

Howth Heathland Management Plan



DRAFT

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Particular acknowledgement is due to the dedication of Marion Kelly, goat herder, and the local goat wardens (Finola Young, Jaco Costello, Michael Murtagh and Jeromie Pageot) without whose assistance the two year goat grazing trials could not have been carried out.

Executive Summary

This Management Plan was prepared at the request of the Howth Special Amenity Area Order (SAAO) Management Committee in 2011 to assist them in managing the valuable heathland habitats. It was informed by desk research, fieldwork, a goat grazing trial and consultations with the regulatory authorities. Recommended actions are based on the principle that all management actions should be reviewed regularly by the committee to support on-going learning.

The valuable heathland on Howth is under threat from Birch and Rhododendron invasion and unmanaged inappropriate fires. This is due both to the demise of farming and use of publicly accessible areas for recreation.

Maintenance and enhancement of heathland now requires:

- The establishment of a community based “fire watch” .
- A strategic plan and yearly budget to manage invasive species.
- The development of closer links between the Howth SAAO Management Committee and organisations involved in heathland management nationally and internationally.
- An Advisory Service to ensure heathland is managed appropriately.
- A research and monitoring programme which will improve the baseline data, provide regular reports on heathland condition and particularly on the impact of management initiatives.

An indicative budget of 15k/year is required to implement these recommendations.

1 Introduction

This report was prepared for the Howth SAAO Management Committee, under the direction of Deborah Tiernan, Biodiversity Officer, Fingal County Council. The SAAO Management Committee is chaired by Helen Lahert, from 2015 and includes councillors representing the Howth/Baldoyle ward, council officials and representatives of local community development, recreation and environmental organisations. It was set up following the confirmation by government in 1999 that much of the undeveloped land in Howth Head and Ireland's Eye (Fig. 1) is a Special Amenity Area, making it a legal requirement that the area is protected and enhanced for its landscape, biodiversity and amenity values. Management priorities were initially developed through an EU funded project SEMPA (Suburban Environmental Management; A Participatory Approach) and have recently been reviewed in 2015, using a planning process which involved public workshops.



Fig. 1 Area covered by Howth Special Amenity Area Order

The SAAO covers 547 hectares and includes Ireland's Eye as well as most of the undeveloped land on the peninsula.

If a property or private land is included in the core area of the SAAO, the exemptions from planning permission under Class 1 of the Planning & Development Regulations 2001 do not apply. Associated with the Order, a twenty one kilometre network of trails was designated as “public paths”. To inform the designation process a map was produced showing the principal land uses including heathland related types. However the heathland area was not mapped separately but in conjunction with scrub and grassland (Fig. 2).

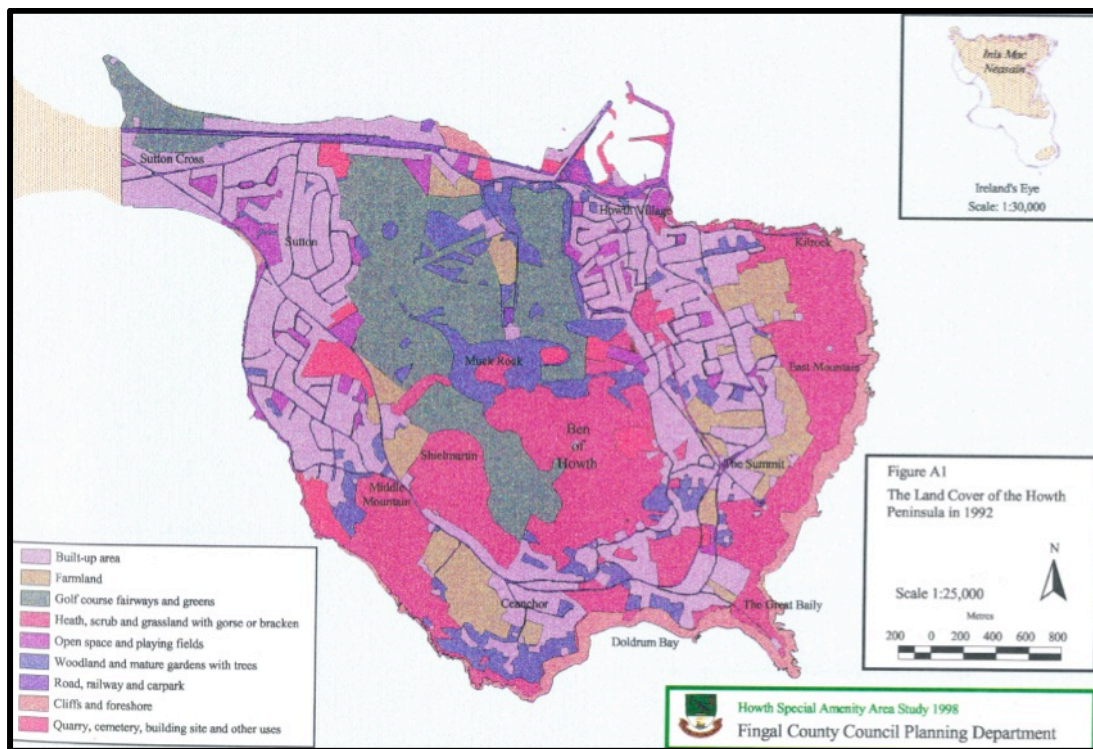


Fig. 2 Landcover map prepared in 1992 to inform application for SAAO Order

In the SAA Order several objectives refer to the importance of heathland.

Under Objective 1.1 “to manage the area in an integrated manner” there is a

requirement to address the issue of “heathland management including a burning programme and fire fighting emergency plan”.

Heathland found on Howth Head is an example of a habitat associated with the Atlantic region of Europe (Figure 3).

