

# MAPPING GEOMORPHOLOGY AND TRAILS AROUND THE BIOLOGICAL STATION AT THE RESERVA BIOLÓGICA ALBERTO BRENES (SIERRA DE TILARAN), COSTA RICA

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## The Area

In the last years several research projects were started to elucidate structure, dynamics and diversity of the primary premontane forest at the Reserva Biológica Alberto Brenes (RBAB). The Biological Station steadily was improved and is more and more a very useful base for research in tropical ecology (Ortiz 1991).

The geomorphology of the area is characterized by rather steep slopes with the higher erosion rates and by several ravines and small rivers. The ridges sometimes are extremely sharp and their slopes extremely steep. So far, the available maps (edit. by Instituto Geografico de San José: e.g. Hoja 3642-I: San Lorenzo, 1:50.000) are inadequate for mapping details and for using them as tools for vegetation mapping, documentation of test sites (Sprengrer *et al.* 1995) and other research activities, where large-scale maps are necessary.

## Mapping

In spring 1995 all accessible trails and some of the slopes in the vicinity of the Biological Station were mapped according to exposition, exact position of trails on slopes and detailed situation of the Rio Lorencito valley with its tributaries and river geomorphology. The area covered is mainly the whole Rio Lorencito area, including the Fila de Volcan Muerto ridge, representing the Eastern and South-Eastern parts of the RBAB. Mapping was done with 1:5.000 sketches, and critical comparisons were made with enlarged aerial

photographs (provided by J. Bittner). Repeated checks of the altitudes of known controls were used for checking altitudinal relations with a highest quality THOMMEN-altimeter. Some amendments southwest of the Lorencito Valley including the steep slopes of the Quebrada Chispa.

The rough map-sketches from the field data map were scanned and drawn by use of the OCAD5-programme for mapping and editing orienteering maps (licensed software by Hans Steinegger/Switzerland). All forest-covered areas are kept white, open forest-gaps are in yellow, rivers in blue, trails and paths in black. The eastern border of the Reserva is indicated in pink.

All details which were verified and which could be checked in detail are printed in full colour. All details, which were only visible from the distance and could not be checked thoroughly are printed in half-tone (Fig. 4).

This map is described and partly presented here.

## The Map

It is available in all necessary scales (1:5.000 => 16 DINA4-sheets; 1:10.000 => 4 DINA4-sheets); and a special part of that map with the closer surroundings of the station on one DINA4-sheet (1:10.000, Fig. 1) without detailed legend; additionally a black-and-white DINA4-printout (1:20.000) of the whole area mapped is available, too (Fig. 2).

Since the map is easily accessible by PC and diskette, it is easy to amend details, or to enlarge parts

of it for special purposes. An example is given in Fig. 3, where the close vicinity of the Biological Station is shown (scale 1:2.000).

### Applications of the Map

This maps provides visitors and researchers now with an additional good tool for their safety, and it is strongly recommended, that every visitor or research project member working at the Station never should leave the station without a map, without compass, torch and whistle.

This map provides researchers with the basic knowledge of the topography of the area, it enables to delimitate research plots (Schrers *et al.* 1995, Wattenberg *et al.* 1995) and to control important geomorphological dynamics. It also provides a basic tool for mapping distributional relations of forest-types, animal-species occurrence, location of single tree stands, planning a hiking trail for demonstration of the main dominant tree species and vegetation types, which could be a good means to minimize damages by visitors within the primary forest areas etc.

Since in future several research groups with very different research topics may be active at the Station it will be increasingly important to have an exact map for minimizing the destructive influences of collecting, measuring, sampling etc. on the one side and on the other side to have an exact map for the documentation of all activities in the area.

### Cooperation in Future

It would be very helpful, if amendments and improvements or corrections could be indicated to Prof. Rodolfo Ortiz and to the authors to keep the map updated. It is intended to complete the detailed mapping in the whole area of the Rio Lorencito-valley and to map other parts of the RBAB in the future. The comparison with former and newer aerial photographs will reveal on overview of the area and give an idea on the temporal changes. For future conservation it will be very important to check the relevant conditions of all parts of the area. This can easily be documented by adjusting this economic software programe which is bases for these maps.

