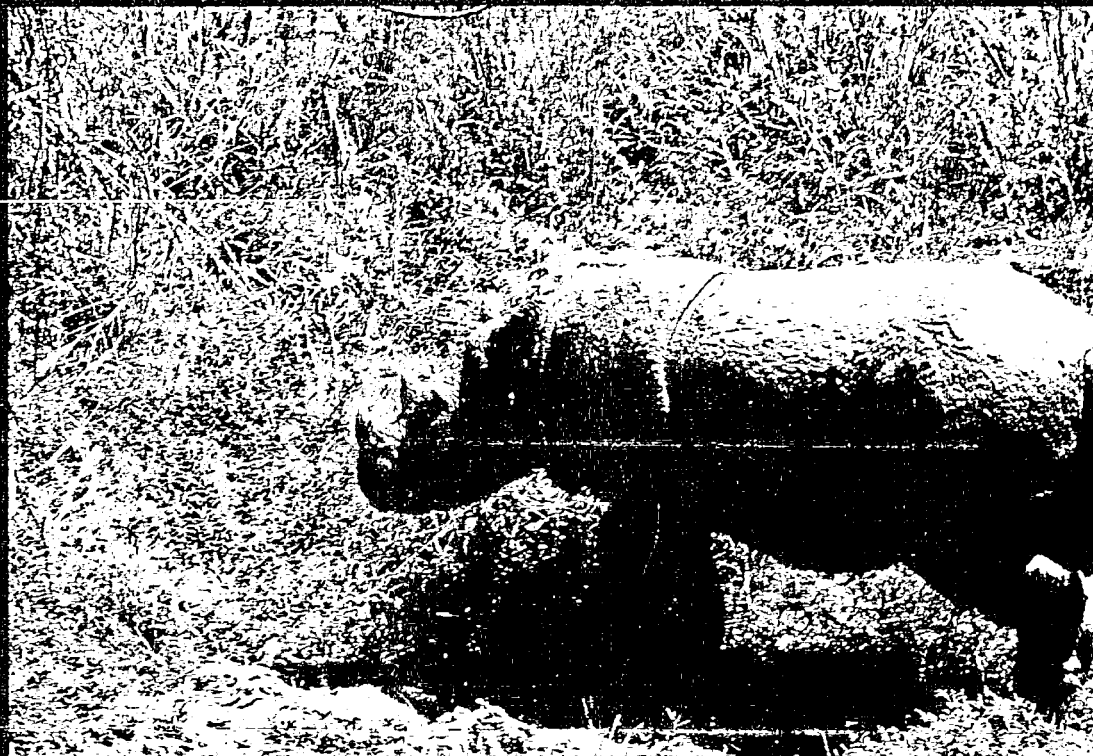


# INDIRECT OBSERVATIONS OF THE SUMATRAN RHINOCEROS IN THE WILD

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**ABOVE and LEFT:**  
A male Sumatran rhinoceros in  
the natural enclosure at the  
Sumatran Rhinoceros  
Conservation Centre (SRCC) at  
Sungai Dusun Wildlife Reserve.

**SUMATRAN**  
*Dicerorhinus sumatrensis* (family Rhinocerotidae, order Perissodactyla)  
**RHINOCEROS**

is one of three species of rhinoceros living in Asia: the other two are the Javan or smaller one-horned rhinoceros *Rhinoceros sondaicus*, and the Indian or greater one-horned rhinoceros *Rhinoceros unicornis*. The Sumatran rhinoceros is characterized by two horns on its nose, and it is the hairiest and smallest of the three species.

The Sumatran rhinoceros is an extremely shy mammal that resides in the dense forests of South-East Asia. It is the most endangered of all rhinoceros species. Its numbers have decreased by 50% over the past decade, due to poaching for its horn. Now, fewer than 400 individuals survive in small fragmented populations, mainly in Malaysia and Indonesia.

Direct sightings are very rare. Over the past ten years, the Rhino Patrol Units of the Department of Wildlife and National Parks (DWNP) have had direct sightings of wild rhinos on only three occasions. Thus, the presence of the animal is usually inferred by indirect observation, using distinct signs left by the rhinoceros. These signs are divided into four categories: marking, feeding, trails and wallows.

At the Sumatran Rhinoceros Conservation Centre, Sungai Dusun Wildlife Reserve, Selangor, we have observed and recorded these signs in our ten-acre natural enclosure.

