The Biodiversity of Falkirk

An Assessment Of Priority Habitats And Species

This document has been produced on behalf of the Falkirk Local Biodiversity Action Plan Steering Group with assistance from :-

Falkirk Council

SCOTTISH NATURAL HERITAGE

Falkirk Environment Trust

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an assessment of
priority habitats and species

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Produced on behalf of the
Falkirk Local Biodiversity Action Plan Steering Group

April 2000

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1. INTRODUCTION

1.1 What is Biodiversity?

One of the most widely used definitions of biodiversity is that given in Article 2 of the Convention on Biological Diversity which stated that biodiversity is:

" the variability among living organisms from all sources including, inter alia, terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems ".

In other words it is the variety of life that exists on earth in all its many forms, including the complex relationships and systems formed by plants and animals.

1.2 The International and National Commitment

In 1992 over 170 world leaders met for the 'Earth Summit' in Rio de Janeiro. They met to discuss growing threats to the global environment due to our unsustainable exploitation and pollution of the earth's resources. The summit concluded that to safeguard our global quality of life future development must be sustainable. A key element of sustainable development is the need for conservation of biodiversity to be at the heart of economic policy. At Rio 153 world leaders, including the British prime minister, indicated their commitment to this principle by signing 'The Convention on Biological Diversity'. By so doing they pledged to help stop the global loss of species, habitats and genetic resources by conserving and enhancing the biodiversity in their own countries.

In 1994, to meet the UK's obligation under the Biodiversity Convention to produce a strategy for the conservation and sustainable use of biodiversity, the UK Biodiversity Action Plan was published. This set out 59 steps that should be taken to safeguard the nation's biodiversity, including establishing a Biodiversity Steering Group to develop proposals for national targets and action. This group identified the most rare or threatened species and habitats in the UK and, for each one, produced an action plan outlining targets for conservation and the actions required to meet them. The government continues to be committed to the conservation of biodiversity and both the UK and Scottish Biodiversity Groups are continuing to develop and implement national species and habitat action plans.

For this ambitious programme of action to succeed it has to be interpreted and implemented at local level. Local Biodiversity Action Plans (LBAPs) are being developed throughout Scotland and the UK to do just that. These plans aim to translate national targets for the conservation of key species and habitats into focused, local action. However there are many other species and habitats that contribute to the local landscape and quality of life. Local Biodiversity Action Plans must make a commitment to safeguard and enhance these locally characteristic, distinctive or highly valued species and habitats as well as nationally important ones.

1.3 The Falkirk Perspective

Biodiversity within Falkirk is important as a focus for nature conservation. However it means much more than that, having implications for every area of life. Falkirk's biodiversity forms the character and quality of the landscape in which its people live, work, play and learn. It helps shape the economic and social values of the area. It is part of our heritage and culture. Biodiversity is inseparable from all these aspects of our lives and makes a significant contribution to our quality of life. Our welfare is inextricably linked to the welfare of biodiversity. When plants and animals interact with each other and the physical world they help to create a life support system for the planet, keeping the earth and its inhabitants (including us) healthy.

There is a clear need for a local biodiversity action plan for Falkirk both to take a lead in interpreting and implementing the UK biodiversity action plans at a local level and in recognition of the social, economic and cultural value of its biodiversity. Falkirk Council responded to this need by appointing a LBAP Project Officer in August 1999 to take the process forward, and the Falkirk LBAP Steering Group met for the first time in November 1999.

This report provides invaluable data about the species and habitats of conservation concern within Falkirk. It will be the basis for the development of a local biodiversity action plan for Falkirk and should enable Falkirk Council and other land managers, land users, and conservation agencies to respond to the needs of biodiversity within their land management, development and planning policy decisions. Thus confirming their commitment to sustainable development and the conservation of biodiversity within Falkirk.

Falkirk Council has a key role to play in its capacity as an enabler, ensuring that a wide range of organisations, groups and individuals are able to positively contribute to the local biodiversity action plan process in Falkirk. It is essential that all the important players sign up to this process and carry out agreed actions.

The report will cover all of the Falkirk Council area (including the relevant part of the Forth estuary), see map 1. Since biodiversity does not recognise these artificial boundaries, it is essential that co-operation and information sharing with LBAP groups in neighbouring local authorities is optimised.

[Note that within this report 'Falkirk' will be used to mean the whole of the Falkirk local authority area. 'Falkirk town' will be used to indicate the town of Falkirk.]

1.4 Falkirk's landscape and its influence on biodiversity

1.4.1 Geology and Landform

The geology of Falkirk consists primarily of sedimentary rocks from the Carboniferous period, formed between 360 and 290 million years ago. These rocks were formed during a period of transition from a coastal and marine environment (with a repeating cycle of sedimentation from forest, river, delta, lagoon and marine habitats), to a terrestrial environment with river systems and only very occasional incursions of the sea. The majority of this rock consists of coal measures and forms part of the central coalfield of Scotland. Most of the rest was formed in the Namurian period and consists of sandstones with silstones, mudstones and limestones.[1]

On several occasions over the last 2 million years much of Scotland has been covered by huge ice-sheets. The formation, movement and melting of these ice-sheets resulted in the transportation and deposition of large quantities of material. Over much of the Falkirk area, particularly to the south and north-west, the bedrock is covered by boulder clay or sand and gravel, carried there and deposited by water produced by the ice-sheets as they melted about 16,000 years ago. This has produced a characteristic landform of mounds, ridges and terraces. The discharge of meltwater from the Carron and Bonnywater rivers into the sea produced a large delta and terrace complex where material was deposited at the river mouth.[1]

The rise in sea levels due to the ice-sheets melting resulted in the deposit of marine sediment in areas such as Grangemouth, forming beaches of clay, silt, sand and gravel. When these raised beaches were exposed as sea level fell again, about 10,000 years ago, peat was able to accumulate on them. This formed the peat covered carselands. Some of this peat remains exposed (e.g. at Letham moss and Dunmore moss) but most of it was subsequently covered by sand, silt and clay as the estuary silted up. This took longer in the Grangemouth area and hence the presence of a lower shoreline and raised mudflats. With the post-glacial fall in sea level, melt water drained rapidly towards the estuary creating deep river gorges like the River Avon gorge near Birkhill.[1]

The exploitation of Falkirk's geology by people has also had an impact on the landscape. Peat deposits have been extracted in various places (e.g. Gardrum moss) and coal, sand and gravel has been extracted leaving behind waste tips or bings throughout the area.[1]

The geology and landform of the Falkirk area provide the basis for its habitats and landscape. They influence the topography, soils, hydrology, and micro-climate of a site and thus play a crucial role in determining the condition and diversity of habitats within this area. The diversity of habitats in Falkirk, from river valleys to hills to peatbogs to estuary, owes much to the area's geology and landform. The extent of this relationship is still unclear but that there is a link must be acknowledged.

1.4.2 Soils

The soils of the Falkirk area can be divided into two main types. On the relatively flat carseland area, along the Forth estuary, the soil is based on silts and clays deposited there when sea levels were higher in glacial and post-glacial periods, and occurs as gleys or gleyed brown forest soil. Elsewhere the soils are basically brown forest soils (gleyed or not), although the hilly area to the north-west of Falkirk also has some rocky outcrops and the Slamannan Plateau to the south-west of Falkirk contains a large area of wet, acid peaty soil.1 Within these soil types there can be considerable variation in pH, moisture levels, soil chemistry, texture and organic matter content. As such it is difficult to generalise about the soils within the Falkirk area. On the whole soil properties can be deduced by looking at the vegetation that it supports. This vegetation can also give an indication of the biodiversity within the soil itself. Soil is a complex biological system not just a growing medium and needs to be conserved in its own right alongside the plants and animals it helps to support.

1.4.3 Land-use

The activities of people have had an extremely significant impact on the landscape and natural resources of the Falkirk area. Without human activity most of it would still be woodland. All of the biodiversity of Falkirk has been and continues to be affected by our use and management of the land.

Past Land-use:

People first started to have a significant impact on this landscape about 6000 years ago with the development of early farming communities who began to systematically clear forests for agriculture. As agricultural tools and techniques become more sophisticated the population in the Falkirk area increased with a corresponding increase in the need for agricultural land and subsequent woodland clearance.

By the 1500's-1600's the vast majority of the Falkirk area was dominated by small scale agriculture. Falkirk generally has good quality soils and benefited greatly during the 1700's and 1800's from a growing livestock trade and demand for good quality pasture. Agricultural improvements and the enclosure and improvement of over 10,000 acres of the Callendar estate in the late 1700's and 1800's helped to safeguard the agricultural industry in this area. Despite a decline in agriculture this century, in line with the rest of the country, this industry has remained important in the Falkirk area and has for centuries had a significant impact on its landscape.[1]

The existence of the central Scotland coal field has been known since before the 13th century. With the rise in demand for coal in the late 1700's exploitation of this resource increased and numerous deep coal mines were established. These included mines at Kinneil, Carriden, Barleyside, and South Bantaskine. Most deep coal mines had closed by 1960 leaving a legacy of numerous old spoil tips throughout the area. More recently only open cast mining has taken place in Falkirk. With the coal industry came the development of the iron industry in Falkirk. The Carron works, established in 1759, was the birth place of the Scottish iron industry.[1]

The development of canals and railways during the late 1700's and 1800's had a major impact on Falkirk, assisting trade and so boosting the agricultural, iron and coal industries. These transport systems, or their remains, are still present today contributing to the social and economic well-being of Falkirk and providing often very valuable wildlife habitats and corridors. More recently (1920's onwards) Falkirk's location and good transport links has resulted in considerable industrial development, particularly in the Grangemouth area.

The growth of industry and transport links contributed to the expansion of towns and villages. For example, the growth of coal mining and clay and brickworks resulted in the development of small rural settlements like Slamannan. Over the last 200 years Falkirk has seen a continued growth in its urban areas, encroaching on semi-natural habitats and leaving only small pockets of habitat such as woodland or grassland in these predominantly built up zones.

Present Land-use:

Much of the Falkirk area, particularly the northern half, is now urbanised, the main urban areas occurring along the low lying Carron valley from Denny in the west to Grangemouth in the east. Falkirk continues to support a large industrial zone in Grangemouth. This has a significant influence on the economic and social well being of the area but also impacts heavily on its biodiversity.

The remaining area is largely open agricultural land.[2] In the north and north-east lowlands agriculture takes advantage of the fertile carseland soils with mainly arable crops and some improved pasture. This gives way to rough grazing and conifer plantations in the more upland areas around Denny.[3] The south of the Falkirk area, including the Slamannan Plateau and Avon Valley, is more rural with a few small settlements and numerous scattered farms. Most of the land here is used for sheep and cattle grazing, however there are also widespread and frequent conifer plantations.[4]

Though deep coal mining and open cast mining operations are not currently taking place within Falkirk there are still plans to exploit some of the remaining coal reserves in the area. These operations can have an immediate and devastating impact on the mined site but also produce spoil tips which influence biodiversity both through habitat destruction and by producing new bing habitats which will regenerate once work ceases. Numerous spoil tips of varied sizes and ages are a characteristic feature of Falkirk today. The demand for new open cast mining sites will continue to impact on the area's biodiversity, as will the restoration and management of old spoil and mine sites.

Large scale peat extraction is still taking place at Letham Moss and has recently occurred at Gardrum Moss. This activity inevitably impacts on biodiversity causing considerable, long-term or permanent habitat loss. Smaller scale, non-mechanised peat cutting has largely ceased.

All of the Falkirk area is shaped by human activity. There is a clear and inextricable link between the well being of Falkirk's biodiversity and natural resources and the activities of its people. The conservation of its biodiversity must consider the needs of both people and wildlife and will, to a large extent, depend on how we continue to use and manage our natural resources.

Information sources.

[1] Corbett L., Dix N.J., Bryant D.M., McLusky D.S., Elliot B.J., Tranter N.L. (Ed.), 1993,

[2] Watson K., 1998.

[3] Bates M.A. et al, 1995.

[4] Shotton J. & Arnott D.A., 1994.

1.5 Scope and use of this report

This report includes all the habitats and species listed by the UK Biodiversity Steering Group which occur within the Falkirk area. It also includes a small and by no means exhaustive selection of species and habitats considered to be of local importance. (see sections 2.1 and 3.1 for the detailed habitat and species selection criteria). The report was compiled using existing data, no survey work was carried out. The information comes from a variety of sources including publications, advice from specialists, the C.A.R.S.E. local records centre and other databases, and local surveys including phase I and II surveys, river corridor surveys and some species surveys.

1.5.1 Habitats

The habitat statements have, for convenience, been divided into 7 groups: Woodland; Grassland & Farmland; Heathland and Bogs; Wetland & Water; Estuary; Rock Exposure; and Urban. For each broad habitat type the Broad Habitat statement is given first, followed by statements for any Key or Locally Important habitats which fall within the broad habitat category. Each habitat statement includes the following information:

Current status, extent and distribution:

This section outlines the extent and distribution of the habitat within Falkirk based on the most up to date available data. Where possible it also indicates the current quality/status of this habitat.

The habitat distribution maps are based on phase I survey data from 1994/95 and indicate the presence of the habitat type within 5km squares. They also give an indication of the abundance of the habitat in each 5km square.

Significance:

This section indicates the extent of the habitat within the UK and/or Scotland to allow an assessment of the importance of Falkirk in terms of the proportion of the national habitat which it holds. It also gives an indication of the local value of the habitat.

Note that the Falkirk local authority area represents approximately 0.12% of the land area of the UK and 0.36% of the land cover of Scotland. As such Falkirk could be considered to be important in UK terms for any habitat for which more than 0.12% of its UK extent occurs in this area. The same holds for any habitats for which more than 0.36% of its Scottish extent occurs in this area. This is a relatively crude method which does not take into account the geographical distribution of different habitats, however it does help to indicate habitats that are disproportionately represented within Falkirk.

Associated species/Audit species:

Examples of associated species from this audit are given for each habitat. This is to provide a link between the habitat and species statements and to indicate the rare species that may rely on the particular habitat. However, this is not a comprehensive list.

Area / quality trends & influencing factors:

Where known, local trends in the area and quality of the habitat are outlined. National trends are also outlined to allow comparison and in some cases to indicate the likely local trends where these are unknown. The main factors which may affect the area and quality of the habitat within Falkirk and nationally are also noted.

Conservation status:

The 'conservation status' section of each statement is designed to give an indication of the current conservation value of a habitat and measures that might be necessary to conserve or enhance it. It may also highlight conservation issues that could be considered during landuse planning and land management. It is not an action plan.

1.5.2 Species

The species included are initially arranged in taxonomic groups. Within these they are subdivided into 'priority species', 'species of conservation concern', and 'locally important species' (see section 3.1 for full definition). Within these groupings they are arranged alphabetically by scientific name, except for mammals and birds which are arranged in taxonomic order.

Statements have not been given for most of the bird species of conservation concern, although an indication of the species abundance in the area is provided. More general information about these species is widely available elsewhere. However, statements have been included for those birds of conservation concern which were considered to be particularly important within this area.

Each species statement includes the following information:

Current status & distribution:

This section outlines the current extent and distribution of the species within Falkirk, based on the most recent available data.

Note that species records from C.A.R.S.E. do not distinguish between sites where a species is breeding and sites where it has occurred but is not breeding. So where sites are given they cannot be assumed to be breeding sites unless stated. In most cases the frequency with which a species visits a given site is not indicated either and so it cannot be assumed that the species is a resident or regular visitor to the site. Further surveying would be required to determine the breeding sites of many of the species included in this audit.

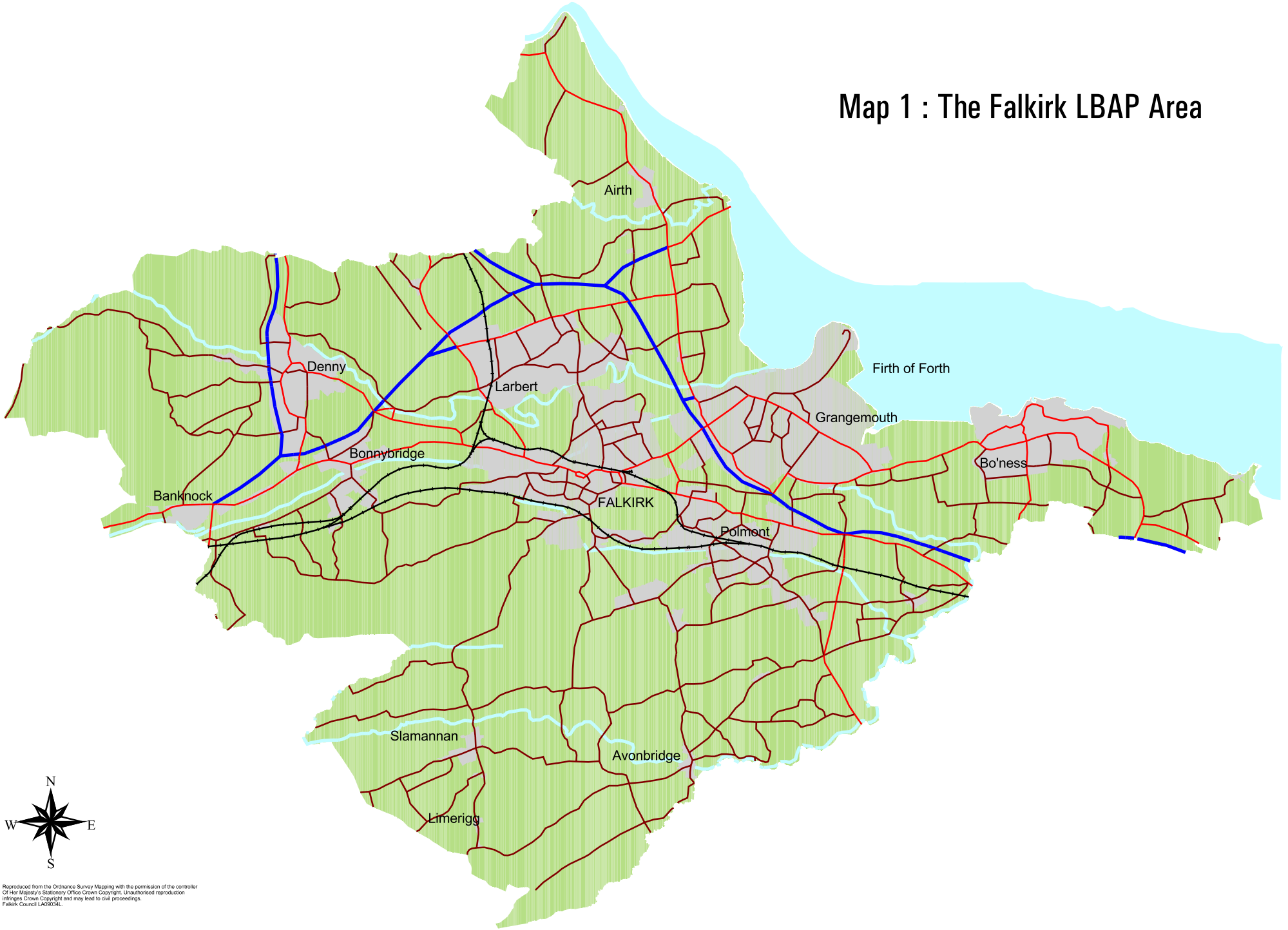
Scottish/UK significance:

This section indicates the UK and/or Scottish species population to allow an assessment of the importance of Falkirk in terms of the proportion of the national population which it holds. Where possible it also gives an indication of the local importance of the species.

Population trends & influencing factors:

Where known local trends in the population size and distribution are outlined. National trends are also outlined to allow comparison and in some cases to indicate the likely local trends where these are unknown. The main factors which may affect the species population within Falkirk and nationally are also noted.

Map 1 : The Falkirk LBAP Area



2. HABITATS

2.1 Habitat selection

In 1995 the UK Biodiversity Steering Group Report set out a framework for habitat classification across the UK. This consisted of 37 'broad habitat types' (27 following re-assessment since 1997) and aimed to provide a comprehensive and straightforward means of describing all the habitats present within the UK countryside and surrounding seas. This system of 'Broad Habitat' types provides the context for the 47 'Key Habitats' identified by the UK Biodiversity Steering Group as requiring habitat action plans. The criteria for selection of these 'key habitats' is:

* *Habitats for which the UK has international obligations.*
* *Habitats at risk, such as those with a high rate of decline especially over the last 20 years, or those which are rare.*
* *Areas, particularly marine areas, which may be functionally critical (essential for organisms inhabiting wider ecosystems) such as sea grass beds (for spawning fish).*
* *Areas important for (or formed from) key species.*
* *Marine habitats for which 40% or more of the north-east Atlantic's occurrence is located in the UK.*
* *Habitats important for rare species.*

Habitat Action Plans have now been published for all key habitats. The habitat descriptions given in these plans have been used in defining the key habitats in this report. For the broad habitat types the habitat descriptions given in the broad habitat statements or in the UK Biodiversity Group Tranche 2 Action Plans have been used.

This report includes statements for all the 'key' and 'broad' habitats which occur within the Falkirk area. In addition it also includes several locally important habitats. Locally important habitats are those which:

* *are particularly distinctive or characteristic of the local area.*
* *are particularly important for locally rare or threatened species.*
* *are locally rare, locally threatened, or rapidly decreasing in extent.*
* *are likely to be particularly important to local people.*

The selection of locally important habitats is inevitably subjective. The selection included in this report is not exhaustive and may change following further consultation.

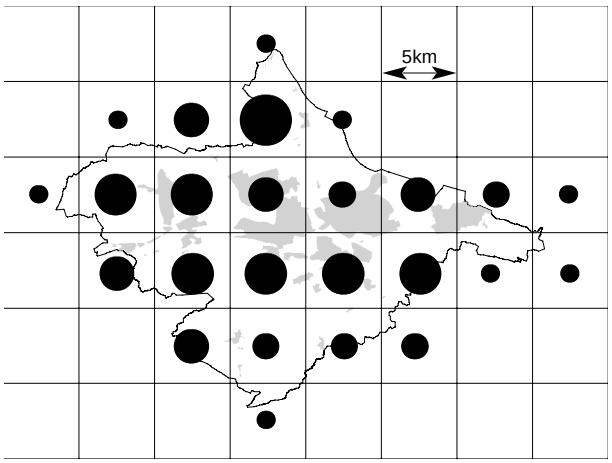
The most recent habitat information for the Falkirk area is available from the phase I surveys undertaken for south and north Falkirk in 1994 and 1995 respectively, and phase II surveys undertaken for over 45 sites in subsequent years. To use this information it has been necessary to equate Phase I habitat categories to LBAP broad and key habitat types. In some cases this is straightforward, however, in others some assumptions must be made. Appendix 2 includes a table of Phase I categories with their corresponding LBAP habitat types and a more detailed justification of the links made.

2.2 Woodlands

2.2.1 Broadleaved, mixed and yew woodland (Broad habitat)

This broad habitat type includes all broadleaved and yew stands and mixed broadleaved and coniferous stands where the canopy is made up of more than 20% broadleaved and yew trees. It also includes areas of scrub over 0.25 hectares which make up a continuous canopy. Integral woodland features such as glades and rides are also included.[1]

Current status, extent & distribution.



Presence of habitat in each 5km grid square

Source : Phase 1 Surveys of Falkirk 1994-1995

● = <25ha
● = 25 - <50ha
● = 50 - <100ha
● = 100 - 200ha
● = >200ha

Within the Falkirk area there are approximately 971ha of broad-leaved woodland, comprising about 3.35% of Falkirk's total land cover. The vast majority (about 836ha) of this is semi-natural woodland (very little of which is mixed) and the rest (135ha) is plantation woodland.[2,3]

This broad-leaved woodland is widespread throughout the Falkirk area, occurring in 20 of the 25 5km squares covering it. Though relatively evenly distributed, this habitat does tend slightly to favour the central and northern parts of the area and occurs less along the estuary. Approximately 150 broad-leaved woodland sites can be identified from the phase I surveys. 76 of these are less than 2ha, 23 are 5-10ha, 12 are between 10-20ha, and 14 are over 20ha in size. Part or all of about 90 of these broad-leaved woodland sites have been listed as ancient or long established.[4] Since 1995 over 650ha of broad-leaved or mixed woodland has been planted. The majority of this is multi-purpose woodland.[6]

Significance.

It is estimated that the UK has 800,000ha of broad-leaved, mixed and yew woodland, 302,000ha of which is ancient.[5] Falkirk holds a small proportion (approx. 0.1%) of this total UK broad-leaved woodland cover. However, the broad-leaved and mixed woodland resource in this area is of considerable local importance. This habitat is relatively scarce within the Falkirk area and often occurs in small, fragmented pockets. It is important for many species which rely on woodland habitats as well as forming a distinctive, if small, part of the Falkirk landscape. Broadleaved and mixed woodland is also important to the local population for its aesthetic and recreational value. A significant number of the sites in Falkirk are ancient or long-established woodlands which are particularly valuable as mature, relatively undisturbed habitats and may support a diverse range of characteristic plants, animals and micro-habitats.

Associated species.

Broadleaved woods often support a wide variety of species in their ground layer including bryophytes, lichens, ferns, fungi and invertebrates. The wide variety of micro-habitats means that many animal species can be found in woodland. Mature trees and associated dead wood can support a wide range of invertebrates, particularly beetles, spiders and two-winged flies. They are also important for hole-nesting birds, bats and many lower plant species.[10]

Audit species.

Priority:

Sciurus vulgaris (Red Squirrel)

Passer montanus (Tree Sparrow)

Pyrrhula pyrrhula (Bullfinch)

Hyacinthoides non-scripta (Bluebell)

Ribes alpinum (Mountain currant)

Conservation Concern:

Erinaceus europaeus (Hedgehog)

Plecotus auritus (Brown Long-eared Bat)

Meles meles (Badger)

Capreolus capreolus (Roe deer)

Accipiter nisus (Sparrowhawk)

Strix aluco (Tawny Owl)

Picus viridus (Green Woodpecker)

Area/quality trends & influencing factors.

Within Scotland the area of broadleaved and mixed woodland declined by about 25% between the 1940's and the 1980's. However, this decline is not mirrored in the central region where there was no overall decline in the area of broad-leaved and mixed woodland during this period.[8]

Locally the area of broad-leaved and mixed woodland is likely to have decreased little over recent years. In fact planting programmes may actually be succeeding in increasing the overall area of this habitat.

There are no accurate accounts of quality changes for broad-leaved and mixed woodlands in the Falkirk area. However, many of the identified ancient and long-established broad-leaved woodland sites are not currently being managed and as a result may be suffering some degradation. Sycamore is a common invasive species in many woodlands in the area and elm has suffered over recent years from Dutch elm disease.[7] Increased fragmentation and isolation of woodlands (particularly those in or near urban areas) is likely to have made them less robust and reduced the number and variety of species they can support.

The status and management of woodlands tends to be significantly influenced by both the use they are put to and their ownership. Similarly funding has an impact on the nature and extent of woodland management and creation in the area. At present the grant aid available for woodland management and planting is limited.

Current factors which may cause loss or decline of broad-leaved and mixed woodlands include:

* *competition from other land-uses such as urban development, intensive agriculture, mining or transport routes;*

* *fragmentation of woodlands resulting in a less robust ecosystem;*

* *inappropriate management such as planting of non-native species or allowing invasion by non-native species, or neglect resulting in loss, degradation or dereliction of the woodland;*

* *damage resulting from recreational use of woodlands;*

* *limited planting, expansion and management of farm woods, and over-grazing of such woodlands;*

* *Dutch elm disease;*

* *damage of the habitat by air pollution and acid deposition;*

* *harvesting of trees in a manner which is unsympathetic to the woodland and the species and micro-habitats it supports;*

* *collapse of restoration programmes following large scale disruptive operations (e.g. opencast mining) which may have aimed to reinstate woodland, amongst other habitats.*

* *and a reduced demand for native hardwoods.*

Conservation status.

National forestry policy already includes a presumption against the clearance of woodland for other land-uses, and particularly seeks to protect ancient and semi-natural woodland habitats. This presumption against development of woodland sites or immediately adjacent to native broad-leaved woodlands could be reinforced through the local authority planning process.

Several ancient or semi-natural woodlands are already protected by designation as SSSIs. Others are afforded some protection by TPOs (Tree Preservation Orders). Some of the other ancient or semi-natural broad-leaved woodlands are designation as wildlife sites (WS) or sites of importance for nature conservation (SINC). These designations may be used to give extra protection to these woodlands. Other particularly valuable woodland sites could also be designated to allow increased protection. The designated sites probably need to be reviewed to ensure that important ancient and semi-natural woodlands are included.

The Central Scotland Countryside Trust (CSCT) is already working to increase and sustain the broad-leaved and mixed woodland resource in this area which makes a valuable contribution to the Central Scotland Forest. With support from its main partners, Falkirk Council, the Forestry Commission, Scottish Natural Heritage and Forth Valley Enterprise, CSCT continues to seek opportunities to increase the size of existing woods, establish woodland wildlife corridors and develop new mixed and broad-leaved woodlands. The appropriate management of new and existing broad-leaved and mixed woodlands, especially ancient and semi-natural sites, would be an important element of any conservation programme and is highlighted in the Central Scotland Forest Native Woodland Action Plan.[9]

Information sources.

[1] UK Biodiversity Group, 1999b.

[2] Bates M.A., Arnott D.A. & Nugent E., 1995.

[3] Shotton J. & Arnott D.A., 1994.

[4] Semi-natural Woodland Survey: Falkirk North, 1986.

[5] UK Biodiversity Steering Group, 1995b.

[6] CSCT, 1999.

[7] Watson K., 1998.

[8] Mackey et al, 1998.

[9] McPhillimy D. & Stiven R, 1998.

[10] Lott D. & Stubbs A., 1999.

2.2.1.1 Upland oakwood (Key habitat)

Upland oakwoods have a canopy dominated by oak (usually sessile oak Quercus petraea but sometimes with pedunculate oak Quercus robur as well) and birch, with some other broad-leaved trees like holly, rowan and hazel. The ground layer plants vary according to soil type and grazing pressure, from bluebell, bramble and fern communities to moss dominated areas. Most oakwoods also contain more diverse areas often by streams, towards the base of slopes or where the soil becomes more alkaline.[1] Upland oak woodlands loosely correspond to the NVC types W11, W16 or W17. Despite its name, altitude is not a key defining feature of this habitat type, particularly within Scotland.

Current status, extent & distribution.

Within the Falkirk area there are approximately 212ha of upland oak woodland. This habitat occurs in 11 of the 25 5km squares covering Falkirk. It does not occur on the lower carseland along the estuary or on the peatland of the Slamannan Plateau. Outwith these areas upland oak woodland is fairly widely distributed. However, it particularly favours the area north-west of Falkirk town where the lowlands begin to give way to the uplands, and also to some extent the area around Muiravonside Country Park. Of the 30 upland oak woodland sites identified, 18 are between 1 and 5ha in size. The others range from 7ha to 25ha.[2,3,4] In many cases the canopies have been modified by past management and planting and so the semi-natural vegetation can be rather variable.5 Many of these woods contain considerable quantities of birch, however the constant presence of oak in the canopy distinguishes them as oak woodland.

Key sites:

SITE	GRID REF.	AREA (ha)
Quarter Wood	NS 800 850	25
Roughcastle wood	NS 839 798	20
Braes Wood	NS 793 847	18
Dales Wood	NS 818 850	17
South Glen	NS 957 738	14
Muiravonside	NS 960 754	13 *
Haining Wood	NS 955 774	12
Torwood Glen	NS 835 857	12
Castle Glen	NS 787 775	12
Wallacebank Wood	NS 846 845	11
Callendar Wood	NS 905 791	5 *
Moss wood	NS 872 889	3 *

* part of a larger more varied woodland.

Significance.

It is believed that there are between 70,000 and 100,000ha of upland oakwood in the UK, most of this occurring in the north and west.[1] Of this resource Falkirk holds approximately 0.3%. Upland oakwood makes up about 22% of the total broadleaved woodland resource within Falkirk. It is likely to constitute an even higher proportion of the local long-established or ancient woodland resource.

Associated species.

Oak woodlands have a distinctive breeding bird assemblage as well as supporting the usual broad-leaved and mixed woodland species.

Audit species.

Priority:

Muscicapa striata (Spotted Flycatcher)

Conservation concern:

Phylloscopus sibilatrix (Wood warbler)

Ficedula hypoleuca (Pied Flycatcher)

Locally important:

Enicmus fungicola (A Mould Beetle)

Also see the 'Broad-leaved, mixed and yew woodland' habitat statement (2.2.1).

Area / quality trends & influencing factors.

See the 'Broad-leaved, mixed and yew woodland' habitat statement (2.2.1).

Specific trends for upland oak woodland in the Falkirk area are not known.

Conservation status.

See the 'Broad-leaved, mixed and yew woodland' habitat statement (2.2.1).

Information sources.

[1] UK Biodiversity Steering Group, 1995b.

[2] Bates M.A., Arnott D.A. & Nugent E., 1995.

[3] Shotton J. & Arnott D.A., 1994.

[4] Semi-natural Woodland Survey: Falkirk North, 1986.

[5] Watson K., 1998.

2.2.1.2 Upland mixed ash woodland (Key habitat)

Upland mixed ash woodlands occur on base-rich soils and have ash Fraxinus excelsior as their main canopy species. However, species such as oak, birch, elm, small-leaved lime, and hazel can be locally dominant. This habitat loosely corresponds to NVC types W8 and W9.[1] Despite its name, altitude is not a key defining feature of this habitat type.

Current status, extent & distribution.

Falkirk has approximately 237ha of woodland which appears to meet the criteria for upland mixed ash woodland.[2,3] However, the sites do vary in terms of the extent to which they conform to this woodland type. Some woodlands are clearly upland mixed ash woodland, in others ash is less dominant or the ash woodland occurs in pockets within other woodland types.[4] In many of these less clear instances oak species are frequent and the distinction between mixed ash woodland and oak woodland can be difficult.

This type of woodland occurs within 13 of the 25 5km squares covering Falkirk. Almost half of these woods are less than 4ha in size and tend to represent relatively recent planting around developments or transport corridors. Of these small woods only Inchyra Grange wood and Chough Glen appear to be remnants of ancient or long-established woodland.

The other 16 woodlands which are over 4ha have a more limited distribution occurring in only 8 of the 25 5km squares. The vast majority of these occur as valley woodland: in Carron Glen and Castlerankine Glen west of Denny; along Carriden glen near Bo'ness; along the Westquarter Burn; and in several places along the River Avon valley. Most of these larger mixed ash woodland sites are either long-established or ancient woodlands.[2,3,4] These valley woodlands have tended to retain their features of interest and diversity because of the difficulty of gaining access to them.[5]

Key sites:

SITE	GRID REF.	AREA (ha)
Carron Glen	NS 757 844	35
Castlerankine Glen	NS 788 820	25
Westquarter Burn Wood	NS 906 786	16
Carriden Woods	NT 028 808	15
Muiravonside	NS 960 754	6
Skipperton Glen	NS 808 785	6
North Glen	NS 953 749	6
Avon Valley Wood	NS 982 777	5
Polmont Woods	NS 945 795	5

Significance.

In the 1980's it was estimated that ancient semi-natural woodland of this type covered approximately 40,000 - 50,000ha in the UK. Crude estimates suggest that the current total area of upland mixed ash woodland in the UK is around 67,500ha.[1] Falkirk's ash woodland represents about 0.35% of this resource. Within the Falkirk area upland mixed ash woodland constitutes just under 25% of the total broad-leaved and mixed woodland area.

Associated species.

Mixed ash woods represent a rich wildlife habitat, supporting a wide range of woodland flowers. They also support a rich invertebrate population which may include uncommon or declining species. The bark of old ash can support important lichens and rotting wood also provides a habitat for many beetles, flies and other rare invertebrates.[1]

Audit species.

See the 'Broad-leaved, mixed and yew woodland' habitat statement (2.2.1).

Area/quality trends & influencing factors.

Reduction in the area and the quality of these woods may have been less pronounced than for other woodland types because many of them are located in inaccessible river valleys and gorges. However some decline and degradation of this habitat type is likely to have occurred over the last 100 years.

See the 'Broad-leaved, mixed and yew woodland' habitat statement (2.2.1).

Conservation status.

See the 'Broad-leaved,mixed and yew woodland' habitat statement (2.2.1).

Information sources.

[1] UK Biodiversity Group, 1999b.

[2] Bates M.A., Arnott D.A. & Nugent E., 1995.

[3] Shotton J. & Arnott D.A., 1994.

[4] Semi-natural Woodland Survey: Falkirk North, 1986.

[5] Watson K., 1998.

2.2.1.3 Wet woodlands (Key habitat)

Wet woodland occurs on poorly drained or seasonally wet soils. It usually contains alder Alnus glutinosa, birch Betula spp. and willows Salix spp., but may also include ash, oak, pine and beech. These woods can occur on floodplains or as successional habitats in peaty hollows or on bogs, fens, streamsides, or flushed hillsides. This habitat type loosely corresponds to NVC types W1, W2, W3, W4c, W5, W6, and W7.[1]

Current status, extent & distribution.

There are about 120ha of wet woodland within the Falkirk area (65ha of which is modifying, i.e. drying out). A small proportion (c. 5ha) of this consists of areas of wet woodland about 1ha in size within much larger woodlands of other types. Smaller wet areas which occur as integral parts of other woodland types have not been included. The 16 other wet woodland sites range from 0.5ha to 40ha in size. Five of these sites (Dunmore moss, Letham moss wood, Drumbroider moss, Carron Dams and Lochgreen moss) totalling 65% of the area's wet woodland habitat, are mire sites where natural regeneration has resulted in wet scrub and woodland development. In these cases the conservation status of at least parts of the wood may be subordinate to that of the mire habitat.

The majority of these sites, including all those developing on mire vegetation, are dominated by birch species (NVC type W4). NVC communities W4a and W4b are slightly drier sub-communities and better associated with northern birchwoods than wet woodland.[1] Both the Letham moss and Dunmore moss woods have some areas classed as W4a/W4c. These areas are probably having a drying effect on the mire and gradually becoming drier birch woodland. Distinction between areas of W4a and W4c vegetation is difficult so the whole area (65 ha) has been included as modifying wet woodland.

Alder dominated vegetation (NVC types W7 and W6) constitutes approximately 11.5 ha of the wet woodland habitat and occurs at 8 main sites (Torwood glen 1ha, Seabegs wood 0.5ha, Dales wood 0.5ha, Dunipace south wood 3ha, Denny school wood 3ha, Tor wood 3ha, South Glen 1ha, and Muiravonside 1ha). It may also occur in smaller patches alongside some rivers and streams in the area.

Wet willow woodland is uncommon within the Falkirk area (totalling c. 5ha) and tends to occur with wet birch woodland. It is present at Stoneywood, Drumbroider moss, and Lochgreen moss.

The vast majority of the area covered by wet woodland lies to the north-west of the Falkirk area, particularly where the land remains relatively low lying, before it reaches the upland area around Denny Muir. Some wet woodland occurs in the Avon valley and there are several small, scattered sites on the northern part of the Slammanan Plateau and towards the southern edge of Falkirk town. Little or no wet woodland occurs along the coast.

Key sites:

SITE	GRID REF.	AREA (ha)
Letham moss wood	NS 878 853	25
Dunmore moss	NS 865 890	40
Dunmore wood	NS 878 885	15 *
Carron Dams	NS 876 826	8
Drumbowie Reservoir	NS 784 810	6
Lochgreen Moss	NS 818 776	3
Denny school wood	NS 811 816	3
Tor wood (west)	NS 828 851	3
Dunipace south wood	NS 845 818	3
Drumbroider Reservoir	NS 917 744	1

* various sites within a larger wood.

Significance.

There is no precise data on the total extent of wet woodland in the UK, but a crude estimate puts it at 50,000 - 70,000ha.[1] Falkirk holds approximately 0.24% of the UK resource. Wet woodland (including the modifying wet woodland) constitutes about 12% of the total broad-leaved and mixed woodland resource in Falkirk.

Associated species.

Wet woodlands can support a wide variety of invertebrates and their humidity favours bryophyte growth. They may also provide shelter for various mammals and support species formerly found in open wetlands.[1]

Audit species.

Priority:

Lutra lutra lutra (European Otter)

Muscicapa striata (Spotted Flycatcher)

Emberiza schoeniclus (Reed Bunting)

Conservation Concern:

Bufo bufo (Common Toad)

Rana temporaria (Common Frog)

Also see the 'Broad-leaved, mixed and yew woodland' habitat statement (2.1.1).

Area/quality trends & influencing factors.

Local trends in the extent and quality of this habitat are not known. Some wet areas have probably been quite recently colonised by wet woodland, particularly where this habitat already existed and has been able to expand in size over a greater wetland area. At other sites the habitat may be restricted by the limits of the wet area. However, any increase is probably more than balanced out by the loss of wet woodland where it is having an overall drying affect and becoming drier birch woodland. Overall the total area of wet woodland has probably declined in both area and quality, although accurate data is unavailable.

Many of the influencing factors noted in the 'broadleaved, mixed and yew woodland' habitat statement (2.2.1) also affect wet woodland. However these wet habitats are

often under less human pressure since they tend to be inappropriate sites for development or for recreational purposes.

Conservation status.

See the 'Broad-leaved, mixed and yew woodland' habitat statement (2.2.1).

Unlike other broad-leaved and mixed woodland types, wet woodlands may often occur in conflict with mire or bog sites. In such cases the conservation status of at least parts of the wood may be subordinate to that of the mire habitat. This must be taken into account when managing the site.

Information sources.

[1] UK Biodiversity Group, 1999b.

[2] Bates M.A., Arnott D.A. & Nugent E., 1995.

[3] Shotton J. & Arnott D.A., 1994.

[4] Semi-natural Woodland Survey: Falkirk North, 1986.

2.2.1.4 Birch woodland (Locally important habitat)

Birch woodland is not listed as a key habitat by the UK biodiversity group however it is one of the main native woodland types within Scotland. Birch woods can contain both downy birch Betula pubescens and silver birch Betula pendula. Many also contain species such as willow, rowan and alder. This habitat type does not include birch dominated wet woodlands but does include areas of maturing birch scrub that was once wet but has become drier (e.g. NVC types W4a and W4b).

Current status, extent & distribution.

Birch woodland (including areas of birch scrub) covers approximately 132ha of the Falkirk area. There are about 30 birch woodland sites indicated by phase I surveys, over two-thirds of which are less than 3ha in size.[1,2] Almost all of these birch woods have developed naturally, often on disturbed land such as old industrial sites (e.g. Grangemouth Docks) and spoil heaps (e.g. Almond Bing). In places they have also naturally regenerated on mire vegetation (e.g. Letham moss and Dunmore moss woods). Much of this regenerating scrub vegetation now forms mature stands of birch woodland. None of these woodland sites are listed as ancient or long-established.[3] This habitat occurs throughout most of the Falkirk area, though less so near the coast, and tends to occur where it has had the opportunity to colonise disturbed ground.

Key sites:

SITE	GRID REF.	AREA (ha)
Dunmore moss *	NS 865 890	40
Letham moss *	NS 878 853	25
Castlecary Low Wood	NS 798 781	21.5
North Drum wood	NS 819 783	8
Bly Wood	NS 841 828	10
Almond Bing	NS 961 762	6

* also included as modifying wet woodland in the ‘wet woodland’ habitat statement.

Significance.

Birch woodland represents a significant proportion of the native woodland in Scotland. This habitat covers a relatively small area of Falkirk, constituting about 13% of its total broad-leaved woodland habitat.

Associated species.

As well as supporting many of the usual broad-leaved woodland species, some birch woods have a ground flora similar to acidic grassland or heath vegetation and may support species associated with these habitats.

Audit species.

Priority:

Turdus philomelos (Song Thrush)

Epipactis youngiana (Young's helleborine)

Also see the 'Broad-leaved, mixed and yew woodland' habitat statement (2.2.1).

Area/quality trends & influencing factors.

Some areas of established birch woodland may have been lost or reduced in size and quality in recent years. However, birch woodland is well adapted to colonising disturbed ground and as such has probably increased its extent within the Falkirk area.

Conservation status.

See the 'Broad-leaved, mixed and yew woodland' habitat statement (2.2.1).

In some cases birch woodland may colonise habitats which have a greater conservation value than the developing woodland, in such cases conservation of the original habitat may be a priority.

Information sources.

[1] Bates M.A., Arnott D.A. & Nugent E., 1995.

[2] Shotton J. & Arnott D.A., 1994.

[3] Semi-natural Woodland Survey: Falkirk North, 1986.

2.2.1.5 Scrub (Locally important habitat)

This habitat includes areas of dense scrub ranging in size from thick hedge banks and field corners (which might also be included in the boundary features broad habitat type) to much larger expanses.

Current status, extent & distribution.

Phase I surveys for Falkirk suggest that there is about 190ha of dense, continuous scrub and about 70ha of more scattered scrub.[1,2] Much of this is likely to include large proportions of Gorse Ulex europaeus and/or Broom Cytisus scorparius scrub. However, there will also be areas of scrub which include species such as Hawthorn Crataegus monogyna, Blackthorn Prunus spinosa and Elder Sambucus nigra. Further information about the extent, quality and composition of scrub within Falkirk is unavailable.

Significance.

Information about the extent and importance of scrub habitats both nationally and locally is very limited. However, within Falkirk scrub does appear to be a valuable habitat, supporting a variety of species. Its habitat value may be even greater where it augments other hedgerow and woodland habitats or occurs in habitat mosaics with grassland or heath vegetation.

Associated species.

Scrub vegetation can support a wide range of bird species, including many in decline, and often provides shelter for a variety of other animals which may use both the scrub and surrounding habitats.

Audit species.

Priority :

Turdus philomelos (Song Thrush)

Pyrrhula pyrrhula (Bullfinch)

Carduelis cannabina (Linnet)

Conservation Concern:

Prunella modularis (Dunnock)

Locustella naevia (Grasshopper warbler)

Saxicola torquata (Stonechat)

Area/quality trends & influencing factors.

The local and national area and quality trends of this habitat are not clearly known. Certainly scrub is often cleared on farmland because scrubby areas can harbour rabbits. However, it can regenerate quite quickly and will usually recover from cutting or burning, particularly where grazing is excluded. Areas of mature scrub (particularly hawthorn and blackthorn) can become sparse and leggy as a result of poor management and heavy grazing.

Conservation status.

Locally, areas of scrub appear to be valuable habitats supporting a wide variety of declining bird species. However, it would be useful to have more information about the extent, composition, quality and biodiversity importance of scrub to inform any conservation programme. Much of the scrub in Falkirk is likely to occur on farmland. This may restrict the level and type of conservation that could be carried out and is likely to put the emphasis on the provision of adequate incentives and guidance for farmers to protect and enhance scrub. The capacity of scrub to recover from damage and to regenerate on land where there is limited disturbance means that habitat creation or expansion may frequently be a viable option to replace scrub that is lost through changes in land-use. However, mature scrub is a valuable habitat and its loss or degradation should be avoided where possible.

Information sources.

[1] Bates M.A., Arnott D.A. & Nugent E., 1995.

[2] Shotton J. & Arnott D.A., 1994.

2.2.2 Lowland wood pastures and parkland (Key habitat)

This habitat includes: lowland wood pastures and parkland derived from medieval forests and emparkments, wooded commons, parks and pastures with trees in them; parkland originating in the 19th century or later if they contain older trees from earlier landscaping; under-managed or unmanaged wood pastures with veteran trees; and parkland or wood pasture that has been converted to other land uses but retains veteran trees of nature conservation interest. This habitat is most commonly associated with NVC types W10, W14, W15, and W16.[1]

Current status, extent & distribution.

Falkirk appears to have several areas of old parkland. It is difficult to determine the date when these parks were initially designed and planted, however in many cases the associated house or castle can be dated. Parkland areas which probably date from between the 16th and 18th century include: Dunmore park, Airth Castle, Callendar Park, Powfowlis, South Bantaskine, Carron House, Kinnaird House, Muiravonside Country Park, and Larbert House. In most cases the parkland is likely to be in fair condition. Several old estates which might have had considerable areas of parkland have been developed for housing leaving only remnant areas of open land and occasional mature trees (e.g. Parkhill estate and Polmont House estate). Other parkland sites are discernible from the phase I surveys but these are all likely to have been planted more recently with no significantly older remnants. The total area of parkland and the number and condition of veteran trees in Falkirk is unknown.

Key sites:

SITE	GRID REF.	AREA (ha)
Airth	NS 899 868	2*
Dunmore Park	NS 885 892	10
Muiravonside Park	NS 960 754	20
Callendar Park	NS 90- 79-	15

* extent not accurately known

Significance.

There are no reliable statistics on the total extent of this resource in the UK. The current best estimate suggests that there may be about 10,000 - 20,000ha currently in a working state and many more relict parklands.[1] Though most common in the south of England there are scattered examples of this habitat throughout the UK. In Falkirk this habitat represents a very small proportion of the total area. However, locally parkland has considerable cultural and amenity value as well as representing an important habitat, often occurring in association with other valuable grassland and woodland habitats and supporting numerous mature specimen trees. Several local parklands are used extensively for recreational purposes.

Associated species.

Parklands are valuable habitats for birds and bats, as well as supporting a distinctive community of saproxylic (wood-eating) animals and epiphytic plants (plants which live on other plants). Mature parkland trees and associated dead wood can support a wide range of invertebrates, particularly beetles, spiders and two-winged flies.[2]

Audit species.

Priority:

Pipistrellus pipistrellus (Pipistrelle Bat)

Conservation concern:

Strix aluco (Tawny Owl)

Area/quality trends & influencing factors.

Between the 17th and the 19th centuries Falkirk would have had many more small estates which probably had landscaped parkland. Many of these smaller estates have subsequently been developed for housing leaving only the occasional large house and remnant old trees. It is unlikely that any very extensive areas of old parkland have been lost over the last century, although the original extent and condition of parkland in this area is unknown.

Several of the existing parkland sites (e.g. Muiravonside Park and Callendar Park) are managed for recreational purposes, however the management and condition of the others is unknown. It is likely that some of these parkland areas are not being managed to retain their conservation status and the value and diversity of the habitat may be declining.

These habitats are often still present in the landscape because they have been adapted for recreational use (either public use or as attractive hotel grounds etc.). This use will both impact upon the habitat and affect the management that is possible and desirable.

Conservation status.

Of particular importance to this habitat is appropriate management and planting to ensure that new trees are developing to replace dead and dying ones, thus sustaining the number of mature trees in the landscape over the long-term. Conservation of this resource would need to consider the current landuse at these sites and its impact, and respond to the continued need or desire to use these parklands for recreational and other purposes.

Information sources.

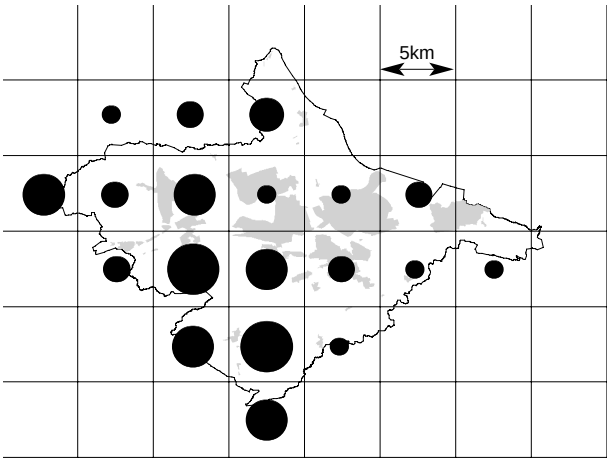
[1] UK Biodiversity Group, 1999b.

[2] Lott D. & Stubbs A., 1999.

2.2.3 Coniferous woodland (Broad habitat)

This habitat includes all coniferous stands where broadleaved trees make up less than 20% of the canopy (with the exception of yew woods).[1]

Current status, extent & distribution.



Presence of habitat in each 5km grid square

Source : Phase 1 Surveys of Falkirk 1994-1995

= <25ha
= 25 - <50ha
= 50 - <100ha
= 100 - 200ha
= >200ha

Within this area there are about 1457ha of conifer plantation, 7ha of conifer woodland with a semi-natural appearance, and 155ha of mixed plantation (likely to have <20% broad-leaved trees in the canopy), totalling 1619ha. There is no native pine woodland within the Falkirk area.[2,3] Since 1995 at least a further 170ha of conifer woodland has been planted.[5] Other more recent larger scale commercial planting has also taken place (e.g. under the woodland grants scheme, Central Scotland Forest challenge fund, and locational supplements).

