

# TROOPERS HILL PROPOSED FOOTPATH IMPROVEMENTS

## ECOLOGICAL REPORT

### 1 INTRODUCTION

The aim of this report is to provide an assessment of proposals to improve steps and footpaths on Troopers Hill, in particular to a flight of steps on the south facing slopes of the hill below the chimney.

Troopers Hill is a Local Nature Reserve (LNR) and Site of Nature Conservation Interest (SNCI). It is of high nature conservation value for its heathland and acidic grassland plant communities and for its populations of invertebrates. The Hill is managed by Friends of Troopers Hill and Bristol City Council to maximise its biodiversity and amenity value.

This report has been prepared by Rupert Higgins. I first surveyed the hill in 1985 and since then have been responsible for bird and botanical surveys of the LNR, the preparation of management plans for the hill and regular vegetation monitoring. I have led guided walks and have taken part in moth-trapping sessions and studies of spotted bee-fly on the site. For the purpose of this report an initial survey was carried out in March 2011, and a detailed survey on 23rd May 2011.

### 2 PROPOSALS – MAIN STEPS

A variety of options for works is being considered. Most of these involve relatively minor alterations to existing paths and steps, which are unlikely to have any significant ecological impact.

Ecological concerns focus on proposals being considered to rebuild a major flight of steps in the southern part of the Hill, along a major footpath leading up a steep slope between Crews Hole Road and the chimney. Concerns have been voiced for many years (at least since 1986) that public access is creating a large and increasing area of bare and trampled soil on this slope. However, photographic monitoring has shown that this zone of bare and partially bare soil is not consistently increasing in extent; rather it appears that its size is determined by weather conditions, shrinking in wet years and expanding in dry years. Moreover, a series of surveys has shown that the bare and partially vegetated slopes in this area are a key feature of importance for invertebrates, including large and diverse populations of burrowing bees of the genus *Andrena*, and a good population of the bee-fly *Bombylius discolor*, which is a parasite of these bees and a UK Biodiversity Action Plan (BAP) priority species. The bare areas are kept open by a combination of moderate trampling, the steep slopes and the very poor nature of the underlying substrates. This slope has the largest and most important area of this habitat type on the LNR.

Steps were constructed on the slope in 1991, following ecological survey. Provision of these steps did not appear to have a marked impact on the extent of the bare ground, or on other features of ecological importance on the Hill, but they did allow greater numbers of people to enjoy the site and added to its amenity value (a key feature in the management of LNRs). The steps are now, twenty years after construction, in a poor and deteriorating condition.

## **2.1 Options for Steps**

The options for these steps being considered by Friends of Troopers Hill are as follows:

- a. Do nothing and allow the steps to further deteriorate.
- b. Remove the steps completely and allow people to find their own desire lines.
- c. Rebuild the steps to a similar design to the original 1991 construction.
- d. Rebuild the steps as above and add a handrail.
- e. Rebuild the steps to full DDA standards with handrails both sides, this would probably require a revised route to allow sufficient landings and even step spacing.

### 2.1.1 Implications of Options

Options a and b would, in the long term, probably have a similar impact, although this impact would be seen more quickly if option b was chosen. As the steps deteriorated people would be forced to find their own routes up the hill. This would mean that some areas that at present are lightly trampled and suitable for burrowing bees and other insects would be heavily trampled, whilst light trampling would extend into further areas of grassland. The net result would probably be that the area of insect habitat would remain similar, but at the expense of areas of grassland.

These options would probably have a slight adverse ecological impact, as well as a marked adverse impact on the amenity value of the LNR.

Option c would leave the situation much as it is today and would not have any significant ecological impacts, apart from the potential for slight impacts as works are carried out.

Option d would also have very little ecological impact, although establishment of footings for the handrail would involve greater opportunities for adverse impacts as some excavation would be required.

Option e would require further landtake for path construction. Careful design and routing of the path could minimise these impacts to some extent but it would be difficult to avoid adverse impacts as flat steps would have to be created in this area of key biodiversity value.

In summary, options a and b would have some minor adverse ecological impact, but a major adverse impact on amenity. Options c and d would have no ecological impact or a very slight impact, and option e might have a more significant adverse impact.

### 2.1.2 Construction Details

Options c and d would involve surfacing the steps. There are different surfacing methods that could be used:

i) Limestone aggregate with dust binding or resin bound surface. Much of the biodiversity interest of Troopers Hill is a result of the highly acidic soils, which support distinctive and unusual plant communities. Use of limestone, which has a high pH, would potentially alter the nature of these soils and therefore the vegetation, although any effects would be highly localised and there are areas of the hill where a similar effect can already be seen, and it could be argued that this has introduced ecological diversity. So long as the aggregate could be immobilised, for instance through use of resin surfacing, this method would probably not have a significant adverse impact. Whilst an increase in pH might change the species composition of small areas of grassland it would not change its structure, and therefore not have a significant impact on the key insect populations.

The effect of the previous use of limestone ballast was reviewed during the May 2011 survey. No evidence could be seen that there had been any impact on vegetation of adjacent areas, with highly acidic grassland remaining just below areas surfaced with limestone. A distinctive vegetation has developed in small patches on the ballast, particularly on parts of steps. This vegetation is not diverse and does not have species of significant conservation value, but it does support nectar-rich plants that provide a food source for insects. Similar vegetation would develop on lightly-trodden patches following any resurfacing.

ii) Plastic grid with grass growing through. This method would appear more acceptable. However, it is unlikely that either turf or seed would establish readily without topsoil being imported. Topsoil would allow more vigorous vegetation to become established and it would be difficult to contain the more fertile soil within the steps. This option would therefore involve the possibility that a zone of lush grassland would become established alongside the path. This would deprive invertebrates of an area of the bare ground or very sparse vegetation that they require, and may shade adjacent areas to some extent. It might therefore have some adverse impact in a more widespread area. It is therefore considered that

this would potentially have a more significant adverse impact than would the use of aggregate. If seeding is required in any area then fine grass species should be used, the most suitable being Chewing's fescue (*Festuca rubra ssp commutata*), which is clump forming but does not spread like some other commercially available fescues. Common bent (*Agrostis capillaris*) would also be acceptable but might not be sufficiently hard-wearing.

