

The Unique History of Soay Sheep – A Relic Population

Gevan Marrs - ©2006 – WoodlandCreekFarm.com

Note: much of the information in this article is a distillation of the information presented in Clutton-Brock, Juliet, (1987).



Soay sheep occupy a very unique place in the history of man's domestication of sheep, and in fact in domestication of all mammals (Clutton-Brock 1987). It is believed that all domestic sheep (*Ovis aries*) were domesticated from wild sheep about 11,000 years ago, probably in south-western Asia. Very broadly speaking, sheep that moved with man to northern climates (mostly in Europe) were selected for meat and milk production, as well as wool, in order to provide fiber for clothing to protect humans from the cold of northern climates. In contrast, those sheep moving to equatorial climates needed no wool coat for themselves nor their keepers, and thus retained the hair coat of the wild ancestors (most likely this was the Asian Mouflon (*Ovis orientalis*), or possibly the Argali (*Ovis*

ammon) or the European Mouflon, (*Ovis musimon*).

Sheep are believed to be among the very first animals domesticated—preceded only by the dog (whose domestication is believed to predate sheep by about 2,000 years). Goats were likely domesticated concurrently with sheep, but domestication of other agricultural animals (cattle, swine, etc.) occurred later. It is believed that sheep were first domesticated largely because they occupied the same locations as developing human cultures, were utilizing the same foods (wild grains that became wheat and barley), and their behaviors (flocking—at least loosely), size, and temperament all made for a unique fit with evolving human culture. There are more sheep breeds today, and they are found in more climatic areas and regions of the world than any other domesticated animal.

As sheep were moved with humans to more northern climates they were naturally selected for increasing the wool fiber types over the coarser hair which is most evident in wild types. Both wild and domesticated sheep breeds have two types of hair fiber follicles (Ryder 1973): primary (producing kemps—very coarse and long—in primitive breeds), and secondary (producing wool fibers—very fine and often wavy). Domestication has caused selection for primary follicles to produce ever-finer heterotype fibers (intermediate in coarseness). It is largely the proportions and lengths of these different fiber types that distinguish the changes occurring in domestication of northern wool-type sheep. It is believed sheep were brought to England about 9,000 years ago, and Soay sheep are cited as a specific example of “ancient sheep of this type”.

Expert opinion (Clutton-Brock 1987, Ryder 1983, Ryder 1984) is that sheep were first domesticated in south-west Asia, and one grouping moved by and with humans to ever more northerly regions in Europe, leading to the broad group of Northern short-tailed sheep with considerable woolliness (Shetlands, Icelandic, etc.). In more accessible, heavily populated areas the rate of selection for woolliness and elimination of color (that is, selection for white wool) moved forward much more rapidly (more people means more sheep and more exchanges of sheep and more opportunities to produce and selectively breed for preferred traits like white wool). But in the less accessible, more lightly populated areas, sheep populations would be naturally lower, and the opportunities for exchange of preferred breeding stock would be far less. This theory would explain why ‘more primitive’ (colored coats, horned, smaller body size, less flocking, easier birthing, etc.) breeds of sheep

could still be found in more remote ‘outposts’ of human occupation. One of the most remote and inaccessible could arguably be claimed to be Soay Island, in the St. Kilda group, in the North Atlantic off the west coast of Scotland. This island is (as the breed name of the sheep suggests) where Soay sheep were ‘found’ in modern times. They almost certainly *did not* naturally evolve there, nor were they developed there (via breeding selections) by man living on Soay island, but instead were likely placed there after being semi-domesticated elsewhere.



Map of St Kilda islands. From Jewell et. al. 1974

Although it is not certain, most expert estimates put the date of arrival of Soay sheep in the St. Kilda group at about 5,000 years ago (Clutton-Brock and Pemberton 2004)—that is, roughly concurrent with arrival of Bronze age culture in the ‘British Isles’. So if sheep elsewhere continued to be selected for increased woolliness and decreased hairiness, and later white wool, why would Soay sheep selection for these same traits have been ‘suspended’ in the St. Kilda islands?

As early humans populated ever more remote locations it is nearly certain that they took along sheep. Feral or primitive sheep breeds were or are still found on most islands in the British Isles. In the St. Kilda group, of the 4 main islands (Soay, Hirta, Dun, Boreray) only Hirta has been populated by man in recorded history. It is the largest island, and notably the one most accessible by boat (a decent bay and landing beach—albeit still giving problematic access in much of the rough North Atlantic weather). It seems only logical that early humans also chose Hirta

to populate, and that they would have therefore populated Hirta with their own semi-domesticated sheep—essentially what we call today the Soay sheep. In the nineteenth century, as accessibility of the St. Kilda islands improved and preferred sheep breeds had been developed in Scotland, the people of St. Kilda—who ‘tenanted’, (but did not live on) Dun and Boreray—and lived on Hirta brought an ‘improved breed’ (Scottish blackface - Jewell et. al. 1974, Ryder 1983) to at least Hirta.