Coniferous woodland is present in at least 19 of the 25 5km squares covering Falkirk. Almost all of the planted conifer woodland occurs within 20 main sites, 9 of which are over 50ha and 6 of which are over 100ha in size. Most are dominated by pine and spruce species, however many contain substantial quantities of scots pine, and european larch is also frequent. Occasionally these woods include a few broadleaved trees such as oak.

The vast majority of conifer woodland lies to the south and west of the Falkirk area, particularly in the south-west on the Slamannan Plateau area and around Denny Muir. However, there are several large sites north of Falkirk at Dunmore wood and Torwood. Virtually no conifer woodland occurs on or near the estuary coastline.

It is clear from the phase I surveys that in the past several of these large plantations have been planted on bogs or semi-natural grassland habitats. On more mature plantation sites the original under-lying habitat may no longer be clear and might be unable to regenerate after harvesting.

A very small proportion (7.2ha) of the conifer woodland is semi-natural in appearance.[2,3] However, this will be old plantation woodland which has been allowed to mature and regenerate naturally. This woodland is likely to be of greater value in terms of its biodiversity.

Key sites:

SITE	GRID REF.	AREA (ha)
Tor Wood	NS 825 838	145
Drum Wood	NS 839 775	205
Limerigg Wood	NS 859 707	160
Denny Muir (west of)	NS 745 825	150
Black Loch (east of)	NS 873 705	100
Burnhead Moss	NS 885 699	100
Shielknowes	NS 835 733	100

Significance.

Conifer woodland comprises approximately 5.6% of the land cover of Falkirk and represents a substantial proportion of the woodland within this area. Within Great Britain it represents about 0.1% of the total resource (1,516,000ha)[4]. Some of this woodland has considerable amenity value for local people.

Associated species.

Conifer woods support a variety of species and have some features and habitats which are particularly important for wildlife. Woodland rides and glades can be valuable for vascular plants and invertebrates, decaying wood and certain understorey vegetation can also form valuable habitats.

Audit species.

Priority:

Sciurus vulgaris (Red squirrel)

Tetrao tetrix (Black Grouse)

Turdus philomelos (Song Thrush)

Conservation concern:

Loxia curvirostra (Common Crossbill)

Area/quality trends & influencing factors.

Large scale conifer plantations are a relatively recent feature of the landscape since the 1930's-40's. Information about trends in conifer woodland cover in the Falkirk area is not available but it is likely to be slowly increasing. Conifer plantations are not a threatened habitat, however their conservation value can vary considerably. Woodlands with a wide variety of species, a diverse age structure, open glades and some dead and dying wood are of far greater conservation value than less diverse plantations. Insensitive management, extensive clear felling and replanting which disrupts other aspects of the woodland habitat (e.g. rides, glades, ground flora) all have a negative impact on a plantation's biodiversity. The conservation value and quality trends of the conifer woodland in the Falkirk area are unknown.

Conservation status.

Conifer plantations are not a threatened habitat. However, enlightened management of these usually commercial sites can minimise adverse impacts on the species using them and will provide scope for enhancing their conservation value, particularly in the short-term. There may also be opportunities to restore other important habitats where plantations have been harvested.

Information sources.

[1] UK Biodiversity Group, 1999b.

[2] Bates M.A., Arnott D.A. & Nugent E., 1995.

[3] Shotton J. & Arnott D.A., 1994.

[4] UK Biodiversity Steering Group, 1995b.

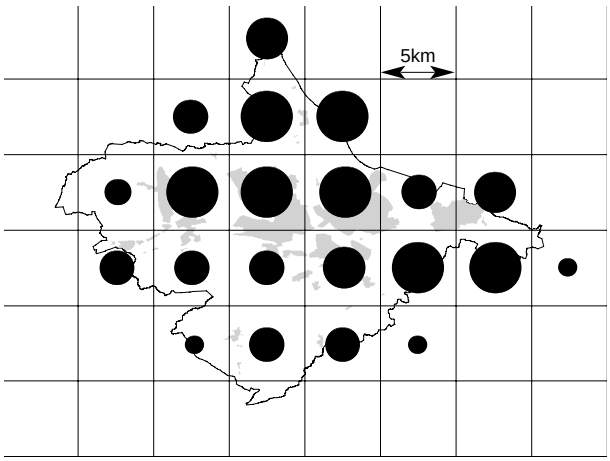
[5] CSCT, 1999.

2.3 Grassland and Farmland

2.3.1 Arable and horticulture (Broad habitat)

This habitat type includes arable crop land, commercial horticultural land, freshly ploughed land, annual leys, rotational set aside and fallow.[1]

Current status, extent & distribution.



Presence of habitat in each 5km grid square

Source : Phase 1 Surveys of Falkirk 1994-1995

= <25ha
= 25 - <50ha
= 50 - <100ha
= 100 - 200ha
= >200ha

In 1994-95 arable land covered approximately 4198ha of the Falkirk area, approximately 15% of the total area. [2,3] The majority of this arable land (over 3500ha) lies within the flat, fertile carseland to the north-east and east of this area and within the lower Avon valley. The remaining 700ha is widely distributed but relatively scarce throughout the rest of the Falkirk area which tends to be better suited to livestock farming.

Significance.

In the British landscape tilled land represents 41% of the total land area. It occupies 44% of land in England, 28% in Scotland and 9% in Wales.[4] Much of the Scottish arable land is likely to occur in the lowlands of eastern and southern Scotland. This habitat makes a significant contribution to the conservation value of the farmed landscape in Falkirk. It particularly makes an important contribution to the landscape where it occurs over large areas near Airth and in the lower Avon Valley.

Associated species.

Much of the wildlife interest of arable areas occurs at the field margins (see the 'cereal field margins' habitat statement (2.3.1.1). However arable fields provide both food, shelter and nesting sites for a variety of species.

Audit species.

Priority:

Lepus europaeus (Brown Hare)

Perdix perdix (Grey Partridge)

Alauda arvensis (Skylark)

Miliaria calandra (Corn Bunting)

Conservation concern:

Vanellus vanellus (Lapwing)

Area/quality trends & influencing factors.

There does not appear to have been a significant change in the area of arable fields in Falkirkover the last 25 years. However, changes in agricultural methods have had a significant impact on the species which use arable fields. In particular, herbicide and insecticide use, removal of hedges, changes in sowing times, more efficient harvesting and the removal of winter stubble have all had a negative impact on many species which use arable fields.

Conservation status.

This broad habitat is not under threat, however changes in agricultural methods are reducing its value for biodiversity. There are opportunities to promote the use and management of arable land in a way which maximises its conservation value, and the developing links between national and local biodiversity targets and agri-environment grants schemes should help this process.

Information sources.

[1] UK Biodiversity Group, 1999b.

[2] Bates M.A., Arnott D.A. & Nugent E., 1995.

[3] Shotton J. & Arnott D.A., 1994.

[4] UK Biodiversity Steering Group, 1995b.

2.3.1.1 Cereal field margins (Key habitat)

Cereal field margins are strips of land lying between cereal crops and the field boundary, and extending for a limited distance into the crop, which create favourable conditions for farmland species. This includes: an uncropped wildlife strip adjacent to the cereal crop; a conservation headland forming the outer margin of the crop and managed to favour wild plants and invertebrates; a combined wildlife strip and conservation headland; and game crops, stubble or grass fallow lying between annually cropped land and the field boundary.

Current status, extent & distribution.

There are approximately 4198ha of arable land in Falkirk (See the 'Arable and horticulture' habitat statement (2.3.1) above). In Scotland about 44% of arable land consists of cereal crops, this would suggest that there are about 1847ha of cereal fields in Falkirk. In fact, the proportion of arable fields with cereal crops in Falkirk is likely to be higher than the Scottish average. There is no accurate information available regarding the extent or conservation value of cereal field margins within Falkirk's arable areas or how many of these habitats are being deliberately managed to create favourable conditions for farmland species. It is likely that few farmers in this area currently manage their cereal field margins specifically to benefit wildlife. However, many unmanaged margins (even just narrow uncultivated strips along fencelines) will be of value to biodiversity.

Significance.

Estimating the average national field size at about 12ha suggests that the UK has about 400,000km of cereal field edge. Then about 200,000ha of land around cereal fields could potentially be managed for the benefit of farmland species. Similarly, Scotland probably holds about 88,000ha of cereal field margins which potentially could be deliberately managed to benefit farmland species.[1] The importance of the Falkirk area for managed cereal field margins is probably quite limited at present, however there is potential to increase the area that is deliberately managed for wildlife.

Associated species.

Much of the wildlife interest in arable fields is found at the field edges. Many field margin plants, once considered to be farmland weeds, are now nationally rare. These plants in turn attract insects and other invertebrates. The plants and invertebrates supported by field margins are a vital source of food for many farmland birds and mammals. Even excluding soil invertebrates and micro-organisms, around 2000 invertebrates are commonly found in cereal fields.[1]

Audit species.

Priority:

Lepus europaeus (Brown Hare)

Perdix perdix (Grey Partridge)

Alauda arvensis (Skylark)

Emberiza schoeniclus (Reed Bunting)

Conservation concern:

Tyto alba (Barn Owl)

Emberiza citrinella (Yellowhammer)

Fumaria purpurea
(Purple Ramping-fumitory)

Locally Important:

Chrysanthemum leucanthemum
(Ox-eye daisy)

Area/quality trends & influencing factors.

Though the area of arable fields may not have changed greatly in recent years there may have been a reduction in the area of cereal field margins as a result of the removal of hedges to increase field size, particularly in the north-east of Falkirk. Changes in the area of field margins which are deliberately being managed to benefit farmland species are not known. It is likely that with increased agricultural intensification the quality of cereal field margins is worsening and areas being left as stubble have declined. The extent and quality of this habitat is mainly influenced by farming methods. Factors which can negatively impact on this habitat include: increased use of herbicides and pesticides, loss of winter stubble fields with the shift to winter cropping, a reduction in the rotation of crops, and the reduction of under-sown areas.[1]

Conservation status.

The restoration and appropriate management of cereal field margins should be encouraged wherever possible. The growing links between agri-environment grant schemes and biodiversity priorities will assist in this process, particularly through the Countryside Premium Scheme prescriptions for field margins and boundaries which encourage the management of grass margins and beetlebanks in arable fields and the management of conservation headlands. It is possible for cereal field margins to be managed in a way which benefits wildlife without having any serious detrimental effects on the rest of the crop.[1] At present the field margins of other non-cereal arable crops are not included in this habitat type due to a lack of knowledge concerning their value to wildlife and appropriate management practices. However, conservation issues for other crop margins could be tackled given the necessary opportunities and experience.[1]

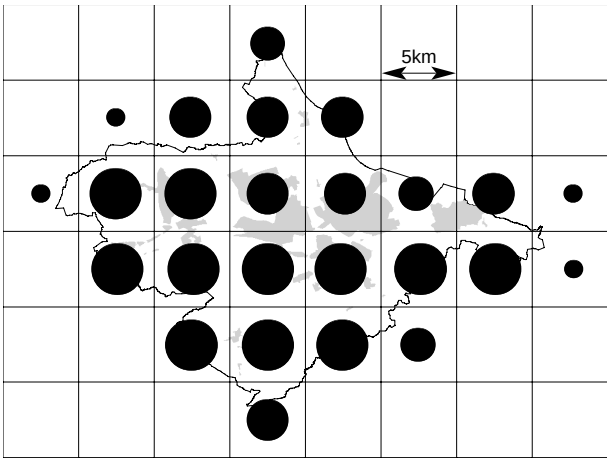
Information sources.

[1] UK Biodiversity Steering Group, 1995b.

2.3.2 Improved grassland (Broad habitat)

Improved grasslands include all species-poor, grass dominated vegetation communities resulting from sowing or modification of unimproved grassland for agricultural or recreational purposes.[1]

Current status, extent & distribution.



Presence of habitat in each 5km grid square

Source : Phase 1 Surveys of Falkirk 1994-1995

= <25ha
= 25 - <50ha
= 50 - <100ha
= 100 - 200ha
= >200ha

Improved, species-poor semi-improved and amenity grassland covers about 12390ha (43%) of the Falkirk area. The 948.4ha of amenity grassland occurs mainly within or near residential areas. The other improved or species-poor semi-improved grassland is primarily used for livestock grazing. This grassland is widely distributed throughout the area but the vast majority is located in the more upland agricultural areas around Denny and on the Slamannan Plateau to the south of the Falkirk area.[2, 3]

Significance.

In the past 50 years the area of improved grassland in the UK has increased by about 90%, largely at the expense of more biodiversity-rich habitats. This habitat is important where it provides feeding grounds for wildfowl or nesting sites for farmland birds.[4] In this area much of the improved grassland on the Slamannan Plateau is important for the bean geese which feed and roost there.

Associated species.

This habitat is often low in biodiversity, however some areas of improved grassland provide valuable feeding and nesting sites for certain bird species.[4]

Audit species.

Priority:

Lepus europaeus (Brown Hare)

Alauda arvensis (Skylark)

Conservation concern:

Anser anser (Greylag Goose)

Anser fabilis (Bean Goose)

Anas penelope (Widgeon)

Vanellus vanellus (Lapwing)

Area/quality trends & influencing factors.

Trends in the area of improved grassland in the Falkirk area are not known. However, it is likely that the area has steadily increased as more rough unimproved grassland and other habitats (e.g. scrub or mire) is drained and improved for use as grazing pasture. The quality of this improved grassland is likely to be maintained because of its use and management by livestock farmers. Fluctuations in the profitability of farming, particularly livestock farming, may produce some fluctuations in the quality of improved grassland because of the amount of management and improvement that is undertaken.

Conservation status.

This is not a threatened habitat. However, in specific areas where this grassland provides an essential habitat for important species (e.g. bean geese) it may be important to ensure that its agricultural management and use continues to maintain the required habitat.

Information sources.

[1] UK Biodiversity Group, 1999b.

[2] Bates M.A., Arnott D.A. & Nugent E., 1995.

[3] Shotton J. & Arnott D.A., 1994.

[4] UK Biodiversity Steering Group, 1995b.

2.3.2.3 Coastal and floodplain grazing marsh (Key habitat)

Grazing marsh is periodically inundated pasture or meadow with ditches, containing either brackish or fresh standing water, which maintain water levels. Almost all areas will be grazed or cut for hay or silage. This habitat does not include extensive areas of tall fen vegetation.[1]

Current status, extent & distribution.

This area supports no coastal grazing marsh. Nor does it appear to support any extensive areas of floodplain grazing marsh. However phase I surveys do indicate the presence of small areas of marshy grazing land alongside watercourses and drainage ditches which may periodically flood. Eight such sites can be identified from recent surveys ranging from 1ha to 5ha in size and totalling 23.5ha. Four of these sites are beside ditches and the other four are beside small burns or rivers. All but one of these sites is on the Slammanan Plateau to the south-west of Falkirk. The other is near Shippytrouty wood in the far north-west of this area.[2, 3]

Note that all these examples are of river valley floodplain grazing and are unlikely to exhibit the typical floodplain drainage systems with standing water. As such this area only has relatively poor examples of floodplain grazing marsh.

Significance.

The total extent of floodplain grazing in this area is unclear. However, it is apparent that there are no extensive or particularly representative examples of this habitat in the Falkirk area and that the extent of the habitat within Falkirk constitutes a very small proportion of the national resource of 300,000ha[1].

Associated species.

Grazing marsh is particularly important for the variety of breeding waders it supports. It also often supports wintering wildfowl.

Audit species.

Conservation concern:

Vanellus vanellus (Lapwing)

Numenius arquata (Curlew)

Gallinago gallinago (Snipe)

Area/Quality trends & influencing factors.

Unknown.

Key sites:

SITE	GRID REF.	AREA (ha)
Oakersdyke	NS 845 738	7.5
Upper Avon Mires	NS 825 734	6

Conservation status.

There are no extensive areas of good quality floodplain grazing in the Falkirk area. Where smaller areas occur the conservation value of these habitats should be recognised and the landowner could be encouraged to maintain the site and manage it to enhance its ecological value as floodplain grazing habitat.

Information sources.

[1] UK Biodiversity Steering Group, 1995b.

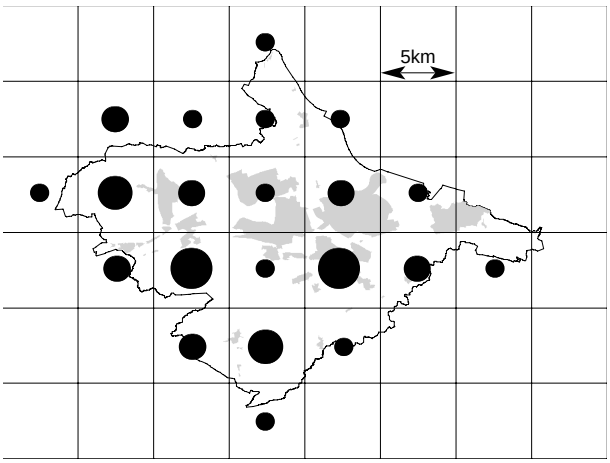
[2] Bates M.A., Arnott D.A. & Nugent E., 1995.

[3] Shotton J. & Arnott D.A., 1994.

2.3.3 Neutral grassland (Broad habitat)

This habitat type includes all semi-improved and unimproved grassland which occurs on circumneutral soils.[1]

Current status, extent & distribution.



Presence of habitat in each 5km grid square

Source : Phase 1 Surveys of Falkirk 1994-1995

= <25ha
= 25 - <50ha
= 50 - <100ha
= 100 - 200ha
= >200ha

There are approximately 200ha of semi-improved and 171ha of unimproved neutral grassland within this area (371ha in total).[2,3] This habitat is widely distributed across most of the Falkirk area, but tends to occur in small patches. 30 of the 97 sites identified from the phase I surveys are under 1ha and 52 are between 1ha and 5ha in size. Although present throughout most of the area, over half of the land covered by neutral grassland occurs east of Falkirk town in the 10km square covering Polmont, Grangemouth, Whitecross and Bo'ness.

Key sites:

SITE	GRID REF.	AREA (ha)
South Drum Claypit	NS 823 774	38.5
South Polmont	NS 923 782	12
Polmont Station	NS 923 784	8
Redding Grassland	NS 918 787	15
Grangemouth Docks	NS 954 834	7
Bonnybridge Nature Park	NS 817 803	13

Significance.

The total UK extent of species-rich neutral grassland is estimated at less than 15,000ha, approximately 11,000 - 12,000ha of which is in England and Wales.[4] Little data is available regarding the extent of this habitat within Scotland. However, if we assume Scotland holds the remaining 3,000ha of species-rich grassland then the extent of this habitat in the Falkirk area may be significant. Even excluding the semi-improved neutral grassland (since semi-improved grass may not be included in the national estimates) the 171ha of unimproved neutral grassland could account for 5.7% of the Scottish extent of this habitat and over 1% of the estimated UK species-rich neutral grassland resource. However, these estimates should be viewed with caution because it is unclear how much of the unimproved neutral grassland within Falkirk can be considered species-rich.

Audit species.

Priority:

Lepus europaeus (Brown Hare)

Alauda arvensis (Skylark)

Area/quality trends & influencing factors.

Throughout the UK unimproved neutral grassland has undergone a dramatic decline this century, mainly due to changes in agricultural practices.[4] Area and quality trends are not known for this area. However, it is almost certain that the area of un-improved neutral grassland has declined as a result of agricultural intensification. Similarly the extent of species-rich neutral grassland is also likely to have declined either as a result of improvement or due to management practices which do not favour many grassland flower species.

Conservation status.

Farmers are likely to continue to improve areas of pasture to increase their economic value for livestock farming. This agricultural pressure means that any conservation programme would need to encourage farmers to protect and enhance unimproved neutral grassland, using appropriate incentives and guidance. This would be assisted by the growing links between biodiversity and agri-environment grant schemes. Other areas of species-rich unimproved grassland could be protected from development through the planning process and the landowners encouraged to manage these sites to promote species diversity and the overall conservation value.

Information sources.

1 UK Biodiversity Group, 1999b.

2 Bates M.A., Arnott D.A. & Nugent E., 1995.

3 Shotton J. & Arnott D.A., 1994.

4 UK Biodiversity Steering Group, 1995b.

2.3.3.1 Lowland meadows (Key habitat)

Lowland meadows include all unimproved neutral grasslands which occur across the enclosed lowlands of the UK and are either cut for hay or used primarily for grazing. In some cases where management has ceased or does not take place every year the characteristic lowland meadow plant community may still persist with only subtle changes. These sites are also included.[1]

Current status, extent & distribution.

It is unclear which of the 36 unimproved neutral grassland sites identified from the phase I surveys are managed, either by cutting or grazing, or what the quality of the vegetation at these sites is. However, 11 sites (totalling 36ha) have been identified as supporting species-rich unimproved neutral grassland.[2,3] Three of these sites (Bo'mains meadow, Birkhill Claymine and Carron Glen) are known to be managed by cutting or grazing. A fourth species-rich neutral grassland site (California North) may also be grazed. In addition to these sites identified via phase I surveys, it is known that there is a managed species-rich meadow near Wester Arnloss and that Bonnyfield Quarry supports a large area of species-rich neutral grassland that is likely to be managed as meadow in the near future. There is also about 4ha of species-rich grassland along Bo'ness foreshore near Kinneil Colliery which is cut however it is mainly managed for amenity purposes. SNH data suggests the presence of 10ha of MG5 species-rich neutral grassland at NS775819 (near Castlerankine).[6] This is not confirmed by more recent phase I surveys and further investigation of this site might be needed.

For several of the other species-rich neutral grassland sites it remains unclear whether they have been recently managed or not. These sites include South Polmont (12ha), Redding Grasslands (15ha), Hallglen Haven (2ha), Grangemouth Docks (7ha), and three other sites totalling 6.5ha. Because their management status is unclear these sites are not classed as lowland meadows but should be noted as having potential for future management as lowland meadows.

Almost all of the above mentioned sites lie to the east or south of Falkirk town within relatively built up areas. It is this location that has probably prevented their improvement for agricultural use. The exceptions are Wester Arnloss which lies on the Slamannan Plateau and Carron Glen meadow which is located to the far north-west of the Falkirk area. Several of the sites have developed on or near old mine workings where there is nutrient poor soil and spoil.

Additional sites which may support characteristic meadow species include road verges which are not regularly treated by herbicides and pockets of species-rich grassland in churchyards, recreational areas etc. The extent of such sites in Falkirk is not known.

Key sites:

SITE	GRID REF.	AREA (ha)
Bo'mains Meadow	NS 988 794	1.5
Birkhill Claymine	NS 965 789	1
Wester Arnloss	NS 86 - 72 -	5*
Carron Glen meadows	NS 770 846	9.9
Bonnyfield Quarry	NS 817 799	15

* exact area and location is not known.

Significance.

The area of species-rich unimproved neutral grassland in the UK is estimated at about 15,000ha. The proportion of this area which supports characteristic meadow plant assemblages, undergoes appropriate grazing or cutting, and has a low-input nutrient regime is uncertain. Though the meadow habitat within Falkirk is likely to represent a very small proportion of the UK resource, it is rare and possibly declining in the Falkirk area and so of some local significance.

Associated species.

Lowland meadows are important habitats for a number of farmland birds. They are also important for a variety of flowering plants.

Audit species.

Priority:

Alauda arvensis (Skylark)

Locally important:

Platanthera chlorantha
(Greater Butterfly Orchid)

Area/quality trends & influencing factors.

The local area and quality trends of this habitat are not clearly known. However, it is likely that there has been a decline in the area and quality of such meadows over the last 50 years as grassland has been improved and much heavier grazing and cutting regimes imposed on many farms and other grassland areas .

Conservation status.

Areas of unimproved neutral grassland which support typical meadow plant assemblages are rare within the Falkirk area, suggesting a need to conserve and manage them wherever possible. On farmland such management might be encouraged via agri-environment schemes. Several of the other meadow areas are already being protected and managed for their conservation value. In other areas there may be potential to establish management regimes to create or improve meadow habitats. In such cases the owner could be encouraged to establish appropriate cutting or grazing regimes. There is considerable scope for the local authority to alter cutting and spraying regimes on road verges and in public open spaces to increase the conservation value of unimproved/semi-improved grassland areas, and the feasibility of this could be explored.

Information sources.

[1] UK Biodiversity Group, 1999b.

[2] Bates M.A., Arnott D.A. & Nugent E., 1995.

[3] Shotton J. & Arnott D.A., 1994.

[4] Robertson J. & Steven G., 1990.

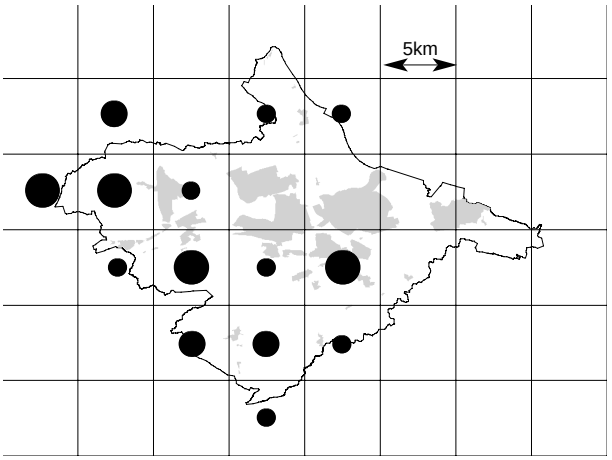
[5] Gillespies, 1995.

[6] Mackintosh J., Pers Comm.

2.3.4 Acid grassland (Broad habitat)

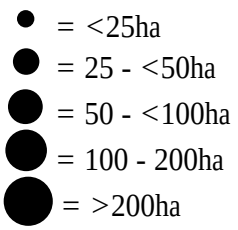
Acid grasslands include all semi-improved and unimproved grassland which occurs on acid soils. It includes wet acid grasslands and pioneer annual rich calcifuge communities.[1]

Current status, extent & distribution.



Presence of habitat in each 5km grid square

Source : Phase 1 Surveys of Falkirk 1994-1995



There are approximately 450ha of acid grassland in the Falkirk area, occurring at at least 53 distinct sites.[2,3] This habitat is present in only 14 of the 25 5km squares covering Falkirk and the majority of it occurs in three main areas: the upland area around Denny Muir; the Slamannan Plateau south of Falkirk; and the area around Polmont and south-east of Falkirk. Almost none of it occurs on the carse area to the north and east of Falkirk.

This broad habitat includes upland acid grassland (mainly around Denny Muir and on the Slammanan Plateau), wet acid grassland (probably including much of the acid grassland on the Slamannan Plateau), and dry acid grassland (see the 'Lowland, dry acid grassland' habitat statement (2.3.4.1)).

At least 120ha of Falkirk's acid grassland is likely to be upland in character. This may be greater but for many sites the information available makes it difficult to determine the character of the grassland. In many areas it is likely to occur in a mosaic with heath vegetation or grade into heathland (see 'dwarf shrub heath' habitat statement (2.4.1)).

The vast majority of this acid grassland habitat is either NVC type U5 (including the upland acid grass habitats) or NVC type U4. There are however some areas of U1 acid grassland (often grading into U4 or U5 vegetation communities), an area of U5-U6 vegetation, and localised patches of U2 grassland at Carron Glen meadows (see the 'lowland, dry acid grassland' habitat statement (2.3.4.1)).[5,6,7]

Significance.

Acid grasslands are probably one of the most extensive semi-natural habitats in Britain. It is estimated that there is over 1,200,000ha of acid grassland in the UK uplands as well as no more than 30,000ha of lowland acid grassland.[4] Falkirk's acid grassland represents only a small proportion of the total national area of acid grassland. However, its lowland acid grassland may be more significant given the rarity of this habitat in much of the UK (see the 'lowland, dry acid grassland' habitat statement (2.3.4.1)).

Associated species.

In the British uplands acid grasslands tend to be quite species poor, however they do contribute to the conservation value of moorland habitats. In the lowlands acid grasslands provide important reservoirs of rare species.[4]

Audit species.

Priority:

Perdix perdix (Grey Partridge)

Alauda arvensis (Skylark)

Conservation concern:

Circus cyaneus (Hen Harrier)

Falco columbarius (Merlin)

Asio flammeus (Short-eared Owl)

Oenanthe oenanthe (Wheatear)

Vipera berus (Adder)

Area/quality trends & influencing factors.

The local area and quality trends of this habitat are not known. However, Falkirk has a relatively small area of upland ground and it is likely that the extent of upland acid grassland has remained reasonably stable in this area, although some parts may have been lost to forestry plantations. This upland grass may also have become degraded as a result of heavy grazing, abandonment, or grassland improvement. Loss and degradation of lowland acidic grassland is likely to have been more widespread due to agricultural intensification and grassland improvement, and under-grazing resulting in invasion by coarse grasses and scrub (see the 'lowland, dry acid grassland' habitat statement (2.3.4.1)).4

Conservation status.

Upland acid grassland is not a particularly rare habitat nationally or regionally, however it is quite scarce in Falkirk. As such it may be desirable to protect this habitat from harmful development and encourage appropriate management wherever possible. The lowland acid grassland resource is more significant and may need to be protected from harmful development via the planning process. Many of these sites are designated as wildlife sites or SINCs and could be given protection via these designations. Sensitive management of existing sites and creation of new sites could be encouraged, using the planning system and other mechanisms (e.g. agri-environment schemes).

This habitat often occurs within other heath or grassland habitats. The management of these habitats should take account of the other significant habitats that occur with them.

Information sources.

[1] UK Biodiversity Group, 1999b.

[2] Bates M.A., Arnott D.A. & Nugent E., 1995.

[3] Shotton J. & Arnott D.A., 1994.

[4] UK Biodiversity Steering Group, 1995b.

[5] Watson K., 1994b.

[6] Watson K., 1997.

[7] Robertson J. & Steven G., 1990.

2.3.4.1 Lowland dry acidic grassland (Key habitat)

This habitat typically occurs on nutrient-poor, free-draining, acid soils. It includes enclosed and unenclosed acid grassland occurring throughout the UK lowlands, and often occurs in mosaic with lowland heath. It includes the NVC communities U1, U2, U3, and U4.[1] Despite its name, altitude is not a key determining feature of this habitat type.

Current status, extent & distribution.

There appears to be as much as 145ha of lowland, dry acid grassland within the Falkirk area at at least 27 different sites.[2,3] However, in many cases the acid grassland is in mosaic with grassland more typical of damper areas or upland grassland and it remains unclear from the present data whether many of these sites truly meet the criteria for lowland, dry acid grassland.

This habitat only appears in about 10 of the 25 5km squares covering Falkirk. The two main areas where it occurs are: north-west of Denny where the lowlands giveway to the uplands; and on the Slamannan Plateau (particularly to the north and east of this area). In many cases the grassland is marginal tending towards grassland more typical of upland areas.

The most common NVC community type represented in this habitat is U4 Festuca ovina-Agrostis capillaris-Galium saxatile grassland. However, types U1 and U2 do occur on a few sites within this more common vegetation community.

Key sites:

SITE	GRID REF.	AREA (ha)
By Stoneridge	NS 875 700	5
California north	NS 902 765	1
Cowden Hill	NS 771 798	2
Near Shippytrouty wood	NS 789 840	6
Maddiston west	NS 925 761	12
Balquatstone	NS 864 723	22
Near Castlecary High Wood	NS 806 765	25
South Drum	NS 824 774	7
Myot Hill	NS 781 825	6

Significance.

It is estimated that there is less than 30,000ha of lowland acid grassland within the UK, less than 5000ha of which occurs in Scotland.[4] The vast majority of this habitat is found in southern England and along the Welsh-English border.[5] Falkirk's lowland acid grassland may represents as much as 0.48% of the total UK resource, although it

is fragmented with many semi-improved or degraded stands. Falkirk has very little U1 and U2 grassland, which is more typical of southern Britain (U3 grassland is not found anywhere in Scotland). However the very presence of U1 grassland and possibly U2 grassland is of significance in this area since it is on the northerly range of its occurrence in the UK.[6,7] Locally lowland acid grassland is rare and may be threatened by development and inappropriate management.

Associated species.

Dry, acid grassland can support a significant number of rare and scarce vascular plants, many of which are annuals. A variety of important bird species also use acid grasslands for breeding and wintering. Many invertebrates which occur in acid grassland do not occur in any other grassland types.

Audit species.

Priority:

Alauda arvensis (Skylark)

Conservation concern:

Vanellus vanellus (Lapwing)

Picus viridis (Green Woodpecker)

Area/quality trends & influencing factors.

Throughout the UK dry, acid grassland has undergone substantial declines over the last 100 years, though no figures are available on the rate of loss. This decline is mainly due to agricultural intensification, although development and afforestation of sites may have caused decline in certain areas. Local area and quality trends are unknown, however it is likely that the national trends apply to this area and that the extent of dry, acid grassland has been significantly reduced. The dry acid grassland in Falkirk has also become very fragmented with many sites now small and isolated and often on the margins of upland or wetter acid grassland.

Conservation status.

Lowland dry acid grassland is a rare habitat both locally and nationally. As such any remaining sites should be conserved. The habitat should be protected from harmful development and wherever possible managed to protect and enhance the grassland habitat and its conservation value. Some of Falkirk's dry, acid grassland sites are already designated as wildlife sites or SINCs and should be afforded protection via this designation. Other sites may need to be assessed to determine to what extent they actually represent this habitat, and those that do represent dry, acid grassland could be protected by designation as a wildlife site or SINC. Opportunities to develop new dry, acid grassland sites should be taken, however these are likely to be limited by the availablity of appropriate dry, acid sites.

Information sources.

1 UK Biodiversity Group, 1999b.

2 Bates M.A., Arnott D.A. & Nugent E., 1995.

3 Shotton J. & Arnott D.A., 1994.

4 UK Biodiversity Steering Group, 1995b.

5 UK Biodiversity Group, 1999b.

6 Jefferson R., Pers Comm.

7 Sanderson N.A., 1998.

2.3.5 Boundary and linear features (Broad habitat)

There are three main types of boundary feature: hedgerows, walls and ditches. Frequently there are linear grass verges associated with these features, especially along roadsides. These features support a large proportion of the biodiversity in the countryside and provide opportunities for species to move into and through otherwise inhospitable areas.[1]

Current status, extent & distribution.

The Falkirk area has approximately 120km of hedgerows.[2,3] These are distributed throughout the area but appear to be more predominant in the agricultural areas to the south of Falkirk. The phase I surveys indicate the presence of almost 250km of wall (136km of which is intact). The surveys do not distinguish dry stone walls from others however, at least half of these walls (approx. 125km) occur along field boundaries in agricultural areas and so can be assumed to be dry stone walls. These features occur throughout the agricultural areas around Falkirk, however they are particularly predominant as field boundaries in the countryside to the north-west of Falkirk around Denny. The Phase I surveys also indicate approximately 47km of drainage ditches and 5km of dry ditches. These are distributed throughout the area, although primarily in agricultural areas and more so to the south of Falkirk.

Significance.

These features are likely to represent a very small proportion of the UK or Scottish total. However, their limited extent within the Falkirk area, their contribution to the agricultural landscape and their value as wildlife corridors make them locally significant.

Associated species.

Hedges support a wide range of woodland and farmland species, as well as providing opportunities for shelter and for animals to move within otherwise unfavourable habitats (see the 'ancient and species-rich hedgerows' habitat statement (2.3.5.1)). Dry stone walls support plants and animals adapted to a rocky habitat, including various mosses and lichens. They are used by a wide range of invertebrates, reptiles, birds and mammals for feeding, breeding and shelter[1]. Drainage ditches, especially within heavily used agricultural land, are an important refuge for aquatic plants and animals. They can also provide a valuable water source for many other farmland animals.

Audit species.

Priority:

Arvicola terrestris (Water Vole)

Emberiza schoeniclus (Reed Bunting)

Conservation concern:

Erinaceus europaeus (Hedgehog)

Also see the 'Ancient and species-rich hedgerow' habitat statement (2.3.5.1).

Area/quality trends & influencing factors.

There is no data relating to the area and quality trends of boundary features in Falkirk. However, it is likely that with agricultural intensification and the increased use of fencing on farmland the numbers of species-rich hedges and dry stone walls will have significantly decreased. Many of the remaining features are likely to be degraded due to a lack of repair and maintenance. Associated grass verges have in the past suffered from an increased use of flail mowers and chemicals. This may have

ceased in many areas but often the remaining semi-natural vegetation is being overcome by rank grass and scrub species. Disturbance of boundary features and road verges as a result of road widening and the laying and maintenance of cables and pipes is also having a negative impact on their extent and quality. Drainage ditches may have actually increased in extent, however a lowered water table and increased chemical run-off from fields will reduce the conservation value of these features.[1]

Conservation status.

Boundary features are valuable habitats and wildlife corridors and wherever possible their quantity and quality should be maintained, protecting features of conservation value and bringing derelict features into appropriate management. The management of many of these features could be encouraged through agri-environment funding schemes. Local authority management of boundary features and grass verges could be adapted to take full account of their conservation value and aim to maintain and enhance it.

Information sources.

[1] UK Biodiversity Steering Group, 1995b.

[2] Bates M.A., Arnott D.A. & Nugent E., 1995.

[3] Shotton J. & Arnott D.A., 1994.

2.3.5.1 Ancient and/or species-rich hedgerows (Key habitat)

Ancient hedgerows are those which existed pre- enclosure (i.e. before 1840). Species-rich hedgerows are those which contain on average 4 or more native woody species in a 30m length. It may also include hedges with a rich basal flora of herbaceous plants though practical criteria for identifying these has not yet been agreed. Recently planted species-rich hedges are included.[1]

Current status, extent & distribution.

Phase I surveys indicate that there are 5050m of species-rich hedgerow within the Falkirk area, 1500m of which include hedgerow trees. This represents approximately 4.3% of the total length of intact hedgerow within the Falkirk area. A further 300m of defunct species-rich hedge is also present.[2,3] Since the phase I surveys CSCT has planted about 9000m of hedge and FWAG have proposed the planting of at least a further 1000m of farm hedge, some of which has already been planted. These newly planted hedges use a variety of native hedgerow species. This gives a current total of about 15km of species-rich hedgerow. The majority of this habitat occurs within the lowland arable areas of the Avon valley.

Key sites:

SITE	GRID REF.	Length (m)
Whitecross (north of)*	NS 972 778	4400
Hamilton Road*	NS 866 844	300
Rumford*	NS 926 765	350

*old species-rich hedgerows

Significance.

In 1990 it was estimated that there were about 33,000 km of hedgerow remaining in Scotland. The UK total in 1995 was about 450,000km. Past analysis suggests that 42% of British hedges are ancient and/or species-rich. However, such hedges are relatively scarce within Scotland[1]. Ancient and/or species-rich hedges in Falkirk represent about 0.04% of the total Scottish resource and 0.003% of the total UK resource. However their scarcity within the Falkirk area make them locally significant.

Associated species.

Species-rich hedges are a primary habitat for over 47 species of conservation concern in the UK, including 13 globally threatened ones1. They are especially important for butterflies and moths, farmland birds, and bats and are an essential refuge for numerous woodland and farmland animals as well as supporting many plant species. Hedgerows also act as valuable wildlife corridors. Mature hedgerow trees and associated dead wood can support a wide range of invertebrates, particularly beetles, spiders and two-winged flies. They are also important for hole-nesting birds, bats and many lower plant species.[4]

Audit species.

Priority:

Perdix perdix (Grey Partridge)

Emberiza schoeniclus (Reed Bunting)

Pyrrhula pyrrhula (Bullfinch)

Carduelis cannabina (Linnet)

Passer montanus (Tree Sparrow)

Conservation concern:

Emberiza citrinella (Yellowhammer)

Fumaria purpurea
(Purple Ramping-fumitory)

Area/quality trends & influencing factors.

The past extent of ancient and species-rich hedgerows in the Falkirk area is not known. However, it is estimated that there is an annual net loss of 5% of this habitat every year throughout the UK. Although Falkirk is likely to have started out with a smaller proportion of hedges than other areas in the UK (especially in England) it has probably experience a similarly dramatic decline. The quality of remaining hedges is also likely to be poor since many hedges are no longer managed in a way that will retain their conservation value. The decline and degradation of ancient and species-rich hedges has at least partly been caused by: a lack of cutting or laying, badly timed or too frequent cutting, loss of hedgerow trees without replacement, use of herbicides, pesticides and fertilisers up to the base of hedges, grazing by livestock, and removal for agricultural or developmental purposes.[1]

Conservation status.

Given the scarcity of this habitat in Falkirk it is important that further losses are avoided. All ancient or species-rich hedges could be protected in the planning process by an assumption against their removal or destruction. The management of hedges could be encouraged wherever possible, including through planning and development policies. Hedge planting programmes (e.g. by FWAG and CSCT) could be encouraged to ensure the continued planting and subsequent good management of species-rich, native hedgerows in this area.

Information sources.

[1] UK Biodiversity Steering Group, 1995b.

[2] Bates M.A., Arnott D.A. & Nugent E., 1995.

[3] Shotton J. & Arnott D.A., 1994.

[4] Lott D. & Stubbs A., 1999.

2.3.6 Bracken (Broad habitat)

This habitat includes all areas greater than 0.25 hectares dominated by continuous bracken[1].

Current status, extent & distribution.

The phase I surveys for Falkirk indicate the presence of almost 60 hectares of bracken. However most of this occurs in relatively small patches (c. 1 hectare or less). The most extensive stands of continuous bracken occur on the northern upper slopes of Carron Glen (approx. 20 ha) and on the outer edges of Letham moss and Dunmore moss (c. 5ha & 3ha respectively). Most of the other bracken patches occur as integral parts of or in mosaic with other habitats, particularly woodland or scrub.

Significance.

The limited area of continuous bracken within Falkirk is likely to represent a very small proportion of the total UK cover.

Associated species.

Bracken often occurs as an invasive species in other habitats (e.g. grassland) which have a higher conservation value than the bracken itself. However, it is an important habitat for some specialist species, particularly invertebrates, and can provide valuable shelter for other animals.

Area/quality trends & influencing factors.

The area and quality trends of bracken are not fully known however it tends to be an invasive species and so is likely to have increased in extent both nationally and locally. This trend may be reversed in localised areas where bracken is being managed to protect habitats which it has invaded.

Conservation status.

Bracken is not a threatened habitat and Falkirk has no records of important species which rely on areas of bracken. Thus conservation of this habitat is not required. In fact in some cases control of bracken may be necessary to safeguard the conservation value of the habitat in which it occurs. In some areas a light covering of bracken can encourage the growth of violets, the food plant of small pearl-bordered fritillary. If future data suggests that in certain areas this species would benefit from bracken growth the management approach to this habitat could be reviewed.

Information sources.

[1] UK Biodiversity Group, 1999b.

[2] Bates M.A., Arnott D.A. & Nugent E., 1995.

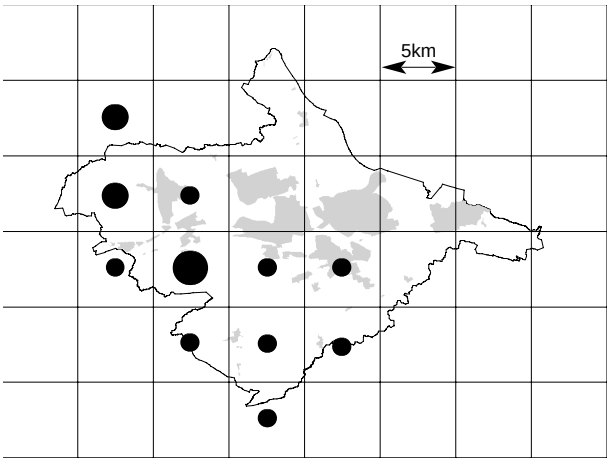
[3] Shotton J. & Arnott D.A., 1994.

2.4 Heathlands and Bogs

2.4.1 Dwarf shrub heath (Broad habitat)

This habitat type includes vegetation dominated by heath species, such as heather Calluna vulgaris and cross-leaved heath Erica tetralix, or dwarf gorse species.[1]

Current status, extent & distribution.



Presence of habitat in each 5km grid square

Source : Phase 1 Surveys of Falkirk 1994-1995

● = <25ha
● = 25 - <50ha
● = 50 - <100ha
● = 100 - 200ha
● = >200ha

Surveys from 1994/95 indicate that Falkirk supports about 168ha of heathland, which accounts for approximately 0.6% of its total land cover. Much of this habitat occurs in relatively small pockets (< 5ha). However, there are five much larger heath sites at Shippytrouty wood (40ha of dry heath and grass mosaic with a neighbouring area of 14ha of dry heath); Torwood heath (18ha of wet dwarf shrub heath); Graystone knowe (16ha of wet dwarf shrub heath); Denny Muir (10ha of wet heath) and Newcraig (24ha of dry dwarf shrub heath and grass mosaic). This habitat is present in 11 of the 25 5km squares covering Falkirk and almost entirely restricted to the western half of the area.[2,3] Most of these heath habitats occur in mosaic with grassland and/or mire habitats. There are also several conifer woodlands which appear to have heathy understoreys (e.g. Castlecary High wood).

Key sites:

SITE	GRID REF.	AREA (ha)
Shippytrouty wood	NS 780 848	54
Torwood Heath	NS 824 844	18
Denny Muir	NS 758 832	10
Newcraig	NS 846 759	24*
Graystone Knowe	NS 809 760	16

* four areas within the mire site.

Significance.

There are approximately 3.7 million hectares of upland heath and 58,000ha of lowland heath within the UK.[4] Clearly Falkirk's 168ha of heath represents a very small proportion of this UK total. Much of the heath in Falkirk occurs in small pockets and is rather isolated.[2,3] However, it often represents a valuable element of a larger mosaic habitat with grassland and mire vegetation. The relative scarcity and fragmentation of heath in Falkirk and its conservation value where it does occur gives this habitat local significance.

Associated species.

This habitat can support a wide variety of characteristic heathland birds, invertebrates, vascular plants, bryophytes and lichens.4 It often provides shelter in an otherwise open and windswept environment.

Audit species.

Priority:

Tetrao tetrix (Black Grouse)

Conservation concern:

Cervus elaphus (Red Deer)

Falco columbarius (Merlin)

Pluvialis apricaria (Golden Plover)

Coenonympha tullia (Large Heath)

Dyscia fagaria (Scalloped Bar Moth)

Area/quality trends & influencing factors.

Local trends in the extent and quality of dwarf shrub heath are not fully known. However, it is likely that, as in the rest of the UK and Scotland, it has declined in area and in quality. In the upland and agricultural areas of Falkirk heath is likely to have been lost over the last 50 years due to changes in landuse particularly afforestation, improved grassland for grazing, and heavy grazing pressures. Areas may also have been lost or degraded as a result of poor moorland management. Elsewhere heath may have been lost where areas have been built on. A few fragments remain in built up areas which are probably remnants of much larger heaths. Much of the heath in Falkirk occurs in small pockets and this increases the threat of decline or degradation because the habitats are less robust and more susceptible to damage and vegetation loss around the edges

Conservation status.

In order to protect the dwarf shrub heath in this area it would be necessary to protect against further loss through the planning process and might also be desirable to designate particularly important or vulnerable sites to afford them increased protection against alternative land-uses. The existing heath is likely to require specific management to maintain its conservation value over the long-term and good heathland management should be promoted wherever possible. In some cases where heathland is already degraded as a result of poor management, it might be feasible to restore the habitat and then implement a suitable management regime.

Information sources.

1 UK Biodiversity Group, 1999b.

2 Bates M.A., Arnott D.A. & Nugent E., 1995.

3 Shotton J. & Arnott D.A., 1994.

4 UK Biodiversity Steering Group, 1995b.

2.4.1.1 Lowland heathland (Key habitat)

This habitat type is characterised by the presence of heather, dwarf gorse, cross-leaved heath and wavy hair-grass, and generally occurs below 300m in altitude. Good quality heath consist of an ericaceous layer with areas of scattered trees, scrub, bare ground, gorse, wet heath, bog, and standing water.[1] Lowland heath in Scotland differs from that in southern England in its species composition and richness and many of the plant communities listed by the UK Biodiversity Group as in this habitat do not even occur in Scotland. [2] Several plant communities can occur in both upland and lowland heath, including NVC community H12 which occurs widely within Falkirk.

Current status, extent & distribution.

The distinction between lowland and upland heath in this area is unclear and for most sites the current information is inadequate to determine whether the heath is upland or lowland in character. Distinctions based on altitude are erroneous in Scotland where upland heath can actually extend down to sea level.

With the habitat data presently available it is impossible to estimate the extent of lowland heath in this area. Much of the heath below 300m in Falkirk is likely to show upland characteristics (see 2.4.1.2).

Significance.

Lowland heath is a rare and threatened habitat with a UK coverage of about 58,000ha.[1] Falkirk is likely to support a very small proportion of this resource.

Associated species.

Lowland heath supports many of the heathland species listed above (2.4.1). The species occurring in this habitat in Falkirk will be influenced by the limited extent of most of the heath sites and the adjacent habitats. Many of these areas are likely to be too small and isolated to support species with large ranges such as grouse or red deer.

Area/quality trends & influencing factors.

Changes in the extent and quality of lowland heath in Falkirk are not known. Much of the heath that occurs is now very fragmented and it is likely that any lowland heath has suffered degradation and/or decline as a result of reclamation of land for development; agricultural improvement or afforestation; heavy grazing pressures; or poor heather management.

Conservation status.

The conservation status of lowland heath in the Falkirk area could only be accurately assessed with further work to determine the types of heath communities that occur and which ones if any are lowland in character. Until then it must be assessed and managed within the broader dwarf shrub heath habitat (see the 'Dwarf shrub heath' habitat statement (2.4.1)).

Information sources.

[1] UK Biodiversity Steering Group, 1995b.

[2] Alexander et al. 1998.

[3] Bates M.A., Arnott D.A. & Nugent E., 1995.

[4] Shotton J. & Arnott D.A., 1994.

2.4.1.2 Upland heathland (Key habitat)

Upland heath is generally dominated by heather Calluna vulgaris, bilberry Vaccinium myrtillus, crowberry Empetrum nigrum and bell heather Erica cinerea. However, it may be dominated by mixtures of cross-leaved heather Erica tetralix, purple moor-grass Molinia caerulea and Sphagnum. This habitat is usually found in areas of high rainfall on nutrient-poor, acid soils.[1]

Current status, extent & distribution.

Falkirk contains 10 hectares of heathland which is clearly upland in character and occurs above 250m, within Denny Muir SSSI. The majority of this (8ha) is wet dwarf shrub vegetation dominated by heather Calluna vulgaris and bilberry Vaccinium myrtillus.[2] Elsewhere within the site there is a small area (1ha) of wet heath and acid grassland mosaic and another of dry dwarf shrub heath. This upland heath occurs within a much larger mosaic of flushed grassland, blanket bog and unimproved acidic grassland.[3,4]

Other sites which have heath vegetation dominated by heather with molinia caerulea (purple moor-grass), Nardus stricta (Mat grass), Vaccinium myrtillus (Bilberry) or Vaccinium vitis-idaea (Cowberry) are almost certainly upland heath habitats. There are at least 5 such sites (and probably many more) from the 32 heath sites identified from phase I surveys.

The status of the remaining heath in Falkirk remains unclear. Most of this heath habitat is NVC community H12 which can occur in both upland and lowland heath communities.

Significance.

Falkirk supports a relatively small area of upland heath which represents a tiny proportion of the total Scottish resource of between 1,700,000ha and 2,500,000ha.[5]

Associated species.

Upland heathland is a prime habitat for moorland birds as well as supporting various upland mammals. It can also be very rich in bryophytes and lichens.

Audit species.

Conservation concern:

Cervus elaphus (Red Deer)

Circus cyaenus (Hen Harrier)

Pluvialis apricaria (Golden Plover)

Numenius arquata (Curlew)

Gallinago gallinago (Snipe)

Dyscia fagaria (Scalloped Bar Moth)

Area/quality trends & influencing factors.

The local area and quality trends for upland heath are not fully known. Within Scotland there was a 22% decline in heather moorland between the 1940's and the 1980's.6 Locally the habitat is not extensive and may not have suffered such a serious decline, however it is likely to have declined in both extent and quality. The main factors affecting upland heath are heavy grazing, afforestation, poor heather management, agricultural intensification and acidification. The area of upland heath at Denny Muir is protected from most of these threats by its SSSI designation and appears to have undergone little change since its designation in 1992.

Conservation status.

Specific assessment of the conservation status of upland heath and its appropriate management would require further information to enable upland and lowland heath habitats in Falkirk to be clearly distinguished. Until then it must be assessed and managed within the broader dwarf shrub heath habitat (see the 'dwarf shrub heath' habitat statement (2.4.1)). It may be that the distinction between upland and lowland heath in this area is not that great, particularly where they are part of a complex mosaic of grassland and mire vegetation, and that they should in fact be treated as one basic habitat.

