INVERNESS DISTRICT PHASE 1 HABITAT SURVEY 1992 to 1995

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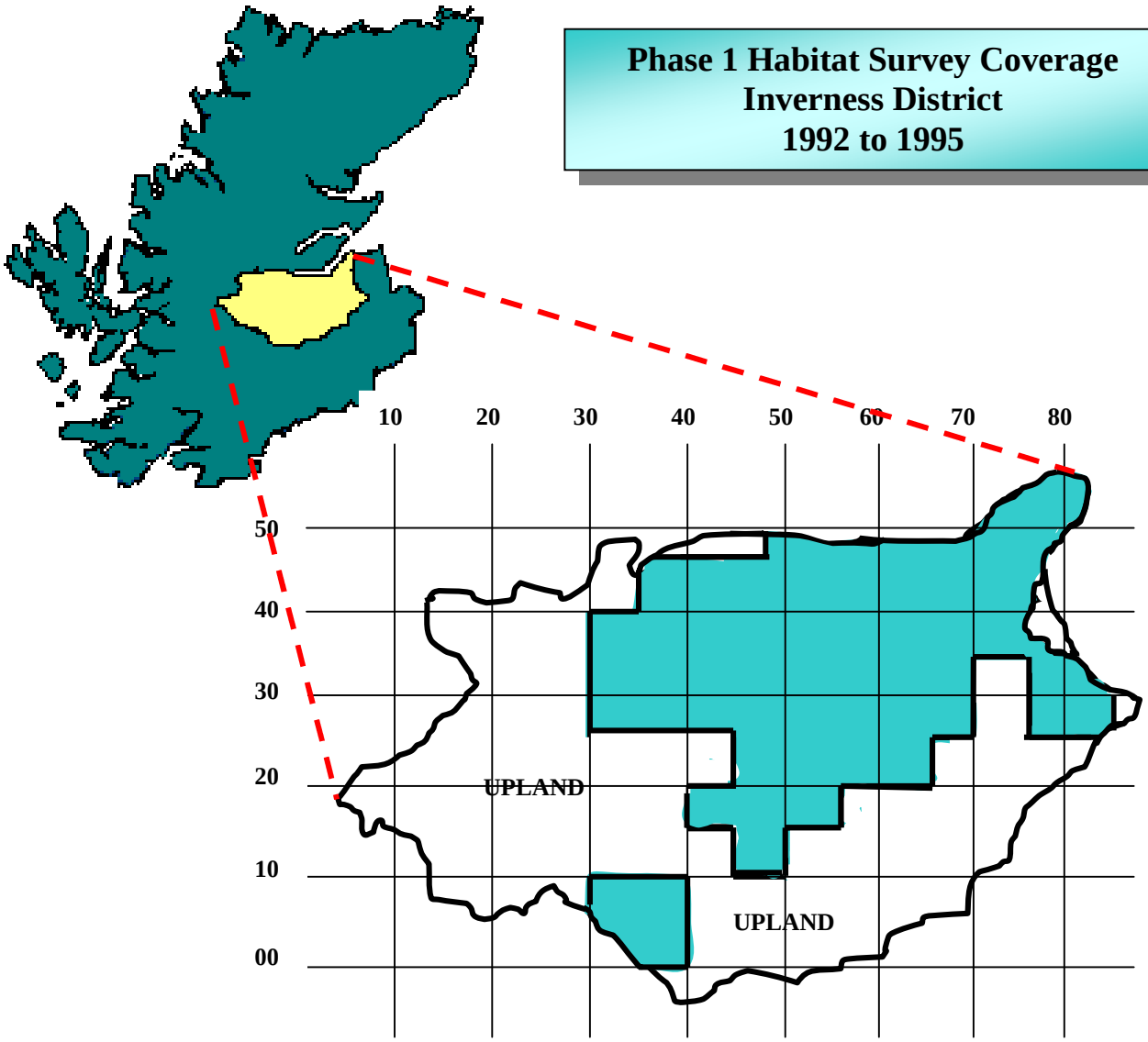
Phase 1 Habitat Survey Coverage
Inverness District
1992 to 1995



I. WILDLIFE HABITATS

Woodland and Scrub

Semi-natural broadleaved
Mainly birch (*Betula* sp.) woodland with alder (*Alnus glutinosa*) in wetter areas such as by rivers and lochs. Also planted but well established beech (*Fagus sylvatica*) woodland. Oak (*Quercus* sp.) is relatively scarce though in a natural state much of the dryer, low-lying areas would be dominated by the species. Tree regeneration is confined to but a few discreet locations within the district due to grazing. Thus the future of much of the remaining semi-natural woodland is uncertain unless active management to encourage regeneration is undertaken soon.

Semi-natural coniferous
The most notable examples are to be found in the glens to the north of Loch Ness (including Affric, Cannich, Strathfarrar, and Moriston). Elsewhere the habitat is under-represented in the area. Most of that recorded other than in the above mentioned glens is actually of plantation origin but sufficiently well developed to deserve semi-natural status. (Parts of Craigphadrig by Inverness provide a good example of this).

Semi-natural mixed (broadleaf and conifer)
The smaller stands are mostly birch (*Betula* sp.) with some Scots pine (*Pinus sylvestris*), sometimes within conifer plantations. These are the only areas which approximate to locally native semi-natural woodland in Inverness district. (Most of the birch woodland under natural conditions would include a large proportion of oak (*Quercus* sp.) with other species such as hazel (*Corylus avellana*). Selective removal of oak for timber over the years has led to the woodlands being currently dominated by birch.)

Plantation broadleaved
Confined to small areas very recently planted. Some areas too small to map or hidden from view may not be recorded here. While still a relatively small category such planting is clearly on the increase. Indeed, as most semi-natural broadleaved woodland in Inverness district is over-grazed by livestock or deer, showing little or no signs of regeneration, the future of such woodland may rely heavily upon planting schemes.