It seems most probable to me that when the earliest humans brought sheep (Soay) to the St. Kilda islands that they placed them on all 4 main islands—as this would most effectively utilize the grazing resources. And as preferred ‘improved’ breeds became available, the more primitive Soay types were eradicated, as they would compete for limited grazing with the newer preferred types. This pattern occurred in the Hebrides with Hebridian sheep. The original breed was exterminated in the Hebrides in favor of ‘improved’ breeds, and it only survived in the self-colored black form we know today due to existence of selected ‘Park sheep’ on estates in Great Britain (see Hebridian sheep web site).

Soay island is exceptionally difficult to access, even today with modern powered boats and even helicopters. The island rises from the rough North Atlantic via steep cliff faces and there are no suitable landing sites. St. Kildans purportedly visited the island infrequently—perhaps once per year, and then with great difficulty, to collect birds, eggs, and perhaps some Soay sheep meat. One of the most notable recent investigators of Soay sheep on Hirta was reported to have only ever found it possible to visit Soay Island once in ten years of studying the St. Kilda islands. Given this difficulty of access, it does not surprise me that the St. Kildans had no great incentive to introduce *and* provide the level of care (mostly by eliminating the likely more robust Soay sheep competition) on Soay island.

In fact, Elwes (1912) states that a St. Kildan reported that a few white, improved rams *were* placed on Soay island prior to about 1850, but that “*they apparently did not change the basic type*”. That could be construed as meaning that in natural selection, the ‘wild characteristics’ were favored. One recognized authority gives the opinion that even with introductions of ‘improved types’ to Soay Island, they ‘*may well have not interbred*’ with the feral Soay sheep (Ryder 1983). This same pattern of preferential selection in feral conditions for a more ‘wild type’ (colored wool, mouflon patterns, horns, seasonal breeding) can be found in other areas in modern times. Although there are several good examples of this on the web site “Sheep 101” (web reference below), one good example is the Arapawa breed (see web link below). These sheep are believed to have ‘reverted’, if you will, from more ‘modern’ merino sheep having gone feral about 130 years ago on an uninhabited island off north coast of the South Island of New Zealand. In photos of this breed I am convinced that one can see many of the same basic coat color patterns that Soay sheep exhibit—self-colored blacks, light and dark phase, and white spotting. ‘Reversion’ to a more wild type upon going feral is cited in Clutton-Brock (1989) as a general truism for mammals. There are so many feral sheep in New Zealand that there is an entire section devoted to these ‘breeds’ in the Rare and Minority breeds of New Zealand web site (<http://www.rarebreeds.co.nz/ferals.html>). Even the ‘stragglers’ of ‘improved’ Scottish Blackface removed from Hirta in 1930 to nearby Boreray showed ‘reversion’ to the more wild type (horned, colored fleeces, etc.) in the 70 years or so that they ran feral.

From these sources I put forth a theory that early humans populated the St. Kilda Islands and brought semi-domesticated sheep with them (for all practical purposes the Soay sheep we know today on the islands of Soay and Hirta) about 5,000 years ago. They would have likely put Soay sheep on all 4 main islands, but only actively managed those on Hirta (where humans lived), and on Dun and Boreray, which were relatively accessible. When improved breeds became available, the primitive Soay sheep were eradicated in favor of those more modern breeds, except on Soay island which was too difficult to access and thus the effort to manage improved breeds there was not feasible. A word-of-mouth recollection that ‘a few rams of the race preceding the Scottish Blackface’ were once placed on Soay island had, by all informed accounts, no measurable or lasting effect on the phenotype. As Clutton-Brock suggests, without constant intervention by man, the reversion to a feral type through natural selection would eliminate the ‘improved’ breed traits (or, as Ryder postulated, they may have had little opportunity to breed). The Soay sheep on Soay island were essentially left to maintain their ‘primitive state’ equilibrium point without intervention from humans (aside from the initial domestication) for several thousand generations.