Information sources.

[1] UK Biodiversity Steering Group, 1995b.

[2] Denny Muir SSSI citation.

[3] Bates M.A., Arnott D.A. & Nugent E., 1995.

[4] Shotton J. & Arnott D.A., 1994.

[5] UK Biodiversity Group, 1999f.

[6] Mackey et al, 1998.

2.4.2 Bogs (Broad habitat)

Bog habitats are wetlands that support vegetation which is usually peat forming, and which receive nutrients only from precipitation. This includes blanket bogs, intermediate bogs and raised bogs.[1]

Current status, extent & distribution.

Bogs cover about 948ha (approximately 3.3%) of the Falkirk area. The overwhelming majority of this coverage (886ha) consists of raised bogs or intermediate bogs. Only 62ha is blanket bog.[2,3] (See the 'lowland raised and intermediate bogs' and 'blanket bogs' key habitat statements below). Bogs occur in 12 of the 25 5km squares covering Falkirk. The majority of them are found to the south-west of Falkirk mainly on the peatlands of the Slammanan Plateau but also on the peat deposits around the Denny area (particularly near Denny Muir). The exceptions to this are Letham moss and Dunmore moss which lie to the north of Falkirk on the peaty carselands. The Falkirk area has two large peat extraction sites: at Gardrum moss where extraction has taken place over 130ha leaving bare peat which will not recover; and at Letham moss where extraction continues on much of the 117ha site. Other sites have experienced some peat cutting but to a much lesser extent.

Significance.

In terms of bogs generally (including blanket, intermediate and raised bogs) Falkirk only holds about 0.06% of the UK total. However it does hold a much larger proportion of the UK coverage of raised and intermediate bogs (see 'Lowland raised and intermediate bogs' key habitat statement (2.4.2.1)).

Associated species.

Bogs tend to support a variety of specialised plant assemblages, as well as a distinctive range of animals including various waders, wildfowl and invertebrates.[1]

Area/quality trends & influencing factors.

(See 2.4.2.1 & 2.4.2.2 below)

Conservation status.

(See 2.4.2.1 & 2.4.2.2 below)

Information sources.

1 UK Biodiversity Group, 1999b.

2 Bates M.A., Arnott D.A. & Nugent E., 1995.

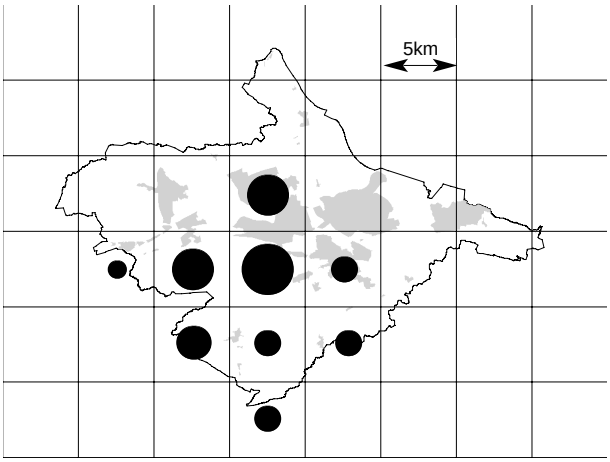
3 Shotton J. & Arnott D.A., 1994.

2.4.2.1 Lowland raised and intermediate bogs (Key habitat)

Lowland raised bogs consist of a deep mound of water-logged peat, with its surface covered by a living layer of plants and mosses. Characteristic plants include heaths Erica, cotton grasses and bog mosses.1 Intermediate bogs show characteristics of both raised bogs and blanket bogs. They consist of a layer of peat which tends to follow the contours of the underlying ground but also exhibit raised domes typical of raised bog habitats. Lowland raised and intermediate bogs can be classified as primary or secondary depending on the level of damage they have sustained. Primary bogs are those where the surface layer of plants (called the acrotelm) is undisturbed and rich sphagnum communities typically occur. Secondary bogs are those which have been damaged (e.g. by peat extraction) but retain a stable water table.

(Because of the close affinity of intermediate bogs to lowland raised bogs and their value in this area, it is important that intermediate bogs are highlighted in this audit. They are thus being included here with lowland raised bogs.)

Current status, extent & distribution.



Presence of habitat in each 5km grid square

Source : Phase 1 Surveys of Falkirk 1994-1995

= <25ha
= 25 - <50ha
= 50 - <100ha
= 100 - 200ha
= >200ha

There are approximately 808ha of raised bog within the Falkirk area. This includes primary and secondary bogs with widely varying degrees of disturbance and water content. It also includes 130ha of moribund peatland at Gardrum moss where peat extraction has devastated the bog with no hope of regeneration. [2,3]

Assessing the level of disturbance of these bogs is difficult with the information presently available. However, about 11 of the 35 raised bog sites (totalling approximately 234ha) can be identified as relatively unmodified (i.e. primary bogs without tree cover.)[2,3,4] Of these only parts are primary, active bog habitat (probably totalling less than 180ha), the rest has suffered some degradation but is likely to retain some peat forming vegetation. In many cases modification has affected only parts of a bog with elements of it remain relatively undisturbed, making it difficult to categorise the bog as a whole. There are

several bogs which are not included in the 11 primary raised bogs but may have elements that fit into that class. All of these relatively undisturbed bogs occur on the Slamannan Plateau and are listed below.

The other 24 raised bogs (totalling about 431ha) are classed as modified.[2,3] These include primary raised bogs which have suffered varying degrees of peat cutting, grazing, drainage or planting, and secondary raised bogs. Many of these modified sites have retained their domed surface and some bog vegetation and so can be classed as either regenerating secondary bog or degraded primary bog. It is possible that some of these bogs also contain small areas of undisturbed primary, active bog but without further data the exact area and condition of such habitats cannot be determined. Almost all of these modified raised bogs are located within the Slammanan Plateau area. However several (Letham moss and Dunmore moss) occur on the carseland to the north.

Much of this habitat occurs in small fragmented sites with only 14 sites of 15 ha or more, several of which are over 50ha. Though some of these larger bogs have been significantly modified or are becoming drier, there are several that are relatively intact and active. These include: Darnrig moss SSSI (78ha), Garbethill Muir (47ha within Falkirk), Grangeneuk (32ha), Howierig Muir SSSI(18ha), and Black Loch Moss SSSI (108ha, 2ha in Falkirk)

There are at least ten intermediate bog sites totalling approximately 71ha, within the Falkirk area.[2,3] It is possible that some of the other modified bogs are in fact intermediate, however most have been classified as raised bogs either within phase I surveys or within the peatland inventory. All these intermediate bogs are located on the Slamannan Plateau.

Key sites:

SITE	GRID REF.	AREA (ha)	STATUS
Shortrigg South	NS 833 736	8	(Intermediate)
Greyrigg	NS 869 719	6	(Intermediate)
Wester Jawcraig north	NS 841 758	4	(Intermediate)
Greenhill	NS 825 786	15	(Intermediate)
Blackhill Moss	NS 814 776	15*	(Intermediate)
Newcraig North	NS 846 762	14	(Intermediate)
Darnrig Moss SSSI	NS 855 752	78	(Part active raised bog)
Garbethill Muir	NS 831 761	47	Raised bog
Grangeneuk	NS 818 736	32	Raised bog (5ha active)
Drumbroider Moss	NS 919 743	26	Raised bog
Shielknowes	NS 829 726	14	Raised bog
Howierig SSSI	NS 854 786	18	Raised bog (6ha active)
Candie Moss	NS 927 739	5	Raised bog
Newcraig	NS 849 759	7	Raised bog
Easter Greenrig	NS 827 744	20	Raised bog (8ha active)
Easter Drumclair	NS 865 711	8	Raised bog
Black Loch Moss SSSI	NS 855 697	2ha (108ha total)*	Raised bog

* only 2ha of this site lie within the Falkirk area.

Significance.

The area of primary, active lowland raised bog in the UK has decreased dramatically to its current level of about 6000ha.[1] It is difficult to determine from the phase I surveys exactly how much of the lowland raised bog within Falkirk is primary, active bog however it is likely to be at least 150ha, constituting 2.5% of the total UK cover of that habitat. In addition to this many of the modified raised bogs (approx. 200ha) occurring within the Falkirk area are likely to be reasonably intact, retaining some of the characteristics of primary, active bogs, and having potential for enhancement.

The area of lowland raised bog within Falkirk is clearly of considerable significance. Much of the UK lowland raised bog resource is scattered over many small sites, so the presence of several sites over 50ha within the Falkirk area is particularly significant.

There are 11,719ha of intermediate bog in Great Britain, most of which occurs within Scotland. Falkirk's intermediate bogs represent 0.6% and 0.66% of the Great Britain and Scotland resource respectively. This area's intermediate bogs are of considerable local conservation value and help to reinforce the presence and ecological value of the lowland raised bogs, making a significant contribution to the overall lowland bog habitat.

Associated species.

Lowland raised and intermediate bogs support a distinctive range of plants and animals including many wetland birds and invertebrates such as the mire pill beetle Curimopsis nigrita.[1]

Audit species.

Conservation concern:

Numenius arquata (Curlew)

Gallinago gallinago (Snipe)

Coenonympha tullia (Large Heath Butterfly)

Carum verticullatum (Whorled Caraway)

Locally important:

Drosera rotundifolia
(Round-leaved Sundew)

Area/quality trends & influencing factors.

Within Scotland the area of lowland mire (including some fens as well as intermediate and raised bogs) declined by about 44% between the 1940's and the 1980's. A similar decline of 40% took place in the central region during this period.[5] It is likely that Falkirk has experienced a similarly dramatic loss of lowland raised and intermediate bogs over the last century. Though some of the bogs in Falkirk are still completely or partly primary and active, many have suffered some degree of modification. While most of the sites retain some of their characteristic raised bog shape and vegetation and have potential for enhancement and recovery, several have suffered irrepairable damage either from afforestation, peat extraction or draining and re-seeding for pasture. Other serious threats to raised and intermediate bogs in this area include: built development resulting in the destruction of bogs or serious damage to a bog's hydrology, and drainage either in or adjacent to a bog site resulting in its drying out and degeneration. At some sites pollution from agricultural runoff may be a problem and climate change (higher winter rainfall and greater drought risk in summer) may also increase stresses on some bogs.[6]

Conservation status.

The lowland raised and intermediate bogs in Falkirk are of considerable local and national importance. Protection of this resource would require that existing lowland raised and intermediate bogs in Falkirk are safeguarded and where possible their current condition maintained or enhanced. In many cases the bogs have suffered limited degrees of modification and may offer opportunities for enhancement. Threats from other land-uses, particularly development or afforestation could be prevented through the local authority planning process and other policy strategies (e.g indicative forest strategies).

Information sources.

[1] UK Biodiversity Steering Group, 1995b.

[2] Bates M.A., Arnott D.A. & Nugent E., 1995.

[3] Shotton J. & Arnott D.A., 1994.

[4] Lindsay R. & Immirzi P., 1996.

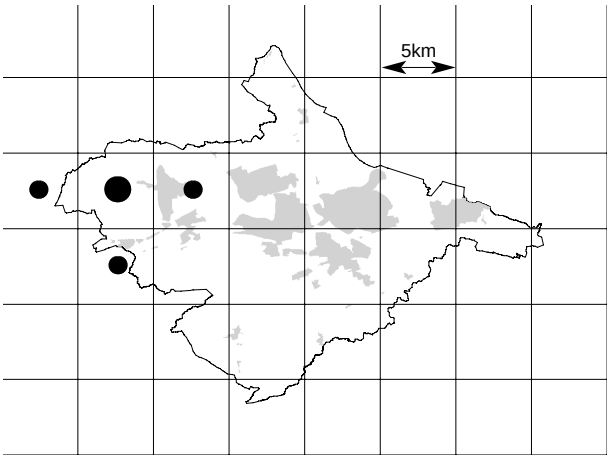
[5] Macket et al, 1998.

[6] Mackinlay L., 1999.

2.4.2.2 Blanket bogs (Key habitat)

Blanket bog typically occurs in areas of high, regular rainfall. It consists of a mantle of peat which forms in wet hollows and on large areas of undulating land surface. Typically sphagnum is abundant and a wide range of ericoids may be present on drier hummocks with cotton-grasses. Active blanket bogs are those which are still capable of accumulating peat through the growth and impeded decay of sphagnum and eriophorum communities.[1]

Current status, extent & distribution.



Presence of habitat in each 5km grid square

Source : Phase 1 Surveys of Falkirk 1994-1995

- = <25ha
- = 25 - <50ha
- = 50 - <100ha
- = 100 - 200ha
- = >200ha

Phase I surveys indicate the presence of five areas of blanket bog [2,3]. All of these occur in the area near Denny where the lowland begins to giveway to the uplands of the Campsie hills to the north-west. Altogether they comprise 61ha, the largest site being Denny Muir mire at 31ha. Only one site (Whitehill mire - 13ha) is a primary, active blanket bog. Takmadoon mire (11ha) is regularly drained but still supports active mire vegetation. The other three sites are degraded or have been drained at some time, however they do retain some characteristic mire vegetation.[4]

Key sites:

SITE	GRID REF.	AREA (ha)
Denny Muir	NS 758 829	31
Takmadoon	NS 739 819	11
Whitehill mire	NS 771 803	13
Doups	NS 744 811	4
Torwood mire	NS 823 846	2

Significance.

The UK has approximately 1.5 million hectares of blanket bog, the vast majority of which occurs within Scotland.[1] Falkirk holds a very small proportion of this UK resource.

Associated species.

Blanket bogs support many upland species and are important nesting habitats for a variety of birds.

Audit species.

Conservation concern:

Pluvialis apricaria (Golden Plover)

Calidris alpina (Dunlin)

Gallinago gallinago (Snipe)

Rana temporaria (Common Frog)

Carum verticullatum (Whorled Caraway)

Area/quality trends & influencing factors.

Throughout Scotland there was a 21% decline in the area of blanket mire between the 1940's and 1980's. During this period the decline in blanket bog was much less significant within the central region (only 6%). Falkirk has a relatively small upland area where blanket bog is likely to have occurred and so the original area of blanket bog is unlikely to have been very extensive. However, the existing bogs are remnants of larger blanket bogs which will have been reduced in area by processes such as reclamation of land for forestry, drainage and re-seeding for agricultural use, heavy grazing, peat extraction and erosion. These factors continue to be threats to the current blanket bog sites in Falkirk

Conservation status.

Falkirk holds a relatively small area of blanket bog and so is unlikely to be able to have a significant impact on the regional or national conservation of this habitat. However, the existing sites could be protected by safeguarding them against damaging developments or afforestation, and promoting their appropriate management and sympathetic use. All these sites (except possibly Torwood Mire) are used for grazing and the agricultural use and ownership of these sites is likely to influence the type of management that may be possible or desirable.

Information sources.

[1] UK Biodiversity Steering Group, 1995b.

[2] Bates M.A., Arnott D.A. & Nugent E., 1995.

[3] Shotton J. & Arnott D.A., 1994.

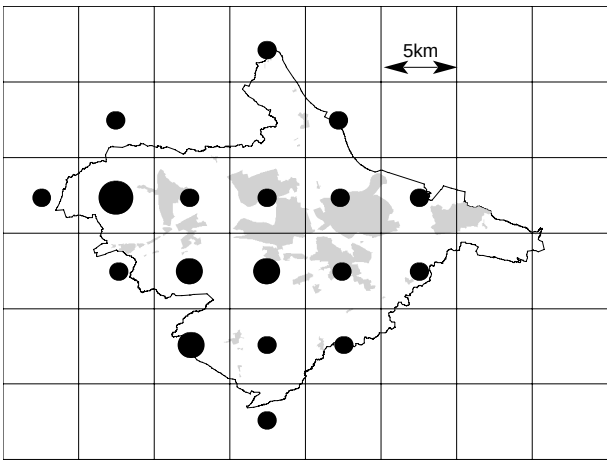
[4] Mire Site Evaluation Forms, 1994.

2.5 Wetlands and Water

2.5.1 Fen, marsh, and swamp (Broad habitat)

This habitat type includes vegetation which is ground water fed, and permanently, seasonally, or periodically waterlogged peat, peaty or mineral soils where grasses are not dominant. It also includes emergent or frequently inundated vegetation on peat or mineral soils as well as flushes.[1]

Current status, extent & distribution.



Presence of habitat in each 5km grid square

Source : Phase 1 Surveys of Falkirk 1994-1995

= <25ha
= 25 - <50ha
= 50 - <100ha
= 100 - 200ha
= >200ha

There are approximately 225ha of fen, marsh and swamp vegetation in the Falkirk area. Of this 124ha is fen vegetation (see the 'Fens' key habitat statement (2.5.1.1)), 86ha is flush vegetation and 15ha is swamp or marginal inundated vegetation.

Most of the flush vegetation occurs in the north-west of this area, almost all of it (85ha) within Denny Muir SSSI in a mosaic of blanket bog and upland acid grassland.

Of the swamp and marginal vegetation about 5ha is reedbed (see the 'Reedbeds' key habitat statement (2.5.1.2)). The other 10ha occurs as small areas of marginal vegetation at the edge of lochs (e.g. Black Loch), along river and canal edges (e.g. parts of the union canal and the Pow burn), and within wet ditches and pools. Several of these pools and ditches occur next to the mudflats and saltmarshes at Skinflats and Kinneil Kerse. It is likely that these areas are closely linked to the saline lagoons there (see the 'saline lagoons' key habitat statement (2.6.2.3)).[2,3]

Significance.

The 225ha of this broad habitat type occurring within Falkirk is of limited UK significance. However, some of the key habitats contained within this broad habitat may be of much greater significance. (see the 'Fens', 'Reedbeds', and 'Saline Lagoons' key habitat statements). Within Falkirk wet vegetation communities appear to be relatively scarce and represent an important habitat of considerable conservation value.

Associated species.

These wetland habitats can support a vast range of species, including many plants and invertebrates which favour damp conditions, as well as numerous wetland birds. (see 2.5.1.1 - 2.5.1.2 for more detail.) Springs and flushes are particularly important for the wide range of invertebrate species which they support, including soldier flies, crane-flies, and water beetles, as well as the flowering plants and mosses associated with them. Floodplain wetlands can also be of great value for invertebrates, particularly beetles, flies and snails.[4]

Area/quality trends & influencing factors.

There are no clear local area and quality trends for this broad habitat (see 2.5.1.1 - 2.5.1.2. for details about fens and reedbeds). However, wetlands generally are sensitive to natural succession to scrub, pollution and drainage. It is likely that the total area of wetland habitats within Falkirk has declined because of some or all of these pressures and that many wetlands will have become fragmented or reduced in size.

Conservation status.

Wetlands are an important habitat for biodiversity and often require active management to retain their ecological value. Initial protection against development or alternative land-use would be an important element of a conservation programme for wetlands. In addition appropriate wetland management and wetland habitat creation could be encouraged wherever possible. Wetlands can vary greatly both in terms of the nature of the habitat and in the management required to maintain or enhance them, so conservation plans must assess the status and needs of each distinct habitat separately.

Information sources.

1 UK Biodiversity Group, 1999b.

2 Bates M.A., Arnott D.A. & Nugent E., 1995.

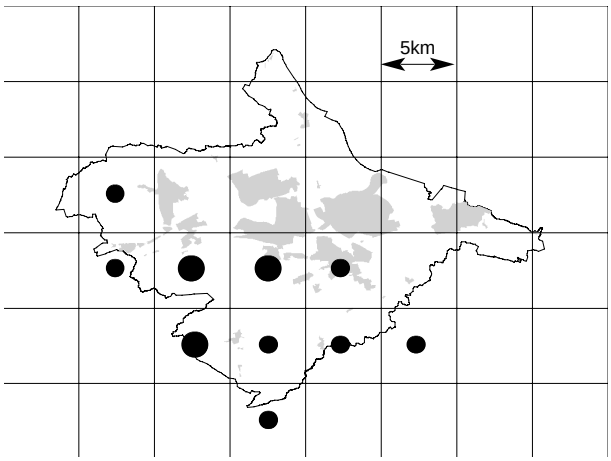
3 Shotton J. & Arnott D.A., 1994.

4 Lott D. & Stubbs A., 1999.

2.5.1.1 Fens (Key habitat)

Fens are peatlands which receive nutrients from the soil, rock and ground water as well as from rainfall. They include basin fens, floodplain fens, valley mires, mires associated with springs and flushes, trackway and ladder fens within blanket bogs, and lagg fens associated with raised and intermediate bogs.[1]

Current status, extent & distribution.



Presence of habitat in each 5km grid square

Source : Phase 1 Surveys of Falkirk 1994-1995

- = <25ha
- = 25 - <50ha
- = 50 - <100ha
- = 100 - 200ha
- = >200ha

There is approximately 124ha of fen in the Falkirk area. This consists of 29 identified fen sites ranging in size from 1ha to over 25ha. Sixteen of these sites (c.65ha) appear to be lagg fen occurring as integral elements of the numerous raised and intermediate bogs in this area (see the 'lowland raised and intermedaite bog' key habitat statement (2.4.2.1)). Of the other sites two are valley mires (1ha and 5ha in size), one is a substantial area (>25ha) of floodplain mire on the River Avon, and the others are basic mires (ranging from 1ha to 6ha).[2,3] Carron dams SSSI is particularly notable as the largest area of rich fen vegetation in the Falkirk area. The vast majority of these fens are found on the Slamannan Plateau to the south and west of the Falkirk area. However, several fens occur in the peaty upland fringes around Denny Muir and Carron Dams SSSI lies within the residential area of Stenhousemuir having developed from an old man-made reservoir.

Key sites:

SITE	GRID REF.	AREA (ha)
River Avon Floodplain (Floodplain fen)	NS 826 733	25
Wester Jawcraig (Lagg Fen)	NS 841 760	10
Darnrig moss (Lagg Fen)	NS 865 756	10
Carron Dams (Rich fen)	NS 876 826	10
Garbethill north (Lagg Fen)	NS 829 761	9
Castlecary wood south (Basic Fen)	NS 810 757	8
Loch Green (Basic Fen)	NS 818 776	6
South Castlecary High Wood (Valley Fen)	NS 806 763	5

Significance.

Fens have been poorly recorded, particularly in Scotland, but it would appear from the known distribution that most of the total UK cover occurs within England and less than 1% (1215km2) in Scotland.[4] Falkirk holds about 0.1% of the estimated total Scottish area of fen and just 0.001% of the UK total. Many of the fens in Falkirk occur as lagg fen in association with lowland raised or intermediate bogs. It is likely that the presence of relatively intact lagg fen is now quite scarce and this habitat is both important in its own right and a valuable element of the raised and intermediate bog habitats. Locally Carron Dams SSSI is also particularly important as one of the few rich fen communities within the central region.

Associated species.

Fens support a very diverse range of plants and animals. Some can contain up to a third of all the UK's native plant species and more than half the UK's dragonfly species. This habitat can support several thousand insect species and is an important habitat for a range of aquatic beetles.[1]

Audit species.

Priority:

Emberiza schoeniclus (Reed Bunting)

Conservation concern:

Tringa totanus (Redshank)

Gallinago gallinago (Snipe)

Locustella naevia (Grasshopper Warbler)

Bufo bufo (Common Toad)

Rana temporaria (Common Frog)

Area/quality trends & influencing factors.

The area and quality trends of fens in the Falkirk area are not fully known. Within the UK as a whole the area of fen vegetation has declined dramatically over the last 100 years.[1] It is likely that Falkirk has experienced a similar decline in the area of fen and those that remain tend to be rather fragmented and isolated. Without suitable management fen communities will tend to be naturally colonised by scrub and ultimately woodland communities. Management to prevent this can include mowing, grazing, burning, peat cutting, and scrub clearance. The current factors which may affect this habitat are: loss of area as a result of drainage and conversion to intensive agricultural use; development which seriously alters the water table of the fen; the large proportion of fragmented and small sites which are particularly vulnerable; a lack of or inappropriate management; afforestation; and pollution from agricultural run-off.[1]

Conservation status.

Fens are clearly a valuable habitat however their current conservation status and management within Falkirk is not fully known. If this habitat is to be conserved it would be important to ensure that fens are not being lost as a result of a lack of management or inappropriate management. Built development of fen sites is unlikely, however such sites would need to be protected from other damaging development or changed land-use if their current extent is to be maintained. On sites where succession has already reduced the area and/or quality of the fen there may be potential to restore the habitat and initiate a programme of appropriate management. The ownership and use of these sites is likely to have a significant impact on the type and level of management that could be implemented. Fens need to be actively managed to prevent succession and so uses such as grazing or peat cutting could play an important role in site conservation if carried out at a sustainable level.

Information sources.

[1] UK Biodiversity Steering Group, 1995b.

[2] Bates M.A., Arnott D.A. & Nugent E., 1995.

[3] Shotton J. & Arnott D.A., 1994.

[4] Lindsay R. & Immirzi P., 1996.

2.5.1.2 Reedbeds (Key habitat)

Reedbeds are wetlands dominated by stands of the common reed Phragmites australis, where the water table is at or above ground level for most of the year. They may incorporate areas of open water and ditches and be associated with small areas of carr woodland or wet grassland.[1]

Current status, extent & distribution.

The phase I surveys for this area do not distinguish reedbeds from other marsh or swamp vegetation. However from various other surveys at least 10 sites (totalling about 5ha) which are dominated by Phragmites australis can be identified. None of these sites are likely to be greater than 1ha in size and they all occur along drainage ditches, around the edge of small pools, in places along rivers and burns, or along the estuary.[2,3] Almost all of the identified sites are close to the estuary, however other small patches of reedbed may occur along watercourses throughout Falkirk. The condition of the identified reedbeds is unknown.

Key sites:

SITE	GRID REF.	AREA (ha)
Grange Burn	NS 936 820	< 0.5
Muirdyke Burn	NS 900 846	< 0.5
Ladysmith Burn	NS 906 815	< 1
Pow Burn	NS 914 873	< 0.5
Orchardhead	NS 924 832	< 0.5
Near Bonnywater	NS 774 788	< 0.5
Dunmore	NS 892 897	< 0.5
River Carron	NS 743 835	< 0.5
A drain	NS 877 907	(700m strip)
	NS 948 830	< 1

Significance.

There are about 5000ha of reedbeds within the UK and of the 900 or so sites only about 50 are over 20ha in size.[1] The total area of reedbed within Falkirk represents about 0.1% of the UK total area of reedbed. Locally it is an important habitat which can support a variety of specialist species and its scarcity within the area makes the few small sites where it is known to occur particularly significant.

Associated species.

Reedbeds are important habitats for birds in the UK, supporting a distinctive breeding bird assemblage and providing roosting and feeding sites for migratory species. They also support a variety of threatened invertebrate species.[1]

Audit species.

Priority:

Emberiza schoeniclus (Reed Bunting)

Conservation concern:

Rallus aquaticus (Water Rail)

Area/quality trends & influencing factors.

Local area and quality trends are not known for this habitat. Its occurrence in small pockets makes it particularly vulnerable and reduces the population sizes of species which the habitat can support. Most of the reedbeds in Falkirk appear to be beside water courses where the main threats to them are likely to be: drainage of or extraction from the water course resulting in the eventual loss of the reed vegetation; inappropriate management leading to drying and scrub encroachment; sea-level rise causing the loss of coastal reedbeds; and pollution of water supplies to the reedbed.[1]

Conservation status.

The conservation status of this habitat is difficult to assess without a more complete account of the extent of the reedbeds within Falkirk. However, reedbed conservation is likely to require measures to ensure that they are not lost to or damaged by changed land-use or inappropriate management. Retention of reedbed areas by landowners could be encouraged and opportunities for reedbed creation at other appropriate sites could be explored. Little can be done to prevent the loss of reedbeds to sea-level rise but the overall habitat area might be maintained by habitat creation or expansion elsewhere.

Information sources.

[1] UK Biodiversity Steering Group, 1995b.

[2] Bates M.A., Arnott D.A. & Nugent E., 1995.

[3] Shotton J. & Arnott D.A., 1994.

2.5.1.3 Purple moor grass and rush pastures (Key habitat)

This habitat occurs on poorly drained, usually acidic soils in lowland areas with high rainfall. The distinctive vegetation consists of species-rich types of fen meadow and rush pasture. Purple moor-grass Molinia caerulea and rushes Juncus spp. are usually abundant. This habitat often occurs in a mosaic with wet heath, dry grass, swamp and scrub.[1]

Current status, extent & distribution.

Current surveys are not sufficiently detailed to indicate the presence of this habitat with any confidence. However, they do indicate 5 wet grassland sites (totalling 26.5ha) with abundant purple moor-grass molinia caerulea and sharp-flowered rush Juncus acutiflorus which are characteristic of the distinctive vegetation community of this habitat (see table below). A further 5 sites (totalling about 31ha) are noted as having marshy grassland with abundant sharp-flowered rush (often with other rush species as well). These sites may also represent purple moor-grass and rush pasture but this would need to be confirmed by further surveying. Similarly 3 marshy grassland sites (totalling 15ha) dominated by purple moor-grass with either soft rush or unspecified rush species may also represent this habitat but further surveying is required.[2,3] Most of these potential purple moor-grass and rush pasture sites occur to the southwest of Falkirk on the Slamannan Plateau. However, several are in the upland fringes around Denny Muir and one is located to the north of the area near Torwood.

Key sites:

SITE	GRID REF.	AREA (ha)
Balquatstone	NS 866 721	15
S. of Shippytrouty wood	NS 785 846	7
-	NS 768 799	2
Craigmad	NS 903 719	1.5
Near South Torwood	NS 826 833	1

Significance.

The total extent of this habitat within the UK is likely to be about 56,000ha. Although there are no area estimates for this habitat in Scotland, the total extent is thought likely to be around 2,000ha.[3] If all of the identified sites in Falkirk do in fact support purple moor-grass and rush pasture then they represent over 3.5% of the Scottish total area of this habitat and 0.12% of the UK total. However, this must be viewed with caution since this habitat should by definition support a quite distinctive vegetation community which may not actually occur in all of the sites identified above. A full assessment of significance could only be made with more accurate information about this habitats occurrence within Falkirk.

Associated species.

This habitat supports a range of characteristic plant species as well as various damp grassland invertebrates and birds.

Audit species.

Priority:

Xylena exsoleta (Swordgrass Moth)

Conservation concern:

Numenius arquata (Curlew)

Gallinago gallinago (Snipe)

Tyto alba (Barn Owl)

Carum verticullatum (Whorled Caraway)

Locally important:

Platanthera chlorantha
(Greater Butterfly Orchid)

Area/quality trends & influencing factors.

Local area and quality trends are not known. Throughout the UK this habitat has declined dramatically over recent years and commonly occurs in fragmented and isolated stands.[1] Much of this decline is due to its susceptibility to agricultural modification and reclamation. Current factors affecting this habitat include: agricultural improvement through drainage, fertiliser application and cultivation; overgrazing or too frequent burning; a lack of grazing leading to rankness and scrub invasion; fragmentation and disturbance for building developments; and afforestation.

Conservation status.

The current conservation status of this habitat is difficult to assess and will only become clear with further surveying. This could explore the main pressures on the habitat in this area and thus influence the conservation measures required. It is likely that conservation of this habitat would require both protection of sites from damaging development and land reclamation via the planning process and other land-use strategies and the promotion of appropriate management by land owners.

Information sources.

[1] UK Biodiversity Steering Group, 1995b.

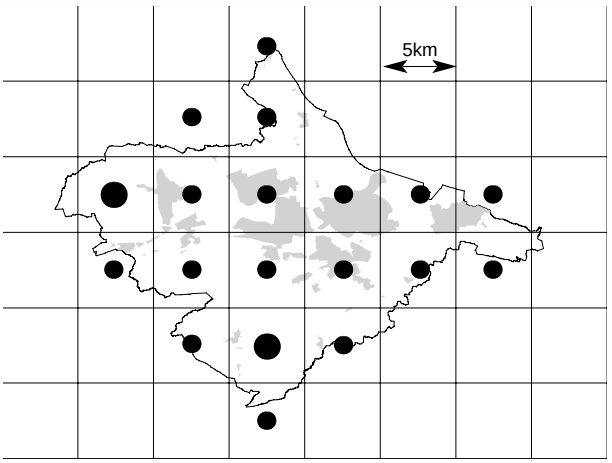
[2] Bates M.A., Arnott D.A. & Nugent E., 1995.

[3] Shotton J. & Arnott D.A., 1994.

2.5.2 Standing open water and canals (Broad habitat)

This habitat includes natural water bodies such as lochs and pools, and man-made water bodies like reservoirs, canals, ponds and gravel pits. It includes the open water zone, water fringe vegetation and ditches with open water for most of the year.[1]

Current status, extent & distribution.



Presence of habitat in each 5km grid square

Source : Phase 1 Surveys of Falkirk 1994-1995

= <25ha
= 25 - <50ha
= 50 - <100ha
= 100 - 200ha
= >200ha

This area has approximately 160ha of standing water. This includes pools, ponds, reservoirs, lochs and canals. A recent (1993) survey identified 58 ponds and lochs within the Falkirk area (including reservoirs, man-made ponds, and saline lagoons). Only about 10 of these were absent from aerial photographs taken in 1988/89.[4]

Both the Forth and Clyde canal and the Union Canal run through Falkirk, covering a distance of about 25km (see the 'Canals' Local habitat statement (2.5.2.3)).

Several saline pools occur within the coastal saltmarsh habitats (see 'Saline lagoons' key habitat statement (2.6.2.3)). Most of the other small pools and ponds are scattered throughout the region and consist mainly of urban ponds, gravel pits, and pools within bog habitats, although others such as woodland ponds and farm ponds occur occasionally.

There are currently 5 reservoirs within the Falkirk area totalling about 28ha (not all in use). The largest of these are Drumbowie Reservoir (13ha) and Little Denny Reservoir (10ha), both situated to the west of Denny.

Falkirk also has two large lochs:
Loch Ellrig (15ha) and Black loch (40ha). Both of these lie to the southwest of Falkirk on the Slammanan Plateau.

Significance.

Nationally the extent of standing open water within this area is of limited significance. However, locally standing water habitats are an important and valued element of the environment. Certain types of standing water are of particular significance and conservation value (see 2.5.2.1 - 2.5.2.3).

Associated species.

Standing water supports a wide range of aquatic species as well as providing feeding and roosting sites for many other animals. The range and type of species will vary according to the nature of the site (e.g. its size, level of disturbance, environmental conditions, water quality etc.). Small pools and ponds can provide distinctive invertebrate habitats, supporting a wide variety of species including dragonflies, beetles, caddis flies, water bugs, flies, leeches, flatworms, spiders and snails.[5]

Audit species.

Priority:

Arvicola terrestris (Water vole)

Triturus cristatus (Great Crested Newt)

Conservation concern:

Cygnus olor (Mute Swan)

Anser fabilis (Bean Goose)

Anas platyrhynchos (Mallard)

Rana temporaria (Common Frog)

Locally important:

Naumburgia (Lysimachia) thyrsiflora (Tufted Loosestrife)

Area/quality trends & influencing factors.

Local area trends are not fully known for the standing water bodies in Falkirk. Throughout Britain there has been a decline in the area of ponds and lochs over the last century however, a recent survey of ponds and lochs in the central region identified from maps dating from 1896 to 1990 actually suggested that the area had experienced an 87% increase in the number of small water bodies over that period. Some of this increase can be accounted for by different recording methods and improved recording however, it does appear that the area has not experienced the dramatic declines that have occurred elsewhere in Britain.[4]

These standing water bodies are likely to have experienced a change in quality with increased agricultural runoff and pollution causing unnatural eutrophication and a lack of management of some small ponds (e.g. many farm ponds). Quality trends are not fully known.

Also see the key habitat statements 2.5.2.1 - 2.5.2.3 below.

Conservation status.

It appears that the smaller water bodies within Falkirk are in a reasonably healthy state. However, some ponds, pools and reservoirs are likely to have been lost over recent years and others degraded. Conservation of this resource would need to be based on a good understanding of its extent and quality. Since this continues to change, further surveying and monitoring may be necessary. There is scope for creation of new ponds throughout this area e.g. farm ponds, ponds associated with SUDS (sustainable urban drainage systems), garden ponds etc. and this may offer a means of enhancing this habitat and increasing the biodiversity it supports. Existing ponds, reservoirs and small lochs might also offer scope for habitat enhancement and expansion.

Also see the key habitat statements 2.5.2.1 - 2.5.2.3 below.

Information sources.

[1] UK Biodiversity Group, 1999b.

[2] Bates M.A., Arnott D.A. & Nugent E., 1995.

[3] Shotton J. & Arnott D.A., 1994.

[4] Lassiere O., 1993.

[5] Lott D. & Stubbs A., 1999.

2.5.2.1 Eutrophic standing waters (Key habitat)

This habitat type only includes naturally eutrophic waters. It does not include waters which are suffering cultural eutrophication as a result of pollution. Naturally eutrophic standing water bodies contain naturally high nutrient levels and are characterised by the presence of particular macrophyte communities.[1]

Current status, extent & distribution.

As yet there is no inventory of the eutrophic standing water bodies in Scotland.[1] However, a survey of ponds within the central region in 1993 looked at five ponds within Falkirk all of which were classified as type 8 (Eutrophic / base-rich) based on their plant assemblages.[2] Of the larger standing water bodies in Falkirk very few have been surveyed in sufficient detail to be able to determine whether or not they are eutrophic.

Key sites:

SITE	GRID REF.	AREA (ha)
Stenhousemuir Pond*	NS 868 827	0.28
Fankerton Pond*	NS 791 829	0.02
Denovan pond*	NS 824 831	0.1
Dunmore park pond*	NS 879 886	0.16
Pineapple pond*	NS 887 883	0.3

* Eutrophic ponds: based on the assessment of flora assemblages present as type 8.2

Significance.

There are no accurate estimates of the area of eutrophic standing water in Great Britain. However, current work suggests that about 15% (240km2) of all inland standing water in Scotland is eutrophic (compared with 80% in England and 40% in Wales). The area of eutrophic standing water in Falkirk is likely to represent a very small proportion of the Scottish resource. The local and regional significance of the Falkirk resource could only be fully assessed with more extensive information concerning the extent and quality of this habitat within the area.

Associated species.

Naturally eutrophic waters contain a high level of biodiversity including abundant plankton and submerged vegetation, and numerous species of invertebrates and fish. The abundance of food at some of these sites can attract internationally important bird populations.[3]

Audit species.

Priority:

Triturus cristatus (Great Crested Newt)

Conservation concern:

Anas strepera (Gadwall)

Anas penelope (Widgeon)

Cygnus cygnus (Whooper Swan)

[Locally rare:

Myriophyllum spicatum
(Spiked Water-milfoil)]

Area/quality trends & influencing factors.

The local area and quality trends are not known. Throughout the UK the main factors likely to reduce the biodiversity value of this habitat are: pollution; changes in land cover releasing nutrients in the soil which may enter the water body; water abstraction from the water body, surface feeders or aquifers; the introduction of fish, removal of predators or manipulation of existing fish stocks; heavy stocking of bottom-feeding fish; disturbance from recreational and sporting use; and the release of non-native plants and animals.[3]

Conservation status.

Any conservation programme to protect and enhance this habitat would benefit from more detailed and extensive information regarding the current extent and status of eutrophic waters within Falkirk. This would then allow an assessment of the need for conservation and the opportunities for site protection and enhancement.

Information sources.

[1] Pers. Comm., I.Fozzard.

[2] Lassiere O., 1993.

[3] UK Biodiversity Group, 1999b.

2.5.2.2 Mesotrophic lochs (Key habitat)

Mesotrophic lochs include natural and man-made water bodies over 1 hectare which are moderately enriched.[1] A key indicator of mesotrophic lochs is the presence of one of several characteristic macrophyte communities.[2]

Current status, extent & distribution.

Not all of the larger water bodies within Falkirk have been surveyed, however recent surveys of some identify two water bodies which are likely to be mesotrophic. These are St Helen's Loch and Faughlin reservoir both of which support type 5a macrophyte communities. In addition Carron Dams, which supports a type 9 macrophyte community, may be mesotrophic but this cannot be determined from the macrophyte community type alone.[3] It also remains unclear whether Black Loch is mesotrophic since the macrophyte community type which it supports (type 3) can exist in mesotrophic waters but is more commonly considered to indicate oligotrophic lochs.[2] The current inventory of mesotrophic lakes, which lists 260 sites in Scotland, does not include any within Falkirk. However, this inventory was based on currently available data and may not include all mesotrophic lochs.[1] The extent and quality of mesotrophic lochs in Falkirk will only be fully ascertained with further surveying of the water bodies in the area.

Key sites:

SITE	GRID REF.	AREA (ha)
St Helen's Loch	NS 832 795	4.2
Faughlin reservoir	NS 741 829	4.2

Significance.

The exact extent of this habitat is not known, however about 600 known and potential mesotrophic lakes have so far been identified within the UK. Given the relatively small number of mesotrophic lakes in the UK any example of this habitat is significant. However, a full assessment of the significance of the Falkirk area for this habitat requires more information about the local extent and quality of this habitat.

Associated Species

Mesotrophic lochs have characteristic aquatic plant communities and often support a range of fish including salmonids and coarse species. Various invertebrates also live in this habitat, with a wide range of dragonflies, mayflies, stoneflies, caddis, and waterbeetles represented.

Audit species.

[Locally rare:

Myriophyllum alterniflorum (Alternate Water-milfoil)]

Area/quality trends & influencing factors.

There is insufficient data to determine area or quality trends for any mesotrophic lochs within this area. However, of the possible mesotrophic sites listed above it is thought that St Helen's Reservoir is vulnerable because of the potential level of human disturbance. Faughlin reservoir is known to have a fluctuating water level, however this may not adversely affect its biodiversity and may even increase it. Carron dams has experienced a rapid decrease in the area of standing water as a result of encroaching fen and scrub vegetation. It also experiences considerable amounts of pollution due to runoff from the built-up areas and roads around it. Planned management of this site is likely to look at both of these threats. Throughout the UK a considerable number of mesotrophic lakes have suffered some degradation. This is usually as a result of activities which stimulate nutrient supply and thus disturb the sensitive natural balance of nutrients in mesotrophic lakes. Such activities include: effluent discharge; leaching and erosion of nutrients from agricultural or forestry land; and the release of nutrients from the loch sediment by bottom feeding coarse fish.[2]

Conservation status.

A full assessment of the conservation status and needs of mesotrophic lochs within Falkirk will need to be based on more detailed information about the local extent and quality of this habitat. The main requirement for conservation of this habitat is to retain the natural balance of nutrients by carefully controlling the level of nutrient inputs to the water body. Restoration of mesotrophic lochs which have suffered nutrient enrichment may sometimes be feasible, however a careful assessment of the loch would be necessary to determine whether restoration is feasible.[2]

Information sources.

[1] Fozzard I., Pers Comm.

[2] UK Steering Group for Mesotrophic Lakes, 1999.

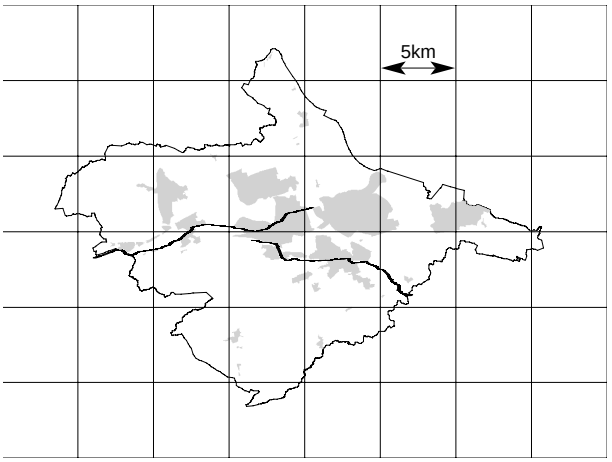
[3] Anon, 1997.

[4] Macadam C., Pers Comm.

2.5.2.3 Canals (Locally important habitat)

Construction of canals took place mainly between 1750 and 1830. They vary considerably in terms of their state of repair and the degree of disturbance they experience.[1]

Current status, extent & distribution.



Source : Falkirk Council LA09034L 2000

Two canals, totalling approximately 25km, pass through Falkirk: the Forth and Clyde Canal and the Union Canal.

The Forth and Clyde canal was built to link Glasgow with Grangemouth, and runs east-west across the Falkirk area, through Bonnybridge and much of Falkirk town, stopping just before it reaches Grangemouth. Current canal development work includes plans to link the eastern end of the canal to the River Carron by way of a short cutting, taking it out into the Forth estuary.

The Union Canal was built to link Edinburgh to the Forth and Clyde canal and thus to Glasgow. At present it no longer joins the Forth and Clyde canal but current development work will soon reinstate this link. The canal runs from the Falkirk area's south-east boundary near Linlithgow through Polmont and around the southern edge of Falkirk town, ending at Greenbank (south of Camelon).

Significance.

The canals in Falkirk represent a considerable proportion of the area's total standing water habitat and are a valuable biodiversity resource. They also act as wildlife corridors running through many of the built-up areas in Falkirk. As well as being of value for their biodiversity, these habitats are of considerable amenity, cultural and economic value to this area, and command a high level of public interest.

Associated species.

Canals, particularly those which no longer carry heavy boat traffic, can support very diverse plant and animal communities. The canal margins may often support wetland habitats with marginal vegetation, and also act as wildlife corridors.[1] Old bridges are often valuable habitats for some species.

Audit species.

Priority:

Arvicola terrestris (Water Vole)

Triturus cristatus (Great Crested Newt)

Pipistrellus pygmaeus
(Brown Pipistrelle Bat)

Conservation concern:

Myotis daubentonii (Daubenton's Bat)
Alcedo atthis (Kingfisher)

Rana temporaria (Common Frog)

Locally important:

Naumburgia thyrsflora (Tufted Loose-strife)

Area/quality trends & influencing factors.

The area covered by this habitat is relatively stable although a small part of the Forth and Clyde canal in Grangemouth has been lost in the past and current development works plan to build a small new stretch of canal near Grangemouth. Of much greater significance to this habitat are the quality trends. Detailed quality trends are not known, however these canals have experienced a long period of minimal use which will have resulted in decreased disturbance from traffic and an increased growth of aquatic and marginal plants. The current development and opening up of the canal for increased boat traffic will have a significant impact on its biodiversity. Much of this habitat in Falkirk runs through urban areas and pollution is likely to be a problem in some parts. The main factors which may impact on this habitat and its biodiversity are: disturbance from recreational use, adjacent land-use, boat traffic, current development work and subsequent maintenance work, and pollution from adjacent land-use and boat traffic.

Conservation status.

The current development of the canals in Falkirk is resulting in considerable and widespread disturbance of the habitat and will also produce increased boat traffic and recreational use of the canals. This is having and will continue to have a significant impact on the canals and the species they support, although efforts are being made to minimise adverse environmental impacts. However, this development also presents a valuable opportunity to both conserve and enhance the biodiversity of the 'new' canal network and to highlight the intrinsic, social, aesthetic and economic value of biodiversity to canal users and local people. This development process may also create various opportunities to integrate action to conserve this habitat with other canal development and management projects.

Information sources.

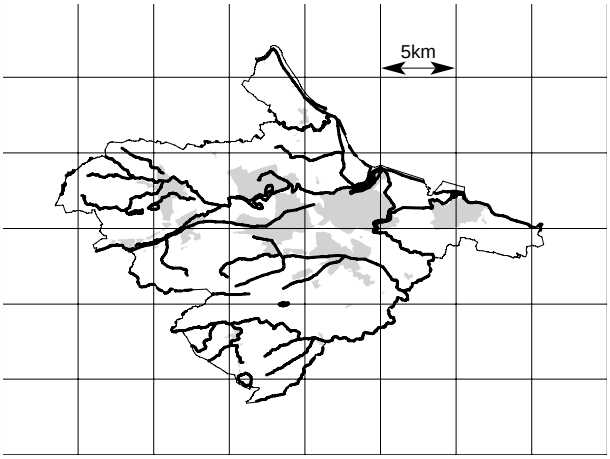
[1] UK Biodiversity Steering Group, 1995b.

2.5.3 Rivers and streams (Broad habitat)

This habitat includes rivers and streams and any associated riparian, bankside and floodplain vegetation. This includes the open water zone, water fringe vegetation, exposed sediments, shingle banks and riparian or floodplain vegetation.[1]

[Note this definition differs from the UK biodiversity group habitat definition by including riparian habitats as well as the river habitat from bank top to bank top.]

Current status, extent & distribution.



Source : Falkirk Council LA09034L 2000
Above Map Includes Canals

There are over 220km of rivers, streams or ditches with flowing water within the Falkirk area.[2,3] Falkirk is covered by two main river catchments, those of the River Avon and the River Carron.

The River Avon forms on the Slammanan Plateau from several tributaries. It then flows east along much of the area's south-eastern boundary and eventually into the estuary at Kinneil Kerse. The water quality of this river is classed by the Scottish Environment Protection Agency (SEPA) as good above the Logie water confluence at Westfield and fair from there down to the Forth Estuary.[4] Most of the pollution of the River Avon comes from urban runoff and sewage effluent from the West Lothian part of the catchment, particularly the Logie water which flows into the Avon and significantly affects its quality. Now that no open cast coal seams are operational in the Falkirk area, the major polluting inputs are due to agriculture and sewage.[4] The river supports a range of riparian and floodplain vegetation.

The River Carron flows east from the Campsie Fells and Carron Valley reservoir, entering the Falkirk area to the north-west of Denny Muir. It then flows down the Carron Glen, through Denny and the northern part of Falkirk town, and finally enters the Forth estuary at Skinflats on the northern edge of Grangemouth. The water quality of the River Carron is classed by SEPA as excellent above Denny but the quality gradually deteriorates as the river flows through Denny, Larbert and Falkirk and is only of fair quality at the tidal limit at Falkirk. The Bonny Water is seriously affected by urban runoff from Cumbernauld and it in turn causes a deterioration in the quality of the River Carron below their confluence near Bonnybridge.[4] Much of the River Carron catchment in Falkirk is found in urban areas where flood defences and impoundment have often been used to contain the river. Elsewhere the river supports a range of riparian and floodplain vegetation.

Significance.

Rivers and streams provide an often very diverse habitat, supporting a wide variety of species. They also form valuable wildlife corridors which can link fragmented habitats within intensively used agricultural or urban landscapes. As well as being important for biodiversity this habitat forms a highly valued part of the local landscape and environment.

Associated species.

The mosaic of features found in and associated with rivers and streams support a very diverse range of plants and animals. This diversity will be affected by the range and quality of the riparian and aquatic habitats. Mature riverside trees and associated dead wood can support a wide range of invertebrates, particularly beetles, spiders and two-winged flies. Numerous specialised invetebrate species can also be found in the sediment exposed during low summer flows and in and alongside fast flowing streams.[5]

Audit species.

Priority:

Arvicola terrestris (Water Vole)

Lutra lutra lutra (European Otter)

Emberiza schoeniclus (Reed Bunting)

Conservation concern:

Alcedo atthis (Kingfisher)

Lampetra planeri (Brook Lamprey)

Salmo salar (Atlantic Salmon)

Locally important:

Salmo trutta trutta (Sea Trout)

Salmo trutta fario (Brown Trout)

Area/quality trends & influencing factors.

The area of rivers and streams in this area is likely to have changed little over the last 100 years. However, the quality of the Avon and Carron river catchments deteriorated considerably with industrial, urban and intensive agricultural development over the last 150 years. There has been a marked improvement in the water quality of these river catchments more recently. The cessation of opencast mining operations has resulted in a decrease in the level of silt pollution, though ferruginous pollution from abandoned mines is still a problem, particularly in the Bonnybridge and Tamfourhill areas. More effective pollution control, particularly for sewage treatment works and industrial operations along the rivers e.g. paper mills, has significantly improved water quality. Improvements to sewage treatment works and sewer overflows will reduce the impact of these inputs on water quality in the future. Agricultural and urban run-off is likely to remain a problem, although urban pollution should be alleviated by the use of surface water treatment systems (e.g. sustainable urban drainage systems).

Conservation status.

Despite recent improvements in the quality of Falkirk's rivers there remains considerable scope for improvement of this habitat. A key element of conserving rivers and streams is the improvement of water quality, and particularly targeting areas of poor water quality and point sources of pollution for improvement. With point discharges coming under tighter regulatory control, the impact of diffuse pollution such as urban and agricultural runoff is becoming more evident.[4] However, the health of the habitat and the range of species which it supports depends on the nature of the habitat as well as the water quality. Thus habitat enhancement would also be an important part of any conservation programme, and particularly the enhancement of areas which may form barriers to species moving up or down stream, or to species increasing their range. It is important to recognise the role of riparian, floodplain and bankside habitats within the river ecosystem and ensure that river conservation targets the whole system. The nature of the river system means that the environmental quality or pollution of one part of a river or stream can impact on a much larger area downstream. As such management of the whole river catchment is often a useful approach to take to river conservation.

