

**RECOMMENDED  
BREEDING & REGISTRATION  
POLICY  
FOR  
NORWEGIAN FOREST CATS**



**Pan's Truls - The Original Forest Cat.**

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# Norsk Legend and Folklore

The existence of Norwegian Forest Cats can be found within early Norsk mythology. Norsk gods, The Aesir (warrior gods) and The Vanir (fertility gods) fought many battles but ultimately united. Most well known of these Vanir gods was Freya, a dominating goddess of love. She rode into battle with the Aesir in a chariot drawn by TWO LARGE CATS. NFC enthusiasts like to consider these were some of the first documented Norwegian Forest Cats!! It is known that the Vikings kept the Skogkatt (forest cat) on their vessels for pest control and companionship. The cats sailed the seas along with their Vikings, and perhaps "jumped ship" to contribute to the feral cats found in the United States, who later became known as "Maine Coon" Cats and maybe also to other natural cats around the world.

Unlike many pedigree breeds the Norwegian Forest Cat is an ancient breed, evolved naturally in cold, adverse climates. The breed developed through natural selection; only the fittest of the breed surviving and today we have a very healthy and hardy cat. During the winter they naturally develop a dense and warm undercoat which complements its flowing waterproof overcoat to provide the perfect protection for this harsh climate. The harsh "guard" hairs of their top coat are unlike any other breed and allow the water to flow off their coat, keeping the undercoat dry and allowing them to dry out very quickly. They became the strong, muscular farm cats of Scandinavia, perfectly suited to their environment with their double coats, lynx tips, snowshoes and a unique ability to climb headfirst down trees!! A strong but elegant cat, standing high on the hind legs with a friendly and intelligent nature.

***They are "the perfect pet with a hint of the wild" as a breed they are not the product of planned breeding; and therefore the challenge for today's breeder is to maintain the breed as nature intended.***

## Establishment of the NFC as a Pedigree Breed \*

Pedigree Cat breeders in Norway first started showing an interest in the semi-wild Norwegian Forest Cat as early as the 1930's. However, mainly due to the 1939/45 War it was not until the beginning of the 1970's that things really began to happen in earnest for the NFC as a pedigree breed. It had become apparent that if the breed was to be saved from extinction a controlled breeding program must commence. The environment had changed, modernisation spreading into the Norwegian waste lands had started to change the landscape. If a planned breeding program had not taken place, the Norwegian Forest Cat may not have been preserved.

The idea of recognition for the Norwegian Forest Cat was taken up by Carl Frederick Nordane and other members of the Norwegian Breed Advisory Committee. They went to see two kittens of approximately six weeks of age, one red and the other brown tabby

& white. These kittens were living with the Nyland family near Oslo. The Nylands, together with Freddy were to become the driving force behind the recognition of the Forest Cat. However, at this time it was the brown tabby & white kitten that caught the interest of the visiting group — this kitten's name was Pan's Truls (picture below) — he was destined to become the Forest Cat to set the standard for all Norwegian Forest Cats. The Breed Advisory Committee took Pan's Truls as the breed ideal and set up a standard of points; this is still the basis of the GCCF standard we have today.



In 1976 the Norwegian Forest Cat was granted Provisional Recognition by FIFE, the International Cat Organisation. This meant that now it had been recognised as a pedigree cat it could be exhibited at shows, although not eligible for any titles, such as Champion etc.

In 1977, FIFE recognised the breed as an International Pedigree Breed at its General Assembly in Paris, . This meant that in Scandinavia and across the whole of continental Europe, the NFC could now be shown at International Shows and

gain titles — Champion, International Champion, European Champion etc.

*\*Precised from an original article by: - Eileen M Hancock a long time NFC breeder in the UK.*

## **Breed Establishment in the UK.**

It is believed that the first NFC's were brought into this country during 1986/87 from Holland and Norway respectively. A British breeder of Abyssinian cats; Alan Eagland first became interested in NFC's after seeing them at a FIFE show in Amsterdam and over time imported the first 4 breeding NFC's into the UK. These cats formed the foundation of his Norsechat line. Around the same time period, Gill Hart returned to England after living in Norway for some years. Although Gill had returned to the UK without her NFC cats, once back in England she decided to take up breeding again under the Trakhatt prefix. Gill and Alan founded the Norwegian Forest Cat Club (NFCC) in 1986. Significant numbers of NFC's have been imported from all parts of continental Europe by a band of dedicated breeders. This has given the UK NFC breed an excellent and quite diverse gene pool, enabling us today to produce a quality of cat that can rival that found in the breed's native land.

The breed was fortunate to be sponsored in the UK by the Colourpoint, Rex Coated and AOV Club who at that time (before the existence of BAC's) sponsored the breed and supported our application with the GCCF for recognition. The breed gained preliminary recognition with the GCCF in late 1989, allowing the first NFC's to be exhibited at the Supreme Show in May 1990.

### **Key landmarks in the breed's progression in the UK are:-**

1987 – NFCC Club formed

1988 – Colourpoint, Rex Coated and AOV Club agrees to be the NFCC's sponsors

1989 – The breed gained Preliminary recognition with the GCCF

May 1990 – The first Norwegian Forest Cats were shown at the GCCF Supreme Show.

Seven cats were shown and four gained the very first Merit certificates for the breed

1993 – The NFCC gains affiliation to the GCCF and the NFC Breed Advisory

Committee was initiated

1995 – The breed progressed to Provisional status and was now complete for

Intermediate certificates

1995 - NFC's awarded Best Provisional Adult & Kitten and Supreme Provisional Exhibit

at the GCCF Supreme show

1996 – NFC's awarded Best Provisional Adult & Neuter and Supreme Provisional

Exhibit at the GCCF Supreme Show

1996 – Norsk Skogkatt Society (NSS) formed 1997 – The breed progressed to

Championship status

1997 – 1<sup>st</sup> NFCC Exemption show

1999 – 1<sup>st</sup> NFCC Sanction show

2000 – NSS gains affiliation to the GCCF and joins the NFC BAC

2002 – 1<sup>st</sup> NFCC Championship show

2004 – 1<sup>st</sup> NSS Exemption show

2004 – An NFC kitten gained BOV SLH Kitten at the Supreme Show and became the 1<sup>st</sup> NFC in the Supreme final selection of twenty-one cats.

2007 – 1<sup>st</sup> NSS Sanction show

2008 – A NFC kitten becomes Supreme Kitten and the 1<sup>st</sup> NFC in the Supreme final selection of three in NFC history.