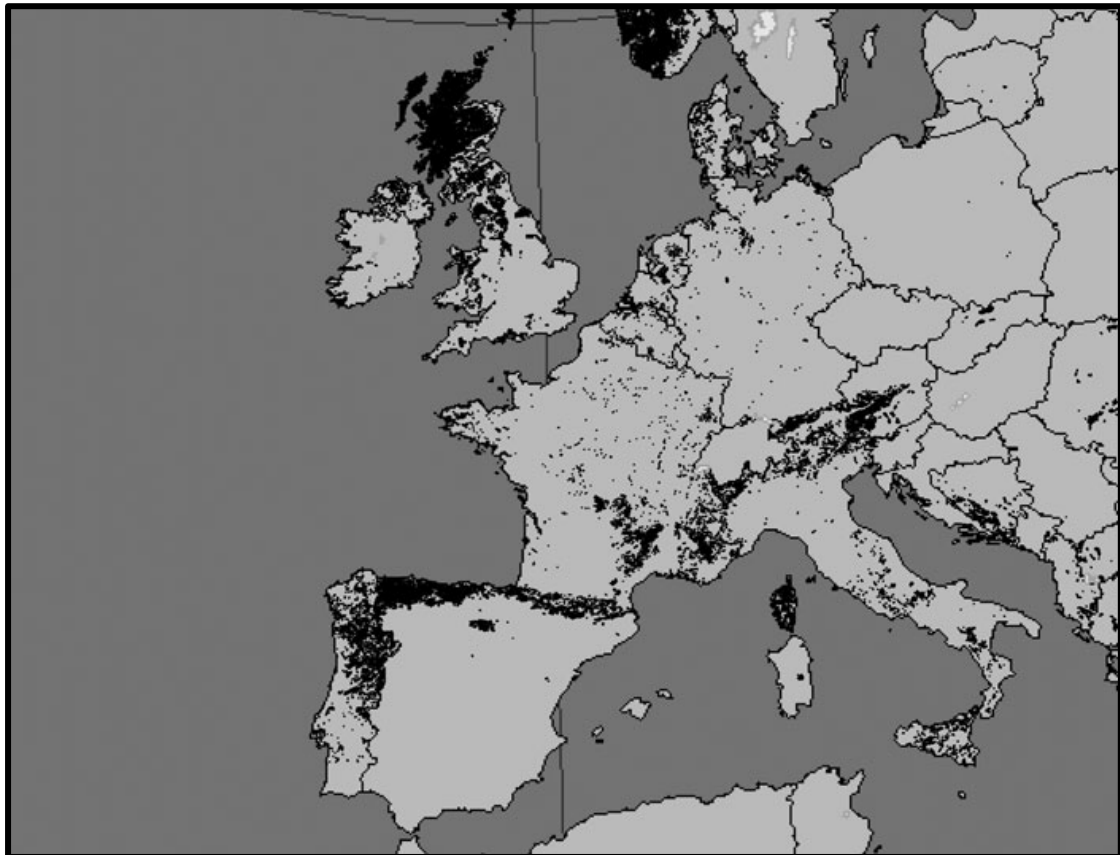


Fig. 3 Current heathland distribution in Europe (Source: Corine Land Cover 2000 seamless vector data. European Environment Agency (EEA))

Heathland on Howth principally appeared in the Bronze Age or even earlier after tree removal caused erosion and a decline in soil fertility. Therefore while most of the heathland on Howth is not a primeval vegetation type it is possible that the topmost parts of hills and exposed coastal locations may always have had this type of vegetation.

To be called heathland the vegetation must have at least 25% cover of shrubs (Fossitt, 2000). In Howth heathland consists of a combination of Ling Heather (*Calluna vulgaris*), Bell Heather (*Erica cinerea*) and Autumn Gorse (*Ulex gallei*). As its name suggests Autumn Gorse flowers in autumn. Another type of gorse is also found on Howth. This is Common Gorse (*Ulex europaeus*) or Furze. It prefers deeper soils and can grow up to 2 metres tall. It flowers in late spring/early summer.



Fig. 4 While two gorse species are in this image the easiest way to distinguish them is flowering time.

On Howth both gorse types are regularly seen growing together (Fig. 4).

This management plan is primarily concerned with heathland which has the two heather species and Autumn Gorse. Areas with gorse only (almost always the common type *Ulex europaeus*) are of less importance as this habitat

is commonly found throughout Ireland and Europe which rapidly spreads in abandoned land. (Fig. 4). Areas with both types of gorse are typically found close together and often in association with grassland i.e. areas without 25% scrub cover.

The commonest type of heather is Ling Heather which has very small flowers and tightly pressed leaves, resembling scales. Bell Heather has larger flowers and its leaves are arranged in threes around the stem.



Fig. 5 Ling heather, Bell Heather and Autumn Gorse.

Until relatively recently heathland on Howth was principally a resource for farming. The habitat was maintained through grazing and burning.

Quarrying and mining also occurred within heathland as rock was close to the surface. Quarrying still occurs on the Hill of Howth.

As an ancient cultural landscape, heathland is also important for many heathland plants, birds and invertebrates. A Flora of Howth published in the 19th century (Hart, 1887) listed several rare plants associated with heathland. These were *Filago minima*, *Eleogiton fluitans* and *Lythrum portula*. According to Declan Doogue, ecologist the presence of *Filago minima* is related to the occurrence of fire. The other two species were associated with wetlands. None of these species have been seen in recent decades.

Throughout Britain and Ireland the area of heathland has declined by 90% in the past 200 years (Stevenson and Thompson, 1993) due to land use changes, building and farming intensification. As a result of this decline and awareness of its special characteristics, heathland is now designated as a Priority Habitat under the EU Habitats Directive. Areas containing good examples must be designated by national governments as Special Areas of Conservation or Natura sites (under EU Habitats Directive) and a report must be provided by governments to the EU regularly on the condition of this habitat. The National Parks and Wildlife Service has recently reported that Nationally Dry Heath is in poor condition (NPWS, 2013). A more recent assessment of heath and scrub habitats listed under-management or abandonment resulting from under grazing, succession to scrub or heath, bracken encroachment as threats (DAHG, 2014).

The remaining valuable heathland on Howth is now protected by this designation known as an SAC (Special Area of Conservation) or Natura site.

The NPWS, as the regulatory authority for Natura sites has generic management objectives for priority habitats which are relevant to Howth heathland:

- To maintain the favourable conservation status of the Qualifying Interests of the SAC.
- To maintain the extent, species richness and biodiversity of the entire Natura site
- To establish effective liaison and co-operation with landowners, legal users and relevant authorities.

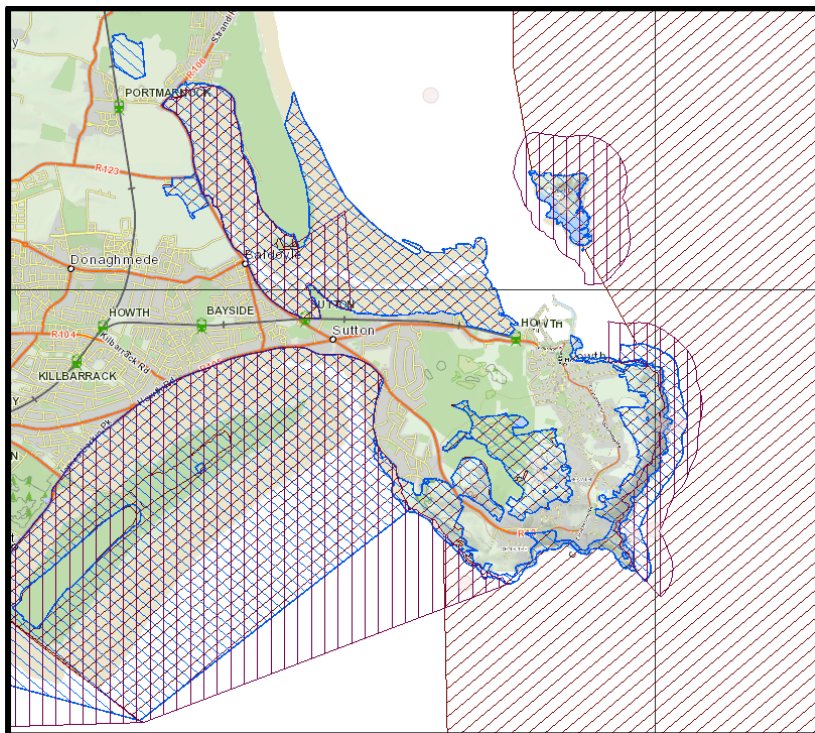


Fig.6 Area covered by EU Natura designations

As objectives for Natura habitats and the SAAO complement each other there are obvious synergies between the Howth SAAO Management Committee and the statutory responsibilities of the local authority and the NPWS.

