



Goat Grazing Study Howth, Co Dublin

for

Fingal County Council

by

the Old Irish Goat Society

Date: 01-July-2018





Old Irish Goats being milked on Howth head c1950s

"In many parts of Ireland and in the Highlands of Scotland, their Goats make the chief possessions of the inhabitants; and in most of the mountainous parts of Europe supply the natives with many of the necessaries of life: they lie upon beds made of their skins, which are soft, clean and wholesome; they live upon their milk and oat bread; they convert part of it to butter and some into cheese. The flesh of the Kid is considered as a great delicacy; and when properly prepared is esteemed by some to be little inferior to venison." David Mackenzie 1967.

Contents

A. EXECUTIVE SUMMARY:	1
B. GENERAL BACKGROUND:.....	5
C. PROJECT SCOPE:	6
D. INTRODUCTION:	6
E. GENERAL OBSERVATIONS OF HOWTH:.....	7
F. CONSERVATION GRAZING CASE STUDY ASSESSMENT.....	7
G. BACKGROUND LITERATURE ON CONSERVATION GRAZING:	12
H. TACKLING ROOT CAUSES:	12
I. WILDFIRES:	12
J. THE PRACTICALITIES OF SETTING UP A GOAT GRAZING SCHEME ON HOWTH.....	13
K. GOAT GRAZING PROJECT AS A COMMERCIAL ENTERPRISE:	22
Appendix 1 References:.....	27
Appendix 2 Conservation Grazing Trial Poster Designs:	27
Appendix 3 Material Quotes:.....	28

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Cover: Cheviot goats on route to Thordon House in Essex for conservation grazing initiative courtesy Legacy Grazing (Place Services)

Cover: Howth heathland at Sheilmartin



Tall gorse encroaching on heath on Sheilmartin



Bracken and scrub encroachment onto amenity grassland in Howth Redrock Area

A. EXECUTIVE SUMMARY:

In developing this conservation grazing proposal for Howth Head's heathlands, the Old Irish Goat Society's overarching recommendation is to establish conservation grazing on approximately 5 hectares initially, using 50 Old Irish Goats. Utilise the time and the resources available to achieve progress and develop longer term strategies for conservation grazing and enterprise, with an emphasis on innovation and added value.

Integrating the proposal into a wider consciousness through Geodesign, a collaborative landscape design process, is highly recommended as a broad consensus, based on sustainability, is needed to support the project. It would help build local ownership, identify alternative sites and resources, including landowners, complimentary scheme resources, for example SOLAS, to support the project and to expand the footprint into public amenity areas in 2019 / 2020.

The proposal recommends a substantial upscaling of the Goats for Howth pilot project completed in 2013, on 0.12 hectares, to 45 hectares or ~1/4 of Howth's heathlands by 2020. This can deliver a highly visible impact and progression to the original intent of the Goats for Howth initiative. The project would help deliver valuable, nationally important, research and practical application, to expand the project across the 200 hectares of heathland on Howth.



Old Irish Goat browsing on Gorse. *"The character and high species diversity of the Burren owes much to the browsing of goats. Together with the hardy out-wintered cattle they kept the upland grazing clear of all woody growth and rough weedy herbaceous vegetation. The goat is an incomparable browser; it will clear land of brambles, briars, furze, ivy, heather and is particularly fond of such weeds as thistles, nettles and docks."* J Feehan, 2003 Farming in Ireland, History, Heritage and Environment. (With correct management Old Irish Goat can reduce fire risk and enhance biodiversity on Howth).



The Cheviot goat is closely related to the Old Irish Goat. Cheviot Goats, a primitive native breed of England, are being successfully used for conservation grazing at Thordon House Country Park, Essex, UK, (Image Courtesy Legacy Grazing, Place Services) and have essentially paved the way for utility of primitive goat breeds in conservation grazing in Britain and Ireland.

The Old Irish Goat Society having visited Howth, engaged with local stakeholders and analysed the scale heathland and amenity grassland management required, proposes a conservation grazing approach to address the complex challenges, in an innovative and inclusive manner, worthy of the UNESCO Dublin Bay biosphere, within which Howth is an iconic landscape, see figure 2.

The UNESCO Biosphere guidelines and by extension the United Nations Sustainable Development Goals provide a very useful and well-articulated policy backdrop to the Goats for Howth Project that reflect both local and global community values and provide a readymade framework to guide endeavours under the 3 functions of UNESCO biosphere reserves:

- Conservation: contribute to the conservation of landscapes, ecosystems, species and genetic variation
- Development: foster economic and human development which is socio-culturally and ecologically sustainable
- Logistic: support demonstration projects, environmental education and training, research and monitoring related to local, regional, national and global issues of conservation and sustainable development

For this framework to be fully exploited it is recommended that a tailored GeoDesign be developed for the UNESCO Dublin Bay biosphere site or Howth' designated terrestrial sites. Geodesign provides advanced collaborative design technologies to enable groups to plan for infrastructure investments, develop cultural, tourism and environmental management strategies and ultimately build capacity and sustainability. This being a very meaningful way to engage stakeholders, as in, rather than simply promote the Howth Goat Conservation Grazing Project, instead host a meaningful debate and plan for sustainability in Howth, centred on its natural assets, within which the conservation grazing project forms a vital and leading role.

In considering the conservation grazing feasibility specifically and the constraints and opportunities presented, the Old Irish Goat Society, in collaboration with local stakeholders are proposing to graze some 5 hectares of Howth's heathland, at a cost of €50,000 initially, see table 1, and expanding to 45 hectares or approximately ¼ of the target heathland by the end of 2020 at an estimated cost of ~€100,000. This would represent significant progress for the Howth and the Dublin Bay Biosphere.

The proposal is made based on focussed research and the application of common sense, that is to start simply, in a safe area, with favourable conditions and features and expand from there into more challenging areas. While remaining focused on the task at hand, which is to graze heathland in an eco-friendly manner, with the goat already identified as the best means to do so. Added value is embedded in the proposal; by utilising the Old Irish Goat, the project will leverage a low cost primitive goat breed, these already

being recognised in Thordon House Conservation Grazing scheme, in Essex, as the optimum goat type. In addition, primitive breeds generally have a wider grazing palette and therefore make for better conservation grazers. Utilising the breed will also help to conserve it, help Ireland to meet international obligations to the Convention on Biodiversity, in regard to conservation of genetic resources, and the United Nations Sustainable Development Goal 15, Life on the Land and Aichi Biodiversity Target 13 "Genetic Diversity".

Having selected the Old Irish Goat as the optimum grazer to commence with for heath and having looked at several alternative sites the society is recommending the Red Rock / Sheilmartin region as the optimum place to start, along with the existing Goats for Howth base, near the Howth Summit as an alternative, both needing landowner support. Red rock presents an opportunity to base operations on an existing farm with a conservation ethos, and utilise existing farm boundaries, which require some maintenance, to establish a 2 to 5 hectare grazing scheme at a relatively low capital investment cost of ~€50,000. The site is private and relatively safe for animals from the threat of dogs. It would allow the grazing team, of herders and goats, to settle in, heft and essentially get a foothold. While setting up, preparations for the more challenging public areas can get underway, with stakeholders being able to visit the conservation grazing site to view the goats and fencing. Fingal County Council lands and Sheilmartin itself consisting of some 15 and 25 hectares respectively, will require more detailed preparations, consultations and statutory interfacing. Mixed grazing, close shepherding and mobile fencing may form part of the effort here. Note that while it is important to look beyond the first 5 hectares, it remains the pivotal gateway to the next phases.

The project is pioneering in many respects in that it essentially sets out to reverse decades of decline in agricultural activity in what is now a heavily built up region presenting very significant challenges to farming. It is therefore quite symbolic, in that those practices and traditions that have essentially been cast aside are now belatedly realised to be essential, and in need of restoration, to maintain Howth's environment and ultimately to meet our collective community, UNESCO and United Nations sustainability objectives.

Any project of this scale and complexity requires a multidisciplinary team. The Old Irish Goat Society is well placed to assist Fingal County Council and the Howth community. Having already pioneered the national herd of Old Irish Goats in 2014, the society is keen to restore the Old Irish Goat to Howth, as the 2nd site for the national herd, and participate in the positive disruption needed to enhance Howth's natural and cultural landscapes.

Costs: employment of herder, insurance, goats, housing, transport

Table 2: Cost to establish 2 Conservation Grazing Sites for 1 year at Howth (45 Hectares)

Howth 5 Months Conservation Grazing Proposal (5 hectares)						
Set-up @ Red Rock (5 hectares)		Administrative				
Item	Supplier	Qty	Unit	Rate	Sub-Total	Total
Coordinator Administration	OIGS	5	dys	350	1750	
Develop Landowner Agreements	FCC	0	dys	350	0	
Health & Safety Assessment	OIGS	2	dys	350	700	
Animal Health Plan	OIGS	2	dys	350	700	
Statutory Consents NPWS	FCC	0	dys	350	0	
Signage "Grazing in Progress" Artwork	OIGS	1	dys	350	350	
Signage "Grazing in Progress" 6 Election Posters	OIGS	6		32	192	
Insurance General Farm	FBD				250	
Insurance Employment Sheppard	FBD				550	
Insurance 2 Week Roaming Trial (estimate)	FBD				500	
Lease	Bellingham's				10	
Set Up Administration - Total						€5,002
Habitat Mapping, Condition Score, Set Points	OIGS	2	dys	500	1000	
Perimeter Fencing Materials Site 1 (5hts)	Clipex	1000	m	2.7	2700	
Internal Fencing Materials	Clipex	700	no	5.6	3920	
Electric Fencing	Koppel				1200	
Stake Driver 2 Stroke	Clipex	1	no	1750	1750	
Handling Pen, Drop Pin Sheep Hurdles	Clipex	20	no	60	1200	
Goat Trailer	OIGS	1	no	1000	1000	
Animal Welfare: Shelter, Water / Meal Troughs	Fingal Farming	1	no	2200	2200	
Storage Container	FCC				800	
Set Up to support 50 goat herd						€15,770
Set-up Total:						€20,772
Implementation						
Goats Transport Mulranny to Howth (562km)	OIGS	5	562	0.3	843	
Goats Transport Howth to Mulranny (562km)	OIGS	5	562	0.3	843	
Goat Maintenance / Feed		5		20	100	
Sheep Dog Use	OIGS	2	no	0	0	
Herder / Labour (39hrs x 4.3 weeks / 5 months)	OIGS	840	hrs	15	12600	
Ecological Assessment / Monitoring	OIGS	3	dys	500	1500	
Coordinator / Reporting 5 Site Visits	OIGS	10	dys	350	3500	
Financial Administration	OIGS	1	dys	300	300	
Accommodation	OIGS	120	dys	50	6000	
Travel Mulranny to Howth (562km)	OIGS	20	562	0.3	3372	
Implementation (50 goats)						€29,058
Grand Total						€49,830

A step by step overview to set up a goat grazing scheme on Howth

It would be desirable to commence conservation grazing project in Howth as soon as possible and have ¼ of Howth's heathlands under grazing by Q4 2020, the principle steps advised are:

