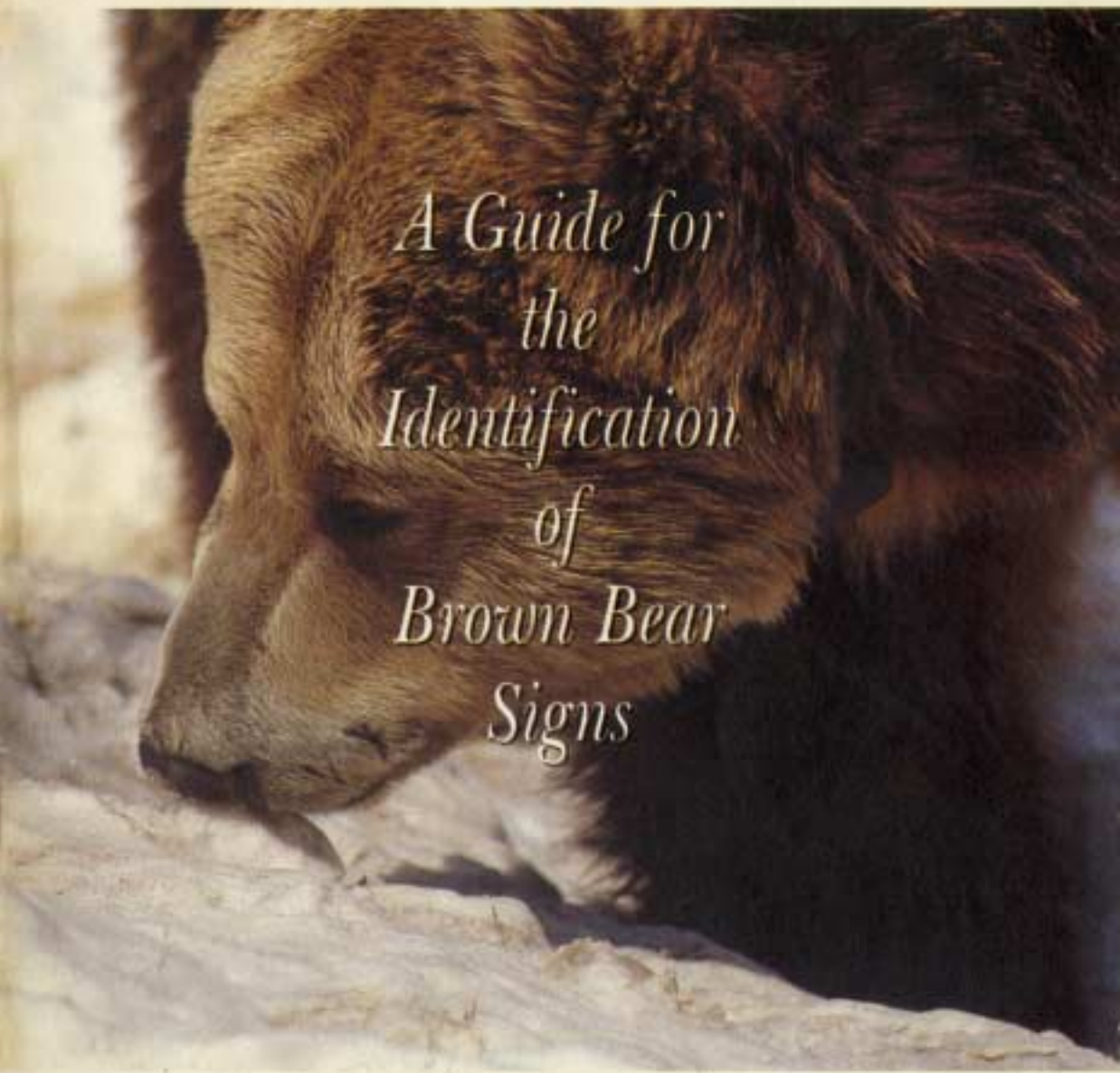


A R C T U R O S



*A Guide for  
the  
Identification  
of  
Brown Bear  
Signs*





*A Guide  
for the  
Identification  
of Brown Bear  
Signs*



*Editor: Constantinos Godes*

*Translation and adaptation of text: Yorgos Mertzanis, Constantinos Godes*

*Layout: Hy Brazil*

*Colour Separations: studio ikona*

*Cover photo: Yorgos Anastasiopoulos*





## INTRODUCTION

*This booklet is not intended to be a scientific study, but rather an easy-to-use field guide for the identification of bear signs in the wild. Our goal is that this guide will not be used exclusively by scientists and other professionals who work with bears. We hope that simple hikers and nature lovers who want to learn more about that extraordinary animal will also find this guide useful. Furthermore, we believe that this guide will provide invaluable help to the Forestry Service personnel, who work in the bear habitat.*

