

## Guide

to the identification of wounds  
inflicted on livestock by predators.



Editor: Demetris Bousbouras Biologist

Thessaloniki 1997



## INTRODUCTION

The need for a guide such as this was recognized during the first phase of the ARCTOS project. We often found ourselves having to identify wounds inflicted on livestock by predatory animals. However, the biologists in the field with experience in identifying the traces of wild animals were often unable, because of their heavy workload, to conduct immediate examinations of the victims, often found at some distance from where they themselves were occupied. Since the examination of the victim must be conducted with the minimum delay, the dissemination of the information contained in this guide to a broader circle of colleagues and agencies was deemed necessary.

Careful and meticulous examination of injuries is also necessitated by other issues: - the human factor, and the cost of compensation.

- As the programme develops we and members of our network of local colleagues are often called on to conduct examinations in order to decide on claims for compensation for injuries inflicted by bears not covered by ELGA, the Greek Agricultural Insurance Organization (number of animals below one animal unit and, today, following the adjustment of the compensation rules, below one half unit).
- The problem of distinguishing between wounds inflicted by wolves and those caused by wild dogs has recently caused us serious concern in some regions. Often wounds inflicted by dogs have been attributed to wolves (even in regions where the wolf is unknown).
- Another serious issue is the attribution to wild animals of deaths caused by illnesses not covered by ELGA. Fortunately a careful examination by a vet can determine with certainty the actual cause of death, provided always that the examination is carried out within a very short time after the animal's death. This guide contains information to enable even a non-expert to conduct a preliminary examination.

The guide will be of assistance to colleagues in the bear and wolf programmes, as well as to those working in agencies such as the Forestry Service who encounter the problem of predator-inflicted injury and are aware of the issues involved (in those cases where the loss of livestock falls within the type of case covered by ELGA).

In writing this guide, apart from our own experience in the field and the basic field manuals on the identification of mammals and their spoor (Corbet & Ovedon 1984, Reichholf 1984, Bang & Dahlstrom 1991, Thomassin 1982), we have drawn on the Austrian identification manual of Kaczeensky & Thomas 1994. This material has been supplemented by new information from colleagues working in Greece, as well as data supplied by claims assessors at the ELGA offices in Kozani and Western Sterea.

Editor: D. Bousbouras, biologist

### **Collaborators:**

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The conference, held to determine how to make best use of the available experience in the identification of animal wounds by ELGA personnel, was attended, apart from the two colleagues mentioned above, by Sotiris Hiras, Stergios Nasmos, Theodoros Vassos, Kostas Konstantinidis, all agronomists, and by Vangelis Pantos and Konstantinos Papadiamantis, both veterinary doctors.

S. Psaroudas, agricultural economist and Head of Environmental Projects of Arcturos, collaborated on administrative issues, while the translation from German was done by K. Maniatis and M. Mathiopoulos, forester.

## 2. Necessary equipment

The examination of the victim will involve the use of:

- ▶ Camera with flash
- ▶ Tape measure to measure distance between animal tracks and size of prints
- ▶ Scalpel or sharp knife for the examination of bite wounds
- ▶ Plastic surgical gloves, disposable
- ▶ Disinfectant soap
- ▶ Plastic bags for the preservation of material
- ▶ Envelopes for the collection of hairs
- ▶ Printed examination forms or notebook

## 3. EXAMINATION

### 3.1. Photographic documentation of injuries

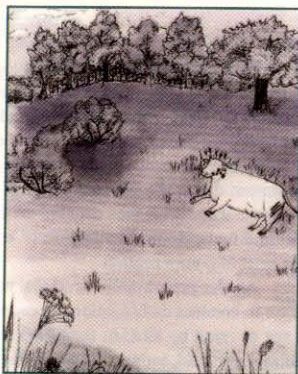
We photograph the animal in such a way as to include the surrounding area, the body and the position in which it was found, and details of the actual wounds.

#### Additional instructions

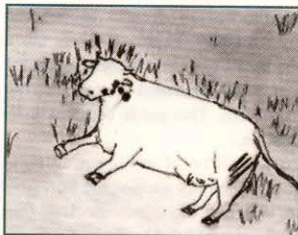
- ▶ Photographing the area and the animal from a variety of angles will give a fuller picture of what happened.
- ▶ If it is dark we must use a flash.
- ▶ We note the time and place at which photographs were taken.