Information sources.

[1] UK Biodiversity Group, 1999b.

[2] Bates M.A., Arnott D.A. & Nugent E., 1995.

[3] Shotton J. & Arnott D.A., 1994.

[4] Hemingway A., Pers comm.

[5] Lott D. & Stubbs A., 1999.

2.6 Estuary

2.6.1 Supralittoral rock (Broad habitat)

Supralittoral rock is rock that occurs above the high water mark, in areas affected by sea-spray and wave splash.[1]

Current status, extent & distribution.

There is a small outcrop (c.1ha) of rock jutting out into Blackness Bay on the Forth Estuary. The O.S. map also indicates several smaller rocks in Blackness Bay although it is unclear whether these lie above the high tide mark. The conservation value of these rocks is unknown. However they are unlikely to experience significant sea-splash or wave-spray which helps to produce the distinct flora and fauna communities which this habitat should support. (Given the limited extent of this habitat, its estuarine rather than coastal location and its probable low conservation value it will not be included separately under the 'maritime slope and cliff' key habitat type.)

Significance.

Supralittoral rock occurs commonly all around the UK coast. However the plant and animal communities which they support can vary and some species or communities are relatively rare. The small area of rock at Blackness appears to be a poor example of this habitat and of very limited extent. However, it remains a valuable element of the local estuarine environment.

Associated species.

This habitat, as well as supporting distinctive flora and fauna assemblages attached to the rock, can also provide valuable habitats for wintering birds.

Area/quality trends & influencing factors.

This habitat is very robust and so is unlikely to have experienced a significant change in its extent. However the plant and animal communities which the rocks support may have experienced a greater degree of change and are vulnerable to pollution, excessive trampling, and erosion. Coastal defence works may also damage supralittoral rock habitats as they can prevent the removal of eroded material by the sea which damages the plants and animals which depend on the unstable surface.[1] Trends relating to the species living on and using this habitat in Falkirk are not known.

Conservation status.

Despite its probably limited flora and fauna assemblages, the small area of supralittoral rock in Falkirk does represent an integral part of the estuarine habitat and landscape and should be protected as such.

Information sources.

[1] UK Biodiversity Group, 1999e.

2.6.2 Littoral sediment (Broad habitat)

This habitat includes all sediment which accumulates within the tidal zone. A large proportion of this habitat occurs within estuaries where it can form various features including beaches and banks, and inter-tidal mudflats. It also includes littoral sediment which occurs at the head of inlets and sea lochs.

Current status, extent & distribution.

The littoral sediment in Falkirk is almost entirely made up of mudflat and saltmarsh habitats. The only other habitat indicated by the O.S. map is an area of sand (<10ha) within the mudflats at Kinneil Kerse SSSI.

See the 'Coastal saltmarsh' and 'Mudflats' habitat statements (2.6.2.1) & (2.6.2.2) below for further details.

Conservation status.

Much of the estuarine coastline within Falkirk is backed by linear coastal defences (sea walls, embankments or revetments). Given this and the predicted figures for sea-level rise, it is likely that Falkirk's intertidal habitats will experience future loss due to coastal squeeze (constriction of the habitat between the sea and the sea defences). In light of this, proposals to renew or strengthen coastal defences should be carefully considered in terms of their environmental impact and economic cost. The loss of intertidal habitats as a result of coastal squeeze might be avoided in places by implementing a programme of managed retreat. This would allow previously reclaimed land to be flooded and revert back to natural intertidal habitats such as saltmarsh and mudflat, thus compensating for the loss of habitat to sea-level rise and providing an effective natural coastal defence.[1,2]

See the 'Coastal saltmarsh' and 'Mudflats' habitat statements (2.6.2.1) & (2.6.2.2) below for further details.

Information sources.

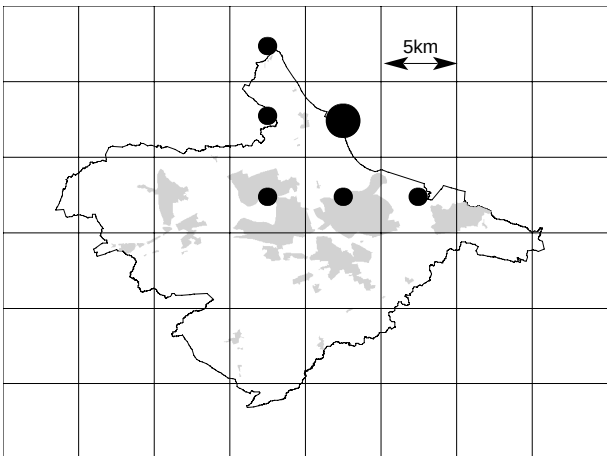
[1] Forth Estuary Forum, 1996.

[2] Tilbrook C. & Corbet N., 1999.

2.6.2.1 Coastal saltmarsh (Key habitat)

Saltmarsh develops along sheltered coasts with soft, shallow shores, usually within estuaries. It comprises the upper, vegetated parts of mudflats, defined as the area from the lower limit of pioneer saltmarsh vegetation up to 1m above the level of highest astronomical tides. Characteristic species include: common saltmarsh-grass Puccinellia maritima, sea aster Aster tripolium and glasswort Salicornia spp..[1,2]

Current status, extent & distribution.



Presence of habitat in each 5km grid square

Source : Phase 1 Surveys of Falkirk 1994-1995

= <25ha
= 25 - <50ha
= 50 - <100ha
= 100 - 200ha
= >200ha

There are about 100ha of saltmarsh within the Falkirk area.[3,4] This all occurs on the estuary except for 2ha on the River Carron at the Carron Meander about 3.5km inland. A small area (approx.6ha) of saltmarsh occurs at Kinneil Kerse SSSI to the south of the mudflats and in patches along the River Avon to about 2km upstream. Other small patches occur at the mouth of the Grange Burn and in small strips along it for about 1km, and near Blackness. The main expanse of this habitat runs all the way up the estuarine coast from the Carron River mouth by Grangemouth to Alloa Inches.[5]

The saltmarsh at Kinneil Kerse and along the Avon is mainly pioneer saltmarsh dominated by Sea Aster, with several patches of mid- and upper marsh communities.[5,6]

The larger area of saltmarsh, running from Grangemouth along the south of the mudflats at Skinflats SSSI and up the estuary to Alloa Inches, varies in width from about 10m to about 400m. Throughout this length it is backed by a sea wall or embankment and the whole marsh up to this boundary is regularly inundated by sea water. The sea wall limits the development of high marsh and freshwater transitional communities, which only occur within the Falkirk area at a few patches just north of Dunmore. Erosion of the lower marsh area means that pioneer and lower marsh communities are restricted along much of the saltmarsh, occurring mainly where the saltmarsh is actually spreading over the sandflats (often growing from rejuvenating fragments of eroded saltmarsh). This saltmarsh is drained by several channels and in places there are areas of turf cutting and pans at various stages of colonisation by vegetation. These features allow opportunities for colonisation by lower marsh vegetation, thus achieving a mosaic of saltmarsh communities.[5]

The number of saltmarsh species found in this area is rather low and several of the species which do occur are not particularly abundant . Some areas have also been affected by cattle and sheep grazing and the resulting poaching.[5]

Key sites:

SITE	GRID REF.	AREA (ha)
Skinflats-Pow Burn estuary - Alloa Inches.	NS 931 878 - NS 868 910	84
Carron Meander	NS 896 828	2
Kinneil Kerse / River Avon mouth	NS 956 809	13
Grange Burn	NS 950 830	1

Significance.

The most recent saltmarsh survey in the UK estimated the total extent of UK saltmarsh at approximately 45,500ha, 6747ha of which is in Scotland. Falkirk's saltmarsh represents approximately 1.5% of the Scottish resource and about 0.2% of the total UK resource. Saltmarsh, in association with inter-tidal mudflats, is a very important habitat for wildfowl and waders and is now uncommon in eastern Scotland.[7] The type of pioneer saltmarsh vegetation found at Kinneil Kerse has a very restricted distribution within the Forth Estuary and so is also of regional importance.

Associated species.

Saltmarshes are an important resource for wading birds and wildfowl, acting as high tide refuges for birds feeding on adjacent mudflats, breeding sites for waders, gulls, and terns, and as a source of food for passerine birds, especially in autumn and winter. Diverse saltmarsh areas, especially those with a transition from fresh to brackish conditions or with fresh water seepages, are important for a range of specialised invertebrate species, particularly flies.8 Saltmarshes provide nursery sites for several fish species and support many uncommon plant species.[2,7]

Audit species.

Conservation concern:

Tadorna tadorna (Shelduck)

Anas crecca (Teal)

Calidris canutus (Knot)

Locally important:

Sphaerophoria loewi (A Hoverfly)

[Locally rare:

Oenanthe crocata (Hemlock Water-dropwort)]

Area/quality trends & influencing factors.

Originally large areas of saltmarsh occurred along the southern edge of the inter-tidal mudflats along the Forth. This declined during the 18th and 19th centuries when large sections of the saltmarsh in the upper Forth were lost to land reclamation with the building of extensive sea walls.[7] The remaining strip has been subject to some erosion although much of it now seems to be stable.[5] This past reclamation and erosion has resulted in a reduction in the area of pioneer saltmarsh, upper marsh and transitional freshwater communities. Threats to the existing saltmarsh include: reduced species diversity as a result of intensive grazing by cattle and sheep; extensive poaching of areas by cattle; further reclamation of saltmarsh for other land-use; continued erosion; oil pollution; loss of saltmarsh as a result of sea-level rise; and potentially loss of saltmarsh as a result of subsidence (having a similar affect to sea-level rise) caused by mining operations beneath the estuary.

Conservation status.

This saltmarsh, particularly in association with the adjacent mudflats and given its regional rarity, is a very important habitat. Planning and development policies should be used to protect this habitat from further loss and degradation, and positive management of it should be encouraged wherever possible. Much of this habitat lies within SSSIs and so is already being managed to protect and enhance its conservation value. The whole of the Forth Estuary and Firth of Forth is a proposed SPA (Special Protection Area). Designation as an SPA will offer the area, including the saltmarsh, increased legal protection. The areas of saltmarsh extending up the River Avon and Grange Burn and at Carron Meander could also be protected and enhanced.

Information sources.

1 UK Biodiversity Steering Group, 1995b.

2 UK Biodiversity Group, 1999e.

3 Bates M.A., Arnott D.A. & Nugent E., 1995.

4 Shotton J. & Arnott D.A., 1994.

5 Burd F., 1987.

6 Tilbrook C. & Corbet N., 1999.

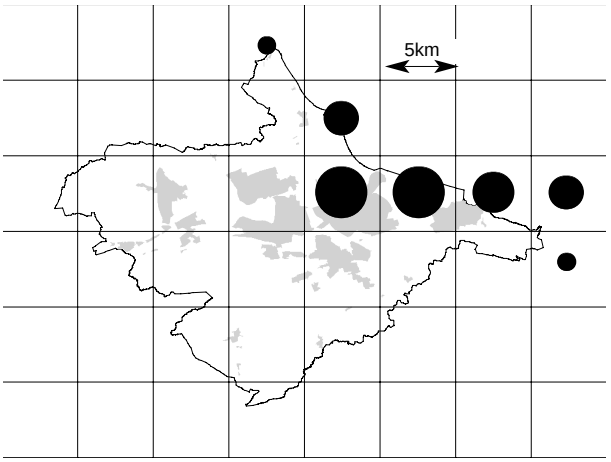
7 Forth Estuary Forum, 1996.

8 Lott D. & Stubbs A., 1999.

2.6.2.2 Mudflats (Key habitat)

Mudflats are sedimentary inter-tidal habitats consisting mainly of silts and clays with a high organic content. This habitat commonly forms the largest part of the inter-tidal area of estuaries.[1]

Current status, extent & distribution.



Presence of habitat in each 5km grid square

Source : Phase 1 Surveys of Falkirk 1994-1995

● = <25ha
● = 25 - <50ha
● = 50 - <100ha
● = 100 - 200ha
● = >200ha

Inter-tidal mud occurs on most of Falkirk's estuarine coastline and covers approximately 1305 ha. It is only completely absent where sea defences have been erected so that no inter-tidal area remains.[2,3] The majority of this habitat occurs within three large inter-tidal bays: Skinflats SSSI (c.430 ha), Kinneil Kerse SSSI (c. 650 ha), and Blackness Bay SSSI (31.5 ha in Falkirk, 189.6 ha in total).[4] These are extensive mudflats grading naturally into large areas of saltmarsh and saline lagoons. Smaller strips of inter-tidal mud occur elsewhere along the estuary, usually backing onto saltmarsh vegetation to the south.

Key sites:

SITE	GRID REF.	AREA (ha)
Skinflats SSSI	NS 932 845	430
Kinneil Kerse SSSI	NS 970 825	650
Blackness Bay SSSI	NT 058 800	31.5 *

* area within Falkirk. Total site area = 189.6 ha

Significance.

It is estimated that intertidal flats (including mud- and sand-flats) cover about 270,000ha within the UK.[1] Falkirk's mudflats represent about 0.5% of this total UK cover. They also support a rich invertebrate fauna and nationally and internationally important numbers of wildfowl and waders. These mudflats make a considerable contribution to the overall conservation value of the Forth Estuary area. This habitat is particularly valuable because of its occurrence in association with saltmarsh communities.

Associated species.

Mudflats are characterised by high biological productivity but low diversity. However, the high levels of macroinvertebrates attract large numbers of predatory birds and fish. These mudflats provide feeding and resting areas for internationally important populations of migrant and wintering waterfowl.[1]

Audit species:

Conservation concern:

Tadorna tadorna (Shelduck)

Anas acuta (Pintail)

Calidris alpina (Dunlin)

Calidris canutus (Knot)

Tringa totanus (Redshank)

Locally important:

Podiceps cristatus (Great Crested Grebe)

Area/quality trends & influencing factors.

Since the 1800's the Forth Estuary has experienced a considerable decline in the extent of mudflats.[5] At least some of this loss is due to the construction of sea defences which have eliminated the tidal zone in some areas. More recent changes in extent are not known. A rise in sea-level will reduce the area of inter-tidal mud unless a simultaneous erosion of saltmarsh habitats exposes more mud. Similarly proposed mining operations under the estuary could result in subsidence, having much the same affect as sea-level rise. The quality trends of this habitat in Falkirk are not fully known. However, at least parts of this habitat will have been affected by pollution in the past and probably still experience some pollution and runoff. The Kinneil Kerse mudflats around Grangemouth are currently of unsatisfactory quality but are gradually improving as a result of recent reductions in industrial waste discharges to the area.[6] Other threats to the conservation value of this habitat include the introduction of invasive non-native species such as cord-grass, and the disturbance of fauna by human activities.[1] Bait digging is also having a growing impact on the mudflats in Falkirk.

Conservation status.

Most of the mudflat area in Falkirk is protected from damaging operations because it lies within SSSI designated sites. It also lies within the area of the Firth of Forth potential SPA (Special Protection Area) which will afford the habitat greater legal protection. Planning and development policies should prevent further damage or development of this habitat and serious consideration should be given to the issues surrounding sea-level rise and methods to safeguard as much of this habitat as possible. If the existing extent of mudflat cannot be retained efforts could be made to create or restore other areas of mudflats to offset any loss. The Forth Estuary Forum is already looking at many of the issues affecting the conservation value of the Forth Estuary.

Information sources.

[1] UK Biodiversity Group, 1999e.

[2] Bates M.A., Arnott D.A. & Nugent E., 1995.

[3] Shotton J. & Arnott D.A., 1994.

[4] SNH, 1992.

[5] Forth Estuary Forum, 1996.

[6] Hemingway A., Pers comm.

2.6.2.3 Saline lagoons (Key habitat)

Saline lagoons are natural or artificial bodies of saline water partially separated from the adjacent sea, which retain some of their sea water at low tide.[1]

Current status, extent & distribution.

Saline lagoons occur within the saltmarsh communities at Kinneil Kerse and Skinflats. A large lagoon (c.10ha) is found to the south of Kinneil Kerse mudflat where there may be several other smaller brackish pools.3 At Skinflats the lagoon system is associated with abandoned river meanders and shows a range of salinity.[2] This site, known as Island Farm Lagoon, consists of one main lagoon (c.8ha in size). Other pools occur in this area but either have such a low salinity that they support freshwater vegetation or dry out completely and contain no permanent biota communities.[4] The exact current extent of the saline lagoons within this area is uncertain, however there is probably about 18ha of this habitat.

The Island Farm lagoon is about 200m in length and 0.2m deep. It connects to the River Carron via an open ditch and end culvert pipe. The tidal flap valve at the end of this culvert pipe, originally intended to drain this area of land, is broken. If it were mended the lagoon might dry up. The lagoon has a fine clay/mud bottom and generally supports the vegetation communities and species expected in brackish water habitats. The presence of the brackish water barnacle Balanus improvisus is worth noting since in 1994 it had not been recorded at any similar sites in Scotland.[4]

Key sites:

SITE	GRID REF.	AREA (ha)
Kinneil Kerse	NS 968 812	10
Skinflats	NS 923 832	8

Significance.

Currently there are 139 saline lagoon sites listed within Scotland covering 3892ha (this excludes the Kinneil Kerse site which should be added).[5,6] The lagoons in Falkirk represent two of the three lagoons on the Forth Estuary and Firth of Forth, and about 22% of the saline lagoons known on the east coast of Scotland.[6] The saline lagoon resource in Falkirk represents about 0.5% of the total Scottish resource and is likely to represent over 0.2% of the UK total, although accurate estimates of the UK coverage are unavailable. It constitutes a significant proportion of the regional resource and is of considerable local significance. Coastal lagoons are listed as a priority European habitat in the Habitats and Species Directive.

Associated species.

Saline lagoons support a variety of specialist, indigenous plants and animals which makes this habitat particularly important to the UK's overall biodiversity.[5]

Area/quality trends & influencing factors.

Area and quality trends for the saline lagoons in Falkirk are not fully known. It is thought that the Island Farm Lagoon did not changed greatly between surveys in 1984 and 1994. However, it was noted in 1994 that further deterioration and collapse of the culvert pipe might prevent water movement into and out of the lagoon, which would impact on its conservation value.[4] The area and quality trends for the Kinneil Kerse lagoon are not well known however the refuse tip immediately adjacent to this area is encroaching into the lagoon and likely to be having a continued detrimental impact on it.[3]

Conservation status.

This habitat is extremely rare in Britain and the Falkirk lagoons represent a significant proportion of the local and regional resource. Both of these lagoons lie within SSSI designated sites and so should be protected from damaging operations. Future damage to these sites by adjacent activities (as in the case of Kinneil Kerse tip adjacent to the Kinneil lagoon) should be prevented by appropriate planning and development policies. Restoration of the Kinneil Kerse tip area, following the cessation of tipping, should recognise the conservation status of the Kinneil lagoon and aim to protect and enhance this habitat as much as possible.

Information sources.

1 UK Biodiversity Steering Group, 1995b.

2 SNH, 1992.

3 Bates M.A., Arnott D.A. & Nugent E., 1995.

4 Covey et al, 1998.

5 UK Biodiversity Group, 1999e.

6 Downie A.J., Pers Comm.

2.6.3 Inshore sublittoral sediment (Broad habitat)

The inshore area is defined as being within 6 nautical miles of the shoreline. The seabed of these inshore areas is dominated by extensive areas of soft sediment. In more sheltered coastal areas this sediment is likely to be muddy.[1]

Current status, extent & distribution.

The sub-tidal habitat of the Forth Estuary is largely sedimentary and based on fine materials with a limited number of coarser sediment areas.[2]

Significance.

There is a considerable area of sublittoral sediment around the UK coast. The Forth Estuary bed represents a very small fraction of that habitat.

Associated species.

In many cases the species found in inshore waters are determined by the type of sediment present. Fine sediment is likely to be rich in benthic invertebrates, which will attract the marine species which feed on them.

Area/quality trends & influencing factors.

Local area and quality trends are not known. The sublittoral sediment habitat may be affected by pollution and un-natural enrichment; disturbance by operations which impact on the estuary bed including bottom fishing/trawling, dredging, and marine aggregate extraction; and other activities or developments which affect the detachment and flow of sediment through the estuary.

Conservation status.

Evaluation and control of activities which impact upon the estuary should take into consideration the sublittoral sediment and any potential impacts upon it or species dependant on it. Damage to this habitat should be minimised as far as possible and the overall conservation value of the estuary maintained.

Information sources.

[1] UK Biodiversity Group, 1999e.

[2] Forth Estuary Forum, 1996.

2.6.4 Estuarine waters (Locally important habitat)

Estuarine waters are not included in the UK Biodiversity Group's newly defined broad and key habitats. However, this habitat is an integral part of the whole estuarine habitat that occurs within the Falkirk area and so is considered here as a locally important habitat. Estuarine water is a mix of saline water entering the estuary from the sea and fresh water entering from rivers, run-off and see page [1].

Current status, extent & distribution.

The Forth Estuary forms the north-eastern boundary of the Falkirk area, from Alloa Inches where it is less than 0.5km wide down to Blackness where it is about 4km wide. In this area the water is considerably shallower than in the Firth of Forth and its salinity and temperature is highly variable.[3]

Significance.

163 estuaries have been identified around the UK coast, representing approximately 30% of the total estuarine area of the North Sea and Atlantic seaboard of western Europe.[2] The estuarine waters included in the Falkirk area represent a small proportion of the UK total. However, locally this habitat makes a significant contribution to the landscape and the variety of species present in Falkirk.

Associated species.

Estuarine waters provide nursery grounds for a variety of fish as well as accommodating fish that migrate from the sea to freshwater to spawn. Several other fish species live in estuaries, migrating to the sea to spawn.[2] Estuaries are also used by a wide range of marine animals as areas to feed and shelter.

Audit species.

Priority:

Phocoena phocoena (Harbour Porpoise)

Alosa fallax (Twaite Shad)

Conservation concern:

Phoca vitulina (Common Seal)

Halichoerus ampullatus (Grey Seal)

Turisiops truncatus (Bottle-nosed Dolphin)

Lagenorhynchus acutus (White-sided Dolphin)

Osmerus eperlanus (Smelt)

Petromyzon marinus (Sea Lamprey)

Salmo salar (Atlantic Salmon)

Locally important:

Salmo trutta trutta (Sea Trout)

Area/quality trends & influencing factors.

In the past the Forth Estuary has suffered from considerable levels of pollution, causing the extinction of several estuarine species in this area. More recently, pollution levels have been significantly reduced so a greater variety of species should again be able to survive within the estuary. However, pollution remains a threat to the estuarine habitat and the species it supports. Area changes are likely to have been long-term and reasonably subtle. Erosion of mudflats and saltmarsh communities, and the construction of sea defences will have had some impact on the coastline, but little affect on the overall extent of the estuarine waters. Sea-level rise is set to have a long-term impact on the extent of the estuarine water, causing the low and high tide levels to encroach further inland (except where sea-defences prevent this).

Conservation status.

Pollution control mechanisms and catchment management could be used to further improve the estuary's water quality. The negative environmental impacts of operations (e.g. fishing) on the estuary should be minimised as far as possible.

Information sources.

[1] UK Biodiversity Group, 1999e.

[2] UK Biodiversity Steering Group, 1995b.

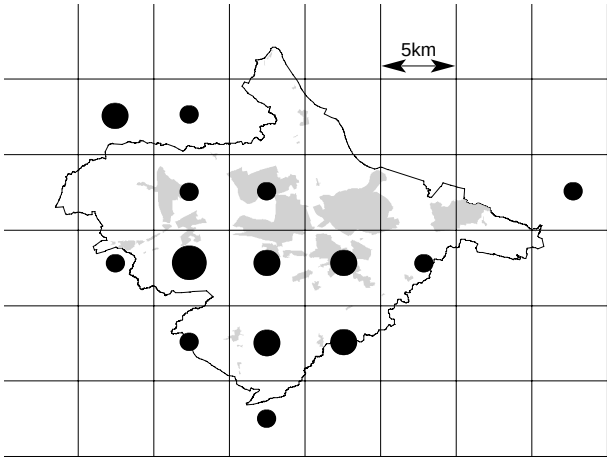
[3] Forth Estuary Forum, 1996.

2.7 Rock Exposures

2.7.1 Inland rock (Broad habitat)

This habitat type includes natural and artificial exposed rock surfaces which are almost entirely lacking in vegetation, such as inland cliffs, ledges, caves, and scree. It also includes various forms of waste tip and excavation such as quarries and quarry waste.[1]

Current status, extent & distribution.



Presence of habitat in each 5km grid square

Source : Phase 1 Surveys of Falkirk 1994-1995

= <25ha
= 25 - <50ha
= 50 - <100ha
= 100 - 200ha
= >200ha

Falkirk has a large number of disused open cast mine sites and disused and working quarry sites, as well as numerous spoil tips where the waste from these sites has been deposited. The vast majority of these are small scale works. Phase I surveys indicated the presence of 6 quarries only one of which is over 3ha (Boards Quarry 42ha) and 8 mine workings averaging around 15ha each. However, Northfield quarry is now also quite large. There are over 21 spoil tips (and probably more which have already been well colonised by scrub). (See the 'Bings' locally important habitat statement (2.7.1.1).) Most of the quarrying and mining activity has or is taking place in the south-west half of the Falkirk area, particularly the Slammanan Plateau area and the Bonnybridge/Denny area.

Phase I surveys have indicated some natural rock features within this area, although there are certainly others which have not been noted in surveys. Acid/neutral inland cliffs occur at at least 6 sites: Westquarter glen, West Craig (100m of exposed rock face), Castlecary (two 300m lengths of north facing cliff), Torwood (250m length of broken crags), River Avon (150m of crags along the bank), and Tippetcraig (200m of broken crags). All these features support vegetation communities including ferns, lichens, and mosses. They also tend to support acid heath or grassland vegetation in places. Many of the disused quarry sites which have not been infilled should support similar vegetation communities.

Note that cemeteries often simulate the habitat conditions provided by natural inland rock sites and can help to support species normally found in these natural habitats.

Key sites:

SITE	GRID REF.	LENGTH
West craig	NS 798 773	100m
Castlecary	NS 804 773	300m
Castlecary	NS 813 774	300m
Tippetcraig	NS 830 771	200m
Nr Torwood	NS 838 853	250m
By River Avon	NS 969 783	150m

Significance.

The inland rock in Falkirk is a valuable habitat supporting species specially adapted to live on natural rock features. However, it is likely to represent a very small proportion of the total UK or Scottish area of inland rock.

Associated species.

Inland rock outcrops can be important for lichens and bryophytes and, where they have a thin layer or pockets of soil, they may also support a variety of interesting vascular plants. Several birds species also use rock ledges as nesting sites. Soft-rock (limestone, sandstone and clay) cliffs can support a significant range of invertebrate fauna where erosion allows the development of a mosaic of bare ground and pioneer vegetation. The main invertebrate groups that may be found are bees, wasps, beetles and flies.[2]

Audit species.

Conservation concern:

Falco peregrinus (Peregrine)

[Locally rare:

Saxifrage hypnoides (Mossy Saxifrage)

Sedum anglicum (English Stonecrop)

Thymus praecox subsp. arcticus (Wild Thyme)]

Area/quality trends & influencing factors.

Area and quality trends are unknown however, this is usually quite a naturally robust habitat. The main threats are loss or degradation as a result of development or a change in land-use. This is particularly the case for artificial features such as quarries and spoil tips which might be heavily used and disturbed (e.g. for landfill or further removal of material). Several old open cast sites have been restored (e.g. Roughcastle and Howierig wood), and several other sites are due for restoration.

Conservation status.

Conservation of this habitat would require that natural inland rock features be retained and their conservation and landscape value protected and enhanced where possible. The conservation value of man-made rock features should be given full consideration when development and/or management decisions are being made. Features with a high conservation value could be retained, protected and enhanced.

Information sources.

[1] UK Biodiversity Group, 1999b.

[2] Lott D. & Stubbs A., 1999.

2.7.1.1 Bings
(Locally important habitat)

Bings are the large heaps of spoil produced during mining operations. This material (shale) is generally inert and once undisturbed becomes colonised by a succession of various vegetation communities including scrub (usually birch dominated) and grassland.

Current status, extent & distribution.

There are over 21 spoil tips in the Falkirk area (and probably more which have already been well colonised by scrub). Several of these are large: 50ha of old mine tips at Howierig Wood; 10ha of mine waste at Wester Greenhill; and at least 5ha of mine waste by Wester Jawcraig. However, the majority of the spoil tips are less than 5ha and often consist of several small heaps of less than 1ha.[1,2] These bings varying widely from old bings already colonised by quite mature scrub or woodland (e.g. Howierig wood), to newly colonised disused bings and those where tipping or removal of shale is still ongoing.

Key sites:

SITE	GRID REF.	AREA (ha)
Almond Bing	NS 960 762	7.5

Significance.

The UK significance of this habitat in Falkirk is unknown, although it is likely to represent a small proportion of the total area of bings in Britain. The conservation value of this habitat is largely determined by the species which it supports. In some cases the colonising vegetation is of little significance, however in some cases these habitats can support species rich grassland communities or particularly rare plant species. In Falkirk Almond Bing is of particular value by virtue of the orchid species it supports (see the 'young's helleborine' priority species statement (3.5.2)).[3]

Associated species.

Bings can be colonised by a variety of habitats, often providing islands of scrub, woodland and grassland within highly developed agricultural or industrial landscapes. Several rare species depend on the conditions provided by these habitats.

Audit species.

Priority:

Epipactis youngiana (Young's Helleborine)

Conservation concern:

Epipactis leptochila var. dunensis (Dune Helleborine)

Area/quality trends & influencing factors.

The area trends of this habitat are not fully known and may vary periodically depending on the level of mining activity. Mining activity has become less widespread in Falkirk as old mines are exhausted and abandoned. As such it is likely that fewer bings will be established in the area. Existing bings will gradually become covered with established vegetation unless the natural colonisation and succession is interrupted and managed. The main factors affecting bing habitats are: natural colonisation and vegetation succession, removal to allow other land-uses, removal of spoil (e.g. for ballast), and addition of new shale (possibly with different chemistry and pollutants to the original material).

Conservation status.

The conservation value of bing sites will vary greatly. The existing or potential value of a site should be assessed before development or management decisions are made. Where possible old sites should be managed to enhance their conservation and amenity value by allowing appropriate natural colonisation and by habitat creation and management. Sites which support particularly important species should be protected and managed accordingly.

Information sources.

[1] Bates M.A., Arnott D.A. & Nugent E., 1995.

[2] Shotton J. & Arnott D.A., 1994.

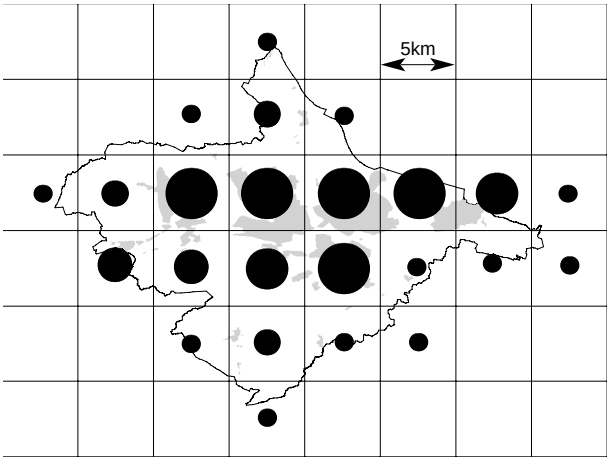
[3] Watson K., 1994.

2.8 Urban

2.8.1 Built up areas and gardens (Broad habitat)

This habitat includes rural and urban settlements, farm buildings and other man made structures,[1] and urban greenspace. Urban greenspace includes remnants of ancient natural systems, pre-industrial rural landscapes, managed greenspace such as parks and gardens, naturally seeded urban areas and waste or derelict ground.

Current status, extent & distribution.



Presence of habitat in each 5km grid square

Source : Phase 1 Surveys of Falkirk 1994-1995

- = <25ha
- = 25 - <50ha
- = 50 - <100ha
- = 100 - 200ha
- = >200ha

About a sixth of Falkirk consists of built up areas and gardens [2]. This will have increased since the phase I surveys of 1994-95. The major built up centres are Falkirk town, Stenhousemuir and Larbert, Grangemouth, Slammanan and Limerigg, and Denny, Dunipace and Bonnybridge. However, most of the rural area also has frequent settlements and farms.

Significance.

This habitat within Falkirk is of limited national significance but, particularly given the built up nature of a large proportion of the Falkirk area, is of considerable local value.

(see 2.8.1.1 - 2.8.1.3 for more detail)

Information sources.

[1] UK Biodiversity Group, 1999b.

2.8.1.1 Gardens (Locally important habitat)

This habitat includes both private gardens and cultivated public space such as parks. Inevitably this habitat is extremely variable, however it is generally characterised by some degree of management and planting for aesthetic and amenity purposes.

Current status, extent & distribution.

There is no estimate of the number of gardens in Falkirk or the area which they cover. However given the relatively urban nature of much of the Falkirk area it is likely to be reasonably high. Continued urban growth will also result in an increase in the area of gardens. The value of these gardens for biodiversity will vary greatly, although all gardens have the potential to support a range of wild plants and animals.

Significance.

This habitat constitutes a large and potentially diverse area of greenspace within urban and sub-urban Falkirk, supporting a wide range of species and providing an extensive network of green corridors through which species can travel. It is also a habitat which the majority of people within Falkirk have access to and influence over.

Associated species.

The capacity of gardens to support wild plant and animal species varies greatly depending on the location and nature of the garden. However, they can often support a variety of naturally occurring wild species which can also be found in less disturbed natural habitats.

Audit species.

Priority:

Turdus philomelos (Song Thrush)

Conservation concern:

Erinaceus europaeus (Hedgehog)

Parus caeruleus (Blue Tit)

Carduelis chloris (Greenfinch)

Bufo bufo (Common Toad)

Hyacinthoides non-scripta (Bluebell)

Area/quality trends & influencing factors.

The local area and quality trends for this habitat are not clearly known. However, a steady increase in the number of houses within Falkirk over recent years will have produced a similar increase in the number of private gardens. The recent popularisation of gardening through the media and an increasing awareness of environmental issues (including wildlife gardening) is likely to have resulted in an increase in the popularity of gardening and the number of gardeners who wish to attract wildlife to their gardens. Some of the main factors which influence the value of gardens for biodiversity are: the level of chemical use and disturbance; the availability of suitable food plants, shelter and water; the availability of nesting sites; and the presence of areas which are similar to semi-natural habitats (e.g. log piles, hedges, meadow areas, or wildlife ponds).

Conservation status.

There is considerable scope to increase the value of this extensive habitat for biodiversity. There is no reason why gardens cannot retain their amenity value while helping to support wild plant and animal species. The vast majority of gardens are in private ownership and the key to getting people to manage their gardens for biodiversity will be education, awareness raising and guidance. This could include work with businesses and other organisations to encourage management of any landscaped areas for biodiversity (e.g. landscaping around office buildings). Similarly for sites which are managed for public use, those responsible for management/maintenance could be encouraged to adopt management practices to benefit biodiversity. In such cases consultation with and education of the public using these areas may be important to ensure that people recognise the benefits of any changes.

2.8.1.2 Urban greenspace (Locally important habitat)

Urban greenspace includes remnant semi-natural habitats within built up areas, naturally seeded urban areas and derelict land, and managed urban habitats with a semi-natural appearance. It also includes buildings and other structures which support naturally occurring animal or plant species.

Current status, extent & distribution.

The extent of this habitat within Falkirk is not fully known. In fact it is difficult to determine because it includes numerous small habitat pockets and even some transitory habitats which colonise abandoned or derelict land. There are 14 designated SINCs and 8 designated wildlife sites which lie within built up areas and are either remnants of semi-natural habitats, derelict land habitats, or habitats which are semi-natural in appearance. However, these sites by no means represent all the urban greenspace within Falkirk which will include: local ponds; undisturbed areas in church yards or cemeteries etc.; naturally seeded areas of rough or derelict ground; urban streams and ditches; areas where vegetation is colonising old industrial sites; canals; roadside trees and verges; and buildings being used as nesting sites (e.g. by House martins) or bat roosts. All the urban/sub-urban areas within Falkirk will have pockets of greenspace being used by wild plants and animals.

Significance.

The extent of this habitat within the Falkirk area has little national significance, however it is of considerable local importance, particularly given the built up nature of much of the area and the concentration of a large proportion of the population within these areas. This habitat makes a considerable contribution to Falkirk's urban landscape and the biodiversity it supports. Urban greenspace also tends to have considerable amenity value and is often where people living in built-up areas come into contact with wild plants and animals.

Associated species.

Urban greenspace includes a vast array of different habitats all of which will support different plant and animal species. These habitats within the built environment offer a valuable refuge for many species which otherwise would be unable to survive within urban Falkirk. Recently disturbed waste ground and derelict sites often support a distinctive range of disturbance tolerant plant species which may not be found in other less disturbed vegetation communities. Derelict sites which include bare ground in a mosaic with other vegetation types or which support sparse vegetation can also be of considerable importance for pioneer invertebrate species. The main invertebrate groups which may be found on such sites are bees, wasps, beetles, bugs, flies, grasshoppers and spiders.[1]

Audit species.

Priority:

Pipistrellus pipstrellus
(Common Pipistrelle Bat)

Pipistrellus pygmaeus
(Brown Pipistrelle Bat)

Turdus philomelos (Song Thrush)

Fumaria purpurea
(Purple Ramping-fumitory)

Conservation Concern:

Anas platyrhynchos (Mallard)

Hirundo rustica (Swallow)

Delichon urbica (House Martin)

Prunella modularis (Dunnock)

Rana temporaria (Common Frog)

Locally Important:

Chrysanthemum leucanthemum
(Ox-eye Daisy)

Area/quality trends & influencing factors.

Local area and quality trends for this habitat are not known. Given the location of this habitat within built-up areas there is very limited scope for the extent of urban greenspace to increase, although occasionally land may become newly derelict or disturbed allowing natural colonisation by plant species. It is more likely that areas of urban greenspace are lost to urban development. The quality of these habitats is likely to vary greatly. The main factors likely to affect their quality are: disturbance from direct use of the land or from adjacent activities; pollution; fragmentation and isolation as a result of urban development; and inappropriate management (e.g. frequent cutting of naturally seeded grass areas is likely to result in reduced species diversity).

Conservation status.

Given the many demands on land within built-up areas and the potential for site development, protection of urban greenspace against development through the planning process is likely to be an important element of any conservation programme. This might require reinforcement of the SINC and Wildlife Site designations to ensure protection of these designated sites. The conservation value and needs of urban greenspace sites will vary greatly. Thus assessment of the conservation value of different sites/habitat types and the potential for management or enhancement will be important in determining appropriate and feasible conservation actions.

Information Sources.

[1] Lott D. & Stubbs A., 1999.

2.8.1.3 Urban wildlife corridors (Locally important habitat)

Urban wildlife corridors are strips of greenspace which run through built up or heavily used areas, allowing animals to travel through these otherwise inhospitable zones. These corridors can also facilitate the spread of plant species from one area to another since seed may develop in and spread along them. Wildlife corridors include canals, rivers and streams, railway and road verges/embankments, adjacent areas of remnant semi-natural habitat and/or gardens and parks. Ideally these sites should form a network of 'green corridors' allowing species to travel throughout built up areas and into larger 'green' sites.

Current status, extent & distribution.

There are several major identifiable corridors which pass through the Falkirk area and which are likely to act as urban wildlife corridors. These are the M9, M876 and M80 trunk road corridors, rail corridors, the Forth & Clyde and Union canals, and the River Carron and other smaller rivers and streams. There are also numerous other smaller or more disjointed corridors formed by adjacent gardens and greenspace, hedges, vegetated ditches, roadside verges, etc.. However, there are still significant built-up areas which are likely to have few affective wildlife corridors within them and gaps between different networks of wildlife corridors which restrict the movement of species.

Significance.

This habitat type has limited national or regional significance but is of considerable local importance, particularly within more built up areas. These corridors facilitate the movement of plant and animal species throughout the area, thus increasing the area over which species can spread and reinforcing the local species populations.

Associated species.

Most species move around to some extent and the presence of urban wildlife corridors can facilitate this movement. Different species will use different types of wildlife corridor, e.g. some species move through water or wetlands while others may require shelter in long grassland or scrub.

Area/quality trends & influencing factors.

The local area and quality trends of this habitat are not known.

Conservation status.

Although local area and quality trends are not fully known, it is clear that there is scope for improving the network of urban wildlife corridors within Falkirk by targeted habitat creation or enhancement to link existing greenspace and form a network of wildife corridors throughout the area. This would be assisted by management / maintenance of the main transport corridors to enhance their value for biodiversity. The biodiversity value of the trunk road corridor network has recently been recognised by the Scottish Executive who have produced the Trunk Road Biodiversity Action Plan which aims to enhance and protect the biodiversity found along these road corridors.[1] The adoption of similar approaches to the management and enhancement of the local road network and the rail network could protect and significantly increase their value as wildlife corridors and have a considerable impact on the biodiversity of these areas.

Information sources.

[1] Scottish Executive Development Department, 1999.

3. SPECIES

3.1 Species selection

The UK Biodiversity Steering Group identified around 1250 species (the 'long list') which fulfilled one or more of the following criteria:

* *threatened endemic and other globally threatened species.*

* *species where the UK has more than 25% of the world or appropriate biogeographical population.*

* *species where numbers or range have declined by more than 25% in the last 25 years.*

* *in some instances, where the species is found in fewer than 15 ten km squares in the UK.*

* *species which are listed in the EU Birds or Habitats directives, the Bern, Bonn, or CITES conventions, or under the Wildlife and Countryside Act 1981 and the Wildlife Order (Northern Ireland) 1985.*

From this 'long list' about 400 species were selected which met one or both of the following criteria:

* *species which are globally threatened*

* *species which are rapidly declining in the UK, i.e. by more than 50% in the last 25 years*

These species comprised the 'short list' and the 'middle list'. These lists were initially produced in 1995 and, due to subsequent changes in the status of some species, about 100 species have since been added to the 'middle list' and several others removed from it. These lists will be subject to regular review and are based on the best available information. 'Short' and 'middle' simple indicates a species inclusion in the first or second phase (respectively) of action plan writing. Action plans have now been produced for all these species.

Use of the terminology 'long', 'middle' and 'short' lists has caused some confusion regarding the relative priority of species on different lists. To clarify this the UK Biodiversity Group has revised the list structure and definitions as follows: all species fulfilling the 'long list' criteria are now defined as 'Species of Conservation Concern'; all those species from this list which fulfil the 'middle' and 'short' list criteria are defined as 'Priority Species'. In line with this revised structure this report refers to 'priority species' and 'species of conservation concern' rather than 'long', 'middle', and 'short' list species.

Note that the list of 'species of conservation concern' is not exhaustive and there are many red data book species which are not included.

This report includes all the species listed by the UK Biodiversity Steering Group as 'priority species' or 'species of conservation concern' which are known to occur within the Falkirk area. It also includes a number of species of local importance. The broad criteria used for the selection of 'locally important' species are:

* *species that are found only or mainly within the Falkirk area.*

* *species whose local population has declined very rapidly*

* *species which are locally threatened or rare*

* *species which are particularly characteristic of the Falkirk area*

* *species which could be used as indicators of habitat quality or to encourage participation and raise awareness.*

This is a preliminary list of 'locally important' species which may be developed further following consultation with local specialists and the public.

3.2 Vertebrates

3.2.1 Mammals

Priority Species

Pipistrellus pipistrellus (Pipistrelle Bat)

Current status & distribution

Falkirk has 20 recorded roost sites for the pipistrelle bat, at least 9 of which hold over 50 bats. These roosts are all in buildings (mainly houses but others such as outbuildings and schools as well). The roosts occur in many of the built up areas of the Falkirk area including Banknock, Falkirk town, Denny, Larbert, Stenhousemuir, and Polmont, as well as in several less urban areas such as Muiravonside Country Park and Airth.[1] The total number of pipistrelle bats at recorded roosts is approximately 950.

The pipistrelle bat has recently been found to actually represent two distinct species; pipistrellus pipistrellus ('common' or 'masked' pipistrelle) and pipistrellus pygmaeus ('soprano' or 'brown' pipistrelle). Both species occur within Falkirk, although firm identification of pipistrellus pygmaeus has only been made in the past year. As such the proportion of these known roosts supporting pipistrellus pygmaeus has not yet been determined, however this species is thought to be more common in the Falkirk area than pipistrellus pipistrellus.

Scottish/UK significance

The pipistrelle bat is the most abundant and widespread bat species in the UK. Although there is no accurate estimate of the total UK population, the current pre-breeding population for the UK is thought to be approximately 2 million.[2] About 550,000 of these occur in Scotland. The status of this species is further complicated by the fact that it does in fact represent two distinct species using different frequency bands. While one type is predominant in southeast England, the other is predominant in Scotland.[3] These distinct populations will be of greater significance given their smaller total population sizes and more restricted distributions. The pipistrelle bat is listed in the Bern Convention, the Bonn Convention, and the EC Habitats Directive as well as being protected under the wildlife and countryside act 1981. Given this status any colony of pipistrelle bats is significant.

Population trends & influencing factors

The pipistrelle bat is thought to have undergone a significant decline this century and the UK population has suffered a population decline of between 25% and 49% in the last 25 years.[2] Factors which may have led to this decline include: loss of insect food through insecticide use and destruction of habitats such as wetlands, hedges and woodlands; loss of roosts through building maintenance and conversion; and poisoning from chemicals used to treat roost timbers.[2] Local trends are not known at present.

Information Sources

1 Haddow J., Pers Comm.

2 UK Biodiversity Steering Group, 1995b.

3 Harris et al, 1995.

Lepus europaeus (Brown Hare)

Current status & distribution

Brown hares tend to occur mainly in lowland agricultural areas in grassland and open woodland. This species was listed in the 1980 species list for Falkirk District[1] and more recent records also exist for at least 10 sites within the Falkirk area (mainly in open agricultural habitats). Few, if any, brown hares will occur along the estuary coastline or in built up areas. Outwith these zones they are likely to occur throughout the arable farmland and pasture habitats, particularly in less disturbed areas. There has been no extensive survey of brown hares within this area so it is difficult to estimate the total population size and distribution. However, Falkirk has approximately 4200ha of arable land and 11,500ha of pasture. Based on estimates of average hare densities for these habitats and upland fringe areas Falkirk is likely to have approximately 600 brown hares.

Scottish/UK significance

Brown hares occur throughout Britain except for northern Scotland and other upland areas where it tends to be replaced by the mountain hare. The most recent estimate of the British population is around 752,000 adults[2], with approximately 187,000 occurring in Scotland[3]. The rough population estimate for this area suggests that Falkirk probably holds about 0.08% of the UK population and around 0.3% of the Scottish population.

Population trends & influencing factors

The British brown hare population is thought to have declined to just 20% of its 1880 population, especially following substantial declines in arable areas during the 1960's[4]. Over the last 25 years the UK population has declined by between 25% and 49%[5]. It is unclear to what extent these trends have been followed in the Falkirk area.

Information Sources

[1] Martin S., 1980.

[2] Temple R. et al, 2000.

[3] Harris et al, 1995.

[4] Alexander et al, 1998.

[5] UK Biodiversity Steering Group, 1995.

Arvicola terrestris (Water Vole)

Current status & distribution

The water vole usually inhabits well-vegetated banks of rivers, streams, canals, ditches, lakes and ponds, particularly favouring slow-flowing water courses.[1] They occur mainly in the lowlands but can also be found in more upland areas.

The national survey and data review carried out by the Vincent Wildlife Trust in 1989-90 looked at 2 10km squares in Falkirk. Signs of water voles were found in NT07, however these are likely to be from West Lothian rather than Falkirk. No signs of water voles were found in the other square (NS 97). Recent records are held for sites on the western and southern fringes of this area but not within it. Lack of data for most of this area reflects the limited surveying undertaken rather than the absence of water voles.[2]

A recent survey of the Grangemouth area (5km radius) identified 4 positive water vole sites, two unsurveyed sites identified by the public and a further three sites with possible water vole burrows.[3] These include sites on the Union Canal, the rivers Carron and Avon, and the Pow Burn. Two further sites have recently been confirmed on small streams at Bonnybridge and Rumford. Most of these identified sites occur in relatively built up and disturbed areas. It is likely that, since the water vole has managed to survive in these areas, it is also present on rivers, canals and streams elsewhere in Falkirk. Ditches and watercourses around Grangemouth and the Forth estuary may support strong water vole populations because of the small number of mink hunting at such sites.

Scottish/UK significance

The British pre-breeding water vole population is estimated at 1,169,000 individuals, including 376,000 in Scotland.[4] Water voles are more widespread in west/central Scotland than further north, however they are most frequent in England. Some of the greatest declines have occurred in northern England and southern Scotland and in these areas any remaining stronghold should be regarded as a key site for the species locally. Falkirk may prove to be nationally important but further survey data would be required to confirm this.[5] Water voles are also valued locally and members of the public have expressed concern over their loss or decline.[6]

Population trends & influencing factors

Water voles were formerly widespread throughout the British Isles. There has been a long term decline in the water vole population in the UK since 1900, however over the last 15 years this decline has been catastrophic. Recent surveys show that populations in the north and west are now scarce and fragmented. This rapid decline is largely due to habitat loss and degradation (as a result of changes to land-use and management of riparian habitats) and predation by a growing population of American Mink.[1] Within the Falkirk area development of land has almost certainly impacted on water vole populations. However, surveys within Falkirk as well as national guidance suggest that water voles which occur in urban situations are actually very tolerant of disturbance and benefit from the reduced numbers of predators in these habitats.[1,3] Lack of historical data makes it difficult to assess water vole population trends within Falkirk. However it is likely that, as in the rest of the UK, the population has declined dramatically over the last 20 years and will continue to do so without remedial action.

Information Sources

[1] Strachan R., 1998.

[2] R. Green, (Vincent Wildlife Trust), Pers. Comm.

[3] Edey L.M., 1999.

[4] Harris et al, 1995.

[5] Strachan R., Pers. Comm.

[6] Perks A., Pers. Obs.

Sciurus vulgaris (Red Squirrel)

Current status & distribution

Although primarily adapted to living in native Scots pine woods, red squirrels do occur in mixed woodlands and plantations of non-native conifer trees, though in lower densities. Red Squirrel sightings in Falkirk are very sparse with a record for Torwood Glen in 1981 and one for Barleyside in 1994.[1] Red squirrels have also been sighted in the Carron Valley Forest over recent years.[6] This species is not on the 1980 species list for Falkirk.[2] Falkirk has no native pine woodland and only about 1600ha of conifer woodland. There has been no systematic recording of this species in Falkirk so it is probably under recorded, however the total population is still likely to be small due to the limited area of appropriate habitat for this species.

Scottish / UK significance

The red squirrel has disappeared from much of England and Wales so that the Scottish red squirrel now forms a substantial proportion of the total British population. Scotland holds about three quarters (120,000) of the estimated pre-breeding population total of 160,000 red squirrels.[3] This species is widespread throughout Scotland except the Northwest Highlands and much of the Central Belt.[7] It is likely, particularly given the limited quantity of conifer woodland, that Falkirk holds a very small proportion of the Scottish red squirrel population.

Population trends & influencing factors

It is thought that in Scotland generally the red squirrel is not endangered. However loss of appropriate habitat, particularly in Falkirk where mixed plantation and conifer woodland constitutes less than 6% of the overall land cover [4,5], could significantly impact upon the local red squirrel population. In England there is evidence that competition from the grey squirrel is an important factor in the decline of red squirrels. There are grey squirrels within the Falkirk area which may have an impact on the red squirrel population.

Information Sources

[1] C.A.R.S.E., 1999.

[2] Martin S., 1980.

[3] Harris et al, 1995.

[4] Bates M.A., Arnott D.A. & Nugent E., 1995.

[5] Shotton J. & Arnott D.A., 1994.

[6] Haddow J., Pers. Comm.

[7] Ward S.D., 2000.