While the heathland habitat has been listed as an important feature of the SAAO, its location has not been mapped accurately nor has its condition been assessed. Neither has a Management Plan been prepared for the SAC.

An ecological appraisal of Howth commissioned by the SAAO (Doogue, 2012) provided location details and accounts of important plant habitats. They are associated with a wide range of maritime and terrestrial habitats including unintensively managed grasslands and surviving small wetlands associated with heathland.



Fig. 7 Rare plant locations in Howth

The Heathland Management Plan was commissioned by the SAAO Management Committee in 2011 to examine the following issues:

- Location of heathland
- Characteristics of good quality heathland
- Factors affecting heathland biodiversity
- The impacts of fire
- The potential of fire and grazing to manage heathland
- Identification of management goals
- Indicators to measure the success of management

After this plan was commissioned the SAAO committee decided to implement a goat grazing trial in 2012 and 2013. Management and reporting of the biodiversity impacts of this trial were added to the brief for the study. In 2013 a further report was requested on the fires which affected the peninsula during that (unusually dry) summer.

Agreed outputs include this Heathland Management Plan and a digital data set describing the condition of heathland in discrete areas.

The principal objective is to enable the Howth SAAO Management Committee to make informed choices on how to use their limited resources to maintain and improve heathland biodiversity for future generations. It should capture the mutual learning during the several years over which the plan took shape. It should present management as a dynamic process, supported by on going learning which is thus able to respond to new opportunities and consider a diverse range of perspectives.

To characterise heathland quality a methodology developed for the National Parks and Wildlife Service (NPWS) by Perrin et al, (2014) was adapted for use in Howth. With the exception of inaccessible private areas for which access permission could not be obtained almost all heathland was directly examined in 2011 and 2012 by either Mary Tubridy or Brendan O' Hanrahan, who was a joint author of the NPWS report.

Contacts were developed with the NPWS, the regulatory authority for Natura sites, by the Biodiversity Officer. The Forest Service (Ciaran Nugent, Forestry Inspector) provided advice about managed burning and mechanical methods of managing tall heathland vegetation. A UK based provider of suitable equipment for flailing (i.e. mechanically cutting tall vegetation) inspected Howth heathland in 2012 at the invitation of Mary Tubridy in order to provide an opinion on the suitability of the terrain for flailing and a specification for an appropriate machine to carry out this type of management work.

The goat grazing trials in 2012 and 2012 were designed to examine the suitability of goats as grazers and raise awareness of management issues associated with abandoned heathland. Consultations associated with the trial provided valuable information on land use history and local attitudes to the re-introduction of grazing goats. Discussions were also held with three local landowners on the potential of expanding the grazing trial to other parts of Howth.

Appendices (in a separate document) contain detailed information about how the Management Plan was drawn up, a review of heathland management based on the literature, results of the 2012 Howth heathland survey, the goat grazing trials and an account of wildlives in Howth in 2013.

Appendix 1 Methodology

Appendix 2 Review of heathland ecology and management

Appendix 3 Howth heathland

Appendix 4 Goat grazing trials 2012-2013

Appendix 5 Heathland fires in 2013.

2 Assessment of Howth Heathland

2.1 Strengths of Howth Heathland

Howth is an unusual area of undeveloped upland as it is covered almost exclusively in one habitat type, dry heathland. It is protected not only under the EU Habitats Directive but also through the SAAO designation. Despite the absence of a Natura Management Plan the SAAO Management committee is aware of its value and Fingal County Council is in regular communication with NPWS to ensure that good practice in management is followed by the local authority and SAAO committee. Fig. 8 shows the location of dry heathland recorded in Howth in 2012.



Fig. 8 Heathland in Howth 2012

Fig. 9 shows the relationship between the SAAO and heathland.

While heathland dominated by low gorse everywhere in Howth qualifies as an example of the internationally important habitat, heathland of exceptional quality is found in areas which have been subject to little recreation pressure where fires rarely occur, which have been little affected by Birch or Rhododendron infestation and which are still used for low level grazing. This type of heathland is characterised by the presence of a mosaic of Autumn Gorse and heather. Lichens should be present at inland sites (indicating infrequent fires). The “best” quality heathland is found in the enclosed, private lands and lands managed for horse grazing in East and Middle Mountain. Rabbit grazing has an important local effect of maintaining grassland and heathland near the Martello Tower at Red Rock.

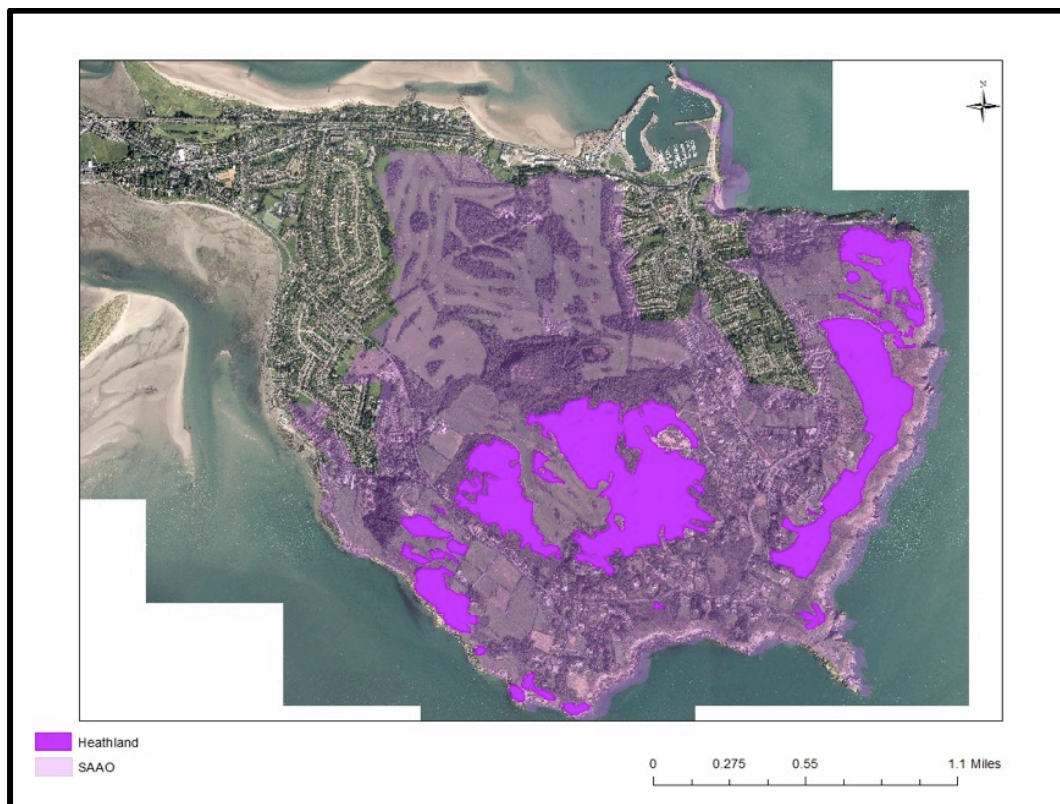


Fig. 9 Heathland and the SAAO

The presence of housing near the heathland is an asset for biodiversity as residents will notice fires and the fire brigade responds to call outs in such locations. This is not the practise if fire occurs in unoccupied area of countryside even if valuable heathland is at risk.

