.

Incentive schemes

- Rural Stewardship Scheme prescriptions encouraging sympathetic management of wet grassland exist but could be further promoted.

OBJECTIVES AND TARGETS

	Objectives	Targets
1	Ensure no net loss in area or reduction in quality of wet grassland in Tayside, accounting for natural processes.	No net loss in area or reduction in quality of the habitat by 2007.
2	Establish the location, extent and quality of existing and potential areas of wet grassland. Identify areas that could be restored.	Identify and survey all substantial (c.10ha. +) wet grassland areas by 2003. Identify areas of this habitat which could be restored by 2003.
3	Restore areas of degraded habitat in identified areas (see Objective 2). Set a target area for re-instatement to be reached by 2007.	Begin restoration of degraded habitat by 2003. Set a target for restoration by 2002.
4	Produce integrated management plans that promote the maintenance and enhancement of the biodiversity of wet grassland. Incorporate them into other plans such as Catchment Plans, as appropriate.	The inclusion of wet grassland management within individual Rural Stewardship Scheme plans. The inclusion of wet grassland management within other plans relating to other LBAP priorities.

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5	As a matter of priority set up a programme of events to raise awareness of wet grassland, its importance and the need for its conservation in Tayside. Establish best practice resource for use by practitioners.	Set up awareness and education programme by 2003.

Stakeholders

- Landowners, land managers and advisers, statutory bodies, general public.

ACTION FOR BIODIVERSITY

		Action - Wet Grassland	Deliverers		To take place by	Meets Objective No.
			Lead Partners	Partners	02 03 04 05 06 07 11 16	
LBAP Ref.	**A**	**Policy and legislation**				
F5	1	Complete SAC and pSAC consultation and designation processes for all currently identified areas.	SNH	SE EU	#	
F5	2	Following a survey of wet grassland (see Research and Monitoring) designate important sites as local Wildlife Sites and incorporate them into the planning system.	SNH	SWT, SEPA, PKC, AC DCC	#	
F5	3	Ensure all regional planning documents take full account of wet grassland as a habitat of potential national and international importance.	SNH	PKC AC DCC	# # # # # #	1
	B	**Site safeguard and management**				
F5	1	Oppose development or other proposed activities that threaten loss or damage to this habitat.	PKC DCC AC	SEPA, SWT RSPB SNH	# # # # # #	1
F5	2	Help raise awareness of the need for appropriate management and restoration of wet grassland through whole farm plans and prescriptions for incentive schemes such as RSS and its successors.	FWAG SAC	SEPA SEERAD	# # # # # # # #	1,3,4
F5	3	Prioritise management actions on a site-by-site basis following audit and survey of site conditions.	TBP		#	All
	C	**Species management and protection**				
F5						
	D	**Advisory**				
F5	1	Visit all landowners and land managers who have examples of wet grassland. Advise them about management which could be carried out to maintain and enhance this habitat.	SAC FWAG	RSPB	#	1,5
	E	**Research and monitoring**				
F5	1	Survey wet grassland areas in the region and use the data obtained to identify areas where restoration is possible and to act as a baseline for wet grassland to be surveyed every five years.	SNH	SWT, SAC FWAG, PKC DCC, AC	#	
F5	2	Monitor the delivery of this plan yearly and in detail every five years.	TBP		# # # # # # # #	
F5	3	Ensure all data collected for this Plan is shared with a Biological Records Centre.	TBP		# # # # # # # #	
	F	**Promotion and awareness-raising**				
F5	1	Identify farms where there is sympathetic management for wet grassland. Conduct a series of farmwalks/open days/training events for other farmers, advisers and anyone else who may be interested.	SAC FWAG	SWT	# # # # #	1,5