

Scottish Upland Path Audit

An initial investigation into the extent of path repairs needed in Scotland's hills.

Summary

This desk-based study has drawn together the first national picture of the scale of upland pathwork undertaken to date and the remaining challenges to bring Scotland's upland paths into management.

Around 700km of paths have been repaired and restored over the last 30-40 years and the study has identified a further 410km that are in need of repair. An initial estimate of between £27 and £30 million is required for capital investment to secure and enhance the benefits of these paths to the nation, its people and the visitors who come to enjoy Scotland's mountains. The investment would, over a ten-year period provide stability to a fragile industry and secure upwards of 40 skilled jobs in rural areas (not accounting for any multiplier effects). This investment would help to sustain and nurture the estimated £1 billion of value contributed by upland paths to the economy over same period.

The challenge of managing the impacts of recreation does not end with capital repairs and, like all infrastructure, upland paths need care and maintenance to ensure that the investment is worthwhile and the benefits can continue to be enjoyed. This study has also estimated, for the first time, the likely resource requirements and employment opportunities to sustain the management of Scotland's upland paths. This will be an incremental cost during the major repair phase which would reach approximately £400,000 per annum to maintain 1,100km of upland path and provide long term skilled employment opportunities for at least 20 people.

It is estimated that the cost of gathering the necessary information for each path, which would allow the detailed analysis of repair requirements, could cost up to £25,000 and this would also enable the prioritisation of repairs across the country.

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1 Background

Since the early 1980s, considerable volunteer and professional effort has been dedicated to minimising and reversing the adverse impacts caused to Scotland’s mountains by recreation. From small, experimental beginnings to the development of a highly skilled industry, many millions of pounds of public money and charitable donations have been spent on upland path repair and management. However, there remain some significant challenges to controlling impacts on Scotland’s hill paths, related to geography, land ownership and management, changing recreational patterns and expectations and, perhaps critically, the availability of funds to continue path management. Up to now estimates of the future scale and cost of repairing the remaining upland paths in Scotland have been rudimentary at best and this study is the first attempt to collate a national picture and generate a basis for forward planning upland path management.

It has been estimated by Scottish Natural Heritage that upland paths help to generate, indirectly, upwards of £100m per annum through in-country and external tourism which is particularly valuable in rural and remote areas of Scotland. Paths are often considered a resource or an asset, but can also be a liability if they are not adequately managed. Their value goes beyond monetary terms, providing opportunities for people to enjoy Scotland’s extraordinarily diverse landscapes in many different ways, and contribute to mental and physical wellbeing. However, without sustained intervention it may not be possible to retain the range of landscape, habitat, environmental, economic and social values of upland paths in Scotland.

1.1 Acknowledgements

The audit was completed with the assistance and extensive knowledge of a number of individuals and organisations through an online survey, the practitioners’ workshop and by email correspondence. Significant input was provided by Fiona Cuninghame (Scottish Natural Heritage) throughout the study.

Information was contributed by staff from Forestry Commission Scotland, Highland Council, John Muir Trust, National Trust for Scotland, Nevis Partnership, Outdoor Access Trust for Scotland, Pentland Hills Regional Park, Ramblers (Scotland), Scottish Borders Council and Scottish Natural Heritage.

The workshop was hosted at Battleby and was attended by Dr Bob Aitken (Scottish Mountaineering Trust), Jonathon Binney (Mountaineering Scotland), Bob Brown (National Trust for Scotland), Fiona Cuninghame (Scottish Natural Heritage), Jack Mackay (Forestry Commission Scotland), Matt McConway (Upland Access Limited), Dougie Sinclair (Nevis Partnership) and Mark Wrightham (Scottish Natural Heritage). It was facilitated by Chris York (Walking-the-Talk) and notes taken by Linda Wilson (Notetaking Scotland).

2 Definitions

For the purposes of this audit upland paths are considered to be evolved, repaired or constructed paths in the hills of Scotland that are constructed in an “upland style” as described in the Upland Pathwork Manual (UPAG, 2015). They are non-vehicular and primarily for recreational use. The main underlying principle of upland path repair is the protection of the environment, rather than development of access facilities, although it is recognised that these two factors cannot be completely disentangled.