Illustration 1: Photographing an injured or dead animal.

- ▶ General, overview photograph. Illus. 1a
- ▶ Photograph of victim. Illus. 1b
- ▶ Detailed photographs of wounds. Illus. 1c/1d



Illus. 1a



Illus. 1b



Illus. 1c/



Illus. 1d



foto.: M. Mathiopoulos

Bear tracks



foto.: M. Mathiopoulos

Bear track Hide foot

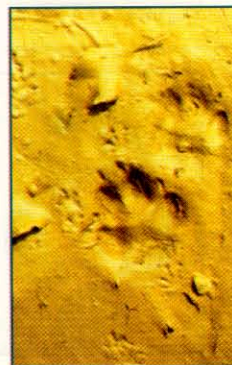


foto.: D. Busburas

fox track

### 3. 2. Documentation of spoor

Conclusive identification of the bite wounds is only possible when there is sufficient corroborating evidence of animal activity. The scene of the attack must be searched for tracks, droppings and hairs, which must be documented as follows:

▶ We photograph each impression of animal paws separately (alongside the tape measure), and also the sequence of impressions forming the animal's tracks.

▶ In the case of foxes, wolves and dogs we measure the length of the paw; with bears we measure the width of the front paw.

▶ We measure the distance between two successive prints of the same paw.

▶ If a whole sequence of tracks is visible, we follow a portion of it.

▶ We gather droppings and hairs, where these are to be found. The hairs are kept in a paper envelope because plastic destroys the DNA found in the mitochondria of the root (it is possible to use these in special cases to determine the individual animal or to investigate the possibility of the existence of cross-breeds of wolf and dog).

### 3. 3. Recognition of signs of activity

#### a) Tracks

To identify an animal from its tracks we must observe both the shape of the impression and the behaviour of the animal as it moves.

The length of its stride can be calculated by measuring the distance between two successive impressions of the same paw in a straight line on level ground.

## Wolf

- ▶ Length of paw 9-13cm.
- ▶ Width 7-9cm.
- ▶ The paw has four digits.
- ▶ The length of the animal's stride is 80-120cm..

The impression left by the paw of an adult wolf resembles that of a large dog and isolated prints will not permit us to distinguish between the two animals. One distinguishing feature often cited is that in the wolf the two front digits are perceptibly longer than their two fellows. While this is often so, it should not be depended on as the only criterion. Moreover, certain dogs also have two elongated front digits.

Sometimes in wolves the two middle digits have grown together at their rear end and are joined; thus when the ground permits us to make out such an impression it is easy to confirm the presence of a wolf.

To distinguish the tracks of a wolf from those of a dog one must follow the animal's trail over a fairly large distance in favorable snow conditions. Over the right distance (500-1000m) it is easy to identify the animal.

Wolves cover significant distances at a steady speed, advancing in a straight line with a regular stride. Their hind paws always come down in the impressions made by their front paws. Many of them move together in a line, treading in the tracks of the animal in front. These observations do not hold when the wolves are hunting, marking out their territory or encountering other wolves. Unlike dogs, wolves steer clear of human constructions and detritus, e.g. tractors and plastic refuse bags.

## Dog

The dimensions of the paw and the length of stride depend on the animal's size. Those animals capable of attacking refuges are large and approach the size of a wolf. The nails of the dog will not be visible in every impression it leaves. If the ground is soft or there is a stable layer of snow we can make out the nails if we examine the impression at an angle from behind.

As the dog advances he very frequently turns, stops and often crosses from one side of the road to the other.

## Fox

- ▶ Length of paw, 5cm.
- ▶ Width, 4cm.
- ▶ The paw is oval in shape.

In muddy ground the impression of the hairs on the paw will be visible. The paw has four digits. The two middle digits protrude beyond the straight line formed by the edge of the two outer digits. The length of stride is 70-80cm.

