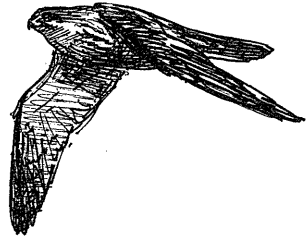


Gyrfalcon *Falco rusticolus* predation on poultry and domestic animals: a review

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(Med et dansk resumé: Jagtfalkens prædation på husdyr)

Introduction

The Gyrfalcon *Falco rusticolus* spends most of its adult life in barren, wilderness tracts far from areas of human habitation. Attacks on poultry and other livestock by adult falcons are therefore rare occurrences. In contrast, young birds often roam extensively (Glutz von Blotzheim et al. 1971:864), and may in certain cases be attracted by inhabited areas because of access to easily caught prey (cf. Fig. 1).

In the monograph »Der Gerfalk« by Dementiev (1960:45), attacks on domestic birds are barely mentioned, and even recent standard works give no information on the subject (Cramp & Simmons 1980, Cade 1982).

A general problem is that rare and inaccessible birds of prey are mainly known to us from random observations and registration, for example collections of prey remnants from a few nests. As far as the Gyrfalcon is concerned, one can make the mistake of generalizing about the predatory habits of the species purely on the basis of the choice of prey made by the male in the three months of spring (April, May, June).

This article is part of a larger work based upon a comprehensive literature search, whose

purpose is to collect fragmentary, often scattered and almost forgotten information about the Gyrfalcon's biology, in order to provide new insight into the feeding habits of the species.

A summary of the basic material is presented in Tab. 1. Only sources containing specific information are included. Where the authors have failed to mention the exact number of prey animals involved, a probable minimum estimate is given in parentheses in the abstract column.

The former nomenclature Greenland Falcon and Iceland Falcon is retained to conform with original sources.

Artificially induced attacks on domestic animals, such as hunting and falconry expeditions making use of decoy pigeons *Columba livia*, are not included in the material (Manniche 1910, Herdemerten 1939:83, Mattox 1968, Mattox & Graham 1968).

H. Holgersen, the late J. Josefsen, K. Kampp, W. G. Mattox, T. R. Nielsen and K. Malling Olsen, contributed with personal information. The British Museum (Natural History) kindly provided details from their collections, and the library of the University of Trondheim assisted with obtaining rare literature.

Tab. 1. The Gyr Falcon's predation on domestic birds and animals. Only sources with specified information are included. Number of prey individuals in parentheses are probable minimum estimates.
Jagtfalkens prædation på husdyr, sammenfattet fra litteraturen. Kun kilder med specifikke oplysninger er medtaget. Antal dræbte dyr sat i parentes angiver sandsynlige minimumstal.