Plantation coniferous
Conifer plantations cover large areas of Inverness district. Some large examples not recorded on the available 1:10,000 Ordnance Survey maps were noted during this survey. Although some conifer plantations appear to have been planted on heath of only average species richness others have been planted within existing broadleaved woodlands. These have shaded out many native trees leading to a greatly impoverished habitat. This trend has seen significant decline in recent years but needs to be acknowledged as yet another potential threat to a dwindling broadleaved woodland resource. Another effect of conifer planting has been to reduce the overall area available to herds of red deer. This further exacerbates problems of overgrazing and lack of woodland regeneration. The fact that forestry grants go to fence private plantations from unsustainable levels of deer populations appears to be subsidising poor environmental management. Deer fencing is also strongly implicated in the deaths of birds (including economically important game birds) as they fly into unseen wires. Recent encouraging trends in deer management may lead to a situation where deer fencing is no longer required in many areas. The timber crops frequently frowned upon by

conservationists may then blend more readily into the environment. This is particularly the case where native Scots pine (*Pinus sylvestris*) is planted. Parts of Craigphadrig, by Inverness, give some idea of how a conifer plantation can attain semi-natural status, valuable both as a timber crop and to wildlife as well as providing areas suitable for recreation.

Recently felled
Still part of the plantation system for practical purposes but future uncertain as no signs of management after felling. Some such areas show signs of reverting to a more natural state as they develop scrub, bramble, grasses and herbs. Such areas are often important for invertebrates, birds and small mammals. However, as plans for future management are uncertain, and often involve re-planting with conifers, these sites are recorded simply as recently felled.

Scrub - Dense/continuous
Mainly gorse (*Ulex europaeus*) with some broom (*Sarothamnus* [*Cytisus*] *scoparius*), but occasionally juniper (*Juniperus communis*). Every effort is made to include dominant species codes on the maps. Where none is given the species can be taken to be gorse and/or broom. Juniper is less common in most parts of Inverness district (the exception being on the hillsides around Tomatin above the River Findhorn) and as it is closely related to locally native woodlands it is recorded wherever found and sometimes target noted.

Grassland

Semi-natural acid
Mainly small areas on the upland fringe where grazing has reduced heather cover, but not to the extent where plant species richness is seriously reduced. The relatively high abundance of mat grass (*Nardus stricta*) is the main indicator of such areas in much of Inverness district.

Semi-natural neutral
Relatively small areas in lower lying parts where grazing levels are near optimum for floral richness. Indicated by a greater number of plant species. If completely un-grazed such areas turn to rank grassland dominated by species such as cock's foot (*Dactylis glomerata*). This shades out less aggressive species and reduces species richness. Eventually succession can proceed towards woodland or scrub. Maximum species richness is only maintained by suitable levels of grazing. As most grasslands show levels far in excess of this, species rich, semi-natural neutral grassland is exceedingly rare in Inverness district.

Marsh/marshy grassland
A category which covers a range of conditions from the wetter parts of improved fields still dominated by soft rush (*Juncus effusus*) to relatively species rich areas which represent a transition from marsh to dryer conditions through attempts at drainage. Much of that recorded in Inverness district is of limited wildlife interest but of little use for grazing. Thus any areas showing greater species richness (indicated by target notes) represent a relatively scarce plant community.

Land improved for Agriculture and Amenity

Improved and poor semi-improved grassland
Grassland for animal feed, of limited wildlife value in itself. However, such areas adjacent to other habitats, woodland in particular, may form an important part of the home range of a number of animals including badger. Thus developments such as building for example, on grassland adjacent to woodlands can have serious consequences for wildlife even though the trees themselves are not touched. The provision of buffer zones in these cases can help prevent such problems.

All Cultivated/disturbed land
(arable land and amenity grassland)
Arable land is of limited value as a habitat in itself in that few species of plant or animal live there. However, in the same way as improved grassland it often forms part of a larger system. It is frequently utilised for food by a number of bird species for example and may thus be an important component of a larger ecological system. Amenity grassland is that developed for recreational purposes. This includes the well tended grassland of graveyards but excludes lawns in private gardens. In terms of wildlife interest this is probably no greater than arable land. However, the importance to both locals and visitors can be high.

The wildlife value of the agricultural land of Inverness district should not be underestimated. However it is seriously reduced by the lack of hedgerows or shelter belts of trees. Hedgerows and shelter belts do not only provide valuable habitats in themselves but represent corridors along which wildlife can disperse to the wider area. Isolated sites are generally more vulnerable and poorer in species. Hedgerows can provide corridors for re-colonisation following disturbance and thus improve the wildlife interest of the area as a whole. They also greatly reduce topsoil erosion, a problem that affects not only agriculture but also air quality and visibility for motorists at certain times of year. The tendency to plough fields to the maximum (sometimes to within centimetres of trees or fences) reduces the area available for field edge species to thrive. Much could be gained for wildlife by leaving slightly wider margins. Methods of improving agricultural areas for wildlife are widely documented and cannot be dealt with in detail here.

Continuous Bracken

Bracken (*Pteridium aquilinum*) is an invasive species and a known carcinogen, which is hard to eradicate. In dense bracken the wildlife value is limited to the cover which it provides. In this it may be more useful than agricultural land or dense plantations of exotic conifers. However, it is of little agricultural value and in general its presence represents an area which could be usefully managed one way or another. Again the importance of such areas depends heavily upon what lies adjacent.

Heathland

Both wet and dry heath. Dominated by heather (*Calluna vulgaris*) but separated by species due to better drainage resulting from different topography. Generally, steeper slopes support dry heath, gentle slopes support wet heath and relatively flat areas turn to bog (mire), (see below). In this survey the recording of heathland is limited to that adjacent to or surrounded

by lowlands. The wildlife interest of such areas varies considerably but, being relatively poor in nutrients, quite large areas are needed to support the full potential range of wildlife. Most dry heath would support areas of woodland in a natural state. Overgrazing (mainly by deer) is preventing tree regeneration throughout most of the heathland of Inverness district. Heath/grassland mosaic is not common, and many areas which appear as such from a distance are not always what they seem. A common error with less experienced surveyors in considering such areas has been to assume that prominent sedge species such as hare's tail cotton sedge (*Eriophorum vaginatum*) and deer sedge (*Trichophorum cespitosum* [*Scirpus cespitosus*]) are grasses. A number of maps have had to be corrected as a result of this; a task which is not only time consuming but which holds the potential danger of deleting some areas which are in fact grassy.