*The bear, after being hunted down by man for centuries and having lost more than half of its past distribution in Europe, is a shy animal and avoids people by being active mostly at dusk, dawn and during the night. Since the chances of meeting a bear in the wild are small, in order to study it we have to resort, (in the absence of a better method) to the recording and "decoding" of the signs it leaves behind in its habitat.*

*Like humans, bears are creatures of habit. If left undisturbed, it will follow specific routines in its daily activities. It will use the same convenient stream bank and forest road for its movement, the same footpath to go to its den and the same abandoned orchard to find fruits. That gives us the opportunity to study the bear indirectly, without actually having to see it. The signs left by a bear in an area can be tracks (footprints), droppings (excrement), claw marks on tree trunks, hairs caught on a fence, broken branches from fruit trees, destroyed beehives, turned over rocks as it searches for insects, half-eaten carcasses, etc.*

*Since, in order to protect the bear efficiently, we need to know as much as possible about the animal and its habits, the aim of this guide is the increase of not only the amount<sup>1</sup> of our knowledge, but the quality<sup>2</sup> as well. As it often happens, our passion, enthusiasm and inexperience as we search for bear signs can lead us to wrong conclusions. Thus, tracks and signs of other mammals can be attributed to the bear. Without believing that such mistakes will disappear with the use of this guide, we do hope that in combination with common sense and the progressive gain of experience in sign identification, it will help in the diminution of the phenomenon and the positive and reliable identification of the signs of bear presence. A series of reliable information sources comprising scientists, forestry service staff, game wardens, hunters, mountaineers and hikers will be the cornerstone for the improvement of our knowledge -and ultimately the conservation- of the bear.*

*Finally, as it happens with all publications of this kind, this guide has ample room for improvement. With that in mind, any comments and criticism will be welcome.*

*Thessaloniki, June 1998*

---

<sup>1</sup> recording of more signs

<sup>2</sup> correct identification of signs





## FOREWORD

*In Greece, during the 17th century, the distribution of the brown bear extended south all the way to the Peloponessus. Today, the remaining 150 bears form two distinct, non-communicating populations, one on the Northern Pindus range, the Peristeri range and Mt. Varnous, the other on the Rodhopi range. The western (Pindus) bear population communicates with the populations of Albania and the Former Yugoslav Republic of Macedonia (FYROM), while the eastern (Rodhopi) population communicates with the one in Bulgaria. Despite the recent socio-political developments in the area, the Balkan bear population, although under pressure, remains one of the healthier and most numerous in Southern Europe. In Albania there are an estimated 250 bears, in Bulgaria 700, in FYROM 165 and in Yugoslavia (Serbia and Montenegro) approximately 400 bears. With all that in mind, we decided to direct our conservation efforts on a wider range of distribution in the Balkan Peninsula and not to confine our efforts to Greece.*

*Since 1995, through a series of conservation programs with a Balkan dimension, Arcturos is implementing various actions and cooperating with similar organizations in the fields of scientific research, education, awareness raising and dissemination of information. The present publication was produced within the framework of the Balkan Net project, which was financed by the General Directorate 11 (DG XI) of the European Committee. The aim of the project was the enlargement of the network for the awareness raising and information dissemination to the wide public and the local and state authorities on matters of bear protection and habitat conservation. The countries comprising the Network are Albania, Bulgaria, FYROM, Yugoslavia and Greece.*

*We hope that this guide, as well as the other printed material produced within the Balkan Net project, will help us understand better and protect more efficiently that beautiful and misunderstood animal, the bear.*





## 1. Foot tracks

Tracks are the most obvious sign of the presence and movement of a bear in an area. Because of their characteristic shape and size, they are not very likely to be confused with tracks of other animals, except under certain circumstances.