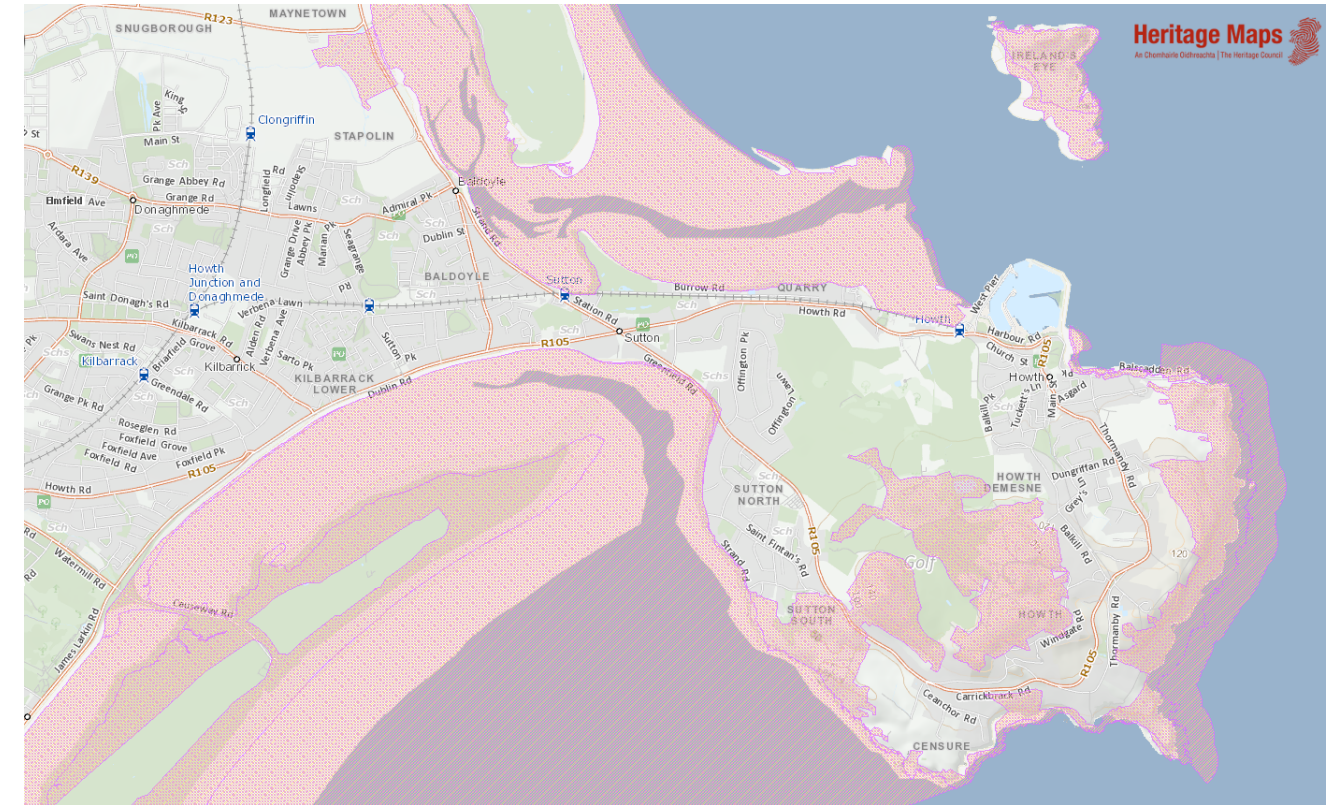
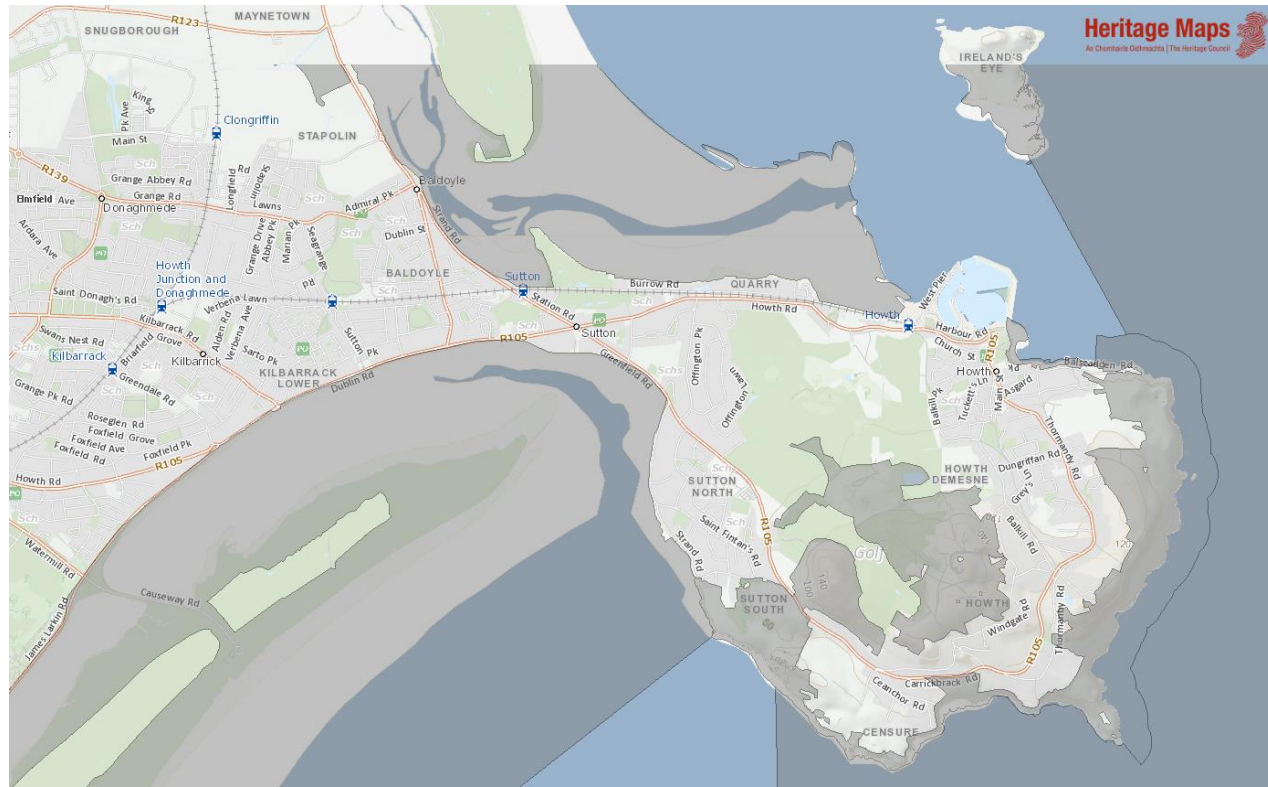
1. Setup: Agree a pilot concept / scale and integrated approach with stakeholders
2. Develop and agree a memorandum of understanding or lease with the relevant landowners, to cover land use, responsibilities, compliance and insurance
3. Establish a budget that will make an impact considering the scale of the effort; €50,000 set up budget and €100,000 per year to get the project up and running and a €30,000 contingency.
4. Recruit a competent shepherd, that can deliver good goats and good habitats that will be valued by the community.
5. Form a cross-functional team with delegates from the Howth SAAO Committee, Howth Trails, Howth SOLAS, Fingal County Council, Newbridge House, the Old Irish Goat Society, the Irish Rare Breeds Society, Teagasc, the National Parks & Wildlife Service and others to champion and guide the project.
6. Establish a meeting / site visit and reporting schedule. Communication between the shepherd, landowners and ecologists is critical, with an end of season visit by the whole team.
7. Develop a context / framework for the Goats for Howth Initiative by conducting a Geodesign workshop for Howth's natural heritage sites or Dublin Bay Biosphere which can voice for example the need to "Develop a Responsible Pet Ownership Byelaw for Howth" in a positive collaborative forum, place the goat conservation effort and map out the other initiatives on Howth, for example map fire management zones and engage stakeholders.
8. Develop a Goats for Howth Health and Safety and Animal Welfare plan addressing the 5 freedoms.
9. Conduct a detailed ecological assessment of the target area with baseline imagery and vegetation cover measurement, habitat condition score, desirable and undesirable species cover and indicative target covers for the next 5 to 10 years, to monitor progress. This will provide clear objectives for the site. Develop a results based model for heath.
10. Provide statutory notifications to National Parks and Wildlife Service and Department of Agriculture Food and Marine related to establishing a goat holding in Howth.
11. Implementation (5 Hectares): Enhance existing boundary fences to make stock-proof, provide animal handling equipment and low cost shelter, e.g. temporary hutches or temporary lean-to structures.
12. Settle in and commence training of goats, conduct small free grazing and trials using proprietary Clipex electrified mobile fencing in collaboration with project team.
13. Public engagement, awareness and education program. Introduction to project team, aims and preparations to extend grazing trial to public amenity land using temporary fences and free range grazing over the winter period.
14. Expansion (40 Hectares): Post peak tourism season, carry out a trial grazing project on Fingal County Council Lands at Red Rock public lands and Sheilmartin using the Clipex temporary fencing system, in a mosaic style using existing project labour.
15. Develop a business plan for goat based enterprises and acquire permissions for new permanent fencing and housing facilities, that can attract enterprise supports and ensure long term feasibility and grazing on Howth for the 5 to 20-year period, targeting enterprise support initiatives.

Figure 1a Howth Head Target Heathland and Target Conservation Grazing Areas

- Howth Heathland ■
- 1. Set-Up 5 Hectares (Ht) ■
- 2. Expansion 25 Ht ■
- 3. Consolidation 15 Ht ■



Figure 2 Howth Townlands, Designated Sites and Trails

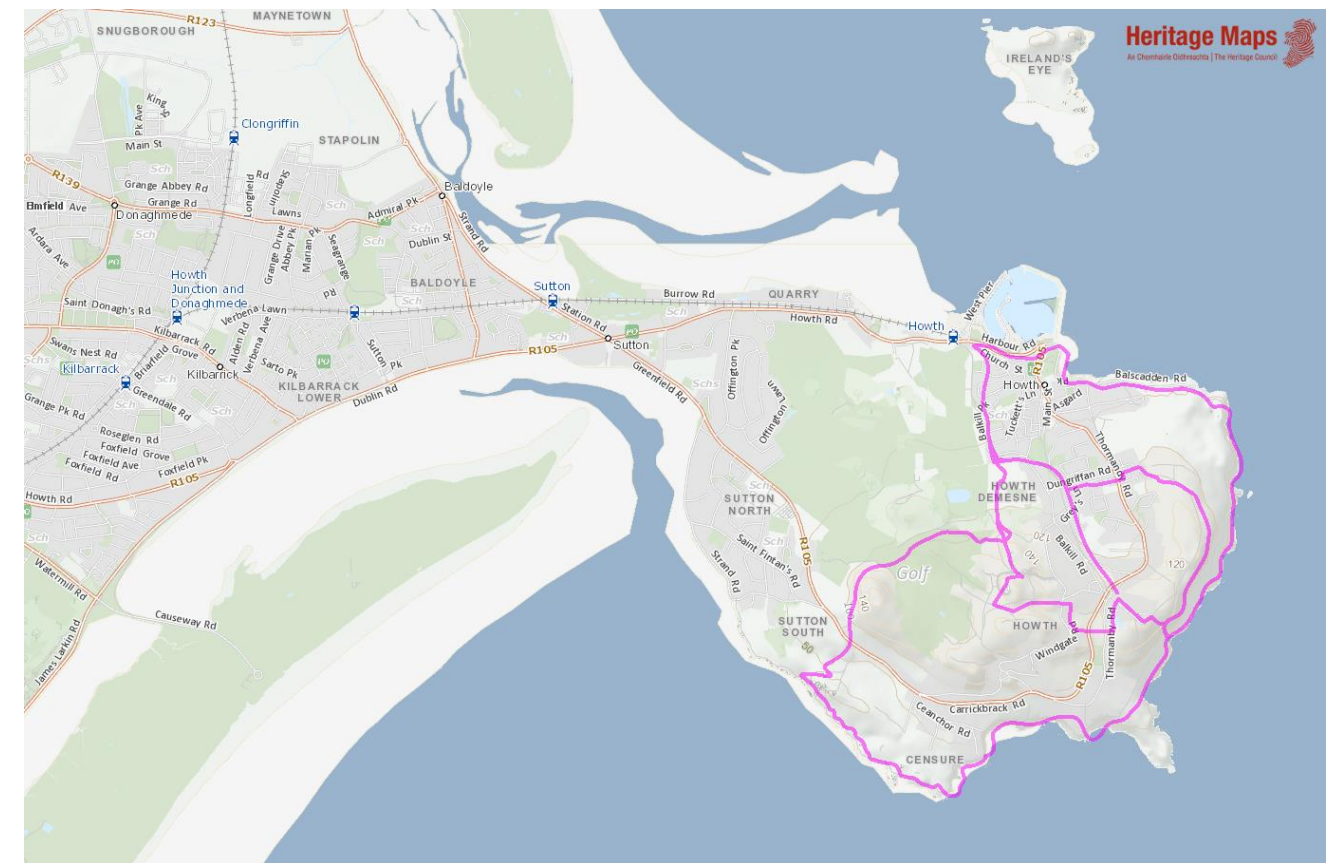


Dublin Bay Biosphere Core Area

Special Area of Conservation



Howth Townlands



Howth Trails

B. GENERAL BACKGROUND:

The Old Irish Goat Society was commissioned by Fingal County Council, in August 2017, to conduct a feasibility study on expanding the Goats for Howth pilot conservation grazing initiative in 2018. The conservation grazing target habitat is primarily Howth's heathlands, which extends to some 200 hectares interspersed among high amenity grasslands as well as urban residential and recreational areas. Howth's heathlands are protected under the EU Habitats Directive Special Areas of Conservation (SAC) Designation, the Howth Special Amenity Area Order and more recently through the UNESCO Dublin Bay Biosphere Site. The ecological integrity of Howth Head heathland SAC is being compromised as the habitat is transitioning into woodland due to the encroachment of woody/scrub species. It is generally accepted by researchers that heathland vegetation cover should consist of less than 20% of woody species (NPWS, 2016).

C. PROJECT SCOPE:

The Howth SAAO committee commissioned a heathland management Plan in 2011 to establish what measures are required to maintain the heathland in an optimum condition. While this plan was being prepared, a goat grazing trial was also undertaken in 2012 and 2013 to examine the suitability of goats as heathland grazers. The heathland management study found that extensive grazing by horses, cattle and ideally goats, at sustainable levels, would be the preferred management practice. The big challenge with livestock however is the requirement for fencing to ensure that the livestock stays within the grazing lands and does not venture onto roads or into private property such as back gardens and golf courses. It is envisaged that the public support for fencing off parts of Howth Head to prevent straying of animals is low, given the many pathways on Howth. The rocky environment also poses a major problem for fence post installation and proved to be very costly. So a grazing solution has to be found that allows for controlled free roaming livestock and it is considered that a herder is the most feasible solution. Sheep and goats are considered more suitable for herding compared to horses and cattle. Goats were kept on the heathland and the goat grazing trial showed that they will eat heather and young trees. It was therefore decided to explore the possibility of establishing a goat grazing project using a herder.