Some general exclusions have been applied:

- vehicle tracks (for hill routes that include sections on a track, parts of the route on vehicle tracks are not included in calculations)
- paths that have been specifically developed and designed for mountain bike use in one direction (often referred to as ‘singletrack’)
- paths that have been developed to stimulate demand or encourage access where there has been little evidence of previous damage, except where they overlap with sections of hill routes
- infrastructure associated with upland paths such as bridges

In this audit, the paths that have been included show physical signs of damage and deterioration, usually caused originally by recreational use, but which may have been overtaken by environmental pressures, such as water flowing down the path line, or extreme weather events. In some cases paths have been previously repaired, but for one or more reasons it is necessary to reinvest a capital sum. This could be due to changes in recreational patterns that were not foreseen, insufficient drainage or unsuitable path construction, or catastrophic failure due to extreme weather events. There are also a number of paths where maintenance has been insufficient and they have deteriorated to the point that they need to be repaired.

3 Purpose of the Upland Path Audit

This work is being done to help assess the level of investment required in upland paths throughout Scotland. This is the first stage of accurately estimating the scale of the required investment that would help protect the benefits that upland paths bring to local economies.

The objectives of this stage of the work were to identify the paths in need of repair, develop estimates for the overall capital investments and maintenance, and prioritise those paths that require more detailed survey.

4 Process of identifying paths in need of attention

A provisional list of upland paths that need attention was drawn up through input from an online survey and direct contact with path managers, which highlighted 72 paths. A workshop was used to examine the list, identify gaps in knowledge and point towards potential sources of further information.

Additional paths were then included following further desk-based analysis of information available on the internet (e.g. Walk Highlands website) and from information provided from further requests to give a list of 129 paths in need of repair (see Appendix 1), some of which have been repaired or managed in the past. The list was reduced to 116 by excluding some paths that didn’t match the definition of Upland Paths. Where survey data was not available paths were mapped digitally at a broad scale to provide an estimate of the path length, so path lengths have been considered as a range of $\pm 10\%$ when calculating costs.

A further 198 paths (over 700km) have been identified where ongoing maintenance is required to secure the previous capital investment that has been made. Not all of these paths currently have maintenance

regimes and they will be deteriorating – these will potentially need to be added to the list of paths requiring further capital repair unless they can be brought into a maintenance programme soon.

This is the first attempt to collate a national picture of upland paths so there are likely to be paths that have been omitted; although the audit is presented in good faith, it does not claim to be a complete picture of upland paths that are, or need to be, within a maintenance programme.

4.1 Limitations on the available data

The level of detail available for most paths within this audit is insufficient to allow an accurate assessment of the management needs of all upland paths in Scotland. There are a number of paths (c25) where a recent Condition Survey (the industry standard reconnaissance method) or specification survey is available to allow accurate estimation of likely costs. For the remaining paths, the cost of path management has been based on the broad assumptions outlined below to calculate the likely investment that would be required to control and reverse the impacts of recreational use of Scotland's upland areas.

The National Trust for Scotland undertook a full audit of their 419km of upland paths in 2018 and following discussion with the Trust's Paths Manager, an allowance for capital repairs has been included in this audit based on 20% of paths on Trust land requiring work. This is an initial estimate and will be revised when the audit has been fully analysed.

5 Basis for estimating costs

The path identification process revealed approximately 410km of paths that need repair. A simple calculation based on previous project costs would be one way to estimate the likely cost of future programmes. Available figures put the average cost of repair per kilometre of path at between £22,000 and £45,000 (these are taken from multi-path projects run by different organisations). Without accounting for inflation, that could suggest a total cost of between £11 million and £22 million for the 410km of identified paths. However, the basis of these figures is not consistent and they represent different approaches to delivery so are not easily compared. It is therefore difficult to translate this to paths within the audit with confidence.