The width of the tracks ranges from 9 - 10 cm for immature and adolescent animals, while it can reach up to 14cm for a large male (measurements taken in Greece). Usually all five toes are visible on the track, in the shape of an open arc.

In contrast to other mammals, the bear walks on the flat of its feet (plantigrade), especially the hind. For that reason, the tracks of the

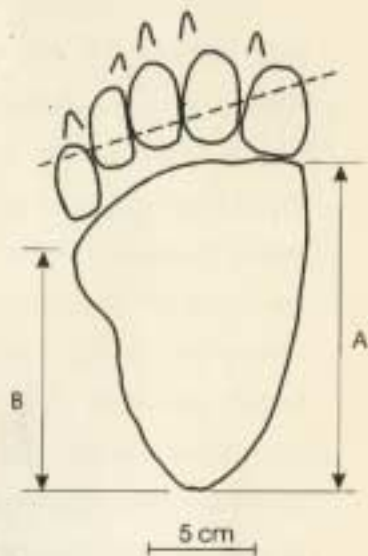


Fig. 1 ▶ Track of the right hind foot of a bear. Notice that an imaginary straight line passes through the toes, while the outside of the track is longer than the inside, which forms a slight arch.



Fig. 2 ▶ The tracks of the bear and the badger may have similar shape, but those of the bear are much larger. Three distinct interdigital pads may be visible in the badger track.

hind feet are longer than those of the front.

It is possible for someone to confuse the tracks of a bear cub with those of an adult badger, especially in the springtime when the newly born cubs start moving in the forest with their mother.

Although the bear and badger tracks are somewhat similar, they differ mainly in size. The bear cub tracks are usually larger, while the badger tracks can also be distinguished by the marks of the three distinct interdigital pads.

The tracks of the bear are imprinted most clearly on mud or snow. On the snow their shape changes rapidly as the snow melts. Their characteristic shape and outline becomes almost round, while human tracks under the same conditions take an elliptic shape. The characteristic that disappears last as the snow melts and can help us in the positive identification, are the five claw marks of the bear paw.

During the last stage of the distortion of a bear track on snow due to melting, even the most experienced tracker can be deceived, as the track resembles a round hole.

It is also more possible to



Fig. 4 ▶ The human tracks, when they deteriorate tend to have an oblong-oval shape, while those of a bear are more round at the same stage of deterioration

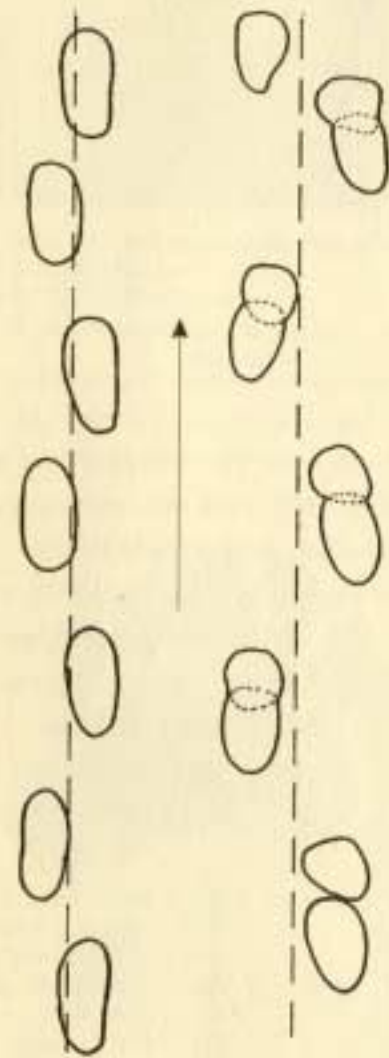


Fig. 3 ▶ In the snow, the claw marks can provide invaluable help in the identification of the track, as they are the last to disappear, as the snow melts.



misidentify a track when only a small number of them is visible (occasionally only one). The identification is a lot easier when we can see the tracks over a long distance (trail).