The heathland management Plan identified several key threats to the heathland resource:

1. The spread of the invasive species such as Rhododendron, tall Gorse, Bracken and Birch.
2. Regular uncontrolled fires in popular and accessible locations.
3. The absence of grazing.

This study focuses on item 3, the absence of grazing, with separate studies underway relating to invasive species control and controlled burning.

The aims of a grazing regime in the heathland on Howth are threefold:

1. to create a Mosaic of different vegetation heights and different species
2. to maintain status quo after the habitat reaches optimum condition
3. to assist with the reduction of Birch, Gorse, Bracken and Bramble cover

Three strands of activity were identified to achieve the aims and they form the study scope:

- a. Investigate other goat grazing projects to provide examples and identify the key issues and lessons learned at other grazing schemes.
- b. Investigate the practicalities of setting up a goat grazing scheme on Howth that will result in a step by step overview of actions that need to be taken by FCC and the SAAO committee to get a goat grazing project established on Howth.
- c. Investigate the possibility of developing the grazing scheme into a commercial enterprise to ensure the long term sustainability of heathland grazing on Howth.

D. INTRODUCTION:

The Old Irish Goat Society has been familiar with the Goats for Howth project since the early days of the initiative in 2012 having hosted a visit to Mayo from the Goats for Howth team. At that point the Old Irish Goat Society was in similar position piloting a challenging breeding program based on feral Old Irish Goats. Since then the society has bred some 40 Old Irish Goats, meanwhile in Howth, the Goats for Howth team have successfully demonstrated goat based conservation grazing to be a viable concept and effective means of grazing heath in Howth. The convergence of the two initiatives is welcome and there is considerable scope for synergy.

The Old Irish Goat Society team visited Howth on a number of occasions meeting with local stakeholders. First impressions were one of pride of place and community, a sense of urban village with rural roots and connections. Howth Head, including the townlands of Howth, Howth Demesne, Censure, Sutton North and Sutton South, by virtue of its defined boundaries endows a strong sense of identity in the hearts and minds of its residents. The landscape is picturesque and location ideal for amenity and enterprise.

Howth's rural heritage is being encroached upon by urban / sub-urban and recreation development, and general tourism footfall. Howth is not unique in this regard, in fact on the contrary it shares these challenges with many rural areas across Ireland. The spread of suburbs and one off housing, have effects disproportional to their footprint, by impeding on traditional methods of keeping and droving of livestock, this in its traditional form, being increasingly recognised as a virtuous endeavour for Ireland's biodiversity. The decline of traditional agriculture eventually leads to encroachment of dominant or invasive species, loss of habitat and management diversity and eventually decline in ecosystem richness, to the point that generations live in a lacklustre "amenity landscape" that has lost much of its rich dichotomy of ecology and the supporting culture and traditions that weave further distinctiveness into the landscape. This process is abundantly evident in Howth, but Howth can lead the process of rehabilitating and regenerating these high amenity environmental and cultural resources.



Howth heathland at Sheilmartin and grasslands at Red Rock in the background



Howth heathland at Redrock

E. GENERAL OBSERVATIONS OF HOWTH:

In assessing Howth for conservation grazing some general observations and the apparent modes that are affecting Howth's heath and amenity grasslands most are:

▪ Suburban Encroachment:

It would appear that the sub-urban pressures are acknowledged under initiatives like the Special Amenity Area Order, however caution is still required. It is important that the "white spaces" on the map between developments are not merely considered future development land but important amenity space that could benefit from conservation measures or linkage. Geodesign is a means to proactively advance conservation initiatives in these spaces.

▪ Tourism:

Responsible tourism, that is tourism that puts the needs of the environment and local community at the centre of the tourism experience, has significant potential in Howth and could form part of the funding mix to support the primary conservation objectives sought in this endeavour. Leveraging tourism to support conservation have been implemented in Connemara and Mulranny. A notable example being the "Mulranny Stone Wall Festival", which utilises tourism to repair important cultural landscape features. This approach helps to revive traditional maintenance skills, raises appreciation of their importance to the local ecology and for animal welfare, by virtue of their associated micro climates.

▪ Golf:

Efforts to engage with the course management would be beneficial, so as to utilise goodwill toward nature conservation.

▪ Trails:

The proliferation of trails and the associated soil compaction and erosion, with effects on important habitats, indicates a lack of overarching strategy, or implementation, as regards amenity landscape management in Howth. The unfettered nature and the seemingly supreme status of trails will need to be reduced if a more biodiverse, sustainable Howth is to emerge including by extension an improved Howth tourism product. At present Fáilte Ireland are producing sustainability tool kits for tourism initiatives including trails that will be a useful resource to initiate planning.

Managing these issues requires an approach to development that is community rather than developer led and processes like Community Futures, Village Design Statements, Geodesign, Local Biodiversity Plans and Local Area Plans can help the local community to articulate and publish their values and ambitions in policy. Howth, similar to many other areas, could benefit from completing a geodesign workshop and developing a sustainability dash board, that helps to hold public servants to account.

F. CONSERVATION GRAZING CASE STUDY ASSESSMENT

Five case studies of goats grazing for nature conservation projects, with a herder in one project, in semi-natural habitat / heathland were sought / assessed;

Table 1: Six Case Studies - Nature Conservation Grazing Projects using Goats

	Site Details Location	Lough Avalla Farm (2 acre paddock), The Burren, Co Clare (Visited 01/10/17)	Horse Island (32 hectare island), Lower Lough Erne (Visited 10/9/17)	Rhandir mwyn, Carmarthenshire, Wales (2 x 25 acres paddocks (the total are to be grazed is 600ha and the paddocks will be expanded/moved in time)	Ventnor Downs, Isle of Wight.	35 hectares in Confluence Park - National Park area in Calgary, Alberta, Canada	Thornton Park Essex (Visited 10/11/17)
1a	Habitat Type	Semi-natural woodland (e.g. Hazel and whitethorn scrub) on calcareous (e.g. Karsk) grassland	Semi-natural grassland and woodland scrub	Woodland with encroaching brambles and invasive species	Coastal Chalk grassland with acid gravel cap with encroaching scrub (i.e. Holm Oak Woodland invading chalk downland)	Modified grassland (native and non-native species), upland low shrub, and riparian shrub.	Semi-natural grassland, woodland and some heath.
2	Conservation Objectives of the scheme	Female yearlings are stop yearlings being covered	This island is a designated 'area of special scientific interest' for the high density of breeding waders on the island along with the Red Listed Curlew. The goats are very efficient at grazing Horse Island and this is noticeable by the high browse line on the island and the exposed soil which allows chicks to feed on invertebrates	Cost-effective weed control for a Royal Society for Protection of Bird Nature Reserve with the added benefit of having a genetic reserve of Bagot Goats.	The aim is to restore valuable chalk grassland, and that glower-rich turf has re-established and butterflies, like Adonis blue, that rely on these chalk-loving plants. The goats are quiet successful at carrying out these objectives, and have made a marked difference to the advancement of scrub, both with a visible browse line and ring barked mature trees. Additionally, Adonis Blue butterfly numbers have increased.	This is a pilot project that aims to target the encroachment of the Canada thistle, yellow clematis and nodding thistle. Additional objectives relate to other land management goals such as opening areas that were heavily overgrown and the reduction of fuel load. This year, there has also been a scientifically designed monitoring program established that measures costs and also the effectiveness of goats as a weed control tool. This monitoring should continue for the next few years.	County's finest examples of wood-pasture and parkland, with many large veteran trees that support a nationally important assemblage of beetles. Most of the wood-pasture and ancient woodland is designated as a Site of Special Scientific Interest (SSSI) with other areas of woodland and grassland notified as Local Wildlife Site (LoWS). Our Cheviot goats work alongside the Red Polls to graze an area of species-rich grassland to the west of Childerditch Wood that is within a Higher Level Stewardship scheme and noted for its butterfly fauna. The goats are used to target dense stands of bramble. Reduce scrub maintain open land, Counter bramble, sycamore, birch. Hawthorn invasion
3	Who manages the herd on a daily basis	Goats have their diet supplemented daily by the Jeuken family with oats, barley and also seaweed on occasion	These goats are not managed on a daily basis as they became feral once released on Horse Island	A local farmer is paid to tend to the goats on a daily basis. The goats diet is supplemented with a coarse, dry goat mix and grass pellets that provide fibre. Fresh water is available through natural springs.	Once the goats are rounded up the tags are checked, the kids recorded and tagged, hoofs trimmed, and health assessed. Once this is done they are released again back on to the downs. The goats fend for themselves though out the year and any visual checks are occasional. Fresh water is available from streams and water is also supplied via troughs attached to the mains, but this is rarely used by the goats.	The goats are monitored 24 hours a day by the shepherd, her staff of (1-2 helpers) and two guard dogs. The goats stay in the park over night as does the shepherd in a caravan/mobile home.	3 rangers manage herd

	Site Details Location	Lough Avalla Farm (2 acre paddock), The Burren, Co Clare (Visited 01/10/17)	Horse Island (32 hectare island), Lower Lough Erne (Visited 10/9/17)	Rhandir mwyn, Carmarthenshire, Wales (2 x 25 acres paddocks (the total are to be grazed is 600ha and the paddocks will be expanded/moved in time)	Ventnor Downs, Isle of Wight.	35 hectares in Confluence Park - National Park area in Calgary, Alberta, Canada	Thornton Park Essex (Visited 10/11/17)
4	Year round or seasonal grazing, if so when and why?	March to August	Year-Round	April to October	The grazing is practically year round. When originally released the goats were fully feral within the fenced area. Now the goats live a feral lifestyle, grazing throughout the year, but are rounded up once a year for management in September or October.	The goats graze for approximately 8 days at a time for three sessions, which are approximately 1 month apart in July, August and September.	Grazing is year round more concentrated in Summer and extensive in Winter
5	What breed of goat is used and why?	Mixed Breed (Golden Guernsey's / British Alpine / Sannen / Old Irish?)	These goats had an Old Irish Base, which is still somewhat visible however introgression has occurred with improved Swiss breeds	Bagot	Leyton Feral Goats	A range of breeds were used such as Angora, Boer, Kiko and Sannen breeds.	Cheviot Goat (similar to the Old Irish Goat) Goat of choice due to graving preferences hardiness, long coat. Swiss goats not as hardy
6	Are goats dual use, milking and grazing?	Yes	No	No (However tourism makes up a small element of the Bagot Goat Society Grazing Projects and also these goats are part of a breeding program and it has been recorded that they are in very good condition for this purpose)	No	No	Their purpose is grazing and meat production
7	How are goat numbers determined	8 Female Yearlings that are too young to be covered and so are kept separate	15 goats from a founding population that was all that was readily available	14 / This number is to be doubled next year but as this is a rare breed, 14 was all that was readily available	These goats have been bred from the feral Lynton herd. Currently there are 35 tagged goats made up of 16 Billies and 19 Nannies. From casual observation we have had 8 kids born counted this year but the exact numbers will be determined at the round up on the 19th of October	106 goats were used in the summer of 2016. The Urban Conservation Group hired an independent contractor (a shepherd who specialises in vegetation management using goats) who carried out a site assessment prior to beginning and decided that 300 goats was a manageable number for the park. The goats were monitored 24 hrs a day by the shepherd her staff and two guard dogs.	Trial and error, start with a large blitz with lower numbers to manage regrowth
8	How is Shelter / Housing addressed	1 Calf Hutch	No / there is growth enough on the island to provide natural shelter	Temporary structures consisting of a corrugated iron roof held up by wooden posts	The shelter available is natural within the coombes, under trees and scrub.	The program was carried out in the summer so the weather and temperature were warm/hot. The goats spend the night in a pen, which is set-up/taken down before and after each grazing session. When there was heavy rain and lightning storms, plastic covers were pulled out over the pen or the goats were loaded into the transport trailer.	Basic, using tree trunks and plywood roof