It might be noted here that it is commonly believed that the European mouflon (*Ovis musimon*), which was found only on the islands of Sardinia and Corsica (before re-introduction to Europe in modern times) is likely a semi-domesticated form that was placed on those islands by early man, and went feral. They too could be considered a ‘relic’ population—one even more primitive than Soay sheep, but so little differentiated from wild types, yet so little domesticated as to generally be considered a full, separate species. The persistence of European mouflon on Sardinia and Corsica *probably* was not for the same reasons as the Soay sheep on Soay island (isolation), but instead was due to lack of motive for eradication. Being quite readily accessible, residents of these islands were not as constrained by having only the island resources (grazing, etc.) available (e.g., Corsica has over 1,000 times the land area of the entire St. Kilda group, and Sardinia over 3,000 times) so had much less motivation to completely eliminate the competition—in fact it was probably a nearly impossible task given the large area involved, the terrain, and the ground-cover (very bushy, making it difficult to find and eliminate any Mouflon).

When representatives of Soay sheep from Soay island were brought *back* to Hirta in 1932, they then established a much more accessible, and observable population. But in essence, unlike any other sheep

breed, the Soay sheep breed has been ‘suspended in time’ (with respect to man’s intervention in breeding) for thousands of years, following a slight domestication, and we now have these same wild, primitive characteristics available today. How fortunate for Soay enthusiasts that Soay island was so terribly inaccessible and inhospitable to humans, but quite hospitable for Soay sheep! I am not aware of any other breed of domesticated agricultural animal that has an intermediate primitive form—arguably part way between the wild type and today’s domesticated stock, preserved in an isolated, self-sustaining and selecting population, largely free from human intervention. Clutton-Brock (1987) in fact use Soay sheep as the prime example of a semi-domesticated animal that is ‘stuck’ mid-way between a biological sub-species (essentially the status of the European mouflon) and a domestic breed—her term for Soay sheep is ‘primitive domestic breed’. We are very fortunate to have this primitive domestic breed still in existence.

References

- Ryder, M.L. (1973) *Hair*, Studies in Biology, No. 41.
- Ryder, M.L. (1983), *Sheep and Man*, Duckworth, (page 48 original breeds, page 511 ‘assortative behaviour’), 846 pp.
- Ryder, M.L. (1984), *Sheep*, Chapter 9, pp. 63-85 in Mason, I.L., editor, *Evolution of Domesticated Animals*, Longman.
- Jewell, P. A., Milner, C., and Boyd, J.M., (1974), *Island Survivors: The Ecology of the Soay Sheep of St Kilda*, Athlone Press, Univ. of London.
- Clutton-Brock, Juliet, (1987) *Domesticated animals from early times*, BAS Printers Ltd. Reprinted in paperback as: Clutton-Brock, Juliet (1989) *A Natural History of Domesticated Animals*, Univ. of Texas Press.
- Maijala, K.(1997) *Genetic Aspects of Domestication, Common Breeds and Their Origin*, Chapter 2, pp. 13-49 in Piper, L., and Ruvinsky, A. (1997) *The Genetics of Sheep*, CAB International.
- Clutton-Brock, T. and Pemberton, J. (2004) *Soay Sheep – Dynamics and selection in an island population*, Cambridge University Press.
- Hebridian* Sheep Society: <http://hebrideansheep.org.uk/>
- Arapawa Sheep*, <http://www.rarebreeds.co.nz/arapawa.html>, link valid on 18-Dec-05.
- About Feral Sheep in New Zealand*, <http://www.rarebreeds.co.nz/ferals.html>, valid 20-Jan-06
- Arapawa sheep: *Critters*, <http://www.badassbees.com/critters/critters.html#arapawas>, link valid on 18-Dec-05
- Sheep breeds ‘regressing’ on going feral: *Sheep 101*, <http://www.sheep101.info/breeds.html> see in particular Arapawa, Pitt Island, Hog Island, Boreray, Santa Cruz, and how they compare to primitive feral breeds: Faeroes, Gute, North Ronaldsay, Hebridians, Manx Loaghtan, and of course Soay.
- Addendum:
- A New Zealand site on feral sheep specifically notes reversion of feral sheep to colored fleece. In discussing sheep on Campbell island, it is noted:
- “Three percent of the sheep had coloured fleeces, usually dark grey/brown but with a light saddle. As this percentage exceeded the norm at the time the island was stocked, we may have been seeing the start of a trend, noting that the Pitt Island and Arapawa sheep populations went to roughly 90% coloured over a period of 130 years. The Campbells had been feral for 45 years at the time of this exercise.”
- <http://www.rarebreeds.co.nz/campbella.html>