### Marking

A Sumatran rhinoceros is a solitary and territorial animal. Its home range is about 10km square, and it lets other rhinoceros know where its territory is by leaving marks.

The twisting of saplings, and sometimes the fronds of palms, is a habit unique to the Sumatran rhinoceros. The rhino twists the sapling by placing it between its two horns and twisting it clockwise. Saplings about 7cm in circumference are usually twisted thus, at a height of about 73cm. The animal does not eat the twisted sapling.

The debarking of trees is another marking method, with the rhinoceros starting at the bottom of the tree trunk and scraping upwards with its horn to expose the tree's inner bark. Debarking can reach a height of 196cm but averages 126cm.

Sumatran rhinoceros use their hind legs to scrape the ground. After locating a tree or bush, the animal backs towards it and starts rhythmic scraping with subsequent urine spraying or defecation or both. This is normally followed by a few more scrapings before the animal moves away. The scraped ground usually measures about 50 x 20cm.

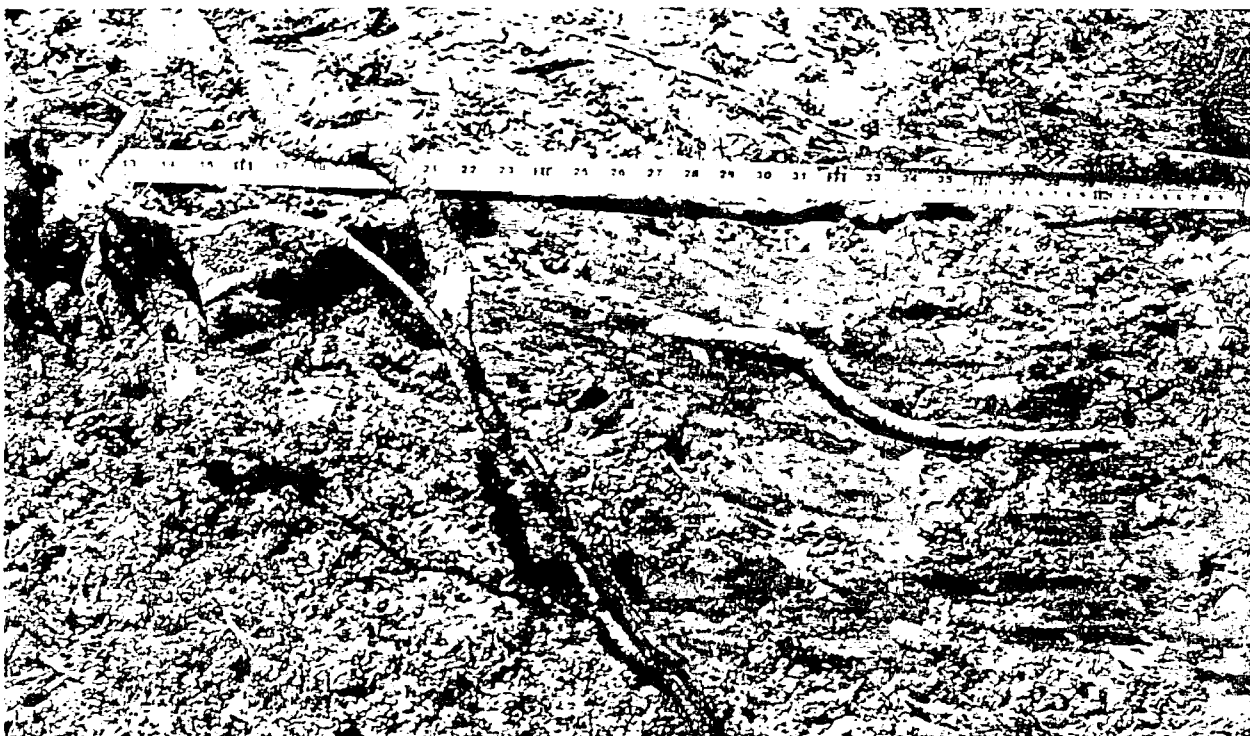
The rhinoceros will spray its urine onto a tree, bush or shrub to mark its territory. The urine can be sprayed 4m and the spray will reach a height of 1.5m. There is no difference between the height and distance of the urine spray by male and female



### BELOW:

The twisting of saplings is a habit unique to the Sumatran rhinoceros.





rhinoceros.

Drops of urine can usually be found on leaves and low-lying bushes. They are a clear yellow colour and turn pinkish to brown after a while because of oxidation. The urine has a strong pungent smell and thus makes a good indicator of the presence of rhinoceros.