	Site Details Location	Lough Avalla Farm (2 acre paddock), The Burren, Co Clare (Visited 01/10/17)	Horse Island (32 hectare island), Lower Lough Erne (Visited 10/9/17)	Rhandir mwyn, Carmarthenshire, Wales (2 x 25 acres paddocks (the total are to be grazed is 600ha and the paddocks will be expanded/moved in time)	Ventnor Downs, Isle of Wight.	35 hectares in Confluence Park - National Park area in Calgary, Alberta, Canada	Thornton Park Essex (Visited 10/11/17)
8	Is there a need for fencing and if so, what type	6 foot poultry fencing with one offset electric wire	Being an island there is no need for fencing. However, while the goats roam freely their grazing is still effective enough to create ground-nesting bird habitat	Standard height 3.5 - 4 foot fencing with two stands on top that are not electrified	The fencing used is 1.5m high deer fencing however, this type of fencing can no longer be purchased but the nearest equivalent is Tornado T15/155115 Deer Fence.	There is minimal fencing used as the goats are herded and never left alone.	yes, electric and post and wire. Netting wire fence 1.05m and standard fence 5 ft. (1.2m sheep wire and 2 barb). Checked daily.
9	What are the biggest obstacles / problems encountered?	The area has been cleared of scrub to such an extent that regrowth is compromised and therefore more supplementary feeding will be necessary next year	The main challenge has been the inability to manage these goats. However, the RSPB are planning to introduce more goats to Lough Erne next year for which plans will be put in place for them to be managed.	Supplementary feeding was required.	The logistics of rounding up the goats was an initial challenge that has now been addressed by the formation of a long line of people stretching from the top of the down to the bottom which walk from east to west where the capture pen is located.	Grazing wasn't permitted within the Calgary City prior to the 2016 project and the majority of efforts were focused on getting the necessary amendments in place within the city bylaws. Those changes came into effect July 2017 and grazing is now used widely in the parks spaces and they are looking to expand. Dogs are a risk but walkers are asked to keep them on a leash and to keep a reasonable distance.	Public reaction to fencing and animals or livestock - dog control, dog attack by livestock, people can't control dogs. Consultation needed. Strong box needed to secure electric units / batteries.
10	Is a dog used to assist a herder?	No	No	No	No	Yes, 2 livestock guard dogs are used.	No the goats are "bucket-trained".
11	Is there a commercial side to the business e.g. meat, milk, cheese, tourism	The selling of goat meat and milk (currently the family are considering producing goat hides)	No	No	No	The only commercial side business is the shepherds who only uses goats for vegetation management. Website: http://organicweedcontrol.ca/	GS13 Management of grassland for target features £90 per ha 46 GS6 Management of species-rich grassland £182 per ha 32 SP8 Native breeds at risk supplement £94 per ha 75 Pure Cheviots expect to bring in about £130 each. Red Poll steers ready for the butcher are budgeted at £800
12	Contact Details	Melissa Jeuken Phone: 08 68122410 Email: meljeuken@hotmail.com	Brad Robson, Royal Society for Protection of Birds Fermanagh Area Manager, Phone: 028 6634 1456 Email: brad.robson@rspb.org	Nick Bohemia (Chair/Acting Secretary) Phone: 00441568 770215 Email: info@bagotgoats.co.uk	David Mears, Area Ranger (South & East Wight) Phone: 07970 637547 Email: david.Mears@nationaltrust.org.uk	Sarah Kellett, Parks Ecologist and coordinator of the grazing program in Confluence Park. Email: sarah.Kellett@calgary.ca Phone: +1 720-913-1311	http://www.essexgrazing.org.uk/ Roger Beecroft HERD MANAGER rogerbeecroft@wildlife-countryside.co.uk Luke Bristow PROJECT MANAGER Luke.Bristow@essex.gov.uk Legacy Grazing, Place Services, County Hall, Chelmsford, Essex. CM1 1YS Telephone: 0333 0136867 / 01245 436604 Legacy.Grazing@essex.gov.uk

Figure 3 Conservation Grazing Sites
Lough Avalla Farm (2 acre paddock),
The Burren, Co Clare



Before goat grazing



After goat grazing



Lough Avalla goats are cross bred with an
Old Irish Goat base



Regrowth



Tree protector



Fencing combination of existing
stone wall boundary light timber
post and electric fence

Thordon House Country Park Essex



Thordon House Goats behind electric
fence



Thordon House Cheviot / Pygmy Crosses



Typical sheep wire and double barbed
wire fence used at Thordon



Temporary Fencing used at Thordon



Protective Fencing used at Thordon



Confluence Park - National Park area in
Calgary, Alberta, Canada



Horse Island, Fermanagh, understory kept
clear by free grazing goats

G. BACKGROUND LITERATURE ON CONSERVATION GRAZING:

As well as looking at goat based conservation grazing in practice, the society also reviewed some of the available literature:

“Goats have developed in harmony with local conditions of climate, terrain, vegetation, and even pathogens over centuries in many areas, while they have been blamed of causing environment degradation in other ones. Most of the environmentally harmful effects of goat grazing arise from improper management practices at very high grazing pressures whereas goat grazing can be a useful tool for conservation if managed adequately. Moderate grazing pressures can be compatible with high levels of biodiversity and provide externalities, whereas high intensity at short term can be a valuable tool for weed control. Goat genetic heritage is seriously threatened and requires more studies and greater support from national and international institutions, in parallel with other efforts in rural development, especially for remote areas which hold an outstanding reservoir of livestock diversity adapted to the local conditions. A multidisciplinary approach of scientists, policy makers, rangeland managers and local communities is required for the design of future sustainable management plans.” García et al 2012

In order to enhance soil quality, plant and animal biodiversity, goats require adequate management practices (El Aich & Waterhouse, 1999). Having open heathlands with higher biodiversity values depends on appropriate stocking rates, as goats at too low a density will not impact on advancing scrub, whilst too high a density will reduce heathers ability to compete with grasses. Therefore, lenient stocking rates are advised, which maintain diversity and do not deplete heather shoots. Of course, stocking density depends on the breed of goat used and as the Old Irish Goat has not been tested in studies in conservation grazing / scrub clearance initiatives to date, a degree of experimentation is necessary. Interestingly, it has been recommended to stock cashmere goats at around 10-12 goat's hectare on heathlands (Celaya et al. 2010) and the Old Irish Goat is a cashmere breed.

Grazing is imperative for the conservation of vast majorities of heathland habitats. Hardy, traditional breeds are being increasingly utilised over machinery and mainstream breeds for conservation grazing projects as keystone species that benefit biodiversity, with suitability for low quality keep and challenging conditions. Essentially, the use of these breeds presents a more economically, environmentally and culturally sustainable solution (GAP, 2001). Grazing is beneficial for maintaining and increasing species diversity, namely for invertebrates and birds and is particularly important for coastal heath (NPWS, 2016). The introduction of a grazing regime using Old Irish Goats could effectively control the advancing scrub and invasive plant species. Goat grazing presents a solution to the excessive encroachment of thorny, woody species (e.g. bramble, gorse, birch, etc.) (Celaya et al. 2010). Goats are deemed as “necessary” in the management of heather-gorse scrublands because of the extent with which they have been shown to manage the accumulation of woody species (Celaya et al. 2007). Goats have exhibited the ability to control the accumulation of gorse, especially after fires, (Radcliffe 1986) as they are able to include high percentages of gorse in their diet, that increase in the spring and winter months (Clark et al., 1982). They remove hardened gorse shoots, green growth and bark, thus leaving bushes exposed and with reduced root reserves. Moreover, goats have an increased ability to adapt to harsher environments such as low nutritive quality heathlands due to their skilful grazing behaviour and efficient digestive systems (Silanikove, 2000).

H. TACKLING ROOT CAUSES:

The decline of Howth's Heathland, is linked to the decline of traditional farming. In parallel, the decline of the Old Irish Goat is set against a backdrop of rural economic decline, decline in traditional hill farming and a degrading uplands environment. While much progress in landscape management has been made in Ireland on the back of the “innovation” of returning to traditional farm practices, that innovation has not yet extrapolated to the use of traditional breeds in Ireland. The result being that in the development of agricultural ecosystem services; “Often, “fashionable” exogenous breeds, such as Highland cattle or Hebridean sheep, are preferred over the use of better adapted local breeds of a region.” EIP-AGRI Focus Group Genetic Resources – Cooperation Models 24 July 2015

Howth and the Dublin Bay Biosphere has particular opportunities and responsibilities in this regard as it is linked to United Nations articulated values that elevate genetic resources; valuing them not merely as an enabler to support other species, while acknowledging their significant functional value in doing so, but importantly to their warranted importance, in their own right, alongside other biodiversity concerns.

So in endeavouring to manage Howth's heathland, initially through traditional farm practices and use of “sheep and goats”, the society would recommend that the Howth SAAO and its partners, go one step further in designing their scheme, by using traditional native breeds and in this point, ultimately that will achieve a better overall result.

Beyond the immediate pressing concerns of heathlands management and accumulated ecological damage from wild fires, keeping of Ireland's traditional goat represents an opportunity to preserve genetic resources and help in pressing landscape management challenges. Development of complementary artisan food and tourism can help to create additional economic benefits that further support conservation. The Old Irish Goat is an unrealised local, national and international heritage and cultural asset and genetic resource whose origins date to the Céide Fields in county Mayo, Poul nabrone Portal Dolman in the Burren and the Megalithic Chamber Tomb, Bru na Bóinne, in county Meath. With distinctive traits, 12 colour patterns, and an ancient appearance it has the potential to become a tourism icon of Howth and Ireland, to anchor or add value to a UNESCO World Heritage Site as a cultural asset and become an eco-friendly alternative to herbicide based invasive species control of heath. It can also provide a milk, dairy product and meat source from challenging farm land and scrub.

I. WILDFIRES:

A symptom associated with the decline of Howth's heathland, is the significant and expanding wildfire potential to Howth which poses risks to property and ecology, through fire damage to shallow peat. Portugal has been at the vanguard of this field in Europe and significantly has employed the goat as a counter measure: Sky News; “Goats help prevent Wild Fires in Portugal” <https://news.sky.com/story/goats-hired-to-help-prevent-deadly-wildfires-in-portugal-11403803> Creation of fire breaks may present an opportunity to install temporary fencing for goat conservation grazing / grazing patches and should be availed of as an opportunity.

J. THE PRACTICALITIES OF SETTING UP A GOAT GRAZING SCHEME ON HOWTH:

The heathlands and headlands of Howth are severely under-grazed, the sheer scale of the challenge is daunting, some 200 hectares covered in a blanket of overgrown and often rank vegetation, with a spreading cover of dense impenetrable scrub engulfing high amenity heathland and grassland. The terrain is rugged and of high visual amenity and so does not lend itself to mechanical management or fencing. The target landscape is criss-crossed by a network of public byways that bring major health and safety and animal welfare risks to the project.

There is ample published research that points to grazing in particular by goats as being an optimum management tool; Grazing is beneficial for maintaining and increasing species diversity, namely for invertebrates and birds and is particularly important for coastal heath (NPWS, 2016). The introduction of a grazing regime using Old Irish Goats could effectively control the presently advancing scrub. Goat grazing presents a solution to the excessive encroachment of thorny, woody species (e.g. bramble, gorse, birch, etc.) (Celaya et al. 2010). Goats are deemed as “necessary” in the management of heather-gorse scrublands because of the extent with which they have been shown to manage the accumulation of woody species (Celaya et al. 2007). Goats have exhibited the ability to control the accumulation of gorse, especially after fires, (Radcliffe 1986) as they are able to include high percentages of gorse in their diet, that increase in the spring and winter months (Clark et al., 1982). They remove hardened gorse shoots, green growth and bark, thus leaving bushes exposed and with reduced root reserves. Moreover, goats have an increased ability to adapt to harsher environments such as low nutritive quality heathlands due to their skilful grazing behaviour and efficient digestive systems (Silanikove, 2000).

Were the challenges overcome and a goat based grazing scheme successfully deployed, Howth’s heathlands and headlands have potential to change from their current threatened / degraded state to ecologically magnificent landscapes, enriched by a cultural tradition, keeping of Old Irish Goats and traditional livestock generally, which is intrinsically linked to the history of Howth. Livestock, particularly if traditional to the area, would add to the spectacle of Howth and restore a cultural heritage that has been lost. It is a considerable challenge, as recreation needs to accommodate herbivores that are essential to maintain this designated landscape.

How do we do this? It is proposed to expand on the pilot Goats for Howth Project by scaling up to 5 livestock units, or 30 goats, on 5 hectares in the next phase. Key resources are; the local landowners / community e.g. SAAO, local residents and local assistant herders complemented by experienced goat herders. Howth’s traditional goats, Old Irish Goats, would be utilised. Clipex fencing is a robust, light-weight fencing system that, while new to Ireland, has been trialled in the UK, and can be configured to suit the particular requirements of the Goats for Howth Project while remaining temporary in nature. The Clipex system would be complemented by electrified fencing. The Old Irish Goat Society (OIGS) and by extension the Irish Rare Breeds Society (IRBS) and statutory bodies, including NPWS and Teagasc, led by the local authority, could bring support to the initiative.

Trial results would inform the design of the subsequent phases; ultimately the project would seek to graze the ~200 hectares of heath and amenity grassland on Howth, but target ~45 hectares by Q4 2020 in parallel with the other landscape management initiatives e.g. scrub removal and burning.

1. What breed of goat is suitable for our purposes; Either non-milking goat or goat breed that can be turned into milking goats after trail grazing period?

The most common goats in Ireland are Swiss dairy breeds, the Sannen, the British Alpine, the Swiss Toggenburg, and meat breed the Boer and Anglo Nubian. These breeds have been bred to fit into commercial farming practice which requires high output and by therefore on high quality feed. As a result commercial breeds can be difficult to manage in a low forage quality environment. Traditional breeds are generally preferred for conservation grazing for a variety of reasons, from animal husbandry to a broader grazing palette. In comparison to sheep and cattle, the exemplifies greater grazing capacity and minimal fodder quality requirement. Within the various goat breeds the traditional Irish breed, the Old Irish Goat, with a large rumen, being both small and hardy with a long coat and relatively small udder, it lends itself to extensive grazing in areas of low forage value such as heath. By contrast modern dairy goats, with short coats and protruding udders are more susceptible to inclement weather, injury to udders and mastitis presenting increased animal welfare challenges. Also there is an increasing preference for primitive breeds in conservation grazing supported by anecdotal evidence that primitive breeds provide a wider grazing spectrum than their continental counterparts, while interestingly dairy cattle are seldom if ever used for conservation grazing.