In contrast to many other places in Ireland with this valuable habitat, there is a long standing tradition of biodiversity related research in Howth, due partly to its location near Dublin. In the 19th century the famous naturalist Praeger produced a map showing the location of soils in Howth and thus indirectly locations where heathland may have been present.



Fig. 10 Praeger and Pethybridge unpublished map of Howth held in the National Botanic Gardens (courtesy of Daniel Kelly, TCD)

At a time when most of the land in Howth was farmed a Flora of Howth was produced which described the location of all plant species in Howth and noteworthy ones in heathland. In the 1990's before the SAAO was declared, habitat based plans and studies were prepared by An Taisce and Fas. The current resurvey of the Flora of Howth by the Dublin Naturalists Field Club is providing information on changes in the flora since the 19th century.

The traditional study of the area by botanists includes field studies carried out by undergraduate students from Trinity College Dublin, who until recently mapped heathland vegetation on part of the Hill of Howth. A research project carried out by an undergraduate in TCD (Shanahan, 2014) contributed to the evaluation of the goat grazing trial reported on in Appendix 4. Thus the heathland has been of particular educational value to third level institutions in Dublin.

The appraisal of Howth habitats (Doogue, op.cit) revealed the location of important areas adjacent to or within heathland. Fig. 11 below shows that rare plant sites occasionally overlap with heathland, generally in areas where semi-natural dry acid grassland occurs within or close to heathland.

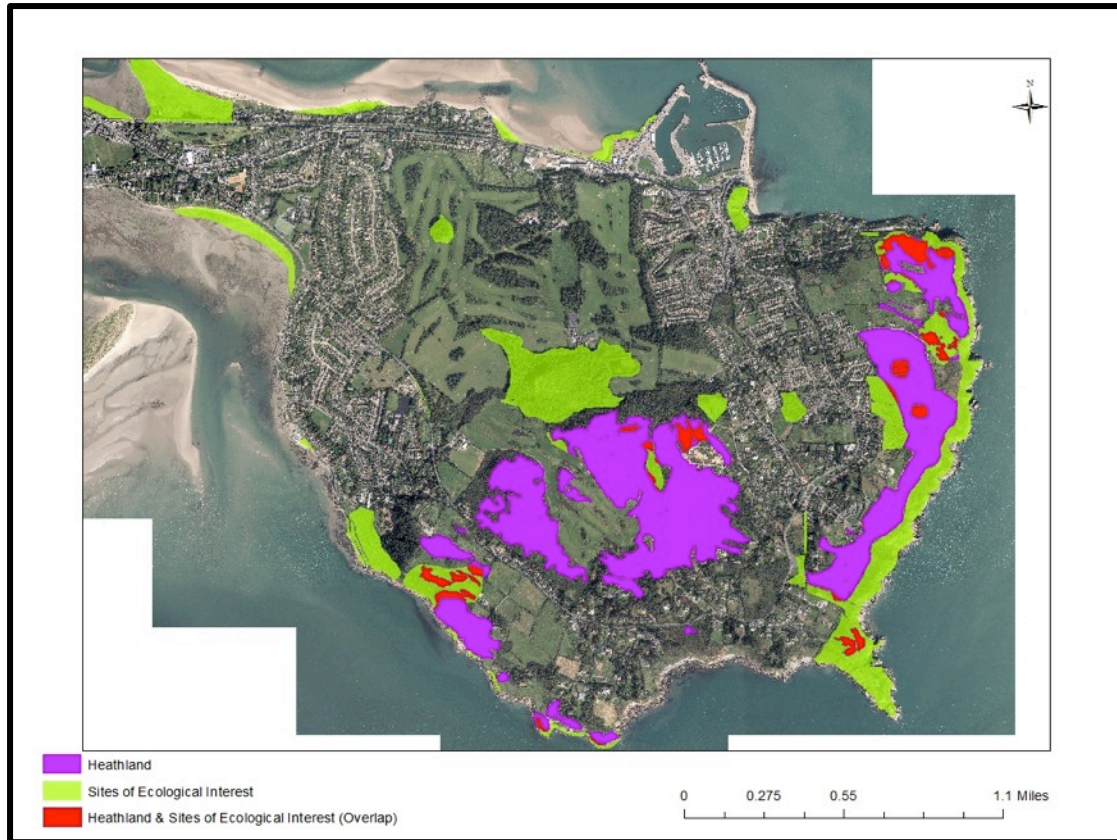


Fig. 11 Heathland areas in relation to rare plant sites

Almost everyone who visits Howth Head is aware that the heathland habitat enhances the beauty of the landscape (Fig. 12). Heathland cover is long standing, is easily visible and changes seasonally. Close up views reveal a surprising diversity as it often present in a mosaic with grassland or bracken. As a result of a long tradition of public access, particularly to the heathland owned by the Howth Estate, it is possible to enjoy a direct experience of this habitat and panoramic views of it and from it through a network of trails. This experience is enjoyed not only by Howth residents but by hundreds of thousands of visitors each year from the city and overseas.



Fig. 12 Heathland near the Bailey

Recent initiatives taken by the Howth SAAO Committee to protect heathland have the potential to inform heathland management efforts nationally. The goat grazing trial involved co-operation between the largest landowner, the Howth Estate, Howth Golf Club, Fingal County Council, the public and NPWS. As a result of the goat grazing trial there is increased local awareness of heathland management issues and some owners and lessees have become interested in actively participating in conservation grazing projects.

2.2 Threats to Heathland

Heathland is threatened by a number of pressures, some of which are interlinked. These are:

1. The spread of the invasives, Birch, Rhododendron, Tall Gorse and Bracken.
2. Regular uncontrolled fires in popular and accessible locations.
3. The absence of grazing.
4. Lack of easily available information to owners and managers about heathland biodiversity and management.

1 Spread of Invasives

Birch and Rhododendron are spreading into heathland from the semi-natural Birch woodland on the Hill of Howth and the historic Rhododendron garden.



Fig. 13 Birch invading heathland

The degree of threat from these plants depends on local environmental conditions and the proximity of sources of invasion to heathland. Birch is spreading more rapidly in sheltered locations. Research studies elsewhere

have shown that Rhododendron invasion is a greater risk to heathland than Birch. In contrast to Rhododendron, heathlands invaded by Birch retain some heathland flora and fauna. Under Rhododendron none survive. The goat grazing trial (Appendix 4) confirms that in the past the spread of these species were controlled by grazing animals particularly goats. Since farming has been abandoned on Howth, Birch has spread dramatically.



Fig. 14 Rhododendron in heathland

The spread of two other species Bracken and Tall Gorse are also directly related to the decline of farming as these plants started to flourish when grazing ceased on better quality land. The occurrence of regular fires supports their expansion and dominance in semi-natural areas. They are less of a direct threat compared to Birch and Rhododendron, as they are not associated with good quality heathland.