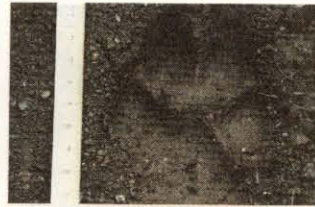
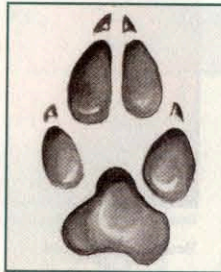


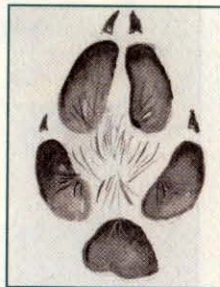
foto.: E. Hatjimihail  
Wolf track



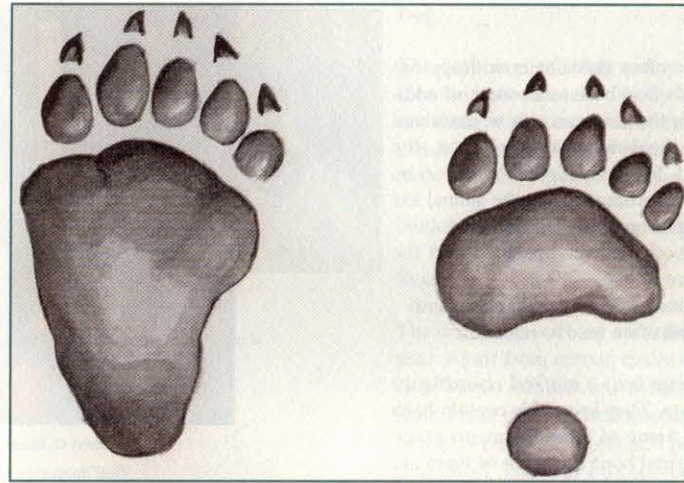
Wolf track (1/2)



Dog track



Fox track (actual size)



Bear tracks (1/3)

examination will reveal significant differences in shape. Moreover, it is very likely in the case of a young bear that the tracks of the mother will be found close by.

## Bear

- ▶ The length of the front paw is 10-12cm and the width 10-14cm.
- ▶ The length of the hind paw is 17-23cm and the width 9-17cm.
- ▶ The paw has 5 digits.

The nails protrude conspicuously from the digits. The length of stride depends on the size of the animal. The tracks of a young bear resemble those of the badger but careful

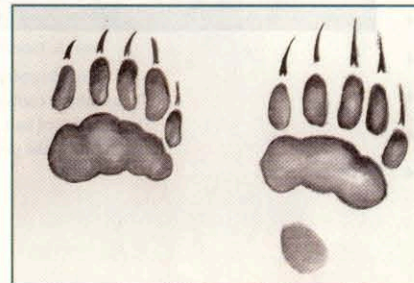


Φωτ.: Μ. Ματθίουπουλος  
Τζηνη αρκούδας

## Badger

- ▶ Length of paw 4-5cm.
- ▶ Width 5cm. The paw has 5 digits.
- ▶ The paws resemble those of a young bear.
- ▶ The length of stride is 30-50cm.

On the rear pad of the badger's paw we can make out 3 or 4 lobes which are not seen in the bear's paw.



Badger tracks (actual size)

## b) Droppings and hairs

The area around the bite often yields hairs or droppings from the aggressor. We collect both as a source of additional information. While the hairs can only be examined in the laboratory with the help of a microscope, the droppings can be used for immediate identification. They vary considerably, according to what the animal has been eating. To assist in correct classification the following description covers both their composition and the location in which they are found.

**N.B.** Animal droppings may well contain various parasites or their eggs and can often lead to infection.

**Wolf:** The wolf's droppings bear a marked resemblance to those of the larger dogs. They invariably contain hairs and fragments of bone. Some of these fragments maintain the form of the original bone but most of them are confused in an amorphous, thick, grey paste. The color of the droppings ranges from black to light grey, depending on the proportions of meat, blood and bones in the most recent meal. The odour is intense. The wolf leaves its droppings in conspicuous positions or along frequently used paths.

- ▶ Size: Up to 2.5-3cm in diameter
- ▶ Shape: Sausage-shaped with pointed end
- ▶ Size: Up to 3cm in diameter
- ▶ Shape: Cylindrical, sausage-shaped.

