

## Highland Biodiversity Action plan – Review of eight area BAPS

### 1. INTRODUCTION

The purpose of reviewing the eight area biodiversity action plans was to extract from them the strategic issues that were identified. These feed into the process of clarifying and determining the current issues that should be addressed through the Highland Biodiversity Action Plan.

At the initial meeting with the Highland Biodiversity Partnership of 9<sup>th</sup> February 2006, it was agreed that the strategic basis for the review would follow the eight framework themes of:

- Lack of information;
- Lack of awareness;
- Lack of policy or strategic measures;
- Species and habitat loss and fragmentation;
- Inappropriate management;
- Pollution, man induced erosion and climate change;
- Invasive non-native species; and
- Re-introduction of extinct native species

This review has included an analysis of the two key elements of the area Biodiversity Action Plans (area BAPs):

- The issues identified under each main habitat category; and
- The actions listed within each habitat category.

Across eight area BAPs there were 61 different issues raised and 637 different actions identified, following a degree of collation of slightly differently worded but essentially similar issues or actions, across the following broad habitat types.

Each local area BAP has used slightly different terminology for each habitat type. To avoid confusion the table below sets out the terminology adopted in this report.

<b>USED IN THE REPORT</b>	<b>Habitat nomenclature Variations:</b>	<b>Districts using the different terms:</b>
<b>UPLAND</b>	Mountain, Moorland & Grassland	WR
	Mountain & Moorland	L, S
	Bog, Moor & Hill	ER,
	Moorland & Hill	C, I, S&L
<b>FARMED LAND</b>	Montane, heath and bog habitats	Cg
	Croft and Farmland	WR, S, C, ER, I
	In-by Croft and Farm Land	S&L, L
	Farmland and grassland habitats	Cg
<b>FRESHWATER</b>	River, Loch & Wetland	S, L, ER, C, WR
	Freshwater	S&L, I
	Wetland and water habitats	Cg
<b>SEA &amp; COAST</b>	Sea & Coast	ER, WR, S&L, C, S, L
	Sea & Seashore	I
<b>URBAN</b>	The Built Environment	S&L, WR, L,
	Town & village	S, C, ER
	Urban	I
<b>FOREST &amp; WOODLAND</b>	Woodland habitats	Cg
	Forest and Woodland	ER, WR, C, S,
	Woodland	I, L, S&L,

OVERARCHING ACTIONS	Recurring themes General	ER, WR, S&L C, S, L, I,
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<u>LIST OF LBAP AREA ABBREVIATIONS</u>	
CAITHNESS	C
INVERNESS & NAIRN	I
LIVING LOCHABER	L
ROSS & CROMARTY (EAST)	ER
SKYE & LOCHALSH	S&L
SUTHERLAND	S
WESTER ROSS	WR
CAIRNGORMS	Cg

## **2. REVIEW RESULTS**

### **2.1 HIGHLAND AREA BIODIVERSITY ACTION PLAN ISSUES SUMMARISED ACROSS THE STRATEGIC FRAMEWORK THEMES:**

#### **2.1.1 Identification of Strategic Issues using frequency as the criteria to identify Highland significance**

The issues were categorised by framework theme across each of the broad habitat types. From this it is possible to identify trends and key areas of concern. This was done primarily on the basis of the number of areas identifying similar issues for a habitat type, and the prevalence of the issue across different habitat types. An issue was considered strategic when more than four areas (i.e. more than half) cited it. A necessary part of this process has been the collation of similar issues with different wording into one of marginally more general issue. Table 1 lists those issues identified as strategic through this process and is followed by a more detailed explanation of the issues.

Interestingly, the number of different issues for most habitat types is comparable (between 20 and 25), with slightly lower numbers (13 to 17) for Farmed land, Urban and the Over-arching categories. There are no conclusions that can be drawn from this as there will have been many factors affecting the identification of issues at the time of drawing up the plans, which was outside the scope of this review to examine.