Concrete is relatively inert and its use for footing would probably not have any impact beyond that of the actual loss of small patches of vegetation.

### 2.1.3 Construction Methods

There are no items of environmental legislation that affect the proposed works, apart from the requirement to safeguard the nature conservation and amenity value of the LNR.

The timing of the works is probably not crucial; since life stages of the key invertebrates will be present in the ground throughout the year. The ground is very free-draining and therefore not vulnerable to water-logging and consequent compaction.

The main constraint on construction methodology will be the need to carefully site all works, including tipping areas from excavation. Features such as compounds would also need to be carefully sited. The working corridor should be kept as narrow as possible. The importance of protecting a superficially unattractive habitat impressed on contractors. Details of the vegetation alongside the path are given in the Appendix, and should be referred to whilst planning works.

## **2.2 Summary**

In summary it should be possible to replace the steps, either with or without a handrail, without significant adverse impact, provided that working methods and routes are carefully designed. The use of a limestone aggregate would probably have lower impacts than importation of topsoil. Construction of steps to DDA standards would have a greater adverse impact, even with careful design, and might damage a key feature of Troopers Hill's biodiversity interest.

## **3 OTHER PROPOSALS**

An initial assessment suggests that the other proposals should not have any significant adverse ecological impact. The aim of waymarking paths through the Crews Hole woodland would be to increase visitor numbers on the hill. This in line with the amenity aims of LNR management and is unlikely to have any significant adverse impact. A relatively high level of public use is beneficial to the Hill's habitats, since it maintains areas of short and sparse grassland in the

absence of grazing or mowing. The main adverse impact associated with public access is dog fouling, which raises soil fertility, but it seems unlikely that the proposals will lead to a significant rise in the level of fouling.

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## APPENDIX – VEGETATION TYPES ALONGSIDE PATH

Most of the habitats adjacent to the footpaths are of ecological importance; particularly important are areas of sparse, herb-rich grassland and patches of bare friable soil. The following descriptions identify areas of particular sensitivity, and also those areas that are less sensitive to disturbance. These are a mixture of areas of nutrient-rich grassland, which are of low intrinsic interest, and areas of tall herb vegetation, which are of higher interest (largely as a nectar source for insects) but can be expected to recover from disturbance more readily than the sparse grassland and bare ground.

The path is described facing uphill.

1 The lower part of the path, between the highway boundary and the bottom of the lowest flight of steps, is of low ecological value and lacks sensitive habitats.

2 Lower steps (bottom flight):

i adjacent to the bottom 13 steps there are no sensitive habitats to either side of the path.

ii between steps 14 and 17 there is sensitive grassland to the left (west) of the path but the habitat to the right is not sensitive.

iii from step 18 there is sensitive grassland immediately to both sides of the path and the working corridor should be kept very narrow here. There would be some benefit in cutting back the bramble to the left (west) of the path and the bramble, hawthorn and cotoneaster to the right (east) of the path.

3 Lower steps (stretch without steps between two flights):

i There is sensitive grassland to either side of the path throughout this section.

4 Lower steps (upper flight):

i adjacent to the bottom 6 steps there is sensitive grassland on the right (south-eastern) side of the path but the habitat to the left is less sensitive.

ii for the remainder of the flight the grassland to either side of the path is sensitive.

5 Around the bench above the lower steps there is a patch of bare ground to the south of the bench and a small area of lush grassland to the north-east of the

bench that could both be used for storage etc, but the adjacent slopes have sensitive grassland.

6 Between the lower and main steps:

i the habitats immediately adjacent to the path are not highly sensitive but there is valuable grassland in the hollow to the left (west) of the steps. Bramble clearance here would be beneficial.

ii where the paths meet below the main steps there is an area of bare ground to the right (east) of the path that is highly compacted and could be used for storage etc. The grassland to the left (west) of the path is sensitive, however.

iii the bare soil on the slope above here is less compacted and is a key invertebrate habitat; it should not be disturbed.

7 Main steps:

i to the left (west) of the path there is a strip of disturbed grassland that is not sensitive approximately 50cm wide beyond this the shorter grassland is highly sensitive.

ii to the right (east) of the path the strip of non-sensitive habitat is narrower, extending as far as the narrow informal path. Beyond this the grassland is highly sensitive.

iii sensitive grassland is also present on both sides of the path between the main steps and the top steps.

8 Top steps:

i on the left (west) side of the path there is a large patch of bramble and tall grassland that is not sensitive and could be used for storage etc.

ii for the lower four steps there is sensitive grassland to the right (east) of the path but the habitat to the left (west) is not of interest.

iii along the middle section of the steps the grassland to both sides of the path is of low interest.

iv adjacent to the top two steps there is grassland of interest to the right (east) of the path but the grassland to the left (west) continues to be of low interest.

9 Above the top steps the habitat continues to be of interest, with the exception of an area to the left (west) of the path that could be used for storage etc.



# Troopers Hill Local Nature Reserve

## Proposed Works – Community Spaces Grant