Bracken dominated areas are particularly poor for biodiversity, for farming and for recreation. They harbor ticks and bracken is toxic to animals. Spores

contain carcinogens. The presence of Bracken and Tall Gorse increases the rate of soil/peat erosion as very few plants grow below them. Thus particularly hot frequent fires affecting areas dominated by these species can lead to further soil erosion and biodiversity impoverishment. While Bracken and Tall Gorse are less of a direct threat to good heathland compared to Birch and Rhododendron their presence nearby or within mosaics with heathland increases the risk of uncontrolled fires in heathland.



Fig. 15 Burnt gorse patch near the summit car park

2 Uncontrolled fires

Research on heathland management (Appendix 2) confirms that optimum management should include managed burning and light grazing. Heathland plants can recover after burning if this occurs at the right stage of the growth cycle and does not cause the removal of soil. This is not occurring in Howth. Instead, uncontrolled burns are frequent. The severity of fires in some areas has led to the removal of peat soil. Heathland is probably not burnt at the correct growth stage because controlled burning is not occurring in Howth. As heather growth cannot tolerate regular intensive uncontrolled burning

burning in certain areas has led to the permanent removal of heathland plants and their replacement by either a monoculture of Bracken or Tall Gorse.



Fig. 16 Fire fighting on Howth in the summer of 2013

The location of fires suggests that recreational use is indirectly responsible for regular probably accidental uncontrolled fires, as these principally occur in the most popular and accessible areas.



Fig. 17 Area affected by one of the three large fires in Howth during summer 2013 (from report in Appendix 5).

The re-introduction of controlled burning as a management practise is limited by the suburban location of Howth. The map in Fig. 18 shows the extent of the area covered in low heather (<30cm in height) which is the optimum height for a controlled burn.



Fig. 18 Distribution of heather of suitable height for burning in Howth

The re-introduction of grazing, ideally by goats is unlikely due to the expense associated with establishing suitable boundary fences. The enclosure of heathland will require a planning consent as it will change the landscape. The support of residents, neighbours and recreational users will not be easily

given as there is now an established tradition of public access throughout the heathland, despite its ownership status. Dogs are allowed roam freely.

The importance of recreational use of heathland to the public has the further effect that most debates on heathland management focus on the issue of path maintenance. Partly because of the importance of path management less attention is paid to the management of heathland for its biodiversity value.

Heathland is threatened by lack of information as almost all landowners and lessees who manage valuable heathland are unaware of the presence and value of this habitat on their land. Overgrazing or undergrazing could occur.

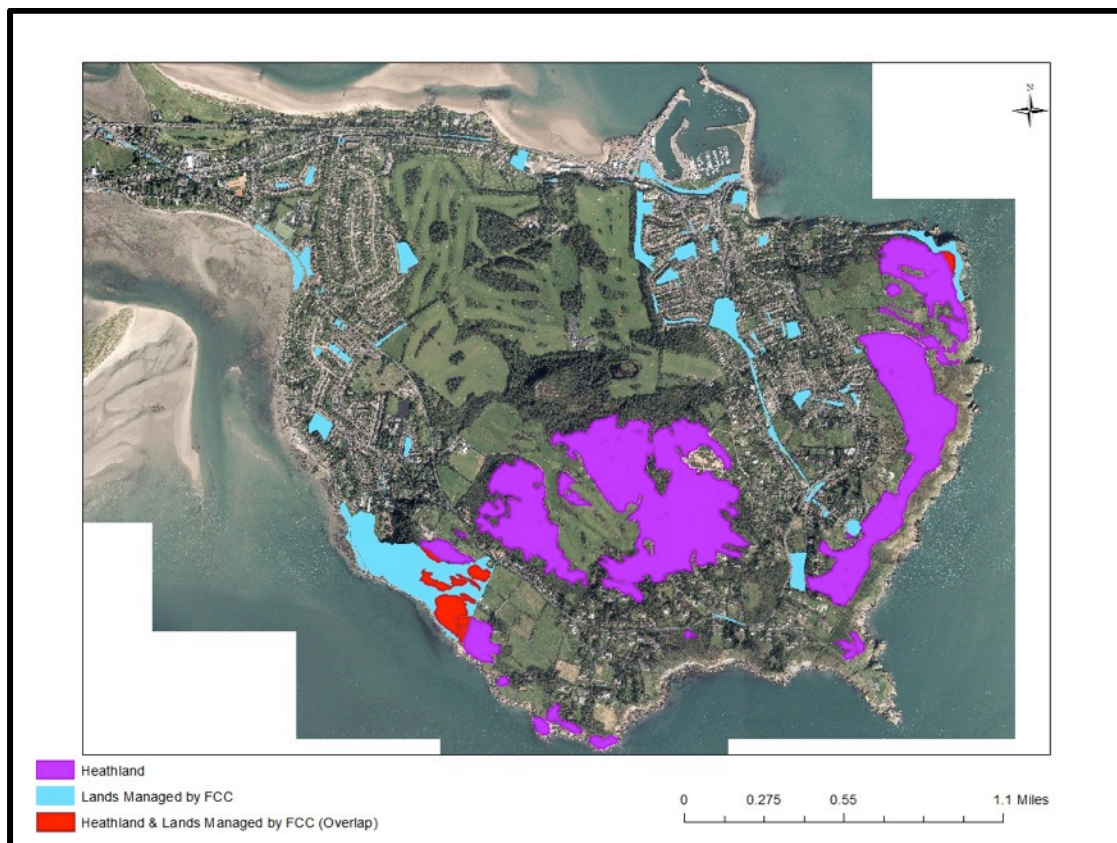


Fig. 19 Management of valuable heathland by Fingal County Council

Valuable heathland might be cleared to improve grazing and landowners may breach some or all of the various legal binding obligations associated with management of this type of land. The current good condition of heathland in many of these enclosed areas implies that this risk should be managed and attention given to strengthening the capabilities of these owners and managers through the provision of information, advice and support.

Heathland is also threatened by the common perception that Howth heathland was always a wilderness, is still a wilderness and should be “left to nature”. This lack of understanding of the history of heathland and the role of historic farm related practises in maintaining heathland threatens future management efforts as it is associated with a preference for inaction and resistance to allocating resources to heathland management.

3 Management Strategy

3.1 Aims and objectives

The aim of the Heathland Management Strategy is to respond to threats to heathland, maintain and enhance it as a biodiversity, amenity, grazing and landscape resource through actions and initiatives informed by research and which can be undertaken by the Howth SAAO Committee in partnership with the community. Actions listed in the final part of this strategy (and responsible individuals) are first informed by a review of statutory obligations arising from legislation and relevant best practise followed by an explanation of the rationale behind the work programme.

3.2 Statutory obligations

The principal ones are:

- Preservation of all valuable heathland (under the SAA Order and EU Habitats Directive).
- Requirement for an ecological assessment (Appropriate Assessment) when considering any work which might indirectly affect valuable heathland (required under Article 6 of the Habitats Directive).
- Protection of native fauna and certain plant species associated with heathland (Wildlife Amendment 2000 Act)
- Planning permission for works such as drainage or clearance of semi-natural vegetation in the core area of the SAAO (SAA Order)
- Restrictions on burning between 1st March* and end of September and associated regulations regarding burning in SAC's and near forestry.