#### **2.1.2 Explanation of the issues identified**

This section elaborates on each issue

##### **A. Lack of information**

- a.i Over-arching. The issue was raised comprehensively across Highland and relates to the lack of accessible and useable information on animals, plants and habitats. This issue encompasses the basic lack of information due to lack of survey; and the inaccessibility of existing information for people who need it, such as planners and developers for site selection, for use in feeding information into the local distinctiveness of incentive programmes, local communities for awareness raising, schools for educational purposes.
- a.ii Farmed land. Over half the areas raised the lack of information about biodiversity on farms as a particular issue.

**Table 1. Strategic Issues identified by frequency of mention across the areas.**

	<b>Framework theme</b>	<b>Issue</b>	<b>Habitat(s)</b>	<b>No. of areas</b>
A	Lack of information	None or fragmented information	Over-arching	<b>8</b>
			Farmed land	<b>5</b>
B	Lack of awareness	Insensitive, or excessive recreation	Sea & Coast	<b>7</b>
			Upland	<b>7</b>
C	Invasive species	<i>Rhododendron ponticum</i> , and other invasive non-natives	Woodland	<b>7</b>
			Freshwater	<b>6</b>
			Over arching	<b>6</b>
		Native non-local, or non-native fish	Freshwater	<b>6</b>
D	Species & Habitat loss & fragmentation	Lack or loss of habitat linkages	Woodland	<b>7</b>
		Loss of habitat and species stimulated by changes in agricultural grants and practice	Farmed land	<b>8</b>
		The impact of dredging and trawling	Sea & Coast	<b>5</b>
		The impact of wild marine harvesting on white fish and shell fish	Sea & Coast	<b>6</b>
		The decline in salmon & sea trout spawning	Freshwater	<b>5</b>
E	Inappropriate management	Inappropriate grazing levels and muirburn	Woodland	<b>7</b>
			Upland	<b>8</b>
		Change from cattle to sheep	Farmed land	<b>7</b>
		Intensification of cropping & stock management	Farmed land	<b>8</b>
		Road verge maintenance & general “tidying up”	Urban	<b>7</b>
		The balance of open and forested land	Upland	<b>5</b>
		The broad impact of traditional production forestry – monoculture, deer fences, clear-fell	Woodland	<b>6</b>
F	Wildlife crime	Egg theft and persecution of birds, taking of other protected species	Over-arching	<b>5</b>
G	Pollution, climate change and erosion	Agricultural, and forestry pollution, sewerage discharges	Sea & Coast	<b>6</b>
			Freshwater	<b>5</b>
			Farmed land	<b>6</b>
		Marine & land waste	Sea & Coast	<b>5</b>
H	Renewable energy	Alteration of habitats	Freshwater	<b>5</b>
		Loss of site biodiversity	Upland	<b>5</b>

**B. Lack of awareness**

b.i Rising levels of recreational use of

b.i.a Sea & Coastal facilities. This includes access to coastal areas for walking and dog exercise, use of motorised vehicles, use of high-speed craft in inland waters, and wildlife tourism businesses. These all have the potential to a greater or lesser extent to cause disturbance to birds, or marine animals, and erosion.

b.i.b Upland areas. Again this essentially is an issue of disturbance and erosion, caused by walkers, dogs, motorised vehicles and wildlife tourism.

In both cases the disturbance and damage potentially relates to habitats and species of national importance (such as dotterel, sea mammals, terns, and highly fragile upland vegetation communities, including high altitude lichens e.g. *Bellemeria alpina*, *Gyalideopsis scotia*) and some locally important fungi, including a range of agaric species, cup and puff-ball fungi. In upland areas, there is also an increase in the use of off-road motorised vehicles for estate work allowing access to a far wider area of the hill than previously possible.

- b.ii Perceived low levels of knowledge or understanding of wildlife and native plants. This issue is important simply because it underlies many of the other issues encountered, particularly 2 above, and a number of those below. If the general level of understanding and sympathy across the population was higher then it follows that greater care would be taken in the exercise of either work or recreational activities that impact on the environment.