The Old Irish Goat would add value to Howth by virtue of its charismatic nature and cultural value

It is worth noting that the protection of genetic resources is enshrined in the UN Sustainable Development Goal 15 “Life on the Land” and function 1 of UNESCO biosphere reserves: “Conservation - contribute to the conservation of landscapes, ecosystems, species and genetic variation”. Given that the Old Irish Goat is a critically endangered Irish breed choosing the Old Irish Goat and other traditional breeds brings additional added value to the Biosphere site credentials and annual reports to UNESCO.

Howth has a deep cultural connection with the Old Irish Goat



Old Irish Goats being milked on Howth head c1950s



It is possible to return Howth’s native goat breed, as a result of the pioneering captive breeding program by the Old Irish Goat Society

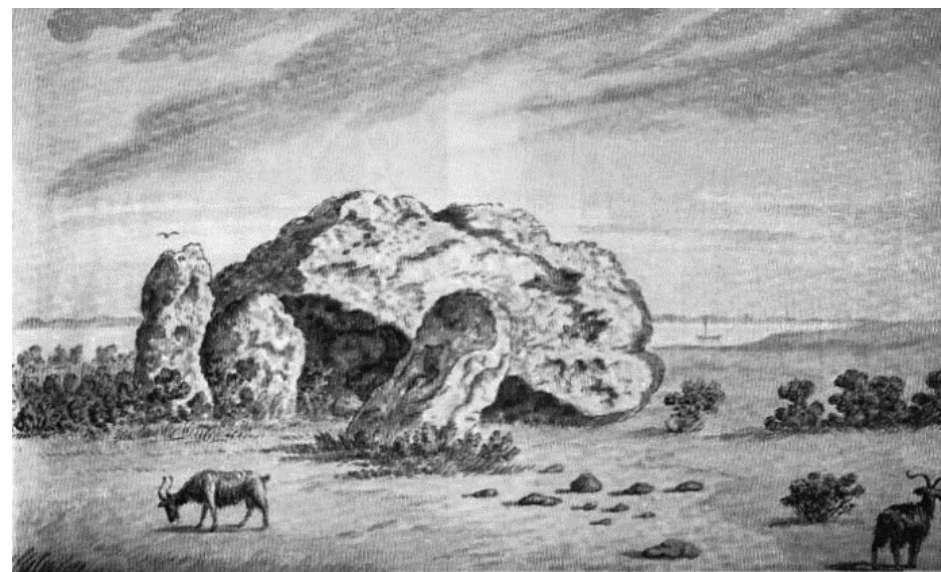
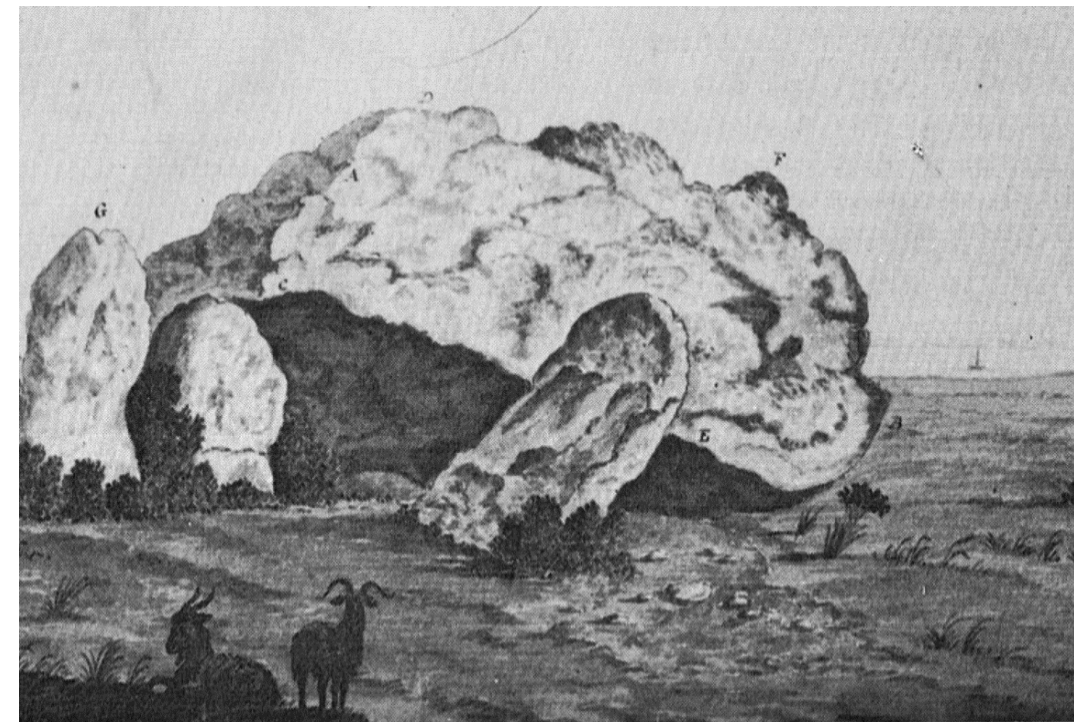


PLATE II: A watercolour by Beranger of the Cromlech on Howth, as observed by him in 1775. No. 16 of Manuscript 3.C.30 in the Royal Irish Academy. (Reproduced with permission of the Council of the Royal Irish Academy).



A watercolour drawing of the cromlech on Howth by Beranger, about 1760. Photograph by permission of the Council of Royal Irish Academy.

2. Can the old Irish Goat be used for this purpose and what are the associated practicalities?

Yes, the supply of Old Irish Goats, while perhaps somewhat limited, is possible, with up to 40 or so available initially and numbers expanding, allowing the project to get off the ground and expand organically with kidding. The Old Irish Goat Society would be keen to establish a 2nd herd in Howth on bio-security grounds as in a back-up herd. A base is required of some 5+ hectares of secure ground with suitable shelter and animal handling facilities in Howth to provide a safe and secure environment. The herd could expand to 200 goats over time to meet the long term needs of Howth.

The Old Irish Goat, Howth's traditional Goat and Ireland's endangered landrace breed are the recommended goat for the Howth GRAZING initiative.



Female Old Irish Goat, Connemara, is a threatened Irish Genetic Resource

3. Identify areas of heathland that are suitable for grazing and show this on a map

The OIGS team considered 4 sites to expand the initial pilot project; 1 Redrock on the coastline in Sutton including Fingal County Council lands and Sheilmartin, on the east mountain 2 sites were assessed and a 4th at the original "Goats for Howth" pilot study area. The coastline site in Sutton presents physical challenges in terms of terrain but has an existing farm, farm yard and some security from public trails and therefore presents a viable scenario. The original goat for Howth site is also a useful site with, access to heath, good ground cover and gentle contours, with local landowner interest. All 4 sites present opportunity to introduce conservation grazing, see maps in appendix 1.

4. What number of goats do we need for grazing purposes per hectare of suitable heathland?

Published recommendations vary from 1 ewe or goat to 0.25-2 hectares, 1 cow to 2-8 hectares and 1 pony to 5-12 hectares.

5. Do we graze seasonally or year round?

To determine a plant's response to grazing, it should be grazed during its growth stage. To be effective, targeted grazing must be applied with the right type of livestock at the right time and the correct amount of pressure for each vegetation situation. Two or more grazing treatments may be needed during a growing season to suppress undesirable vegetation. Seasonal variation in grazing can significantly affect the results in terms of species cover and is a subject that requires monitoring in Howth. Considering these points, it is suggested that goat grazing be carried out at Howth year round, this is driven primarily by practicality of maintaining a herd on goats on site to maximise grazing potential on Howth. The Old Irish Goat is equipped to thrive in inclement winter weather.

6. What evening housing is required and what housing is required during the period that the goats are not grazing the heathland.

Basic shelter is required of approximately 1.5m² per goat, dog kennels, lamb or calf hutches would be a suitable means of shelter in the short term but ideally some basic agricultural buildings would provide for night time security and animal handling. Basic housing, which is well-ventilated and can accommodate feeding is required. Calf hutches can support small satellite herds.



7. What animal welfare issues are to be considered?

It is important that the goats are well treated and feel comfortable on the home base. Protection from dogs is the main concern. The project design would need to provide for the Five Freedoms:

1. Freedom from hunger and thirst
2. Freedom from discomfort
3. Freedom from pain, injury or disease
4. Freedom to express normal behaviour
5. Freedom from fear and distress

A specific animal welfare plan for the project to address the 5 freedoms should be developed dependent on the site selection and choice of livestock.

8. Is any particular experience required to be a goat herder?

Any project that relies on animals requires a high skill level and particularly one in the public eye. The project would require an experienced goat herder with excellent goat and sheep dog handling experience with the competency to manage the Goats for Howth Project on the ground as well as deal with situations when they arise. This is a specialist skill set in short supply in Ireland. Ideally this skill-set would be recruited for the project and training provided to local enthusiasts and staff. Over time the need for high levels of support may be reduced as skills and knowledge are transferred.

9. What are the working hours of a herder

In a free grazing scenario with a herder, the work hours would be built around two 3-hour grazing shifts in early morning and afternoon this would be complimented by fencing or manual removal of encroaching scrub. This scenario would require an 8 to 10 hour working day. In a fenced in scenario, there would be less supervision and more time for scrub removal and fencing maintenance.

10. What are the key safety issues that need to be considered for the herder e.g. lone worker and what are responsibilities of Fingal County Council in this respect.

The principle risks encountered by the herder will, for the most part, be typical to working on a farm. The major cause of death 2006 to 2015 statistics highlights the main risk areas: Tractors / Farm Vehicles 29%, Machinery 19%, Livestock 14%, Drowning Gas, 10%, Falls from Height 10%, Falling Objects/ Collapse 7%, Timber Related 7%, Electrocution 2%, Other 2%. The best approach to identifying and mitigating risk is to adopt the Health and Safety Authority, Farm Safety Code of Practice, Risk Assessment Document once a site has been identified and livestock selected.

The potential negative impact from trails and their users to an expanded Goats for Howth endeavour is considerable and their management is pivotal if the project is to succeed. Indeed, with regard to feasibility, trails and their usage is probably the biggest challenge, in particular;

1. Loose pet-dogs; these have potential to wreak havoc and cause severe distress and indeed injury to grazing animals, with major legacy issues should an incident occur in terms of livestock behaviour and project perception.
2. Stray dogs at night pose a significant risk to livestock.
3. Cyclists travelling at speed also represent a particular hazard.
4. Unsociable behaviour suggest that this could impact negatively on livestock and herders.
5. Grazing animals, particularly cattle, can pose a risk to recreation users.

Ultimately the “Goats for Howth” initiative would need to coexist alongside best international practice in trail management at Howth, with Mountaineering Ireland / the National Trails office being obvious intermediaries to access best practice. At this point it is envisaged that to bring about the scale of grazing required, closure of sections of trails for specific periods should be trialled. Similar approaches are taken to traffic management systems in relation to street pedestrian improvement schemes, whereby the alternative use is trialled for a period. This suggestion would entail the rather novel exercise of reverting an area to its original traditional farmed landscape, and excluding people and pet traffic, from an area. Thus enabling the prospect of mixed grazing with traditional Irish breeds, ideally including goats, cattle, ponies, pigs and horses. It would be vital to

resource the initiative well and ensure that a critical mass of livestock be deployed to achieve visual and grazing impact. These experiments would provide data from which to identify the full scale of grazing livestock needed to achieve favourable conservation status in terms of grazing. Grazing of the scale envisaged requires cultural change particularly in relation to trails as well as an objective assessment of priorities for Howth’s amenity landscapes. An event like this could act as an engaging catalyst for change, if complimented by a workshop or conference. Once identified, a project Health and Safety statement will address specific risks relating to the defined grazing sites.