The Sumatran rhinoceros also leaves faeces, which are in a shape of a bolus and weigh 100-200gm each. The rhinoceros usually defecates 6 to 15 bolus at one time. The colour is greenish to yellowish brown and turns into dark brown after a few days. Defecation is usually done in a

**FROM TOP:**

Scrape marks are another sign of the presence of Sumatran rhinoceros.

Wallowing is an important daily activity for a Sumatran rhinoceros, which digs its wallow using nails, horns, body, head and rear end.

specific 'toilet' or 'dung-pile', but is also performed at the scraped ground where the rhinoceros generally scrapes the faeces into shreds. The size of a bolus from a rhinoceros and a tapir is almost the same. Therefore, a sample (10-20gm) of the faeces is needed for analysis to determine whether it is from a tapir or rhinoceros. If the faeces contain fibres 2.23-2.68cm long, then they are probably from rhinoceros, while fibre lengths of 1.54-1.80cm indicate the tapir.

**Feeding**

The Sumatran rhinoceros is a generalist herbivore and a browser. In the forest, the rhinoceros usually chooses saplings with young shoots at a height of about half a metre from the ground. It also eats fruits that have fallen to the ground.

These animals consume over 200 species of plants. The majority of their diet consists of *Prunus* spp, *Ficus* spp., *Medusanthera* spp. and

*Eugenia* spp. *Macang* (*Mangifera foetida*) and *lanjut* (*Mangifera langifera*) are their favourite fruits. There are two signs associated with feeding: browsing and damage to trees.

The rhinoceros prefers to browse on plants that are 3–7cm in diameter, and it leaves behind saplings with jagged edges. The animal reaches high shoots by bending the tree. The rhino bends the tree with its chin and neck or by walking over it, using its abdomen to press the tree down.

Trees that have been bent while the animal feeds may remain bent after the animal walks off, or they could snap or get uprooted. However, some trees do not die from this damage and instead produce new shoots, thus increasing the food supply for the rhino.

### Trails and Tracks

The home range of a rhinoceros in the forest contains several trails, which it uses daily. There are three types: a main trail, feeding trails and wallow trails. The main trail – usually a wide, clear path – is used very often by the animal to commute from one place to another, and one can often see rhino tracks here. Feeding trails normally branch off the main trail and are used less often and changed more frequently, depending on the availability of food. The wallow trail or trails is used a few times a day.

The rhinoceros has a flat sole with three toes or nails. The forefoot carries most of the weight and is slightly larger than the hindfoot, and the hindfoot overlaps the imprint of the forefoot almost completely. It is easy to confuse the tracks of a Sumatran rhinoceros with those of a tapir, especially as, although the tapir has four toes, it usually leaves a three-toe imprint on the ground just like that of the rhinoceros.

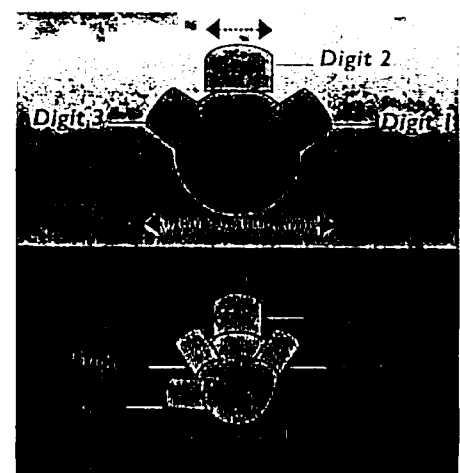


The Sumatran rhinoceros uses its horns to debark trees as a means of marking its territory.

Rhinoceros Track	Tapir Track
3 toes for both forefeet and hindfeet	4 toes for the forefeet, 3 toes for hindfeet
bigger and rounder	longer and smaller
20-25 cm (D1-D3), 7.5-9 cm (D2)	14-17 cm (D1-D3), 5-6.5 cm (D2)*

\*A tapir's track usually has a three-toe imprint, just like that of the rhinoceros. Measurements have to be taken to verify whether the track belongs to a tapir or rhinoceros.