In cases where the tracks lose rapidly their basic characteristics because of the nature of the medium (melting snow, thick mud), we have to depend on other characteristics, such as the length to width ratio, or the position of the tracks in



relation to the trail's imaginary axis.

As a general rule, it is a lot easier to make a mistake in identification when there is only one unclear track available.

Contrary to that, when a large number of tracks is available (a trail), the identification of the animal is a lot easier. Under difficult weather conditions (usually during an early spring or an especially rainy autumn), the tracks can deteriorate very quickly. Even in those situations, the ratio between the length and the width of the track can facilitate the identification.

When we cannot identify human from bear tracks due to deterioration, we must use the trail marks. In the case of a bear, the tracks lie on either side of an imaginary line running through the trail; the human tracks are **on** the imaginary line.

Mud, which is often encountered on forest roads used by bears as crossing points, is an ideal medium for tracks and trails. Unlike

Fig. 5 ▶ On a trail set, bear tracks are on either side of an imaginary line, while human tracks are **on** the same line

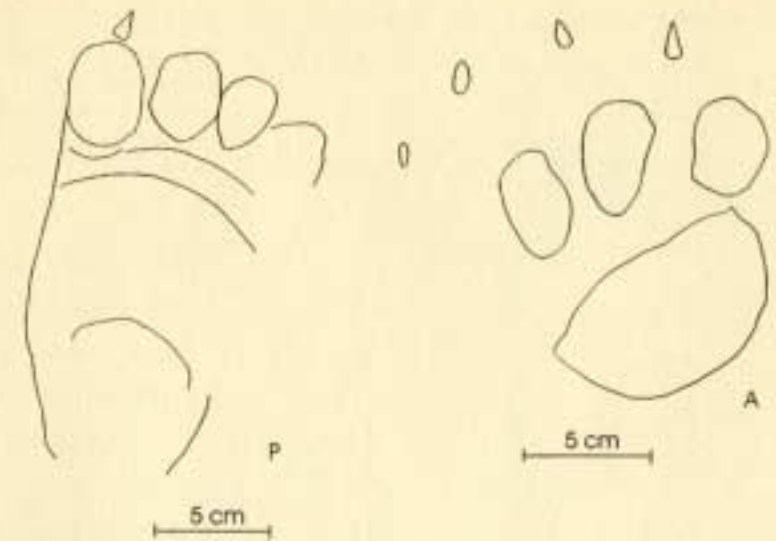


Fig. 6 ▶ Notice that on an incompletely imprinted track, the clearest part are the toes and nails. Such tracks are often found on hard and compact substrates.

snow, however, the tracks in mud may not be imprinted completely. In such a case, the claw marks may appear as small triangular points, or not at all. In other cases, the animal may slip in the mud and produce deformed tracks.

Another possible source of confusion is the case of "registered" tracks in which, two tracks of another species (e.g. dog) overlapping may appear as a front track of a bear cub. Extra care must be taken in those cases where identification is not so obvious. Bear tracks are the most important sign allowing us to estimate the population size in an area. This is achieved by taking the measurements of the size of a track, which are usually standard for a given age class of the species.

The measurements taken on a track are usually standard (see Fig.9-10)

These measurements should be taken:

- on well - defined, clear tracks
- on uniform medium (i.e. all mud)
- repeatedly: measurements should be taken on many different tracks from the same trail set (same animal)



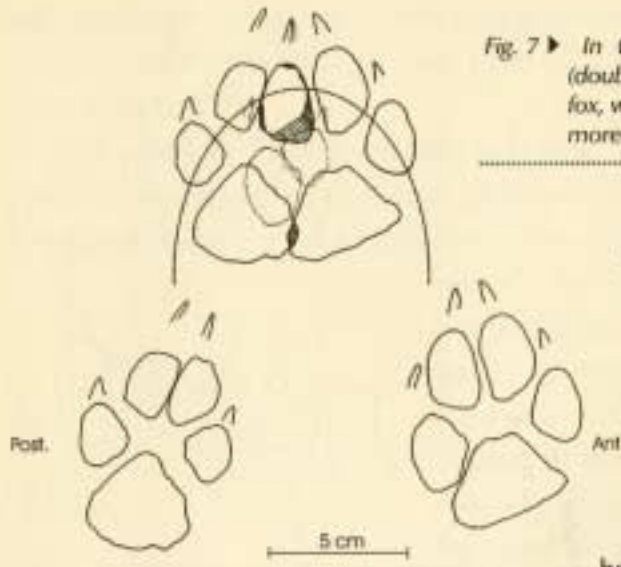


Fig. 7 ▶ In the case of a "registered" track (double imprint) from a canid (dog, fox, wolf), the arc formed by the toes is more acute than that of a bear.