2010 – 1<sup>st</sup> NSS Championship show

2012 – 25<sup>th</sup> Anniversary of the NFCC

2012 – GCCF accepts Amber into the list of recognised colours.

## **Introduction**

In the GCCF standard for the Norwegian Forest Cat; coat pattern, eye and coat colour carry no points. However every cat is more than simply the “sum of its parts”. The essence of a good Norwegian Forest Cat can be seen in its head type, expression and attitude; if this is not right then the essential characteristics of the forest cat are missing.

The elements of the head together form 40% of the marks on the standard of points. The head of the Norwegian Forest Cat must be clearly triangular with a long straight

profile, a definite chin and an alert aristocratic expression. They have high upright ears following the lines of the head and large well-opened eyes set slightly obliquely. The distinctive double coat and longer hind legs are also characteristic of the Norwegian Forest Cat.

In summary, the key attributes of an NFC are head, type, conformation and coat quality.

The aim of this breeding policy is to give advice and guidance to breeders to enable them to observe what is considered “best practice” in breeding NFC’s. This breeding policy incorporates details from the NFC GCCF Registration Policy. The over-riding factor is always to maintain the “Forest” cat as it was when it walked to meet man from the forest and to breed strong, healthy NFC’s typical of the standard of points. Most importantly NFCs must show the correct coat quality and conformation that was necessary for them to survive the harshest of Norwegian winters.

## Genetic Make-up

The Norwegian Forest Cat originated in harsh natural conditions. The breed became an outdoor working cat on Norwegian Farms and the appearance of the Norwegian Forest Cat should reflect this natural heritage. The Norwegian Forest Cat matures slowly, and full development of the cat and its coat can take around four years. A distinctive double coat is a prerequisite.

Whilst the NFC does not have any points allocated to coat pattern & colour or eye colour within the GCCF standard of points, it is still useful to have a basic understanding of the genes that form the colours and patterns that we usually see within the breed. All listed colours and patterns are allowed within the NFC breed (except Chocolate, Lilac, Apricot, Caramel, Cinnamon, Fawn and Himalayan pattern). Any amount of white is allowed i.e. white on paws, chest, belly or blaze, locket etc. This means that a number of both dominant and recessive genes come together to build the full rainbow of colours that are possible with NFC’s and a basic understanding of these genetics is useful when breeding NFC’s.

All domestic cats are descended from a wild ancestor (probably either *Felis silvestris* or *Felis lybica*) a mackerel tabby patterned animal, and thus all domestic cats are of an underlying genetic tabby pattern. All cats have 19 pairs of chromosomes upon which there are many thousands of genes that govern the eventual shape, size, sex, colour, and pattern and hair length of the individual animal. Over the generations a number of mutations have occurred and selective breeding has been used to isolate these to produce the various pedigree breeds we see today. In the case of the NFC they have genes to produce both agouti and non- agouti coat patterns. The key genes influencing these patterns and genetically linked colours within the breed are:

**Agouti (A)** - the natural “wild” gene that is the basis of the tabby cat. The base agouti pattern is bands of black on a yellow background; in the cat this is overlaid with one of the tabby patterns.

**Non- agouti or “hypermelanistic” (a)** - a recessive gene mutation that turns the original “wild” tabby cat into a self black by overlaying the agouti base colour with melanic pigment, making the whole animal appear black, although often in certain light the underlying tabby pattern may still just be discernible. Other genes work to change this black pigment to other colours (see Orange & Amber below).

**Inhibitor (I)** – a dominant gene that suppresses the development of pigment in the hair of the coat, typically producing hairs that are fully coloured only at the tip and have a silvery white base. It has greater effect on the lighter pigment in an agouti cat, removing the yellow colour and turning the base colour white or “silver”. In the case of a non-agouti cat the inhibitor removes colour from the base of the hair-shaft to produce a silvery white hair with a coloured tip i.e. a Smoke.

**Tabby patterning genes** – Traditionally it had been believed that the three forms of tabby pattern were inherited as an allelic series; however it now appears as if at least two, and probably three, different loci are responsible for the various tabby patterns (Lorimer, 1995). At one locus are the alleles for mackerel and blotched (classic) tabby patterns with mackerel dominant to classic; at another locus is the Abyssinian or ticked pattern, which is epistatic (masking) to both mackerel and classic; and at the third locus there appears to be a modifying gene for either the classic or mackerel patterns resulting in the spotted tabby pattern. The patterns can be summarised as follows:

**Mackerel (Mc)** – the basic striped tabby pattern that overlays the agouti base (i.e. “wild” form).

Description: - Narrow unbroken line from head to base of tail with narrow broken line either side. Narrow vertical lines run down body. Necklaces (may be broken); spotted or barred belly; leg bars; narrow tail rings.

**Ticked (T)** – an incompletely dominant gene which removes most of the stripe pattern leaving the ticked agouti base pattern on the body with minimal overlaying stripes on legs, chest (necklace) and face.

Description: - Two or three bands of colour extending well down the hair shaft. “M” on forehead; skull cap on kittens. Necklaces may be broken or unbroken; may have belly spots, may have tail rings or continuation of the spine line.

**Spotted (Sp)** – current thinking is that it is likely that a specific single gene causes the spotted tabby pattern, breaking up the mackerel or classic pattern into elongated or rounder spots respectively.

Description: - Clearly defined spotting. Round and evenly distributed. Lines over head breaking on shoulders. Bars or spots on legs. Necklaces (may be broken); belly spots. Complete or broken tail rings.

**Classic (mc)** – a mutation of the mackerel allele recessive to all other tabby patterns which gives a blotched pattern with the characteristic “butterfly” motif across the shoulders and “oysters” on flanks.

Description:- “M”; Lines over head; Butterfly; Parallel spine lines; Oysters; Markings symmetrical; Broken necklaces; Blotched, spotted or barred belly; Tail banded

Under the GCCF NFC standard of points there are no points for quality the of the tabby pattern and within the breed numbering system all tabby patterns are currently registered together by colour i.e. Brown Tabby / Silver Tabby etc.