Conservation Grazing with Exmoor Ponies



Conservation Grazing with Cattle

11. What are the costs: employment of herder, insurance, purchase of goats, housing, vet bills, transport etc.?

Table 3: Indicative cost to establish 2 Conservation Grazing Sites for 1 year at Howth (5 Hectares)

Howth 5 Months Conservation Grazing Proposal (5 hectares)							
Set-up @ Red Rock (5 hectares)							Notes
Item	Supplier	Qty	Unit	Rate	Sub-Total	Total	
Coordinator Administration	OIGS	5	dys	350	1750		1
Develop Landowner Agreements	FCC	0	dys	350	0		2
Health & Safety Assessment	OIGS	2	dys	350	700		3
Animal Health Plan	OIGS	2	dys	350	700		4
Statutory Consents NPWS	FCC	0	dys	350	0		5
Signage "Grazing in Progress" Artwork	OIGS	1	dys	350	350		6
Signage "Grazing in Progress" 6 Election Posters	OIGS	6		32	192		6a
Insurance General Farm	FBD				250		7
Insurance Employment Sheppard	FBD				550		7a
Insurance 2 Week Roaming Trial (estimate)	FBD				500		7b
Lease	Bellingham's				10		8
Set Up Administration - Total						€5,002	9
Habitat Mapping, Condition Score, Set Points	OIGS	2	dys	500	1000		10
Perimeter Fencing Materials Site 1 (5hts)	Clipex	1000	m	2.7*	2700		11
Internal Fencing Materials	Clipex	700	no	5.6	3920		12
Electric Fencing	Koppel				1200		12a
Stake Driver 2 Stroke	Clipex	1	no	1750	1750		13
Handling Pen Drop Pin Sheep Hurdles	Clipex	20	no	60	1200		14
Goat Trailer	OIGS	1	no	1000	1000		15
Animal Welfare: Shelter, Water / Meal Troughs	Fingal Farming	1	no	2200	2200		16
Storage Container	FCC				800		16a
Set Up to support 50 goat herd						€15,770	17
Set-up Total:						€20,772	18
							19
Implementation							20
Goats Transport Mulranny to Howth (562km)	OIGS	5	562	0.3	843		21
Goats Transport Howth to Mulranny (562km)	OIGS	5	562	0.3	843		21a
Goat Maintenance / Feed		5		20	100		22
Sheep Dog Use	OIGS	2	no	0	0		23
Herder / Labour (39hrs x 4.3 weeks / 5 months)	OIGS	840	hrs	15	12600		24
Ecological Assessment / Monitoring	OIGS	3	dys	500	1500		25
Coordinator / Reporting 5 Site Visits	OIGS	10	dys	350	3500		26
Financial Administration	OIGS	1	dys	300	300		27
Accommodation	OIGS	120	dys	50	6000		28
Travel Mulranny to Howth (562km)	OIGS	20	562	0.3	3372		28a
Implementation (50 goats)						€29,058	29
Grand Total						€49,830	30

Notes

- Coordination covers management support to the project set-up, recruitment of staff and support for the project, training of goats to electrical fencing prior to arrival on Howth. It is anticipated that this element will also support fencing design / procurement, design of experiments, human resources management, assessment and ordering of materials, supplier related meeting / administration, promotion of the project to for example DAFM and NPWS.
- This element recognises the landowner as a key resource to the project, current and future and the need to develop and maintain good relations, which requires interaction and updates, and allows for time to interface with neighbouring landowner, with heath, which would be conducted by Fingal County Council
- The small holding will require a health and safety, risk assessment and plan
- The small holding will require an Animal Health risk assessment and Plan
- Statutory Compliance / Consents refers to the need for animal movement administration, movement training requirements, liaison with NPWS regarding Activities Requiring Consent, which would be conducted by Fingal County Council
- Develop up Conservation Grazing Trails Signage
- FBD quote
- Lease
- Set Up administration total
- This is based on an estimated cost of 2 days' x €500 detailed habitat mapping to national standards, condition score and point set up.
- This is based on providing a stock proof perimeter fence by fencing the entire 5 hectares with standard Clipex sheep fencing of perimeter ~1,120m with sheep wire and one electric wire with a finished height of 115cm at 5 m post centres.
- This is an estimate based on 600m of internal fence. 140m of Clipex Horse Fence 1.3m and a combination of 100 Clipex 165 @~€7, 40# 1.5 metre electric posts @ €35/20, 600m internal electrical fencing @ 5 strands electrical wire, 3,000m. 12a: Koppel quote
- Clipex quote
- Clipex quote
- Purchase a 2nd hand road worthy livestock trailer to facilitate emergency goat movements.
- Provisional estimate for a basic shelter, may take the form of a lean-to shed, a closed trailer or horse box, container or a combination. 16a Container by FCC
- Set up for goats
- Set up and Admin total for goat conservation grazing set up
- This budget is for delivery of goats in 5 lots of 10. 21a Removal of goats in 5 lots of 10.
- A small level of meal will be required to maintain goat health and handling.
- The project will have accessibility to 2 sheep dogs, to cater for internal handling and escapes
- Full time competent conservation grazer
- Ongoing ecological assessment
- This allows for 10 days of management support during project implementation 1.66 days / month over 6 months. It also provides for all ongoing general decision making, liaison with stakeholders, public engagement, reporting, analysis that the project requires. It is anticipated that this element will also support practical application of fencing, design of experiments, human resources management, assessment and ordering of materials, administration of suppliers and research into traditional farming practices in Howth, liaison and site visits with potential volunteers and project sponsors e.g. SOLAS / DAFM and Teagasc.
- Basic book keeping and financial transaction administration, statutory financial reporting for the project.
- This is a broad value for money estimate based on Public Service Domestic Subsistence Allowance of €133 in Dublin, full day meals of €33. 28a: and Public Service Mileage bands ranging from 44.79 cent to 83.53 cent, trailer towing 3.85 cent.

* Note this rate takes account of existing boundary infrastructure at the proposed site and labour at point 24. The exact specification of the proposed fencing may be adjusted in collaboration with the client to achieve the optimum value for money based on the results of initial trails on site. Internal fence budgets may be deployed to perimeter fence budgets depending on site chosen and desired sequence of grazing trials.

Table 3: Indicative cost to establish 2 Conservation Grazing Sites for 1 year at Howth (45 Hectares).

Set-up @ Red Rock (5 hectares)	Expansion (40 hectares)			
Item	Qty	Unit	Rate	
Coordinator Administration	14	dys	350	4900
Develop Landowner Agreements	3	dys	350	1050
Health & Safety Assessment	3	dys	350	1050
Animal Health Plan	3	dys	350	1050
Ecological Assessment	3	dys	500	1500
Statutory Consents	25	dys	350	8750
Signage "Grazing in Progress"	5	#	300	1500
Insurance				2000
Lease				2000
Fencing erected Site 1 (5hts)	3000	m	10	30000
Electric Fencing	1	no	2000	2000
Stake Driver 2 Stroke				0
Handling Pen Hire				0
Handling Unit Hire				0
Goat Trailer Hire				0
Animal Welfare Facilities				3000
Set-up Total:				58800
	Implementation			
Goats	150		50	7500
Goat Maintenance / Feed	150		15	2250
Sheep Dog Use	0	no	450	0
Herders (Part Time)	150	dys	150	22500
Coordinator	10	dys	350	3500
Financial Administration	2	dys	300	600
Travel / Accommodation	77	dys	50	3850
Implementation Total				40200
Grand Total				€99,000

12. A step by step overview of what actions are required to set up a goat grazing scheme on Howth

It would be desirable to commence conservation grazing project in Howth as soon as possible and have ¼ of Howth's heathlands under grazing by Q4 2020, the principle steps advised are:

1. Setup: Agree a pilot concept / scale and integrated approach with stakeholders
2. Develop and agree a memorandum of understanding or lease with the relevant landowners, to cover land use, responsibilities, compliance and insurance
3. Establish a budget that will make an impact considering the scale of the effort; €50,000 set up budget and €100,000 per year to get the project up and running and a €30,000 contingency.
4. Recruit a competent shepherd, that can deliver good goats and good habitats that will be valued by the community.
5. Form a cross-functional team with delegates from the Howth SAAO Committee, Howth Trails, Howth SOLAS, Fingal County Council, Newbridge House, the Old Irish Goat Society, the Irish Rare Breeds Society, Teagasc, the National Parks & Wildlife Service and others to champion and guide the project.
6. Establish a meeting / site visit and reporting schedule. Communication between the shepherd, landowners and ecologists is critical, with an end of season visit by the whole team.
7. Develop a context / framework for the Goats for Howth Initiative by conducting a Geodesign workshop for Howth's natural heritage sites or Dublin Bay Biosphere which can voice for example the need to "Develop a Responsible Pet Ownership Byelaw for Howth" in a positive collaborative forum, place the goat conservation effort and map out the other initiatives on Howth, for example map fire management zones and engage stakeholders.
8. Develop a Goats for Howth Health and Safety and Animal Welfare plan addressing the 5 freedoms.
9. Conduct a detailed ecological assessment of the target area with baseline imagery and vegetation cover measurement, habitat condition score, desirable and undesirable species cover and indicative target covers for the next 5 to 10 years, to monitor progress. This will provide clear objectives for the site. Develop a results based model for heath.
10. Provide statutory notifications to National Parks and Wildlife Service and Department of Agriculture Food and Marine related to establishing a goat holding in Howth.
11. Implementation (5 Hectares): Enhance existing boundary fences to make stock-proof, provide animal handling equipment and low cost shelter, e.g. temporary hutches or temporary lean-to structures.
12. Settle in and commence training of goats, conduct small free grazing and trials using proprietary Clipex electrified mobile fencing in collaboration with project team.
13. Public engagement, awareness and education program. Introduction to project team, aims and preparations to extend grazing trial to public amenity land using temporary fences and free range grazing over the winter period.
14. Expansion (40 Hectares): Post peak tourism season, carry out a trial grazing project on Fingal County Council Lands at Red Rock public lands and Sheilmartin using the Clipex temporary fencing system, in a mosaic style using existing project labour.
15. Develop a business plan for goat based enterprises and acquire permissions for new permanent fencing and housing facilities, that can attract enterprise supports and ensure long term feasibility and grazing on Howth for the 5 to 20-year period, targeting enterprise support initiatives.

Figure 4. Conservation Grazing proposal at Redrock and Sheilmartin to achieve ¼ of Howth heathland by 2020



Howth Heathland ■ 1. Set-Up 5 Hectares ■ 2. Expansion 25 Hectares ■ 3. Consolidation 15 Hectares ■ Howth Loop Walk ■



Old Irish Goat Milking on Howth c1950's



As a result of the pioneering captive breeding program by the Old Irish Goat Society It is now possible to return Howth's native breed of goat

▪ **Goats for Howth Concept / Integrated approach:**

The Goats for Howth initiative will not work in isolation and leaving aside the need for wider integration in terms of planning and tourism, the integrated management of trails, grasslands and headlands and other invasive species control measures including controlled burning would have immediate direct benefits to the Goats for Howth project and vice versa.

An integrated approach is also relevant to scrub removal and controlled burning as pre-grazing of target areas with goats will have beneficial effects.

Goat grazing ahead of manual scrub removal can substantially reduce the impenetrable nature of scrub by reducing / removing the understory of briars and herbaceous shrubs, creating runs and exposing stems or trunks of woody material. Thus the dense nature and payload of scrub is substantially reduced and by extension manual labour and costs.

Depending on the target plant species / areas for burning, pre-grazing will have the beneficial effect of reducing the carbon load of the fire and thereby reduce fire temperatures, risk of fire spread and damage to soil. Note that Rhododendron is poisonous to goats although they will generally survive if they are in good health.

▪ **Resources and Funding:**

Typically, a project like this would seek to become self-sustainable in the 3 to 5-year term. However, farming by and large is a heavily subsidised enterprise as it is generally unviable, even in areas far removed from the challenges and constraints confronted in Howth.

A good approach to start with in relation to the Goats for Howth project would be to establish 4 principle strands of funding;

- B. The principle national actors for designated landscape management, the Department of Communications, Climate Action and Environment and Department of Agriculture, Food and the Marine, may part fund the project. More locally Fingal County Council may fund while the Heritage Council is targeting Uplands Areas for additional support. The state has commitments to meet on behalf of its citizens to support landscape conservation, these commitments require investment. The challenge is to present a viable plan with good prospects for environmental, social and economic benefits. Ireland's economic think tank, the ERSI is currently advising against tax-cuts to avoid overheating the economy. This macro-economic view should lend itself to investment in projects that can realise benefits in the medium term for climate change mitigation, avoidance of EU environmental fines and support high revenue return on authentic experience based tourism sector in Howth.
- C. Slightly further afield EU LIFE sources are worth considering, but require substantial investments of time upfront with typically a 1 in 4 chance of success.
- D. Enterprise could form a third strand with meat or milk production at artisan food standard or responsible tourism, again significant upfront investment is needed for milk production.
- E. Lastly private philanthropy / volunteerism / social enterprise can play a significant role.

▪ **Proposed Trial Sites**

It is proposed to base operations for the next phase of the Goats for Howth Project in Sutton, close to existing farmyard infrastructure and significant Fingal County Council land-bank and or at the existing Goats for Howth base at the Summit.

The project would develop from the current Goats for Howth pilot study area of 0.12 hectares, to some 5 hectares initially, using a modified version of Clipex poultry / horse style fencing or adapted sheep wire with internally protruding electrified wire options, see figures 5, 6 and 7 with the principle project elements and provisional costs listed in table 1. This phase would trial and utilise herded grazing without fences and conduct other experiments, these would be developed once landowner agreements are in place.

▪ **Fences:**

To be effective, targeted grazing must be applied with the right type of livestock at the right time and the correct amount of pressure for each vegetation situation. Fences while undesirable from a visual amenity perspective are essential for effective conservation grazing, particularly in highly trafficked areas. The underfoot conditions of shallow peat with little mechanical property for post stability and a rocky subsoil that is difficult to penetrate add to the challenges. Choosing the right fence for the Howth Project is crucially important, when considering the livestock of choice, the prevalence of people and pets, the irregular topography and the shallow and rocky nature of the terrain. At the nub of this endeavour is the need to keep livestock in and people and pets out, for the general welfare of all, versus the need to minimise visual impact and cost. There is also a need for the fencing to be temporary yet robust enough to withstand the attentions of the most agile of livestock, the goat.