In most cases, the figures available are contractors' costs, and exclude the overhead of project development and oversight during delivery. Calculation of cost-equivalence from volunteer work can be done but is wide open to debate, therefore has not been included.

Estimated costs for this stage are therefore derived from a judgement matched against out-turn costs from a wide range of projects delivered at different times and with a range of management objectives. A baseline figure of £90 per linear metre, of upland path repair has been used, which can then be adjusted according to the potential solution for each path in recognition that not every metre of path requires intervention and the total cost of path repairs is below £90,000 per kilometre.

Do path repairs really cost £90 per metre?

The baseline figure was developed by aggregating actual costs for different path restoration contracts (this comes from around 40 individual projects plus aggregated costs from a range of multi-path projects), some of which have been implemented by hand and others using excavators across a period of years. The actual cost per metre has varied from c£30/m for 'machine built' sections up to c£220/m for stone pitching done by hand with import of stone. This 'average' cost of £90 per metre relates to work on the ground rather than the 'total managed path length', as repairs are often undertaken in discrete sections, with little or no work in between. However, figures are often quoted as the total cost per metre for the whole path, which is often much lower, and can lead to confusion if this distinction is not accounted for.

The estimated costs and different options for management have been developed to provide a logical framework for estimating funding required. They give some flexibility in determining costs but cannot be used to allocate nominal sums to an individual path. Such calculations cannot reasonably be done without a detailed condition survey as well as better information about the repair and restoration requirements. This information would include objectives for path management, any constraints on availability of materials, access to the site and environmental conditions.

It is also worth stressing that the apparent financial benefits of “machine-assisted” repairs cannot reasonably be applied across all upland paths in Scotland because not all paths are suited to the use of machinery. There is a range of topographical, logistical or safety reasons that prohibit or restrict machine access, and many locations are considered inappropriate for the intensive interventions that may result from the machine-built approach.

Capital-intensive projects have been used for upland pathwork for at least twenty-five years and have influenced the style of repair and restoration, given that resources for maintenance have generally been time-limited at best. This has resulted in ‘single pass’ restoration in many cases, which involves a one-time intervention of capital repair, within a project involving a number of paths or as a single path, followed by a period of maintenance. Organisations such as NTS and JMT have developed more of an ‘ongoing relationship’ approach to repair and management, which can adapt to changes over time. Each approach has advantages and disadvantages but it is beyond the scope of this audit to critically analyse them. Some organisations have generated skills and capacity with volunteer labour, thereby reducing the ‘cash cost’ of path repair.

This audit does not advocate a particular delivery approach but needs to take account of the prevailing capacity and contract mechanisms to establish likely approximate costs at the national scale. Actual costs can also vary significantly depending on the prevailing ‘market conditions’ and location, as well as the delivery mechanism.

6 Options for management

Each path in the audit that has not already been surveyed has been nominally allocated a level of intervention based on information currently available, and a range of assumptions has been made about the potential solutions for these paths. There may be more than one solution available for delivery, but at this stage it would be unhelpful to prejudge the exact combination of techniques that would be appropriate, hence the use of generic options. Some of the interventions have been allocated on the basis of the path’s location or setting, where there is considered to be an obvious overriding rationale to use a given option.

6.1 Full restoration

Full restoration involves a full range of techniques that are described in the Upland Pathwork Manual – it will be a combination of drainage to control water, path repair with aggregate and stone (some of which might need to be imported) and landscaping to restore the habitats. Every path has a unique requirement and without a ground-based survey the actual work needed cannot be determined.

Past projects have not often repaired the entire length of a path; instead the work is carried out in discrete sections. It has been assumed, therefore that at the baseline cost per metre along the whole path can be reduced to 75% of the full cost of repairing every metre of path, meaning the overall cost per kilometre is reduced to from £90,000 to £67,500 to reflect that work is mostly done in discrete sections. However, it does not necessarily mean that there will be 750m of path repaired in every kilometre, this is an

approximation for the sake of simplicity. A number of ‘scenarios’ have been put together in Table 1 to indicate how the model compares with combined costs for different techniques (all figures are hypothetical but are based on the outputs of previous projects that were classed as full restoration).