### **C. Invasive species**

There is considerable concern across the Highlands at the impact of non-native species, and whether there is sufficient monitoring of spread to allow for prevention (of spread), or protection (for native species or habitats) measures. Equally there is no clear strategic policy on how to tackle their control. For example, garden centres still stock *Rhododendron ponticum* and in addition a number of other types use *R. ponticum* as a rootstock. This issue was raised by most areas at a general level and the species cited include *Rhododendron ponticum*, Japanese knotweed, giant hogweed, Himalayan balsam, American mink, American signal crayfish, Sika deer, New Zealand flatworm, minkjac deer and grey squirrels. In addition species issues were cited for some habitats:

- c.i Woodland. Particularly in the west there is a serious issue with the spread of a number of aggressive plants, including *Rhododendron ponticum*, Japanese knotweed, and Himalayan balsam. Not only is the impact of these plants devastating to native vegetation but they are very difficult to control or eradicate, in particular *R. ponticum*. To be effective there is a need for co-ordinated control action between landowners or managers and other bodies.
- c.ii Freshwater.
  - c.i.a To the issue of invasive plants can be added a range of animals, particularly American mink, and American signal crayfish.
  - c.i.b In addition in freshwater there is the serious issue of the deliberate introduction of native, but non-local animals. The introduction of pike across the Highlands for sporting fishing is an example. As concerning are recent unconfirmed reports that UK native crayfish may have been introduced to Highland freshwaters from England in order to safeguard the species from decimation by the American species.

### **D. Species and Habitats Loss and Fragmentation**

Of the 34 different issues raised under this theme by far the majority were raised by one or two areas only, and can be considered of local concern. Five are of wider concern:

- d.i The loss or lack of habitat linkages in woodland. This was widely raised in relation to most types of native woodland but with particular mention of riparian woodlands. The agents of loss were cited as developments, changes in agricultural management, and afforestation.
- d.ii On farmed land, the trends in agriculture are considered to be an ongoing issue in relation to the retention of habitat and species interests. There was total consensus on this issue across the Highland areas. This links strongly with other issues raised below, and has strong links to nos. 1 & 2.2.
- d.iii At Sea, the impact of scallop dredging and trawling on the seabed is causing high levels of concern in those areas where this is practiced.

- d.iv Sea & Coast. There is considerable concern in most areas at the levels of harvest of shellfish from beaches and the level of harvest of crustaceans and white fish from deeper waters.
- d.v Freshwater. The success of salmon and sea trout in reaching and spawning in rivers and burns is strongly linked to the success of freshwater pearl mussels. The decline in the number of fish successful spawning and the state of spawning grounds is of concern. There may be implications in this issue for GAEC, agri-environment schemes and forestry. Otherwise it is a local issue that is within the remit of the local Fisheries Trusts.

### **E. Inappropriate management**

As with Species & Habitat loss, this theme includes a relatively high number of different issues (27), although a higher number, seven, have Highland wide significance.

- e.i In Woodland, inappropriate levels of grazing attract almost universal concern. This principally relates to the lack of regeneration and moribund state of many woodland remnants due to uncontrolled either sheep or deer grazing. But it does also include the degradation that occurs when grazing is completely removed and the diversity of the ground flora can be lost.
- e.ii In the Uplands inappropriate grazing by both deer and sheep, and burning is an issue raised across all areas of the Highlands. The concerns are similar to those for grazing in woodlands, too much or too little, both leading to loss of diversity. Between 2000-2005, numbers of sheep in Scotland have decreased by 13%, particularly in areas of the north and west.
- e.iii Historical loss of cattle and replacement of cattle by sheep. The value of cattle as a habitat management tool has now been recognised for their size and the nature of their grazing. Recently evidence suggests that the size of the Scottish beef herd is relatively stable, although it is still declining in the north west.
- e.iv Agricultural intensification. The effect of increased intensity of arable management is increased field sizes and the loss of ‘wild corners’, boundary features such as dykes and hedges. In addition there has been similar intensification in stock farming with a focus on high production animals, usually of non-local breeds that are dependent on intensive grass and silage production. It should be noted that the use of non-native breeds in Highland is long-standing and not necessarily a recent phenomenon.
- e.v Road verge maintenance and general “tidiness”. The management of infrastructure, in particular roads, appears to one of the most contentious issues related to biodiversity management in the Highlands, from the issues raised in the area plans to the comments arising from area meetings. The issue includes; the spread of invasive species; the disregard for habitats and species in planning or implementation of either construction or maintenance works, in particular the obstruction to mammals and fish, and the lack of effective measures to ensure their safe passage. Also the ‘tidy-up’ attitude of many managers of public spaces, gardeners and in general to urban land, excludes animals such as birds and butterflies.
- e.vi The balance of land use in the Uplands. This concern relates primarily to the balance of open ground habitats and forestry. It is not clear whether ‘forestry’ includes native woodland or refers solely to softwood production forestry. The concern perhaps reflects the former loss of open hill and farm land to forestry in middle of the last century.
- e.vii The broad impact of production forestry management on woodland species. This concern arises from the barriers created by fences, the monoculture nature of production forests and the clear fell regimes that are still being practiced. All three aspects contribute to direct loss of birds, or the loss of useful habitats for both plants and animals.

