

**Knoydart Foundation  
Feral Goat (Capra Hircus)  
Management Plan  
February 2006.**

**Introduction.**

The following plan has been put together to look at the management of the Knoydart Foundation Feral goat population and to establish a future five year management strategy. Over the last seven years since the Knoydart Foundation take over of the Knoydart Estate the Feral goat population has slowly been on the increase. Although some goats have been culled during the last seven years the feral goat density has come to a level where now a management plan must be established.

The recorded history of the feral goat population certainly dates back to the 1850's and most probably a lot earlier. We only have to look at some of the Gaelic place names on the peninsula, Coire Na Goa, "Coire of the Goat" (above Bromasaig) and Sgurr Na Goa, "Peak of the Goat" (by the Dubh Coire) to realise that there have been goats on the peninsula for some hundreds of years. Goats were kept as livestock and would have been an important resource for milk and food. A strong belief is that during the Highland clearances many domestic goats would have been released and that over a short period of time would have become feral. It is known that domestic goats that are released into the wild can over a ten-year period very quickly evolve into what we know as feral goats. Their coats will increase in length to deal with the harsh exposure to the elements and they will quickly adapt to their new environment.

Over the past thirty years some goats have also been introduced. Both Donald McGulish and Tim Bowyer at one point released goats on the West Coast of the Peninsula and both Peter Carr and Rick Rhodes had some escapee domestic goats (cashmeres) on the North coast of the Peninsula. The numbers, sexes and colours released or escaped, have all varied, from 8-10 wild billys and nannies from Jura, in blacks, browns and grays, to 3 pure white domestic nannies to a mixture of coloured domestic billys and nannies. All have contributed to what makes up our feral goat population to this day. We also know that before these introductions there was already a small feral goat population, this is backed up by various sightings of feral goats on the peninsula before the release of any of the above goats and that what was introduced only added, to make up our existing resident herd.

## **Current Populations.**

We have at present two populations of feral goats. The most concentrated being on the West Coast of the peninsula (Glaschoille to Airor) and a smaller population on the North Coast (Loch Hourn). The feral goats have two grazing ranges, one during the winter and one during the summer. They usually move in-groups that can build to large herds as their numbers increase. Ranges i.e. areas searched for food, can vary from 100m to 20 km in width. Grasslands, scrub and forest are all used extensively by the feral goats as feeding. Goats in general have been recognised as “the single most destructive herbivore”. Their highly varied diet includes plants that are avoided by sheep, deer and cattle, increasing the impact on native vegetation. Feral goats are extreme generalist herbivores and will forage on any palatable plants within their grazing range. They prefer to browse, but will readily shift to herbaceous vegetations during periods of seasonal plant growth and have rather large rumino-reticular volume so they are able to subsist on poorer plants than most herbivores. Feral goats are particularly destructive to island ecosystems. The introduction to areas worldwide has resulted in widespread primary and secondary impacts via overgrazing, often leading to ecosystem degradation and biodiversity loss. Predominantly during the winter months the goats will be low level and normally grazing the coastal areas. Here, during the night while they are not feeding they will seek refuge in the rocky outcrops and caves to keep out of the weather and to try to keep their coats dry. As the summer months draw nearer they will move higher into the more open ground in search of fresh grazing and into areas where they can rest or sun themselves.

### **South Coast Feral Goat Population. (Glaschoille to Airor)**

The South coast population (Glaschoille to Airor) after the last count which was done in December 2005 comprised of a total number of 59 billys, nannies and kids. The most common area that they were seen to be grazing during the winter was from Glaschoille to Mary Ann’s point, but at other times they have often been seen down at Doun and sometimes a small number at Airor. Each year it has been seen that their wintering ground is slowly expanding in accordance with the population expansion.

During the summer months the feral goats will move higher up into the Black Hills and at times can be seen on the highest points of the Black Hills ridge. During these summer months they will range extensively in search of new and fresher grazing.