Table 1 scenario based costs of full restoration

Built length (of 1km total)	Pitching at £220/m	Hand built aggregate at £90/m	Machine built path at £40/m	Cost
460m	200m	260m	0m	£67,400
600m	200m	400m	0m	£80,000
600m	300m	300m	0m	£93,000
600m	50m	250m	300m	£42,500
750m	250m	500m	0m	£100,000
700m	100m	0m	600m	£40,000
850m	250m	300m	300m	£91,000
900m	0m	0m	900m	£27,000
<i>680m (68%)</i>			<i>Average:</i>	<i>£67,613</i>

6.2 Partial repair

Many paths will have extensive sections that currently have limited damage or are less dynamic for one or more reasons. They will require repair using the same methods as for full restoration, but less of the path is in a condition that warrants substantial intervention. These paths may have had work done previously, some of which may have failed.

For the purposes of estimating the costs, it has been assumed that these paths will require repairs on 40% of their length or that capital repairs would equate to 40% of the baseline cost per kilometre.

This level of intervention has also been used for the 20% of paths on NTS properties likely to require repair to provide an estimate of the likely costs for those paths – this is the equivalent of allocating £90 per metre for 33.5km of paths within the total of 419km managed by NTS (or 8% of total path length).

6.3 Early intervention

There are some paths where it is possible to arrest and reverse the damage by undertaking partial repairs, focussing on dynamic (rapidly changing) sections or by removing water from the path. In some places ‘line definition’ can be used to limit the damage where the vegetation and underlying soil / subsoil can cope with trampling pressure.

For early intervention to be successful it should not increase pressure on areas where damage is likely to accelerate without further work. This means, for example, that repairing short boggy sections across a blanket bog is unlikely to be a sustainable solution as areas at the end of the repaired sections will deteriorate as visitor pressure is concentrated on these points, and early intervention is therefore not the appropriate solution.

For the purpose of costing these paths it has been assumed that, on average, 25% of the path length will be repaired using the same range of techniques as full restoration or the capital repairs would equate to 25% of the baseline cost per kilometre.

6.4 Minor Repairs

For paths that have previously had repair and restoration work undertaken, it will sometimes be necessary to carry out repairs to specific sections of the path. This is more intensive work than routine maintenance, and may involve reconstructing previously built features that have failed, closing down new desire lines or resurfacing sections that have exposed sub-base materials. In order to be considered as minor repairs (rather than full or partial restoration) it has been assumed that work is required on less than 10% of the total path length or the capital repairs would equate to 10% of the baseline cost per kilometre.

6.5 Light touch or minimal intervention

Some paths require special treatment because of their location in areas of high landscape sensitivity or protected habitats. The techniques include line definition by moving boulders or turf to help focus use along particular routes, landscaping and subtle drainage works. The term light-touch has often been misused or misunderstood to suggest insubstantial work, and minimal intervention may be more appropriate to indicate the least amount of work possible to be effective. This type of work is highly specialised, can be locally intensive, always needs to be done by hand and needs to be carefully developed in collaboration between the path manager and the path workers. Pricing this type of work by quantities is notoriously difficult but can be effectively managed through day-rate work with ongoing supervision and negotiation to ensure a quality outcome.

For the purposes of calculating costs, it has been assumed that 50% of the baseline cost per kilometre would provide a reasonable budget in most situations, although this would be dependent on detailed survey before any individual path budget is settled.

6.6 Maintenance only

A total of 709km of upland path have been identified within this audit that have previously been repaired or are being managed (e.g. National Trust for Scotland or John Muir Trust properties). This represents 198 paths across Scotland. These paths need to be maintained on a frequent, if not regular, basis. There is no such thing as a 'fix and forget' solution even though this approach has occurred more often than it should. The amount of maintenance work is likely to vary from year to year and at times will enter a 'grey area' close to minor repair, where features are rebuilt or repaired. At the very basic level, maintenance should be planned and preventative, clearing drainage features and ensuring that the surface is clear of obstructions or unusually loose material. This is most usefully achieved through day-rate work by contractors or in-house staff and can be accompanied by inspections to highlight where resources need to be targeted most effectively. Some maintenance tasks can be successfully undertaken by volunteers, but it is not usually reasonable or viable to offload this essential aspect of path management to an entirely voluntary effort.