Recognising the many constraints the team has selected the Clipex fence system as the optimum solution for Howth. The Clipex fence originates from Australia and has been used in the UK for conservation grazing, it was launched in Ireland at the national ploughing championships 2017. The system is a composite of galvanised angle metal posts with a proprietary flexible box wire mesh. Clipex allows the galvanised square mesh wire to be clipped on and off the post with addition of electrical wires also possible. The post is both strong, fire resistant and relatively light and the slender nature is optimum for transport and erection over challenging terrain. The grey colour of the post and grey square mesh also minimises visual impact when compared to chain-link and is easier to strain and restrain. The tuff knot wire mesh eliminates sliding of vertical wire and occurrence of livestock entrapment. The design of the fence aids dismantling, with wire being unclipped and the inherent strength allowing for post withdrawal and removal.

It is noted that goats can be contained with 5 strands of electric wire, with the 1st wire 150mm above ground, 2nd wire at 140mm, 3rd wire at 185mm, 4th wire at 200mm, 5th wire at 230mm above 4th wire. This could be useful method to upgrade existing boundaries and create temporary fence enclosures.



Above Left: Existing 3 strand barbed wire livestock fences would require enhancement to make suitably stock-proof for goats. Above right: The Clipex fencepost with electric wire.



Above left, existing boundary fences could be improved similar to Lough Avalla Farm (Figure 3)

Above right, Clipex features a modified reinforcement bar end which lends itself to use in solid rock, via drilling, and in drystone wall supplementing with wire fencing.

Within the Clipex range the OIGS team are recommending the Clipex poultry / horse / sheep fence using the lightest Eco-Post with centres reduced from 5m to 3m. These posts, weighing 2.6kg and standing installed at 1.8m will lend themselves to installation using a 3-ton mechanical excavator or by hand in favourable soils. Poultry / horse wire will practically eliminate the occurrence of animals becoming snagged in the wire and will not present a toe hold for would-be individuals seeking entry. The 3m post centres are recommended to add mechanical strength to the fence and reduce escape routes under the fence wire which is an issue with goats and contour variation. With the



right application it is considered that the proposed fencing solution will bring important capability to achieve the objectives of the project.

The Clipex Fence would be complimented by electrified fencing either netted fencing or multi-strand tensioned electrified wire to facilitate more extensive grazing over greater areas, the latter fence type being less visually intrusive, the latter recommended. Due to the high levels of pedestrian usage it may be necessary to install a simple exclusion fence to create a gap between pedestrians and electrified fence. Electrified netted fencing may necessitate the use of polled (hornless) goats, or supervision to prevent goat entanglement.

<https://www.premier1supplies.com/p/permanet-plus-48-inch-starter-kit>



Temporary electrified fencing, to facilitate conservation grazing on Howth

▪ **Animal Welfare, Health and Safety and Ecological Assessments:**

Once a land base has been agreed, then it would be possible to design the project to meet the five freedoms and conduct meaningful assessments. Animal welfare and Health and Safety plans can be drawn up as well as a targeted ecological baseline and monitoring program and design of experiments. A results based agricultural environmental scheme style of monitoring would be the ideal in terms of providing simple and easily measureable data that supports ecological improvement of areas and a positive cycle of support from administrators and funders. A draft heathland and peatland score card is available at <https://rbaps.eu/documents/>



Above left: Hay feeder and salt lick. Above Right: Signage to ensure dogs are on leads





Above Old Irish / Swiss Crossbred Goats: “The Irish goat in the process of time has developed a coat which acts as a natural thatch in the moist humid atmosphere of its native districts.” Walter Paget 1918

K. GOAT GRAZING PROJECT AS A COMMERCIAL ENTERPRISE:

1. Identify the potential of a commercial enterprise on Howth using Goat milk/Goat cheese/Goats as a local product and a Tourist attraction

The notion of developing a goat based enterprise in Howth is worthwhile from a local and national sustainability viewpoint considering the 4 sustainability pillars i.e. social, economic, environmental and organisational. At a national level goat farming is underdeveloped, has significant growth potential and is being favourably supported from an enterprise perspective. At a local level the need to develop capacity to support conservation grazing is critical for the long term management of Howth’s significant landscape assets.

Initial analysis suggests that a mixed approach of goat dairy, cheese-making, meat and conservation grazing herd combined with responsible tourism would be the most beneficial in terms of social enterprise benefits, scale and capacity. These enterprises should be developed organically as spinoffs once the core conservation grazing project is established and capacity evolves over time.

Common sense would advocate developing low capital high conservation grazing / revenue generation enterprises first and taking on capital intensive enterprises later. Generally, this would translate to a. conservation grazing, b. responsible tourism, c. premium goat meat brand, d. premium goat cheese brand, e. commercial cheese making and f. commercial goat dairy.

It is worth noting that a national conservation grazing enterprise could develop from the Goats for Howth Initiative. As there is currently no professional conservation grazing service providers in Ireland and given the peripheral nature of the goat in general, the Old Irish Goat and native breeds in particular, this would make the enterprise highly innovative in Ireland. Given the context of farm abandonment in Ireland and related declines in farmland birds it is anticipated that demand for this service will grow significantly in Ireland over the coming years and it is recommended that this enterprise be pursued in the first instance, with more conventional enterprises to follow as resources allow. Interestingly, green goat grazing services are available in the USA for \$250/day and a mobilisation fees of \$150 minimum depending on distance for “small jobs” measured in square footage which implies a small area and small number of goats. Temporary fences are provided.

Aran Island Goats Cheese offers historical tours @ €15 per person, Island Tours @ €30 per person and a cheese-making tour @ €25 per person. These are high labour / low capital intensive enterprises. The Old Irish Goat being the traditional goat of Howth, has a 5,000-year history in Ireland aligning to the 5,000-year theme in the Ireland’s Ancient East brand offering and therefore lends itself to a tourism offering.

2. How do you set up a commercial goat’s milk/goats cheese business – give two best practice examples

Two of case studies were assessed: Claudia Marl and her husband Juergen run a herd of 350 goats at their farm near Collinstown for goat milk production. The goats are modern Swiss breeds of Toggenburg, Nubian, Alpine and Saanen breeds, and are housed all year, with 30 to 50% of the herd in kid an any time. The goats are milked at 7am and 5pm. They use 70 hectares for fodder

production in the form of silage which is supplemented by one kilogram of meal. The farm produces 750 litres a day and receives 70c per litre from the processor' which amounts to a turnover of €191,625.00. This has to pay for goat replacement of 20%, fixed overheads and variable costs and labour. The net margin per goat is €95 or €19,000 per annum for a 200-unit dairy herd.

An interesting alternative enterprise model is offered by Aran Island Goats Cheese:

The enterprise runs 93 adult goats producing approximately 1000ltrs of milk a week. 50 litres of milk produces about 5 kg of hard cheese or 100kg per week. A typical goat cheese retails at €5/100g which equates to a turnover of €250,000 per year. Several distinct cheeses are produced. Incidentally the bi-product of making cheese, whey, is fed to Tamworth pigs on the farm.

In analysing these 2 studies, goat milk output varies from 1.5 to 2.5 litres per day, reflecting the more commercial commodity production and the less intensive higher added value approach. The Old Irish Goat has been known to produce up to 200 gallons or 2.5 litres of milk per day. This was likely a record and so, based on observation of the Old Irish Goat, at close hand, although not specifically measured, is not inconceivable that a 1litre per day would be achievable.

3. Can the herder operate a facility like this or is another person hired to do that.

A 200 commercial unit dairy herd is considered a "1-person unit", this is based on a full year round housed goat herd that doesn't graze but is milked twice daily.

4. Is it commercially viable to set up a commercial goat's milk/goats cheese business based on the goat numbers required on Howth? Will there be enough milk to produce a product in large enough quantities to make it viable.

Yes, but current commercial goat dairy farming practice is far removed from the extensive grazing required for Howth. However, a small scale dairy and cheese-making enterprise, could play a useful role in adding enterprise to the mix and therefore capacity, particularly if a premium brand of cheese could be developed, and by adding value as a unique experience based responsible tourism enterprise.

5. Set up costs of a mobile milking unit and cheese & milk processing unit

The capital cost to establish a commercial goat dairy, as in housing and dairy parlour is advised at €1,150 per goat which translates to €230,000 for a 200 goat herd or "1 person" unit. Capital grants vary from 40% to 60% depending on the age and educational profile of the applicant.

A small-scale milking machine can be purchased for €2000 and a bulk tank for €2 per litre capacity. Cheese-making equipment is expensive and must be carefully selected and funded through a full business plan. A typical cheese making plant / facility costs approximately €50,000.

Refer to the Department of Agriculture, Fisheries and Food Minimum Specification for Milking Premises and Dairies in S106, Minimum Specification for Goat Housing detailed in S159, Minimum Specification for Farm Fencing detailed in S148.

Goat meat production is a more suitable alternative in the short term, with dairy / Boer cross kids being bought for €10, input costs of €63, killing costs of €10, fetching prices of €200 to €250.

It may be possible to leverage farm payments, including schemes like GLAS and Areas of Natural Constraint, these could potentially earn from €10,000 to 15,000 for a 30 to 40-hectare farm on Howth and so would be worth considering as part of a medium to longer term approach, provided pilot trials showed promise and 5-year land lease were available.

6. Compliance:

Howth's heathlands are designated as a Special Area of Conservation and therefore in considering the Howth project there are 38 Activities Requiring Consent within Natura 2000 sites that need to be considered, the most relevant if these are listed here:

ARC-02 Use of excavators, rock breakers, bulldozers, back hoes or use of any other hydraulically-powered excavation equipment.

ARC-05 Cutting, uprooting or otherwise removing plants. [Consent is not required for harvesting of cultivated crops, or for grazing or mowing.]

ARC-06 Introduction, or re-introduction, of plants or animals not found in the area. [Consent is not required for the planting of crops on established reseeded grassland or cultivated land.]

ARC-09 Construction or alteration of tracks, paths, roads, bridges, culverts or access routes.

ARC-10 Construction, removal or alteration of fences, stone walls, hedgerows, banks or any field boundary other than temporary electric fencing. [Consent is not required for normal maintenance.]

ARC-15 Burning, topping, clearing scrub or rough vegetation or reseeding.

ARC-17 Agricultural improvement of heath or bog.

ARC-20 Significant changes in livestock density (including introduction of grazing), changes in livestock type or grazing season, other than on established reseeded grassland. [Consent is not required for changes of less than 20% in livestock density unless notice has been given that a lower percentage is applicable to a particular site.]

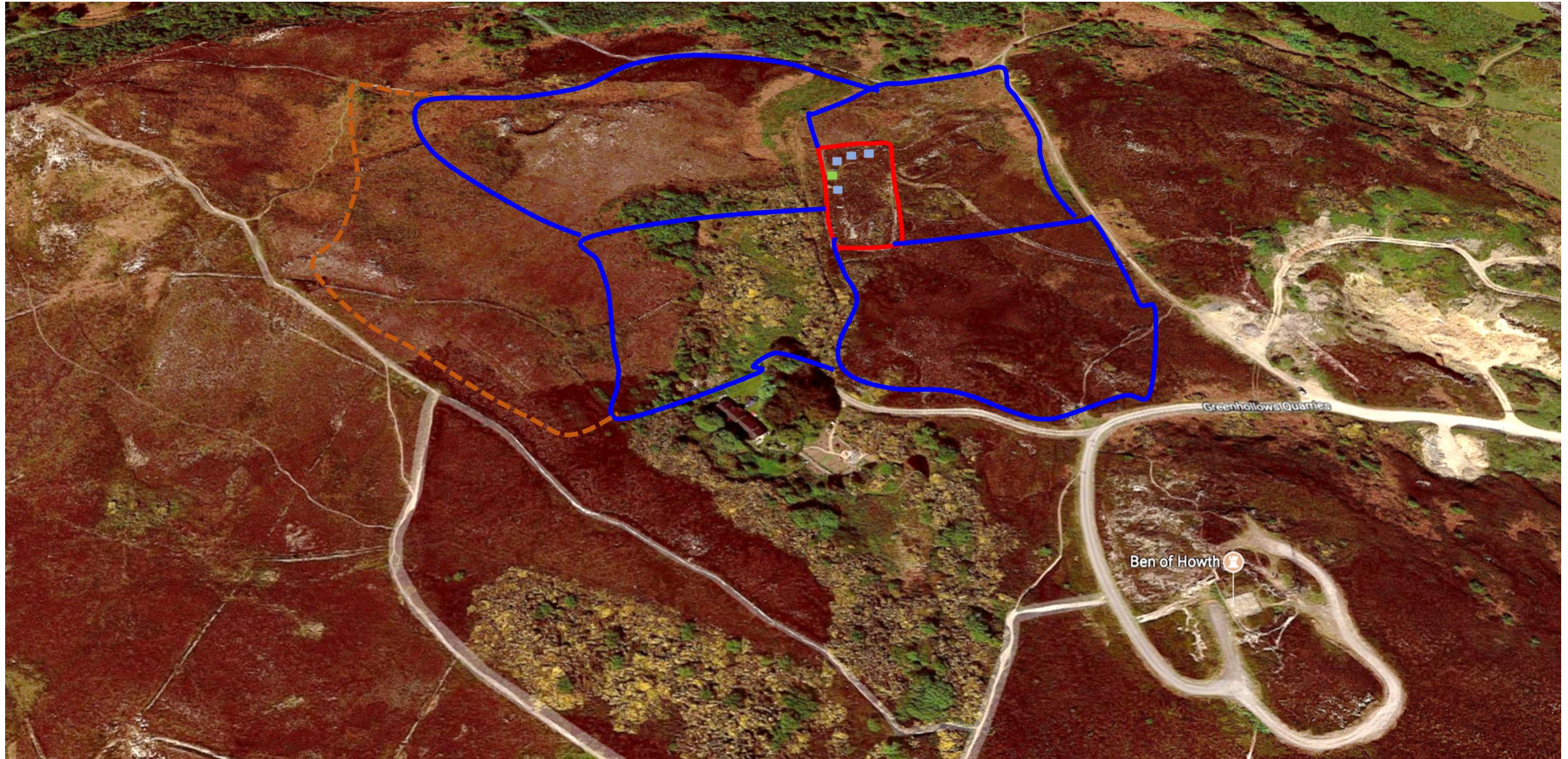
ARC-28 Felling of trees or removing timber, including dead wood.