Species	Abstract	Locality	Source
Domestic pigeon <i>Columba livia</i>	A juvenile female ^a stooped at tame pigeons and was shot	Akureyri, Iceland	Faber 1827
Domestic pigeon <i>Columba livia</i>	Only 2 young pigeons were lost during years of pigeon keeping	Greenland	Holböll 1842-43
Rabbit <i>Oryctolagus cuniculus</i>	An adult Greenland Falcon male was killed on wing above a rabbit-warren	Dunfanaghy, Ireland	Thompson 1849:32
Pheasant <i>Phasianus colchicus</i>	A juvenile Greenland Falcon male killed a cock Pheasant (8) almost daily over a period of 8-10 days	Pembrokeshire, U.K.	Tracy 1850 (cf. Fig. 1)
Domestic poultry <i>Gallus domesticus</i>	An Iceland Falcon killed a great many chickens (7) before being shot	Outer Hebrides, U.K.	Gray 1871:22
Domestic pigeon <i>Columba livia</i>	Greenland Falcons and an Iceland Falcon killed minimum (5) tame pigeons	Shetland, U.K.	Saxby 1874:13
Pheasant <i>Phasianus colchicus</i>	An adult Greenland Falcon male killed some Pheasants (3) before being shot	Guernsey, U.K.	Couch 1876
Domestic poultry <i>Gallus domesticus</i>	A black Gyr Falcon caught several hens (3). Captured alive under a barn	Maine, U.S.A.	Purdie 1879
Rabbit <i>Oryctolagus cuniculus</i>	A Greenland Falcon was caught alive after gorged itself on a Rabbit	Lough Foyle, Ireland	Payne-Galloway 1882:311 (cf. Ussher & Warren 1900:137)
Domestic pigeon <i>Columba livia</i>	Unsuccessful attack on a pigeon. Another pigeon had disappeared some days previously	Isfjorden, Spitsbergen	Cocks 1883
Domestic pigeon <i>Columba livia</i>	A juvenile female caught a tame pigeon but gave up when disturbed by people	Nolsø, Faeroes	Andersen 1898 1899
Domestic pigeon <i>Columba livia</i>	A Greenland Falcon carried off a Fantail Pigeon before being shot	Douglas, The Isle of Man, U.K.	Kermode 1901
Domestic poultry <i>Gallus domesticus</i>	A juvenile male caught 11 hens and large chickens before it was shot	Nord-Fyn, Denmark	Grill 1903; cf. Schiøler 1931:346, 347
Domesticated White-fronted Goose <i>Anser albifrons</i>	Swooped down and killed a full-fledged goose	Greenland	Müller 1906:19
Domestic poultry <i>Gallus domesticus</i>	A sub-adult Gyr Falcon killed and immediately began to eat a vicious cock	Portland, U.S.A.	Norton 1907 (cf. Fig. 2)
Turkey <i>Meleagris gallopavo</i>	A white Gyr Falcon was shot in the act of attacking a Turkey	Alberta, Canada	Cassels 1922
Domestic poultry <i>Gallus domesticus</i>	A black Gyr Falcon female was shot when attempting to carry off a hen	Essex, U.S.A.	Fuller 1922
Domestic poultry <i>Gallus domesticus</i>	A Gyr Falcon was once after the poultry	Greenland	Helms 1926
Domestic pigeon <i>Columba livia</i>	Shot when leaving a pigeon house with a pigeon in its claws	Godthåb, Greenland	Oldendow 1933
Domesticated White-fronted Goose <i>Anser albifrons</i>	Captured alive when it was riding the back of a goose	Sukkertoppen, Greenland	Oldendow 1933
Domestic poultry <i>Gallus domesticus</i>	Fetches 2 large chickens from a henyard. Shot upon arriving the third time	Frederikshåb, Greenland	Oldendow 1933

Domestic poultry <i>Gallus domesticus</i>	Stooped two times at a hen that was cowering under a woman's arms	Iceland	Stevens 1953:201
Domestic pigeon <i>Columba livia</i>	A white Gyr Falcon was shot when it stooped at a homing pigeon	Norway	Waller 1959
Domestic duck <i>Anas platyrhynchos</i>	An adult Greenland Falcon killed and completed a meal on a fat Aylesbury duck	Mottisfont, U.K.	Meinertzhagen 1959:147
Domestic duck <i>Anas platyrhynchos</i>	A Greenland Falcon was shot when eating a duck	South Uist, Outer Hebrides, U.K.	Meinertzhagen 1959:147
Domestic pigeon <i>Columba livia</i>	A grey male chased a local pigeon (medio August)	Ivigut, Greenland	Mattox 1968 and pers. comm.
Domesticated Mallard <i>Anas platyrhynchos</i>	A juvenile female killed and ate domesticated Mallards (2) before it was shot	Vancouver, Canada	Campbell & Morrison 1969
Domestic poultry <i>Gallus domesticus</i>	A pellet collected at a nest contained fragments of a chicken	Utsjoki, Finland	Mikkola & Sulkava 1972
Domestic cat <i>Felis catus</i>	A juvenile female made an unsuccessful attack on a cat with young	Finnmark, Norway	J. Josefsen pers. comm.
Domestic poultry <i>Gallus domesticus</i>	A juvenile female killed 16 large chickens before she was shot	Rogaland, Norway	H. Holgersen pers. comm.
Domestic poultry <i>Gallus domesticus</i>	A juvenile female killed a hen in a poultry-yard before being shot (autumn 1950)	Rogaland, Norway	T. R. Nielsen pers. comm.
Domestic pigeon <i>Columba livia</i>	A juvenile Gyr Falcon pursued pigeons (primo August 1981)	Julianehåb, Greenland	K. Kampp pers. comm.

a: The author calls this falcon *Falco lanarius* L. but several details indicate that it was in fact a Gyr Falcon (cf. Hantzsch 1905:279)

Visits to built-up areas

As early as in 1746, Johann Anderson, mayor of Hamburg, wrote that the keeping of domestic fowl on Iceland was rendered nearly impossible partly by the presence of birds of prey (Anderson 1746:39). Niels Horrebow (1752:142), the foremost authority on Icelandic Gyr Falcons at that time, disputed this statement, while at the same time admitting that a falcon or a small hawk may infrequently kill an occasional hen or a chicken *Gallus domesticus*.