**Long-hair (l)** – a recessive gene mutation which produces a semi-long haired cat.

**White masking gene (W/w).** The "W" gene prevents the normal replication and migration of pigment producing cells during embryologic development. As a result, WW and Ww cats have a greatly reduced number of melanocytes and appear white, no matter what other colour genes it may carry. Only a cat that is homozygous recessive (ww) will express normal pigmentation. Thus, W is epistatic to the other coat pigmentation genes. Some cats with the W allele of this gene are deaf and/or have depigmentation of the iris of one or both eyes, resulting in blue eye colour. In the NFC although solid white cats are registered by eye colour, any combination is allowed. Blue, Green, Orange or odd-eyed. Despite the issue of depigmentation, at this time there is no substantive evidence of deafness being linked to any particular eye colouring in NFC's.

**White spotting or piebald spotting gene (S/s)** has variable expression, so that an SS cat often has more extensive white patching than an Ss cat. It is this gene that creates the various levels of white from a bi-colour or Van pattern to the more common white blaze on the face, white bib, and mitted paws. Often NFC's with the white spotting gene will also have a white tip to the tail, which has been attributed back to one of the original Pan's cats a famous black and white cat with a white tip to his tail; "Pan's Polaris". Some researchers believe that there are separate white spotting genes for distinct forms of white pattern, such as the white gloving gene (Birmans), or the white locket that some cats have on their neck or bellies. Within the NFC the three common options of this gene, produce the following results:-

- SS (two dominant alleles) results in high grades of white spotting (sometimes resulting in a solid-looking white cat or a white cat with just a few colour hairs)
- Ss (one dominant, one recessive allele) results in medium grades of white spotting
- ss (two recessive alleles) results in solid colour or low grades of white spotting (sometimes as little as a few white hairs)

It is useful for breeders to note that when mating a without-white cat to one with-white. It is most likely that the offspring will exhibit the pattern expressed in the with-white parent.

**Orange gene (O)** determines if there will be an orange or red coat. As this gene is located on the X chromosome it is sex-linked. In cats with a red coat, phaeomelanin (orange pigment) completely replaces eumelanin (black or brown pigment). The O allele is also epistatic over the non agouti genotype; that is, the agouti to non-agouti mutation does not have a discernible effect on red or cream coloured cats, resulting in these self-coloured cats displaying tabby striping independent of their genotype at this locus. This explains why you can usually see some tabby pattern on red and cream coloured non-agouti cats, even if only on the head/face.

- Males have only one X chromosome, so only have one allele of this gene. O results in a red coat, and o results in black or whatever other colour is underlying.
- Since females have two X chromosomes, they have two alleles of this gene. OO results in orange fur, oo results in a red coat, and Oo results in a tortoiseshell cat, in which some parts of the coat are red and others areas non-red. A cat with Oo and white spotting genes will become a tortie and white. The reason for the patchwork effect in female cats heterozygous for the O gene (Oo) is due to X-inactivation, where one or the other X chromosome in every cell in the embryo is randomly inactivated and the gene in the other X chromosome is expressed.

For a cat to be tortoiseshell, or a dilute variation such as blue-cream, the cat must simultaneously express two alleles, O and o, which are located on the X chromosome. Males normally cannot do this, as they have only one X chromosome, and therefore only one allele, and so tortie cats are normally only female. Male tortoiseshell cats do occur, but this is usually a chromosomal abnormality i.e. genotype XXY (usually these cats are sterile) but there are rare genetic alternatives where they may be fertile, i.e. chromosomal mosaicism (only portions of their cells have the genotype XXY, so these cats may be fertile), or chimericism (a single individual formed from two fused embryos, at least one of which was male). Within the NFC breed another phenomenon is more common (according to Ester Verhoef; Norwegian Forest Cat). Red or cream males, with black or blue “freckles” or spots, which sometimes used to be taken for torties. The spots are not really of black pigment however, but red and in some places so tightly clustered that they look like black spots. Many of these males are descendants of “Trippel”, a red and white NFC male with black spots. The Orange gene is also dominant over Amber a new and unusual mutation that is now known to be present in the NFC genotype.

**Dilute (d)** – a recessive gene which reduces and spreads out the pigment granules along the hair-shaft and turns a black to blue and red to cream.

**Amber gene (e/e)\*\*** – The history of the Amber gene in the NFC began back in 1992 when two Swedish Norwegian Forest Cat kittens with unusual colouring were born into the “Wildwood’s” cattery. The two kittens were S\* Wildwood’s Imer and his brother S\* Wildwood’s Iros. The colouring was quite unusual and could not be explained by their parents’ colour genotype. These colours continued to be seen in other litters across a number of countries. Initially, it was thought, that these colours were related to the chocolate & lilac genes and they became known as the “X-Colours” at that time it was thought that these colours had come about as a result of outcrosses to other breeds. (e.g. Somali)

From tracing back in the pedigrees, one cat has been found to be a common ancestor for these unusual coloured kittens, she was N\* Klofterhagens Babuschka. It is thought she is the only foundation ancestor for this colour in the Norwegian Forest Cat population and she herself can be directly traced back to Pan’s Truls, the foundation cat of nearly all Norwegian Forest Cats. Most of the UK imported cats, can be traced back to Babuschka

via Pan's Polaris another early prolific breeding male. Additionally, a small number of Amber cats have been imported into the UK and therefore it is becoming more likely that this colouring will appear in UK born kittens.

Test matings were carried out and over time this proved that "X-Colour cats" are actually genetically black and neither chocolate, nor lilac. FIFe (Fédération Internationale Féline) recognized this new colour on the 1st January 2005 and the colour was renamed as amber/amber-tabby; this was followed by recognition within LOOF (Livre Officiel des Origines Félines) in January 2010. Amber became a recognised colour within the GCCF in the UK in February 2012. This will now enable breeders to track the presence of Amber within their breeding lines.

Marc Peterschmidt was the first person to identify and scientifically prove that this colour is a genetic mutation for the NFC breed. This mutation is seen in other mammals, for example red-haired humans or chestnut horses. The Amber gene is a mutation at the extension locus *E/e* and through the gradual replacement of eumelanin with phaeomelanin it changes black pigment to amber or light amber. It is an autosomal recessive mutation in the *MC1R* gene that results in kittens that are born with a black/brown tabby pattern (but can also be present in dilute cats). As the kittens mature, the black/blue pigment is gradually replaced by yellow resulting in the Amber coat colouration seen in adult cats. The amber mutation, visually, only affects the hair colour (not the skin) and all Amber animals are genetically black: their coat is yellowish and their skin black, so they retain the black paw pads, eye rims and nose leather nose (however, amber agouti cats will have the usual pink nose leather).