## **F Wildlife crime**

The principal and on going issue in relation to wildlife crime is the persecution of raptors and the taking of eggs/young. The recent introduction of custodial sentences for this crime has significantly reduced the levels of egg theft for private collections. There has been less impact of the taking of eggs or young wild birds for falconry due to their high monetary value. Wildlife crime was raised as an over-arching concern and also includes the taking of other protected species such as freshwater pearl mussels, water lilies and bluebells.

## **G Pollution, climate change and human induced erosion**

- g.i Land use generated pollution and sewerage disposal.
  - g.i.a Sea & Coast. Waste from agriculture and forestry, as outlined below, causes concerns around the Highland coasts. In addition there is concern regarding the ongoing sea disposal of sewerage.
  - g.i.b Freshwater. Of particular concern is the run off from agriculture and forestry operations of chemicals, pesticides, fertilizers, lubricants and fuel.
  - g.i.c Farmed Land. In addition to the above issue there is concern about the amount of plastics and other solid wastes that are generated in agricultural businesses without clear mechanisms for disposal.
- g.ii Marine and land generated waste. The issue raised here is the quantities and nature of waste turning up on beaches and shorelines from shipping, fishing and tourism or other land activities, and its impact on wildlife and plants.

## **H Renewable energy**

- h.i Alteration of freshwater habitats. This issue relates to the increase in hydropower schemes in running water. Apart from the impact of installation works, in the majority of cases they cause significant change to the water flow which has a knock on effect on the water habitats, both bank and submerged vegetation. In some cases they may prevent access past the installation to migratory fish, salmon, sea trout or eels.
- h.ii Wind power sites in the uplands. This issue relates to the level of site works that is required to establish the turbines and the potentially unnecessary destruction of habitat features or loss of habitat for other animals and plants.

## **2.2 HIGHLAND AREA BIODIVERSITY ACTION PLAN [ACTIONS](#) SUMMARISED ACROSS THE STRATEGIC FRAMEWORK THEMES:**

Six hundred and thirty seven distinct actions were identified in the review from a total of 806 actions cited. The framework theme percentages given in the analysis below relate to the total number of actions cited, rather the number of different ones. The percentages in the tables relate to the overall number of actions within the framework theme.

### **1 LACK OF INFORMATION**

There are 102 (16%) actions (including repeats) from the area BAPs that are essentially information gathering exercises. Many relate to filling gaps in the information available for an area for a particular group. Others relate to research into the impact of a particular operation. For example the proposal for a desk exercise to quantify the loss of winter stubble in relation to the loss of winter feed for geese. These are summarised in the table below. The numbers include repeats across different areas, but exclude 21 actions that are considered to be primarily related to enterprise, marketing, tourism or more general environmental issues.