*Proposal to change burning dates under license has recently been announced by government.

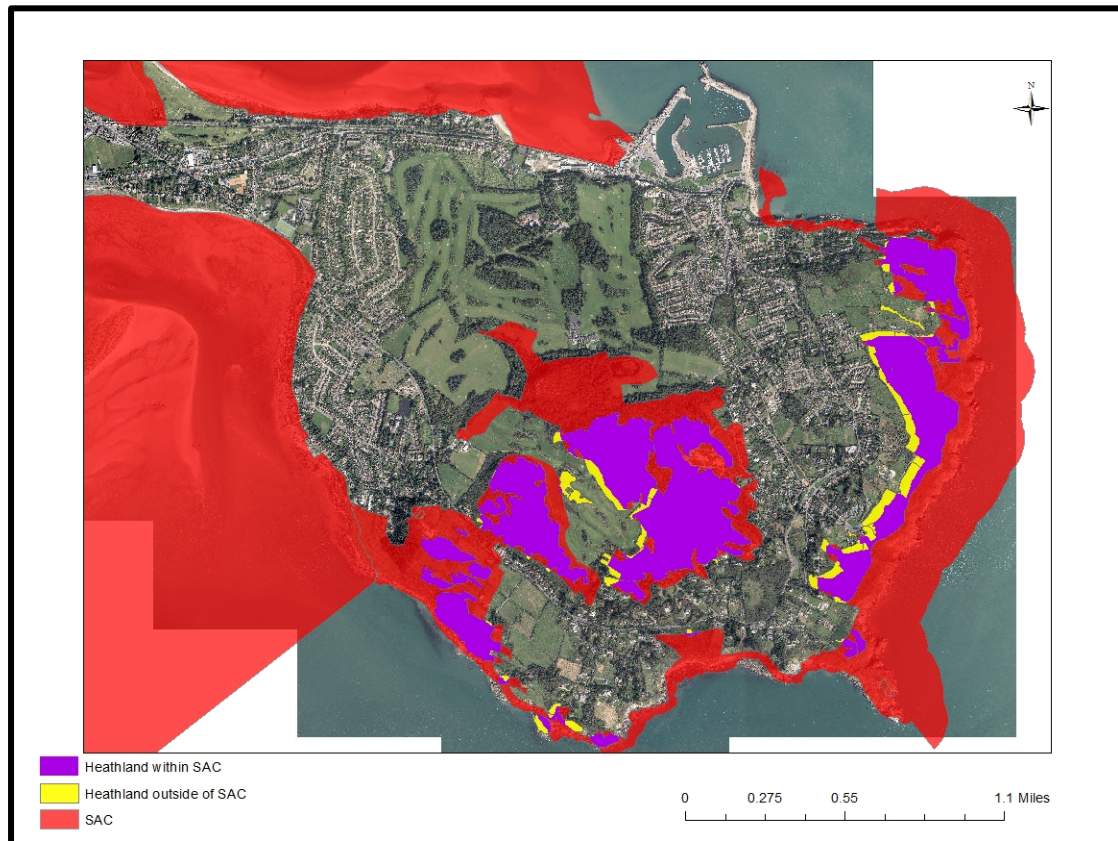


Fig. 20 Heathland and the Natura site (Howth Head SAC)

3.3 Management rationale

3.3.1 Grazing

Research on heathland management confirms that extensive grazing by horses, cattle and ideally goats at sustainable levels is the preferred management practise. The goat grazing trial showed that goats cause the death of the invasive Birch through grazing.

Therefore management should seek to support sustainable grazing regimes where present, and re-introduce grazing where possible, particularly goat grazing at sustainable levels to all areas where grazing is needed to maintain or restore heathland habitats.

To ensure that valuable heathland and associated habitats are managed properly the SAAO Management Committee should support grazing directly in lands under its control and offer an Advisory Service to other relevant landowners and lessees. Without information landowners will probably never know that their land contains a valuable habitat. It is possible that the quality of the heathland they own or manage will decline, grazing will be too intensive or too extensive, they will breach some or all of the various legal binding obligations associated with management of this type of land and they will miss out on opportunities to maintain and improve its biodiversity value.

Pilot scale management projects involving grazing or invasive removal in privately owned lands should be encouraged and supported by the Advisory Service and Howth SAAO Management Committee. Target areas should be defined based on biodiversity value and management potential.

Any interventions in grazing or management of invasive species should be carefully designed and monitored through the Advisory Service. The SAAO Management Committee should source funding to support management works focussed on valuable heathland. Further development of grazing and its commercial spin offs might be eligible for funding from the LEADER Rural

Development Programme with which Fingal Co Co will have a closer relationship from 2015.

3.3.2 Fire

Research confirms that optimum management should include managed burning. However this is not occurring in Howth.

The history and potential of fire on heathland in Howth confirms that action is needed to control fire impacts. While there is a role for fire to maintain heathland biodiversity a programme of controlled burning is unlikely to be introduced in the short term. Its role as a management tool requires further research and dedicated resources which are probably outside the current capacity of the Howth SAAO Management Committee. As burning is only appropriate for limited areas other options for heathland vegetation management such as flailing or mulching will need to be explored (described in Appendix 4)

Because of the constant fires affecting Howth heathland a community based "Fire Watch" service should be set up. This would comprise a network of neighbours and landowners particularly concerned with the risk of fire. A nominated person would liaise with the Fire Service . The "Fire Watch" modelled on the Neighbourhood Watch Scheme would improve the efficiency of the Fire Service response and establish a liaison between the Fire Service and community. This liaison could be valuable if controlled burning is initiated.

Considerable resources are needed to manage controlled burning. Areas suitable for burning must have heather in the building phase c.20-30cm. However much of heathland is generally taller than 30cm. Neither is burning

of Tall Gorse and Bracken recommended due to the difficulty of containing fires involving these species. Birch is little affected by fire.

Controlled burning requires expertise, manpower and co-ordination.

Opportunities are limited by the time allowed for burning. In the Cooley Mountains an informal network was established between farmers, the local fire service and local NPWS staff to carry out controlled burning. This resulted in meetings, an outline plan and plans for a controlled exercise on a defined day. However, due to the limitations of weather, burning was not carried out on appointed days. (Matthew Mc Greehan, Louth IFA, pers. comm.).

Pilot grouse management projects involving NPWS, environmentalists and the game management sector have been more successful in carrying out controlled burning. On Boleybrack Mountain in Leitrim (an SAC) as part of a grouse management project, controlled burning exercises have been carried out within the legal burning period since 2011 (John Carslake, gamekeeper, pers. comm.). The national umbrella for this project has mobilized the local gun club, the National Association of Regional Game Councils (national umbrella organisation for gun clubs), the Golden Eagle Trust, (a national environmental group supported by the NPWS), and local NPWS manager and ranger. To facilitate burning, a burn plan was produced involving NPWS and the grouse management group. The ecological assessment (Appropriate Assessment) was prepared by the NPWS. Burning operations are still being carried out by the gamekeeper, who has experience of managed burning in Scotland. The project in the Cooleys lasted one season and never successfully

carried out any burning. The success in Boleybrack suggests the importance of institutional support (particularly NPWS), and the value of a specialist to manage the burning operation.