**Fox:** Foxes leave their droppings in conspicuous positions. The droppings vary considerably according to diet. They often contain hairs of small mammals, fruit, the carapaces of insects, hairs from various carcasses and garbage. They have a strong and distinctive odour.

- ▶ Size: 1.2 to 2.5cm in thickness
- ▶ Shape: Sausage shaped with pointed end



foto.: G. Iliopoulos  
Wolf droppings with presence of hair



foto.: S. Tzortzakis  
Wolf droppings. Typical shape containing remains of hair of the prey.



foto.:G. Mertzanis  
Bear droppings containing wild apple remains



foto.:G. Mertzanis  
Bear droppings. Shapeless mass with presence of hair of the prey and fruit seeds.

## Dog

The droppings will vary widely - according to breed and diet - in both size and colour. As a rule, when the dog is not living wild, there will be few or no hairs. There are usually traces of human refuse and scraps of food (fruit etc.). The dog's droppings have a characteristic odour.

- ▶ Size: Various
- ▶ Shape: Sausage-shaped.

## Bear

The droppings will vary according to the diet and time of year. Apart from certain traces of animal origin - mainly ants, wasps, tortoises and rarer animal remains - we mainly find plant matter: grasses, beech nuts, acorns, berries, sloes, wild apples and pears, strawberries and other fruit. The bear's digestive system fails to break down its food completely and so we can make out the various constituents of its droppings.

- ▶ Size: 3-6cm in thickness
- ▶ Shape: Thick sausage shapes or large mounds.

## Collection and preservation

The droppings are placed in plastic bags and frozen or air-dried. It is especially important to keep a careful note of:

- ▶ Date: Day, month, year.
- ▶ Probable animal
- ▶ Site where found
- ▶ Nearest village
- ▶ Description of area: Forest, road, meadow
- ▶ Altitude
- ▶ Additional information from site: Bite marks, spoor
- ▶ Identity of collector

## 4. Recognition of wounds

### 4.1 Wolf

The wolf's main prey are the roe deer, wild goat, hare and small mammals (rodents etc.); it rarely hunts larger creatures. Among domestic animals its main victims are the goat and the sheep.

It may however attack larger animals such as calves and mules, especially if it finds them alone and relatively weak (from age or youth). It will approach its victim stealthily and attack when the animal turns to flee. In the case of a whole herd of cows staying close together it may attack the dominant animals which put up the greatest resistance.

Wolves live and hunt mainly in packs. They pursue their prey and attempt to surround or corner it. They often pursue their victim for some distance, so blood spoor are found on the ground a long way from the dead animal. They dispatch small animals like roe deer and sheep with a bite to the nape of the neck or the larynx. Larger deer and cattle they will bite repeatedly during the chase, in the flanks or the thighs, causing massive hypodermic hemorrhaging.

The wolf frequently seizes its victim by the knee, which is the best point of attack to immobilize the creature. It is here too that the wolf often begins to feed on the victim.

If the prey is still erect, the wolves will often sink their teeth into the animal's muzzle, causing it to suffocate. If the victim is on the ground, it will be finished off by a firm bite to the larynx. The nails of the wolf, like those of the dog, are not sharp and do not tear the skin of the victim. In an attack on a cow, one wolf may hold the animal by the hind legs while another kills it. Animals which have survived a wolf attack are generally very gravely wounded.

Both wolves and dogs tear open the belly of their victim and eat first the innards and then the muscles. If left undisturbed, wolves will take their time and consume the whole carcass at their leisure. If they are disturbed, or if their victim is a large cow, they rend the body asunder and remove the pieces to a quieter spot. Of smaller animals like roe deer they will leave uneaten only the contents of the large intestine, the bowels, scraps of skin and fragments of bone.