Biological recording	43%	This covers all actions relating to establishing a biological recording system and proposals for individual species or
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		habitat surveys. The emphasis of the actions is on a widely accessible, comprehensive data management system with specific actions for parish level, marine, freshwater and farmland audits. This Highland and area supported need provides an opportunity for forward planning to develop co-ordinated community level surveying that serves both local and Highland requirements.
Countering negative impacts	25%	This covers all investigations of the impact of either individual management or harvesting activities and that of invasive species or climate change (although not necessarily negative). There is a fairly wide spread of focus on different issues across the areas with minor emphasis on monitoring climate change impacts on sea levels and coastal habitats, and the control of invasive species.
Development control	16%	Actions relate to identifying key sites that should be safeguarded from permitted developments and infrastructure management (such as verge cutting), and those that require careful development or management in order to safeguard biodiversity interest on them. There is particular emphasis on the impacts of road verge maintenance.
Positive management	16%	This includes actions related to proposals for positive management, such as development of a local wildflower seed source. The focus of actions here is in relation to improving the perceived value for wildlife of urban features such as school grounds, verges, parks etc.

## 2 LACK OF AWARENESS

A high (38%, 275 actions) percentage of the total actions appear in this category, and they include actions that are essentially about raising awareness, either of elements of biodiversity or measures to reduce human impacts on biodiversity. Again, biodiversity was not the primary focus of 22 actions listed. A number of the actions identified under this issue were tied closely with 1., which highlights the difficulty of raising enthusiasm for something about which there is little information.

Raising awareness	Schools / General public	27%	The majority of actions cited relate to providing interpreted access, usually with the aim of preventing damage & disturbance. Many actions are more about providing public information on the importance of different habitats/species (blanket bogs, white fish) and issues directly affecting them (climate change, waste). Smaller numbers aim to encourage gardeners and schools to take action for biodiversity (e.g. use local native plants), or to learn about biodiversity (e.g. Salmon in the classroom).
Countering negative impacts		20%	The most frequent actions in this section relate to management practices that have directly negative impacts (e.g. muirburn, overgrazing, road verge maintenance). Strongly linked to this is the control of invasive species. Others that feature relatively highly are those related to protecting species or habitats (e.g. discouraging

			disturbance of nesting areas, responsible pet ownership), management of wild harvesting (e.g. of shell fish), and reducing pollution (e.g. encourage reed bed installation), including litter.
		20%	The principle focus of these actions relate to farm/croft, moorland or forest land and they are about equally split between habitat creation or enhancement activities (e.g. encourage the creation of, or management of existing, wildflower meadows) and management planning activities (e.g. better matching of carrying capacity of land to numbers of herbivores, development of moorland management plans including improved burning practice). Other actions include better management (for biodiversity) of public land, gardens and school grounds, and better nest site provision for birds and bats (e.g. nest box and access to buildings).
Raising awareness	Land managers	16%	The vast majority of these actions relate to improving management practices of land & freshwater managers (e.g. catchment management plan training, wildflower meadow management advice). Significantly fewer relate to raising awareness of farmland habitat enhancement opportunities and site/species protection (e.g. raise awareness of RSS, and of the value of birch woodland and scrub). Still fewer relate to pollution issues (e.g. issues associated with septic tanks), knowledge of sites (e.g. ensuring land managers know of sites of importance and how to manage them)
		6%	Biological recording
		2%	Development control

An issue that was consistently raised in areas meetings and within the area plans was the management of road verges and the impact this has had directly on biodiversity and indirectly on the efforts of others to manage their land effectively. Specifically, under this framework theme is the question of understanding the value of road verge habitats in both routine maintenance and management changes. For example there is currently a trend to replace road side ditches, now frequently home to spawning frogs and other wildlife, with French drains (cleaning out, inserting a plastic drain and backfilling with gravel) with no apparent consideration of the timing of the work or its impact on wildlife such as water voles. Also included in this theme is apparent lack of awareness of the potential for the accidental spread of invasive species through operational practice.

### 3 LACK OF APPROPRIATE POLICY OR STRATEGIC MEASURES

This framework issue has the second largest group of actions attributed to it (173, 27%). As the title of this issue implies actions categorised within it tend to be those dependent either on incentives or agency input, at least at an area level. Again it relates to the need for good levels of information and awareness amongst those working in agencies and other bodies, both providing and developing incentives or those undertaking environmental management to



ensure that the desired outcomes are delivered. But it is also critical that those with the greatest potential to do good are aware of and are attracted to make use of them.