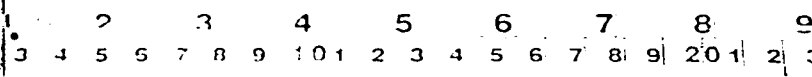
Diagrams comparing tracks of a Sumatran rhinoceros (top diagram) and a Malayan tapir (bottom diagram)



### Wallows

Wallows are mud pools formed in poorly drained areas, where the soil remains wet for long periods. Wallows often exist individually or in a network of up to ten pits. Wallowing is an important daily activity for a Sumatran rhinoceros, since by covering itself with a layer of mud it protects itself from biting insects and keeps its skin moist and cool.

When a rhinoceros is marking its territory, it looks for an area to dig a wallow. It does so by using its nails, horn, body, head and rear



The footprint of a Sumatran rhinoceros.

located in the Gunung Leuser National Park (GLNP) in Aceh, Indonesia. The park is situated in the northern part of Sumatra, Indonesia, and is the largest of the Djarum, West of Wildlife and National Parks (DWWNP). The reserve area is 10,400 acres, and it is bordered by two rivers, Sungai Djarum in the South and Sungai Barisan in the North.

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# The SUMATRAN RHINOCEROS CONSERVATION CENTRE

**BELOW and RIGHT:** The Sumatran rhinoceros is a generalist herbivore that often eats saplings with young shoots.



end, the whole process taking about two hours. A good wallow is filled with thick creamy mud and has barriers like a log or an uprooted tree at the edge for protection. An active wallow has thick mud and a strong mud smell, with signs of mud being rubbed off on nearby trees and shrubs. An inactive wallow will have clear water in it and mud that is no longer thick. Branches, leaves and faeces can be found floating in an inactive wallow. The wallow takes the shape of the rhinoceros and it grows wider after some time. The average length and width of a wallow are 2.57m and 1.94m, respectively, with an estimated area ranging from 2.5 to

The centre is headed by an experienced senior wildlife veterinarian, Dr. Zainal Zahari Zainuddin, assisted by veterinarian Dr. Aidi Mohamad and seven rangers. Two male and five female Sumatran rhinoceros are managed at the centre. Three of these animals were originally from this reserve. It is interesting to note that the SRCC possesses the world's largest single population of captive Sumatran rhinoceros. The rest of the captive Sumatran rhinoceros are found in the Melaka Zoo, DWNP (one female); Tabin Wildlife Reserve, Wildlife Department, Sabah (one female); Sepilok Rhino Centre, Wildlife Department, Sabah (one male, one female); Sumatran Rhino Sanctuary, Sumatra, Indonesia (one male, two females); and Cincinnati Zoo, USA (one male, two females).



studying the reproduction, behaviour and habitat-utilization of the Sumatran rhinoceros. The public, especially schoolchildren, are taught about the importance of nature with the Sumatran rhinoceros as the flagship species.

Efforts to conserve the Sumatran rhinoceros do not stop at the centre. Rhino Patrol Units (RPU) visit core Sumatran rhinoceros areas to check for encroachment and to update figures on the rhinoceros population. This programme was mooted by DWNP and intensive patrolling started in 1995, with funding and support from the United Nations Development Programme (UNDP). The RPUs also work on an *ad hoc* basis, to investigate any reports of rhinoceros outside their usual habitats, mostly in plantations and timber camps.

At Sungai Dusun Wildlife Reserve, the seven animals are kept in various natural enclosures. Besides the enclosures, an interpretive centre and a camp site are being built. The facility is expected to function as a Sumatran rhinoceros research and nature education centre by the middle of this year.

The main objective of this centre is to breed the endangered Sumatran rhinoceros. The animals are released into their natural habitat, which in this case means the enclosures, to breed. This concept also satisfies another of the centre's objectives, which is to return the animals to the wild, but under close security to protect them from poachers.

The SRCC's other objectives are to be a centre for research and to educate the public on nature conservation. The SRCC team and local researchers are currently

The DWNP realized that one sure way of preventing poaching of this animal was by educating the Orang Asli, who otherwise would act as guides to poachers. The Orang Asli are taught about endangered species and also about sustainable forest use in village outreach programmes, such as the one currently conducted with funding from UNDP.

Sumatran rhinoceros conservation efforts worldwide concentrate on the captive breeding of this animal. The SRCC is in liaison with the other centres to share information and research. So far, none of these centres has been successful in breeding the Sumatran rhinoceros in captivity. However, this dedicated team of wildlife experts, researchers and scientists are still trying and will not stop till their quest is fulfilled.

**RIGHT:**

The mud on this tree is dry, which indicates that it is an old sign. Besides the rhinoceros, other animals that leave mud on tree trunks are the wild boar, sambar deer and elephant.