Of larger animals they will leave the larger bones and the hide.



foto.: ELGA

Cow bitten on the neck by wolf



foto.: ELGA

Sheep bitten on the neck by wolf



foto.: ELGA

Cow bitten on the muzzle and the fold of the flank by wolf (i. e. the area on the belly close to the hind leg)



foto.: D. Busburas

Mule killed by wolves. The innards and part of the muscles have been eaten, but not the digestive tract. The photograph has been taken before the arrival of dogs.



foto.: ELGA

Cow bitten on the fold of the flank by wolf



foto.: ELGA

Calfs bitten on the fold of the flank by wolf



foto.: ELGA

Wolf attack. Tooth and claw marks on the knee fold and thighs.



foto.: ELGA

Wolves often kill sheep biting them on the neck.

## 4.2 Dog

As a consequence of their domestication and lack of practise dogs are usually poor hunters. Few of them have the chance to hunt regularly, improving their tactics in the pursuit and the kill. When they do attack large animals, they bite indiscriminately all over the victim's body. Their prey rarely dies from deliberately inflicted and grave injuries, but from shock or exhaustion due to the long and chaotic chase.

(Wolves on the other hand are efficient hunters whose skill has not been allowed to degenerate. When they attack an animal, they do so in order to eat. They bite discriminately, using all their strength, and their victims die from the severity of the wounds.)

When dogs have brought their victim to the ground they hurl themselves on to the nape of the neck or the larynx, tearing great gashes and causing heavy loss of blood from throat, nape of neck and the area of the head. But there are also dogs which can kill with just one snap of their jaws. The dog's nails are folded back and are too blunt to pierce the skin. Nail marks are often found, but only as superficial scratches.

Dogs usually kill because that is the natural goal of the hunt, without bothering to eat their victim. This is because they are fed by man. If they do cut into one of their victims they begin from the stomach. They remove the innards and show a preference for the digestive system (stomach and intestine).

The following table lists the differences between the injuries inflicted by the two animals:



foto.: ELGA

Sheep bitten by dog

	AGRESSORTYPE OF BITE
<b>Dog</b>	<ul style="list-style-type: none"> <li>▶ Numerous wounds all over the body: ears, muzzle, larynx, shoulders, breast, flanks, chest, front and hind legs.</li> <li>▶ The bites are of varying depth and ferocity.</li> <li>▶ The distance between upper and lower teeth varies from 3 to 5.7cm.</li> </ul>
<b>Wolf</b>	<ul style="list-style-type: none"> <li>▶ The wounds are often confined to the front of the body: head, larynx, muzzle.</li> <li>▶ The wounds are always very serious, even in cases where the victim survives.</li> <li>▶ The distance between the teeth marks is unchanging, about 4cm for the upper and 3cm for the lower.</li> </ul>



foto.: Wildbiologische Gesellschaft

The sharp teeth of the fox leave many small and deep marks, resembling shotgun wound.

## 4.3 Fox

The fox mainly hunts small mammals. If there is easy access it will raid chicken houses. It is only likely to seize sheep or larger wild animals if these are sick, weak or very young.

In winter, in conditions of great hunger, it may even kill adult (large) animals. It pursues its prey and bites the legs, flanks and belly. This is why hypodermic hemorrhaging is seen in these areas. As soon as it manages to bring its victim to the ground, it turns to the larynx and kills with repeated bites to the throat and nape of neck.

Because of the numerous bites we can observe hemorrhaging at the larynx, belly, flanks and legs. The pointed teeth leave a host of small, deep punctures. The wounds resemble those inflicted by shotgun pellets.

The fox will begin to devour his prey at the belly, displaying a preference for the entrails. It often removes parts of the body and makes off with them.

#### 4.4 Bear

Bears are remarkably strong and can kill with one or more blows to the spine or nape of neck. Thus the spine, nape of neck or forehead of the victim is often found to be broken. The head of the victim is mangled and unusually stretched. Blood runs from the mouth or nose. There may be bite marks on the muzzle and nape of smaller animals.

Because there is no particular method to the bear's attack, the wounds appear more serious than those inflicted by any other animal. The wounds from the bear's claws, if they exist, will be very deep.

The bear attacks close to or inside wooded areas. He will attack only one animal at a time. Droppings are often found close to the carcass. The bear will often move its victim's body and cover it with earth and branches.

Because the bear will often feed on carcasses of animals it finds, we must ascertain whether the animal was already dead from some other cause when eaten, even if there are clear indications of the presence of a bear at the scene.