Countering negative impacts		29%	Most of these actions relate to protecting habitats or species from ongoing management or development of land/water (e.g. better strategic function of aquaculture businesses in a water body, taking account of biodiversity in road re-alignment projects). Another key area is the strategic prevention of the spread of existing, or new introductions of non-locally native invasive species (e.g. set up mink control programmes, discourage introductions of pike). Some of these actions refer to the role of incentives but there are also a range of actions specifically referring to the local targeting of incentives, such as agri-environment and forestry grants. A small number relate to control and management of waste (sea and farm) and the need for wild harvesting codes of practice.
Positive management		25%	The majority of these actions relate to habitat enhancement or creation that requires some sort of agency or strategic decision (e.g. leaving structures on the seabed as artificial reefs). Many actions also relate to creating incentives, or adjusting existing schemes for locally relevant management. A small number of actions relate to protecting habitats and species and the co-ordination of action between different bodies.
Development control		18%	Most of the actions in this category relate to protection of habitats or species (e.g. ensure green energy developments take account of biodiversity interests, ban commercial sand eel fishing). Several actions are concerned with agricultural waste and water quality and a few with the development of partnerships for more effective delivery.
Raising awareness	Public/schools	9%	Developing materials for use in schools and more widely is the focus of many of the actions in this category (e.g. employ a teacher/biologist to write materials, deliver a workshop road show on wildlife). Other actions relate to tourism (e.g. build links between local produce and biodiversity, support green tourism to implement best practice).
Biological recording		7%	All these actions relate either to the development and provision of a records system or to the provision of incentives for local specific surveys.
Delivery of BAPs		3%	These actions specifically relate to support for area groups in delivering their area BAP.
Raising awareness	Land managers	2%	These three actions cover developing value for farmed land from biodiversity, provision of training, and employment of a farmland biodiversity officer.

#### 4. SPECIES AND HABITAT LOSS AND FRAGMENTATION

Of thirty-six actions (6%), the majority (83%) allocated to this issue relate to positive measures to achieve habitat enhancement or creation (e.g. provision of rafts for black-throated divers, nest boxes for barn and long-eared owls) and protection measures (e.g. propagation of less common farmland wild flowers, inclusion of measures for black grouse and capercaillie

in woodland management). Despite specific measures and projects being available to tackle some of these issues their impact remains relatively small. This refers back to 3. and the issue of making biodiversity measures in both forestry and, more importantly, agricultural incentives at least as attractive as other measures. The remaining different actions cover improving protection for raptors, deterring mechanical cockle harvesting, preventing further loss of wetlands and reducing walker disturbance of ground nesting birds. On 30<sup>th</sup> June 2006 a Partnership Against Wildlife Crime initiative was launched in Grampian following two recent bird-poisoning incidents. One of the initial tasks the partnership has identified is to tackle hare coursing. A similar initiative was set up in the Moray Firth in 2002 on the specific issue of stopping the illegal use of monofilament gill nets.

#### 5. INAPPROPRIATE MANAGEMENT

Thirty-five actions (5%) are listed under this issue, most of which fall into the category of positive management relating to habitat enhancement or creation (e.g. restructure existing plantations) and to adaptation of management practice to benefit biodiversity (e.g. establish appropriate grazing of coastal grassland). The remaining actions relate to removing negative impacts (e.g. artificial barriers to migratory fish).

#### 6. POLLUTION, EROSION AND CLIMATE CHANGE

There are 7 actions categorised under this theme. Many of these actions deal with extending recycling facilities and minimising rubbish, all of which could be considered as addressing environmental rather than biodiversity issues. One action relates to nutrient budgeting on farms.

The small number of actions categorised under this framework theme does not reflect the level of interest in this topic. At least a further 18 actions relating to this topic were listed under one of the other framework themes of lack of information, lack of awareness, lack of appropriate policy or strategic measures, or inappropriate management.

#### 7. NON-NATIVE INVASIVE SPECIES

There are ten actions allocated to this topic and an additional 20 actions related to this topic but which have been categorised under a different framework theme, for example under inappropriate management or raising awareness. The actions included here are those relating directly to control or eradication (e.g. eradicate *Rhododendron ponticum*, control sika deer to stop expansion in range).