Mire

Blanket bog and raised bog
Fairly un-modified, intact mires supporting a relatively high number of plant species. The definition of blanket and raised bog, and distinctions between the two, can often lead to confusion. Although altitude can also play a part, this is primarily because the distinction is based on topography and hydrology rather than the species which the habitats support. Furthermore, the Phase 1 method, developed as it was in England, does not fully consider the conditions found in the north of Scotland. It is important to attempt to clarify this as these habitats are amongst the most important in Europe. This subject is covered in some detail in the Easter-Ross report and a detailed consideration is therefore not repeated here.

This plant community (or range of communities) is scarce not only in Inverness district but also worldwide. The most valuable areas are normally found at lower altitudes. In Inverness district these are mainly confined to small areas within larger modified bogs, and are usually best developed where transition between open water and bog is encountered. Discrete examples of this were found at NH607318 and NH662347. However, land adjacent to the latter has been planted with conifers and has already begun to degrade. As the trees mature it will become considerably modified. An additional noteworthy area can be found at NH634431, in a hollow formed by the Torvean esker near Craig Dunain hospital. Apparently once a small lochan, the area is currently at a stage in succession that has developed an area of abundant *Sphagnum* with sedges, particularly bottle sedge (*Carex rostrata*). With time the site should become increasingly like an intact mire. Species richness will be limited mainly by isolation from suitable sources of colonisers, and the limited extent of the site. (See also maps and target notes.)

Modified bog
Blanket bog, usually over extensive gently sloping ground, altered by drainage, grazing and/or burning so that species richness is reduced. Though only very small areas occur along the upland margins these plant communities dominate very large areas of the uplands proper. (See also Easter-Ross report for general details.)

Flush
Discreet areas where nutrients are washed in from relatively nutrient poor upland areas. Only those found within or adjacent to enclosed lowlands were recorded.

Fen (valley mires)
Limited to small areas. Although the term is often associated with more alkaline conditions, in this context it largely relates to neutral or slightly acid areas. Distinguished from other "bog" communities by the clear influence of running water (ie. incorporating well defined channels).

Swamp (marginal vegetation)
Reed or sedge beds at margins of lochs or burns. Dominant species codes are given wherever possible. Bottle sedge (*Carex rostrata*) is one of the most common species. Common reed (*Phragmites australis*) and reed canary grass (*Phalaris arundinacea*) also fall into this category. Such areas often provide valuable nesting sites for waterfowl.

Open Water

Standing
Lochs, reservoirs and ponds. The survey of standing water has been limited here to marginal vegetation and the occasional brief examination. A more detailed study of standing water in Inverness district would be useful, particularly in terms of identifying locations valuable for fauna such as amphibians and a range of invertebrates. However, this would be time consuming and is beyond the scope of this survey. A number of lochs and lochans were found to have fringing "marginal vegetation" of sedge beds and were important for waterfowl. Rare species such as Slavonian grebe and osprey are among those which benefit from such habitats.

Running
The wildlife value of running water is influenced not only by channel flow but also by adjacent habitat. Most bodies of running water in Inverness district represent important wildlife corridors.

Coastland

Intertidal mud/sand
(with or without Zostera or Algal beds)
Most of this substrate within Inverness district was not studied closely. Such areas represent important feeding grounds for wading birds, part of a larger system incorporating the Dornoch, Cromarty, Beauly and Moray Firths and of international importance. The long debated and controversial Longman refuse tip remains the single greatest cause of damage to this habitat in Inverness district. Any proposed development which infringes upon this (apparently lifeless but actually internationally important) mud must be considered very carefully. The construction of the road beneath the Kessock Bridge to the new football stadium was very discouraging.

Intertidal shingle/cobbles + boulders
(with or without Zostera or Algal beds)
Most of this substrate within Inverness district appeared to be bare and lying close to shore.

Dense/continuous saltmarsh
The most important areas of this habitat occur around the mouth of the River Beauly (NH550475), adjacent to the Muirtown Pools (NH651465), west of (behind) Castle Stuart (NH739496). There are a few scattered fragments elsewhere, but the habitat is generally scarce in Inverness district.

All sand dune habitats
Inverness district no longer supports any areas of sand dune habitat. Most of the coastline is unsuited to establishment of sand dunes or has been developed (for agriculture for example) for some considerable time. Records show that some of the area now occupied by the Longman refuse tip and the A9 was once sand dunes.

For the purposes of Phase 1 habitat survey in Highland Region to date all habitats associated with sand dunes are combined as they frequently form a mosaic which is hard to separate. The nearest surviving sand dune habitats are in Nairn district (see 1993 report). These are now all the more important as they represent a resource which is under-represented in the area of Highland Region south of the Moray Firth.

Rock Exposures

Natural
This includes all natural cliffs and exposed bedrock including rocky ravines. The area recorded for this underestimates actual surface area due to abundance of vertical surfaces. In these areas rocky ledges in particular can be rich in species. However, difficulties of access often makes close inspection impossible.

All artificial and waste types
(quarries etc.)
Currently of limited wildlife value in many cases, such sites may sometimes have inevitably destroyed other wildlife habitats. However, once operations cease, interesting habitats often develop. Of the disused quarries recorded in Inverness district Torvean Quarry is the most well known example of an area with considerable scope for improvement for the purposes of wildlife and informal recreation.

Miscellaneous

Wall
Stone walls functioning as stock proof barriers. These provide some habitat for smaller animals, cover for wild animals and livestock and may represent an important landscape feature in some areas. They can also support a range of lower plants including mosses, ferns and lichens and may substantially increase the botanical interest of an area. Walls in a poor state of repair no longer functioning as a barrier were excluded, although some may have wildlife value and scope for restoration.