While Fingal Fire Service is currently not supportive of controlled burning in Howth, Fire Services in several local authorities have started to show an interest in “wildfire” management. The Forest Service is supportive of these initiatives (Ciaran Nugent, FS, pers. comm 2015) and is promoting training in controlled burning practice.

3.3.3 Flailing/mechanical management of vegetation

In the absence of grazing and controlled burning, vegetation management to remove invasives and maintain heathland in a building phase is likely to involve mechanical methods of cutting. Tall Gorse which is a fire hazard to homes could also be managed using mechanical methods. Other groups in Ireland are also interested in a mechanical approach to heathland management, involving the use of mulchers (by National Park authority in Wicklow and Forest Service) hand tools (IFA Countryside and Slieve Felim Development Group) and more recently robotly controlled heather cutting machines. This practise is in its infancy in Ireland. Demonstrations by the several groups attached to gun clubs took place at two locations in 2015.

According to the UK agent for mulchers, who inspected Howth, a suitable mulcher attached to a tractor is available to cut tall heathland vegetation, tall Gorse and semi-mature (c. 10 year old) Birch. While the terrain in Howth

would be challenging for this type of operation, an experienced operator would be able to carry out the task. However costs would be larger than expected (at least € 200/hour for hire of machine) as regular damage would probably occur to cutter blades.

At the National Ploughing Championships in 2014 two contractors suggested that they had suitable machines and would be interested in carrying out this work in Howth.

TFH/M Front or Rear Mounted

Teagle TBM - TBM/S - TFH/M Flail Mowers

Heavy Duty Machine Ideal for grassland/set-aside/heavy undergrowth. Front/Rear Mounting TFH/M incorporates front & rear linkage. Hydraulic Side Shift fitted as standard. Heavy Duty Hammer Flails for long life and a clean finish.

Fully Double Skinned Top Hood to reduce external damage. Underhood Blades to increase mulching. Optional Double Free Wheel Gearbox for reverse drive tractors.

Specifications	180	200	230	250	270	285	300
Cutting Width m.	1.8	2	2.2	2.5	2.7	2.8	3
Overall Width m.	1.93	2.18	2.38	2.68	2.88	3	3.18
Length cm.	154	154	154	154	154	154	154
Height cm.	125	125	125	125	125	125	125
No. of Hammers	16	18	20	22	24	26	28
Min. Tractor HP	80-140	80-140	90-140	90-140	90-140	90-140	90-140
PTO rpm	540/1000						1000
No. of Beils	4	4	5	5	5	5	5
Weight kg.	1010	1040	1,060	1,100	1,150	1,230	1,280
Roller Diameter mm.	194	194	194	194	194	194	194
Control Hops	351	351	351	351	351	351	351
Linkage Centre to Piv Side of Machine - Minimum (mm)	0.9	1	1.1	1.25	1.35	1.425	1.5
Hydraulic Offset (m)	0.52						

The company's policy is one of continuous improvement and development, therefore specifications are subject to change without notice. Made in Italy by Berli

Teagle Machinery Ltd.,
Blackwater, Truro,
Cornwall TR4 8HQ

Tel: 01872 560592
e-mail: sales@teagle.co.uk
website: www.teagle.co.uk

TBM
Heavy Duty
For use on tractors from 50 - 90 HP ideal for grass & undergrowth up to 3 - 4 cm. Dia

TBM/S & TFH/M
Very Heavy Duty
For use on tractors from 50 - 140 HP ideal for grass & undergrowth up to 5 cm. Dia

Fig. 22 Typical machines used to remove scrub vegetation and small trees

Mechanical management of vegetation or gorse/heather hand cutting would require a contractor.

In the short term the SAO Management Committee should invite specialist contractors to inspect suitable sites in Howth for mechanical management of

Tall Gorse and heathland, establish contacts with groups who have similar interest in managing overgrown/tall vegetation in areas of biodiversity importance. This issue is likely to be given greater consideration due to the nationwide decline of farming in upland areas

<http://www.agriland.ie/news/ireland-facing-massive-fines-commonage-undergrazing/> and the probable introduction of an Uplands Agri-environmental Scheme in 2016, which may provide support for the sustainable management of this type of vegetation.

3.3.4 Invasive species

A focussed and budgeted work programme is required to manage this threat to heathland.

In Howth there is a history of the involvement of contractors, organised volunteers and residents in invasive species removal. According to Hans Visser and Deborah Tiernan, Fingal Co Co (pers.comm.) there is a need to review the continued investment of time and funding. As no evaluation has been carried out it is hard to comment on the cost effectiveness of this work. This targetted approach obviously causes minimal damage to heathland. However volunteers cannot cut large trees. Neither can large trees be felled on steep slopes.

A more strategic approach is needed, based on the relative value of the areas affected, the risk of infestation and potential for other management options. Scientific evidence suggests that the removal of *Rhododendron* should be

prioritised, followed by Birch, particularly as both these species are an immediate threat to heathland.

Prioritisation of areas for Birch and Rhododendron clearance could be clarified through considering both the climatic and environmental factors favoring invasion, and the relative value of affected heathland. Thus while Rhododendron control will obviously focus on the Hill of Howth nearer the source of this invasive in Howth Castle Gardens, prioritisation of areas for Birch control will require further research and discussion.

As the control of Birch and Rhododendron will be on-going, resources must be dedicated on an-going basis. In the medium term consideration should be given to developing a semi-commercial operation based on sales or upcycling of Birch or Tall Gorse waste.

The removal of Tall Gorse and Bracken is of lower priority as areas dominated by these species are unlikely to be heathland. Management of these species should include mechanical methods of removal, targeted application of fast degrading herbicides and ideally appropriate grazing regimes. Northern Ireland's farmers advisory service (CAFRE) is carrying research on bracken control by trialling cutting, rolling and spraying methods at a range of sites in NI.

3.3.5 Awareness raising

Awareness raising about the biodiversity value of heathland and need for management should focus on 1) landowners/managers 2) residents 3)

general public 4) school goers. Different strategies and actions should be developed for each of these groups. Awareness raising among the public should build on local interest in the goat grazing trial and long tradition of public access to heathland. An information campaign which engages visitors should add to the visitor's experience. School related initiatives could include self guided trails for younger age groups. Older students require engagement through research/ action projects.

3.3.6 Research

A mutually beneficial relationship should be developed between the Howth SAAO Management Committee and researchers through *Action Research Projects*. Action Research is research tool whereby the expert supports a group of non experts to become more capable of carrying out their objectives. This implies that the Howth SAAO Management Committee organises a regular discussion to clarify research priorities and produces to update a list of action research/ management questions and becomes involved in the research process.

An adequate yearly budget should be allocated to research involving interested researchers covering geodiversity, hydrology, history, land use, flora, fauna and management.

An effort should be made to source funding for a large scale project which would allow for trials of different methods of heathland management in

collaboration with the community, landowners and the authorities both within and outside Howth.