### **North Coast Feral Goat Population. (Loch Hourn)**

The feral goat populations on the North Coast of the peninsula are normally seen during the winter to be ranging between the Li Face and Meall Breac. Again, mostly they are seen on the coastal areas seeking refuge in the rocky outcrops and in the cliff faces and are predominantly resident in the coastal regions below Coire Sgamadail. Since the Knoydart Foundation's shooting rights to this area reverted back to Doug Hawthorne (six years ago) sightings of the feral goats on the North Coast of the peninsula have been limited due to the infrequency of access into this area. At times the feral goats have been seen on the Li Face near to the march with Doug Hawthorne's ground and also at other times near to the march at Croulin and Meall Breac. The exact number of feral goats making up the North Coast population is difficult to ascertain. Through what sightings that have been made during movements of this feral goatherd it is estimated a population of approximately 30 billys, nannies and kids.

Although this is an estimated figure, this coming spring it is hoped that the annual deer count will be made by the Deer commission for Scotland using a helicopter and digital camera. During this count we hope that it will be possible to also ascertain an accurate figure of the loch Hourn feral goat population.

During the summer months the feral goats will range higher in search of new and fresher grazing and have been sighted roaming as high up as the top of Beinn Na Caillich, but seem to be predominantly lower down nearer to the coastline in the Coire Sgamadail region.

## **Life Cycle and Annual Increments.**

### **Male Feral Goats. (Billys)**

The average mature male will weigh between 45-55 kilos. The natural lifespan of a male is between 7-10 years of age and most probably a higher occurrence of mortality being between 9-10 years. Male mortality rates reflect the costs of rutting during the summer and the most probable months of mortality are from September through to December, although there can occur some levels of natural mortality from March to August, after the winter. Their horns are dimorphic, having homonymous spiral and anterior keel. Each year a new section of horn is grown and from this we are able to ascertain their age. Males are bearded and have a strong smell during the breeding season. They do not defend territories and wander more widely than females.

The normal pattern of feral goat reproduction is for dominant males to fight for access to females and then to service the females as they come into estrus. In one sense this is termed polygyny, because males breed with as many females as they can during the breeding period. More properly this is serial monogamy because the males will tend a female for extended periods both before and after copulation before leaving in search of an additional mate.

### **Female Feral Goats. (Nannies)**

The average weight of a mature female is between 25-35 kilos. The female lifespan is slightly extended to that of the males with natural mortality occurring between 10-12 years of age, but with a higher mortality between 11-12 years of age. Female mortality rates reflect the cost of lactation during the late winter months and the direct period following the birth of that year's kid.

Realised reproduction varies among populations, seasons and years and a very dependent factor being temperature. A typical female in excellent condition would be expected to produce a single young in its first pregnancy, and twins in subsequent pregnancies; however, most feral populations live at densities that exceed the level at which females maintain excellent condition, thus, realised rates of reproduction are generally lower. Twinning rates may vary from zero to perhaps 80% or more depending on the environment and climate that they are living within. Both sexes are physiologically capable of reproduction at about six months of age. The time when females will give birth to their kids is between January through to March, but with the most common month being February.

## **Mortality.**

Male and female mortality rates are very similar up until the age of five years old. Male mortality during the first year of life seems to be a little higher than that of the females. Mortality is high for both sexes during the first year of life (approaching 50%), but then falls to around 5-20% up until the age of five years old. After five years of age, male mortality climbs very steeply, most probably because of the costs involved in rutting. For males the rutting activity is intense from the yearling stage onwards but hits a peak at 4-6 years of age. By contrast, female mortality is relatively constant at 10-20% per annum up to the age of nine years old, after which it rises steeply. As a result, male life expectancy is significantly shorter than that for females.

Kid mortality rates are particularly high during the first two months of life. This reflects the climatically stressful conditions into which most kids are born. 97% of mortality occurs within the first few months, during the kids first winter, but most kids that make it through to week 9 have a fairly high chance of survival.