The first indisputable evidence of concentrated foraging flights in areas of human habitation was recorded by Faber (1822:3, 1827) and referred to his observations on Iceland. He noticed that adult as well as young Gyr Falcons were often seen flying near houses toward the end of August. From northern Finland Montell (1917) reported that juvenile birds during the autumn often flew into villages in order to prey on hens. More recently such behaviour has been confirmed by annual reports from Danish ornithologists on the movements of predominantly young birds (usually from medio August) into settlements in Greenland (K. Falk, F. Wille, and/via K. Kampp pers. comm.).

Hantzsch (1905:283) observed Gyr Falcons

chasing pigeons over the rooftops of Reykjavik. Falcons have in some cases remained in cities over extended periods of time. During World War I, Törne (1940) found that a Gyr Falcon was a regular winter visitor (November-March) to the Russian town of Rostov. After preying on flocks of wild pigeons in the town, the falcon returned to its hideout in the church spire or at the top of cranes in the harbour area. In another Russian town, Pskov, a Gyr Falcon conducted pigeon hunting forays from a bell tower (Dement'ev 1951). In recent decades, Gyr Falcons have wintered in two Scandinavian capital cities during several consecutive years. This may indicate that the same individual returns from year to year. The Gyr Falcon in Stockholm was observed in 1970-1971, and mainly hunted ducks in the harbour area (Jenning & Fridzén 1972). A sub-adult Gyr Falcon also visited Copenhagen in 1982-1983, and preferred hunting pigeons (K. Malling Olsen pers. comm.).

Bold attacks

Among descriptions of Gyr Falcons, audacious attack combined with little fear for humans is a recurrent theme. Saxby (1874:14) emphasized

the impetuosity of Gyrfalcons as opposed to their boldness, and illustrates this with several examples from Shetland. A Greenland Falcon pursued a pigeon through an open door, first abandoning his efforts when apparently taken aback by the screams of frightened breakfasters in the kitchen. In Finnish Lapland, a similar foray after a grouse *Lagopus* sp. ended in the entrance of the vicarage at Utsjoki (Fellman 1906:65). Lloyd (1854:242) and Turi (1910:62) mention that grouse often sought refuge among the encampments of the Lapps, landing at their tents or inside their gammas, fluttering about between the feet of their human protectors, when chased by Gyrfalcons.

A Gyr Falcon in Maine, U.S.A., pursued a hen through a narrow opening under a barn, and was caught in the arms of a man as it came out (Purdie 1879). Oldendow (1933) relates from Greenland how a Gyr Falcon forced his way into a dovecot and sat passively while the resident pigeons sat huddled in the opposite corner. An Icelandic woman was attacked by a Gyr Falcon while she was sitting on her heels washing at a stream (Stevens 1953:201). The reason for this was that a hen had cowered under her arms and the falcon had plunged at it unsuccessfully and then dived again and dug its claws into the woman's arm. A similar episode of blind fixation on prey took place on the Isle of Man, where a man picked up a Rook *Corvus frugilegus* which had only moments before been struck by a Greenland Falcon. The falcon did not surrender its prey, but instead swooped down striking the bird out of the man's hand (Kermode 1901).

Specialization on hens

As is the case with many other birds of prey, Gyrfalcons usually return to areas where they have previously engaged in successful hunting forays (cf. Herdemerten 1939:95), Jennings & Fridzén 1972). This tendency is easily seen in birds which have specialized on hunting hens (Purdie 1879, Oldendow 1933). On the Outer Hebrides, one Gyr Falcon repeatedly returned to the same farmyard, killing a great many chickens before it finally met its fate (Gray 1871:22). In Denmark, a young male managed to kill 11 hens and large chickens before being shot (GriII 1903; cf. Schiöler 1931:346, 347). One young female behaved in a similar manner at Sola, in Rogaland, Norway. This ringed bird

spent more than a month in the vicinity of one farm, killing 16 large chickens before she was shot on November 4, 1936, in spite of the fact that the surrounding area was a rich hunting ground full of migrating waterfowl (H. Holgersen pers. comm.; cf. Dement'ev 1951).