The visual expression of the Amber coloration depends on the presence/absence of dominant Orange to which Amber is subordinate. Genotype for Amber is as follows:-

- *E/E* – No Amber gene present
- *E/e* – one copy of the Amber gene is present - if bred with another Amber carrier and in the absence of the Orange gene 25% of the kittens will be Amber.
- *e/e* – Two copies of the Amber gene are present (Homozygous) – if bred with another homozygous cat and providing that the Orange gene is absent, all of the kittens will be Amber.

Where the Orange gene is present:-

- Amber males that have the Orange gene will be red.
- Amber females that have one copy of the Orange gene will be amber/red tortie.
- Amber females with two copies of the Orange gene will be red.

*\*\*Adapted from an original article by: - Marc Peterschmidt who discovered the Amber gene in NFC's.*

**Polygenes** – these are collections of genes which modify the effect of the main dominant and recessive genes above and together influence a phenotypic trait. A build up of polygenes create a bigger effect, for example a collection of certain polygene's increases

can affect coat length and quality. It can enhance/detract from the effect of the main colour genes, for example, tarnishing in silver cats, or low expression of smoke in smoke cats. The combination of two breeding cats' polygene's can also have a more critical effect on the breed in potentially magnifying genetic weaknesses or the likelihood of deafness; for example by breeding from a deaf NFC. Care must be taken in order to avoid this.

In summary, even given the lack of focus on coat pattern and coat and eye colour from a breeding perspective, the genetics of the NFC are still complex. Not only are there many interacting genes, but the genes sometimes do not express themselves fully or conflict with one another. Without taking into consideration the complications that the "new" Amber gene throws into the mix, there have always been issues which can be complicated for novice breeders to get to grips with. For example, low expression of silver / smoke, being barely discernible to the eye, or the dominant "W" gene masking the real coat colour and pattern.

Whilst for the NFC breed it is important to be aware of the genetic makeup of our breeding animals the focus should remain on health, type, coat quality and conformation above all else.

## **GCCF Registration Policy For The Norwegian Forest Cat**

This registration policy has been agreed with the Executive Committee of the GCCF at Provisional status and is still valid today.

### **1. FULL REGISTER**

Norwegian Forest Cats with full or provisional recognition, which have in their pedigrees within six generations only Norwegian Forest Cats.

### **2. SUPPLEMENTARY REGISTER**

Norwegian Forest Cats with full or provisional recognition, which have in their pedigrees only Norwegian Forest Cats for three generations.

### **3. EXPERIMENTAL REGISTER**

Norwegian Forest Cats with preliminary recognition, which have in their pedigrees within three generations only Norwegian Forest Cats.

### **4. REFERENCE REGISTER**

Norwegian Forest Cats, which have in their background unregistered (1<sup>st</sup> generation NFC/Novice), cats within two generations. These cats will only be recognised, as Norwegian Forest Cats if they are imported into the United Kingdom with a certified pedigree from the country of origin.

No other cats may be registered as Norwegian Forest Cats. No outcrosses are allowed and there are no variants. However the BAC do not consider this to be an issue for the breed in the UK as a considerable number of entire NFC's from many different breeding lines have been imported from continental Europe since the mid 1980's and new lines continue to be imported today. This means that we have a constant trickle of new bloodlines broadening and strengthening the breed and the gene pool in the UK.

## Breeding System

The following points should be noted by all breeders of Norwegian Forest Cats

1. Norwegian Forest Cats should **only** be bred with other Norwegian Forest Cats; there are no variants at all.
2. No colour breeding rules are stated, any listed colour can be bred with any other listed colour.
3. It is the opinion of the Norwegian Forest Cat Breed Advisory committee; that caution should be exercised with line breeding. Including the use of short pedigrees and that the level of in-breeding should always be carefully considered.

Listed above are the main genes that help define the NFC cat through the expression of pattern, colour and coat, but of course there are a large number of other genes that together create the distinctive physical shape and conformation which is the real essence of Norwegian Forest Cat.

In order to ensure the continued development of good NFC type, breeders need to have a clearly defined and well understood **breeding system**. This means the development and management of a breeding programme in which certain cats are affirmatively selected to be bred to others, for predetermined reasons. It is equally important that breeders allow no matings until they have given careful consideration to the outcome.

In particular three key rules must be followed:

- **Health & temperament must be the over-riding considerations in any NFC breeding programme.**
- **The good and bad features of the individual cats should be assessed and weighed against each other before any mating.**
- **When planning a breeding programme, breeders must realise that doubling of the good traits in a cat also results in doubling the defects; the breeding of cats with similar faults should be avoided at all costs otherwise there is a danger of fixation.**

The primary motivation must be to perpetuate the NFC as a distinct breed; to improve the quality of the breed as measured against the standard & preserve the breadth of the gene pool.

The skill in breeding lies in the choice of the individual cats with the required physical or pedigree traits and understanding how the combination of these cats will affect the progeny. It should be recognised that the best show cats do not always produce the best kittens and combinations should be carefully considered. With consideration given both to what is physically expressed and apparent and that which is a trait, apparent in these lines but not necessarily expressed in the current breeding animals.

## ***Inbreeding***

Inbreeding is an inclusive term covering many different breeding combinations and degrees of relationship – including the more distant, less intense. It is consistently more efficient in eliminating heterozygous (varying and diverse) genotypes and increasing homozygous (same) genotype, thereby ensuring a greater likelihood that kittens will closely resemble their parents. Used here, the term does not mean close, purposeful, inbreeding of closely related cats (brother/sister, father daughter), but rather the moderate form that results from the mating of not too distantly related (but not directly related) cats (first cousins, half brother/half sister, second cousins, etc). Some inbreeding is essential to stabilise conformation around a definite type. In-breeding is the act of mating individuals of various degrees of kinship and if continued it produces ever increasing homogeneity in the offspring.

It is important to monitor the percentage intensity of inbreeding for any mating – use this consideration as a key part of the decision making process when considering any mating, and remember: ***“The more intense the in-breeding, the more careful must be the selection”***. ***“Loss of innate genetic variability must not be too great”***.

The overall approach should be one of balance and moderation in the degree of inbreeding coupled with consistent selective breeding with a clear objective in mind – i.e improvement of key aspect and/or the elimination of weak traits or defective genes.