Contrary to popular belief, maintenance cannot be done on paths that have not been previously repaired or restored – such work would be early or minimal intervention. It is important to recognise, however, that the type of maintenance will reflect the original choice of intervention. This means that paths that have had full restoration should require less intensive maintenance than those that have had minimal or early intervention.

Long term maintenance budgets should also include an allowance for additional minor repairs, around 10% of the capital cost every 10 years, which is the equivalent of 1% per year. This element has been added to the capital costs for the 709km of paths by calculating the repairs as £9,000 per kilometre (excluding the 84km of NTS paths that have already been allocated within the partial repair option).

Maintenance is a long term, annual commitment that is an integral part of investing in Scotland’s mountains for their sustainable future and all paths need to have a maintenance schedule as part of their overall management.

For the purposes of calculating costs it has been assumed that a team of two people can undertake maintenance operating for approximately eight months, and costs £32,000 per annum to resource.

6.7 Summary of options and cost calculations

The overall cost per kilometre has been calculated by taking the estimated cost per metre of path repair (£90) and multiplying it by the proportion likely to be required for a given option. Table 2 indicates the cost used in the audit to calculate estimates for the total investment required:

Table 2 summary of options

Option	Equivalent proportion of baseline	Adjusted Cost per kilometre
Early intervention	25%	£22,500
Full restoration	75%	£67,500
Partial repair	40%	£36,000
Light touch / minimal intervention	50%	£45,000
Minor repair	10%	£9,000
Surveyed	variable	£32,000

Taking these adjusted costs per kilometre and applying them to paths and the respective options within the audit, results in an overall average cost of £38,000 per km.

6.8 Work potentially required

Where a condition survey has been done, the costs are taken from the survey instead of the modelled costs. However, for the remaining paths, estimating the level of intervention and range of techniques appropriate for every section of path was not an objective of this project. An indication of the type of work for each path has been made based on the information available. Assuming that full restoration is the best option for all paths would be naive and potentially reckless; likewise using minimal intervention techniques on popular, heavily used paths is unlikely to provide a sustainable solution. As highlighted above, not all paths need work along their entire length and this adjustment is made to avoid significantly over-estimating the task. To avoid confusion, Table 3 includes the mapped length of the path (or identified section of damaged path) rather than the calculated proportion of path requiring repair.

Some of these paths have had work done in the past, including privately funded as, for example, stalkers paths, and some of the work is on sections that have not previously been repaired. Of the 50 paths that have had work previously undertaken, 13 have been allocated for full or partial restoration work amounting to approximately 50km of path.

Table 3 summary of options for audit paths

Status	Work type	Length for repair (m)	Surveyed path costs	Number of paths
No previous work	Early intervention	21,460		4
	Full restoration	67,090		24
	Light touch / minimum intervention	6,520		2
	Minor repair	11,670		3
	Partial repair	27,460		4
	Surveyed	(87,297)	£1,894,965	29
Previous work	Early intervention	6,430		2
	Full restoration	29,890		8
	Light touch / minimum intervention	8,550		5
	Minor repair	47,310		11
	Partial repair	23,140		5
	Surveyed	(73,743)	£1,368,991	19
	Total	410,560	£3,263,956	116

6.9 Geographical distribution of upland paths in need of capital repair

As might be expected there is not an even distribution of paths that require capital investment, although it is useful to note that both of Scotland’s National Parks are significantly under-represented thanks to the previous investment in upland paths within these areas. For the sake of delimiting the distribution, the Local Authority Boundaries have been used – some paths cross administrative boundaries, but these have been allocated to a single Local Authority rather than being duplicated or split as shown in Table 4 and on the maps in Appendix 2.