In some cases, it is easy to distinguish two trails from two different animals left at the same time. This distinction is even easier when we are dealing with a female bear with one or more cubs.

The recording of such cases is the standard method used for the population estimation of an area.

Other instances in which we are likely to encounter tracks of more than one animals at the same time, are

- when there are two same-age adolescent bears separated from their mother
- when the mother has not parted yet with her immature offspring (occasionally the mother keeps an adolescent from a previous birth together with the new-born cubs).



Fig. 8 ▶ In the case of bear tracks, the arc formed by the toes is a lot wider than that of the canids.

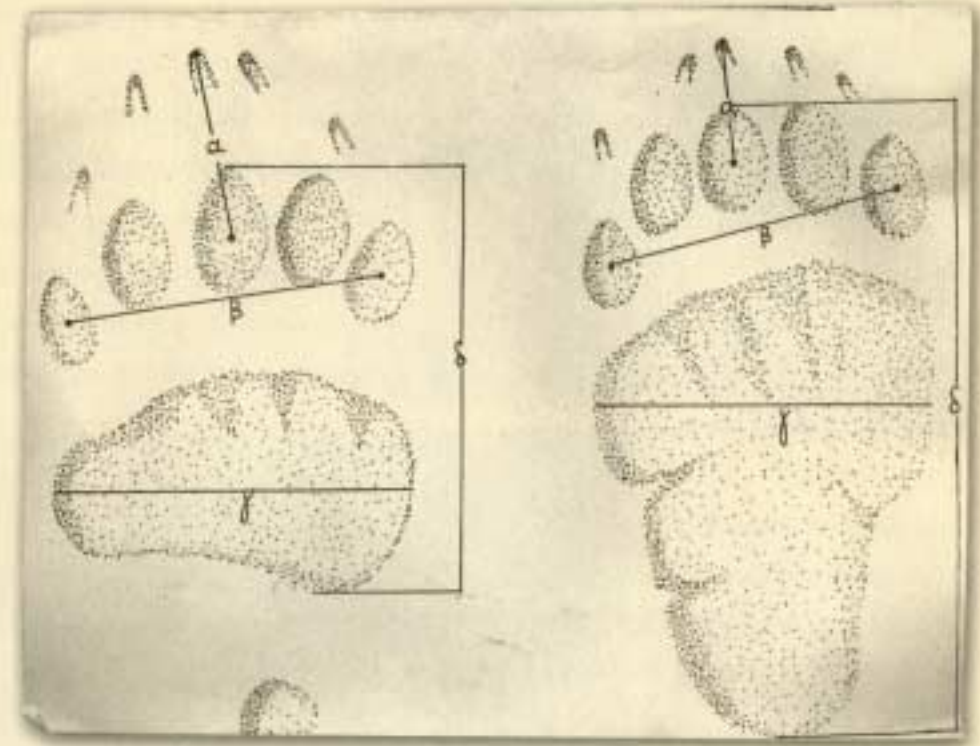


Fig. 9, 10 ▶ Characteristic measurements on a bear track





## 2. Excrements

The excrements (droppings) of the bear are the most reliable and objective indication for the presence and the geographic distribution of the bear in an area. In contrast to other signs that require certain conditions in order to be noticeable (tracks-suitable substrate, hair-conifers and resin), droppings can be found anywhere within the territory of a bear, since bears do not choose specific places to leave them. The places where droppings can be found are random and scattered,

depending only on the movements, the crossings and the food sources of the bear.

The frequency of the droppings depends directly on the season and nutritional needs (or feeding activities) of the animal. The frequency increases

towards autumn, period during which the bear

reaches a peak of feeding activity. In the spring and early summer the frequency of the droppings decreases, as the animal is still at its weight recovering phase following the winter sleep.