Bears first open up the chest or belly and eat the viscera. They consider the breasts a special delicacy. The victim is often dismembered and the various parts found strewn and the area.



foto.: ELGA

Cow killed by blows on the back. Claw marks are visible.



foto.: ELGA

Cow wounded by blows on the back. Notice the depth and extent of the wounds.



foto.: ELGA

Cow consumed by bear and covered with rocks and soil. Muscle mass has been consumed.



foto.: ELGA

Cow wounded by bear. Notice the deep parallel claw marks..



foto.: ELGA

Cow killed with a blow on the neck by bear. Muscle mass has been consumed.

#### 4.5 Birds of prey and scavengers

Certain eagles are sufficiently large and powerful to kill with their talons new-born kids and lambs.

In such cases punctures will be seen in the flesh at the back of the neck. They tear to shreds the flanks of the animal to get at the innards. Birds of prey and crows both feed often on carcasses. They open up the chest or extend already existing openings. They usually remove the hair from the parts they are devouring, (a characteristic only observed in birds). Many of them first tear out the eyes of their victims.

#### 4.6 Animal carcasses (animals killed by disease or accident)

It is by no means certain that every dead animal we encounter has been killed by a predator. The death may have been due to disease, lack of stamina, a fall, or even to lightning. Such carcasses are a source of ready food for birds of prey, dogs and bears. Moreover, many animals are struck by vehicles and discovered hours or days later. Fractures and haematomas will most probably be found all over the body. Foxes, birds of prey, vultures and birds of the crow family prowl and hover in search of such food. These dead animals can display some of the same characteristics as those described above, resulting from attacks of various kinds. Frequent attempts to deceive are made by farmers in order to receive compensation.

When an animal has died not as a victim of aggression the autopsy will reveal hemorrhaging under the skin and the punctures or gashes in the flesh will not be reddened at the lips or rim of the wound. On the other hand, when there is a flow of blood (on the ground or on the animal's skin), or haematomas at the wounds, then it is definitely a case of death by aggression.

Animals dying as a consequence of disease may have remained in one position for a lengthy period of time. The grasses underneath them will have wilted and their hair will be flattened. Where there was an act of aggression, on the other hand, there will be signs of a struggle.



## 5. Damage to bee-hives

The only wild animal to destroy hives in order to eat the honey and the larvae is the bear, and usually the larger members of the species, to judge by the evidence left on the ground.

A characteristic feature of these attacks are the claw and teeth marks left on the exterior of the hives and frames.

The remains of the hives are strewn around and the frames utterly destroyed. If the site was fenced off, the fence will have suffered violent damage.

If there was an electrified fence to protect the site, we should check whether the battery is flat or whether it has been installed incorrectly.



foto.: ELGA

Bee hives destroyed by bear.



foto.: ELGA

Claw marks and foot prints are often visible on the frames.



foto.: ELGA

Ditto.



foto.: G. Mertzanis

Examining the wounds of a killed mule

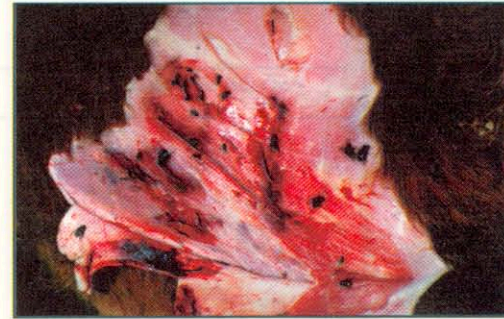


foto.: ELGA

Examining the wounds of a killed cow. The bruises caused by claws are visible under the skin.



foto.: ELGA

Hide (skin) of killed animal. Bruises are visible on the edge of the wounds.

## 6. EXAMINATION OF WOUNDS

### 6.1. What we should observe during external examination of the body:

- ▶ Age, sex and physical condition of animal.
- ▶ Has the animal been mauled or has it lost its life due to other factors?
- ▶ Was the animal killed by a bite to the larynx?
- ▶ Are there scratches on the skin?
- ▶ Has the belly been opened? Is the digestive system missing?
- ▶ Is the spine broken?
- ▶ Move the head.
- ▶ Are the legs broken? Move them.
- ▶ Is the animal bleeding from the mouth or the nose?