Lutra lutra lutra (European Otter)

Current status & distribution

There have been three national otter surveys undertaken between 1977 and 1994. These show Falkirk lying in the heart of the area which suffered the greatest loss of otters during the decline in the 1960's and 70's. However, by the early 1990's only one 10km square in Falkirk (at the head of the river Avon) had no otters and the 10km square covering Denny, Dunipace and Stenhousemuir was newly positive. Though recent surveys show that 18 sites on the Bonny water, lower reaches of the rivers Avon and Carron and their tributaries and the Forth Estuary have not supported otters for a long time, there are numerous new otter sites throughout these areas. Otters are present on the middle reaches of the River Carron and the River Avon and on rivers flowing into the north of the Forth estuary.[1] The Slammanan Plateau report also highlights the presence of otters in that area.[2]

Scottish/UK significance

The majority of the British otter population occurs in Scotland. It is estimated that there were approximately 5600 otters in mainland Scotland in the early 1990's.[3] Otters are now present in almost every 10km square in Scotland, although in lower densities in the south-east. Despite being widespread, it is likely that the majority of the Scottish otter population occurs further north than Falkirk which lies near the southerly edge of this species' main range.

Population trends & influencing factors

Falkirk like much of the country has seen an increase in its otter population over the last 20 years. There has been a well documented continued increase in the distribution and density of otters in neighbouring West Lothian and it is likely that a similar increase is continuing in Falkirk.[1]

Information Sources

1 R. Green, (Vincent Wildlife Trust), Pers. Comm.

2 Smith T., 1997.

Phocoena phocoena (Harbour Porpoise)

Current status & distribution

The harbour porpoise is regularly sighted within the Forth Estuary.[1] Many of these sightings will have occurred within the lower Firth of Forth rather than higher up the estuary. However, harbour porpoises are known to occur within estuaries and will often swim up rivers[2], so despite a lack of records it seems likely that this species continues to occur occasionally within the upper estuary near Falkirk.

Scottish/UK significance

The conservation status of this species around the UK coast is unknown, however a recent survey suggests that there are approximately 350,000 harbour porpoises in the North Sea, Channel and Celtic Sea. The species is listed in the Bern Convention, the Bonn Convention, and the EC Habitats Directive.[3] Given this status the occurrence of the harbour porpoise is of national significance. However, a lack of data about the local population size makes it difficult to assess the significance of the species occurring in the Forth Estuary.

Population trends & influencing factors

Nationally there is some evidence of a decline in the number of harbour porpoises in UK waters since the 1940's, particularly in the southern North Sea and English Channel. The factors affecting this species are not clear but probably include: accidental capture and drowning in fishing nets; pollution; and environmental changes as a result of fishing and possibly climate change.[3] The population trends of harbour porpoises within the Forth estuary are unknown, although pollution and environmental changes are factors in this area and may put pressure on the local population.

Information Sources

[1] Forth Estuary Forum, 1996.

[2] Burton J.A., 1991.

[3] UK Biodiversity Steering Group, 1995b.

Species of Conservation Concern

Erinaceus europaeus (Hedgehog)

Current status & distribution

The hedgehog tends to favour open woodland and hedgerows and has also become well adapted to suburban habitats.[1] It is recorded on the 1980 species list for Falkirk [2] and more recent records exist for several sites. Despite poor recording of this species it is likely to be widespread throughout Falkirk, particularly since woodland and suburban habitats cover a significant proportion of the area. There are no accurate population estimates for this species in the Falkirk area.

Scottish/UK significance

This species is widespread and reasonably common throughout most of Britain, though it is absent from most upland areas particularly in north and west Scotland. The total pre-breeding hedgehog population in Britain is estimated at approximately 1.5 million with 310,000 in Scotland.[3] The urban/suburban nature of much of Falkirk may make this species particularly accessible and appealing to a large number of people.

Population trends & influencing factors

The UK hedgehog population is likely to have decreased slightly over the last 20 years. The main threats to this species come from land use changes which either directly remove the hedgehog's habitat (e.g. hedges or woods) or reduce the amount of food available to it (e.g. by pesticide use). It is unknown whether road kills have a significant impact on the overall population.[3]

Information Sources

[1] Burton J.A., 1991.

[2] Martin S., 1980.

[3] Alexander et al, 1998.

Sorex araneus (Common Shrew)

Current status & distribution

The common shrew occurs almost anywhere that there is ground cover but particularly in thick grass, hedgerows and deciduous woods.[1] This species is probably widespread throughout the Falkirk area although less abundant in built up areas. It is recorded in the 1980 species list for Falkirk [2] and has also been recorded at three other sites more recently.[3]

Scottish/UK significance

The common shrew occurs throughout Britain and is one of the most abundant British mammals with an estimated pre-breeding population of approximately 42 million.[4] The common shrew population in Falkirk is unknown but is likely to reflect the national extent and distribution.

Population trends & influencing factors

The population trends of the common shrew in Britain are unknown. Localised populations will vary as a result of changing land-use and management. Loss of habitat and increased insecticide use will have an adverse impact while habitat creation, particularly woodland and thick grassland, favours the common shrew.

Information Sources

[1] Burton J.A., 1991.
[2] Martin S., 1980.
[3] C.A.R.S.E., 1999.
[4] Alexander et al, 1998.

Sorex minutus (Pygmy Shrew)

Current status & distribution

The pygmy shrew occurs in a wide range of habitats where there is ground cover but prefers grassland and woodland.[1] It is present on the 1980 species list for Falkirk[2], however there are no more recent records of it in the Falkirk area. The lack of recent records is likely to indicate under-recording rather than the extinction of this species in the area.

Scottish/UK significance

The pygmy shrew is widespread throughout Britain. Though usually less densely populated than the common shrew, in parts of Scotland the pygmy shrew can be as abundant or even more abundant. A very approximate estimate puts the British pre-breeding population at 8.6 million, 2.3 million of which occur in Scotland.[3] No estimate of the Falkirk population is available but it appears likely that it represents a small proportion of the Scottish and UK totals.

Population trends & influencing factors

Population trends for the pygmy shrew in Britain are unknown. The main threats to the population are land-use change resulting in habitat loss, and increased pesticide use which will reduce the shrew's food source. Local trends are unknown.

Information Sources

[1] Burton J.A., 1991.
[2] Martin S., 1980.
[3] Alexander et al, 1998.

Myotis daubentonii (Daubenton's Bat)

Current status & distribution

There are few current records of Daubenton's bats within the Falkirk area. However they are known to occur on the River Avon (e.g. at Muiravonside Country Park) and are likely to occur along much of the river from Avon Bridge to Grangemouth, except where it becomes tidal.[1] This species has also been recorded at Banknock (Auchincloch)[1] and Kinneil Estate [2]. They may also feed around the canals. This species tends to roost in trees or bridges or in natural rock crevices, as such their roosts are much less easily found than those of species which like to roost in buildings.

Scottish/UK significance

This species is widely distributed throughout much of Britain except north-west Scotland and southern England.[3] There is no reliable population estimate, however the pre-breeding population is thought to be approximately 150,000, with 40,000 in Scotland.[4] Daubenton's bat is protected under the Bern and Bonn Conventions, the EC Habitats Directive and the Wildlife and Countryside Act 1981.

Population trends & influencing factors

National and local population trends are not known. Since this species feeds almost exclusively over water it depends on moderate to good water quality to ensure its food supply.[1] Changes in water quality and availability could have a significant impact on this species.

Information Sources

[1] Haddow J., Pers Comm.

[2] C.A.R.S.E., 1999.

[3] Burton J.A., 1991.

[4] Harris et al, 1995.

Myotis nattereri (Natterer's Bat)

Current status & distribution

This species is likely to occur within the Falkirk area, although there are no current records of it within the area boundary. The nearest record is for Old Sauchie (NS 779883), and there are records from the Lothians, Fife and the Borders as well as to the west. Natterer's bat is associated with broadleaved woodland and summer roosts tend to be in older stone built, slate roofed houses with large roof spaces.[1]

Scottish/UK significance

Natterer's bat is widespread throughout Britain, except northwest Scotland. There is no reliable population estimate, however the British pre-breeding population is thought to be about 100,000, with 17,500 in Scotland.[2]

Population trends & influencing factors

Population trends are not known.

Information Sources

[1] Haddow J., Pers comm.

[2] Harris et al, 1995.

Plecotus auritus (Brown Long-eared Bat)

Current status & distribution

There are three recorded roost sites for this species in Falkirk. These are at Dunmore, Airth, and Muiravonside Country Park. All these roosts are in buildings and range in size from 3 individuals recorded at Muiravonside to 25 recorded at Airth and 35 recorded at Dunmore.[1]

Scottish/UK significance

This species is widespread in woodlands and gardens throughout Britain, although less so in northern Scotland.[2] It is estimated that the total UK pre-breeding population is about 200,000 with a Scottish population of about 27,500.[3] The brown long-eared bat is protected under the Bern and Bonn Conventions, the EC Habitats Directive and the Wildlife and Countryside Act 1981. The significance of this species within Falkirk cannot be fully assessed since there is no estimate of local population size.

Population trends & influencing factors

Nationally this species has suffered a long-term population decline over the last century and a reduction in range. Factors affecting decline include the loss of broad-leaved woodland and disturbance or insecticide treatment of roof timbers used for roosting. This species is closely associated with woodland, only feeding up to 1km from its roost, and so is very vulnerable to the loss or fragmentation of woodland.[1] The local population trends are not known.

Information Sources

[1] Haddow J., Pers Comm.

[2] Burton J.A., 1991.

[3] Harris et al, 1995.

Mustela erminea (Stoat)

Current status & distribution

Stoats can occur in a wide variety of habitats and have been recorded at several sites within Falkirk including Muiravonside Country Park, Haining Wood and Maddiston.[1,2] Under-recording makes it difficult to determine local population extent and distribution, however it is likely that, as in most of Britain, it is relatively common and widespread. Distribution and density is based more on the availablity of prey than habitats.[4]

Scottish/UK significance

Stoats are widespread throughout most of Britain.[3] The pre-breeding stoat population in the UK is estimated at approximately 460,000, 180,000 of which occur in Scotland.[4] There is no accurate estimate of the local population so an assessment of significance is difficult.

Population trends & influencing factors

Nationally stoat numbers declined dramatically around the middle of this century due to the declining rabbit population (one of their main prey) as a result of myxomatosis. Numbers subsequently increased but may have declined again since the 1970's. Factors causing a decline might include a decrease in mammal and bird prey and increased competition from foxes.[4] Local population trends cannot be determined from current records.

Information Sources

1 Anon, 1983.

2 C.A.R.S.E, 1999.

3 Burton J.A., 1991.

4 Harris et al, 1995.

Mustela nivalis (Weasel)

Current status & distribution

Weasels have been recently recorded at several sites within Falkirk including Haining Wood, Maddiston, Letham moss, and Muiravonside Country Park.[1,2] It was also present on the 1980 species list for the area.[3] It is likely that, as in most of Britain, the weasel is relatively common and widespread in this area. Like the stoat, this species occurs in a wide range of habitats with its distribution determined largely by the availability of prey.

Scottish/UK significance

The weasel is widespread and common throughout most of Britain. The British weasel population is estimated at approximately 450,000, with about 106,000 of these occurring in Scotland.[4] The Falkirk population size is unknown making it difficult to assess significance.

Population trends & influencing factors

The weasel population in Britain appears to have declined since the 1960's, however the Scottish population has been generally unaffected by this change. The reasons for decline remain unclear, although populations do seem to fluctuate depending on the availablity of small rodent prey.[4]

Information Sources

1 C.A.R.S.E, 1999.

2 Anon, 1983.

3 Martin S., 1980

4 Harris et al, 1995.

Meles meles (Badger)

Current status & distribution

A recent survey of badgers within the Falkirk area identified at least 46 setts where badgers were present.[1] At least a further four other sites with badgers present have also been recorded since 1978.[2] The species list compiled in 1980 also noted the presence of badgers within the Falkirk area. The vast majority of these sites are located in the north and west of the area, although they do also occur within Falkirk town and in the Avon valley. Few sites were found either near the coast or on the Slammanan Plateau, where soil conditions are generally unfavourable for badgers.

Scottish/UK significance

This species is widespread throughout most of mainland Britain, except in northern Scotland. The estimated UK pre-breeding population is approximately 250,000, only 10% of which occurs within Scotland.[3] Badgers appear to be well represented in this area and Falkirk may have a higher than average population given its size and northerly location in the UK.

Population trends & influencing factors

Overall badger numbers in Britain have increased this century. Current national trends are unclear but the population is probably reasonably stable. Threats include habitat loss as a result of agricultural intensification, mortality on roads, sett destruction and badger digging. There is no evidence to suggest a population decline in the Falkirk area.

Information Sources

1 SNH, 1999.
2 C.A.R.S.E.,1999.
3 Arnold H.R., 1993.

Phoca vitulina (Common Seal)

Current status & distribution

Common seals do occur throughout the Forth estuary and have been recorded near Kincardine Bridge and in the Pow Burn estuary.[1] They are probably occasional visitors to the Forth estuary, occurring more regularly in the Firth of Tay where they breed.[2]

Scottish/UK significance

Common seals are widespread around the British coastline and occur in most estuaries in northern and eastern Britain. A recent estimate put the total British common seal population at about 25,000, the vast majority of which occur on the Scottish coast.[3]

Population trends & influencing factors

Population trends have varied over the last century but since the 1970's there appears to have been an increase in the British common seal population.[4] However, since 1988 seal populations have been substantially reduced in Britain due to the outbreak of phocine distemper virus. The impact of this virus in Scotland was much less severe than on populations elsewhere, where numbers decreased by as much as 60%. As such the Scottish common seal population represents an even more important part of the British and European population.[5] Pollution and disturbance of breeding sites continue to be potential threats to seals.

Information Sources

1 C.A.R.S.E., 1999.
2 Forth Estuary Forum, 1996.
3 Doody et al (Ed.), 1993.
4 Harris et al, 1995.
5 Davidson et al, 1991.

Halichoerus ampullatus (Grey Seal)

Current status & distribution

Grey seals are regularly recorded in the Forth Estuary all the way up to the tidal limit at Stirling where they feed on Salmon swimming upstream.[1] The nearest breeding colony is on the Isle of May, the most important grey seal breeding colony on the east coast of Scotland.[1]

Scottish/UK significance

Recent estimates suggest that there are about 115,000 grey seals in Britain.[2] This represents approximately 50% of the world population. The vast majority of this British population occurs in Scotland. The grey seals that occur in the Forth Estuary are likely to be associated with the nationally significant colony at the Isle of May and do not constitute a significant separate group.

Population trends & influencing factors

The British Grey seal population has increased considerably this century.[3] The numbers using the Forth Estuary are almost certainly increasing given that pup production on the Isle of May has increased from just a few a year in the 1970's to over 1200 in 1994.[1]

Information Sources

1 Forth Estuary Forum, 1996.

2 Barnes et al, 1996. in Alexander et al, 1998.

3 Harris et al, 1995.

Cervus elaphus (Red Deer)

Current status & distribution

There are recent records of this species occurring at at least two sites in Falkirk (Roughcastle and Muiravonside Country park).[1] This is a species of woodland and open moorlands and, although they tend to favour upland areas, red deer can also be found in lowland areas and will live in close proximity to humans.[2] Unlike the very large herds found in the uplands of much of Scotland, red deer are likely to occur in relatively small numbers in this area given the limited amount of undisturbed woodland and open moorland that is available.

Scottish/UK significance

The red deer is native to most of Scotland and northwest England, however there are also many introduced herds within Britain. The British pre-breeding population is estimated at approximately 360,000, most of which occurs in Scotland.[3] It is likely that the Falkirk population represents a very small proportion of the British or Scottish totals.

Population trends & influencing factors

Red deer numbers in Scotland have steadily increased over the last 40 years. Annual culling in large herds may now have succeeded in producing a relatively stable Scottish population.[4] Hybridisation with introduced Sika deer is becoming a threat to the native stock.

Information Sources

1 C.A.R.S.E., 1999.

2 Burton J.A., 1991.

3 Harris et al, 1995.

4 Alexander et al, 1998.

Capreolus capreolus (Roe Deer)

Current status & distribution

Roe deer have been recorded at seven sites in Falkirk since 1978.[1] These records are scattered throughout the area and represent casual observation rather than the results of systematic surveying. It is probable that roe deer are in fact widespread and reasonably common. This species favours woodland habitats but has also been observed on wetlands and bogs, and in open areas with scrub vegetation.[1] It will occur close to humans and may occasionally be seen in suburban gardens (especially at dusk), however it is likely to avoid heavily built up and disturbed areas. There is no population estimate for the Falkirk area.

Scottish/UK significance

This is the most widely distributed deer in Britain, although it does not occur in parts of central and southern England and Wales.[2] The British pre-breeding population is estimated at about 500,000 with about 350,000 of these occurring in Scotland.[3]

Population trends & influencing factors

This species became extinct in England in the 18th century, surviving only in the remnant woodlands of upland central and northwest Scotland. This century has seen an increase in range in Scotland and re-introduction of populations in England. It appears that the English populations are currently increasing but there is no information about Scottish population trends.[4] There are no obvious threats to this species.[3]

Information Sources

1 C.A.R.S.E., 1999.
2 Burton J.A., 1991.
3 Harris et al, 1995.
4 Alexander et al, 1998.

Turisiops truncatus (Bottle-nosed Dolphin)

Current Status & distribution

Bottle-nosed dolphins regularly visit the Forth Estuary.[1] It is likely that most of these visits are to the lower estuary and the Firth of Forth, however on occasions they may venture further up the estuary into the Falkirk area. Although primarily a marine species they can be found in lagoons, bays and rivers.[2]

Scottish/UK significance

There are two main resident populations of bottle-nosed dolphins in British waters, the nearest is in the Moray and Cromarty Firths, and the other is in Cardigan Bay in Wales. On the east coast of Scotland most observations come from around the Moray and Cromarty Firth area. Elsewhere the species is quite rare with the majority of other sightings coming from south-west Britain.[3,4]

Population trends & influencing factors

This species appears to have become less common in the northern Irish Sea and though formerly quite frequent had virtually disappeared from the North Sea by the 1960,s.[4] Pollution, disturbance from ships, over-exploitation of fish stocks, and incidental catching of dolphins during fishing operations have all been put forward as possible factors contributing to this decline.[4]

Information Sources

1 Forth Estuary Forum, 1996.
2 Burton J.A., 1991.
3 Doody et al, 1993.
4 Davidson et al, 1991.

Lagenorhynchus acutus (Atlantic White-sided Dolphin)

Current status & distribution

Atlantic white-sided dolphins are regularly sighted in the Forth Estuary.[1] As a primarily marine species it is likely that most of these visits are to the Firth of Forth and outer estuary. However, they may occasionally occur higher up the estuary near Falkirk.

Scottish/UK significance

The Atlantic white-sided dolphin's range is confined to northern European waters, from the Arctic Ocean to the North Sea and (very rarely) the English Channel. In British waters it is most abundant around Orkney and Shetland.[2]

Population trends & influencing factors

National and local population trends are unknown. However, like other cetaceans, this species is likely to be adversely affected by pollution, over-fishing, disturbance by ships, and being incidentally caught in fishing nets.

Information Sources

[1] Forth Estuary Forum, 1996.

[2] Burton J.A., 1991.

Locally Important Species

None.

3.2.2 Birds

Priority Species

Melanitta nigra (Common Scoter)

Current status & distribution

Common scoters winter near coastal waters throughout Britain however their breeding sites are restricted to inland wetlands and moorland in northern Scotland.[1] The common scoter occurred on the Falkirk District species list in 1980 and is still regularly recorded in the Firth of Forth in large numbers as a non-breeding winter visitor.[2,3] However, it is likely that the common scoter is only a very occasional non-breeding visitor to the Forth Estuary as far up as Falkirk, particularly since they do not like mudflat habitats.[4]

Scottish/UK significance

The UK breeding population of common scoters is entirely restricted to Scotland where 89 females were recorded in 1995.[1] The wintering UK population is currently estimated at about 25,000 - 30,000 individuals distributed around inshore waters.[1] Common Scoters have important moulting and wintering sites within the UK, including parts of the Firth of Forth. Any individuals occurring within the Falkirk area probably represent a small number of stragglers or short-term visitors from the more important wintering sites elsewhere in the Firth of Forth.

Population trends & influencing factors

The UK breeding common scoter population has declined by over 50% in the last 25 years and seen a decline from 150 breeding pairs to zero in northern Ireland over the last 35 years.[1] The population trends of wintering birds is unknown. The main threats to this species include: marine pollution at wintering sites; commercial harvesting of sand-dwelling shellfish on which the species feeds; and pollution, decline in invertebrate food, predation by mink and afforestation at breeding sites.[1]

Information Sources

[1] UK Biodiversity Group, 1999a.

[2] Martin S., 1980.

[3] Carter S. (Ed.), 1995.

[4] Henty C., Pers Comm.

Tetrao tetrix (Black Grouse)

Current status & distribution

Black grouse occur occasionally on the moorland fringes of the Slamannan Plateau and possibly Denny Muir. Though there are no formal records of black grouse held for Falkirk, there are recent records of them occurring on the Slamannan Plateau at Fannyside/Garbethill just outside the Falkirk boundary and on moorland in the Campsie Fells and Touch Hills of Stirlingshire north-west of Falkirk (including a sighting at Carron Bridge on the boundary between Falkirk and Stirling).[1,2,3] Black grouse are known to breed in the two 10km squares covering these moorland areas and including parts of Falkirk.[4] The lack of records in Falkirk suggests poor recording rather than the absence of this species in the area. Given that suitable moorland and woodland habitats do exist for this species on the north-western and western fringes of this area it is likely that black grouse do occur and might breed within Falkirk.

Scottish/UK significance

The most recent UK population estimate for black grouse is 6510 lekking males.[5] The majority of this population occurs in Scotland. There is a distinct gap in distribution across the Forth and Clyde valleys and a patchy distribution elsewhere which is largely determined by the presence of suitable moorland/woodland habitats.[4] Black grouse are protected under the Bern Convention and the EC Habitats Directive. Given the species' current status any areas supporting black grouse are nationally significant. The species population in Falkirk is likely to be limited by the extent of suitable woodland/moorland fringe habitat and in many cases the area is likely to accommodate birds which also rely on the moorland and woodland habitats of neighbouring districts. The continued presence of black grouse in the Falkirk area is likely to be at greater risk than in many other areas because it lies on the fringe between an area with widespread black grouse occurrence and an area with no black grouse.

Population trends & influencing factors

The British black grouse population has undergone a considerable decline over the last century, the number of lekking males plummeting from an estimated 25,000 in 1990 to just 6510 in 1996.[5] Factors contributing to this decline include: loss of food plants and invertebrate prey due to over-grazing and agricultural improvement of moorland; loss of cotton-grass (a food plant) and invertebrates due to over-grazing and drainage of mires; loss of important food plants due to re-seeding of hay meadows and rough enclosed grazing; loss of moorland through poor management; fragmentation of habitats reducing population sizes; collision with deer fences and overhead cables; predation by foxes and crows; and disturbance of lekking birds. There is localised variation in population trends, in some areas there have even been recent increases in the number of lekking males.[6] Local population trends are unknown.

Information Sources

1 Smith, 1997.

2 Calladine J. et al, 1987.

3 Henty C. in McLusky et al (Ed.), 1999.

4 Gibbons et al, 1993.

5 UK Biodiversity Group, 1999f.

6 Alexander et al, 1998.

Perdix perdix (Grey Partridge)

Current status & distribution

The grey partridge is widespread but scarce on farmland and moorland fringes in the Falkirk area. The BTO Breeding Bird Surveys suggest that there is about one pair per linear 10km within the central area (including Falkirk).[1] Though there has been no systematic recording of this species, there are recent records showing its presence at a variety of sites including: Kinneil Kerse SSSI, Avon Gorge SSSI, Jupiter urban wildlife garden; Bonnyfield Quarry, Jawcraig, the Upper Avon valley, California, Brightons and Muiravonside Country Park.[2,3,4,5]

Scottish/UK significance

The grey partridge is widespread throughout much of the UK, though absent from parts of western Scotland and the Cairngorms.6 The highest UK grey partridge densities occur in east England. In Scotland they are more abundant in the southeast than the northeast. Current estimates suggest that there are about 150,000 pairs in the UK.[7] The grey partridge is protected under the Bern Convention and the EC Birds Directive.

Population trends & influencing factors

Local population trends are unknown. However, surveys of grey partridge in the central area (mainly in Stirlingshire) suggest that they are now absent from 5 10km squares where they previously occurred.[1] It is likely that a similar decline has taken place within Falkirk over the last 20 years. Nationally this species has declined by over 50% in the last 30 years.[7] Populations in some mixed farming areas seem stable, especially in the north. However, in areas of historical low abundance like intensive grasslands in the west declines have sometimes exceeded 95%.[7] This decline is mainly due to changes in agricultural practices which adversely impact on chick survival rates. These changes include: an increase in immediate post-harvest ploughing and sowing of winter crops; efficient harvesting and stubble removal reducing the amount of waste grain left in fields; increased pesticide use resulting in reduced insects for chick food; and intensification and cultivation of field margins resulting in a loss of nesting sites.

Information Sources

1 Henty C., Pers Comm.
2 C.A.R.S.E., 1999.
3 Smith T., 1997.
4 Anon, 1984.
5 Anon, 1983.
6 Heinzel et al, 1972.
7 UK Biodiversity Steering Group, 1995b.

Crex crex (Corncrake)

Current status & distribution

The corncrake was breeding in this area until the mid-1970's. However, over the past 5 years this species has only been recorded a couple of times.[1] The most recent record dates from 1998 when one corncrake was observed calling at Skinflats over several days in June.[2] Certainly none of these more recently recorded birds will have been breeding in this area and no pairs have been noted.

Scottish/UK significance

In 1993 it was estimated that there were only 478 calling males in the UK. Over 90% of these are located in the Hebrides, with the remainder mainly on Orkney. There are very few in England and Wales.[3] The corncrake is globally threatened and is protected under the Bern Convention, the EC Birds Directive, and the Wildlife and Countryside Act 1981. The occurrence of individual corncrakes in Falkirk is too sporadic to constitute a regular visiting population. Certainly every individual is significant, however this is not a breeding area for corncrakes and there is little or nothing that could be done in Falkirk to assist the national recovery of the corncrake.

Population trends & influencing factors

The loss of breeding pairs and the almost complete extinction of corncrakes in the Falkirk area over the last 30 years reflects national population trends for this species. Over the past 100 years the corncrake has experienced a sustained decline throughout the UK and a contraction in range.[3] The factors causing this decline include: loss of traditional grassland mosaics (especially tall vegetation through the breeding season); changes in grassland management and cutting; and predation and disturbance in some places.[3]

Information Sources

1 Henty C., Pers Comm.

2 Henty C., in McLusky et al, 1999.

3 UK Biodiversity Steering Group, 1995b.

Alauda arvensis (Skylark)

Current status & distribution

Skylarks occur in a wide range of habitats in open countryside with short vegetation, although they are most common on arable farmland and rough pasture (habitats that dominate large areas of Falkirk). In this area the skylark appears to be widespread but sparse on lowland farmland and three times more common on hill ground.[1] Though there has been no systematic recording of this species in Falkirk there are recent sightings from a range of sites and habitats demonstrating how widespread it is throughout the area. The skylark occurs in this area as a resident breeding species, however winter numbers may also be augmented by the arrival of large numbers of continental migrants.

Scottish/UK significance

This is one of the most widespread birds of the British Isles with over 2 million breeding pairs.[5] Since there is no estimate for the local population, its significance is difficult to assess. However, a large proportion of Falkirk's countryside is dominated by farmland which is often favoured by skylarks and so the area is likely to remain a stronghold for this species. The skylark is protected under the EC Birds Directive and the Wildlife and Countryside Act 1981.

Population trends & influencing factors

Within the UK the skylark breeding population on lowland farmland has declined by 54% between 1969 and 1991. This species has also suffered substantial declines in other European countries.[5] BTO atlas results indicate that between 1968 and 1991 skylarks have not been lost from any 10km squares in the Stirling area, a result likely to be echoed in Falkirk.[1] However, common species like this can experience a huge reduction in numbers before any loss of range at the 10km square level becomes apparent and it is likely that there has, in fact, been a big reduction in numbers locally.[6] The causes of decline are poorly understood, however likely factors include: intensive management of arable fields and grassland reducing weeds and insect prey; conversion of lowland grass to arable and early silage cutting which destroys nests and exposes the birds to predators. It is also thought that the trend towards autumn-sown cereals (rather than spring-sown) has reduced the number of essential winter stubble fields and may make an unsuitable summer nesting habitat.[5]

Information Sources

1 Henty C., Pers Comm.
2 Anon., 1983.
3 Slammanan Plateau report
4 C.A.R.S.E.,1999.
5 UK Biodiversity Steering Group, 1995b.
6 Gordon P., Pers Comm.

Muscicapa striata (Spotted Flycatcher)

Current status & distribution

The spotted flycatcher is a breeding summer visitor to Britain. There are only two records of this species in Falkirk (at Avon Gorge and Muiravonside Country Park), however this low count reflects a lack of systematic surveying. In fact the spotted flycatcher is probably widespread, breeding throughout this area where there are mature trees. It is, however, likely to be quite scarce. The breeding bird survey undertaken for the Central area (probably reasonably representative of Falkirk) suggests that there is about one pair of spotted flycatchers per linear 10km, although they can be locally more frequent around clearings in conifers.[1] The local population is unknown.

Scottish/UK significance

A recent estimate suggests that there are about 130,000 spotted flycatcher territories in the UK.[2] They are found throughout most of Britain but are scarcer in the far north and west of Scotland.[2] This species is protected under the Wildlife and Countryside Act 1981 and the EC Birds Directive. Though Falkirk probably holds a small proportion of the UK population, it may potentially still be an important area for the species.[3]

Population trends & influencing factors

This species has been in decline since the 1960's. Common bird census data suggests that between 1968 and 1991 there was a 62% decline in the population in woodland and a 70% decline in the population in farmland habitats.[2] There is evidence of similar declines in some other European countries.2 Local BTO surveys of 10km squares covering Stirling suggest that only one of the squares which contained spotted flycatchers in 1968-72 no longer contained them in 1988-91 and it is likely that trends in Falkirk will have been similar.[1] However, well-scattered populations like that of the spotted flycatcher may need big reductions in numbers before anything shows up on 10km square distribution and it is likely that, as in the rest of the UK, a decline has taken place. The causes of decline in the UK spotted flycatcher population are not well known but may include: climate change influencing breeding habits; drought in the Sahel region through which these birds migrate; changes in agriculture reducing summer invertebrate numbers; and loss of large trees for nest sites.[2]

Information Sources

1 Henty C., Pers Comm.

2 UK Biodiversity Group, 1999a.

3 Whitehead S., Ornithologist, CCW, Pers Comm.

Turdus philomelos (Song Thrush)

Current status & distribution

The song thrush is mostly a summer visitor to Scotland with breeding birds much sparser than further south. It is widespread throughout the Falkirk area and tends to be commonest in suburban environments (though it is still only the 13th most common bird here). It is also present on farmland, although seems to prefer conifer woodland where most of the breeding population is likely to occur.[1] The records that do exist for this area demonstrate how widespread the song thrush is. Despite being widespread it is nowhere abundant with about 1 occurring for every linear 1km of conifer woodland.[1]

Scottish / UK significance

The song thrush is a reasonably common and widespread species in the UK. These birds are generally more abundant in the east than the west of the country, although recent declines are having a greater impact in the south compared to the north.[6] Though the local population is unknown this area probably follows national trends in extent and distribution.

Population trends & influencing factors

The BTO surveys for the central area (particularly Stirling but probably representing Falkirk quite well too) suggest that between 1968 and 1991 this species has remained present in the 10km squares where it was originally recorded.[1] Nationally the song thrush has suffered serious decline and it is likely that, despite no decline in the 10km square distribution of this species, the song thrush has suffered a similar decline in the Falkirk area. Throughout the UK there has been a steady decline since the mid-1970's with an estimated population reduction of 73% in farmland and 49% in woodland habitats.[6] This decline has been much more marked in the south of the country. Though the reasons for decline are poorly understood they may include the following factors: changes in farming, especially a move from spring to autumn sowing, affecting food supply and nest sites; severe winter weather affecting food supply; predation by crows and foxes; competition from blackbirds; and hunting in southern France. Most of these factors could impact on the local population.

Information Sources

1 Henty C., Pers Comm.

2 C.A.R.S.E., 1999.

3 Smith T., 1997.

4 Anon, 1984.

5 Gordon P., 1996.

6 UK Biodiversity Steering Group, 1995b.

Emberiza schoeniclus (Reed Bunting)

Current status & distribution

Reed buntings occur in reedbeds and other wetlands, as well as drier farmland habitats such as overgrown ditches, hedges and oilseed rape crops. They are most frequent around ponds and along rivers with plenty of cover.[1] Although reed buntings used to be frequent in young conifer plantations it seems they are now scarce in this habitat.[1] Records for this species show it occurring at a variety of sites in Falkirk from Alloa Inches in the north to Balquatstone and Black Loch in the south.[2,3] Reed buntings are apparently widespread but localised throughout the Falkirk area and are breeding where appropriate habitats occur (rarely if at all in urban Falkirk).[4] An estimate of the local population is unavailable.

Scottish/UK significance

The reed bunting is found throughout Britain, although it is scarcer in the uplands and the far north and west. In 1991 it was estimated that the UK reed bunting population was around 240,000 pairs. Elsewhere in Europe it is common and widespread.[5] This species is protected under the Wildlife and Countryside Act 1981, the Bern Convention and the EC Birds Directive. Falkirk lies just southeast of a large area which supports much fewer reed buntings, and has fewer still that are breeding.[4] It is unclear whether Falkirk, lying near the fringe of this area, also supports a smaller than average reed bunting population for the UK.

Population trends & influencing factors

Reed buntings suffered a UK population decline of more than 50% in the late 1970's taking them from a relatively high population in the mid-1970's to a lower but stable population level in the early 1980's. There appears to have been little change in numbers since then.[5] Locally there does appear to have been a significant population decline between 1968 and 1991 in line with national trends.[1] Local trends for the period after the early 1980's (when nationally the population stabilised) are unknown. Factors that may have caused a decline in the reed bunting population include changes in farming, particularly increased insecticide use, a switch from spring to autumn sowing, loss of winter stubble fields and intensification of grassland use, resulting in less seed and insect food. The deterioration or loss of wet habitats might also have had a serious impact on population levels.[5] All these factors could have had an impact on the local population.

Information Sources

1 Henty C., Pers Comm.

2 C.A.R.S.E., 1999.

3 Smith T., 1997.

4 Gibbons et al, 1993.

5 UK Biodiversity Group, 1999a.

Miliaria calandra (Corn Bunting)

Current status & distribution

Corn buntings are residents of lowland arable farmland and largely dependent on cropped land. They have been recorded at Muiravonside Country Park in 1983 and at the Carronmouth in Skinflats SSSI.[1,2] There have been no sightings in recent years and the corn bunting has probably been extinct from the Falkirk area since about 1996.[3]

Scottish / UK significance

Most of the UK corn bunting population is found in southern and eastern England, although there are small outlying groups in Cornwall, the outer Hebrides, and north-east Scotland. This range is becoming more restricted and fragmented. The Farmland Bunting Survey in 1993 recorded only about 20,000 territories in Britain.[4] The occurrence of the corn bunting in Falkirk represented one of a very small fragmented grouping of occurrences in the Forth and Clyde valleys (the main north-east group is further north).[5] Its loss from this area is not unexpected given the increasingly constricted range of this species. The corn bunting is protected under the Wildlife and Countryside Act 1981 and the EC Birds Directive.

Population trends & influencing factors

The UK corn bunting population has, in some places, suffered decline since the last century and has steadily declined in most areas since the early 1970's, a trend which seems to be on-going. There was a 76% decline in the corn bunting's breeding population between 1968 and 1991 and its British range also declined by 32% during this period.[4] This species is declining over much of north-west Europe but remains common and widespread further south. The loss of extensive mixed farming has probably been the main cause of this decline. The loss of weedy stubble fields has reduced the availability of winter food, increased pesticide use and the decline in mixed farming has reduced the availability of insect prey, and changes in mowing and grazing regimes have reduced the availability of grassland nest sites.[4]

Information Sources

[1] Anon, 1983.

[2] C.A.R.S.E., 1999.

[3] Henty C., Pers Comm.

[4] UK Biodiversity Group, 1999a.

[5] Gibbons et al, 1993.

Pyrrhula pyrrhula (Bullfinch)

Current status & distribution

The Bullfinch is found in orchards, gardens and woodlands (especially conifer woods), as well as on farmland. It is particularly associated with dense shrubs, scrub and hedges. It has been recorded recently at several sites in Falkirk including: Muiravonside Country Park, Carron Dams, Grangemouth and Kinneil kerse.[1,2,3,4] Though reasonably widespread in Falkirk, there do seem to be some gaps in distribution and areas where breeding has not been recorded, particularly in the centre and north of the Falkirk area.[5] This may be due to a lack of suitable habitats. There is no estimate of population size for this area.

Scottish/UK significance

The Bullfinch is a fairly common and widespread resident of the UK, although it tends to be scarce in the far north and west. There are other gaps in distribution mainly where there is a lack of woodland habitat (e.g. on large areas of fen or moorland). In 1991 the UK population was estimated at about 190,000 pairs.[6] The local population is unknown but given the gaps in distribution may well be less than fairly common.

Population trends & influencing factors

Though there was only a small decrease in range between 1968 and 1991, the UK population has declined significantly from 300,000 - 350,000 pairs in 1984 to 190,000 pairs in 1991. The period between 1968 and 1991 saw a population decline of 75% on farmland and 47% in woodland.[6] Despite this national trend there appears to have been no decline in winter flock numbers in this area. There may however have been some local decline in breeding numbers.[7] The causes of the decline of this species are not fully known but factors likely to have an impact include: loss of nest sites and food due to the removal of farmland trees and hedges and the poor management of remaining hedges; loss of seed sources due to the use of herbicides and removal of winter stubble; and trapping. All but the last of these factors will have an impact on the local bullfinch population.

Information Sources

1 Anon, 1983.

2 Davis A.J., 1990.

3 Gordon P., 1996.

4 C.A.R.S.E., 1999.

5 Gibbons et al, 1993.

6 UK Biodiversity Group, 1999a.

7 Henty C., Pers Comm.

Carduelis cannabina (Linnet)

Current status & distribution

The linnet occurs in weedy fields, hedgerows, gorse thickets, heathland and scrub, breeding in summer and in many cases remaining over winter, joined by other breeding birds from northern Europe. Though widespread throughout the Falkirk area the linnet is rather localised occurring mainly in scrubby areas between arable farmland and high ground where the BTO breeding bird survey suggests there are about 4 per linear 10km.[1] There has been no systematic surveying of this species in Falkirk but recent records do exist for several sites including: Alloa Inches SSSI, the Jupiter Wildlife Centre, Bonnyfield Quarry, and Muiravonside Country Park.[2,3] Falkirk appears to be an important wintering area for this species in Scotland.[6]

Scottish/UK significance

The linnet is common and widespread across most of the UK, although scarce in northern and western Scotland.[4] In 1991 the UK population was estimated at around 540,000 territories.[5] Though there is no population estimate for the Falkirk area it seems that it represents a significant part of the UK distribution, particularly since it is close to the north-western limit of the main species range. The linnet is protected under the Wildlife and Countryside Act 1981, the Bern Convention and the EC Birds Directive.

Population trends & influencing factors

Throughout the UK numbers have declined by 56% on farmland between 1968 and 1991. The UK range has also declined slightly over this period, particularly in Northern Ireland. The breeding bird survey atlas suggests a loss of this species from 8 10km squares in the central area (based mainly on results from neighbouring Stirling) between 1968 and 1991.[1] This population decline is likely to have been echoed in Falkirk. As with many farmland birds, the reasons for this decline include a decreased food supply (mainly seeds) due to increased herbicide and fertiliser use, a switch from spring to autumn sowing, loss of winter stubble fields, and a general reduction in farmland habitat diversity. Loss of wildflower plants through the intensification of pasture management and the loss of nest sites due to the removal of hedges, scrub, and thickets is also likely to have a detrimental impact.[5]

Information Sources

1 Henty C., Pers Comm.

2 C.A.R.S.E., 1999.

3 Anon, 1983.

4 Gibbons et al, 1993.

5 UK Biodiversity group, 1999a.

6 Ward S.D., 2000.

Passer montanus (Tree Sparrow)

Current status & distribution

The tree sparrow is a patchily distributed resident species on farmland, probably occurring at a rate of about 1 per linear 10km in this habitat.[1] The most recent atlas of breeding birds suggests that the tree sparrow only occurs to the south of the Falkirk area and that breeding may be restricted to the south-eastern and south-western corners, however an autumn flock has been sighted elsewhere near Dunipace suggesting that the species may be widerspread.[2,1] Despite no systematic surveying of this species in Falkirk, it was recorded in Brightons and Muiravonside Country Park during the 1980's.[3,4] A current population estimate is not available.

Scottish/UK significance

The tree sparrow is patchily distributed throughout much of the UK but is much scarcer in the uplands, the far north and west and most of Wales and Ireland. The main populations are located in the midlands and in southern and eastern England. The local population appears to lie on the north-western edge of an area of patchy occurrence covering the Forth and Clyde valleys and running further up the east coast towards Aberdeen. The species appears almost absent to the north-west.[2] Thus loss or decline of this species in the Falkirk area would help to compound a reduction in its range. This area represents a significant part of the tree sparrow's UK distribution. The tree sparrow is protected under the Wildlife and Countryside Act 1981 and the EC Birds Directive.

Population trends & influencing factors

Throughout the UK the tree sparrow seems to undergo irregular fluctuations in its numbers. There were high numbers in Britain up until the 1930's when numbers began to decrease to a low point around 1950. However during 1960-78 numbers increased again possibly due to an influx of birds from mainland Europe. More recently, between 1968 and 1991, number have declined by 85%, the largest decline of any common species during this period. Its range also decreased by 20% over this period, with particular losses in Scotland and Wales.[5] Locally the breeding bird atlas shows a loss of this species from 4 10km squares near Falkirk between 1968 and 1991. However winter flock numbers do not show any sign of decline.[1] Little is known about the reasons for decline, however a key factor is likely to be a reduction in seeds and insects available for food as a result of changed agricultural practices. Another factor may be a lack of suitable nesting sites. The tree sparrow is a colonial or semi-colonial hole-nesting species and the loss of Elm trees from lowland Britain will have removed large numbers of potential nest sites.[5]

Information Sources

1 Henty C,, Pers Comm.

2 Gibbons et al, 1993.

3 Anon, 1984.

4 Anon 1983.

5 UK Biodiversity group, 1999a.

Species of Conservation Concern (Excluding vagrants & rare migrants)

Species	Status within Falkirk area
Gavia stellata (Red-throated Diver)	Scarce non-breeding visitor on estuary.
Gavia artica (Black-throated Diver)	Very scarce non-breeding visitor on estuary.
Podiceps nigricollis (Black-necked Grebe)	Irregular occurrence only.
Podiceps auritus (Slavonian Grebe)	Irregular occurrence only.
Phalacrocorax aristotelis (Shag)	Scarce visitor on estuary.
Phalacrocorax carbo (Cormorant)	Regular non-breeding visitor on estuary.
Cygnus cygnus (Whooper Swan)	Regular winter visitor.
Cygnus olor (Mute Swan)	Resident breeder. (12 breeding pairs in 1998)
Anser anser (Greylag Goose)	Common winter visitor. (Nov.1998 - 250 at Loch Ellrig & 150 at Larbert) (also on estuary)
Anser fabilis (Bean Goose)	See statement below.
Anser brachyrhychus (Pink-footed Goose)	See statement below.
Anser albifrons (White-fronted Goose)	Rare winter visitor. (Feb.1998 - 1 at Slamannan)
Branta leucopsis (Barnacle Goose)	Scarce winter visitor. (On estuary & Slamannan Plateau.)
Tadorna tadorna (Shelduck)	See statement below.
Anas platyrhynchos (Mallard)	Common resident breeder. (1998 - Flocks>100 at Kinneil and Skinflats. 6 broods at Larbert.)
Anas clypeata (Gadwall)	Scarce non-breeding visitor.
Anas penelope (Widgeon)	Common winter visitor. (Often large winter numbers on estuary, especially at Kinneil)
Anas crecca (Teal)	See statement below.
Anas querquedula (Garganey)	Rare. Irregular occurrence only.
Anas acuta (Pintail)	Common winter visitor. (Winter flocks of 20-50 at Kinneil & Skinflats)
Anas clypeata (Shoveler)	Scarce summer visitor.
Aythya fuligula (Tufted Duck)	Common resident breeder.
Aythya marila (Scaup)	Scarce winter visitor.
Aythya ferina (Pochard)	Scarce winter visitor.
Somateria mollissima (Eider)	Scarce winter visitor.
Bucephala clangula (Goldeneye)	Common winter visitor.
Mergus merganser (Goosander)	Regular winter visitor.
Mergus serrator (Red-breasted Merganser)	Regular winter visitor.
Mergus albellus (Smew)	Irregular occurrence only.

Species of Conservation Concern (Excluding vagrants & rare migrants)

Species	Status within Falkirk area
Accipiter nisus (Sparrowhawk)	Widespread resident breeder. (Breeding records from skinflats.)
Buteo buteo (Buzzard)	Widespread resident. (Possibly breeding)
Circus cyaneus (Hen Harrier)	Scarce visitor.
Falco peregrinus (Peregrine)	Scarce resident. (No proof of breeding)
Falco columbarius (Merlin)	Scarce winter visitor. (Mainly near estuary.)
Falco tinnunculus (Kestrel)	See statement below.
Rallus aquaticus (Water Rail)	Scarce winter visitor. (Kinniel & Skinflats.)
Charadrius hiaticula (Ringed Plover)	Winter resident. (& scarce breeder.)
Pluvialis apricaria (Golden Plover)	Common visitor. (Nationally important autumn/winter flocks on estuary)
Pluvialis squatarola (Grey Plover)	Winter visitor. (1998 - few on estuary.)
Arenaria interpres (Turnstone)	Scarce winter visitor. (On estuary)
Vanellus vanellus (Lapwing)	See statement below.
Calidris ferruginea (Curlew-sandpiper)	Scarce migrant.
Calidris alpina (Dunlin)	See statement below.
Calidris temminckii (Temminck's Stint)	Irregular occurrence only
Calidris minuta (Little Stint)	Scarce migrant. (1 winter record at Kinneil in 1998. The 2nd winter record for Scotland)
Calidris canutus (Knot)	See statement below.
Calidris alab (Sanderling)	Scarce migrant. (Kinneil & Skinflats)
Tringa totanus (Redshank)	See statement below.
Tringa erythropus (Spotted Redshank)	Scarce migrant.
Tringa nebularia (Greenshank)	Scarce migrant.
Tringa glareola (Wood Sandpiper)	Occasional migrant.
Tringa ochropus (Green Sandpiper)	Scarce migrant.
Philomachus pugnax (Ruff)	Scarce migrant.
Numenius arquata (Curlew)	See statement below.
Limosa lapponica (Whimbrel)	Scarce summer visitor.
Limosa limosa (Black-tailed Godwit)	Common winter visitor. (Kinneil & Skinflats)
Limosa lapponica (Bar-tailed Godwit)	Common winter visitor. (Mainly at Kinneil)
Scolopax rusticola (Woodcock)	See statement below.
Lymnocryptes minimus (Jack Snipe)	Scarce winter visitor. (Several winter records on estuary.)
Gallinago gallinago (Snipe)	See statement below.

Species of Conservation Concern (Excluding vagrants & rare migrants)

Species	Status within Falkirk area
Stercorarius skua (Great Skua)	Rare migrant. (1998 - 1 recorded at Bo'ness)
Stercorarius parasiticus (Arctic Skua)	Scarce migrant. (1998 - 1 recorded at Blackness)
Larus minutus (Little Gull)	Scarce migrant. (On estuary)
Larus argentatus (Herring Gull)	Common resident (possibly a few breeding).
Larus fuscus (Lesser Black-backed Gull)	Summer visitor & scarce breeder. (Several on estuary. Some breeding records.)
Sterna sandvicensis (Sandwich Tern)	Regular migrant.
Sterna hirundo (Common Tern)	See statement below.
Sterna paradisaea (Arctic Tern)	Scarce migrant.
Sterna albifrons (Little Tern)	Irregular occurrence only.
Childonias niger (Black Tern)	Occasional migrant. (1998 - 1 recorded at Skinflats.)
Alca torda (Razorbill)	Rare visitor.
Tyto alba (Barn Owl)	See statement below.
Asio otus (Long-eared Owl)	Scarce resident breeder.
Asio flammeus (Short-eared Owl)	Widespread winter visitor.
Strix aluco (Tawny Owl)	Widespread resident breeder.
Alcedo atthis (Kingfisher)	See statement below.
Picus viridus (Green Woodpecker)	See statement below.
Dendrocopos major (Great Spotted Woodpecker)	Scarce resident breeder. (At least 5 sites around Falkirk.)
Hirundo rustica (Swallow)	Summer visitor and breeder.
Riparia riparia (Sand Martin)	See statement below.
Delichon urbica (House Martin)	Summer visitor and breeder.
Anthus trivialis (Tree Pipit)	Scarce summer visitor and breeder.
Anthus pratensis (Meadow Pipit)	Widespread resident breeder.
Motacilla alba (Pied Wagtail)	Widespread breeder and scarce winter visitor.
Motacilla cinerea (Grey Wagtail)	Widespread breeder and scarce winter visitor.
Motacilla flavissima (Yellow Wagtail)	Occasional migrant.
Prunella modularis (Dunnock)	See statement below.
Locustella naevia (Grasshopper Warbler)	See statement below.
Acrocephalus schoenobaenus (Sedge Warbler)	Locally common summer visitor and breeder.
Sylvia communis (Whitethroat)	Widespread summer visitor and breeder.

Species of Conservation Concern (Excluding vagrants & rare migrants)

Species	Status within Falkirk area
Sylvia borin (Garden Warbler)	Widespread summer visitor and breeder.
Sylvia atricapilla (Blackcap)	Widespread summer visitor and breeder. Scarce winter visitor.
Phylloscopus trochilus (Willow warbler)	Common summer visitor and breeder.
Phylloscopus collybita (Chiffchaff)	Widespread summer visitor and breeder.
Phylloscopus sibilatrix (Wood Warbler)	Scarce summer visitor and breeder.
Regulus regulus (Goldcrest)	Widespread resident breeder.
Ficedula hypoleuca (Pied Flycatcher)	Rare summer visitor. (No recent records)
Saxicola torquata (Stonechat)	See statement below.
Saxicola rubetra (Whinchat)	Widespread summer visitor and breeder.
Oenanthe oenanthe (Wheatear)	Visiting migrant and possibly rare breeding resident.
Phoenicurus phoenicurus (Redstart)	Scarce summer visitor and breeder, and migrant visitor.
Turdus pilaris (Fieldfare)	Winter visitor and migrant visitor.
Turdus iliacus (Redwing)	Winter visitor and migrant visitor.
Parus ater (Coal Tit)	Common resident breeder.
Parus major (Great Tit)	Common resident breeder.
Parus caeruleus (Blue Tit)	Common resident breeder.
Certhia familiaris (Treecreeper)	Widespread resident breeder.
Cinclus cinclus (Dipper)	Local resident breeder.
Emberiza citrinella (Yellowhammer)	Common resident breeder.
Plectrophenax nivalis (Snow Bunting)	Scarce winter visitor.
Frngilla montifringilla (Brambling)	Scarce winter visitor.
Carduelis carduelis (Goldfinch)	See statement below.
Carduelis spinus (Siskin)	Widespread winter visitor (possibly rare breeder)
Carduelis chloris (Greenfinch)	Common resident breeder.
Carduelis flammea (Lesser Redpoll)	Scarce resident breeder.
Carduelis flavirostris (Twite)	Winter visitor.
Loxia curvirostra (Common Crossbill)	Winter visitor.

Statements for selected bird species of conservation concern.

Anser fabilis (Bean Goose)

Current status & distribution

Bean geese regularly winter at just two locations in the UK, migrating north to their breeding grounds in spring. These locations are the Yare Valley in Norfolk and the Slamannan Plateau in Central Scotland. The Slamannan Plateau flock tends to confine itself to an area of about 3600ha covering 333 fields, approximately half of which lies within the Falkirk area. This area covers much of the south-west part of Falkirk but the main feeding sites are concentrated to the north and east of Slamannan, near Jawcraig farm and around Loch Ellrig. The only roost within Falkirk is at Loch Ellrig. During the winter of 1999-00 the maximum number of bean geese recorded was 189 including at least 12 juveniles.[1] Usually the bean geese begin to arrive during October and leave during February and March.