Pigeons as decoys

The presence of Gyrfalcons has only infrequently caused problems for homing pigeon breeders (cf. Meinertzhagen 1959:147). Outside the breeding area, the only recorded instances of predation on tame pigeons occurred on Shetland and the Isle of Man (Saxby 1874:13, Kermode 1901). On the other hand, the Gyr Falcon's preference for doves is renowned among falconers and hunters. Müller (1906:22) and Krabbe (1934) maintain that their pigeon flocks were held exclusively for the sake of attracting Gyrfalcons. Manniche (1910) especially mentions the effectiveness of using pigeons to attract Gyrfalcons. During the Danish expedition to the northeast coast of Greenland in 1906-1908, at least 200 Gyrfalcons were lured to the ship, and 40 of these were shot. The pigeons were expert at aerial maneuvers, and the attacking falcons were hardly ever able to catch them (cf. Hagerup 1891:25, Winge 1898).

Larger prey

A summary of those domestic birds and animals which Gyrfalcons have attempted to kill is shown in Tab. 1. Several of these prey species are surprisingly large for this medium sized bird of prey. One would believe, for example, that both male Turkeys *Meleagris gallopavo*, and cocks of domestic poultry, represent a considerable opponent for a Gyr Falcon (cf. Cassels 1922, Norton 1907, Fig. 2). On the coast of Finnmark in northern Norway, a three month old Gyr Falcon chose an even more dangerous adversary, attacking a domestic cat on August 24, 1967 (J. Josefsen pers. comm.).

Attacks on very large poultry species, and the attempted attack on a domestic cat, may represent miscalculations by extremely hungry individuals. However, the strength and hunting ability of the Gyr Falcon are demonstrated by cases where the prey animal was killed instantaneously. In the wild, birds and animals the

Fig. 1. This immature Greenland Falcon male was shot on a warren in Pembrokeshire, U.K., as it attempted to escape after having killed a cock Pheasant (Tracy 1850). The falcon is among the collections of the British Museum (B. M. no. 1855.12.19.1). Woodcut by John Thompson, in Yarrell (1843:26).

Denne unge Jagtfalk blev skudt i en fasangård i Pembrokeshire, Wales, da den forsøgte at undslippe efter at have dræbt en fasan (Tracy 1850). Træsnit af John Thompson, i Yarrell (1843:26).



Fig. 2. This about 18 month old subadult Gyrfalcon killed a large cockerel before it was beaten to death in Portland, Maine, U.S.A. (After Norton 1907.) The bird is one of the five adult Gyrfalcons reported to have hunted poultry or domestic animals.

Denne ca 18 måneder gamle Jagtfalk dræbte en hane før den selv blev slået ihjel. Portland, Maine, U.S.A. (Norton 1907).

size of a goose or a marten may also be preyed upon.

Two observations of Gyrfalcons swooping at dogs in the Outer Hebrides (Gray 1871:21) express more likely an antagonistic behaviour rather than an attack on a possible prey.

Main points and conclusions

There are recorded a minimum of 81 attacks by Gyrfalcons on domesticated birds and mammals, divided among eight species. Sixtyseven attacks (83%) on five different prey species ended in the death of the quarry animal (cf. Tab. 1). More than half of these attacks were recorded in Great Britain and Norway, with the largest percentage levelled against domestic hens. During 45 attacks, a minimum of 42 hens were killed, and these statistics represent 56 percent of the total sample material. The other species was as follows: tame pigeons or doves 15 (19%), Pheasants *Phasianus colchicus* 11 (14%), domestic ducks *Anas platyrhynchos* 4 (5%), domesticated White-fronted Geese *Anser albifrons* 2 (2%), Turkey 1 (1%), Rabbits *Oryctolagus cuniculus* 2 (2%), and domestic cat 1 (1%).

All the Gyrfalcons which have attempted to kill or attack domestic animals were juvenile individuals, with the exception of five adult birds (Thompson 1849:32, Couch 1876, Norton 1907 (Fig. 2), Meinertzhagen 1959:147, Mikkola & Sulkava 1972). This indicates that marked changes in foraging and predatory behaviour may occur after the first year of life.

Fig. 3 illustrates that domestic animals are most frequently preyed upon in September and October, when young Gyrfalcons have reached independence (cf. Faber 1822, Montell 1917).