## **Culling.**

With the annual growth to our feral goat population it has become evident that a management plan must be implemented. Each year the expansion of their wintering and summer grazing ranges has become more and more extensive. Through the habitat monitoring that has been taking place in areas within the wintering range of the South Coast population (Glaschoille to Airor) it has been seen that habitat damage is taking place. Only ten years ago it was estimated that the total feral goat population on the peninsula was approximately 40-60 in number, where as today a total figure of approximately 90 feral goats between the North and South Coast populations would seem more accurate.

In small numbers it is thought that feral goats are almost self-sustaining. The annual increment in direct proportion to the occurrence of natural mortality almost being a perfect equilibrium. Once the stock densities rise over a certain level the overall annual increment to the population can make a sharp increase.

To establish what is a sustainable overall feral goat population must be in direct relation to habitat enhancement, which can be established through habitat monitoring. It must also be recognised that any level of feral goat population will have a certain grazing pressure. What must be established is what is an acceptable level of grazing pressure. It must also be recognised that our feral goat population is part of our natural heritage and one that must be managed and preserved.

As mentioned earlier we have in general two feral goat populations. One on the North Coast of the peninsula, (Loch Hourn), and the second on the South Coast, (Glaschoille to Airor). The North Coast population is a difficult herd to manage. Predominantly they are resident on the coastal stretches below Coire Sgamadail and infrequently venture into the Knoydart Foundation ground, making any form of a management plan very difficult to implement and unsustainable. Whereas, the South Coast population maintains itself within the Knoydart Foundation grounds all year round and one that we can manage effectively.

Over the last ten years approximately 12-15 feral goats have been culled. A large majority of this number has been made up of "Trophy Billy Goats" that have been charged out to clients for sport shooting. The remainders that have been culled have been within native woodland regeneration blocks and causing regeneration damage. Although there are varying degrees of support for sport shooting it must be recognised that the income generated through the participation of clients in a selective management cull on our feral goat herd is an important one. A selective management cull will mean that a conscientious effort will be made to cull poor quality, old or infirm feral goats and not to simply shoot the biggest trophy for the highest paying client. An overall selective management policy would be implemented to control, Billy, nanny and kid numbers. What will need to be accepted is that while a selective management strategy needs to be established for the next five years there will obviously be times where an old billy nearing the end of his natural length of life may need to be culled. This should be done, if

appropriate, by a paying client to generate an income which in turn will go towards making a selective management plan financially viable and sustainable. It should also be mentioned that although it is important to implement a selective policy over the culling of the feral goats, the exception to this policy would be if the feral goats were causing a danger to people or were causing severe damage to forestry or agriculture. (i.e. within a fenceline of native woodland regeneration).

Hopefully over the following five years it will be possible to establish what is a sustainable feral goat population. A proposal would be to aim at a target figure of approximately 30 feral goats in total within the South Coast population and to restrict their wintering range from Glaschoille to Doun. Each year it would be important to make an accurate count of the feral goats in this area and to keep accurate records on the habitat monitoring to establish whether the population density is nearing a sustainable level. Suggested cull figures for each year would be as below and these figures take into consideration the annual increment. It would be a flexible proposed cull figure for each year so that depending on habitat monitoring results, or for example a harsher winter than usual with evidence of higher mortality rates, it could be increased or decreased accordingly.

#### **Proposed cull figures.**

- June – Dec 2006            No.12 Billys, Nannies and kids.
- June – Dec 2007            No.12 Billys, Nannies and Kids.
- June – Dec 2008            No. 12Billys, Nannies and Kids.
- June - Dec 2009            No. 10Billys, Nannies and Kids.
- June – Dec 2010            No. 10Billys, Nannies and Kids

We also know that the feral goats generally stay within a strong social family structure and would propose while culling to take this into consideration. An effort would be made to firstly cull stray individuals and to concentrate on removing small complete family units rather than picking away at the total population in general. The feeling is that this would create less stress to the entire goat herd population, but can not be denied that it may cause an element of stress to individuals of a family unit while being culled as a whole.