Scottish/UK significance

The Slamannan Plateau is the only site within Scotland which is regularly visited by wintering bean geese, and is one of only two such sites within the UK. Despite comprising a small proportion of the wintering population of north-west Europe the UK bean geese occupy an important part of this species' traditional wintering range.[2] This species is protected under the Wildlife and Countryside Act 1981, the EC Birds Directive and the Bern Convention.

Population trends & influencing factors

Wintering bean geese appear to have been quite widespread in central and southern Scotland before the 1940's-50's. Since then they have declined in numbers and distribution. The Slamannan Plateau flock was confirmed in the early 1980's.[2] Studies of this flock since 1990 show that there have been no marked fluctuations in flock size recently. The maximum number of bean geese recorded on the Slamannan Plateau each season over the last 7 years are as follows: 1993/94 - 135; 1994/95 - 132; 1995/96 - 123; 1996/97 - 127; 1997/98 - 153; 1998/99 - 168.[3] Elsewhere a flock which wintered in the Castle Douglas area disappeared in the early 1980's. Factors that might adversely affect wintering bean goose populations in the UK include; afforestation within the main wintering area, loss of lochs or wetlands used as roost sites, and disturbance at roosting and feeding sites.

Information Sources

1 Maciver A., Pers Comm.

2 Smith T., Bainbridge I. & O'Brien M., 1994.

3 Simpson J. & Maciver A., 1999.

Anser brachyrhynchus (Pink-footed Goose)

Current status & distribution

The pink-footed goose is a winter visitor to this area, occurring in large numbers on the Forth Estuary, particularly at Skinflats SSSI. The majority of the Forth population (about 9,500 birds) roosts at Aberlady Bay in the Outer Forth, however the Inner Forth regularly supports a smaller flock of about 2,900 birds. These birds spend most of the winter roosting at Skinflats SSSI but usually move to Alloa Inches SSSI in late winter or early spring after the shooting season.[1] Pink-footed geese also occur further inland throughout the lowlands and are regularly recorded on the Slamannan Plateau. In 1998 a flock of 600 geese was recorded at Slamannan.[2]

Scottish/UK significance

The mean winter peak count for the whole of the Forth Estuary and Firth of Forth (1989 - 1993) was 13,335 birds. This represents 7% of the British winter population and 7% of the European winter population. This population is thus of national and international importance.[3] Even the Inner Forth flock taken alone is of national and international importance since it represents over 1% of the UK and European winter populations. This species is protected under the Bonn Convention.

Population trends & influencing factors

The UK pink-footed goose population has actually increased by over 50% in the last 25 years.[4] The Forth Estuary flock has followed this trend with an increase of over 50% between 1986 and 1994.[3] This increase has been assisted by good breeding productivity, high over-winter survival, roost protection and relatively low shooting mortality.[5]

Information Sources

[1] Tilbrook C., 1999.

[2] Henty C. in McLusky D. et al, 1999.

[3] Forth Estuary Forum, 1996.

[4] UK Biodiversity Steering Group, 1995b.

[5] Alexander et al, 1998.

Tadorna tadorna (Shelduck)

Current status & distribution

The shelduck is a resident of mainly coastal areas throughout the UK. It occurs in large numbers within the Forth estuary, particularly the Inner Forth.[1] The two main sites for this species within the Falkirk area are Skinflats SSSI and Kinneil Kerse SSSI. Approximately 700 shelducks winter in Skinflats SSSI (almost 1% of the British total population). The Forth estuary supports around 350 breeding pairs of shelduck each year (about 3% of the British breeding population), a good number of which attempt to breed at Skinflats. This site also supports a non-breeding summer population of about 380 individuals.[2] Kinneil Kerse is one of few sites in Britain which regularly support a large flock of post-breeding moulting shelduck. This flock builds up from mid-July, peaking in early August and then declining into September. An average peak count of 5,200 moulting shelduck for the whole of the Firth of Forth was recorded (1991-1995) representing about 2% of the northwest European population. Kinneil Kerse also holds a large proportion of the estuary's wintering Shelduck population which peaks at an average 3,300 individuals. In addition many of the Forth estuary's breeding shelducks are found at Kinneil Kerse.[3]

Scottish/UK significance

The wintering shelduck population on the Forth Estuary (with an average winter peak count of 3,300 between 1988 and 1993) represents 4% of the British population and is of international importance. A considerable proportion of this population occurs at Kinneil Kerse and Skinflats SSSI. [2,3] The Forth Estuary also supports internationally important numbers of breeding shelduck. In 1992 there were about 350 pairs representing 3% of the British breeding population.3 Kinneil Kerse and Skinflats are two of the main breeding sites. There are few shelduck moulting sites in Britain one of which is at Kinneil Kerse. Though most of the British breeding population gathers at the mouth of the River Elbe to moult [4], Kinneil Kerse is a moulting site for about 2% of the northwest European population.[3]

Population trends & influencing factors

There does not appear to have been a decline in the shelduck population within the Forth Estuary. Nor has there been any significant change in population size nationally. Factors that might have an adverse impact on the shelduck population include: pollution of feeding grounds, disturbance of wintering and breeding birds, and loss of inter-tidal habitat through sea level rise and coastal development.

Information Sources

[1] Campbell L.H. (Ed.), 1978.

[2] Tilbrook C., 1999.

[3] Tilbrook C & Corbet N., 1999.

[4] Heinzel et al, 1972.

Anas crecca (Teal)

Current status & distribution

Teal breed throughout most of Britain on slow-moving fresh water and wetlands such as lochs, bogs, and fens. They winter on lakes, reservoirs, estuaries and coastal waters. Though they do occur and probably breed inland within Falkirk, the most significant population in this area is the large number of wintering birds on the Forth Estuary. In 1994/95 a peak count of 1352 teal were recorded wintering on the Forth estuary, about 540 of these occurring at Kinneil Kerse.[1] Others are likely to have occurred at Skinflats and throughout the Inner Forth Estuary.

Scottish/UK significance

The wintering teal population on the Inner Forth Estuary (much of which will occur in the Falkirk area) represents over 1% of the British winter population and so is of national importance.[2] This species is protected under the Wildlife and Countryside Act 1981 and the Bonn Convention.

Population trends & influencing factors

Teal numbers on the Forth Estuary have not altered dramatically over recent years. If anything, numbers of wintering teal have increased.[2] Nor has the UK population altered significantly over the last 25 years. Like many estuarine birds the main causes of decline are likely to be pollution or loss of feeding grounds, and disturbance of wintering and breeding sites.

Information Sources

[1] Bryant D., 1995.

[2] Forth Estuary Forum, 1996.

Falco tinnunculus (Kestrel)

Current status & distribution

The kestrel is a widespread resident of the Falkirk area, particularly in areas with rough grazing.[1] Though there has been no systematic surveying of this species recent records do exist for several sites including: Muiravonside Country Park, the Jupiter urban wildlife centre, Garbethillmuir moss, Bonnyfield Quarry, Avon Gorge SSSI, Skinflats SSSI, Carron Dams, and Alloa Inches SSSI. It is unclear whether breeding takes place at any of these sites. There are no population estimates for kestrels in this area.

Scottish/UK significance

This species is widespread throughout Britain. It is protected under the Bern Convention and the Bonn Convention. The local kestrel popoulation appears reasonably stable while numbers elsewhere decline, as such this area may represent a stronghold in the kestrel's UK distribution. In fact the kestrel is one of a number of bird species which remain fairly common in this area (and probably across Scotland) which are suffering declines in England.[1]

Population trends & influencing factors

The UK population of this species has decline by between 25 - 49% over the last 25 years.2 However, the local population does not appear to have suffered a decline in numbers.

Information Sources

[1] Henty C., Pers Comm.

Vanellus vanellus (Lapwing)

Current status & distribution

The lapwing tends to be widespread but sparse, occurring mainly on farmland. However, it is locally frequent on some hill farms.[1] Though there has been no systematic surveying of this species in the Falkirk area, there are recent sightings of it at various locations both on the estuary and on grassland and mire sites. This species' occurrence along the estuary will mainly take place during winter. Breeding takes place further inland on rough or wet grassland. There are no population estimates for lapwing in this area.

Scottish/UK significance

This species remains widespread throughout Scotland and northern England but is scarce in lowland England and Wales. The Scottish breeding population was recently estimated at about 93,000 pairs.[2] This species is protected under the Bonn Convention.

Population trends & influencing factors

Throughout the UK this species has declined by between 25 - 49% in the last 25 years.[4] Within Scotland this decline has been much more marked in the north and west.[1] There has probably been some loss of this species within the Falkirk area, however the lapwing still remains relatively widespread.[1]

Information Sources

[1] Henty C., Pers Comm.

[2] O'Brien M., 1994.

[3] Anon, 1995.

[4] UK Biodiversity Steering group, 1995b.

Calidris alpina (Dunlin)

Current status & distribution

The dunlin is the commonest small shore wader, wintering throughout Britain. Large numbers of this species winter on the Forth Estuary, however there are few if any breeding pairs in the Falkirk area. 1994/95 winter counts recorded a peak count of 5144 for the whole estuary and a peak count of 4293 for Kinneil Kerse alone.[1]

Scottish/UK significance

The peak count of dunlin in 1992/93 in the Forth Estuary was 14,724, making this an internationally important population. More recent counts have recorded lower numbers so the Forth dunlin population may no longer be of international importance. However, the Forth Estuary and particularly Skinflats SSSI and Kinneil Kerse SSSI remain nationally important wintering site for dunlin.[2] This species is protected under the Bern Convention and the Bonn Convention.

Population trends & influencing factors

Throughout the UK there has been some decline in the winter dunlin population over the last 20 years. The local population has probably followed this national trend with a slight decline in numbers. Factors influencing population trends may include pollution and disturbance of winter feeding grounds and loss of breeding habitats.

Information Sources

1 Bryant D., 1995.

2 Campbell L.H., 1978.

Calidris canutus (Knot)

Current status & distribution

The knot is a migrant and winter visitor to most of Britain's coastline. Important feeding and roosting sites for knot include Skinflats SSSI and Kinneil Kerse SSSI.[1] During winter 1994/95 a peak count of 1200 knots was recorded for Kinneil Kerse.[2] Similar numbers can be found wintering at Skinflats SSSI.[4]

Scottish/UK significance

Internationally important populations of knot occur at both Skinflats SSSI and Kinneil Kerse SSSI.[3] An average peak count of 8000 was recorded for the whole estuary between 1988 and 1993 representing 3% of the British population and 2% of the European population.[4]

Population trends & influencing factors

Numbers of knot on the Forth Estuary have halved over the last 25 years.[4] A similar decline has not taken place in the UK as a whole, where no clear population trend is apparent. Factors which may have caused this local decline include land claim and changes in effluent disposal in the estuary.[4]

Information Sources

[1] Tilbrook C. & Corbet N., 1999.

[2] Bryant D., 1995.

[3] Campbell L.H., 1978.

[4] Tilbrook C., 1999.

Tringa totanus (Redshank)

Current status & distribution

The redshank occurs as a widespread but scarce breeding bird in river valleys and lower moorland.[1] Small numbers of breeding birds are also found around the estuary including at Kinneil Kerse SSSI.[2] However, there is no estimate of the total breeding population in Falkirk. The redshank occurs in much large numbers on the inter-tidal flats and rocky shores of the estuary during passage and throughout the winter. Some of the largest concentrations are found at Skinflats SSSI (supporting over 800 redshank during winter)[3] and Kinneil Kerse SSSI (with around 1000 wintering redshank)[4].

Scottish/UK significance

The Firth of Forth as a whole supports an average peak of 3,700 wintering redshank (average between 1988 and 1993). This represents 3% of the British winter population and 2% of the European winter population, making it an internationally important wintering population.[3] The vast majority of these birds occur at Skinflats and Kinneil Kerse. This species is protected under the Bonn convention.

Population trends & influencing factors

Breeding redshanks do appear to have declined in numbers within the Falkirk area over the last 30 years. This reflects national trends which have seen the biggest reduction in range occur in the north-east and central Scotland.[6] In fact many European ranges and populations are currently declining. Declines in breeding populations are likely to be closely linked to habitat loss as a result of drainage of wet grassland and more intensive grassland management. Their are no clear trends in wintering populations, although they are likely to reflect the decline in breeding numbers.

Information Sources

1 Henty C., Pers Comm.

2 Tilbrook C. & Corbet N., 1999.

3 Tilbrook C., 1999.

4 Bryant D., 1995.

5 O'Brien M., 1994.

6 Anon, 1995.

Numenius arquata (Curlew)

Current status & distribution

The curlew is widespread in this area breeding on farmland and on hill ground.[1] There is no estimate of breeding numbers for Falkirk. However, it is estimated that there are around 2,500 breeding birds on lowland farmland in Central Scotland, and the total breeding population will be much higher due to additional breeding pairs in the uplands.[2] Large numbers of birds remain in the area over winter, possibly added to by wintering birds from elsewhere. Most of these wintering birds are found on the estuary with a winter average peak count of 2,261 (1988-1993).[3] A large number of these occur at Kinneil Kerse SSSI and Skinflats SSSI.

Scottish/UK significance

The breeding population for the Scottish lowlands is estimated at about 57,000 pairs. Further birds will breed in the uplands, adding to the Scottish total. This large British breeding population is of international significance. The breeding densities on suitable habitats in Falkirk are likely to be similar to densities throughout much of Scotland. The wintering population on the Firth of Forth comprises about 1.9 % of the British wintering population and so is of national importance.[3] Much of this local wintering population occurs within the Falkirk area. This species is protected under the Bonn Convention.

Population trends & influencing factors

There is some evidence of a localised decline in breeding birds in western Scotland.[2] However, there is no evidence of a recent decline in this area.[1] Throughout Europe there appears to have been a decline in the winter population, however no similar decline has been recorded in the Falkirk area over the last 20 years. Where declines have taken place these are attributed to the loss, degradation and fragmentation of breeding habitats caused by widespread agricultural intensification in Europe.[2]

Information Sources

[1] Henty C., Pers Comm.

[2] Anon, 1995.

[3] Forth Estuary Forum, 1996.

Scolopax rusticola (Woodcock)

Current status & distribution

The woodcock is a scarce resident breeding bird of wooded areas and heathland, feeding on marshy ground. It has been recorded in just 2 10km squares in the Falkirk area. There are recent records of it at the Jupiter wildlife garden and Avon Gorge SSSI.[1] This very low number may be a result of under-recording but this species does appear to be quite rare within the area and may be limited by the availability of suitable breeding and feeding habitats.

Scottish/UK significance

There is insufficient data for this species within the Falkirk area to assess its significance.

Population trends & influencing factors

Local population trends are unknown but throughout the UK this species has declined by between 25 - 49% over the last 25 years.[2]

Information Sources

[1] C.A.R.S.E., 1999.

[2] UK Biodiversity Steering Group, 1995b.

Gallinago gallinago (Snipe)

Current status & distribution

Breeding snipe are sparsely distributed on some hillfarms and lower moorlands, where there is wet marshy ground. The breeding population is probably augmented in winter by birds moving into the area from breeding grounds further north. There has been no systematic surveying of this species in the Falkirk area. However, it has been recently recorded at 13 wetland, estuary or river sites including: Alloa Inches SSSI, Barleyside moss, Denny Muir, Garbethillmuir moss, Kinneil Kerse SSSI, and the river Forth.[1]

Scottish/UK significance

Snipe are widely but thinly distributed throughout Scotland on farmland and upland areas. The estimated breeding population in lowland Scotland is about 41,000 pairs.[2]

Population trends & influencing factors

Locally there is no evidence of a decrease in the species range although population trends are not fully known. Nationally, and particularly in eastern Britain, there has been a substantial decline in breeding and wintering numbers. This decline has resulted largely from the loss of breeding habitats due to grassland drainage and intensification of grassland management.[2]

Information Sources

[1] C.A.R.S.E., 1999.

[2] Anon, 1995.

Sterna hirundo (Common Tern)

Current status & distribution

The common tern is a summer visitor to most of the UK. There is a breeding colony of about 100 pairs of common terns around Grangemouth Docks, mainly on islands in old timber ponds. This group typically has good breeding success, probably due to its isolation from mammalian predators.[1] Common terns have also been recently recorded at Alloa Inches SSSI, Skinflats SSSI, Kinneil Kerse SSSI, and the Pow Burn Estuary, although these are probably feeding rather than breeding sites.[2]

Scottish/UK significance

The British breeding common tern population was estimated at about 12,900 pairs in 1985-87, and is largely restricted to Scotland, particularly further north and along the eastern coast. This species is protected under the EC Birds Directive, the Bern Convention, and the Bonn convention.

Population trends & influencing factors

Tern numbers are difficult to assess since the location, size and success of breeding colonies can vary significantly.[3] In Britain numbers appear to have been reasonably stable since 1970, however local trends in numbers are not clearly known. Breeding numbers and success are likely to be affected by predation, disturbance, availability of food, and the weather.[3]

Information Sources

[1] Henty C., Pers Comm.

[2] C.A.R.S.E., 1999.

[3] Alexander et al, 1998.

Tyto alba (Barn owl)

Current status & distribution

There are a few barn owls recorded in the Falkirk area each year indicating the presence of a small breeding population.[1] This species occurs on farmland and other open country with woodland or scattered trees. It frequently uses barns and other old buildings as well as trees for nesting in.

Scottish/UK significance

The Barn owl's main wintering and breeding areas in Scotland are the west central belt, Argyll and Islay, and Galloway.[5] It has a scattered distribution elsewhere and is absent from much of north-east Scotland.[2] There is no local population estimate for this species making it difficult to assess its significance. However, its occurrence in the Falkirk area on the northeastern fringe of its main breeding range may be important.

Population trends & influencing factors

The number of Barn owls in the Falkirk area has decreased over the last 30 years.1 This is in line with a decline of between 25 - 49% in the UK population over the last 25 years.[3] The decline of barn owls has resulted from a variety of factors including: loss of rough grassland as a result of agricultural intensification and housing development; mortality on roads (an increased problem as the loss of rough grassland has made roadside verges important foraging areas); and loss of nest sites as a result of building conversions. Local tree planting and set aside may help replace valuable hunting habitats[4] and nest boxes are used readily where no other sites are available.[1]

Information Sources

[1] Henty C., Pers Comm.

[2] Heinzel et al, 1972.

[3] UK Biodiversity Steering Group, 1995b.

[4] Alexander et al, 1998.

[5] Ward S.D., 2000.

Alcedo atthis (Kingfisher)

Current status & distribution

Several pairs of kingfishers, if not more, occur on the lower River Carron.[1] There are also recent records of this species on the River Avon at Muiravonside Country Park[2] and Avon Gorge,[3] and on the River Carron at Carron Glen.[4] Though no systematic surveying of this species has been undertaken in Falkirk, it appears to be well represented in this area.

Scottish/UK significance

The kingfisher occurs throughout England, Wales, Ireland and southern Scotland. Falkirk appears to support a healthy kingfisher population which is particularly significant given its location near the northern edge of this species' main breeding range.

Population trends & influencing factors

The UK kingfisher population is declining.[5] However, locally there is no evidence of decline. In fact, the breeding bird atlas for neighbouring Stirling suggests that between 1968 and 1991, though the species became absent in 2 10km squares, it appeared in 4 other 10km squares.[1] Where decline occurs this tends to be caused by poor water quality and quantity and sometimes by cold winters.

Information Sources

1 Henty C., Pers Comm.

2 Anon, 1983.

3 C.A.R.S.E., 1999.

4 Howard V.,1996.

5 Alexander et al, 1998.

Picus viridis (Green Woodpecker)

Current status & distribution

The green woodpecker appears to be restricted to just a few localities in the west of the Falkirk area.[1] It requires broad-leaved or mixed woodland or other well timbered areas.

Scottish/UK significance

The green woodpecker occurs throughout England and Wales and in the southern half of Scotland. Breeding pairs are more frequent in England and Wales. Its occurrence in Falkirk may be significant given that this area lies near the northerly edge of the green woodpecker's range. This species is protected under the EC Birds Directive, the Bern Convention and the Wildlife and Countryside Act 1981.

Population trends & influencing factors

This species has declined in parts of its European range.[3] Scotland has only been colonised by this species since the early 1950's when the species advanced 200km in just 20 years. More recent population trends in the UK and the local population trends are not known.

Information Sources

1 Henty C., Pers Comm.

2 Heinzel et al, 1972.

3 Alexander et al, 1998.

Riparia riparia (Sand martin)

Current status & distribution

There are breeding records for sand martins in the 10km squares to the east of this area, although these sites may actually be in midlothian.[1] However sand martins have been known to occur in quarries to the east of Polmont and throughout the area from Polmont running south-east into midlothian (following the line of the M9) which has numerous quarries.[2] Though continued quarrying operations periodically disturb nesting sites, it appears that sand martins still return to the area and, when necessary, find new nest sites in the less disturbed quarries. Sand martins have also recently been recorded at Bonnyfield Quarry though it is unclear whether this site supports a breeding colony. Sand martins require sandpits, gravelpits or vertical river banks for nesting. There is no total population estimate for this area.

Scottish/UK significance

Sand martins breed throughout most of the UK, migrating south for the winter and returning each year to breed. It is protected under the Bern Convention.

Population trends & influencing factors

The UK sand martin population has declined significantly over past decades. Local population trends are unknown though they may well echo national trends. A factor that might affect the local population is the disturbance of established nesting sites. However sandmartins are adapted to breeding in sandbanks which are naturally transient habitats and so their ability to colonise new sites including sand quarries is likely to be high.[4] A much more significant factor is over-winter survival, with birds affected by droughts in their wintering grounds.[3]

Information Sources

[1] Henty C., Pers Comm.

[2] Ludbrook I, Pers Comm.

[3] Alexander et al, 1998.

[4] Gordon P., Pers Comm.

Prunella modularis (Dunnock)

Current status & distribution

The dunnock is a common resident breeder found throughout the Falkirk area, occurring wherever there are shrubs or trees. It is often found in suburban areas and conifer plantations (especially at the edges).[1]

Scottish/UK significance

This species is a widespread and common resident breeder throughout the UK. It is protected under the Bern Convention.

Population trends & influencing factors

The UK dunnock population has declined by 25 - 49% over the last 25 years.[2] Local population trends are unknown.

Information Sources

[1] Henty C., Pers Comm.

[2] UK Biodiversity Steering Group, 1995b.

Locustella naevia (Grasshopper warbler)

Current status & distribution

The grasshopper warbler is a migrant breeder. It is thinly distributed in the Falkirk area where there is dense and damp vegetation.[1] Although there has been no systematic surveying of this species locally, several males sing regularly around Skinflats Pools and there is a recent record of it at Bonnyfield Quarry.[1,2] The grasshopper warbler's occurrence in this area is distinctly erratic year to year.[1] However, it is probably much overlooked because of the difficulty in spotting it and is likely to be found in recent forestry plantations and scruffy habitats such as overgrown farmland and town edges awaiting redevelopment.[4]

Scottish/UK significance

This species occurs throughout most of the UK except the far north of Scotland. However, its main breeding range only extends as far as south Scotland with breeding pairs more thinly distributed across central Scotland and up the west coast.[3] As such its occurrence in Falkirk represents an important part of its distribution near the edge of its range. This species is protected under the Bern Convention.

Population trends & influencing factors

Local information is insufficient to determine population trends and the species' occurrence is rather erratic. Across the UK there has been a decline in numbers by 25 - 49% over the last 25 years. Any decline is likely to be influenced by the loss of habitats, particularly rough grass, wetlands and scrub.

Information Sources

[1] Henty C., Pers Comm.

[2] C.A.R.S.E., 1999.

[3] Heizel et al, 1972.

[4] Gordon P., Pers Comm.

Saxicola torquata (Stonechat)

Current status & distribution

The stonechat is both a resident and a migrant breeder. It has a very localised distribution in the Falkirk area (occurring in scrubby areas on the Slamannan Plateau) and has recently been recorded at Auchengean.[1,2] Breeding numbers are likely to be low, although there is no population estimate for the area.

Scottish/UK significance

This species has a limited distribution. The main breeding populations are found along Britain's west coast and around the coast of Ireland. Less frequent breeding populations occur throughout the rest of Ireland, along the east and north coasts of Britain and on the east coast of Scotland. It occurs as a non-breeding visitor in patches elsewhere in England.[3] Despite the small stonechat population, this area represents an important part of the bird's restricted distribution. The stonechat is protected under the Bern Convention.

Population trends & influencing factors

UK and local population trends are unknown. National numbers can be very variable and this is reflected in the variability in the local population. Clearance of gorse scrub and severe winters can affect numbers.[4] There are signs of a resurgent stonechat population in Lothian and Borders and it is possible that they are also coming back in Falkirk.[5]

Information Sources

1 Henty C., Pers Comm.

2 Smith T., 1997.

3 Heinzel et al, 1972.

4 Alexander et al, 1998.

5 Gordon P., Pers Comm.

Carduelis carduelis (Goldfinch)

Current status & distribution

The goldfinch is a thinly distributed breeding resident on farmland in the Falkirk area. The breeding bird survey suggests that they occur at a density of about 2 per linear 10km in this general area.[1] In winter the birds tend to remain and form small flocks, though some birds may fly further south. Though there has been no systematic surveying of this species in the Falkirk area, it has been recorded at a variety of grassland, woodland and river/estuary sites.[2] There is no population estimate for this area.

Scottish/UK significance

This species occurs throughout most of the UK except for the far north of Scotland. The breeding population is more abundant in the south of England, Wales and Ireland, although the breeding range does reach up into central and parts of northern Scotland.[3] The Falkirk population probably represents a very small proportion of the total UK population, but may constitute an important part of the species' Scottish distribution. This species is protected under the Bern Convention.

Population trends & influencing factors

The UK goldfinch population has declined by 25 - 49% over the last 25 years.[4] However, some areas, such as northern Scotland and northern England, have seen a slight increase in goldfinch numbers and range over recent years.[5] The local population trends are unknown. Goldfinches are probably benefiting from a recent absence of hard winters and a recovery from past trapping. Factors causing the decline in numbers in some areas may include reduced availability of food due to increased herbicide use and intensification of grassland management, and loss of suitable breeding habitats.

Information Sources

1 Henty C., Pers Comm.

2 C.A.R.S.E., 1999.

3 Heinzel et al, 1972.

4 UK Biodiversity Steering Group, 1995b.

5 Alexander et al, 1998.

Locally Important species

Podiceps cristatus (Great crested grebe)

Current status & distribution

Great crested grebes probably occur throughout the Falkirk area and may breed in some years at Black Loch.[3] Much larger numbers of great crested grebes winter on the Forth Estuary. The average winter peak count for the whole estuary and Firth of Forth (1989 -1993) was 728 birds.[1] A significant proportion of these birds winter at Kinneil Kerse SSSI.[2]

Scottish/UK significance

The wintering great crested grebe population on the Forth Estuary and Firth represents about 7.3% of the UK wintering population and as such is of national importance.[1] A significant part of this population occurs at Kinneil Kerse SSSI.

Population trends & influencing factors

Population trends are unknown.

Information Sources

1. Forth Estuary Forum, 1996.

2. Tilbrook C. & Corbet N., 1999.

3. Henty C., Pers Comm.

3.2.3 Amphibians and Reptiles

Priority Species

Triturus cristatus (Great Crested Newt)

Current status & distribution

There are historical records of great crested newts occurring in a pond at Muiravonside Country park.[1] This pond has become overgrown and there have been no recent sightings of great crested newts there.[2] However the area has not been systematically surveyed so it remains uncertain whether great crested newts are still present or not. A survey of this site to determine whether great crested newts are still present would be advisable.

Great crested newts were recorded at a pond near Canada Wood in 1998. This pond is known locally as 'the newt pond' and appears to have supported great crested newts over a long period.[5] It is hoped that the pond still contains great crested newts although no survey has been undertaken since 1998.

There are no records of great crested newts within Falkirk (either historical or present) held on current SEPA records. These records are based largely on surveys which targeted known or likely great crested newt sites within Scotland. No sites in Falkirk were surveyed.[3]

Scottish/UK significance

In Scotland there are less than 1000 great crested newts. This species is more widespread in England and Wales and the British population is one of the largest in Europe. This species is listed on the Habitats Directive and the Bern Convention and is protected under the 1994 Conservation regulations and the wildlife and countryside act 1981.[4] Given the relatively small number of individuals occurring within Scotland and their current status, any great crested newts in Falkirk are of national significance. Any sites that have historically supported great crested newts and might be enhanced to encourage their return should also be regarded as significant.

Population trends & influencing factors

Within Scotland the great crested newt tends to be widespread but localised and has suffered decline in recent years.[4] It certainly appears that the great crested newt has been rare within the Falkirk area for a long period. However, there are insufficient records to accurately determine population trends. In general the main cause of decline has been the loss of suitable breeding ponds and terrestrial habitats, and pollution.[4]

Information Sources

1 Gillespies, 1995b.
2 A.Stewart, Pers Comm.
3 SEPA records.
4 UK Biodiversity Steering Group, 1995b
5 Sheehan K., Pers Comm.

Species of conservation concern

Anguis fragilis (Slow-worm)

Current status & distribution

The slow-worm is known to occur within the Falkirk area although no records of the sites where it has been observed were found.[1] It is likely to be reasonably widespread throughout the area in suitable moorland, grassland, woodland edge, drystone wall, and hedge habitats. No local population estimate is available.

Scottish/UK significance

This species occurs throughout most of the UK, except Ireland and the far north. However, it has an unfavourable conservation status within Europe.[2] It is protected under the Wildlife and Countryside Act 1981.

Population trends & influencing factors

Local population trends are unknown. . Throughout the UK the slow-worm population does not appear to have changed significantly over the last 25 years.[2] However, possible threats to this species might include habitat loss, persecution and habitat fragmentation.[1]

Information Sources

[1] Ward S.D. (Ed.), 2000.

[2] UK Biodiversity Steering Group, 1995b.

Bufo bufo (Common Toad)

Current status & distribution

A lack of systematic recording of amphibians within the Falkirk area makes it difficult to determine the true extent of this species. However it is likely to be widespread and reasonably common throughout most of the Falkirk area where suitable habitats occur.

Scottish/UK significance

The common toad is widespread and reasonably common throughout mainland Britain, but absent from Ireland.[1]

Population trends & influencing factors

There is insufficient data to assess local population trends for this species. Nationally there has been little change in abundance though the species may have declined in southeast England.[2] Where decline has occurred this is likely to be due to habitat loss (e.g. loss of breeding pools).

Information Sources

[1] Arnold E.N., Burton J.A., & Ovenden D.W., 1978.

[2] Hilton-Brown D. & Oldham R.S., 1991.

Rana temporaria (Common Frog)

Current status & distribution

The common frog has been recorded at at least 13 different sites within Falkirk, and the ponds at Denovan, Fankerton, Dunmore park and the Dunmore Pineapple all contained frogs during 1993 surveys.[1] There are also records for various ponds and mire sites throughout the area from between 1980 and 1997.[2] Limited surveying of water bodies and wetlands within Falkirk has probably resulted in significant under-recording of this species which is likely to be reasonably common and widespread where appropriate moist habitats occur.

Scottish/UK significance

The common frog is widespread and common throughout most of the British Isles. This distribution is likely to be mirrored within the Falkirk area. It occurs in a wide variety of habitats and may be found in almost any moist place within its range that is not permanently frozen.[3]

Population trends & influencing factors

There is insufficient data for this area to determine local population trends. There does not appear to have been a significant national decline in this species, although local declines may occur where there is habitat loss (e.g. as a result of drainage and infilling of ponds for urban and agricultural development).

Information Sources

[1] Lassiere O., 1993.

[2] C.A.R.S.E., 1999.

[3] Arnold E.N., Burton J.A., & Ovenden D.W., 1978.

Triturus helveticus (Palmate Newt)

Current status & distribution

Limited surveying of water bodies and wetlands within Falkirk has probably resulted in significant under-recording of this species. It has been recorded in a pond at Dunmore park [1] and is likely to be reasonably widespread throughout the area, where appropriate habitats occur.

Scottish/UK significance

The palmate newt is widespread throughout most of mainland Britain but does not occur in Ireland. It can be found in a wide variety of habitats from mountain lakes to brackish pools near the sea.[2]

Population trends & influencing factors

In most areas there appears to have been no change in numbers. However, a decrease is thought to have occurred in southeast Scotland, probably due to the loss of ponds through drainage or filling-in.[3]

Information Sources

[1] Lassiere O., 1993.

[2] Arnold E.N., Burton J.A., & Ovenden D.W., 1978.

[3] Hilton-Brown D. & Oldham R.S., 1991.

Triturus vulgaris (Smooth Newt)

Current status & distribution

This species does occur in the Falkirk area although no records of sites where it is present have been found.[1] It is likely that this species is widespread throughout the area in suitable open water, grassland, woodland and hedgerow habitats. There is no local population estimate.

Scottish/UK significance

This species is very widespread throughout the UK and the commonest newt over most of its European range.[2] It is protected under the Wildlife and Countryside Act 1981.

Population trends & influencing factors

Local population trends are unknown. Throughout the UK the smooth newt population does not appear to have changed significantly over the last 25 years.[3] However, possible threats to this species might include habitat fragmentation, habitat loss and pollution.[1]

Information Sources

[1] Ward S.D. (Ed.), 2000.

[2] Arnold et al, 1978.

[3] UK Biodiversity Steering Group, 1995b.

Vipera berus (Adder)

Current status & distribution

The current extent and distribution of this species is not fully known however it is known to occur in suitable habitats (e.g. at Drumbroider). This species occurs in a wide variety of habitats in the UK including moors, heaths, bogs, open woods, wet meadows, hedgerows and even saltmarshes.

Scottish/UK significance

This species occurs throughout much of Europe, where it has an unfavourable conservation status.[1] It is also protected under the wildlife and countryside act 1981.

Population trends & influencing factors

Local population trends are not known however, throughout the UK there has been no significant population change (i.e. > 24%) over the last 25 years.[1]

Information Sources

[1] UK Biodiversity Steering Group, 1995b.

Locally Important species

None

3.2.4 Fish

Priority Species

Alosa fallax (Twaite Shad)

Current status & distribution

During the 1800's this fish entered the Forth estuary in tolerable numbers and dozens were caught regularly in Salmon nets.[1] This species has nationally become much rarer and there are only two recent records of it in the estuary, one in the 1980's and one at Stirling in April 1999.[2,3]

Scottish/UK significance

There is insufficient data to assess the significance of this species within the Falkirk area. However, given its scarcity any occurrence of twaite shad is important. It seems likely that this species remains very rare in the Forth estuary.

Population trends & influencing factors

The twaite shad has declined by over 50% in Great Britain over the last 25 years. This is mainly due to pollution and river works.[1]

Information Sources

1 Maitland P.S., 1979.

2 Forth Estuary Forum, 1996.

3 McKenzie T., Pers Comm.

Species of conservation concern

Lampetra fluviatilis (River Lamprey)

Current status & distribution

Considerable numbers of this species were recorded near Kincardine in the 1960's and 1970's. These included young fish migrating downstream to the sea in the spring and adults migrating upstream in the autumn. The river lamprey was noted as being frequent in the Rivers of the Forth catchment up until the late 1970's[1], and there continue to be large numbers in the upper Forth Estuary many of which spawn in the River Forth and River Teith [5]. River lampreys were recorded in the Anchor Burn just above the Denny / Stirling road bridge during 1995.[2] A further survey of the Anchor Burn site in 1996 found that river lampreys were still present. This river lamprey population in Falkirk is likely to be very localised since the Anchor Burn is probably the only stream in the whole of the River Carron system which has suitable access and water quality.[4] A survey of 29 sites in the River Avon catchment in 1994 found no instances of river lamprey.

Scottish / UK significance

The river lamprey is rare but scattered throughout the UK.[3] Clearly any occurrence of this species is significant, however it is difficult to assess the national significance of the small River Carron population. The rivers Forth and Teith are very important spawning areas for this species and have in the past been considered for SAC (Special Area of Conservation) status because of this.[5]

Population trends & influencing factors

The river lamprey population in Britain has been reduced mainly as a result of the pollution of estuaries and the construction of weirs which block the rivers up which they migrate.[3] In the past this species has almost certainly suffered a decline in the Falkirk area although the extent of this loss and more recent population trends are unknown. The water quality of the Carron River is greatly improving which may allow the small population of river lamprey in the Anchor Burn to start to colonise the main river. Further surveying would be required to determine if this is the case.[4]

Information Sources

1 Maitland P.S., 1979.

2 McKenzie T., 1995.

3 Phillips R. & Rix M., 1985.

4 McKenzie T., Pers Comm.

5 Gardiner R., Pers Comm.

Lampetra planeri (Brook Lamprey)

Current status & distribution

In the 1970's this species was noted as being quite common over much of the Forth catchment area and likely to occur in most of the larger unpolluted streams and rivers. More recently this species was recorded at Parkhead Farm on the River Avon [2] and in Anchor Burn (a tributary of the River Carron) [3]. Two brook lamprey were again recorded at the Anchor Burn site in 1996.[5] It seems likely that since this species is non-migratory the Anchor Burn records represent a small historical population that has survived in this relatively clean burn.[5] The actual population size of this species remains unclear, though its distribution appears to be rather rare and localised.

Scottish/UK significance

The brook lamprey is found in scattered localities throughout Great Britain [4] and is quite common in other parts of the Forth catchment.[5] The brook lamprey population within Falkirk is unlikely to represent a large proportion of the UK population. However, its apparent scarcity and localised distribution in this area make the existing local populations particularly important.

Population trends & influencing factors

This species is not migratory so can exist above obstructions or polluted areas in rivers and streams. Usually found in small streams, the young fish bury themselves in soft mud while the adults prefer swifter flowing water.[4] Populations are likely to be affected by water pollution and river management resulting in the loss of suitable habitats for both the young and the adult fish.

Information Sources

[1] Maitland P.S., 1979.

[2] McKenzie T., 1994.

[3] McKenzie T., 1995.

[4] Phillips R. & Rix M., 1985.

[5] McKenzie T., Pers Comm.

Osmerus eperlanus (Sparling)

Current status & distribution

During the 1800's the smelt used to be a common fish of the Forth Estuary and the lower reaches of the rivers flowing into it. Large numbers used to move up the river in spring to spawn about 3km below the Stirling Bridge. However, numbers appear to have declined rapidly since about the 1850's and, though some were recorded in the estuary during the 1960's, there are no records of smelt in this area during the 1970's and 80's.[1] Smelt have recently returned to the Forth Estuary, running up the river to spawn in fresh water.[2] However the current population size is unknown.

Scottish/UK significance

The smelt is usually found in estuaries, from where it migrates upriver to spawn. They occur locally all around the coasts of the British Isles where there are suitable sandy or silty, unpolluted estuaries. The Forth has in the past been an important fishing ground for smelt. Having disappeared from this area for a considerable period they are thought to be returning in some numbers.[4] This is an important recovery. The current smelt population size in the estuary is unknown and its significance will depend on the smelt's continued recovery and presence in the Forth Estuary. This species has an unfavourable conservation status in Europe.

Population trends & influencing factors

The dramatic decline of smelt, as seen in the Forth Estuary between the 1850's and the 1970's, does not seem to have occurred throughout Britain. However, other local declines have taken place such as the loss of the smelt population from the Thames which has only recently recovered.[3] These losses are likely to have occurred primarily because of pollution. Recoveries now seem to be taking place where pollution is being controlled and the estuarine water quality is improving. However, the recovery of smelt in the Forth Estuary may be threatened by the increasing number of spratt boats operating in the inner estuary above Kincardine which inevitably take a large proportion of the smelt population, as well as salmon and sea trout, in their nets.[4]

Information Sources

1 Maitland P.S., 1979.

2 Forth Estuary Forum, 1996.

3 Phillips R. & Rix M.,1985.

4 McKenzie T., Pers Comm.

Petromyzon marinus (Sea lamprey)

Current status & distribution

Sea lamprey regularly run up the Forth estuary to spawn in the River Forth and the River Teith. However, they have not been recorded in either the Avon or the Carron, and tend only to occur in smaller rivers further south in warmer waters.[1]

Scottish/UK significance

The sea lamprey is very localised occurring in some coastal waters and estuaries around Britain. The adults run up easily accessiable rivers to spawn in early summer. This species has become extinct in several southern British rivers as a result of pollution and man-made obstructions. It has an unfavourable conservation status within Europe and is listed as a priority species in the EC Habitats Directive annex II.

Population trends & influencing factors

Local population trends are not clearly known, although the Forth and Teith area appears to represent a stronghold for lamprey species.

Information Sources

[1] Gardiner R., Pers Comm.

Salmo salar (Atlantic Salmon)

Current status & distribution

In the past all the rivers in the Forth catchment area had indigenous salmon stocks wherever there was suitable access. However, in 1950 none of the rivers in the Falkirk area supported salmon, although they continued to run up and down the Forth to spawning grounds in a few rivers elsewhere in the catchment.[1] A recent survey (1994) of 29 sites on the River Avon catchment found no salmon. This river has occasionally been stocked with salmon, most recently in 1990, but without success.1 A similar survey of 21 sites on the River Carron catchment in 1995 found three salmon at one site.[2] Several salmon were also recorded in the River Carron at Carron Bridge in 1996. The River Carron has been stocked with substantial numbers of non-native salmon fry over several years up until the late 1980's, however these fish did not do well and showed little evidence of recruitment.[4] A more recent restocking programme on the Carron introduced fry from stock native to the Teith and Ardoch river systems and it is hoped that a run of native fish may now have re-established. Since 1997 there have been reports of increasing numbers of adult salmon returning to the River Carron. Further surveying will be required to determine the actual situation.[4]

Scottish/UK significance

Salmon are found in coastal waters and rivers throughout most of Britain. Almost all adult salmon return to the river of their birth, probably even to the same area of the river. Salmon populations from different river systems have been found to be remarkably distinct genetically.[3] Because of this genetic distinctness the Forth catchment's salmon population can be considered a distinct entity that is significant in itself, regardless of other UK populations. However, the population within the River Carron could only be considered significant if it is managing to spawn successfully. It is hoped that spawning is taking place but this needs to be confirmed.

Population trends & influencing factors

Following the loss of salmon populations from both the Carron and the Avon by the 1950's, all the salmon found in these rivers are introduced stock. However, after the recent introduction of native stock there are now signs of an increase in adult numbers in the River Carron. The main reasons for the natural decline of salmon populations is the obstruction or pollution of the estuaries and rivers up which they run, and the loss or pollution of suitable spawning grounds. These will also be limiting factors in the success and distribution of any re-established salmon population.

Information Sources

1 Mckenzie T., 1994.

2 Mckenzie T., 1995.

3 Phillips R. & Rix M., 1985.

4 McKenzie T., Pers Comm.

Locally important species

Salmo trutta (Sea trout)

Current status & distribution

The River Carron has a viable population of sea trout following a recent re-stocking programme. It is expected that this will be even more successful than a similar salmon stocking programme which has already seen an increase in the adult fish population. Improvements in water quality, particularly in the main river and Castlerankine burn, mean that the sea trout population should now be able to maintain a healthy population.[1]

Scottish/UK significance

Sea trout is widespread throughout the UK occurring in fast flowing, clean rivers and migrating to the sea after spawning. They are most frequent off the west coast of Scotland and Ireland, although they are also found in larger rivers often with salmon.[2]

Population trends & influencing factors

Past local trends are unknown, however it is likely that the current re-introduced population in the River Carron is now viable and will hopefully increase in size over the next few years. Like salmon, the main threats to this population are the obstruction or pollution of the estuaries and rivers up which they run, and the loss or pollution of suitable spawning grounds.

Information Sources

[1] McKenzie T., Pers Comm.

[2] Phillips R. & Rix M.,1985.

Salmo trutta (Brown trout)

[Though it is now generally agreed that brown trout are genetically identical to sea trout, they are behaviourally very distinct and will usually have different conservation requirements. As such they are being considered separately within this audit.]

Current status & distribution

Brown trout occur within both the Avon and Carron river systems. During 1994-5 brown trout was recorded at 11 of 21 sites surveyed on the Carron river system and 16 of 29 sites surveyed on the Avon river system.[1,2]

Scottish/UK significance

Brown trout tend to be common in streams, rivers and lakes throughout the UK. Within the Falkirk area they represent an important recreational and economic resource. Their health and abundance may also help to indicate the health of the river systems in which they live.

Population trends & influencing factors

Local brown trout population trends are not fully known. However, it appears that they are currently reasonably common and the population is likely to have increased in size with the improving water quality of the rivers in Falkirk. The continued recovery of river systems like the Carron should see a simultaneous population growth, increasing this species' local economic and recreational value.[3]

Information Sources

[1] Mckenzie T., 1994.

[2] Mckenzie T., 1995.

[3] McKenzie T., Pers Comm.

3.3 Invertebrates

3.3.1 Insects

3.3.1.1 Ants, Bees and Wasps (Hymenoptera)

None of the listed species are known to occur in the Falkirk area.

[Sivell D. & Phillips D.S., 1999]

3.3.1.2 Beetles (Coleoptera)

Priority Species

None of the listed priority species are known to occur in the Falkirk area.

[Sivell D. & Phillips D.S., 1999]

Species of Conservation Concern

None of the listed species of conservation concern are known to occur in the Falkirk area.

[Sivell D. & Phillips D.S., 1999]

Locally Important Species

Brachygluta helferi (A Beetle)

Current status & distribution

This species has been recorded in the brackish, coastal habitats at Skinflats SSSI.[1]

Scottish/UK significance

This beetle is rare in the UK and listed as notable on the British red data list.[1]

Population trends & influencing factors

Local population trends are not known.

Information Sources

[1] Tilbrook C., 1999.

Brachysomus echinatus (A Weevil)

Current status & distribution

This weevil is usually found on grassland and coastal cliffs, mainly on calcareous soils. It probably occurs at the roots of plants and the adult weevils have been found in moss. This species has been recently recorded at Avon gorge SSSI.[1]

Scottish/UK significance

This weevil is widespread but local in England, parts of Wales and as far north as North-west Scotland. It is a nationally notable species.

Population trends & influencing factors

Local population trends are not known. However, the main threats to this species are likely to be loss of calcareous grassland through re-seeding and fertiliser application, and lack of appropriate grazing or cutting regimes.[1]

Information Sources

[1] Avon Gorge SSSI Scientific File, SNH.

Enicmus fungicola (A Mould Beetle)

Current status & distribution

This beetle is associated with myxomycete fungi (slime-moulds) on trees. It has been recorded from oak trees in Avon gorge SSSI in 1996.[1]

Scottish/UK significance

This species is widespread throughout most of Britain but very local. Within Scotland it has been recorded in Mid-Perthshire, South Aberdeenshire, Moray and Argyll before 1970 and in South Aberdeenshire since 1969.[2] This is a nationally notable species.

Population trends & influencing factors

Local population trends are unknown. This species would be threatened by clear-felling of woodland and conversion to other land-use. In particular, felling of trees colonised by slime-moulds would pose a serious threat to this species.[2]

Information Sources

[1] Avon Gorge SSSI Scientific File, SNH.

[2] Hyman P.S., 1994.

Enicocerus exsculptus (A Beetle)

Current status & distribution

This species is found on algal films which develop around culverts, boulders and gravel in clean rivers and streams.[1] Enicocerus exsculptus has been recorded in the River Carron at Denny, in 1994.[2]

Scottish/UK significance

In the UK this species occurs mainly in central and southern Scotland and northern England, although there are a few records from other parts of the country. It is listed as nationally scarce on the British Red Data list.[1]

Population trends & influencing factors

The UK Enicocerus exsculptus population has declined over recent years, becoming scarce throughout most of Wales and England (except for the Pennines). The local population trends are not known. The main threats to this species are river modification which alters the flow (e.g. canalisation), siltation and pollution.[1]

Information Sources

[1] Hyman P.S., 1994.

[2] Macadam C., Pers Comm.

Scaphisoma boleti (A Beetle)

Current status & distribution

This beetle is found in broad-leaved woodland and pasture woodland, although it has been known to occur in a wide variety of other habitats. It may have a preference for old dark woodland and can be found on a range of different fungi. This beetle has been recently recorded in the Falkirk area at Avon Gorge SSSI.[1]

Scottish/UK significance

This species is widespread but local in England and southern Scotland. It is a nationally notable species.[1]

Population trends & influencing factors

Local population trends for this species are not known. The main threats to it are likely to be loss of broad-leaved woodland and parkland as a result of clear-felling. In particularly, felling of fungus-infected trees and the removal of dead wood could seriously threaten this beetle. It might also be threatened by infilling of quarries and drainage of wetland sites (both habitats in which it has also been recorded).[1]

Information Sources

[1] Avon Gorge SSSI Scientific File, SNH.

3.3.1.3

Butterflies and Moths (Lepidoptera)

Priority Species

Xylena exsoleta (Swordgrass)

Current status & distribution

There are two records of this moth species in Falkirk since 1970, one in 1973 and one in 1981.[1] There are no other recent records for this area but the Swordgrass used to be widespread throughout south-east Scotland.[2] There has been very limited surveying of lepidoptera in this area, most of it taking place at one site in North Bantaskine. As such the actual extent and status of Swordgrass in Falkirk remains uncertain.

Swordgrass is a species of grasslands and moorland edge, extending into lowland agricultural areas. The larvae feed on broad-leaved species, particularly blackthorn and bird cherry.[2] This habitat occurs in various parts of Falkirk so it is possible that the species is or has been widerspread than records suggest.

Scottish/UK significance

Once widespread throughout the UK this moth has undergone a substantial decline since the 1960's. Only in Scotland is the moth still regularly recorded in large numbers at several upland sites.[3]

There is insufficient data to determine whether the Swordgrass moth still occurs in this area, and if it does its extent and significance.

Population trends & influencing factors

There is insufficient data to assess population trends for this species in Falkirk. A significant influencing factor on this species is likely to be loss of habitat. However, the factors causing loss or decline are not fully known.[3]

Information sources:

[1] Holmes C.W.N., 1984.

[2] Kinnear P.K., 1999.

[3] UK Biodiversity Group, 1999d.

Species of conservation concern

Boloria selene (Small Pearl-bordered Fritillary)

Current status & distribution

It was reported in 1983 that the small pearl-bordered fritillary was common in several small colonies at Blaeberry Mair and Roughcastle.[1] There is also a record from Easter Drumclair in 1994.[2] There are no other recent records. However, this may reflect the under recording of butterflies rather than the complete loss of this species from this area.

Scottish/UK significance

The small pearl-bordered fritillary occurs throughout most of the UK but particularly in the south and west of England, Wales and central to northern Scotland.[5] This species is widespread and locally common in the east of Scotland. However it tends to be scarce in the south of this region which includes Falkirk.[3] Poor records for this area make an assessment of the significance of this species in Falkirk difficult. However any surviving populations in Falkirk would be locally rare as well as regionally scarce.

Population trends & influencing factors

This species has suffered a major contraction in range in the UK over the last 150 years. However in the 1980's it was thought that it may actually have become commoner in Scotland.[5] Loss of the small pearl-bordered fritillary's habitat (damp semi-natural grassland, open woodland, marsh and moorland) as a result of site drainage and improvement, overgrazing, succession of grassland to woodland, and afforestation all threaten this species. Rapid loss of habitat throughout Great Britain has resulted in a population decline of 25 - 49% over the last 25 years.3 Data for the species in this area is insufficient to assess population trends.

Information Sources

1 Holmes C.W.N., 1984.

2 Smith T., 1997.

3 UK Biodiversity Steering Group, 1995b.

4 Kinnear P.K., 1999.

5 Heath et al, 1984.

Coenonympha tullia (Large Heath)

Current status & distribution

This species was common at Letham Moss but in 1983 it was noted as being under threat from peat extraction at that site.[1] There are no other recent records for this species in Falkirk. The lack of recent records may be a result of limited surveying. Its past status as common and the widespread presence of peatland habitats with cotton-grass Eriophorum vaginatum (a main food plant) suggest that the Large Heath may still be present within this area.[2] Another known food plant is white-beaked sedge (Rhynchospora alba) which is also known to occur in the Falkirk area.[4]

Scottish / UK significance

This species occurs locally in Wales, northern England and southern Scotland, and more frequently in northern Scotland. It is confined to lowland raised bogs, peat mosses, upland blanket bog and damp acid moorland habitats.[4] In the east of Scotland this species, though widespread in upland Aberdeenshire and Perthshire, is scarce elsewhere. Because of its scarcity in this area any remaining population is of significance, although Falkirk would probably hold a very small proportion of the UK or Scottish population.