4 Operational Plan

4.1 Manage Grazing

OBJECTIVE	ACTION	RESPONSIBILITY	COST/YEAR	PRIORITY	MEASUREMENT
Ensure all private landowners have easy access to advice to enable them to manage heathland sustainably.	Establish Advisory Service to provide advice, offer supervision and monitoring of management works to ensure private heathland is protected and enhanced.	Contract Ecologist, Howth SAAO Committee and NPWS	€3,000	Top	Annual report confirming at least 80% of heathland inspected/year. Contacts established with all landowners in Year One. Report produced on its condition and management every three years.

4.1 Manage Grazing					
OBJECTIVE	ACTION	RESPONSIBILITY	COST/YEAR	PRIORITY	MEASUREMENT
Establish grazing trials in heathland areas in Howth to inform good grazing practise.	Contact private landowners and leaseholders interested in grazing for conservation. Assist in setting up and monitor grazing trials	Advisory Service	€500-1000	Top	One grazing trial /year. Evidence that grazing is maintaining and enhancing biodiversity.
Develop contacts with statutory and voluntary organisations with similar concerns in Ireland	Make direct contact with the Forest Service, National Association of Regional Game Councils, Old Irish Goat Society and Belfast Hills Partnership.	SAAO		Medium	Partner on relevant projects. At least one study visit /year. One joint project/ three years.

4.1 Manage Grazing					
OBJECTIVE	ACTION	RESPONSIBILITY	COST/YEAR	PRIORITY	MEASUREMENT
Maintain contacts with providers of suitable equipment to manage heathland vegetation mechanically	Set up data base of Irish and Uk based providers. Members of SAAo Mgmt Committee to view operation of machine in Ireland	SSAO			Assess usefulness
Examine potential of goat grazing on heathland as a commercial enterprise	Obtain funding to carry out feasibility study in association with local landowner or interested organisation			Medium	Annual report

4.2 Improve Fire Management

OBJECTIVE	ACTION	RESPONSIBILITY	COST/annum	PRIORITY	MEASURE OF SUCCESS
Establish community based "fire watch"	Local publicity to recruit volunteers, plan service (based on Neighbourhood Watch), initiate and maintain liaison with Fire Service	Community members of Howth SAAO Committee/Fingal County Council Community Development Section Fire Service	€500	Top	Establishment of group and liaison with Howth SAAO Committee in Year One
Produce yearly record of fire events	Produce report on all fire incidences assess causes and impacts.	Heathland Advisory Service	Included in yearly fee	Top	Three year report shows location of fires and describes their impact

4.2 Improve Fire Management					
OBJECTIVE	ACTION	RESPONSIBILITY	COST/YEAR	PRIORITY	MEASUREMENT
Encourage Fire Service to take part in controlled burning exercise	Arrange visit to locations where controlled burning take place. Maintain liaison with Fire Service which is planning controlled burning as a demo/training exercise in East of Ireland	Advisory Service	Potential cost of demonstration exercise c€500-€1,000	Top	Report on potential for controlled burning exercise each year.
Join Leave No Trace a movement to promote responsible recreational use of the outdoors.	Contact Leave No Trace to request membership and use logo	Howth SAAO Management Committee/Fingal County Council		Medium	

4.3 Manage Invasive species

OBJECTIVE	ACTION	RESPONSIBILITY	COST	PRIORITY	MEASUREMENT
Prepare Action Plan with defined goals and allocate budget.	<p>Year One Produce map showing location of areas with Rhodo and Birch.</p> <p>Remove all Rhododendron plants (and particularly young ones) to prevent them producing seed.</p> <p>Produce budgeted plan to deal with Birch</p> <p>Stage 2 (Years 2-5)</p> <p>Implement Birch removal plan</p>	Howth SAAO Committee/Fingal County Council/ contractors	<p>Stage One Zero</p> <p>Stage Two (Years 2-5) 10k/year</p>	Top	<p>Production of map which is used to plan control programme.</p> <p>Development of spatially based action plan and allocation of adequate budget to carry out works each year.</p>

4.3 Manage Invasive Species					
OBJECTIVE	ACTION	RESPONSIBILITY	COST/YEAR	PRIORITY	MEASUREMENT
Record and evaluate impact of management works in 2020	Revisit areas shown on 2011/2012 maps and record cover of Birch and Rhododendron. Produce map based report.	Howth SAAO Management Committee /Fingal County Council	€500	Top	Report also after year 3 and 5 showing areas number of plants treated each year, cost and areas still affected by invasives. In 2020 carry out evaluation based on reference to baseline.
Share best practise with groups with similar aims. same invasive species	Woodlands of Ireland, Killarney National Park, Burren Farming for Conservation Programme	Howth SAAO Management Committee /Fingal County Council		Medium	

4.4 Raise awareness

OBJECTIVE	ACTION	RESPONSIBILITY	COST/YEAR	PRIORITY	MEASURE OF SUCCESS
Communicate the value of heathland to residents and landowners	Promote the Heathland Advisory Service	SAAO Management Committee / Advisory Service	Included in Heathland Advisory Service	Top	Record contacts with landowners in annual report
Provide information and educational programmes in association with local community, schools, local heritage and tourism interests. *Topics below	Organise walks 2/year. Produce self guided Heathland Trail for school groups. Provide easy access to information about heathland and management Produce interpretative display in local library.	SAAO Management Committee	€500-1000	Top	

*Easy identification of gorse (AT Lucas) lobster pots. Awareness raising

Heathland walks X 2 each year during flowering season

Howth heather (autumn) vs prawn festival (summer), Display on history of heathland/ artifacts from heat

4.5 Promote Action Research Projects

OBJECTIVE	ACTION	RESPONSIBILITY	COST	PRIORITY	MEASURE OF SUCCESS
Continue to engage with teaching/ research institutions to ensure studies are relevant and inform best practise	Draw up list of research questions/ studies* Distribute to organisations/ individuals Provide support	SAAO Management Committee's annual review of research needs.		Medium	One relevant research study/ project and one presentation on the topic to SAAO committee each year

4.5 Promote Action Research Projects					
OBJECTIVE	ACTION	RESPONSIBILITY	COST/YEAR	PRIORITY	MEASUREMENT
Continue to engage with members of voluntary conservation organisations to ensure studies are relevant and inform best practise	Draw up list of research questions/studies*				
Investigate potential of research project to examine grazing, removal of invasives, use of machinery and burning trial.					

*Suggestions for undergraduate projects

Use existing data to prepare a review of different types of heathland in Howth.

Survey site for important species which are indicators of heathland quality or important for management including heather beetle, devil's bit scabious, breeding birds, peat depth, soil to estimate original extent of dry acid heathland (vs tall scrub) measure exposure, soil, altitude distance from source, wind direction

GIS exercise to model risk of invasion by birch to heathland.

GIS based multi-criteria analysis to prioritise areas requiring treatment of invasives

Examine Howth Castle records to research heathland land use for quarrying, grazing, burning and amenity use

Hydrological study to examine impact of historic land uses on heathland hydrology and potential for reversal,

4 Conclusions

The SAAO has been very successful in securing the preservation of the heathland on Howth. The SAAO management committee has overseen a range of important projects which have sought to maintain its value. Implementation of the initiatives suggested in the management plan will maintain this momentum, within Fingal County Council and within the SAAO Management Committee to ensure that the internationally important heathland which defines the landscape of Howth is protected and enhanced for future generations.