

## Single Population Analysis Records Keeping System (SPARKS)

The overwhelming risk to Eriskay Ponies is the loss of genetic material over time which is natural in large populations but which can be devastating when only small amounts of genetic material are available in the first place. To help counter this the Eriskay Pony Society has started using SPARKS (Single Population Analysis Records Keeping System) which is a computer database developed by Dr Andy Dell that works with a genetic analysis programme called GENES to help breeders sustain and strengthen small populations of endangered animals

The most important calculation gleaned from the SPARKS and GENES software is the "mean kinship" coefficient which is a number that shows how related a particular pony is to the rest of the population. Ponies with very rare blood lines have mean kinships closer to zero and are considered priority breeders. Ponies with more common blood lines have mean kinships closer to 1 and are considered less important (**but not unimportant**) to breed. The programme also lists the mean kinship of any potential foal a mare would produce with a particular stallion.

The SPARKS sheets show this coefficient number and also places the pony in a banding system which runs from A to G. The software makes recommendations as to what breeding matches would continue to lower the relatedness of the breed and increase genetic diversity among the ponies. SPARKS compliant breeding requires owners to breed to a stallion in the same, or adjacent, band because these pairings will systematically and safely reduce the mean kinship of the overall population.

The data is updated each year and the information provided helps breeders choose pairings that will give the progeny a lower mean kinship than both of the parent animals. Matings that give the progeny a higher mean kinship than both the parent animals are discouraged as are any matings that give the progeny a mean kinship near 0.24, an indication of inbreeding.

Most importantly, the programme strongly discourages genetic pairings between ponies in widely dissimilar bands as this would result in mixing common blood lines with rare blood lines. Although such pairings sharply decrease the mean kinship average initially, over the long-term it would produce a population of ponies who were more, not less, related.

The SPARKS sheets contain the following summary of advice;

- Choose a Stallion from the same or an adjacent band to that of the Mare
- Avoid jumping Bands
- Choose a mating where Co-ancestry Coefficient of Progeny is less than Mean Kinship of Mare
- Avoid matings giving Co-ancestry Coefficient of Progeny greater than 0.18

<b>Tier 1 GREEN</b>	<b>SPARKS compliant &amp; are ENCOURAGED</b>
<b>Tier 2 YELLOW</b>	<b>Not fully compliant but are the "BEST OF THE REST"</b>
<b>Tier 3 ORANGE</b>	<b>Not compliant AND jump Bands which is DISCOURAGED</b>
<b>Tier 4 RED</b>	<b>Should be AVOIDED as they are highly inbred</b>

**Although SPARKS assists with maintaining a healthy, diverse population, the very low numbers of foals born every year give rise for great concern and there is a strong case for saying that any pairing is better than no pairing.**

The Eriskay Pony Society is very grateful to Dr Dell for allowing and supporting the use of SPARKS and also to the RBST, especially Field Officer Ruth Dalton, for their help and encouragement. Please contact any council member for more information or the SPARKS sheet for your mare.