Population trends & influencing factors

Due to chronic under-recording it is difficult to assess regional population trends. It is likely that the Large Heath has suffered some decline as a result of habitat loss to afforestation, peat extraction, drainage, overgrazing, and agricultural improvement. However, the true extent of any decline remains unclear.[3]

Information Sources

1 Holmes C.W.N., 1984.

2 Pers comm., P. Kirkland, Butterfly Conservation.

3 Kinnear P.K., 1999.

4 Heat et al, 1984.

Dyscia fagaria (Grey Scalloped Bar Moth)

Current status & distribution

There has been one record of this species in Falkirk over the last 30 years, in 1978 at North Bantaskine.[1] Though certainly rare, the past and present extent of this species is unclear due to poor recording. As a moorland species feeding on heather there are habitats in this area where the Grey Scalloped Bar moth might occur.

Scottish/UK significance

There is insufficient data both locally and regionally to assess significance.

Population trends & influencing factors

This species is experiencing a population decline at present. However, there are fewer clues as to why it is declining.[2]

Information sources:

1 Holmes C.W.N., 1984.

2 Kinnear P.K., 1999.

Locally important species

Callophrys rubi (Green Hairstreak)

Current status & distribution

In 1983 this species was reported as common with a large colony on heathland to the west of Falkirk.[1] There are no other recent records, however, this may be due to under-recording rather than loss of this species from the area. As a species of acid heaths, moors and bogs, and particularly associated with bilberry in eastern Scotland, the Green Hairstreak might certainly be expected to occur within Falkirk still.

Scottish / UK significance

The green hairstreak is the commonest and most widespread of the five British hairstreak species. However, colonies tend to be rather locally distributed. Though some areas have seen a considerable reduction in the numbers of green hairstreaks, this species remains locally common in other regions, including western Scotland.[3] This species appears to be scarce within east Scotland, although this is partly due to under-recording. It is of 'medium regional priority'.[2] As such its occurrence in Falkirk would be locally important and also of some regional value.

Population trends & influencing factors

The UK has seen a significant decline in this species' population in many areas over the last century.[3] Local population trends are unclear due to under-recording and a lack of systematic surveying. The main threat to this species is loss of habitat as a result of afforestation, scrub regeneration, agricultural improvement and over-grazing.[2]

Information Sources

[1] Holmes C.W.N., 1984.

[2] Kinnear P.K., 1999.

[3] Heath et al, 1994.

3.3.1.4

Dragonflies and Damselflies (Odonata)

None of the listed species are known to occur in the Falkirk area.

[Sivell D. & Phillips D.S., 1999.] & [Hammond C.O., 1985.]

3.3.1.5

Flies (Diptera)

Priority Species

None of the listed priority species are known to occur in the Falkirk area.

[Sivell D. & Phillips D.S., 1999]

Species of conservation concern

None of the listed species of conservation concern are known to occur in the Falkirk area.

[Sivell D. & Phillips D.S., 1999]

Locally important species

Beris clavipes (A Soldier-Fly)

Current status & distribution

This species has been recorded in brackish, coastal habitats at Skinflats SSSI.

Scottish/UK significance

Beris clavipes is rare and tends to occur largely in the southern half of Britain.[1,2]

Population trends & influencing factors

Local population trends and influencing factors are unknown, although loss or degradation of its habitat would clearly have an impact on this species.

Information Sources

[1] Tilbrook C., 1999.

[2] Chinery M.,1986.

Brachyopa insensilis (A Fly)

Current status & distribution

This fly breeds in sap runs on a variety of deciduous trees, particularly beech, elm and horse chestnut. It has recently been recorded in a sap run on an elm tree at Avon Gorge SSSI.[1]

Scottish/UK significance

This is a nationally notable species. It has mainly been recorded in the south of Britain with only 5 records for it in Scotland (mostly from Strathspey and the Moray Firth area). However, recent surveys have found it to be common in Scottish woodlands throughout most of Scotland.[1]

Population trends & influencing factors

Population trends are unknown.

Information Sources

[1] Rotheray G.E., 1996.

Mycetobia pallipes (A Fly)

Current status & distribution

This fly breeds in sap runs on a range of deciduous trees, particularly beech, elm and horse chestnut. It has recently been recorded in a sap run on an alder tree at Avon Gorge SSSI.[1]

Scottish/UK significance

This is a nationally notable species. It is known from a few sites in southern Britain but has recently been found to be common in Scottish woodlands.[1]

Population trends & influencing factors

Population trends are not known.

Information Sources

[1] Rotheray G.E., 1996.

Parhelophilus consimilis (A Hoverfly)

Current status & distribution

This species occurs in rich pools and bogs, usually with reedmace (Typha), and has been recorded at Carron Dams SSSI and Skinflats SSSI.[1] The larvae are thought to live in reedmace beds and so this plant is an important element of their habitat.

Scottish/UK significance

The full distribution of this species is not yet known. However, since 1950 it has been recorded in 9 10km squares in Scotland and 35 throughout Great Britain. This hoverfly is listed as vulnerable within the UK.[1]

Population trends & influencing factors

Population trends are not fully known for this species however, it appears to be declining in the UK. Local population trends are not known. The main threats to this species are habitat loss as a result of afforestation, drainage, pollution, or development. It is particularly dependent on the presence of reedmace beds.[1]

Information Sources

[1] Sivell D. & Phillips D.S., 1999.

Sphaerophoria loewi (A Hoverfly)

Current status & distribution

This species has been recorded in the brackish habitats at Skinflats SSSI. It has also been recorded at other sites on the Forth Estuary.[1]

Scottish/UK significance

The total distribution of this species is unknown. Since 1960 it has been recorded in just 3 10km squares in Scotland and 7 in Great Britain. It is considered to be vulnerable within the UK.[1]

Population trends & influencing factors

This species is likely to be declining within the UK, although population trends are not fully known. The main threats to it are drainage, pollution or development of its coastal habitat.[1]

Information Sources

[1] Sivell D. & Phillips D.S., 1999.

Systenus pallipes (A Fly)

Current status & distribution

This species breeds in decaying sap in sap runs and has also been found in sap filled beetle tunnels in aspen trees. It has recently been recorded in a sap run on an elm tree at Avon Gorge SSSI.[1]

Scottish/UK significance

This is a nationally notable species. It has been recorded at several sites in southern Britain. It was first recorded in Scotland relatively recently and was subsequently found to be widely distributed throughout Scottish woodlands.[1]

Population trends & influencing factors

Population trends are unknown.

Information Sources

[1] Rotheray G.E., 1996.

Other notable red data book diptera found at Carron Glen SSSI :

Acanthocnema nigrimana (Diptera, Scathophagidae)

Neolimnophila carteri (Diptera, Tipulidae)

Symballophthalmus dissimilis (Diptera, Empididae)

3.3.1.6

Mayflies and Stoneflies (Ephemeroptera & Plecoptera)

Priority Species

None of the listed priority species are known to occur in the Falkirk area.

[Sivell D. & Phillips D.S., 1999]

Species of conservation concern

None of the listed species of conservation concern are known to occur in the Falkirk area.

[Sivell D. & Phillips D.S., 1999]

Locally important species

Ameletus inopinatus (A Mayfly)

Current status & distribution

This species has been recorded on the River Avon at the Slamannan Bridge, most recently in 1993. It has not been recorded at any other sites in the Falkirk area and may be locally restricted to this one location.[1] It tends to occur in water without organic enrichment.[1]

Scottish/UK significance

This species has been recorded elsewhere within Britain, however the River Avon site is the only one in the Forth Valley known to support this mayfly.

Population trends & influencing factors

Local population trends of this species are not known, although it was last recorded in 1993. The main threats to this species are organic enrichment and other forms of pollution. River bed disturbance which temporarily increases the level of silt in the water can clog the gills of this sort of aquatic species or bury them. Disturbance or removal of marginal and bank vegetation may also have an adverse impact on ameletus inopinatus.[1]

Information Sources

[1] Macadam C., Pers Comm.

3.3.1.7

Other insects

None of the listed species are known to occur in the Falkirk area.

[Sivell D. & Phillips D.S., 1999]

3.3.2 Other Invertebrates

3.3.2.1

Spiders (Arachnida)

None of the listed species are known to occur in the Falkirk area.

[Sivell D. & Phillips D.S., 1999] & [Bratton J.H., 1991.]

3.3.2.2

Crustacea

None of the listed species are known to occur in the Falkirk area.

[Sivell D. & Phillips D.S., 1999] & [Bratton J.H., 1991.]

3.3.2.3

Millipedes (Myriapoda)

None of the listed species are known to occur in the Falkirk area.

[Sivell D. & Phillips D.S., 1999] & [Bratton J.H., 1991.]

3.3.2.4

Molluscs

Priority Species

None of the listed priority species are known to occur in the Falkirk area.

[Sivell D. & Phillips D.S., 1999] & [Bratton J.H., 1991.]

Species of conservation concern

Lymnaea glabra (A freshwater snail)

Current status & distribution

Lymnaea glabra lives in soft water in small muddy ditches and pools, particularly in areas which periodically dry out and which have poor aquatic flora.[1] This species has been recorded on the River Carron at Carron Bridge during routine biological monitoring by SEPA, most recently in 1993. There are no records of this species elsewhere in the area, however it is possible thatit has been sampled at other sites but not identified to species level.[2] The full extent of the local population is unknown however this species is likely to be rare and localised.

Scottish/UK significance

This species occurs throughout western Europe but is rather localised. Though formerly widespread throughout England, Wales and southern Scotland (as far north as Perth), it is now rare with the main concentration of records in Yorkshire.[1] This species is thought to occur in less than 15 10km squares across Great Britain and is classified as vulnerable in the Red data book.[3,1]

Population trends & influencing factors

This species has become extinct over much of lowland England and is continuing to decline. Over the last 25 years the lymnaea glabra population has declined by 25-49% in the UK.[3] Local population trends are not known. The main threats to this species are the drainage of boggy areas, the loss of small ponds and field drains, the deepening of seasonal pools so that they become permanent ponds, and the eutrophication of water as a result of chemical runoff.[1]

Information Sources

[1] Bratton J.H., 1991.

[2] Macadam C., Pers Comm.

[3] UK Biodiversity Steering Group, 1995b.

Locally important species

None.

3.3.2.5

Other taxa

None of the listed species are known to occur in the Falkirk area.

[Sivell D. & Phillips D.S., 1999] & [Bratton J.H., 1991.]

3.4 Lower Plants

3.4.1 Algae

None.

3.4.2 Stoneworts (Charophyta)

None.

No Red Data Book stoneworts have been recorded in the Falkirk area.

[Stewart N.F. & Church J.M., 1992.]

3.4.3 Fungi

None.

Potential locally rare fungi:

(Identified in surveys during 1979-81.)

Boletus lanatus
Boletus subtometosus
Cortinarius pinicola
Deconica coprophila
Hygrocybe vitellina

3.4.4 Lichens

None.

No Red Data Book lichens have been recorded within the Falkirk area.

[Church et al, 1996]

3.4.5 Bryophytes - Liverworts

Priority species

None.

Species of conservation concern

Plagiochila spinulosa (A liverwort)

Current status & distribution

This species was included in a species list for Falkirk in 1980. The location(s) was not recorded. This record cannot be verified and there are no other records of this species in Falkirk.

Scottish/UK significance

This species is probably globally threatened.[1] It tends to occur on or amongst basic to acid rocks, on cliffs, in scree, or on bark in sheltered, humid woodland habitats. It is widespread and sometimes locally abundant throughout western and northern Britain.[2]

Population trends & influencing factors

Unknown.

Information Sources

[1] UK Biodiversity Steering Group, 1995b.

[2] Smith A.J.E., 1990.

Lepidozia pearsonii (A Liverwort)

Current Status & distribution

This species has been recorded at at least four peat bog sites in Falkirk since 1992.[1]

Scottish/UK significance

Lepidozia may be endemic to the UK. It tends to occur with other bryophytes on humus and peat in moist, humid habitats in woodland and moorland, on north facing rock ledges, and beside waterfalls, and is occasional in western and northern Britain.[2]

Population trends & influencing factors

Local and national population trends and influencing factors are not known.

Information Sources

[1] C.A.R.S.E., 1999.

[2] Smith A.J.E., 1990.

Locally important species

None.

3.4.6 Bryophytes - Mosses

None.

3.5 Vascular Plants

3.5.1 Ferns (Pteridophyta)

Priority Species

Pilularia globulifera (Pillwort)

Current status & distribution

This species has been recorded in the Falkirk area pre-1970. However no post 1970 records exist.[1] Pillwort tends to occur on silty or peaty lake and pond margins, and in shallow pools created by gravel extraction. It is an opportunist which colonises bare subtrate, but may also be found in denser plant communities as a submerged aquatic plant.[1]

Scottish/UK significance

Pillwort is rare but widespread throughout Britain. However, most records since 1970 are for southern and western England and Wales, with a few scattered records throughout Scotland. This species has an unfavourable conservation status within Europe and at least 25% of its world population occurs within the UK.[2]

Population trends & influencing factors

The area in central eastern Scotland including Falkirk, Fife and Perthshire appears to have been a stronghold for this species pre-1970, however the only post-1970 record in this area is from Stirlingshire, suggesting a considerable decline and possible loss of pillwort in much of this eastern Scotland area.[1]

Information Sources

[1] Stewart et al, 1994.

[2] UK Biodiversity Steering Group, 1995b.

Species of conservation concern

Dryopteris aemula (Hay-scented Buckler Fern)

Current Status & distribution

This species was recorded during a survey of Carron Glen during 1979 - 1980.[1] Its exact location and the number of specimens found is unknown. No other records of this species in Falkirk can be found. Nor have other records of this species been found for the east coast of Scotland; all Scottish records between 1930 and 1976 have been from the west coast.[3] This and the absence of any other records of this fern at Carron Glen, which has been surveyed more recently, casts doubt on the validity of the Falkirk record.

Scottish/UK significance

This fern has a scattered distribution, occurring mainly in southwest England and western Scotland. However it is also found in southeast England and the central Scottish highlands.[3] 25-49% of this species' world population occurs within the UK and it currently has an unfavourable conservation status within Europe.[4] If present in Falkirk this species is very significant, particularly since it is outwith its usual range. However, without verification of the record for Falkirk an assessment of the area's significance is impossible.

Population trends & influencing factors

There is no information about the population trends of this species. Even if the initial identification was correct no subsequent records exist that could indicate local trends.

Information Sources

[1] Martin S., 1980.

[2] Fitter et al, 1984.

[3] Perring F.H. & Walters S.M. (Ed), 1976.

[4] UK Biodiversity Steering Group, 1995b.

Locally important species

Species identified as locally rare in Stewart N.F., 1988, and Brackenridge W.R., 1999.,excluding introduced species.

Species	Recorded in Falkirk at:
Cystopteris fragilis (Brittle bladder fern)	Carron Glen SSSI, Castlerankine Glen, Muiravonside
Gymnocarpium dryopteris (Oak fern)	Carron Glen SSSI, Cleuch Plantation, Braes Wood, Castlerankine Glen, Torwood Glen, Muiravonside
Phegopteris connectilis (Beech fern)	Carron Glen SSSI, Braes Wood, Castlecary Glen, Castlerankine Glen, Denny Muir, Torwood Glen
Polypodium vulgare (Common polypody)	Castlerankine Glen, Carron Glen
Asplenium trichomanes (Maidenhair spleenwort)	Denny Muir, Castlerankine Glen, Carron Glen, Carriden Woods.
Phyllitis scolopendrium (Hart's-tongue fern)	Castlerankine Glen, Carriden Glen
Lycopodium clavatum (Stagshorn clubmoss)	Limerigg Pools

3.5.2 Flowering Plants (Spermatophyta)

Priority Species

Epipactis youngiana (Young's Helleborine)

Current status & distribution

This species is known to occur at one site within the Falkirk area near Muiravonside Country Park. Though other orchids have been recorded on this site since at least 1983, the presence of Epipactis youngiana was only confirmed in 1994 by Dr A.J. Richards.[1] Since discovering the presence of this orchid the population has been surveyed in both 1994 and 1995. In 1994 263 helleborine orchids were noted. Of these at least 6 (probably 9) were young's helleborine, 69 were Epipactis leptochila var. dunensis (see statement later) and 185 were Epipactis helleborine.[1] In 1995 a total of 348 orchids were located 11 of which were young's helleborine.[2] All of the young's helleborine occur in the south part of the site, either along the edge of a disused railway trackbed or in a depressed area formed between two disused railway embankments. In both areas there is a well developed canopy of birch scrub.[1,2]

Scottish/UK significance

This species is endemic to the UK and occurs only on derelict spoil heaps where broad-leaved trees have colonised. It is known to have occurred at six sites in the UK, five of which are in Scotland. It is listed as endangered on the Great Britain red data list and is protected under the Wildlife and Countryside Act 1981.[3] The occurrence of this species within Falkirk is thus of national and international significance. It is possible that the Epipactis youngiana identified in England and Wales actually has a different origin to that identified in Scotland. So the Scottish young's helleborine could be genetically different and so of even greater importance.[4]

Population trends & influencing factors

The surveys of 1994 and 1995 suggest that Falkirk's young's helleborine population is relatively stable and concluded that 'there is no immediate reason to believe that the orchids are under any imminent threat'.[1,2] However, the main factors causing loss of this species within the UK are: lack of management leading to canopy closure; extraction of spoil for use as ballast; and the destruction of spoil heaps. Nationally two sites have been destroyed over the last 15 years.[3] At present the population of this orchid in Falkirk is quite small and so may be particularly vulnerable.

Information Sources

[1] Watson K., 1994.

[2] Watson K., 1995

[3] UK Biodiversity Steering Group, 1995b

[4] Allan B., & Woods P., 1993

Fumaria purpurea (Purple Ramping-fumitory)

Current status & distribution

Purple ramping-fumitory occurs on a species list for Falkirk district produced in 1980.[1] It was observed at Parkhill Estate in Polmont in 1978 on wasteground near the old walled garden.[2] More recent surveys have tended not to look at waste ground sites, nor have they revisited the Parkhill Estate. No other records of this species can be found for the Falkirk area. It is uncertain whether this species is still present at its original location or occurs elsewhere in the area.

Scottish/UK significance

At least 75% of this species' world population occurs in the UK and, although its status is uncertain, the Purple ramping-fumitory could be of global conservation concern.[3] This species is rare with a very scattered distribution across the UK, occurring in less than 100 10km squares.[4]

Population trends & influencing factors

This species may have declined in some parts of Britain but the population is believed to be stable in its main areas.[5] Local population trends are not known.

Information Sources

[1] Martin S., 1980.

[2] Various, 1978-81.

[3] UK Biodiversity Steering Group, 1995b.

[4] Perring F.H. & Walters S.M. (Ed), 1976.

[5] Stewart et al, 1994.

Species of conservation concern

Carum verticullatum (Whorled Caraway)

Current status & distribution

Whorled caraway is found on damp acid grassland, marshes, bogs and other damp places.[1,2] This species has been included on species lists for the Falkirk area in 1980 and in 1988 (based on 1983 data).[3,4] During surveys of 55 sites in 1983 this species was located at just 3 : Denny Muir, Loch Ellrig and California Muir. Surveys of these sites within the last 8 years have confirmed its continued presence. Whorled caraway has also been recently recorded at Gardrum Moss and Standburn wildlife site.[5]

Scottish/UK significance

This species occurs in the west of Britain, but particularly in southwest Scotland where it is locally common rather than rare/locally frequent..6,1 Between 25% and 49% of the world population of this species occurs in the UK and it has an unfavourable conservation status within Europe.7 The Falkirk area appears to support a healthy population of this species, lying to the east of its main Scottish range.

Population trends & influencing factors

The local population of whorled caraway appears to have been reasonably stable over the last 20 years, and it has probably not been lost from the few sites where it was known to exist in 1983. However, limited surveying makes it difficult to determine its full population extent and trends. The UK population has seen a decline of 25 - 49% over the last 25 years. A key factor affecting the decline of this species is likely to be the loss of its preferred damp habitats.

Information Sources

[1] Rose F., 1981.

[2] Leaper G., 1999.

[3] Martin S., 1980.

[4] Stewart N.F., 1988.

[5] C.A.R.S.E., 1999.

[6] Perring F.H. & Walters S.M. (Ed), 1976.

[7] UK Biodiversity Steering Group, 1995b.

Chamaemelum nobile (Wild Chamomile)

Current status & distribution

This species was recorded on a species list for Falkirk based on surveys and observations from 1979-80. The site(s) where it was observed were not recorded.[1] There are no other records of wild chamomile in this area. This species is thought to be absent from northern England and Scotland,[2] casting considerable doubt on the record for Falkirk.

Scottish / UK significance

This species is locally frequent in southern England and Wales, on sandy grassland.

Population trends & influencing factors

The UK population has declined by 25 - 49% over the last 25 years.

Information Sources

[1] Martin S., 1980.

[2] Rose F., 1981.

Epipactus leptochila var. dunensis (Dune Helleborine)

Current status & distribution

This species occurs at one site within Falkirk near Muiravonside Country Park. It was first identified there in 1993. In 1994 69 of the 263 helleborine orchids found were identified as Epipactis leptochila var. dunensis. They occur mainly to the south and east of the site, particularly along and between the disused railway embankments. In 1995 54 of the 348 orchids found were Epipactis leptochila var. dunensis, occurring in much the same locations.[2]

Scottish/UK significance

This site represents the largest population of dune helleborine in Scotland. Only a few other specimens have been identified on bings near Glasgow.[1] As such it is of considerable regional and national significance.

Population trends & influencing factors

Although monitoring during 1994 and 1995 indicated a slight reduction in the number of this species at the site, there is no evidence at present to suggest a long-term decline.

Information Sources

[1] Watson K., 1994.

[2] Watson K., 1995.

Hyacinthoides non-scripta (Bluebell)

Current status & distribution

The bluebell is mainly found in open deciduous woodland but also occurs in hedgerows, on riverbanks, and under bracken on moorland. It does not tend to occur in upland areas or wet, fen areas.[1] This species occurs throughout most of the Falkirk area in suitable habitats. It does not seem to occur in the upland area around Denny Muir or on parts of the Slamannan Plateau where it is likely to be too wet.[2] There has been no systematic surveying of this species however it has recently been recorded at over 20, mainly woodland, sites including Haining wood, Braes wood, Avon Gorge SSSI, Callendar Wood and Kinneil wood.[3]

Scottish/UK significance

The bluebell is common throughout Britain except in mountainous and fen areas. It is less common in north and east Scotland because it does not favour upland areas.[2] It has an unfavourable conservation status in Europe.

Population trends & influencing factors

No information.

Information Sources

[1] Rose F., 1981.

[2] Perring F.H. & Walters S.M. (Ed), 1976.

[3] C.A.R.S.E., 1999.

Hypochaeris glabra (Smooth Cat's-ear)

Current status & distribution

Smooth cat's-ear occurs on sandy grassland, arable ground, heaths and sand dunes. It was recorded at Carron Dams SSSI in 1981.[1] There are no other records of it in the Falkirk area and more recent surveys of parts of Carron Dams do not appear to have noted this species. It is unclear whether this species is currently present at Carron Dams SSSI which seems an unlikely habitat for it.

Scottish/UK significance

Smooth cat's-ear is locally frequent in eastern England and rare in western England and Wales. It is very rare in Scotland occurring in less than 9 10km squares most of which are in north Scotland.[2] If still present, the occurrence of this species in Falkirk is very significant, though it would be an extremely isolated population.

Population trends & influencing factors

Local population trends are unknown. The UK Smooth cat's-ear population has declined by 25 - 49% over the last 25 years.

Information Sources

1 C.A.R.S.E., 1999.

2 Perring F.H. & Walters S.M. (Ed), 1976.

Ranunculus hederaceus (Ivy-leaved Water Crowfoot)

Current status & distribution

Ivy-leaved water crowfoot has been found growing in mud next to burns, pools or ditches at Kinneil Estate, Avon Banks wood and Avon Gorge SSSI during the last 20 years.[1, 2] There do not appear to be any other records of this species in the Falkirk area. The records for Kinneil Estate and Avon Banks wood date from the early 1980's and these sites have not been re-surveyed more recently.

Scottish/UK significance

Ivy-leaved water crowfoot is frequent to locally common throughout most of the UK, although it has a very scattered distribution.[3, 4] It has an unfavourable conservation status within Europe and 25 - 49% of its world population may occur within the UK.[5]

Population trends & influencing factors

It is likely that the UK population of this species has declined by 25 - 49% over the last 25 years.[5] The local population trends are unknown.

Information Sources

1 Stewart N.F., 1988.

2 C.A.R.S.E., 1999.

3 Rose F., 1981.

4 Perring F.H. & Walters S.M. (Ed), 1976.

5 UK Biodiversity Steering Group, 1995b.

Ribes alpinum (Mountain Currant)

Current status & distribution

Mountain current is native to ash woods on steeply sloping limestone, however it has been introduced in other areas.[1] This species has been recently recorded at Muiravonside Country Park and at Westquarter Burn (introduced in both cases).[2,3]

Scottish/UK significance

Mountain currant occurs naturally in a few parts of northern and central England and north Wales. However, it has been widely introduced in central and northern England, Wales and much of Scotland.[4]

Population trends & influencing factors

No information.

Information Sources

[1] Stewart et al, 1994.

[2] Stewart N.F., 1988.

[3] C.A.R.S.E., 1999.

[4] Perring F.H. & Walters S.M. (Ed), 1976.

Locally important species

Campanula rotundifolia (Harebell)

Current status & distribution

This species is reasonably frequent in the Falkirk area but may be confined to a strip across the area from Carronbridge and Castlecary to Polmont and Redding Muirhead.[1] This may result partly from a lack of suitable habitats (dry grassland,heaths and hedgebanks) to the south of the area, however it is possible that the surveying of a limited number of sites also resulted in an underestimate of the true extent of the harebell.

Scottish/UK significance

This species is common throughout most of Britain, though rare in southwest England. Locally this species is well recognised as a hedgebank, road verge and meadow species. It's presence and abundance also gives a good indication of the health of these local habitats.

Population trends & influencing factors

Local and national population trends are unknown for this species. However the hedgebank, heath and meadow grassland habitats in which it tends to occur are likely to have declined in extent and quality over the last 50 years with a consequent reduction in the abundance and extent of the harebell.

Information Sources

[1] Stewart N.F., 1988.

Chrysanthemum leucanthemum (Ox-eye Daisy)

Current status & distribution

The ox-eye daisy is reasonably frequent in the Falkirk area and usually occurs on grasslands, meadows and roadsides.[1,2] It is likely to be relatively widespread where suitable habitats occur.

Scottish/UK significance

The ox-eye daisy is quite common throughout the UK on grassland and road verges. Locally it represents a well recognised grassland species which tends to indicate the presence of healthy and species-rich grassland habitats.

Population trends & influencing factors

Population trends for this species are not known. However it is likely that with the intensification of agriculture resulting in increased herbicide use and the loss of field margins and headlands and the intensive management of other grasslands and road verges, the ox-eye daisy has undergone a decline in population size and distribution.

Information Sources

[1] Stewart N.F., 1988.

[2] Rose F., 1981.

Drosera rotundifolia (Round-leaved Sundew)

Current status & distribution

Round-leaved sundew occurs on wet acid peat on heaths and amongst sphagnum in bogs. It has been recently recorded on over 20 of the peat bogs in the Falkirk area including: Barleyside, Blackhill moss, Candie mire, Drumbroider moss, Dunmore moss, Howierig Muir SSSI, Shielknowes and Grangeneuk Moss. It has also been recorded at several heath sites and woodlands near mire habitats.[1]

Scottish/UK significance

The round-leaved sundew is locally common on wet, acid peat. However, dependence on this habitat means that its occurrence in England is very patchy with its distribution mainly focused in northern England, parts of Wales and Scotland. Within Scotland this species is most frequent in the north and west with a much lower occurrence through central Scotland and along the East coast.[2] Because of its dependence on wet, acid peat habitats this species may be a useful indicator of the extent and health of peat bogs in the Falkirk area.

Population trends & influencing factors

This species is declining as a result of the destruction or modification of the peat habitats on which it survives.[3] Local population trends are unknown however, several large peat bogs have been destroyed by peat extraction over the last 30 years with the possible loss of round-leaved sundews. Any further modification or loss of peat bogs in this area is likely to impact on the local round-leaved sundew population.

Information Sources

[1] C.A.R.S.E., 1999.

[2] Perring F.H. & Walters S.M. (Ed), 1976.

[3] Rose F., 1981.

Lychnis flos-cuculi (Ragged Robin)

Current status & distribution

Ragged robin occurs frequently in the Falkirk area in damp areas such as damp meadows, fens, and wet woods.[1,2]

Scottish/UK significance

This species is common throughout the UK in appropriate damp habitats. Locally it is an easily recognised species of damp habitats and its presence is a good indicator of the health and conservation value of the wet woodland, fen and damp grassland habitats in which it may occur.

Population trends & influencing factors

The population trends of this species are unknown, however the extent of ragged robin will be linked to the extent of the damp habitats in which it normally occurs and which are generally declining.

Information Sources

[1] Stewart N.F., 1988.

[2] Rose F., 1981.

Naumburgia (Lysimachia) thyrsiflora (Tufted Loosestrife)

Current status & distribution

Tufted loosestrife occurs in wet areas such as in fens and by lakesides. In the Falkirk area it is found quite frequently beside the Forth and Clyde Canal.[1] In fact in 1988 it occurred in all but one of the 1km squares in Falkirk which the Forth and Clyde canal passes through.[1] This species was also recorded beside the Union Canal during the 1970's and 1980's and is likely to be present still though no recent surveying has taken place. There are no records of tufted loosestrife occurring elsewhere in the Falkirk area.

Scottish/UK significance

Tufted loosestrife is nationally scarce. It can be found in northern England and central Scotland but is rare throughout.[1,2]

Population trends & influencing factors

Tufted loosestrife has been recorded along the Forth and Clyde Canal since the 1970's. More detailed indications of local population trends are unavailable. National trends are unknown.

Information Sources

[1] Watson K.J. & Murphy K.J., 1988.

[2] Rose F., 1981.

Platanthera chlorantha (Greater Butterfly Orchid)

Current status & distribution

The greater butterfly orchid is rare within the Falkirk area but has been recently recorded at at least nine sites. These are: Avonbank wood, Bo,mains meadow, Braes heath, Braes wood, Candie mire, Balquatstone, Carron Glen SSSI, Denny Muir SSSI and Muiravonside.[1,2,3] It is also likely to occur at other unimporved grassland sites.

Scottish/UK significance

The greater butterfly orchid is locally common but has a very scattered distribution within the UK. This species is most frequent in southern England and on the north and west coast of Scotland, elsewhere it has a very patchy distribution.[4] The greater butterfly orchid is regionally scarce in this area with a very limited occurrence on the east coast.

Population trends & influencing factors

Population trends are unknown.

Information Sources

1 C.A.R.S.E., 1999.

2 Anon, 1983.

3 Brackenridge W.R., 1999.

4 Perring F.H. & Walters S.M. (Ed), 1976.

Potamogeton x bennetti (Bennett's Pondweed)

Current status & distribution

Bennett's pondweed is currently found in the Forth and Clyde canal outwith the Falkirk area.[1] This species originally occurred in the canal near Grangemouth but has become extinct in this area. It is being protected in the Forth and Clyde canal where it occurs and may be able to recolonise parts of the canal within Falkirk once the current improvement works have been completed.

Scottish/UK significance

Bennett's pondweed only occurs in the Forth and Clyde canal. As such its presence is of considerable importance. There may be potential for natural or assisted recolonisation of parts of the Forth and Clyde canal in Falkirk in the future.

Population trends & influencing factors

The extent of this species in the Forth and Clyde canal appears to have fluctuatedin the past and the present population remains very vulnerable. However, if it manages to establish itself successfully where it is, it may expand into other parts of the canal in the future.

Information Sources

1 Watson K.J. & Murphy K.J., 1988.

Ulmus glabra (Wych Elm)

Current status & distribution

This species is likely to be widespread and common throughout much of the Falkirk area, often planted.[1] It can flourish in a wide range of habitats, even on hillsides or near the sea.

Scottish / UK significance

Wych elm is widespread throughout the UK but is most abundant in northern Wales and from northern England to the far north of Scotland.[2] This species represents a locally valuable woodland and hedgerow / roadside tree.

Population trends & influencing factors

This species has suffered a decline, particularly in England and Wales but also in Scotland, as a result of Dutch Elm disease. Because it reproduces by seed rather than sucker, Wych Elm has been more resistant to this disease than other species of elm.[3] However, this also means that it will take time to recover from any decline that has occurred.

Information Sources

[1] Stewart N.F., 1988.

[2] Mitchell A. & Wilkinson J., 1982.

[3] National Trust, 1986.

Other potential locally important species:

This list includes species identified as locally rare in: Stewart N.F., 1988; Brackenridge W.R., 1999; and Forth and Clyde Canal Joint Advisory Committee, 1995., except those that are introduced species.

Species	Recorded in Falkirk at :	National status
Adoxa moschatellina (Moschatel)	Avon banks wood	Frequent - Locally common
Agrostis gigantea (Black bent)	Carron Meander, West Mains Pond	Frequent - Common
Alchemilla xanthochlora (Intermediate lady's mantle)	Carron Glen, Muiravonside, Westquarter Burn	
Alchemilla vestita spp. filicaulis (A Lady's mantle)	Braes Wood, Westquarter Glen, Muiravonside	
Allium ursinum (Ramsons)	Carron glen, Kinneil estate, Avon Banks wood	Common
Anthyllis vulneraria (Kidney Vetch)	Kinneil timber basin, Bo'ness foreshore, Jupiter wildlife garden	Frequent - Abundant
Aphanes arvensis (Parsley- piert)	Blackness	Common
Aphanes microcarpa (Slender parsley-piert)	Dunmore wood	Common
Apium inundatum (Lesser marshwort)	Bonnybridge dam	Frequent - Locally common
Avenula pubescens (Downy Oat-grass)	Carron Glen	
Botrychium lunaria (Moonwort)	California North	
Briza media (Quaking grass)	Union canal near Almond	
Callitriche hermaphroditica (Autumnal water-starwort)	Bonnybridge Dam	Locally frequent (N. of Central England)
Cardamine amara (Large bitter-cress)	Castlecary Glen, Castlerankine Glen, CarronGlen, Nr. Glen Village, Avon Banks Wood,Torwood Glen	Locally abundant (mainly in England & Wales)
Carex aquatilis (Water sedge)	Faughlin reservoir,Carron Glen, Darnrig Moss, Wester Drum	
Carex caryophyllea (Spring sedge)	Denny muir, Carron glen, Muiravonside	
Carex disticha (Brown sedge)	South Glen, Kinneil Estate, Hall wood	
Carex hostiana (Tawny sedge)	Denny Muir, Braes wood	
Carex laevigata (Smooth-stalked sedge)	Carron Glen, Calendar Wood, Seabegs wood	

Species	Recorded in Falkirk at :	National status
Carex lepidocarpa (Long-stalked Yellow-sedge)	Carron Glen, Polmont Burn, River Avon at South Glen	
Carex limosa (Bog-sedge)	Bog by Drum Wood	
Carex pallescens (Pale sedge)	Carron Glen, South Glen, Avonbank-Birkhill, Braes wood	
Carex pendula (Pendulous sedge)	Avon Banks wood	
Carex pulicaris (Flea sedge)	Denny muir, Loch Ellrig	
Carex sylvatica (Wood-sedge)	Castlecary Glen, Carron Glen, Torwood Glen, Muiavonside, Union canal	
Centaurium erythraea (Common centaury)	Rough castle (meadow), Summerford, Bo'ness foreshore, Grangemouth docks, Jupiter	Very common (except N.E. Scotland)
Cerastium diffusum (Sea mouse-ear)	Blackness, Grangemouth docks	Locally common (usually by sea)
Cerastium semidecandrum (Little mouse-ear)	Carriden	Frequent - Locally common
Cerastium tomentosum agg. (Snow-in-summer)	Carriden	
Chaenorhinum minus (Small toadflax)	Craigbank Quarry, Jupiter	Common (Rare in N. and W. Scotland)
Chaerophyllum temulentum (Rough Chervil)	Blackness Common	(Absent in N. and W. Scotland)
Chrysosplenium alternifolium (Alternate-leaved golden saxifrage)	Castlecary glen	Occasional - Locally frequent to East
Circaea x intermedia (Upland enchanter's-nightshade)	Carron Glen, Castlecary Glen, Rumford East, Polmont woods	Rare
Cirsium helenioides (Melancholy thistle)	Carron Glen,	Frequent - Locally common in N. England and Scotland.
Convallaria majalis (Lily of the valley)	Avon Banks wood	Very rare in Wales and Scotland. Frequent in England.
Corydalis claviculata (Climbing corydalis)	Torwood, Torwood Glen, Wallacebank Wood, Dunmore wood, Dales wood	Locally common

Species	Recorded in Falkirk at :	National status
Dactylorhiza fuchsii x purpurella (Hybrid Marsh-orchid)	Carron glen, Parkfoot marsh,	
Daucus carota (Wild carrot)	Bo'ness foreshore	Common
Eleocharis quinqueflora (Few-flowered spike-rush)	Tak-ma-doon Road, South Torwood.	
Elymus farctus (Sand couch)	Carriden Bay	
Epilobium roseum (Small-flowered willowherb)	Cleuch Plantation	Rare in Scotland. Frequent in England.
Epipactis helleborine (Broad-leaved helleborine)	Almond bing, Braes wood, Limerigg pools, Torwood Glen	
Eupatorium cannabinum (Hemp-agrimony)	Avon Banks wood	Common (N. Scotland rare - occasional)
Euphorbia peplus (Petty spurge)	Carriden Woods	Very common
Galium mollugo agg. (Hedge bedstraw)	Parkfoot marsh, Rough Castle (meadow)	Scotland: Rare - Occasional. England: Common
Galium uliginosum (Fen bedstraw)	Denny muir, Carron Glen, River Avon, Tak-ma-doon road, South Torwood, Shortrig, Braes wood	Frequent - Locally common (absent N. Scot)
Geranium lucidum (Shining Crane's-bill)	Blackness, Skinflats woods	Occasional - Locally frequent. (rare N. Scot.)
Geranium pratense (Meadow Crane's-bill)	Beside Union canal	Locally frequent. Common mid-Eng - S. Scotland
Geranium sylvaticum (Wood Crane's-bill)	Carron Glen, Union canal Nr. Redding, Avon Valley, Muiravonside, Westquarter burn	Frequent - Locally common in N. England & Scotland.
Geum intermedium (Hybrid avens)	Kinneil Estate	
Hieracium grandidens (Glandulosa subsection) (Hawkweed)	Westquarter Burn	Rare
Honkenya peploides (Sea sandwort)	Carriden Bay, Carriden woods (shoreline)	Locally common (on beaches and dunes)
Hypericum hirsutum (Hairy St. John's-wort)	South Glen	Occasional - common. (Rare in N. Scotland)
Hypericum tetrapterum (Square-stalked St. John's-wort)	Carron Glen, Braas Wood, South Glen, Avon Valley, Polmont woods	Common

Species	Recorded in Falkirk at :	National status
Isolepis setacea (Bristle Club-rush)	Nr. Whitehill reservoir, Carron Glen, Blackhill moss, Muiravonside, Callendar Park, South Torwood, Rough Castle, Maddiston West	
Knautia arvensis (Field scabious)	South Polmont, Bo'ness foreshore, by M9 east of Polmont	Common (Rare in N. and W. Scotland)
Koeleria macrantha agg. (Crested Hair-grass)	Blackness	
Leontodon hispidus (Rough Hawkbit)	Bo'ness foreshore	Common (Very rare in N. Scotland)
Listera cordata (Lesser twayblade)	Candie moss	Rare (N. Eng) - Locally common (N. Scot.)
Listera ovata (Common twayblade)	Old bing near Almond, Braes wood	Common
Melampyrum pratense (Common cow-wheat)	Seabegs wood	Common - Locally abundant
Melica uniflora (Wood melick)	Castlerankine Glen, Carron Glen, Muiavonside	
Mentha arvensis (Corn mint)	Dunmore wood, Callendar park	Very Common
Myriophyllum alterniflorum (Alternate water-milfoil)	Drumbowie reservoir, Black Loch, Bonnybridge Dam,	Uncommon - Locally frequent
Myriophyllum spicatum (Spiked water-milfoil)	Bonnynridge dam, Skinflats ponds, Grangemouth Docks, Union canal, Forth & Clyde canal	Common (in slow or still water)
Nasturtium X sterilis (Hybrid watercress)	West Mains pond	
Nuphar lutea (Yellow water-lily)	Braes Wood ponds, Forth & Clyde Canal	Common (in ponds, canals and slow water)
Oenanthe crocata (Hemlock water-dropwort)	Blackness	S & W of GB: abundant. N & E GB: rare - absent.
Ononis repens (Common restharrow)	Avon Banks Wood, beside Union Canal, South Polmont, Avonbank-Birkhill	Frequent - Common (rare in North)
Ornithopus perpusillus (Common Birdsfoot)	Jupiter, Bonnybridge Quarry	Locally frequent S & E Scotland. Frequent - abundant Eng. & Wales.

Species	Recorded in Falkirk at :	National status
Orobanche minor (Common broomrape)	Jupiter	Rare - absent North GB. Common South GB.
Parnassia palustris (Grass of parnassus)	Denny Muir	Widespread. Common in Scotland only.
Pedicularis palustris (Marsh lousewort)	Denny muir, Black loch, Loch Ellrig	Common in N. & W. GB. Rare SE & central Eng.
Peplis portula (Water purslane)	Drumbowie reservoir, Little Denny reservoir, Loch Ellrig	Frequent - Locally common (esp. in S.)
Pimpinella saxifraga (Burnet saxifrage)	Carron Glen	Very common (Absent NW Scotland)
Plantago media (Hoary Plantain)	Bo'ness foreshore	Rare - very local (more frequent in England)
Poa nemoralis (Wood meadow-grass)	Carron Glen, Carron dams, Muiravonside, Kinneil Estate, Avon Banks wood	
Polygala serpyllifolia (Heath milkwort)	Carron Glen, Braes Wood	Very common (on acid grass or heaths)
Polygonum lapathifolium (Pale Persicaria)	Parkfoot marsh	Scot.:Occassional - Rare. Eng. & Wales: Common
Populus tremula (Aspen)	Old bing near Almond, Castlecary Glen	Common (less in S. & E.)
Potamogeton alpinus (Red pondweed)	Faughlin reservoir, Forth & Clyde canal	Uncommon
Potamogeton crispus (Curled pondweed)	Forth & Clyde canal, Union canal, Muiravonside pond, Skinflats pond	Uncommon
Potamogeton friesii (Flat stalked pondweed)	Forth & Clyde Canal	Nationally scarce
Potamogeton obtusifolius (Blunt-leaved pondweed)	Forth & Clyde canal	Uncommon
Potamogeton pectinatus (Fennel pondweed)	Lathallan sandpit, Forth & Clyde Canal	Uncommon
Potamogeton perfoliatus (Perfoliate pondweed)	Bonnybridge dam, Forth & Clyde canal	Uncommon
Potentilla anglica (Trailing tormentil)	Tor Wood, Muiravonside	Frequent

Species	Recorded in Falkirk at :	National status
Pyrola minor (Common wintergreen)	Old bing near Almond, Union canal near aqueduct, Braes Wood, Summerford, Redding grasslands	Occassional. (Frequent - locally common in N. GB)
Ranunculus bulbosus (Bulbous Buttercup)	Blackness	Very common
Ranunculus omiophyllus (Round-leaved crowfoot)	Drumbowie reservoir, Blackhill moss, South Drum Claypit	Locally frequent in S. and W. of GB
Ranunculus peltatus (Pond water-crowfoot)	Muiravonside, Kinneil Estate	Frequent
Rosa caesia (Dog rose)	Summerford, Tippetcraig	
Rosa pimpinellifolia (Burnet Rose)	South Glen	Occassional - Locally abundant (near coasts)
Rubus saxatilis (Stone bramble)	Auchenlilylinn Spout, Carron Glen	Occassional - Locally common (rare to south). Rare in Scottish lowlands
Rumex x arnotti (Hybrid dock)	Shortrig	
Rhynchospora alba (White-beaked sedge)	Sheilknowes	Regionally rare
Sagina maritima (Sea Pearlwort)	Grangemouth Docks, Nr. Kincardine Bridge	Widespread. Only locally common near coast.
Sagina nodosa (Knotted Pearlwort)	Polmont Burn, Tak-ma-doon road, Shortrig, California north, Loch Ellrig, Craigbank Quarry	Localised (mainly in W. & N.)
Salix nigricans (Dark-leaved willow)	Carron glen	
Salix pentandra (Bay willow)	Shortrig, Craigbank Quarry, Rumford west, Newcraig, Loch Ellrig, Lochgreen	
Salix phylicifolia (Tea-leaved willow)	Denny muir, Carron glen, Darnrig moss, California muir, Greyrigg, Black Loch	
Salix purpurea (Purple willow)	Carron glen, Loch Ellrig, Bonnyfield Quarry, Polmont burn, Wallacestone, Parkfoot marsh,	Frequent - Locally abundant
Salix repens (Creeping willow)	Shortrig, Jawhills, Greyrigg	Locally common (esp. in N)
Salix x smithiana (Hybrid osier)	Carron glen, Carron dams	
Saxifraga granulata (Meadow saxifrage)	Carriden woods	Scot: occassional - locally frequent in E. & S.

Species	Recorded in Falkirk at :	National status
Saxifrage hypnoides (Mossy saxifrage)	Auchenlillylinn spout, Carron Glen	Locally frequent - Locally common N Eng.- N Scot.
Schoenoplectus tabernaemontani (Grey Club-rush)	Grangemouth Docks, West mains pond	
Scirpus sylvaticus (Wood club-rush)	Castlecary Glen	Uncommon
Scleranthus annuus (Annual Knawel)	Bonnyfield Quarry	Widespread but locally frequent
Scutellaria galericulata (Skullcap)	Callendar Park pond	Common (Rare in NE Scotland)
Sedum anglicum (English stonecrop)	Braes wood	Locally common S & E coasts. Common W coast
Solidago virgaurea (Goldenrod)	Carron Glen, River Avon, Shortrig, Torwood Glen	Common
Sparganium emersum (Unbranched Bur-reed)	River Avon, Forth & Clyde Canal, Union Canal, California Muir, Wallacestone	Frequent - Locally common
Sparganium minimum (Least Bur-reed)	Limerigg ponds, California Muir	Frequent - Locally common
Stachys x ambigua (Hybrid woundwort)	Castlecary Glen	
Stellaria nemorum (Wood Stitchwort)	Castlecary Glen, Castlerankine Glen, Carron Glen	Locally frequent (W. & N. GB)
Suaeda maritima (Annual Sea-blite)	Kinneil Timber basin, Kinneil bing	Common (in salt marshes)
Taraxacum sect. spectabilia (Red-veined Dandelion)	Denny muir, Carron glen, Black Loch, Darnrig moss	
Thymus praecox subsp. arcticus (Wild thyme)	Denny muir, Carron Glen, Blackness	Very common
Trientalis europaea (Chickweed wintergreen)	Tor wood	Scot: Occassional - Locally common
Trifolium striatum (Knotted clover)	Blackness	Regionally rare
Trisetum flavescens (Yellow Oat-grass)	Union canal, Howierig wood, Blackness	
Trollius europaeus (Globe flower)	Carron Glen	Nationally rare
Vaccinium vitis-idaea (Cowberry)	Braes wood	Common (in hills)
Veronica anagallis-aquatica (Blue water-speedwell)	Kinneil Kerse	Frequent - Locally common (in wet areas)

Species	Recorded in Falkirk at :	National status
Veronica montana (Wood speedwell)	Castlecary Glen, Castlerankine Glen, Muiravonside	Common (Rare north Scotland)
Viburnum opulus (Guelder rose)	Castlecary glen, castlerankine glen, Carron glen, Torwood glen, Kinneil Estate	Common (Rare in north Scotland)
Vicia sativa ssp. nigra (Narrow-leaved vetch)	Muiravonside, Carriden, Blackness, Grangemouth Docks	
Vicia tetrasperma (Smooth tare)	Jupiter	Scotland: Very rare Eng. & Wales: Frequent
Viola lutea (Mountain pansy)	Denny Muir, Carron Glen, Braes wood	Frequent N. & W. GB (in uplands)
Zostera angustifolia (Narrow-leaved Eelgrass)	Carriden Bay	Rare - Locally freqent (around coasts)
Zostera noltii (Dwarf eelgrass)	Carriden Bay, Balckness Bay	Rare. (Locally common on S. and E. coasts)

4. CONCLUSIONS

4.1 Habitats

The most extensive habitats which occur within the Falkirk area are improved grassland, arable and horticultural land, and built up areas and gardens. This reflects the intensive human occupation and cultivation of much of Falkirk's landscape. Despite the significant level of human impact on this area, Falkirk still supports at least 18 (66%) of the 27 broad habitats and 21 (45%) of the 47 key habitats listed by the UK Biodiversity Group. In addition this audit highlights 8 locally important habitats which have been included because of their significant contribution to the landscape and ecology of the area. This list of locally important habitats is not exhaustive and other habitats or habitat mosaics may be added at a later date.

Falkirk is approximately 29,000ha in size, constituting about 0.1% of the total land cover of the UK. As such any habitat type which has more than 0.1% of its total UK cover occurring within Falkirk could be said to have a disproportionately high representation in this area. Using this rather crude assessment the following habitats in particular appear to have disproportionately high representation within Falkirk:

Neutral grassland:

Falkirk may support as much as 1% of the total UK cover of this habitat, although the true extent of species-rich neutral grass in Falkirk is likely to be much less.

Lowland dry acidic grassland:

Falkirk may support as much as 0.48% of the total UK cover of this habitat.

Lowland raised & intermediate bog:

Falkirk supports about 2.5% of the total UK cover of active raised bog and 0.6% of the total UK cover of intermediate raised bogs.

Mudflats:

Falkirk holds 0.5% of the total UK cover of this habitat.

Upland Oakwoods:

Falkirk holds about 0.3% of the total UK cover of this habitat.

Upland mixed ash woods:

Falkirk holds about 0.35% of the total UK cover of this habitat.

Wet woodland:

Falkirk holds about 0.24% of the total UK cover of this habitat.

Saltmarsh:

Falkirk holds about 0.2% of the total UK cover of this habitat.

Canals:

The proportion of the UK total cover of this habitat occurring within Falkirk is unknown but is likely to be higher than average.

Bings:

The proportion of the UK total cover of this habitat occurring within Falkirk is unknown but is likely to be higher than average.

Several other habitats have a more limited extent in Falkirk and are not disproportionately represented in this area but are, never the less, important because they are nationally rare. These habitats include saline lagoons and mesotrophic lakes.

4.2 Species

This audit has identified 24 priority species (5% of the UK Biodiversity Group priority list) and a further 156 species of conservation concern which are known to occur within the Falkirk area. In addition 24 locally important species have also been identified. This list of species is by no means exhaustive. Additional locally important species are likely to be added following further consultation and other UK listed species may be recorded in this area in the future and need to be added.

The species included in this audit range from the common and widespread to the scarce visitor and very rare specimen. There are also several species which occur here at the edge of their range and so are of increased significance. The Falkirk area is also of national or international importance for a variety of species. These include:

Nationally and internationally important flocks of wintering waders and wildfowl. E.g. Bean Geese on the Slamannan Plateau, and Pink-footed Geese, Shelduck, Teal, Dunlin, Knot, Redshank, Curlew and Great Crested Grebe on the Forth Estuary.

Nationally endemic species. E.g Young's helleborine which is only known to occur in the UK and is restricted to less than 10 sites.

Many species are declining both nationally and within the Falkirk area e.g. Water Vole, Grey Partridge and Skylark. Several others have become extinct in this area over the last 100 years e.g. Bennett's Pondweed and Corn Bunting.

4.3 Further information requirements

The collation of data on this scale is unlikely to pick up on all the currently available information, however several areas where the existing data is inadequate can be identified. Comprehensive data about the presence, extent and status of key species and habitats is important in providing a complete and accurate picture of the biodiversity of Falkirk and its significance in relation to national biodiversity targets. The areas where existing data is deficient include:

Grassland:

Further information about the quality and species composition and diversity of grassland sites would be valuable in assessing the extent and significance of the key grassland habitats in Falkirk.

Wetlands and water bodies:

Further data about the extent, quality and conservation status of wetlands and water bodies would be valuable in assessing the extent and significance of the key water and wetland habitats in Falkirk.

Heaths:

Clarification of the distinction between upland and lowland heath in this area and more data about the composition and quality of the heaths in Falkirk would assist in determining the local extent and status of these habitats.