Breeding systems and practices need to operate so as to ensure the NFC gene pool contains enough variation to give scope to continue improving the breed and avoid the danger of either fixing type too quickly (before the ideal of the standard is reached) or deleterious genes being expressed and becoming fixed in the breed. Breeders need to use inbreeding to gain sufficient homogeneity to fix recognisable NFC type, but with sufficient variation to both enable improvement, and maintain health and vigour, avoiding fixation of defective genes or unwanted traits (and to ensure the elimination of anomalies).

***Anomalies*** – the problem of the genetic anomaly is something of which all breeders should be aware – this is not to suggest that such anomalies are common, but the cat must be expected to have its quota of defects just as are found in other animals. (See Page 18: Genetic Defects).

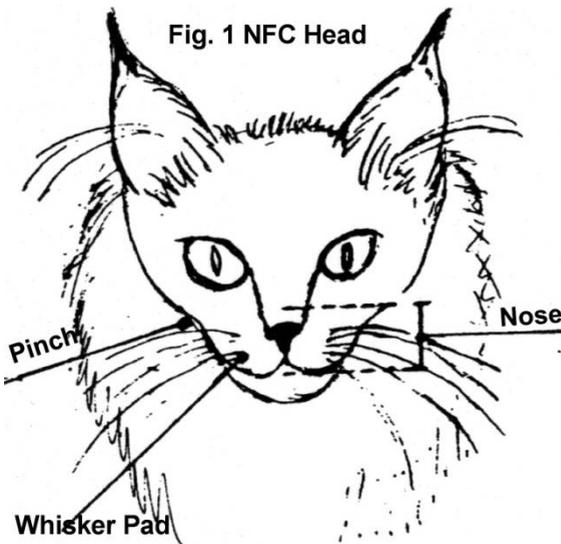
The golden rule is that health is paramount and must be constantly and consistently monitored; any evidence of weakness or the emergence of lack of vigour must be dealt with immediately through modification of the breeding system. No cat with any evidence of health problems or lack of vigour should be used for breeding.

For further reading on cat genetics and breeding practices refer to: "Robinson's Genetics for Cat Breeders & Veterinarians" by Vella, Shelton, McGonagle and Stanglein, published by Butterworth & Heinemann.

## The Norwegian Forest Cat - An Illustrated Standard of Points

GCCF SOP - Valid from 1st June 2004

### Head & Ear Set



**"Triangular, where all sides are equal"** Must be clearly triangular, an equilateral triangle when mature, so this usually means an isosceles triangle (potentially longer & not equilateral) in a kitten. In a mature cat the triangle is measured under the ears and to the front of the muzzle.

**"Triangular, where all sides are equal"** Must be a strong clear triangle, must not be fine boned or too pointed. We don't want an oriental look. Muzzle must not be boxy, pinched or rounded in shape. Quite often an alert and interested NFC will puff his

whisker pads forward, this can look like a pinched or boxy muzzle but to be sure you

need to feel the bones. Your first impression must be of an NFC, if you are not sure what you are looking at, then this is a clear indication of poor type.

## Profile

***“Long straight profile without break in line”***



The profile is long and straight with the length of the nose a little shorter than the length of the forehead as show in this photo to the left. This shows the ideal of a straight line from nose to forehead without a dip or bump. An almost straight profile, providing it does not detract from the overall look is preferable to a bumpy uneven profile, a definite dip (the bone must be felt to find this) or a convex profile (Roman nose). Remember that a stop in

profile is a withholding fault.

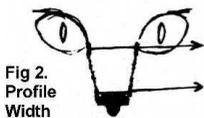


Fig 2.  
Profile  
Width

**Width of nose between the eyes**

**Width of nose at tip of nose**

Not covered in the current Standard of points; but look for the internal triangle between the eyes and nose

leather; this should reflect the external triangle of the head. The facial photographs below are good examples of this. A broad parallel nose bridge or a lack of lateral definition to the nose can spoil the elegance of expression in an NFC.

## Eyes

***“Large, oval, well opened, obliquely set and alert expression”***

The eyes and expression can make or break NFC type. The photo to the right illustrates a typical NFC expression and look.



Too oblique a setting will look oriental; and round or small eyes will not look alert. In the show environment, a judge will need to give the cat time to relax to see this. It is important to look through the coat colour or pattern to see what is really there. i.e. a self cat may look to have small and even deep set eyes as they have no eye make – up, but this is often an optical illusion. Where eyes are a little deep set, this will detract from the alert expression. The illustration below shows the impact of differing eye shapes and set on the NFC look.

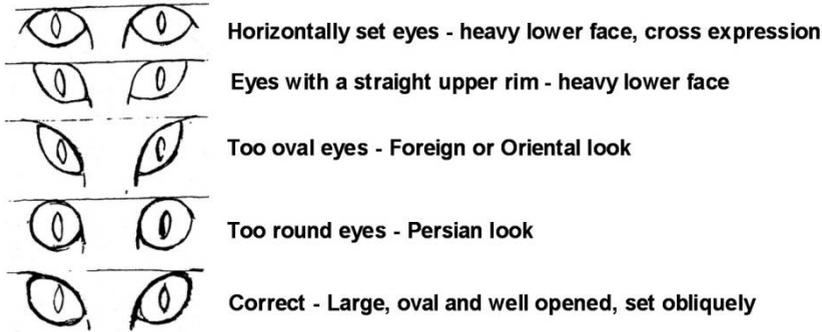


Fig 3. Eye Shape & Set

## Ear Shape

*“Large, not rounded, with good width at base”*



Fig. 4 Too Rounded Ear Shape

Rounded ears will detract from the typically alert expression that is essential in an NFC. The photo to the left shows nicely shaped ears, whilst the figure above shows ears which are too rounded.

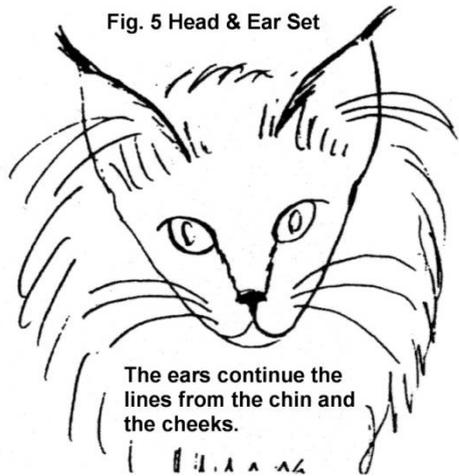
Medium ears can be quite common but small ears are a fault, we don't want huge Maine Coon ears either. It is necessary to feel the base of the ears to the skull to see how large the ears really are. Much of the ear is actually hidden in the coat.