### 6.2. Examination of wounds by flaying animal

Many wounds are concealed by the animal's skin, while minor bites and scratches can close completely if they dry up. Bleeding under the skin due to scratching and haematomas are not apparent from the exterior. Thus the skin must be removed to reveal what lies beneath it. Care must be taken not to destroy the bitten area. This is why we first remove those sections which do not require examination. For a bite to the larynx we begin to cut from the nape of the neck, for a bite to the neck we commence cutting from the larynx. We go on to strip the skin from all likely areas so as not to overlook any injuries. We examine:

- ▶ How many and how large are the bites marks on the nape of the neck or the larynx?
- ▶ Are there other bite marks?
- ▶ Are there marks of nails on the inner side of the hide and do they penetrate to the animal's flesh?

N.B. Nails leave tears rather than punctures.

## 7. Identification key.

Every wound has its own peculiar features. We must always examine all the various characteristics before we can reach valid conclusions. Sometimes the evidence points to more than one aggressor. A bite to the larynx could be attributed, for example, to a wolf, dog or fox. The best course to follow is to examine all parts of the body and determine the aggressor in accordance with the whole range of features. We end up with a list which often features the wolf, fox, dog or bear.

Of special importance are those characteristics on the basis of which just one aggressor emerges, or which absolutely rule out one of the alternatives. Hence we must conduct a careful examination to see which predator the most, or the most significant, evidence points to.

### IDENTIFICATION KEY

Part of body	Wounds	Probable aggressor
Larynx, nape of neck	<ul style="list-style-type: none"> <li>▶ Only a few medium-sized, deep, round wounds</li> <li>▶ A few large, heavily bleeding wounds, with frayed edges and no clear outline</li> <li>▶ Many small, deep, round wounds</li> <li>▶ Punctures without reddened edges and without bleeding under skin</li> </ul>	Lynx (Wolf, Dog)
		Dog, Wolf (Lynx)
		Fox
		Scavenger Head
head	<ul style="list-style-type: none"> <li>▶ Jaw or cranium broken (blood from mouth or nose and head twisted to unusual angle)</li> <li>▶ Head detached from body</li> <li>▶ Bite marks on cranium</li> <li>▶ Deep punctures on cranium</li> </ul>	Bear - Vehicle
		Fox (Wolf)
		Bear, Wolf, Dog
		Birds of prey
		Neck - spine

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		Fox (Wolf)
		Bear, Wolf, Dog
		Birds of prey
Neck - spine	▶ Broken	Bear - Vehicle
Back	▶ Bites on back and flanks	Dog, Wolf, Fox
Thorax	<ul style="list-style-type: none"> <li>▶ Opened wide, the innards eaten</li> <li>▶ Eaten between ribs</li> </ul>	Bear (Wolf, Dog)
		Crows, birds of prey
Area of belly	▶ Opened wide, viscera (intestines and stomach) have been eaten	Fox, Dog, Wolf, Bear
Belly	▶ Bite marks and bleeding below skin	Dog, Wolf, Fox
Thighs	<ul style="list-style-type: none"> <li>▶ The meat of the muscles has been removed</li> <li>▶ Thighs and bones have been severed and removed</li> </ul>	Lynx, Fox, Wolf, Birds of crow family
		Fox (Wolf)
Shoulders	▶ Meat removed cleanly from bone	Lynx, Fox, Birds of crow family
Skin	<ul style="list-style-type: none"> <li>▶ Deep, thin scratches penetrating to the meat</li> <li>▶ 2-5 parallel scratches, very wide and continuous in places</li> </ul>	Lynx
		Bear
skinBleeding or haematoma under skin	<ul style="list-style-type: none"> <li>▶ Only on larynx, or also on nape of neck</li> <li>▶ In all or one of following parts: hind legs (thighs), flanks, belly, back</li> </ul>	Lynx, Wolf (Dog)
		Dog, Wolf, Fox, Bear, Vehicle