#### 8. REINTRODUCTION OF EXTINCT NATIVE SPECIES

There are no actions listed that fit under this issue. Even stretching the definition to include re-introductions of local extinctions there are no actions. This lack of actions on this topic does not reflect the current lengthy and vigorous debate about mammal re-introductions, including the recent debate about beavers. At least one Highland estate has openly proposed the re-introduction of extinct mammals, albeit within a 60 Km fence, with the aim of establishing populations of herbivores and predators in balance with each other and the vegetation.

In Cairngorms, the area BAP has successfully managed a project to reintroduce freshwater pearl mussels in to 2 water bodies where the mollusc had previously become extinct. Elsewhere Plantlife have successfully undertaken reintroductions of pillwort (*Pilularia globulifera*) on Rum at a site where it had recently become extinct due to changes in management of the wetland.

### **3. CONCLUSIONS**

Across the eight Highland area biodiversity action plans (area BAPs) 61 issues were identified across the different habitat categories, 16 of which were emphasised by different areas as of over-arching or general significance. In terms of the framework themes both habitat loss and fragmentation, and inappropriate management are cited most frequently by areas (80 and 85 times, respectively, compared with the next highest, pollution, at 61) and also have a significantly greater number of different issues listed (19 and 14 compared with the next highest, pollution, at 8).

Across both the range of actions and issues raised in the area BAPs, the key prevalent issue is lack of awareness. This can be divided into two elements, the first is a general lack of awareness and sympathy for many aspects of biodiversity amongst everyone living in the Highlands, and those working in and using the natural environment. The second is the lack of information available to people who are daily making decisions about operations or activities that need to be carried out and that effect some aspect of Highland biodiversity.

Information of a high quality is a fundamental requirement that provides the basis on which to raise levels of awareness. The information requirement is different for different sectors of the population. The information required by the general public who may be involved in helping to prevent wildlife crime or in recording a particular species the may be relatively straightforward. For the land use adviser, a policy maker or someone involved in developing incentive schemes for land management there may be a requirement to understand the ecology of a species, or the development phases of a habitat in more detail. Again, if the developer, their advisers or the development control bodies do not have crucial information about a site they cannot be expected to take account of particular biodiversity interests.

A good understanding of the impact of different human activities on wildlife should lead to greater acceptance of environmental regulation, and of the use of resources for environmental improvement measures. For example, the resources required to establish an effective agricultural waste programme may be more readily accepted if there is better understanding of the impact of such waste on biodiversity.

This assessment highlights the range and scope of issues relating to land management and hence the role of forestry and agricultural incentive schemes. The implications are that existing controls and incentives are not well suited to the Highlands, are not sensitive enough to different conditions across Highland or they are insufficiently well monitored to prevent negative impacts. There is a need for greater influence from Highland over the criteria for incentives and how locally focused they need to be. The structure of forestry grants has recently allowed for a degree of local sensitivity but there is a need to extend this and to develop a similar focus for agricultural support. The proposals for regional committees to provide local sensitivity for Land Management Contracts (LMCs) must be welcomed with enthusiasm.

A further issue to arise is the lack of information available during the process of identifying the location of development sites, particularly those for renewable energy developments, the management of the sites during development and their ongoing maintenance. This is really an issue of process and as well as relating to the general lack of readily available information there is a more general issue of the approach of development and utility bodies, at the planning, implementation and monitoring stages.

One of the key elements that is frequently significantly affected by many of these activities but which has been completely overlooked in the LBAP process so far is soil, particularly soil biodiversity and its management.

Many of these issues match the thrust of some of the common issues identified in the Scottish Biodiversity Strategy Implementation Plans<sup>1</sup>, and they have provided the basis for the identification of projects in the work plan.

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<sup>1</sup> Scottish Biodiversity Forum (2005) Scotland's Biodiversity: It's in your hands, Implementation Plans 2005 – 2007, [www.biodiversityscotland.gov.uk/library/sbfsip.pdf](http://www.biodiversityscotland.gov.uk/library/sbfsip.pdf)