Surprisingly enough, there are no reports confirming attacks on domestic animals during the summer months between May and July, when these animals are most vulnerable. This may be explained by the fact that yearling falcons at that time usually abandon inhabited areas in favour of biotopes far from human habitation (cf. Sharrock & Sharrock 1976:72).

Several authors have characterized Gyrfalcons as clumsy fliers (Hagerup 1891:25, Winge 1898, Manniche 1910), based on autumn observations of falcons being out-manoeuvred by both Ravens *Corvus corax* and pigeons.

The most probable explanation for this is that the falcons observed were inexperienced, juvenile individuals.

Confusion of Gyrfalcons with other birds of prey is not very likely on Iceland, where neither the Peregrine *Falco peregrinus*, Rough-legged Buzzard *Buteo lagopus* nor Goshawk *Accipiter gentilis* occur. Peregrines may sometimes have been mistaken for Gyrfalcons in Greenland. In most of the cases listed in Tab. 1, the falcons were shot during their attacks and later identified by a competent ornithologist.

In addition to concrete information on predation and the Gyrfalcon's adaptability and skill as a predator, the material reviewed also affords insight into migratory behaviour. Pursuits of prey on the ground, and forced entries into narrow passages during hunting, are behaviours which contrast sharply with previous descriptions of this species. Two Norwegian authors have even characterized the Gyrfalcon as highly specialized (Hagen 1953), with stereotyped hunting behaviour adapted to flying prey (Folkestad 1970).

In common with other birds of prey, concentrations of domestic birds or other artificial accumulations of prey appear to attract the Gyrfalcon. However, the species prefers isolated habitat and only occurs in small numbers. Therefore, the Gyrfalcon has never represented a serious threat to animal husbandry.

Resumé

Jagtfalkens prædation på husdyr

Der er store huller i kendskabet til Jagtfalkens levestil, især p.g.a. dens sparsomme forekomst og afsides liggende opholdssteder. Dette gælder også fødevalg og jagtteknik; føderester er således kun indsamlet ved få reder, og det drejer sig i hovedsagen om bytte fanget af hannen i løbet af nogle få forårs måneder.

Ligesom andre rovfugle angriber Jagtfalken lejlighedsvist mindre husdyr, og selv om situationen kan opfattes som unaturlig, kan beretningerne herom fortælle noget om fødevalget uden for yngletiden og -området, og om jagtteknik og adfærd i forbindelse hermed.

Jagtfalkeangreb på husdyr er sjældne, og oplysningerne herom findes meget spredt og ofte svært tilgængeligt i litteraturen gennem mere end 200 år. De er her sammenfattet i Tab. 1. De fleste oplysninger stammer fra Storbritannien og Norge. Ved 81 re-

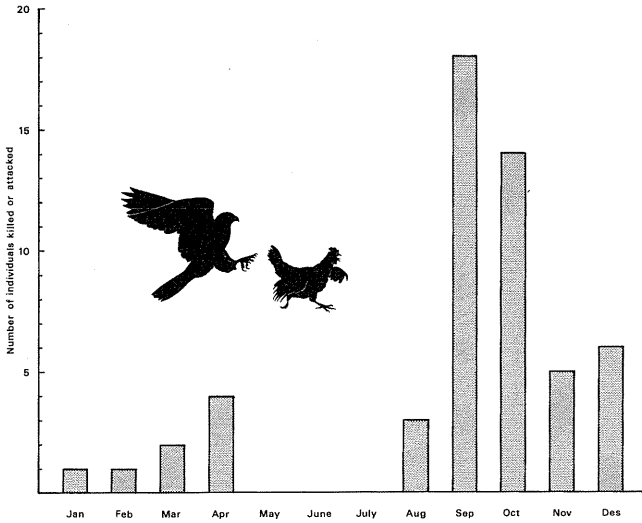


Fig. 3. Monthly distribution of 54 known attacks on poultry and domestic animals.
Månedsvise fordeling af 54 kendte angreb på husdyr.

gistrerede angreb dræbtes byttet i 67 tilfælde. Størstedelen (45) var rettet mod høns, de øvrige mod duer (15), fasaner (11), ænder (4), tamme Blisgæs (2), en Kalkun, to kaniner, samt en kat. Næsten alle angrebene blev udført af juvenile falke, især om efteråret, hvor ungfuglene er blevet uafhængige af forældrene og strejfer vidt omkring.

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