## 8. Basic Bibliography

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## Appendix 1

### Useful addresses and telephone numbers

ARCTUROS  
V. OUGO St. 3  
546 25 THESSALONIKI  
TEL. +31 55 46 23  
FAX +31 55 39 32

## Appendix 2

### Exercises:

How would you interpret the wounds described in the tables below?  
(Answers are given on the last page of exercises)

### Exercise 1

Part of body	Wounds	Probable aggressor
Larynx, nape of neck	Many small or deep punctures	
Head	Eyes missing	
Neck - spine		
Back	Many bites	
Thorax	Entrails eaten	
Area of belly	Large intestine and innards eaten	
Belly		
Thighs	Thighs Meat removed cleanly from bone	
shoulders		
Skin		
skin Bleeding or haematoma under skin	On larynx, hind thighs, back	

The aggressor can be identified with near certainty as:

There is insufficient evidence to identify the aggressor.

**Exercise 2**

Part of body	Wounds	Probable aggressor
Larynx, nape of neck		
Head	Broken jaw, bleeding from nose	
Neck - spine	Probably broken	
Back		
Thorax	Torn open, heart/lungs eaten	
Area of belly		
Belly		
Thighs		
shoulders		
Skin		
skinBleeding or haematoma under skin	SkinBleeding or haematoma under skin Massive bleeding at head and nape of neck	

The aggressor can be identified with near certainty as:

There is insufficient evidence to identify the aggressor.

**Exercise 3**

Part of body	Wounds	Probable aggressor
Larynx, nape of neck		
Head	Detached from body	
Neck - spine		
Back		
Thorax		
Area of belly	Open - innards eaten	
Belly		
Thighs	Meat cleanly removed from bone	
shoulders		
Skin	Pierced in many places but without bleeding beneath	
skinBleeding or haematoma under skin	Left flank and left side of head	

The aggressor can be identified with near certainty as:

There is insufficient evidence to identify the aggressor.

**Exercise 4**

Part of body	Wounds	Probable aggressor
Larynx, nape of neck	6 medium-sized bite wounds	
Head		
Neck - spine		
Back		
Thorax	Flanks partly eaten - heart/lungs missing	
Area of belly	One of two stomachs opened and left untouched next to body	
Belly		
Thighs	Meat of muscles completely removed from all thighs	
shoulders	Left shoulder eaten	
Skin		
skinBleeding or haematoma under skin	In larynx area	

The aggressor can be identified with near certainty as:

There is insufficient evidence to identify the aggressor.

**Exercise 5**

Part of body	Wounds	Probable aggressor
Larynx, nape of neck	Bite wounds and parts eaten	
Head	One side eaten, tongue and eyes missing	
Neck - spine		
Back		
Thorax	Wide open, all innards eaten	
Area of belly		
Belly	Skin pierced by maggots	
Thighs	Meat of muscles removed	
shoulders		
Skin	Largely eaten by maggots - black or green in colour, no longer identifiable	
skinBleeding or haematoma under skin		

The aggressor can be identified with near certainty as:

There is insufficient evidence to identify the aggressor.

Exercise 6

Part of body	Wounds	Probable aggressor
Larynx, nape of neck	A few, large punctures	
Head	Torn ear	
Neck - spine		
Back		
Thorax		
Area of belly	Wide open, partially eaten	
Belly	A few bite marks, bleeding under skin	
Thighs	Left thigh eaten, right thigh carries bite marks	
shoulders		
Skin	Some wide scratch marks (at these points the hair is missing)	
skinBleeding or haematoma under skin	Larynx, hind thighs and belly	

The aggressor can be identified with near certainty as:

There is insufficient evidence to identify the aggressor.

Exercise 7

Part of body	Wounds	Probable aggressor
Larynx, nape of neck	A few, large punctures	
Head		
Neck - spine		
Back		
Thorax	Wide open, all innards eaten	
Area of belly	Open - viscera eaten	
Belly		
Thighs	Left thigh removed, the right thigh severely bitten	
shoulders		
Skin		
skinBleeding or haematoma under skin	Larynx, hind thighs	

N.B. Many sleeping positions in the snow

The aggressor can be identified with near certainty as:

22 There is insufficient evidence to identify the aggressor.

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