All built up areas
These include roads, caravan sites and bare ground. Private gardens also fall into this category, but grounds of larger properties such as castles are sometimes recorded under other categories. The wildlife value of such areas varies considerably. However this can be quite

high in some places (where areas of garden are sufficiently large or numerous for example). The surprising richness of urban wildlife in some areas is well documented. In parts of Inverness district, with such a high proportion of valuable wildlife habitats, the potential is particularly high. However, recent trends in housing development suggest that developers remain unaware of this potential for a better living environment. One of the most worrying trends in recent years has been the practice of siting housing developments in semi-natural woodlands. While the practice goes some way to preserving the integrity of the general landscape in some areas, it destroys valuable wildlife habitats. Habitats such as woodland take decades to establish and cannot easily be replaced. They not only represent a climax community of potentially maximum biodiversity but provide a local environment of great quality.

II. GEOGRAPHICAL AREAS

As habitats have so far been considered as discreet categories it is now useful to consider particular geographical areas within Inverness district in terms of the habitats which they support. Division of the district in this way can pose a number of problems, as meaningful boundaries are difficult to identify. However, general topography has been used as abasis for this as it tends to have considerable influence on both plant communities and land-use, and thus wildlife habitats. The most important single point however is that neither habitats nor geographical areas can be considered in isolation as Inverness district forms an almost continuous, complex system in terms of wildlife movement. Manipulation of any one site may have an influence on a much larger area.

In this section information and evidence from a wide variety of sources have been used to present a reasonably holistic impression of the district, all be it from a wildlife survey point of view. Sources have included local knowledge through formal and informal meetings with residents during our survey activities, discussion with numerous visitors from both Britain and abroad, consultation of planning documents; and discussion with a wide range of ecologists, geographers and others involved with the local environment. In this way it is hoped to bring the information contained within maps and target notes into a wider perspective.

Inverness

Situated in an area of considerable scenic beauty, the town itself is home to a wide variety of wildlife. Where else in Britain can one stand within a city and view animals such as dolphin, porpoise, seal, otter and red squirrel as well as a wide variety of birds and plants?

In terms of development, although well situated as a centre of communication, the town suffers from a lack of suitable land. Wedged between the firths to the north and the uplands to the south and east, suitable areas for development are confined to the triangular coastal plain, along a wedge extending eastward towards Nairn, and the lower hill slopes to the south-east. This has led to industrial estates dominating large areas adjacent to the A9. Unfortunately, as this is the route by which most visitors reach Inverness, this leads to rather poor first impressions of the town. In contrast, the numerous areas of high wildlife value are relatively well hidden and sometimes inaccessible. Sites such as Craigphadrig, the River Ness/Caledonian Canal corridor and the Muirtown Pools (see coastal section and target notes), are ideal for visitors, with easy access. Other fascinating areas such as the coast and mudflats, and Bogbain Wood and heath are virtually inaccessible.

Following careful survey of the town, it appears that the location of Inverness' industrial sprawl was inevitable, and no worse than that of most other towns of similar size. However, greater efforts aimed at landscaping future developments could ameliorate such problems. Housing development, while being well planned in many areas, has devastated broadleaved woodlands in the area of Smithton, Culloden and Balloch, considerably reducing the quality of living environment as well as the wildlife interest in those areas.

Although surrounded by large areas of countryside, residents and visitors to Inverness find much of this inaccessible. Those intent on walking inevitably move on to other areas such as

the Cairngorms or the west coast. In this respect Inverness is little better than some larger towns further south. (There is, in fact, far more green space open to the public within a mile or so of Edinburgh city centre than within the same distance from Inverness centre.) There thus appears to be a strong need for greater access to the surrounding countryside, and country park areas adjacent to the town.

Our survey has identified two areas particularly suited to development as country parks. These are, the Longman refuse tip and Bogbain wood and heath.

The Longman (NH678465) offers easy access to both residents and those passing through. It provides a last chance for Inverness (a coastal town without a coast) to develop sea front access. The wildlife value is already quite high, and the internationally important mudflats are popular with bird-watchers. The development of picnic sites and other spaces for informal recreation, as well as more natural areas for wildlife, would provide a facility of considerable benefit to the town.

Bogbain wood and heath (NH701416) is already of high wildlife value, with a wide range of habitats including regenerating pinewoods. The views from there are quite spectacular. The site offers the possibility of easy access both from the A9 and from residential areas nearby. The site is already used for informal recreation (walking) by local residents, but this is currently tolerated rather than agreed upon. By improving car parking facilities and footpaths the area would provide excellent opportunities for informal recreation and education. The existing visitor centre and picnic site by the A9 could easily be linked to a much larger system.

A large part of the site was once scheduled for development as golf courses with hotel and leisure facilities. This did not and still does not appear to be appropriate for the site. Not only is it exposed and at a relatively high altitude, but such a development would destroy or seriously degrade large areas of habitat as well as depriving the general public of an excellent area for less formal recreational activities. The idea of an interpretative centre in the area, forwarded more recently, would be in keeping with the concept of an informal country park. The site, offering breathtaking views in a natural setting, could provide a gateway to Inverness more appropriate to the Highland capital than the industrial estates and railway lines at present.

Appropriate development for Inverness

To a large extent past trends in development will dictate future development of the area. The Smithton/Culloden area, for example, has already been considerably modified. As most of the damage has already been done, further development of the area is quite appropriate. However, if done with care, this could still have a lower impact than past development. In terms of wildlife, the Smithton/Culloden area partially isolates Inverness from areas to the east, leaving only the fragmented River Nairn corridor and the uplands to the south-east as potential sources of wildlife movement there. The latter appear more likely to connect with areas of wildlife interest around Inverness indirectly from the south rather than directly from the east. The greatest potential for wildlife movement between Inverness and the wider environment thus appears to lie in the Great Glen wildlife corridor, and the complex mosaic of habitats beyond Craigphadrig and Dunain Hill to the west. The most appropriate pattern of development, from the point of view of both wildlife and ease of access, would appear to be eastward along the "golden mile" of the A96, and southward to a limited extent, in areas around Inshes and Castle Heather.