14.8m square. Each wallow will be active for 2 to 12 weeks.

The Sumatran rhinoceros rubs the mud off its body as it walks through the forest after wallowing. Mud on trees that is still wet and shiny indicates it is a new sign, probably one day old or slightly more. Mud that is damp or dry and in layers indicates an earlier sign, up to a month old. Spatterings of mud can also be found on the leaves and on the ground. The average height of the rubbing mark for a Sumatran rhinoceros is 96cm (88-106cm). Other species, including the wild boar, sambar deer and elephant, also leave mud scrapings.

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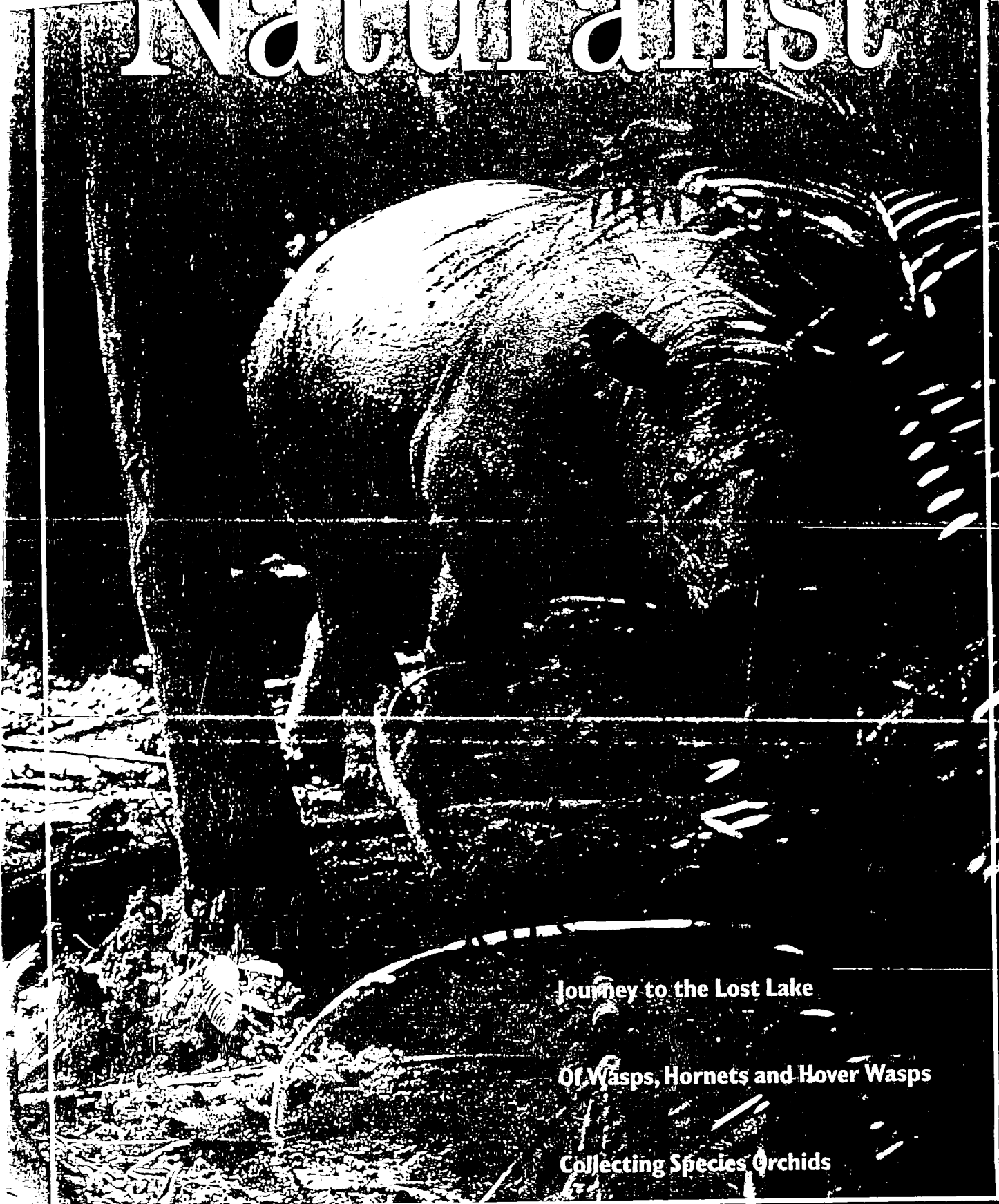
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