“With Lynx-like tufts and long hair out of the ears” Lynx tufts are not seen very often on UK NFC's, but are preferred. Good furnishings in the ear and furred rather than leathered ears are very important, as in a natural cat, they stop the ears freezing. Ears

with good furnishings may appear smaller than those without because it is easier to see the actual ear without the furnishings!

**Ear Set** “*Ear placement, high and open set so that the lines of the ears follow the line of the head down to the chin*”

Ear set and placement is critical to the alert expression and the elegance of the breed. The ears should be placed on the head so that the outer rim of the ear continues the overall triangular shape to the head. Whilst the ear placement should be open; the position of the ear should be very slightly slanted outwards, with a good width to the ear well within itself. This will achieve the typical alert NFC expression. Common issues seen are wide set ears and/or too flared ear placement, sometimes small ears are seen but remember ears should be large not huge.



## **Chin**

**“Strong chin”**



Ideally seen in profile the chin should be in line with the upper lip. A definite chin (as shown in the photo to the left) is very important otherwise you will lose the front of the triangle and the cat may look too foxy or oriental in type.

## **Typical NFC Stance**

***“High on legs, with back legs longer than front legs”*** this is the typical NFC stance and is an important characteristic of the breed. See photograph to the right.



## ***Tail***

***“Long and bushy, should reach at least to the shoulder blades, but preferably to the neck.”***



Examples in the breed of an unusual tail stance have been seen, often referred to as “curly tail or squirrel tail”. Whilst this is not a listed fault, equally it is not the normal tail carriage and caution should be exercised when breeding with cats exhibiting this undesirable characteristic. Where cats with this type of tail have been bred from; it does appear to be a recessive trait and the BAC is not aware of any associated health issues. This photo illustrates a tail with this carriage.

## ***Coat Quality & Texture***

***“The woolly undercoat being covered by a smooth, water repellent overcoat; which consists of long, coarser and glossy guard hairs covering the back, sides and tail.”***

Coat quality and texture is critical to the survival of the natural heritage of this breed and gains 25% of the total points in the SOP. The texture should always be slightly harsh and resistant to the touch, with a definite double coat, even on a young cat and regardless of season (it will just be less evident in summer). Longer, harsher, glossy but resistant guard hairs are also essential. Make allowance for coat pattern or colour, i.e. agouti or non-agouti and dilute colours. However, the coat should never be silky like a Maine Coon and too soft a coat is a fault. A full coat with shorter hair over the shoulder blades and long fur to the sides and flanks with a full ruff and knickerbockers is to be expected in a mature cat. However, allowance should be made for all entire cats during the breeding season and a shorter summer coat is acceptable for all NFC's. Despite being a natural cat, any cat on the show bench should still be in top show condition, well presented and prepared. Don't forget snowshoes – these are the furry tufts between the paws, which help to protect the paw pads from the cold and ice in the wild.

## ***Body & Conformation***

***“Big and strongly built, long and muscular with solid bone structure. Having a deep chest and powerful neck”*** The NFC should be a large, long, and elegant cat but not overweight or fat. Substance is more important than simple weight. Bone strength, structure and body length is very important, especially on females. Whilst females will be smaller than males they should not be small. Strength of limbs should extend all the way through the ankles to the paws.

## ***NFC & GCCF Withholding Faults***

- 1. Cobby, small or delicate build*
- 2. Break (stop) in profile*
- 3. Round or square head*
- 4. Short tail (not reaching to back of shoulder blades)*
- 5. Dry, knotted or too soft a coat*
- 6. Short legs*
- 7. Round eyes*
- 8. Small ears*
- 9. As with all GCCF breeds - Any defect as listed in the GCCF Standard List of withholding faults for all breeds.*

NFC's are not known to be particularly susceptible to any of the GCCF standard withholding faults.

Note: - NFC Illustrations reproduced here by the kind permission of Jette Eva Madsen International FIFE Judge and Breeder of NFC's.

## **Genetic Defects**

The Norwegian Forest Cat is a very robust breed that often has a lifespan of twelve to fifteen years of age. At the time of writing there is a wealth of breeding experience appertaining to the NFC breed in the current BAC. In the experience of that group there are no serious genetic disorders which have a significant prevalence within this breed. However, as with all breeds of pedigree and non-pedigree cats there can be genetic faults which appear from time to time and breeders should watch for symptoms and consider lines carefully when selecting suitable cats for mating. The following defects whilst not significant have been known within the breed.

### ***Cleft Palate & Hare Lip***

A cleft palate is an incomplete closure of the palate, the 'wall' between the mouth and the nasal cavity. The opening, or cleft, may be located in the hard (bony) palate, the soft palate or both. The cleft sometimes extends to the upper lip (hare-lip). This defect can be inherited as a genetic trait. Alternatively, it may be induced during pregnancy by toxic, viral, hormonal or nutritional factors.

Kittens born with a cleft palate often have difficulty suckling, grow poorly and fail to thrive, which can eventually be fatal. They often have a discharge of saliva, milk or food from the nose, especially during and after feeding. Affected kittens commonly gag, cough and sneeze while eating, due to the lack of separation between the nasal cavity and the mouth. This may lead to respiratory infections such as rhinitis (in the nose) and pneumonia from inhaling fluids.

### ***Deafness***

The "W" gene prevents the normal replication and migration of pigment producing cells during embryologic development. Some cats with the *W* allele of this gene are deaf and/or have de-pigmentation of the iris of one or both eyes, resulting in blue eye colour. The particular combination is determined by the polygene's present in the affected animal during the development of the embryo. Therefore, however invisible polygene's are, from a breeding perspective deafness itself can be a selection factor to try to eradicate from any breed. In selecting against deafness, breeders should focus on deafness solely and not eye colour; as this has not proven to be an associated factor.

## **Breeding with white Norwegian Forest Cats**

As described above; in all white cats, pedigree or non pedigree, there is a link between the “W” masking gene and deafness. Most white NFC’s will be fully hearing, but some are completely deaf in both ears (bilaterally) and in others only one ear may be affected (unilaterally). The only way to tell the difference for certain between a hearing cat and one with unilateral deafness is with a BAER (Brainstem Auditory Evoked Response) test, which is a simple test that can be carried out in laboratories such as those of the Animal Health Trust.