Table 4 paths requiring repair by local authority

Local Authority	Length for repair (m)	Number of paths
Aberdeenshire	7,110	6
Angus	1,000	1
Argyll & Bute	29,860	7
Dumfries & Galloway	10,760	4
Edinburgh, City of	7,050	4
Highland	274,843	65
Midlothian	29,137	12
North Ayrshire	1,970	1
Perth & Kinross	17,650	7
Scottish Borders	4,690	2
South Ayrshire	1,860	1
South Lanarkshire	3,780	1
Stirling	16,370	4
West Lothian	4,480	1
Total	410,560	116

This list is provisional and can be updated as more information becomes available and does not include the paths on National Trust for Scotland properties. It is likely that, once the report is published, other paths will be identified that need to be added to the list. Given the organic nature of this process, this is considered to be the lowest likely amount of path that requires attention.

6.10 Maintenance of previously repaired paths

Not all of the previously repaired paths have an active maintenance programme and funding opportunities for maintenance are restricted. Currently maintenance is done on a slightly precarious basis using donations and a significant input from volunteers. This means that some of the previous investment in upland paths is at risk, and it is considered an integral part of the audit to highlight the importance of ongoing maintenance to secure any investment, particularly if it is to involve money from the public purse.

7 Priorities

There are a number of factors that need to be taken into account when prioritising upland paths for repair. Paths that are known to be deteriorating rapidly are generally seen as high priorities, especially where the main cause of deterioration is through recreational use. Paths within sites designated for their conservation value, and paths that have a high landscape impact also need to be dealt with quickly. The rate of deterioration will need to be considered as part of the ground-based survey of each path.

The priorities may be affected by sensitivities in land ownership / management or capacity within the area for implementing high quality upland pathwork.

8 Budgeting and capacity

The modelling and survey costs have been collated to indicate the total cost of capital repair and ongoing maintenance, including a notional allowance for inflation. However, in order to deliver the scale of repairs indicated by the audit a number of issues also need to be considered, notably whether there is sufficient capacity within the industry to undertake the work and how long it might reasonably take to implement.

8.1 Capital repairs

Using the estimates of intervention, the total cost of repair and restoration of the paths within this audit ranges from £20 million to £24 million (not accounting for inflation over the period of implementation). Table 5 indicates the level of investment required for the paths within this audit (using the lengths mapped).

Table 5 outline costs for audit paths by option

Option	Adjusted Cost per kilometre	Total in audit (km)	Calculated cost
Early intervention	£22,500	27.9	£627,500
Full restoration	£67,500	97.0	£6,546,200
Partial repair	£36,000	50.6	£1,821,600
Light touch / minimum intervention	£45,000	15.0	£678,200
Minor repair	£9,000	58.9	£530,800
Surveyed paths	£38,000	161.0	£3,264,000
NTS capital repair	£36,000	83.7	£3,015,000
Minor repair of previously worked	£9,000	625.2	£5,627,000
Total		1,121.0	£22,110,300

Assuming that the cost of project managing the delivery of such a programme would add 10%, the total cost of capital works is estimated as being between £21.9 and £26.8 million.

Assuming that it is possible, on average for path workers to be on the hill for eight months of the year, this gives 144 team-days per annum (based on working 10 days in every 14, with 10% loss for weather / annual leave etc). If, on average, a team of four undertaking a range of restoration techniques can complete 20m

per team-day, each team could repair approximately 2.9km of path per annum. Although the model does not prescribe the amount of path that will be repaired on each path, the proportion has been used as a guide for estimating the total length of path to be repaired and how long that might take to implement, as shown in Table 6.

Table 6 capacity requirements for delivery of capital repair

Capital Option	Km per year	Total path	Team-years
Early Intervention	11.6	27.9	2.5
Full restoration	3.87	97	25.1
Partial repair	7.25	50.6	7
Light touch / minimum intervention	4.35	15.1	3.5
Minor repair	29	58.9	2.1
Surveyed	7.25	161.1	22.3
NTS Capital	7.25	83.8	11.6
Minor repair of previously worked	29	625.3	21.6

This requires a total of 96 “team-years” to complete the task, which means if 10 path teams were fully occupied for 10 years it might be possible to repair all of the paths within this audit. This assumes that there is a constant supply of work throughout the period with no significant capacity losses or delays.