Bear droppings are easily distinguished from those of other species, mainly due to their size (large), the shape, texture and smell, which is by no means unpleasant (unless the bear has consumed meat or ants). In the case where meat from an



Fig. 11a ▶ Droppings with visible remains of ants.

animal killed by the bear, or a carcass, has been consumed, the excrements are mostly shapeless, with an unpleasant odour and are usually found near the carcass.

The color, shape and texture of the droppings are very varied and depend

on the type of food that has been consumed. As an omnivore, the bear consumes a great variety of foods, mostly plants (up to 85%). As the digestive system of the bear



Fig. 11b ▶ Droppings with visible remains of wild apples.

is (in function) between that of an omnivore and a carnivore, most plant foods are being excreted partly digested, making the identification of the food source easy.

In some cases the droppings of the bear can be confused with that of the wild boar, especially when they contain oak nuts, a food source common to both species in the autumn and occasionally in the spring.



Fig. 11c ▶ Droppings with visible remains of grasses and apples.



### 3. Tree marking and hair remains



Fig. 12 ▶ On tree trunks, only four claw marks are usually visible

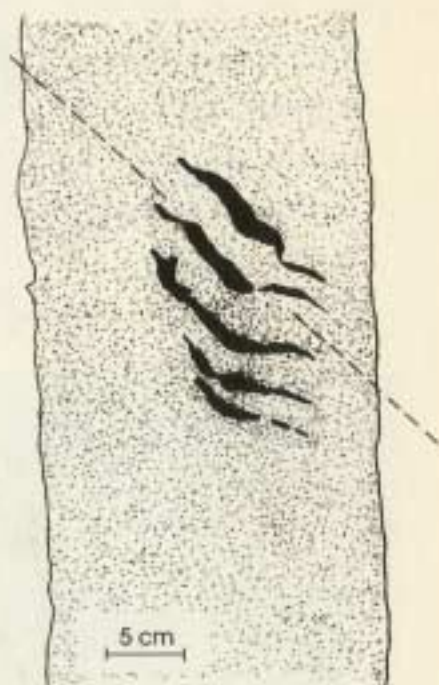


Fig. 13 ▶ The direction of the claw marks on the trunk are more often at an angle, or vertical to the ground. They are seldomly horizontal.

Although a lot less conspicuous, these bear presence indicators have specific aspects that make them easily identifiable. They are usually found in places that the bear uses regularly or occasionally, such as paths, old forest roads, disused logging paths and certain conifer trees which the bear marks systematically.

Tree marking (usually conifers) is a normal part of bear behaviour in the forest and has to do with three basic needs:

- A** Delimitation, or marking of its vital space. The bear is not a strictly territorial animal. It will often accept the presence of other members of its species within her territory. The tooth and claw marks left on the trunks of coniferous trees act as a communication code between bears moving in or utilizing the same area. The height at which the marks are left indicate the size of the animal. In most cases, only the marks of the four claws are clearly visible. Often, round holes from the canine teeth of the bear can be seen on the same tree.
- B** Nutritional needs. Especially during spring, the bear has a need for glucose which can be obtained by marking and debarking the trees and lapping up the juices.
- C** Relief from latent aggression and the riddance of skin parasites with the aid of the resin.



Fig. 14 ▶ A special case of tree marking is the debarking and consumption of the trunk of seedlings (mostly deciduous). This is more often observed in the spring time and indicates a cleansing activity of the animal's digestive system.



During all of the above actions, the bear leaves (unintentionally) hair remains either stuck to the resin, or caught on the bark of the tree. Those remains can easily be seen and registered by using a simple technique (see Fig. 18). The amount of hair left is larger in June, time at which the bear is shedding (changing coat).

Something that we must be aware of is that wild boars can also mark the same trees with their tusks. However, their marks are low on the trunk, while those of bears can be well higher than 1.5 meters. The hair of the two species differ significantly in shape and texture, as well.



Fig. 16 ▶ The hairs of the bear have a characteristic wavy shape which differentiates them from those of other species. They are often bi-colored from root to tip.

Those of the boar are thicker, more rigid and have split ends, while the bear has thinner, softer and often two-tone color hair.