ARC-31 Developing or consenting to the development or operation of commercial recreational/visitor facilities or activities.

Howth is subject to a special amenity order and has specific planning restrictions that need to be considered and designed into the project.

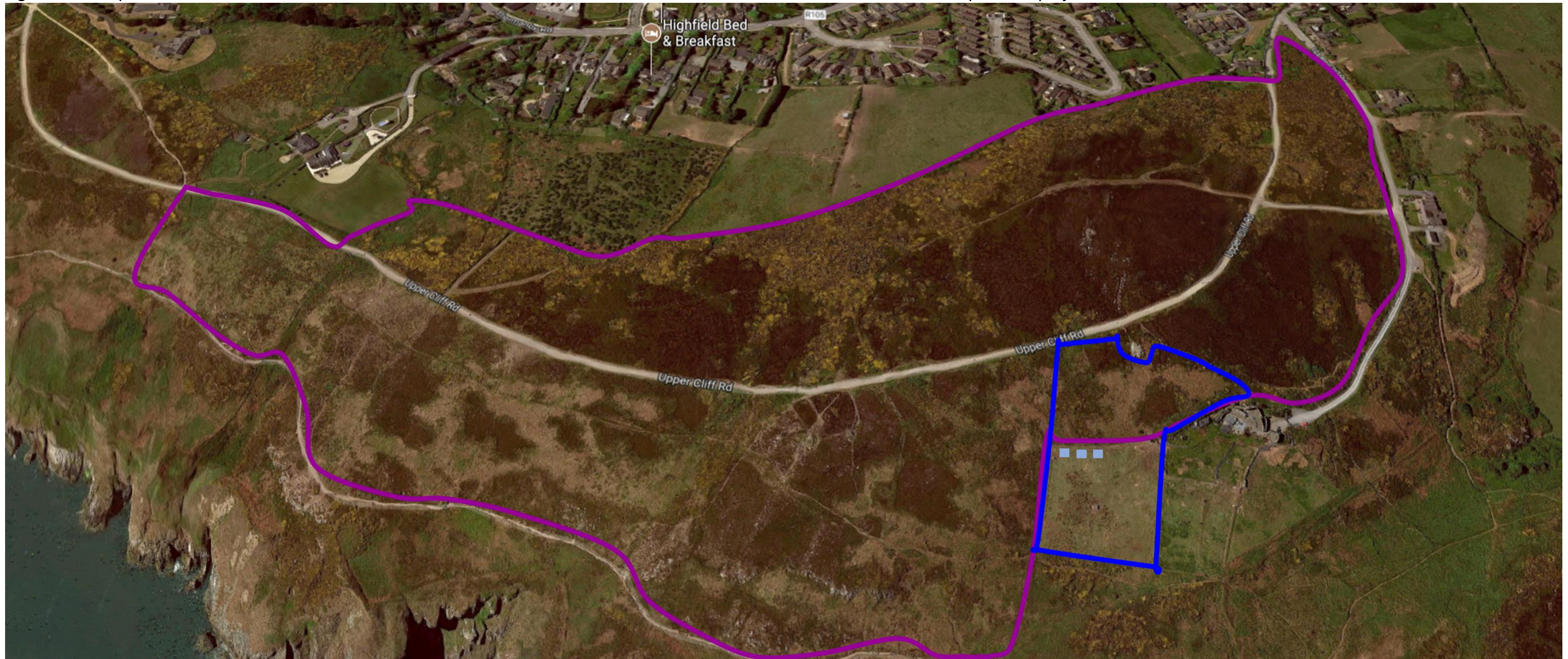
Agricultural code of practice compliance relating to animal identification (tagging) and animal transport regulations need to be considered, although they are not onerous.

Figure 5. Later phases for grazing Howth's heathlands which are generally brown in colour.



- Existing Goat Shelter ■ New Goat shelter ■
- Existing Goat field ■ 0.12ht, 220m boundary
- New Goat Fields ■ 5ht, 1,600m boundary using Clipex modified poultry / horse / modified electrified sheep fence
- New Goat Field ■ 2ht, 400m using a modified Clipex lightweight / electrified fence

Figure 6. Later phases seek to form a secure 1-2 hectares on the east mountain. This would form a solid land base from which to expand the project.

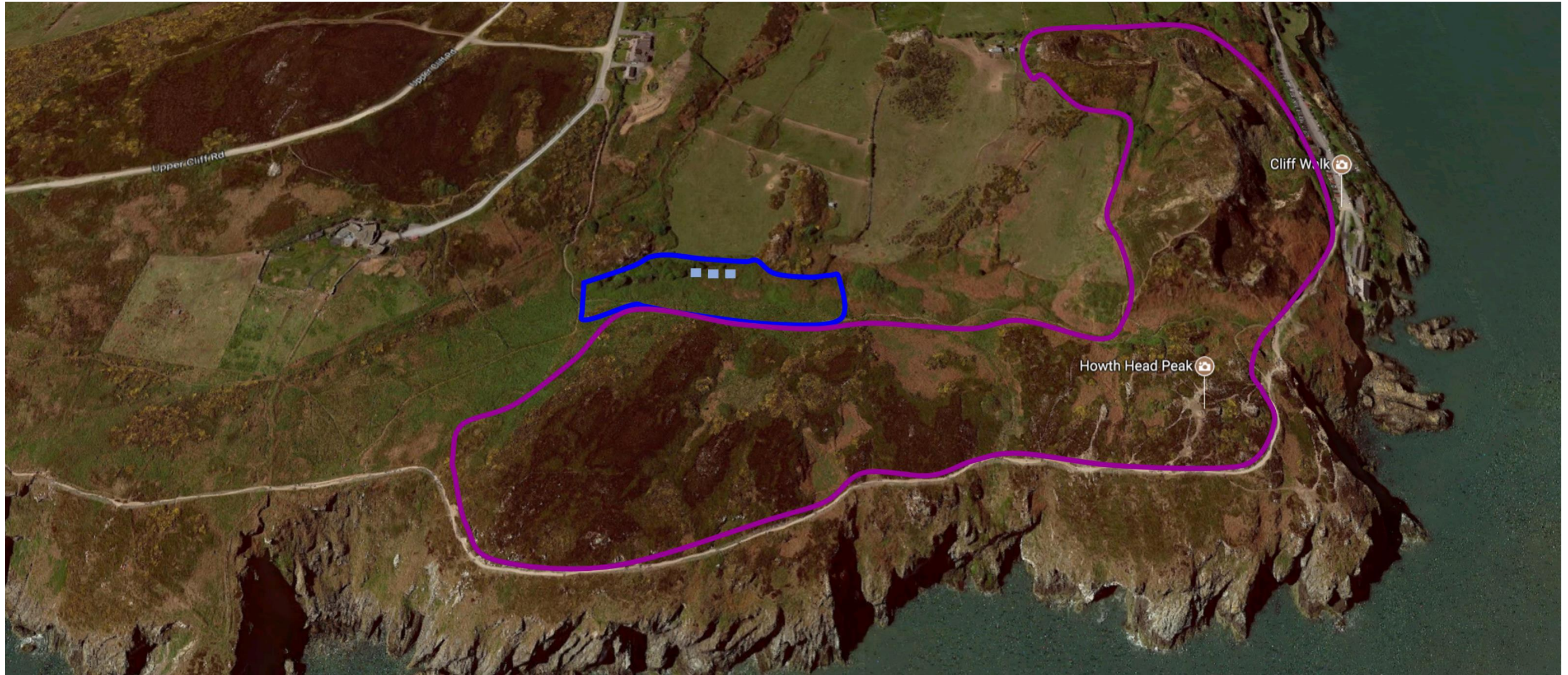


New Goat shelter ■

New Goat Fields ■ ~2ht, 650m boundary using Clipex modified poultry / horse fence

Target heathland for herded grazing ■

Figure 7. Alternative Proposal 2 Howth Herded Goat Grazing on Howth East Mountain



New Goat shelters ■

New Goat Fields ■ ~2ht, 650m boundary using Clipex modified poultry / horse or modified electrified sheep wire fence

Target heathland for close herded grazing ■

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- Geodesign: <https://www.gislounge.com/what-is-geodesign/>
- UK Countryside Stewardship Scheme
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/644181/cs-higher-tier-options-supplements-capital-items.pdf
- Clipex: <http://clipex.ie/>
- Draft peatlands and heathland scorecard:
<https://rbapseu.files.wordpress.com/2018/05/sullivan-and-moran-2017-the-development-of-a-draft-peatlands-and-heathland-scorecard.pdf>

Appendix 2 Conservation Grazing Trial Poster Designs:



Howth Conservation Grazing Trials with OLD IRISH GOATS



**KEEP DOGS
ON LEADS**



**SUPERVISE
CHILDREN**

Old Irish Goats, from Mulranny, on loan to Howth
More information @ www.xxxxfingalcoco.ie



Appendix 3 Material Quotes:

CLIPLEX FENCING LIMITED			
Quotation 26-6-2018			
	Quantity	€	
Length	1310		
Height	1.15+		
Stakes			
BFY Gal 210-9	8	14.50	116.00
Gal 210-9	22	10.00	220.00
BFY Gal 180-11	38	12.50	475.00
Gal 180-11	194	7.00	1358.00
ECO Gal 120-9	0		
End Assembly Stay Fast 100mm	18		
- PROPPED ONE WAY	18	64.00	1152.00
Wire			
Horse S Fence 13-122-5 (50m)	3	200.00	600.00
Sheep S Fence 9-80-22 (100m)	8	115.00	920.00
Top Wire 2.6mm Max Life	3510		
Barb 2mm Max Life	0		
TOP WIRE 2.5 HT 1500 m ROLLS	3	105.00	315.00
Gates			
Field Gates Feral Gate ONLY 2 IN STOCK	2	200.00	400.00
SPECIAL PRICE WITH HANGING POSTS + HANGERS			
Fittings			
Elect Post Cap	160	1.00	160.00
Elect Spacer	192		
CLIPLEX INSULATORS	200	0.50	100.00
Handling Pen			
Drop Pin Sheep Hurdles (6ft)	20	60.00	1200.00
HEAVY DUTY			
Equipment			
2 Stroke Hammer	1	1750.00	1750.00
DELIVERY (2 PALLETS)	1	175.00	175.00
		SUB TOTAL	8941.00
		20% VAT	2056.43
		Total	10997.43

Fencers

- Mains Fencer
- Battery Fencer
- Solar Panel

Batteries

- 90 Ah
- 130 Ah

Cord

- Polyfil Cord

Gate

- Gate Handle Pack
- Gate Set
- Gate Spring
- 3-Way-Counterpart

Insulators

- Spacer for wood for corners for bars

Posts

- Synthetic Material Post, 1.05 mtr
- Synthetic Material Post, 1.50 mtr

Sheep Net

- Sheep Net

Tape

- Tape 20 mm
- Tape 40 mm

Wire

- Iron Braid

Underground cable

- Underground Cable, 10 mtr
- Underground Cable, 25 mtr
- Underground Cable, 50 mtr
- Underground Cable, 100 mtr

Accessories

- Cord Connector
- Digital Fence Tester
- Fence Tester
- Fence Switch

You are here: Home page

Basket

Quantity	Name	Unit price	Total price
2 pcs	Stopline Bomb 1	149,00 EUR	298,00 EUR
2 pcs	Solar panel	95,00 EUR	190,00 EUR
2 pcs	Battery 9 V, 130 Ah	20,00 EUR	40,00 EUR
10 pcs	Spacer	5,00 EUR	50,00 EUR
1 pcs	Egg Insulator	5,00 EUR	5,00 EUR
1 pcs	Synthetic Material Post, 1.50 mtr	20,00 EUR	20,00 EUR
4 pcs	Sheep Net	85,00 EUR	340,00 EUR
1 pcs	Iron Braid	10,00 EUR	10,00 EUR
1 pcs	Underground Cable, 10 mtr	6,00 EUR	6,00 EUR
1 pcs	Cord Connector	8,00 EUR	8,00 EUR
2 pcs	Additional Insulator	10,00 EUR	20,00 EUR
8 pcs	Combi-Insulator	5,00 EUR	40,00 EUR
1 pcs	Digital Fence Tester	20,00 EUR	20,00 EUR

Update

Clear basket

Grand total: 1.047,00 EUR

Included VAT
19,00% VAT: 167,17 EUR
Total weight: 57,70 kg