So far this would appear to coincide closely with current development plans. However, even in these areas, care should be taken to retain as much wildlife habitat as possible. It must be remembered that, although Inverness is indeed surrounded by large areas of countryside, most of this is upland in character and does not support the lowland habitats associated with areas adjacent to the town. Small areas of lowland broadleaved woodland near the town, for example, are quite unlike other woodlands adjacent to Loch Ness only a few miles away. Retention of such habitats also provides a more pleasant living and working environment.

Areas to the west of the Caledonian Canal and adjacent to the River Ness south of Ness-Side and Holm Glen would benefit from habitat creation and restoration. The lower areas between Inverness and Dochfour are, in many places, quite fragmented. Thus further development of green space around Scorguie, Leachkin, Charleston, Torvean, Ness-Side, Holm House, Ness Castle and all areas to the south and west of these should be kept to a minimum. In these areas habitat creation rather than destruction is a priority in order to strengthen links between wildlife within the town and that within the wider area. This would then ensure that Inverness' status as a town of relatively unique wildlife interest is retained and hopefully enhanced.

Finally, while most larger towns in Britain have some initiative aimed at wildlife habitat creation (whether through the local authorities or the voluntary sector), Inverness has become notorious for habitat destruction. Ponds have been filled in, woodlands pruned and "tidied" and the town is infamous for the destruction of internationally important mudflats with the Longman refuse tip. A reversal of this trend by integrating habitat creation schemes with future planning and development (seeking professional advice) would not only go towards restoring a marred image, but would improve the living and working environment for the residents of the town. In this respect Inverness should not be compared with other, less fortunate British towns and cities. The aim should be to take advantage of the unique opportunities offered by Inverness' location, rather than be content to sink to the level of some perceived average of environmental quality.

The relative isolation of Inverness from the rest of Britain means that its attractiveness to business rests, to a large extent, upon its reputation as an attractive place in which to live and work. The vitally important tourist industry also rests upon this. Inverness' unique location.

The Coast

The coast of Inverness district extends for approximately 45 kilometres from Beauly in the west to beyond Fort George (including part of Whiteness Head) in the east, with the more developed area by Inverness lying somewhere midway.

The mudflats are internationally important for wading birds, and the firths are home to a variety of marine mammals including bottle nosed dolphin. In contrast, other coastal habitats are relatively scarce and fragmented. very discreet areas of saltmarsh occur around the mouth of the River Beauly (NH550475), adjacent to the Muirtown Pools (NH651465), west of (behind) Castle Stuart (NH739496), and as a few scattered fragments elsewhere. Reed beds, mainly of common reed (*Phragmites australis*), but also with some reedmace (*Typha latifolia*) at the Beauly estuary and Muirtown Pools, occur at similar locations. The area does not support any intact sand dunes or coastal heath (except for possibly a little at the inaccessible Ministry of Defence shooting ranges at Fort George), and remaining fragments of coastal grassland are heavily modified. The areas of greatest wildlife interest are thus the

River Beauly estuary, the Muirtown Pools, the mudflats and the marine environment. The remainder is considerably modified, making the small remaining areas of semi-natural habitats of considerable local importance.

The main threats to coastal habitats, including mudflats, are the possibility of disturbance through inappropriate development, including further extension of the Longman refuse tip, and pollution from a range of possible sources including sewage outfalls and industry. The most obvious threats to the immediate marine environment are again pollution, and disturbance from tourism, particularly in respect of dolphin watching by boat. Other, less tangible threats, will include national and international trends in pollution control and over fishing for example.

The Aird (for current purposes Fanellan to Inverness)

Referred to by various names other than "the Aird", this area supports a complex mosaic of wildlife habitats, agriculture and forestry. Only careful inspection reveals how valuable for wildlife the area actually is. Broadleaved woodlands are sometimes extensive as at NH540400 and upper Moniack gorge which is a SSSI. Native pinewoods are also well represented as in the area around NH585420. However, conifer plantations bisect many parts, and small-scale housing development is widespread. The area is thus certainly threatened by further such developments if not carefully controlled, and would benefit from habitat creation aimed at consolidating existing habitat systems.

The Strathglass Corridor (River Glass and River Beauly corridor)

Running from south-west of Tomich to Beauly the area is of considerable scenic beauty and of high wildlife value. The glen runs north-east from Tomich, via Cannich, to Struy and then winds east and slightly northward to Beauly. A narrow strip of agricultural land, adjacent to the rivers, is bordered by steep valley sides, wooded with both conifer plantations and broadleaved woodland, which rapidly leads to upland habitats. Semi-natural habitats within the glen are fragmented, mainly by conifer plantations, but are sufficiently abundant as to constitute a wildlife corridor. These areas, along with adjacent uplands are in many cases potentially prime locations for native woodland development (aided by woodland grants from Forest Enterprise). Stands and scattered areas of Scots pine (*Pinus sylvestris*) are widespread. With reduced grazing alone some of these areas would develop into good pinewood habitats. An area at NH455432, near Ardochy, provides a good example of this. In other areas, such as at NH470432, grazed broadleaved woodlands show considerable potential.

The greatest threat to this area is further fragmentation of habitats through development, particularly forestry. One particularly disturbing example of this was found in the area around NH450395, by Eskdale. Here a private forestry company has planted conifers within a semi-natural broadleaved woodland. As the conifers mature the habitat will cease to function and a good woodland will be destroyed.