The careful and systematic collection of bear hair is extremely useful. Recently we have managed, by using special analysis techniques, to obtain



Fig. 15 ▶ Debarked tree trunk, in order for the bear to suck on the treesap.

from hair samples invaluable information, such as the gender and age of the animal, as well as its genetic proximity (kinship) to other bears in the area. Those data, in combination with the track measurements, can help researchers to estimate the size of a population in an area.



Fig. 17 ▶ Bear hair caught on fence-wire.

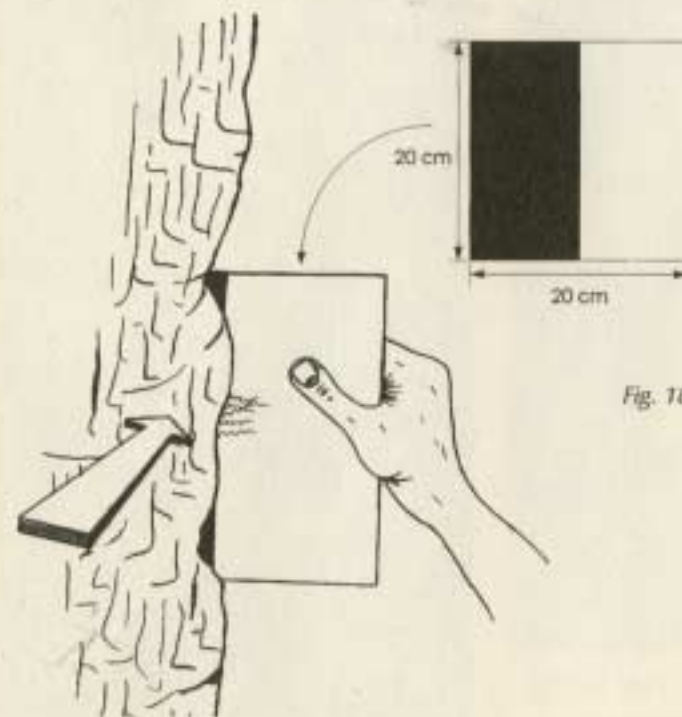


Fig. 18 ▶ An example of using a lightly colored surface in order to see more clearly the outline of the tree trunk and the lodged hair. Alternatively, we can use a bi-colored surface (black and white), in order to achieve the desired visual contrast.



#### 4. Signs of feeding activities

During their daily search for food, bears leave behind a number of characteristic signs, depending on the food source. The most commonly found signs are:

- overturned rocks, often very large in size, while searching for insects (usually ants). Possible confusion with similar signs left by wild boar can be avoided if we keep in mind that the boar simply displaces the rocks, as it moves while the bear completely overturns them. For that, it is aided by the anatomy of its paw.
- dug up ant hills, looking for the highly nutritious larvae and pupae.
- holes on the ground, as it digs for tubers and plant roots. The holes differ from those caused by wild boars, as they are of a smaller extent and the dug out soil is left intact next to the hole.
- damaged or destroyed beehives, with tooth and claw marks evident. Excrements containing bees-wax.
- attacks on livestock. Characteristic, extensive wounds caused by the claws. The prey often has its neck broken by the blow.
- covered up, semi-consumed animal carcasses that may or may not have been killed by the bear. The carcass is dragged to a safe place and covered with soil and branches in order to be consumed later.



Fig. 19 ▶ Overturned rocks by a bear searching for insects. Wild boars merely displace the rocks as they move, without turning them over.



Fig. 20 ▶ Cow attacked by bear.



Fig. 21 ▶ Destroyed beehives by bear.



Fig. 22 ▶ Cherry trees after being "visited" by a bear.



PHOTO CREDITS

*Y. Mertzanis: Fig. 11a,b,c, Fig. 14, Fig. 15, Fig. 19, Fig. 21*

*G. Anastasopoulos: Page 1, Page 2, Page 4,*

*G. Karetsos: Fig. 3, Fig. 22*

*V. Koufis: Fig. 17*

*Th. Vassos - E.L.G.A.: Fig. 20*

*T. Adamakopoulos: header photo*



ACKNOWLEDGMENTS

*This publication was based on the bear track guide of WWF-Italia. Also, Carlo Frapparti's photographs were used where our own were unsuitable.*