Amphibians and Reptiles:

Records of these species are limited (see 3.2.3) and further surveying would help to identify key species and determine their extent and distribution.

Invertebrates:

Local invertebrate records for most of the taxa are very limited (see 3.3). Surveying of these groups might identify priority species which have so far been missed.

Lower Plants:

Currently available data about the lower plants (algae, stoneworts, fungi, lichen, liverworts and mosses) in Falkirk is limited (see 3.4). Surveying of these groups might identify priority species which have so far been missed.

Local quality and area/population trends for habitats and species have generally been difficult to assess because of a lack of comprehensive data for both the past and present. Monitoring of trends in key species and habitats will play an important role in the conservation of biodiversity. It is essential that comprehensive data is available for priority species and habitats in order to inform the setting of conservation targets and as a baseline for any subsequent monitoring. The recently established C.A.R.S.E. Local Records Centre already holds much of the species and habitat information for Falkirk and will be able to play a key role in the development and maintenance of a more comprehensive database.

4.4 Falkirk's Biodiversity: Conclusion

The Falkirk area clearly supports a wide range of biodiversity, from the relatively common and widespread, to nationally rare species and habitats, and internationally important species populations.

This audit is just the first step in assessing the biodiversity of Falkirk and identifying the local priorities for conservation. It will form the basis for prioritising the species and habitats within the area and ensuring that local priorities and biodiversity action plans respond to both the national biodiversity targets and the needs of local biodiversity.

It is important that local biodiversity priorities reflect the needs of the local environment and command the support of the local community. Comments about the local significance and value of the species and habitats contained in this audit and any other species which are considered to be of particular local importance are welcome (a contact address is given at the front of this document).

Acknowledgements

Many people have co-operated in the production of this audit providing advice, information, library facilities and comments on draft sections of the document. I am grateful to the following individuals and organisations for their assistance:

Mr I. Bain, Davie Black (SWT), Lesley Brown (C.A.R.S.E.), Dr A.J. Downie (SNH), Falkirk History Research Centre, Ian Fozzard (SEPA), Iain Fraser (Scottish Agricultural College), Ross Gardiner, Dr P Gilliland (English Nature), Peter Gordon (RSPB), Dave Gorman (Falkirk Council), Rosemary Green (Vincent Wildlife Trust), John Haddow (Central region mammal recorder), Andy Hemingway (SEPA), Dr Cliff Henty (Central region birds recorder), Dr R Jefferson (English Nature), Paul Kirkland (Butterfly Conservation), Olivia Lassiere (British Waterways), Jennifer Learmonth (SEPA), Ian Ludbrook (Falkirk Council), Craig MacAdam (Amateur Entomologists Society), Angus Maciver, Jane Mackintosh (SNH), Nick Mainprize (Forestry Commission), Tom McKenzie (Forth District Salmon Fisheries Board) Roger Meade (English Nature), Scott Nisbet (Farming and Wildlife Advisory Group), Robert Raynor (SNH), Jack Sanderson (Falkirk Council), Wendy Scott (CSCT), Kieran Sheehan (FWAG), Alistair Stewart (Falkirk Council), Rob Strachan (Environment Agency), Dr Steven Tapper (The Game Conservancy Trust), Ruth Temple (University of Bristol), Cathy Tilbrook (SNH), Dr Ruth Warren (Countryside Council for Wales), Guy Wedderburn (Callendar Estates), Dr Colin Wells (SNH), Dr Sian Whitehead (Countryside Council for Wales).
Sorry for any omissions.

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Appendices

Appendix 1: List of the Falkirk LBAP Steering Group Members

British Waterways
Callendar Estates / Scottish Landowners Federation
C.A.R.S.E. (Local Records Centre)
Central Scotland Countryside Trust
East of Scotland Water
Falkirk Council
Farming and Wildlife Advisory Group
Forestry Commission
National Farmers Union of Scotland (corresponding member)
Royal Society for the Protection of Birds
Scottish Agricultural College
Scottish Environment Protection Agency
Scottish Natural Heritage
Scottish Wildlife Trust

Appendix 2: Glossary

10km square:
A 10km x 10km square of the UK national grid as shown on Ordnance Survey maps, each referred to by a unique set of two letters and two numbers.

Ancient woodland:
A woodland that has existed since at least 1600 A.D..

Biodiversity:
The variety of life that exists on earth in all its many forms, including the complex relationships and systems formed by plants and animals.

Bryophyte:
A group of plants comprising mosses and liverworts.

Carse / Carseland:
A riverside floodplain made up of the sediment deposited by the river over many years. In this case it refers to the flat, fertile land of the River Forth floodplain.

Circumneutral:
Having a relatively neutral pH level.

Convention on Biological Diversity:
A convention signed at the Earth summit in 1992 which committed the signatories to helping to stop the global loss of species, habitats and genetic resources by conserving and enhancing the biodiversity in their own countries.

Earth Summit:
The United Nations Conference on Environment and Development held in Rio de Janeiro in June 1992.

Ecosystem:
A living unit consisting of a community of plants and animals and their environment.

Endemic species:
Species which only occur within a given area (e.g. the UK) and which are thought to have originated in that area.

Falkirk:
The local authority area of Falkirk.

Habitat:
An assemblage of plants and animals which occur together and form a distinct ecological unit (see 'ecosystem') or the place in which a plant or animal lives.

LBAP (Local Biodiversity Action Plan):
A process which aims to ensure that nationally and locally important plants, animals and habitats are conserved and enhanced in a given area through focused local action.

Long-established woodland:
A woodland that has been in existence for at least 100 years.

Littoral:
In the tidal area i.e. between the high tide mark and the low tide mark.

Macrophytes:
Submerged, rooted water plants

Micro-habitats:
Small, distinct habitats which occur within a larger habitat type (e.g. wet, flushed areas which occur within a larger woodland habitat).

NVC (National Vegetation Classification):
A classification of semi-natural habitats in the UK based on the plant communities present.

Phase I Survey:
A survey which identifies and maps the broad habitats which occur within an area.

Phase II Survey:
A survey which samples the vegetation within a given area, maps the habitats that are present and usually comments on the condition and conservation value of these habitats.

Red Data Books:
Books published by national and international authorities listing the species which are rare or in danger of becoming extinct either nationally or globally.

Semi-natural habitats:
Habitats which have experienced some human disturbance and modification but which still consist of species which are naturally occurring in the area and likely to have occurred in that habitat before human disturbance.

SINC (Site of Importance for Nature Conservation):
A designated site which does not meet the Scottish Wildlife Trust criteria for a wildlife sites but which, none the less, is of ecological importance particularly for urban wildlife or as part of a wildlife corridor.

Slamannan Plateau:
The relatively discrete area of low, undulating hills forming a plateau that reaches about 230m in height, covering the Southwest of the Falkirk area and stretching from the southern edge of Falkirk town to Airdrie in the south, and from Cumbernauld in the west to Avonbridge to the east.

SPA (Special Protection Area):
A national designation which affords a site protection because of its importance to regularly migrating birds and vulnerable birds.

SSSI (Site of Special Scientific Interest):
A national site designation under the Wildlife and Countryside Act 1981 which protects a site because of it is of special interest by reason of its flora, fauna, geological or physiographical features.

Species:
The basic unit of biological classification, indicating a group of plants or animals which share permanent characteristics that differentiate them from other groups of plants or animals.

Sublittoral:
Below the low tide mark

Supralittoral:
Above the high tide mark.

Taxonomic group:
A biological classification or category of plants or animals.
Vascular plants:
A plant which has a vascular system to carry liquid through it. This includes all flowering plants, conifers and ferns.

WS (Wildlife Site):
A site within the Falkirk local authority area which has been identified by the Scottish Wildlife Trust (SWT) as being of known wildlife importance in a local context.

Appendix 3: Correspondence between Phase I categories and LBAP habitat types.

The major sources of baseline habitat data for the Falkirk area are the phase I habitat surveys of north and south Falkirk carried out in 1995 and 1994 respectively [Bates M.A., Arnott D.A. & Nugent E., 1995] & [Shotton J. & Arnott D.A., 1994]. Since the LBAP process is based on different habitat classifications, as listed in [UK Biodiversity Steering Group, 1995b] it is essential that we can translate Phase I habitat categories into the LBAP habitat types. The table below matches each of the phase I habitats present within the Falkirk area to the most appropriate LBAP habitat type. In some cases there is a clear correlation between Phase I and LBAP habitats, however in others there is no one-to one relationship and assumptions have been made to find the best fit. These less clear cases are justified below:

1) Broadleaved, mixed and yew woodland

The broadleaved, mixed and Yew Woodland LBAP habitat type "includes all broadleaved and yew stands and mixed broadleaved and coniferous stands which have more than 20% of cover made up of broadleaved and yew trees. Areas of recently felled broadleaved woodland are also included.." [UK Biodiversity group, 1999b]. Most of the sites identified as phase I 'mixed plantation' fulfil this criteria and so can be equated to the LBAP 'broadleaved, mixed and yew wood' habitat type.

2) Wood pasture and parkland

The phase I 'Parkland and scattered trees' categories include a range of different habitats that do not all fit into one LBAP category. Thus it has been split into 2 more distinct categories: old wood pasture/parkland, and other parkland/scattered trees. The first category equates directly to the LBAP wood pasture and parkland category. The second is defined as scattered vegetation and omitted from LBAP classification.

3) Neutral Grassland

Marsh/marshy grassland has been included within this category as recommended by the UK Biodiversity Group who state that "wet grass...should be included in the 'neutral grassland' broad habitat type." [UK Biodiversity Group, 1999b]. Though some cases of marsh/marshy grassland might also fit into the 'marsh, fen and swamp' broad habitat type, on the whole these sites are grass dominated. This habitat type could be classified as 'Neutral grassland (wet)' to distinguish it from other neutral grassland.

4) Heath

The phase I surveys do not distinguish between upland or lowland heath. Because of this all the heath identified on the phase I maps will be broadly categorised as dwarf shrub heath. Further distinction as 'upland' or 'lowland' heath will only be possible using additional data on the plant communities present.

5) Bogs

Habitats identified as 'blanket sphagnum bog' or 'raised sphagnum bog' clearly fall into the LBAP key habitat types of 'blanket bog' and 'lowland raised and intermediate bogs' respectively. All the modified bogs are either degraded raised bogs or intermediate bogs and so can be placed in the 'lowland raised and intermediate bogs' habitat type. Bare peat that forms part of a mosaic with an existing bog has been classified as a modified part of that bog. Large areas of 100% peat extraction are classified as bog but noted as moribund to distinguish them from existing bogs.

6) Fen, marsh and swamp

Flushes have been included in the Fen, marsh and swamp LBAP category as recommended by the UK Biodiversity Group [UK Biodiversity Group, 1999b].

7) Inland Rock

All rock exposures, including man made ones such as mines and quarries, are included in the new LBAP broad habitat type of 'inland rock' [UK Biodiversity Group, 1999b]. However, spoil tips (bings) are relatively widespread in this area and can be an important wildlife habitat and so have also been classified as locally important.

8) Saltmarsh

Scattered saltmarsh has been included with dense/continuous saltmarsh in the LBAP saltmarsh key habitat type because of the scarcity of saltmarsh in this area.

9) Ancient or species rich hedgerows

Defunct species rich hedgerows have been included in this LBAP key habitat type because of the scarcity of intact species rich hedges and the potential for repairing these defunct hedges.

10) Built up areas and gardens

Introduced shrubs, lowland tall ruderals, ephemeral/short perennials, and bare ground all tend to occur within built up or industrial areas and as a result of human disturbance. As such they fit best in the 'built up areas and gardens' LBAP broad habitat type.

11) Modified habitat types

To distinguish between unmodified habitats and modified or improved habitats (which usually support fewer species) the LBAP habitat types, where appropriate, can be split into modified and unmodified categories.

Correspondence between Phase I categories and LBAP habitat types.

Phase I Code	Phase I Category	LBAP Category	Habitat Type
A 1.1.1	Broad-leaved semi-natural woodland	Broadleaved,mixed & yew wood	Broad
A 1.1.2	Broad-leaved plantation woodland	Broadleaved, mixed & yew wood	Broad
A 1.2.1	Semi-natural coniferous woodland	Coniferous woodland	Broad
A 1.2.2	Coniferous plantation woodland	Coniferous woodland	Broad
A 1.3.1	Mixed semi-natural woodland	Broadleaved,mixed & yew wood	Broad
A 1.3.2	Mixed plantation woodland	Broadleaved,mixed & yew wood	Broad
A 2.1	Dense / Continuous scrub	Scrub	Local
A 2.2	Scattered scrub	Scattered vegetation	-
A 3.1	Broad-leaved parkland/scattered trees - old wood pasture/parkland - other parkland/scattered trees	 Lowland wood pasture and parkland Scattered vegetation	 Key -

Phase I Code	Phase I Category	LBAP Category	Habitat Type
A 3.2	Coniferous parkland/scattered trees - old wood pasture/parkland - other parkland/scattered trees	 Lowland wood pastures and parkland Scattered vegetation	 Key -
A 3.3	Mixed parkland/scattered trees -old wood pasture/parkland -other parkland/scattered trees	 Lowland wood pasture and parkland Scattered vegetation	 Key -
A 4.1	Recently felled broad-leaved woodland	Broadleaved,mixed & Yew wood	Broad
A 4.2	Recently felled coniferous woodland	Coniferous woodland	Broad
A 4.3	Recently felled mixed woodland	Broadleaved,mixed & yew wood	Broad
B 1.1	Unimproved acid grassland	Acid grassland	Broad
B 1.2	Semi-improved acid grassland	Acid grassland (modified)	Broad
B 2.1	Unimproved neutral grassland	Neutral grassland	Broad
B 2.2	Semi-improved neutral grassland	Neutral grassland (modified)	Broad
B 4	Improved grassland	Improved grassland	Broad
B 5	Marsh / Marshy grassland	Neutral grassland (wet)	Broad
B 6	Poor semi-improved grassland	Improved grassland	Broad
C 1.1	Continuous bracken	Bracken	Broad
C 1.2	Scattered bracken	Scattered vegetation	-
C 3.1	Tall ruderal (in lowlands) Tall ruderal (in uplands)	Built up areas and gardens Upland tall ruderals	Broad -
D 1.1	Dry dwarf shrub heath	Dwarf shrub heath	Broad
D 2	Wet dwarf shrub heath	Dwarf shrub heath	Broad
D 5	Dry heath / acid grassland mosaic	Dwarf shrub heath (modified)	Broad
D 6	Wet heath / acid grassland mosaic	Dwarf shrub heath (modified)	Broad
E 1.6.1	Blanket sphagnum bog	Blanket bog	Key
E 1.6.2	Raised sphagnum bog	Lowland raised and intermediate bog	Key
E 1.7	Wet modified bog	Lowland raised & Intermediate bog (modified)	Key
E 1.8	Dry modified bog	Lowland raised & Intermediate bog (modified)	Key
E 2.1	Acid / neutral flush	Fen, marsh and swamp	Broad
E 3.1	Fen - Valley mire	Fen	Key
E 3.2	Fen - Basin mire	Fen	Key
E 3.3	Fen - Flood-plain mire	Fen	Key
E 4	Bare peat - integrated in modified bog system - 100% extraction	 Lowland raised & Intermediate bog (modified) Bog (moribund)	 Key Broad

Phase I Code	Phase I Category	LBAP Category	Habitat Type
F 1	Swamp (dominated by common reed) Swamp (dominated by other species)	Reedbed Fen, marsh and swamp	Key Broad
F 2.1	Marginal vegetation	Fen, marsh and swamp	Broad
F 2.2	Inundation vegetation	Fen, marsh and swamp	Broad
G 1	Standing open water - Eutrophic	Eutrophic standing water	Key
G 1	Standing open water - Mesotrophic	Mesotrophic lakes	Key
G 1	Standing open water - Oligotrophic, Dystrophic & Marl	Standing open water and canals	Broad
G 1	Standing open water - Canal	Canals	Local
G 1.6	Standing open water - Brackish	Saline lagoons	Key
G 2	Running water	Rivers and streams	Broad
H 1.1	Intertidal mud / sand	Mudflats	Key
H 1.2	Intertidal shingle / cobbles	Littoral sediment	Broad
H 2.4	Saltmarsh - scattered plants	Coastal saltmarsh	Key
H 2.6	Saltmarsh - dense/continuous plants	Coastal saltmarsh	Key
H 3	Shingle above high tide mark	Supralittoral sediment	Broad
H 4	Boulders and rocks above high tide mark	Supralittoral rock	Broad
H 5	Strandline vegetation	Supralittoral sediment	Broad
H 8.1-2	Maritime cliff and slope	Maritime cliff and slope	Key
H 8.4	Coastal grassland	Improved grassland	Broad
I 1.1.1	Natural acid/neutral inland cliff	Inland rock	Broad
I 1.2.2	Natural basic scree	Inland rock	Broad
I 1.4.1	Natural acid/neutral exposure	Inland rock	Broad
I 1.4.2	Natural basic exposure	Inland rock	Broad
I 2.1	Artificial quarry	Inland rock	Broad
I 2.2	Artificial spoil	Spoil / bing	Local
I 2.3	Artificial mine	Inland rock	Broad
I 2.4	Artificial refuse tip	Built up areas and gardens	Broad
J 1.1	Arable	Arable and horticulture	Broad
J 1.2	Amenity grassland	Improved grassland	Broad
J 1.3	Ephemeral / short perennials	Built up areas and gardens	Broad
J 1.4	Introduced shrubs	Built up areas and gardens	Broad
J 2.1.1	Intact native species-rich hedge	Ancient or species rich hedge	Key
J 2.1.2	Intact species-poor hedge	Boundary or linear features	Broad
J 2.2.1	Defunct native species-rich hedge	Ancient or species rich hedge (modified)	Key
J 2.2.2	Defunct species-poor hedge	Boundary or linear features	Broad
J 2.3.1	Native species-rich hedge and trees	Ancient or species rich hedge	Key
J 2.3.2	Species poor hedge and trees	Boundary or linear features	Broad

Phase I Code	Phase I Category	LBAP Category	Habitat Type
J 2.5	Wall	Boundary or linear features	Broad
J 2.6	Dry ditch	Boundary or linear features	Broad
J 3.6	Buildings	Built up areas and gardens	Broad
J 4	Bare ground	Built up areas and gardens	Broad

Appendix 4 : Summary table of habitats (indicating extent and importance)

This table includes all the broad and key habitats listed by the UK Biodiversity Steering Group and the locally important habitats included in this audit and indicates which of these are present within the Falkirk area. The table also gives an indication of the extent of the habitat (% of total Falkirk area) and the percentage of the UK total habitat area (i.e. the proportion of the UK habitat cover which occurs within the Falkirk, in relation to the proportion of the UK covered by Falkirk (0.12%)).

Key:

Extent in Falkirk area:	blank	absent	**% of UK total:**	blank	absent
	•	< 5% of area		•	small (approx. 0 - 0.1%)
	●	5 - 9%		••	medium (approx. >0.1% - 0.25%)
	●	10 - 24%		•••	high (approx. >0.25% - 0.4%)
	●	25 - 49%		••••	very high (approx. >0.4%)

Habitat Type	Habitat	Extent in Falkirk Area	% of UK total area	Notes on local status
Woodlands				
Broad	Broadleaved, mixed and yew woodland	•	••	Relatively scarce but important habitat.
Key	Upland oakwood	•	•••	Many long-established but modified by past use.
Key	Upland mixed ash woodland	•	•••	Several old valley woods.
Key	Lowland beech wood			
Key	Wet woodlands	•	••	Often on mire sites.
Local	Birch woodland	•	••	No long-established birch woods.
Local	Scrub	•	••	An important habitat in the agricultural landscape.
Key	Lowland wood pastures and parkland	•	•	Several parklands. Maybe no true wood pasture.
Broad	Coniferous woodland	●	••	Some plantations may be of conservation value.
Key	Native pine wood			

Habitat Type	Habitat	Extent in Falkirk Area	% of UK total area	Notes on local status
Grassland and Farmland				
Broad	Arable and horticulture	●	•	Arable land mainly confined to the carseland.
Key	Cereal field margins	•	•	The present level of conservation of these areas is unclear.
Broad	Improved grassland	●	••	Widespread in agricultural area. The most extensive habitat in Falkirk.
Key	Coastal and floodplain grazing marsh	•	•	Very limited area of floodplain grazing.
Broad	Neutral grassland	•	••••	Unimproved neutral grass is nationally rare, especially in Scotland.
Key	Lowland hay meadow	•	••	Limited number of species -rich, managed sites.
Key	Upland hay meadow			
Broad	Acid grassland	•	•	Nationally extensive habitat.
Key	Lowland dry acidic grassland	•	••••	Local extent unclear but significant.
Broad	Calcareous grassland			
Key	Lowland calcareous grassland			
Key	Upland calcareous grassland			
Broad	Boundary features	•	••	Locally mainly drystane dykes and hedges.
Key	Ancient or species rich hedgerows	•	•	Locally no ancient hedges, a few species-rich ones.
Broad	Bracken	•	•	No very extensive areas.
Heathlands				
Broad	Dwarf shrub heath	•	•	5 large sites. Often in mosaic with acid grass.
Key	Lowland heath	•	•	Extent unclear but limited.
Key	Upland heath	•	•	Extent unclear.
Mires				
Broad	Bogs	•	•	Mainly raised or intermediate bogs.
Key	Lowland raised & intermediate bogs	•	••••	Many sites constituting a significant proportion of the UK cover.
Key	Blanket bogs	•	•	Only 5 sites in area.

Habitat Type	Habitat	Extent in Falkirk Area	% of UK total area	Notes on local status
Montane				
Broad	Montane			
Water and Wetlands				
Broad	Fen, marsh and swamp	•	•	Many small wetlands sites.
Key	Fens	•	•	Regionally important rich-fen at Carron Dams. Significant areas of lagg fen.
Key	Reedbeds	•	••	Few, very small sites.
Key	Purple moor grass and rush pasture	•	••	Full extent unknown but limited.
Broad	Standing open water and canals	•	••	Numerous small pools, reservoirs etc. and canals.
Key	Eutrophic standing waters	•	•	Full extent unknown but few naturally eutrophic sites.
Key	Mesotrophic lakes	•	••	Nationally rare habitat. Several likely sites in Falkirk.
Key	Aquifer fed naturally fluctuating water bodies			
Local	Canals	•	•••	Important to local biodiversity and landscape.
Broad	Rivers and streams	•	••	Two main river systems.
Key	Chalk rivers			
Estuary, Coastal & Marine				
Broad	Supralittoral rock	•	•	Very limited extent.
Key	Maritime cliff and slope			
Broad	Supralittoral sediment			
Key	Coastal sand dunes			
Key	Machair			
Key	Coastal vegetated shingle			
Broad	Littoral rock			
Key	Littoral chalk			
Key	*Sabellaria alveolata* reefs			
Broad	Littoral sediment	•	•	Mainly mudflats and saltmarsh.
Key	Coastal saltmarsh	•	••	Regionally rare habitat.

Habitat Type	Habitat	Extent in Falkirk Area	% of UK total area	Notes on local status
Key	Mudflats	•	••••	Habitat essential for nationally important bird populations.
Key	Saline lagoons	•	••	Nationally rare habitat.
Key	Seagrass beds (*Zostrea noltii)*			
Key	Sheltered muddy gravels			
Broad	Inshore sublittoral rock			
Key	Sublittoral chalk			
Key	*Sabellaria spinulosa* reefs			
Key	Tidal rapids			
Key	*Modiolus modiolus* beds			
Broad	Inshore sublittoral sediment	●	•	Full extent unknown.
Key	Seagrass beds (*Zostera marina*)			
Key	Maerl beds			
Key	Mud in deep water			
Key	Serpulid reefs			
Key	Sublittoral sands and gravels			
Broad	Offshore shelf rock			
Broad	Offshore shelf sediment			
Key	Sublittoral sands and gravels			
Broad	Continental shelf slope			
Key	*Lophelia pertusa* reefs			
Local	Estuarine waters	●	••	Estuaries are nationally important habitats.
Broad	Oceanic seas			
Rock exposures				
Broad	Inland rock	•	••	Limited extent but valuable habitat.
Key	Limestone pavement			
Local	Bings / Spoil tips	•	•••	One site supports an internationally rare orchid.
Urban				
Broad	Built up areas and gardens	●	••	Covers a significant proportion of Falkirk.
Local	Gardens	•	••	An important habitat in the urban setting.
Local	Urban greenspace	•	••	Important habitats within the urban setting.
Local	Urban wildlife corridors	•	••	Full extent unknown, but potential for increase.

Appendix 5 : Summary table of species (indicating international, national and local importance)

The following species listed as 'priority' or 'of conservation concern' by the UK Biodiversity Steering Group or of 'local importance' occur within the Falkirk area. This table indicates the reason for their being listed and the national importance of their occurrence in this area.

Key:

Reason for listing - reasons for inclusion on national lists by UK Biodiversity Group

T Internationally threatened: Species of global conservation concern or unfavourable conservation status in Europe.

P Internationally important population size: The UK has more than 25% of the world population of the species.

P+ Endemic or possibly endemic: Entire species population restricted to or probably restricted to UK.

D Serious population decline: The numbers or range of species in Great Britain has declined by more than 25% in last 25 years.

L Localised species: Species occurs in less than 16 10km squares in Great Britain. (less than 9 for marine species)

X Protected species: Species listed in the EU Birds or Habitats Directive, the Bern, Bonn, or CITES Conventions, or under the Wildlife and Countryside Act 1981.

N.B. Population size, trends and status in the UK remains unclear for many species and so assessment using the above criteria is based on the best information available and may be uncertain.

(The species selection criteria is discussed in more detail in [UK Biodiversity Steering Group, 1995a])

Importance of Falkirk Area - approximate proportion of the UK population and/or range occurring in the Falkirk area, in relation to the proportion of the UK covered by Falkirk (0.12%).

- • small proportion of UK population
- •• medium proportion of UK population
- ••• high proportion of UK population
- •••• very high proportion UK population
- **E** probably extinct in Falkirk area
- **I** introduced to the Falkirk area
- **?** occurrence in area not certain (record unclear or unconfirmed) or vagrant.

(W) - refers to the proportion of the wintering population (for birds).
(S) - In some cases the proportion of the Scottish population is also given and denoted by (S).

N.B. The above categories are necessarily subjective since in most cases there is insufficient data to accurately determine the population size or proportion. Instead an indication is given based on the best available data.

In many cases where the local population is not known but it seems reasonable that it will mirror national population levels it has been assumed that the local population represents a medium (or average) proportion of the total UK population. In some cases this 'average' designation made need to be altered as more information becomes available about the local population size of a species.

Where a species' local and/or national population size is not known and no educated judgement is possible the column has been left blank. Entries for many of the bird species of conservation concern have also been left blank since this level of species information has not been gathered within the audit.

Priority Species

Taxon	Latin Name	Common Name	Reason for listing	Importance of Falkirk area	Notes on local status
Vertebrates					
Mammals					
	Pipistrellus pipistrellus / Pipistrellus pygmaeus	Pipestrelle Bat	T D X	••	20 recorded roosts with about 950 bats.
	Lepus europaeus	Brown Hare	D	••	Mainly in the agricultural landscape.
	Arvicola terrestris	Water Vole	D	••	Full extent unknown. Dramatic declines in south Scotland so Falkirk's population may be regionally important.
	Sciurus vulgaris	Red Squirrel	D X	•	Few due to lack of appropriate habitat.
	Lutra lutra lutra	European Otter	T X	••	Numbers probably recovering.
	Phocoena phocoena	Harbour Porpoise	T L X	•	Occasional in Firth of Forth and estuary.
Birds					
	Melanitta nigra	Common Scoter	D X	• (w)	Very occasional on estuary.
	Tetrao tetrix	Black Grouse	T D	•	Limited by extent of appropriate habitat.
	Perdix perdix	Grey Partridge	T D	••	Widespread but scarce on farmland and moorland fringes
	Crex crex	Corncrake	T D X	•	Very occasional. Not breeding.
	Alauda arvensis	Skylark	T D	••	Widespread but sparse on lowland farmland and hill ground.
	Muscicapa striata	Spotted Flycatcher	T D X	••	Probably widespread but scarce throughout this area.

Taxon	Latin Name	Common Name	Reason for listing	Importance of Falkirk area	Notes on local status
	Turdus philomelos	Song Thrush	D	●●	Widespread throughout Falkirk ,tends to be commonest in suburban environments.
	Emberiza schoeniclus	Reed Bunting	D X	●●	Widespread but localised.
	Miliaria calandra	Corn Bunting	D X	**E**	Probably extinct since 1996.
	Pyrrhula pyrrhula	Bullfinch	D	●●	Reasonably widespread but some gaps in distribution.
	Carduelis cannabina	Linnet	D X	●●	Widespread but rather localised in areas of scrub.
	Passer montanus	Tree Sparrow	D	●●	Patchy distribution.
Amphibians & Reptiles					
	Triturus cristatus	Great Crested Newt	T D X	●	Currently 1 known site.
Fish					
	Alosa fallax	Twaite Shad	T D L X	●	Two recent records for the estuary, in 1980's and 1999.
Invertebrates					
	Xylena exsoleta	Swordgrass	T D		Local population unknown.
Plants					
Ferns					
	Pilularia globulifera	Pillwort	T P	**E**	No records post 1970.
Flowering Plants					
	Epipactis youngiana	Young's Helleborine	T P+ L X	●●●●	At 1 bing site within Falkirk.
	Fumaria purpurea	Purple Ramping-fumitory	T P	●	Current extent unknown. Recorded at 1 site in 1980.

Species of Conservation Concern

Taxon	Latin Name	Common Name	Reason for listing				Importance of Falkirk area	Notes on local Status
Vertebrates								
Mammal								
	Erinaceus europaeus	Hedgehog					••	
	Sorex araneus	Common Shrew					••	
	Sorex minutus	Pygmy Shrew					••	
	Myotis daubentonii	Daubenton's Bat	T			X	••	
	Myotis nattereri	Natterer's Bat	T			X		Likely to occur but no records.
	Plecotus auritus	Brown Long-eared Bat	T	D		X	•	3 recorded roosts with about 60 bats.
	Mustela erminea	Stoat					••	
	Mustela nivalis	Weasel		D			••	
	Meles meles	Badger				X	••• (s)	At least 50 known setts.
	Phoca vitulina	Common Seal				X	•	Occasional in estuary.
	Halichoerus ampullatus	Grey Seal		P		X	•	Occasional in estuary.
	Cervus elaphus	Red Deer		P			•	
	Capreolus capreolus	Roe Deer					••	
	Turisiops truncatus	Bottle-nosed Dolphin				X	•	Very occasional in estuary.
	Lagenorhynchus acutus	White-sided Dolphin				X	•	Very occasional in estuary.
Birds								
	Gavia stellata	Red-throated Diver	T			X		
	Gavia artica	Black-throated Diver	T		L	X		
	Podiceps nigricollis	Black-necked Grebe				X		
	Podiceps auritus	Slavonian Grebe			L	X		

Taxon	Latin Name	Common Name	Reason for listing	Importance of Falkirk area	Notes on local status
	Phalacrocorax aristotelis	Shag	P		
	Phalacrocorax carbo	Cormorant	X		
	Cygnus cygnus	Whooper Swan	L X		
	Cygnus olor	Mute Swan	X		
	Anser anser	Greylag Goose	X	●● (w)	Common winter visitor.
	Anser fabilis	Bean Goose	L X	●●●● (w)	1 of only 2 UK wintering sites is located in Falkirk.
	Anser brachyrhychus	Pink-footed Goose	P X	●●● (w)	Internationally important wintering population on the inner Forth Estuary.
	Anser albifrons	White-fronted Goose	L X	● (w)	
	Branta leucopsis	Barnacle Goose	T P X	● (w)	
	Tadorna tadorna	Shelduck	X	●●●	Internationally important breeding and wintering populations on the estuary.
	Anas platyrhynchos	Mallard	X		
	Anas strepera	Gadwall	T X		
	Anas penelope	Widgeon	X		
	Anas crecca	Teal	X	●●● (w)	Nationally important wintering population on the inner Forth Estuary
	Anas querquedula	Garganey	T X		
	Anas acuta	Pintail	T X		
	Anas clypeata	Shoveler	X		
	Aythya fuligula	Tufted Duck	X		

Taxon	Latin Name	Common Name	Reason for listing	Importance of Falkirk area	Notes on local status
	Aythya marila	Scaup	T L X		
	Aythya ferina	Pochard	X		
	Somateria mollissima	Eider	X		
	Bucephala clangula	Goldeneye	L X		
	Mergus merganser	Goosander	X		
	Mergus serrator	Red-breasted Merganser	X		
	Mergus albellus	Smew	T X		
	Accipiter nisus	Sparrowhawk	X		
	Buteo buteo	Buzzard	X		
	Circus cyaneus	Hen Harrier	T X		
	Falco peregrinus	Peregrine	T X		
	Falco columbarius	Merlin	X		
	Falco tinnunculus	Kestrel	T D X	●●	Widespread resident.
	Rallus aquaticus	Water Rail	D		
	Charadrius hiaticula	Ringed Plover	X		
	Pluvialis apricaria	Golden Plover	X		
	Pluvialis squatarola	Grey Plover	X		
	Arenaria interpres	Turnstone	X		
	Vanellus vanellus	Lapwing	D X	●●	Widespread but sparse, mainly on farmland.
	Calidris ferruginea	Curlew-sandpiper	X		
	Calidris alpina	Dunlin	T X	●●● (w)	Nationally important wintering population on the estuary.
	Calidris temminckii	Temminck's Stint	L X		
	Calidris minuta	Little Stint	X		

Taxon	Latin Name	Common Name	Reason for listing	Importance of Falkirk area	Notes on local status
	Calidris canutus	Knot	T X	●●● (w)	Internationally important wintering population on the estuary.
	Calidris alba	Sanderling	X		
	Tringa totanus	Redshank	T X	●●● (w)	Internationally important wintering population on the estuary.
	Tringa erythropus	Spotted Redshank	X		
	Tringa nebularia	Greenshank	X		
	Tringa glareola	Wood Sandpiper	T L X		
	Tringa ochropus	Green Sandpiper	X		
	Philomachus pugnax	Ruff	L X		
	Numenius arquata	Curlew	T X	●●● (w)	Nationally important wintering population on estuary. Average breeding densities throughout area.
	Numenius phaeopus	Whimbrel	X		
	Limosa limosa	Black-tailed Godwit	T L X		
	Limosa lapponica	Bar-tailed Godwit	T P X		
	Scolopax rusticola	Woodcock	T D X		Full extent unknown. Likely to be scarce.
	Lymnocryptes minimus	Jack Snipe	T X		
	Gallinago gallinago	Snipe	X		Widespread but sparse on on wet ground.
	Stercorarius skua	Great Skua	P		
	Stercorarius parasiticus	Arctic Skua			
	Larus minutus	Little Gull	T L X		

Taxon	Latin Name	Common Name	Reason for listing			Importance of Falkirk area	Notes on local status
	Larus argentatus	Herring Gull		D			
	Larus fuscus	Lesser Black-backed Gull	P				
	Sterna sandvicensis	Sandwich Tern	T		X		
	Sterna hirundo	Common Tern			X		At least 1 known breeding colony.
	Sterna paradisaea	Arctic Tern			X		
	Sterna albifrons	Little Tern	T		X		
	Childonias niger	Black Tern	T		X		
	Alca torda	Razorbill					
	Tyto alba	Barn Owl	T	D	X		A small breeding population.
	Asio otus	Long-eared Owl			X		
	Asio flammeus	Short-eared Owl	T		X		
	Strix aluco	Tawny Owl			X		
	Alcedo atthis	Kingfisher	T		X		Full extent unknown but a healthy population. Near north edge of breeding range.
	Picus viridus	Green Woodpecker	T		X		Restricted to a few localities in the west of the area.
	Dendrocopos major	Great Spotted Woodpecker			X		
	Hirundo rustica	Swallow	T	D	X		
	Riparia riparia	Sand Martin	T		X		Known to have breed in quarries in this area. Full extent unknown.
	Delichon urbica	House Martin			X		
	Anthus trivialis	Tree Pipit			X		

Taxon	Latin Name	Common Name	Reason for listing			Importance of Falkirk area	Notes on local status
	Anthus pratensis	Meadow Pipit			X		
	Motacilla alba	Pied Wagtail			X		
	Motacilla cinerea	Grey Wagtail			X		
	Motacilla flavissima	Yellow Wagtail			X		
	Prunella modularis	Dunnock		D	X		Common, widespread breeding population.
	Locustella naevia	Grasshopper Warbler		D	X		Thinly distributed, rather erratic occurrence. Impoartnat part of the species' UK distribution.
	Acrocephalus schoenobaenus	Sedge Warbler			X		
	Sylvia communis	Whitethroat			X		
	Sylvia borin	Garden Warbler			X		
	Sylvia atricapilla	Blackcap			X		
	Phylloscopus trochilus	Willow warbler			X		
	Phylloscopus collybita	Chiffchaff			X		
	Phylloscopus sibilatrix	Wood Warbler			X		
	Regulus regulus	Goldcrest			X		
	Ficedula hypoleuca	Pied Flycatcher			X		
	Saxicola torquata	Stonechat	T		X		Very localised, in scrubby areas.
	Saxicola rubetra	Whinchat			X		
	Oenanthe oenanthe	Wheathear			X		
	Phoenicurus phoenicurus	Redstart	T		X		
	Turdus pilaris	Fieldfare			X		
	Turdus iliacus	Redwing			X		

Taxon	Latin Name	Common Name	Reason for listing			Importance of Falkirk area	Notes on local status
	Parus ater	Coal Tit			X		
	Parus major	Great Tit			X		
	Parus caeruleus	Blue Tit			X		
	Certhia familiaris	Treecreeper			X		
	Cinclus cinclus	Dipper			X		
	Emberiza citrinella	Yellowhammer			X		
	Plectrophenax nivalis	Snow Bunting		L	X		
	Fringilla montifringilla	Brambling		L	X		
	Carduelis carduelis	Goldfinch		D	X		Thinly distributed breeding population,mainly on farmland.
	Carduelis spinus	Siskin			X		
	Carduelis chloris	Greenfinch			X		
	Carduelis flammea	Lesser Redpoll			X		
	Carduelis flavirostris	Twite			X		
	Loxia curvirostra	Common Crossbill			X		
Amphibians and Reptiles							
	Anguis fragilis	Slow-worm	T		X	●●	
	Bufo bufo	Common Toad			X	●●	
	Rana temporaria	Common Frog			X	●●	
	Triturus helveticus	Palmate Newt			X	●●	
	Triturus vulgaris	Smooth Newt			X	●●	
	Vipera berus	Adder	T		X	●	
Fish							
	Lampetra fluviatilis	River Lamprey	T		X	●	Recently recorded at one site on Anchor Burn and in estuary
	Lampetra planeri	Brook Lamprey	T		X	●	Recently recorded in the Anchor Burn and River Avon.

Taxon	Latin Name	Common Name	Reason for listing	Importance of Falkirk area	Notes on local status
	Osmerus eperlanus	Sparling	T	●	Recently returned to the Forth estuary/river where numbers may be increasing.
	Petromyzon marinus	Sea lamprey	T X		Regularly occur in estuary.
	Salmo salar	Atlantic Salmon	X	●	Successfully reintroduced to the River Carron recently.
Invertebrates					
	Bolaria selene	Small Pearl-bordered Fritillary	D		Full extent not known
	Coenonympha tullia	Large Heath	T X		Likely to occur in the Falkirk area but not recenty recorded.
	Dyscia fagaria	Grey Scalloped Bar Moth	T D		Current presence and extent not known.
	Lymnaea glabra	A Freshwater Snail	T D	●	The only known site within the Forth Valley area.
Plants					
Lower Plants					
	Plagiochila spinulosa	A Liverwort	P	**?**	Occurrence needs confirming
	Lepidozia pearsonii	A Liverwort	P+		Occurs at at least 4 bog sites.
Ferns					
	Dryopteris aemula	Hay-scented Buckler Fern	T P	**?**	Record needs confirming.
Flowering Plants					
	Carum verticullatum	Whorled Caraway	T P D	●●	Present at at least 5 sites. Occurs here to the east of its main Scottish range.

Taxon	Latin Name	Common Name	Reason for listing	Importance of Falkirk area	Notes on local status
	Chamaemelum nobile	Wild Chamomile	D	**?**	Record dubious.
	Epipactis leptochila var. dunensis	Dune Helleborine	T P+ L	●●● (●●●● S)	Occurs at 1 site. The largest population of this species within Scotland.
	Hyacinthoides non-scripta	Bluebell	P	●●	Widespread throughout most of the area.
	Hypochaeris glabra	Smooth Cat's-ear	D X	●	Recorded at one site.
	Ranunculus hederaceus	Ivy-leaved Water Crowfoot	T P D	●	Several records since 1980. Full extent not known.
	Ribes alpinum	Mountain Currant	D	**● I**	Introduced to several sites in the area.

Locally important Species

Taxon	Latin Name	Common Name	Reason for listing	Importance of Falkirk area	Notes on local Status
Vertebrates					
Mammals					
Birds					
	Podiceps cristatus	Great Crested Grebe		●●● (w)	Nationally important wintering population on the estuary.
Amphibians and Reptiles					
Fish					
	Salmo trutta	Brown Trout		●●	Present in the Carron and Avon catchments.
	Salmo trutta	Sea Trout		●●	Successfully reintorduced to the River Carron recently.
Invertebrates					
	Brachygluta helferi	A Beetle			Nationally natable.
	Brachysomus echinatus	A Weevil			Nationally notable.
	Enicmus fungicola	A Mould Beetle			Nationally notable. Few Scottish records.
	Enicocerus exsculptus	A Beetle			Nationally scarce.
	Scaphisoma boleti	A Beetle			Nationally notable. Near northern edge of range.
	Callophrys rubi	Green Hairstreak			Medium regional priority.
	Beris clavipes	A Soldier-Fly			Nationally rare. To the north of its main range.
	Brachyopa insensilis	A Fly			Nationally notable.

Taxon	Latin Name	Common Name	Reason for listing	Importance of Falkirk area	Notes on local status
	Mycetobia pallipes	A Fly			Nationally notable
	Parhelophilus consimilis	A Hoverfly			Nationally vulnerable. Very localised in Scotland.
	Sphaerophoria loewi	A Hoverfly			Nationally vulnerable. Very localised.
	Systenus pallipes	A Fly			Nationally notable. Widespread in Scotland.
	Ameletus inopinatus	A Mayfly			The only recorded site in the Forth valley.
Flowering Plants					
	Campanula rotundifolia	Harebell		●●	Reasonably frequent throughout most of the area.
	Chrysanthemum leucanthemum	Ox-eye Daisy		●●	Reasonably frequent.
	Drosera rotundifolia	Round-leaved Sundew		●●●	Occurs at over 20 peat bog sites within Falkirk.
	Lychnis flos-cuculi	Ragged Robin		●●	Reasonably frequent.
	Naumburgia thyrsflora	Tufted Loosestrife		●●	Occurs quite frequently along the Forth and Clyde and Union canals.
	Platanthera chlorantha	Greater Butterfly Orchid		●●	Locally rare.
	Potamogeton bennetti	Bennett's Pondweed		E	Originally present in the canal near Grangemouth.
	Ulmus glabra	Wych Elm		●●	

Appendix 6 : Designated sites within the Falkirk area.

6.1 Potential Special Protection Area (pSPA)

Site name	Grid ref	Area (ha)	Main Habitat(s)
Firth of Forth		6,310 (Part in Falkirk)	Estuary and coastal habitats

6.2 Sites of Special Scientific Interest (SSSI)

Site name	Grid ref	Area (ha)	Main Habitat(s)
Alloa Inches	NS 865 920	316.1 (8.6 in Falkirk)	Pioneer saltmarsh / Reedbed / Mudflat
Avon Gorge	NS 960 792	19	Ancient semi-natural woodland
Black Loch Moss	NS 855 695	108 (2 in Falkirk)	Raised bog
Blackness Bay	NT 067 795	189.6 (31.5 in Falkirk)	Mudflat / Saltmarsh / coastal grassland
Bo'mains Meadow	NS 988 794	0.9	Species-rich lowland meadow
Carron Dams	NS 876 826	17.1	Rich fen / Woodland / Open water
Carron Glen	NS 756 844	42.1 (39.7 in Falkirk)	Broad-leaved woodland / Species-rich grasslands
"	NS 771 846		
"	NS 785 835		
Darnrig Moss	NS 863 755	77.5	Raised bog
Denny Muir	NS 758 829	197.6	Flushed grassland / Fen / Blanket bog /
Howierig Muir	NS 854 786	20.53	Raised bog
Kinneil Kerse	NS 970 825	763.5	Mudflat / Saltmarsh / Saline lagoon
Skinflats	NS 932 845	542.6	Mudflat / Saltmarsh / Saline lagoon

6.3 Wildlife Sites (WS)

Site name	Grid ref	Area (ha)	Main Habitat(s)
Almond Bing	NS 960 763	7.52	Birch-Willow Scrub
Balquatstone	NS 865 725	64.13	Unimproved Acid Grassland
Barleyside	NS 862 759	15.43	Mire/Bog
Black Loch	NS 860 700	56.73	Water
Blackhill Moss	NS 813 776	10.31	Mire/Bog/Broad-leaved semi-natural woodland
Bo'ness Foreshore	NS 982 811	54.88	Unimproved Neutral Grassland
Bonnyfield Quarry	NS 817 799	22.37	Unimproved neutral Grassland
Braes Wood	NS 795 850	55.78	Broadleaved Semi-natural Woodland
California	NS 900 762	68.91	Semi-improved Acid Grassland
Callendar Wood and	NS 897 787	105.23	Coniferous Plantation/Broadleaved Semi-natural woodland
Camelon Riverside	NS 870 813	5.43	Dense Continuous Scrub
Candie Mire	NS 927 738	6.08	Blanket Bog
Carriden Wood	NT 028 808	21.2	Broadleaved Semi-natural Woodland
Castlecary Wood	NS 787 775	14.15	Broadleaved Plantation & Semi-natural Woodland/Coniferous Plantation
Cleuch Plantation	NS 887 775	7.1	Broadleaved Semi-natural Woodland
Cowden	NS 771 803	88.76	Unimproved Acid Grass / Improved Grass / Wet Modified Bog
Craigbank Quarry	NS 908 722	2.39	Scattered Scrub/Unimproved Acid Grassland
Drumbroider	NS 919 743	24.33	Raised Bog
Dunmore Moss and	NS 871 890	237.93	Coniferous Plantation / Dense Scrub / Broadleaved Semi-natural Woodland
Easter Drumclair	NS 866 712	6.91	Raised Bog
Easter Greenrig	NS 825 743	19.15	Raised Bog/Wet Modified Bog
Forth & Clyde Canal	NS 785 785	N/A	Standing Water
Garbethill Moss	NS 831 757	176.95	Raised Bog
Grangeneuk Moss	NS 820 736	18.64	Raised Bog
Graystone Knowe	NS 815 761	47.87	Blanket Bog/Wet Modified Bog
Kinniel Estate	NS 980 803	63.83	Coniferous Plantation Woodland
Loch Ellrig & Gardrum	NS 893 750	58.92	Eutrophic Standing Water/Raised Bog
Lochgreen Hospital	NS 876 786	1.06	Unimproved Acid / Semi-improved Neutral Grassland
Lochgreen Moss	NS 819 776	7.32	Dense Scrub/Marshy Grass/Wet Modified Bog/Basin Mire
Maddiston West	NS 929 764	19.7	Unimproved Acid Grassland
Muiravonside	NS 962 756	63.85	Broadleaved Semi-natural Woodland/Broadleaved Plantation Woodland

Site name	Grid ref	Area (ha)	Main Habitat(s)
Newcraig (Auchengean)	NS 850 760	60.52	Dry Modified Bog/Basin Mire
North Walton Burn	NS 806 763	8.34	Raised Bog/Valley Mire/Wet Dwarf Shrub Heath
Parkfoot Marsh	NS 808 797	4.9	Marshy Grassland
Polmont Woods	NS 943 793	19.99	Broadleaved Semi-natural Woodland/Coniferous Plantation Woodland
Pow Burn and Estuary	NS 915 873	27.44	Saltmarsh/Improved Grassland
Rashiehill Mire	NS 824 728	5.94	Wet Modified Bog
Righead	NS 905 742	16.05	Wet Modified Bog
Roughcastle	NS 843 800	74.31	Broadleaved Semi-natural Woodland
Rumford West	NS 924 769	12.29	Dense Continuous Scrub
Seabegs Wood	NS 815 793	10.34	Broadleaved Semi-natural Woodland
Shielknowes Moss	NS 829 726	13.55	Raised Bog/Basin Mire
Skipperton Glen	NS 809 785	7.15	Broadleaved Semi-natural Woodland
South Drum Moss	NS 830 777	11.42	Basin Mire
South Torwood	NS 828 835	8.73	Unimproved Acid Grassland
Standburn	NS 928 750	29.57	Unimproved Acid Grassland/Semi-improved Neutral Grassland
Stoneywood	NS 798 826	5.17	Dense Continuous Scrub
Takmadoon (Denny	NS 739 819	28.01	Semi-improved Neutral Grassland/Unimproved Acid Grassland/Marshy
Torwood Glen	NS 835 857	12.41	Broadleaved Semi-natural Woodland
Torwood Mire	NS 825 844	19.68	Raised Bog
Upper Avon Mires	NS 825 734	52.75	Raised Bog/Basin Mire/Marshy Grassland/Unimproved Neutral Grassland
Wallacebank Wood	NS 847 847	15.68	Broadleaved Semi-natural Woodland
Wester Drum	NS 828 782	7.22	Raised Bog/Marshy Grassland
Wester Mains Pond	NS 906 816	10.04	Broadleaved Plantation Woodland (+Wetland)
Wester Whin	NS 870 686	58.36	Raised Bog
Westquarter Burn	NS 906 786	23.06	Broadleaved Semi-natural Woodland

6.4 Sites of Interest for Nature Conservation (SINC)

Site name	Grid ref	Area (ha)	Main Habitat(s)
Avonbank/Birkhill	NS 966 787	4.49	Unimproved Neutral Grassland/Bracken/Broadleaved Semi-natural Woodland
Baltic Quay,	NS 935 823	26.15	Scattered Scrub/Dense Continuous Scrub
Bantaskine Estate	NS 873 793	27.79	Broadleaved Semi-natural Woodland/Broadleaved Plantation Woodland
Carron Meander	NS 896 828	4.87	Brackish Standing Water/Saltmarsh
Dales Wood	NS 818 851	18.99	Broadleaved Semi-natural Woodland
Falkirk Gasworks	NS 896 813	1.02	Dense Continuous Scrub
Glenfuir Road*	NS 866 799	2.12	Unimproved Neutral Grassland/Broadleaved Semi-natural Woodland
Glenyards	NS 817 789	3.96	Semi-improved Neutral Grassland
Hall Wood, High	NS 829 794	0.71	Broadleaved Semi-natural Woodland
Hallglen Haven	NS 893 783	11.66	Broadleaved Semi-natural Woodland
Letham Moss	NS 880 860	167.22	Bare Peat/Dry Modified Bog
Limerigg Ponds	NS 854 707	1.07	Bare ground/Marshy Grassland
Little Black Loch	NS 879 706	4.13	Basin Mire/Marshy Grassland
Maddiston	NS 944 768	5.99	Amenity Grassland/Unimproved Neutral Grassland
Milnquarter, High	NS 826 797	3.41	Semi-improved Neutral Grassland
North Stenhousemuir	NS 871 841	2.24	Broadleaved Semi-natural Woodland
Polmont Park	NS 933 792	3.13	Mixed Plantation Woodland
Polmont Station	NS 926 783	7.33	Dense Continuous Scrub/Scattered Scrub
Redding Grasslands	NS 918 787	10.62	Semi-improved Neutral Grassland
Rumford East	NS 940 776	10.64	Broadleaved Semi-natural Woodland
South Drum Claypit	NS 825 777	21.89	Marshy Grassland
South Polmont	NS 937 786	11.79	Unimproved Neutral Grassland
Stoneridge	NS 874 702	3.51	Unimproved Acid Grassland/Basin Mire
Summerford	NS 868 797	8.55	Unimproved Neutral Grassland/Dense Continuous Scrub
Tippetcraig	NS 828 773	2.43	Semi-natural Broadleaved Woodland
Union Canal	NS 910 782	N/A	Eutrophic Standing water
Wallacestone	NS 915 770	8.71	Semi-improved Neutral Grassland

* still to be ratified