Animal Health Trust  
Lanwades Park  
Kentford  
Newmarket  
Suffolk  
CB8 7UU  
Contact Telephone: 01638 751000  
Contact Fax: 01638 750410  
Email: [info@aht.org.uk](mailto:info@aht.org.uk)

Given this, the BAC recommends that extra care and consideration should be taken when breeding from white NFC’s. Breeding from a deaf parent may increase the chances of deaf offspring, but there is no substantive evidence to prove this at present. The BAC suggests that if a bilaterally deaf kitten is produced from a particular mating, then caution should be exercised with future mating. As with all breeds the NFC BAC recommends that no completely deaf cat should be used in a breeding programme.

## ***Feline Urinary Syndrome (FUS)***

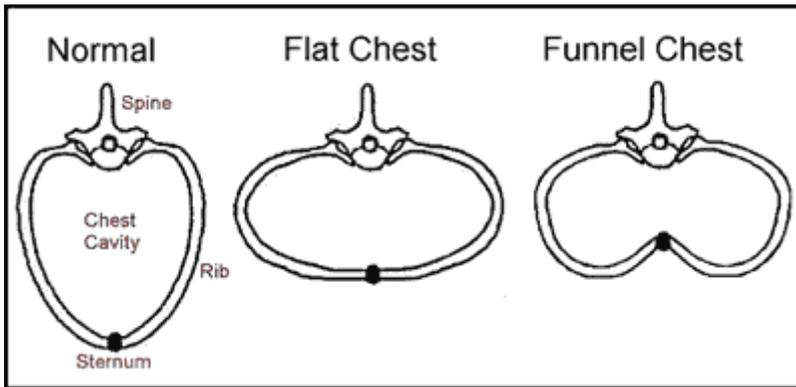
Gravel in the bladder (FUS) is a common disorder, particularly among neutered males. There is a lot of anecdotal evidence that NFC’s can be susceptible to this problem. Treatment is available and in the case of FUS diet can play an important part in prevention. If FUS is suspected veterinary advice should be sought urgently.

## ***Flat-chest syndrome***

There is good evidence that this is caused by a simple recessive gene, but it may also have a more complex genetic cause; the disorder results in a kitten with a compressed flattened rib-cage has and will show difficulty in breathing, etc. It can be fatal in a number of cases, depending on degree of severity. No test is available.

There is anecdotal evidence that the recovery of affected kittens can be assisted by a supplement of taurine, but this is unproven. This syndrome can occur either at birth or spontaneously usually at about the age of 4 weeks. Most kittens with mild flat chests

recover and grow as normal after the age of 9 – 12 weeks, but the development of the heart can be affected. Veterinary advice should always be sought in order to establish the most effective course of action. The BAC would not recommend that any affected cats are used for breeding.



## ***Glycogen Storage Disease***

Glycogen storage disease type IV is an inherited disorder of the Norwegian Forest Cat where an essential enzyme required to produce glucose (energy) is deficient. It is inherited as a simple autosomal recessive trait and can present in 2 ways. Most commonly the affected kittens are stillborn or die within a few hours of birth; however, they may develop normally until 4-5 months of age before suffering terminal neuromuscular degeneration. This causes severe muscular weakness, atrophy and contractures, and inability to use their limbs. Affected cats may die suddenly from heart failure. As this disorder is autosomal recessive, both parents must be carriers of the trait in order for offspring to be affected.

A DNA test is available for the diagnosis of affected kittens and the detection of carrier cats, further information can be found by following this link to the Diagnostic Laboratories at Langford Veterinary Hospital at Bristol University .  
[http://www.langfordvets.co.uk/lab\\_pcr\\_gsd4.htm](http://www.langfordvets.co.uk/lab_pcr_gsd4.htm)

Diagnostic Laboratories Langford House  
Langford  
North Somerset  
BS40 5DU

UK [http://www.fabcats.org/breeders/inherited\\_disorders/norwegian\\_forest.php](http://www.fabcats.org/breeders/inherited_disorders/norwegian_forest.php)

Where an NFC breeder is aware of the presence or potential presence of this disease in their pedigree lines, the BAC would recommend that all entire cats are tested and where they are found to test positively for GSD action taken to remove these carriers from the lines. This can be achieved either by directly removing carriers from the breeding programme or where appropriate by breeding a carrier to a non-carrier to keep a tested non-carrier kitten before neutering the original carrier. This will help to preserve the breadth of lines in the gene pool.

It is useful to note that Langford now also offer a combined GSD / Amber test at a reduced cost. Breeders may find this a useful way to establish the status of their breeding lines, the BAC recommend that any breeders considering breeding for recessive colours should ensure that they aware of their cats GSD status as both of these are recessive traits.

## ***Hypertrophic Cardiomyopathy (HCM)***

Hypertrophic Cardiomyopathy is a terminal condition where the heart muscle enlarges and thickens progressively over time. It can be a cause of sudden death, but symptoms may also be mild or nonexistent. The disease is believed to be caused by mutations in several genes and passed down to offspring, probably by autosomal dominant inheritance. Any cat, regardless of breed, can be afflicted with the disease. Due to anecdotal evidence of a prevalence of HCM in NFCs, a study has now commenced at the Royal Veterinary College under the aegis of Dr Virginia Luis Fuentes.

Under the RVC study, free cardiac ultrasound screening will be offered for NFC's for as long as resources are available. Ultrasound is currently the most effective way of diagnosing HCM. The aims are mainly centred on the following:

- To define the pattern of inheritance of HCM in NFCs using pedigree analysis from cats already screened
- To define what is a normal ultrasound scan and what is abnormal for NFCs compared with other breeds, including defining an 'equivocal' category if necessary
- To rule out other causes of heart muscle thickening in affected cats with blood tests. Older normal cats will be offered blood tests for health screening (e.g. kidney disease). Residual blood will be stored for future DNA extraction. In cats where blood is not obtained, mouth swabs will be used to collect DNA samples.

DNA from screened cats will be analysed to search for a DNA sequence found in NFCs affected with HCM and absent in normal NFCs. At this stage, the project has limited funding, and the team do not have the resources to determine prevalence of HCM in the breed, although this would be a very important aim for the future.

The anticipated timescales for the project are:-

- To complete the pedigree analysis part by the end of 2010, following scans of key individuals in affected families.

- Scanning during 2010/11 should provide the study with preliminary information to establish clearly normal vs. clearly abnormal echocardiographic values, but longer term follow-up information will be required to determine whether cats classified as 'equivocal' truly have HCM or are actually normal. This could take another 5-10 years.