Eskdale Moor

This area lies between Strathglass in the north and west and Glen Convinth in the east, and is bordered by Glen Urquhart in the south. It is essentially upland in character with two lochs, numerous lochans and numerous summits. The highest point is 456 metres at Carn Mor. The area offers limited access at a number of locations. Some of these provide popular walks for locals who know how to find them. However, no formal access agreements are in place. Much of the area lacks paths or tracks, is quite wild in character and is greatly loved by a small number of more adventurous walkers. It is the extent and apparent isolation of this area that gives it its charm. The wildlife interest is generally high, but often dispersed over a wide area. Some of the more species rich areas lie above Glen Urquhart in the south and particularly in the area of lochans and woodland fragments around NH490330 above Balnagrantach. (Part of this is a SSSI.) Some parts of the area offer considerable scope for native pinewood planting under FE Woodland Grant Scheme. However, it is the generally open character which makes the area of scenic interest. Development would thus have to be carefully planned. Further development of exotic conifer plantations would be seriously detrimental to the area and pose the greatest single threat. Grazing by deer has clearly been high in the past, but some recent signs suggest that there is potential for natural regeneration in some areas.

The Glenurquhart Corridor

Running from near Cannich in the west to Drumnadrochit in the east, the area is separated from Strathglass by an area of upland around NH370320 near Milness. Habitats by Drumnadrochit are considered to be part of the Great Glen wildlife corridor. Upper slopes of the northern side of the glen are best considered as part of the Eskdale Moor habitat complex. To the south, slopes rapidly ascend to a large and complex area including Balmacaan Forest. What remains is a narrow, but very important, wildlife corridor linking Strathglass and the higher glens to the west with the Great Glen in the east. Habitats within Glen Urquhart are often quite fragmented, and conifer plantations dominate large areas. However, the wildlife value of the area is high. Meadows with plants such as lesser butterfly orchid have been reported, and species of reptiles and amphibians appear to be abundant and widespread. The first known sighting of a muntjack deer in the Highlands was reported here, and the animal has been seen several times. This is probably an escaped individual and there is no evidence of breeding potential. The fragmented nature of the habitats in this area does appear to pose some threat to the integrity of the glen as a wildlife corridor. Further fragmentation through development would be of serious concern. This is an area where habitat creation, in certain parts, would strengthen links within the system.

The Upper Glens – Strathfarrar, Cannich and Affric

Although not surveyed in detail, these glens are known to be of immense wildlife value, considerable scenic beauty and, in places, high recreational potential. The most prominent and important areas for wildlife are the native pinewoods. These are, in the main, now being carefully managed for wildlife. The incentive (in terms of benefits to wildlife) to link these more firmly with Strathglass, by encouraging native woodland development in the latter area, is thus high. Glen Affric in particular also offers the possibility of linking native woodlands there with others by the west coast. This would produce a new and important wildlife corridor, a coast to coast highway for wildlife in the Highlands. The uplands to the west of

Inverness could then form part of a large habitat system. With proper management (utilising appropriate sylviculture techniques for example) the area could be managed sustainably to the benefit of wildlife, recreation and the local economy.

Balmacaan Forest Uplands

Between Glen Urquhart in the north and Glen Moriston in the south the area stretches from above Tomich in the west to above Loch Ness in the east. Although forest by name, the area is virtually treeless except for large conifer plantations and a few areas of broadleaved woodland around the margins. The highest point is 696 metres at Meall Fuar-mhonaidh, which commands excellent views over the surrounding area. The area is a complex and fascinating mosaic of lochs, lochans, bogs, wet heath and crags. It would apparently benefit from some natural tree regeneration, but would, in the main, appear to be inappropriate for large scale woodland development. However, some areas around the margins could be suitable for native pinewood planting. Further development of exotic conifer plantations would obviously damage the character of the area. Currently access is quite limited. However, the potential for recreational use in some parts is high. Within easy reach of Inverness, the area offers the possibility of glimpses into a fascinating wilderness. Although this potential may not be developed for some time it should be safeguarded as an option for the future. Although not surveyed in detail, due to the extent of the area and difficulty of terrain, the Balmacaan upland complex is almost certainly of considerable wildlife value. Any form of development, including native woodland, in this area would require careful consideration and a detailed habitat survey.

The Glen Moriston Corridor

Although only surveyed in detail around Invermoriston, it is clear that this area is of considerable wildlife interest. The glen supports reasonably large areas of native pinewoods as well as a range of other habitats. It represents an extensive corridor which connects the Great Glen with uplands including Kintail to the west, and the west coast beyond. The area around Invermoriston is probably the most vulnerable section of this corridor due to the ever present possibility of inappropriate management or development, and the fact that the glen is quite narrow at this point. However, as much of the area is extensive uplands, there is always the possibility that conifer plantations could be developed in inappropriate ways (ie. without careful survey and planning to minimise habitat destruction).

The River Ness/Loch Ness Corridor

Part of the much larger wildlife corridor of the Great Glen, this section extends from Inverness in the north-east to just north of Loch Oich in the south-west. Furthermore, the Great Glen Corridor is itself but a part of a much larger system. The part lying within Inverness district has, for example, links with Glen Urquhart (which links with Strathglass and the internationally important habitats in the glens of Affric, Cannich and Strathfarrar), and Glen Moriston (with a range of important habitats including native pinewoods). The whole area is a complex system of habitats in which it is difficult to consider sites in isolation. Thus elongated areas along the sides of Loch Ness may be equally as important as more obvious areas such as Urquhart Bay woodland.

The catchment area of the Great Glen is very large. It incorporates, in addition to the more obvious lowland areas, a very wide range of upland habitats which defy the process of wildlife site selection. Some of these habitats are in quite close proximity to the Great Glen. However, they have not yet been surveyed in detail.

An attempt has been made below to briefly describe the main sites in the area. Emphasis has been placed on those adjacent to the rivers or Loch Ness. However, most sites within and around the town of Inverness, and indeed the town itself are, in fact. all part of this wildlife corridor. (See also maps and target notes.)

1. **Muirtown pools** (NH651465) - a diverse set of habitats around a number of pools which are partially connected to the sea. Habitats include saltmarsh, fresh water marsh with reed beds, bog, scrub and wooded embankments. The adjacent mudflats are part of an internationally important system (for wading birds).

2. **Torvean Hill** (NH650434) - part of an extensive system of esker ridges. A geological SSSI but also of wildlife and amenity value.