Taking the estimates and developing a hypothetical ten-year programme, balanced across the whole period, with a conservative 2% annual increase in costs, the total investment for the capital programme would be £24.5 million to £28.1 million. This is considered to be a more robust basis for calculating the cost than the other methods, and can be easily refined as improved information becomes available.

These calculations indicate that with the current capacity of the industry it would take around 10 years to complete the capital works within the audit. Large scale or rapid expansions (and contractions) of the industry (e.g. to attempt to complete the programme more quickly) are unlikely to retain the skills and quality of work that is integral to upland pathwork, so a more planned or regulated flow of work would be beneficial to delivering sustainable solutions. This programme is, necessarily, seasonal and would require at least 40 skilled people annually to deliver high quality path repairs, plus at least three people to supervise quality control and coordinate the programme. The management costs would include provision for managerial and administrative staff. This study has not taken into account the need to train and develop the workforce over a sustained period to deliver high quality upland pathwork – this is considered to be beyond the scope of the study but may form part of the development process of the delivery phase.

8.2 Maintenance

There will also be an increasing need for maintenance capacity as the capital repairs are completed. Using a similar basis to calculate the team capacity for different options, a small team of two could maintain approximately 91km of upland path per annum (based on maintaining the different options in proportion). By the end of the programme 4 teams would be required to maintain the capital investment, plus a further 6 teams to maintain paths that have already had work done. This means a long term commitment to 10 maintenance teams (20 skilled people) across Scotland wholly devoted to maintaining upland paths.

The annual cost of maintenance by the end of the programme, taking 2% inflation into account is estimated in Table 7. It should be noted that not all ‘previously worked paths’ have been identified so this is a minimum figure.

Table 7 maintenance requirements for hill paths in Scotland

Paths	Total length (km)	Teams	Cost
Repaired paths identified by audit	496.1	4.2	£163,800
Previously worked paths	630	5.7	£222,300

8.3 Combined investment

Modelling the balanced implementation programme and including the increasing maintenance requirement during the ten years of capital investment gives a total cost of £27.4 million to £30.4 million.

9 Potential for deterioration

Natural processes cannot be stopped and recreation cannot be suspended while the process of engendering support and raising funds for repair takes place. This means that, inevitably, the longer paths remain unrepaired the greater the work that will be required. As highlighted above, this is the same for maintenance, and the ongoing deferment of routine tasks is storing up a larger capital repair programme in future. It is not possible to estimate the relative difference between immediate action and deferred repair or maintenance and there is no linear relationship between the length of time before repair begins and the likely cost. However it can be unequivocally stated that the only way to keep the costs and landscape impacts to a minimum is to act decisively and quickly.

10 Conclusions and recommendations

The audit has revealed a large number of paths that potentially need repair and restoration work that could cost between £27 million and £30 million if all the work was undertaken. This equates to an investment of around £3 million per annum for ten years, followed by an ongoing commitment of £380,000 per annum. This estimate can now be used to identify the budget to reverse the impacts of recreation on Scotland’s mountains with ground based surveys used to provide the detailed information about appropriate repair for each path and to assist with prioritising.

Each path will need to be assessed individually to determine what level of investment is appropriate. There needs to be a rationale for management which takes into account the physical characteristics of the path, the landscape and ecological sensitivities, remoteness of the site and the recreational value of the route – this should be considered as the first step in moving forward from the broad-brush national picture developed for this audit.

Public involvement in decision making is an important factor to take into account, but it may not be helpful to rely on this method for selecting which paths to include in a programme – it is prone to ‘campaigning’ and is dependent on adequate promotion across the country for it to be effective or equitable.

Assuming that the previous surveys do not need to be repeated and a very basic estimate of £100 per kilometre to produce the ground based condition surveys, this phase would potentially cost £25,000. It may be helpful to prioritise these surveys geographically and potentially undertake the work in phases to maximise the benefit of the work. This is beyond the scope of the current study.