The BAC supports this study and would encourage interested owners and breeders to contact Virginia to participate in this study. The more NFC's that are screened the easier it will be to confirm what is normal for NFC's and to establish if a gene test is possible and/or necessary.

*Virginia Luis Fuentes*  
*Senior Lecturer*  
*Royal Veterinary College*  
*Dept of Veterinary Clinical Sciences*  
*Hawkshead Lane*  
*North Mymms*  
*Hatfield*  
*Hertfordshire*  
*AL9 7TA*

Tel: +44 1707 666333

Email: - vluisfuentes@rvc.ac.uk

## **How breed numbers work**

The GCCF breed numbers are quite complex and they have been developed over the last 100 years to cover an ever expanding range of cats breeds and colours.

Within the NFC breed although coat pattern, eye and coat colour are irrelevant it is still important to correctly colour register your kittens, although with the range of colours available to us this can be a daunting task for a novice breeder. The BAC or other experienced breeders will always be pleased to help identify any colours that you are unsure of; as kittens' colours can often be very pale or disguised by kitten fur or "temperature markings" so it is easy to get it wrong!

The Norwegian Forest Cat breed numbers range follows Series 1 colour numbering i.e. 67 15 Black (excluding chocolate, lilac, cinnamon, fawn, caramel & apricot). Additionally Series 2 is used to define colouring further i.e. 67 37ts Silver tabby & White NFC.

Please note that there is no distinction made between Tabby patterns in NFC's.

<b>Colour</b>	<b>Number</b>	<b>Colour</b>	<b>Number</b>
<b>Black &amp; White</b>	<b>67 31</b>	<b>Cream Smoke &amp; White</b>	<b>67 31fs</b>
<b>Black Smoke</b>	<b>67 36</b>	<b>Cream Tabby</b>	<b>67 20f</b>
<b>Black Smoke &amp; White</b>	<b>67 31s</b>	<b>Cream Tabby &amp; White</b>	<b>67 31ft</b>
<b>Silver Tabby</b>	<b>67 18</b>	<b>Cream Silver Tabby</b>	<b>67 18f</b>
<b>Silver Tabby &amp; White</b>	<b>67 31ts</b>	<b>Cream Silver Tabby &amp; White</b>	<b>67 31fts</b>
<b>Brown Tabby</b>	<b>67 20</b>	<b>Tortie</b>	<b>67 21</b>
<b>Brown Tabby &amp; White</b>	<b>67 31t</b>	<b>Tortie &amp; White</b>	<b>67 22</b>
<b>Blue</b>	<b>67 16</b>	<b>Tortie Smoke</b>	<b>67 36e</b>
<b>Blue &amp; White</b>	<b>67 31a</b>	<b>Tortie Smoke &amp; White</b>	<b>67 31es</b>
<b>Blue Smoke</b>	<b>67 36a</b>	<b>Tortie Tabby</b>	<b>67 20e</b>
<b>Blue Smoke &amp; White</b>	<b>67 31as</b>	<b>Tortie Tabby &amp; White</b>	<b>67 31et</b>
<b>Blue Tabby</b>	<b>67 20a</b>	<b>Tortie Silver Tabby</b>	<b>67 18e</b>
<b>Blue Tabby &amp; White</b>	<b>67 31at</b>	<b>Tortie Silver Tabby &amp; White</b>	<b>67 31 ets</b>
<b>Blue Silver Tabby</b>	<b>67 18a</b>	<b>Blue Tortie</b>	<b>67 28</b>
<b>Blue Silver Tabby &amp; White</b>	<b>67 31ats</b>	<b>Blue Tortie &amp; White</b>	<b>67 22a</b>
<b>Red</b>	<b>67 15d</b>	<b>Blue Tortie Smoke</b>	<b>67 36g</b>
<b>Red &amp; White</b>	<b>67 31d</b>	<b>Blue Tortie Smoke &amp; White</b>	<b>67 31gs</b>
<b>Red Smoke</b>	<b>67 36d</b>	<b>Blue Tortie Tabby</b>	<b>67 20g</b>
<b>Red Smoke &amp; White</b>	<b>67 31ds</b>	<b>Blue Tortie Tabby &amp; White</b>	<b>67 31gt</b>
<b>Red Tabby</b>	<b>67 19</b>	<b>Blue Tortie Silver Tabby</b>	<b>67 18g</b>
<b>Red Tabby &amp; White</b>	<b>67 31dt</b>	<b>Blue Tortie Silver Tabby &amp; White</b>	<b>67 31gts</b>
<b>Red Silver Tabby</b>	<b>67 18d</b>	<b>Blue eyed White</b>	<b>67 14</b>
<b>Red Silver Tabby &amp; White</b>	<b>67 31dts</b>	<b>Orange eyed White</b>	<b>67 14a</b>
<b>Cream</b>	<b>67 17</b>	<b>Odd eyed White</b>	<b>67 14b</b>
<b>Cream &amp; White</b>	<b>67 31f</b>	<b>Green eyed White</b>	<b>67 14c</b>
<b>Cream Smoke</b>	<b>67 36f</b>		

NB:Amber number series is 67 46 with sub-code a for Light Amber and w for White .

## Conclusion

The NFC Breed Advisory Committee hopes that you have found this document both informative and useful. We would be pleased to receive any feedback on how it can be improved. As a GCCF affiliated BAC we hold bi-annual seminars on a variety of topics; these seminars are open to exhibitors, breeders, stewards, judges and other interested parties. We cover a variety of topics not covered by this document and you will have the opportunity to get hands on with a wide variety of beautiful Norwegian Forest Cats.

If you would like further information about the NFC breed, the BAC members or forthcoming seminars please visit our website at [www.nfcbac.co.uk](http://www.nfcbac.co.uk). The website also holds links to the UK NFC clubs affiliated to the BAC.



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Page 16 – Stance & Tail - Mary Rose Douglas  
Page 16 – Curly Tail – Anonymous

#### **Reference & Acknowledgements**

In addition to the knowledge inherent in the BAC the following texts have been used as a reference point for this project.

Eileen Hancock – Establishment of the Breed in the UK  
Jette Eva Madsen – Illustrated standard of points  
Mary-Rose Douglas – Cats From The Scandinavian Woods  
Ester Verhoef - Norwegian Forest Cat  
Robinson's Genetics for Cat Breeders and Veterinarians. 1999. Fourth edition.  
Marc Peterschmidt - Norwegian Forest Cats in Amber – The show must go on.

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