3. **Canal** tow path and area between Caledonian Canal and the River Ness, Whin Park to Dochgarroch (NH656433 to NH610394) - supports a range of habitats including woodland, scrub and grass verge. Fauna includes otter, deer, small mammals, slow worm and a range of bird life.

4. **North Loch Ness woodlands** (approximately NH555320 to NH591373) - broadleaved woodlands on steep, sometimes unstable slopes. Part of the area was recently for sale. The Woodland Trust submitted a bid but the outcome is unknown. Access is difficult, surveyed from a distance but apparently of considerable interest.

5. **Dirr Wood** (NH595338) - habitat of broadleaved woodland and scrub (including juniper) of varying quality. Not surveyed in detail but apparently quite interesting. The boundary of the area of interest is difficult to define and in close proximity to a range of other habitats up-hill. This is the beginning of a strip of broadleaved woodland running to Inverfarigaig along the loch shore. It is all that remains in this area of a more extensive area of wildlife habitats which are now turned to mature exotic conifer plantations.

6. **Urquhart Bay Woodland** (NH520295) - Part of the wood is an SSSI, but some falls outside of this. The woodland is incredibly rich in species. Primarily an alder (*Alnus glutinosa*) woodland in origin but with dryer areas. Much of the woodland floods in winter, adding large quantities of silt and bringing down trees adjacent to the larger channels. Within the bay the loch is fringed by beds of bottle sedge (*Carex rostrata*) with some reed canary grass (*Phalaris arundinacea*) and supports water fowl including mute swan.

7. **Inverfarigaig woodland** (NH525237) - area of crags and mature broadleaved woodland at the mouth of the Farigaig gorge. Some of this was under-planted with exotic conifers by the Forestry Commission. However, Forest Enterprise are now removing conifers and restoring the area.

8. **Bunloit woodlands** (NH499243) - mature broadleaved woodland, dominated by birch (*Betula* sp.). This could be considered as a broadening of the strip of woodland which

borders the loch in this area. However, the woodland has links with other woodlands up-hill which cannot be included here as they form part of a range of habitats which extend to the large upland area beyond. The woodland at this point has not been surveyed in detail as access is difficult.

9. **Foyers Bay woodland** (NH494212) - a small amenity woodland with relatively high species diversity and excellent views over the loch.

10. **Foyers gorge and waterfalls** woodlands (NH496205) - Area of mature pinewoods and other habitats around a steep sided gorge. The area is of high landscape and amenity value and also supports an interesting range of common species.

11. **Easter Ness Forest** and other habitats between Foyers and Fort Augustus (NH388086 to NH489208) - the forest is a SSSI. However, a wider range of other habitats lie adjacent. The area of interest stretches from the Cemetery at Foyers to the end of the loch virtually unbroken to the Abbey at Fort Augustus. There are no roads here, and some of the steep slopes are virtually inaccessible by land or water. The loch-side habitats connect closely with areas of heath and mire up-hill, in a large and complex mosaic which reaches the woodlands adjacent to the River Foyers upstream from the waterfalls (see 10).

12. **Invermoriston** (NH420169) - small areas of woodland of varied wildlife interest. The oakwood to the north of the river is mature and was identified by SNH in 1986 as a grade 2 site. Glen Moriston as a whole supports a wide range of habitats including native pinewoods and represents an extensive corridor which connects with Kintail to the west and the west coast beyond. The area around Invermoriston is probably the most vulnerable section of this corridor due to the ever present possibility of inappropriate management or development, and the fact that the glen is quite narrow at this point.

13. **River Oich corridor** (NH336035 to NH378092) - a complex and diverse set of habitats, dominated by woodlands, which follow the canal and the river between Loch Ness and Loch Oich. This is an important link in the Great Glen wildlife corridor. Although only surveyed to Phase 1 it is clear that this area is of considerable importance to wildlife. Unfortunately, being far from homogeneous and linking with other adjacent habitats, it is difficult to define. The threat from overgrazing on the south side is of some concern, while the fate of the areas to the north is mostly in the hands of Forest Enterprise. Clearly habitats have been lost to conifer plantations in this area. However, what remains appears to be of considerable wildlife interest.

South-East of Loch Ness

This is a very complex, heterogeneous area between the upper slopes above Loch Ness and the Monadhlaith Mountains. It includes the settlements of Whitebridge, Gorthleck and Farr, the lochs Mhor, Ruthven, Duntelchaig, Ashie and others, with a number of uplands and crags scattered throughout. To the north it includes extensive, relatively flat areas from Drumashie Moor to the slopes above Inverness around Essich, Leys Castle and Milton of Leys. Agriculture is, in the main, restricted to areas around Loch Mhor and the River Nairn, and around Essich, Leys Castle and Milton of Leys. Conifer plantations are widespread and in some places very extensive. Much of what remains is upland in character and often quite heavily grazed. The better wildlife habitats are quite fragmented, but the area as a whole does appear to be rich in wildlife, possibly because much remains sparsely populated. Some areas

do show signs that landowners have taken an interest in habitat creation (particularly in the form of broadleaved tree planting), and provide a good example of how a local environment can be enhanced with a little effort.

The area clearly has high recreational potential, and much could be done within the framework of existing tracks and paths. However, tourism has always been relatively "low-key" on this side of Loch Ness. The undeniable charm of the area is probably dependent upon this. Future development of the tourism potential would therefore have to be carefully considered and part of a well-planned strategy rather than piecemeal small-scale initiatives. Future local planning needs to aim for protection of existing wildlife habitats and future development should be linked with habitat creation and enhancement.

The River Nairn Corridor

In Inverness district, much of the River Nairn lies within the south-east Loch Ness area discussed above. However, it is worth considering further as the river transcends district and geographical boundaries. The River Nairn originates in the north-west of the Monadhlaith Mountains as Crom-allt Beag and Allt Mor below Cairn Ghriogair (805 metres). (In this area the erosion of blanket bog and slopes adjacent to the burn is extensive. This appears to be mainly due to overgrazing and hence lack of tree regeneration which would otherwise stabilise slopes, and probably excessive burning of blanket bog. This is likely to be having adverse effects on water quality and hence fish stocks down stream.) The source of the River Farigaig lies close by to the west, marking a watershed with drainage to Loch Ness in one direction and the Moray Firth in the other. Once leaving these extensive and mostly treeless uplands, the River Nairn meanders through agricultural land (Strathnairn), sometimes bordered by forestry until it reaches the A9 near Daviot. As the banks of the river support only a limited amount of wildlife habitats (being closely bordered by fields for much of the way) the river functions as a corridor in only a limited sense. It is rather the diversity of habitats in the larger surrounding area which constitute a wildlife system. However, it is more likely the sparsely populated nature of the area which allows wildlife to flourish here than the integrity of the habitat system (see above). This is of definite concern as further development in future appears quite likely. Habitat creation and improvement by the River Nairn and in surrounding areas is thus a priority that needs to be incorporated within local plans.

Beyond (north-east of) the A9 the River Nairn corridor improves as it passes through a gorge and area of broadleaved woodland. Beyond this, habitats become fragmented and limited once more until the river enters Nairn district.

As the river is quite extensive and transcends district and geographical boundaries it is important that management of any given area is seen as part of a much larger system. Development of conifer plantations and harvesting of mature timber, for example will change hydrology and can adversely affect water quality. Co-ordination of planning and management, although difficult in an area as diverse as this, is thus essential.

The A9 Corridor

Although not quite so obviously a wildlife corridor as some other areas considered, this area does form a corridor between two extensive areas of upland. It is separated from a vast and, in

some places internationally important, system of wildlife habitats within and around Strathspey, only by a small section of upland around Slochd. To the north the corridor converges with the River Findhorn corridor, then the River Nairn corridor a few kilometres further north and finally reaches Inverness and the coast. As well as a potentially important corridor for wildlife movement between a number of extensive and complex habitat systems, the A9 is also a major communication route to Inverness and the northern Highlands. The landscape quality of this area is thus of considerable importance.

At present that which is not already under dense conifer plantations is heavily grazed or modified in some other way. The area around NH785330 for example was once apparently an intact and potentially interesting bog. It has been drain and, without substantially increasing the grazing value, the former habitat has been destroyed. The only notable remnant of broadleaved woodland is in the area of NH760335, and this is failing to regenerate due to grazing. Around NH751347 a large area of conifers were felled some years ago and the brashings still remain as an unsightly legacy without any benefits of habitat development.

The River Findhorn Corridor (Strathdearn)

Only the area around Tomatin was surveyed in detail. However, it is known that only relatively small pockets of semi-natural woodland remain. These are mainly of broadleaved trees, mostly birch (*Betula* sp.). The whole are is heavily grazed by livestock and unusually large numbers of deer. Thus, without intervention (more careful management) in the near future, what woodland remains will be lost. Of particular note are the large areas of juniper (*Juniperus communis*) on the slopes above Tomatin and the A9. The species is uncommon in many parts of the district and rarely found in such abundance. Although the areas are grazed by livestock it is unclear whether this poses any immediate threat. The area is also well known for its feral goats and large numbers of mountain hare.

That part of the River Findhorn which flows through Inverness district is but a part of a much larger, very important, wildlife corridor which runs from the Monadhlaith Mountains, through Nairn district to Findhorn Bay in Moray district. As management of one part of a drainage basin can have effects on areas down stream (in terms of hydrology and sediment yield, for example, as well as wildlife movement), such a system ideally should be planned as a whole. For example, the upper parts of the Findhorn appear possible targets for further conifer plantations. Such developments invariably affect water runoff and water quality. This needs to be considered if such developments are proposed.

The Lowland/Upland Transition Zone

Although not discrete, this zone can be considered as a geographical area in its own right, with a unique set of habitats and potential threats. This zone obviously overlaps with the geographical areas already considered. The uplands here are defined as areas above the current limit of intensive land-use/cultivation. The lowlands are thus those areas, usually enclosed by stock-proof barriers of some form, which are being managed for agriculture and forestry in a more intensive manner. However, between the agricultural lowlands and the extensive, unenclosed uplands lies a transition zone where distinctions are not always easy to make. In Inverness district much of the transition zone is extensive but often difficult to define.

The transition zone is particularly diverse in habitats. It is also possibly the most threatened area of the district, from planting of conifers and attempts to drain and "improve" wetter parts. Areas of upland habitats currently surrounded by forestry plantations and/or land improved for agriculture, will be seen as having limited agricultural value at present. However, if such areas are eventually taken into more intensive management, Inverness district will lose some important wildlife habitats. While loss of habitat in the lowlands is usually confined to relatively small developments (such as a new house), loss in the uplands can cover several square kilometres in a single season (through ploughing, planting of conifers or drainage). These areas can be located from the habitat maps as those coloured with yellow ochre and/or purple and occasionally magenta.

Some of the dryer parts of the open (un-wooded) habitats would benefit from efforts to encourage natural regeneration of native trees. The wetter areas however are usually more rich in plant species and careful inspection is advised before drainage is considered.

Of the woodlands that remain in the transition zone, (mainly birch (*Betula* sp.) but also smaller areas of other broadleaved species and Scots pine (*Pinus sylvestris*)), most are over grazed and thus show little signs of natural regeneration. As the woodlands are often confined by agriculture or forestry the natural tendency to shift, by regeneration outwith the denser woodland, is suppressed. This alone could lead to loss of woodland unless measures are taken to encourage regeneration by reducing grazing. (This could possibly be in the form of a cycle to allow new growth to mature to the point where young trees will not be killed by livestock.)

The transition zone is also the area most difficult to map and that where important species or habitats can be overlooked. To map this area in detail and search it thoroughly for smaller habitats and individual species would take a number of years. Regrettably a survey at the Phase 1 level cannot go into greater detail and it is at the transition zone, the area potentially most threatened, where important points can be overlooked. Thus care is essential in any proposed developments in this area.

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