## ACKNOWLEDGEMENT

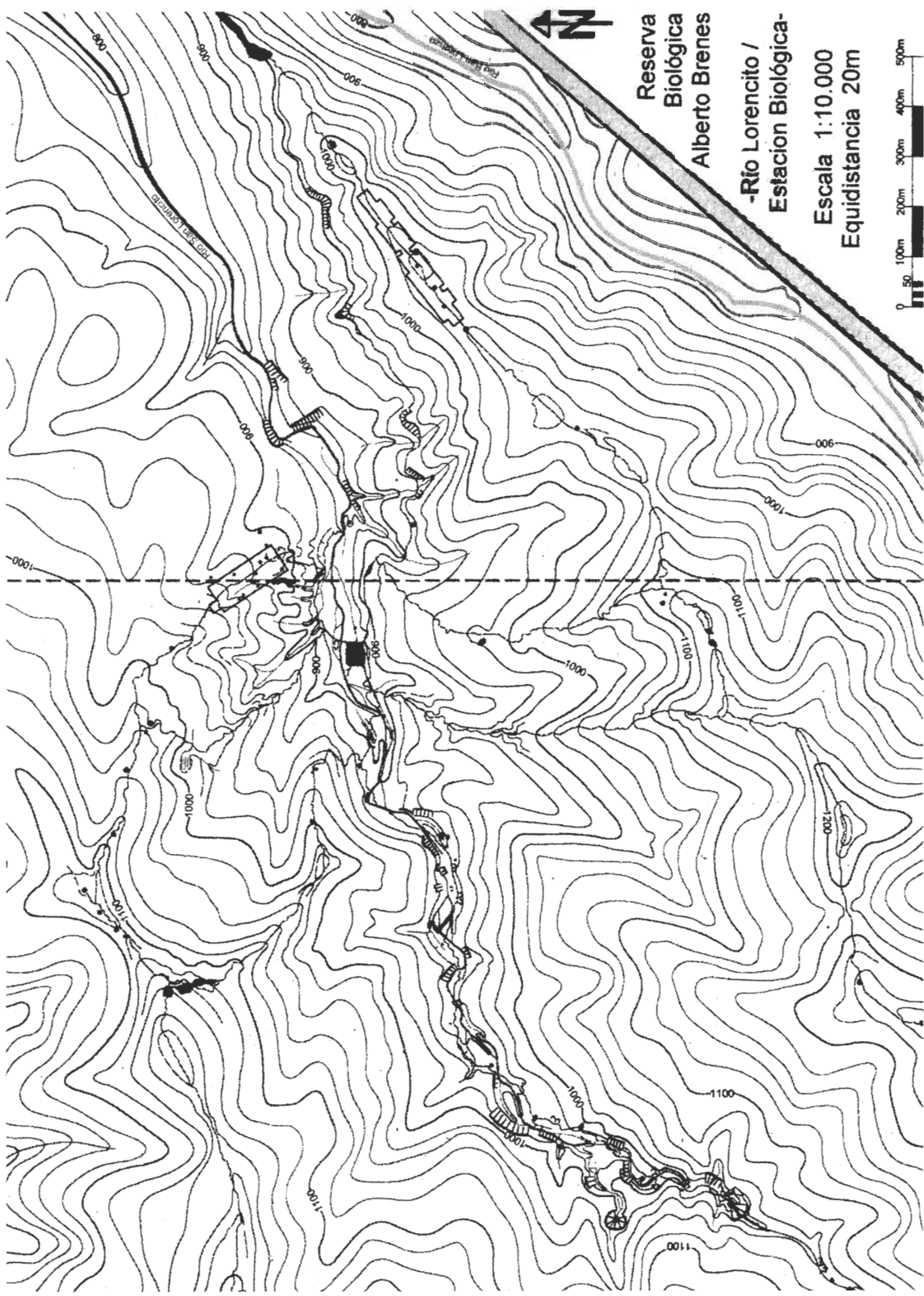
The overall help and overwhelming hospitality of Rodolfo Ortiz, the help and advice of Victor and Hugo are greatly acknowledged. Thanks are due to DFG (Br 379-7/3) for the financial support within the main Research-Programme of the DFG "Mechanisms for Maintaining of Tropical Diversity".

## CITED LITERATURE

- ORTIZ V.,R. 1991. Memoria de Investigación, Reserva Forestal de San Ramón. Serie Catedra Universitaria. San José, Costa Rica. 80 pp.
- SCHROERS, S., BRECKLE, S.-W. & ORTIZ V.R. 1995 Apuntes sobre *Elaeagia auriculata* (Rubiaceae).-in this volume-
- SPRENGER, I., BRECKLE, S.-W. & ORTIZ V.,R. 1995. Investigaciones ecológicas y demográficas sobre *Plinia salticola* (Myrtaceae) en un bosque húmedo premontano en Costa Rica. -en este volumen-
- WATTENBERG, I., BRECKLE, S.-W. & ORTIZ V.,R. 1995. La diversidad de especies de árboles y la estructura de un bosque muy húmedo premontano en la RBAB. -en este volumen-

## MAPS LEGENDS

- Fig. 1 Map with scale 1:10.000 of the closer surrounding of the Biological Station (part of the whole map, without legend).
- Fig. 2 Map with scale 1:20.000 of the whole map (SE part of RBAB), B & W version.
- Fig. 3 Map with scale 1:2.000 (1:5.000), enlarged small detail of the close surroundings of the Biological Station.
- Fig. 4 Legend for the maps (Fig. 1 and 3).



Reserva  
Biológica  
Alberto Brenes

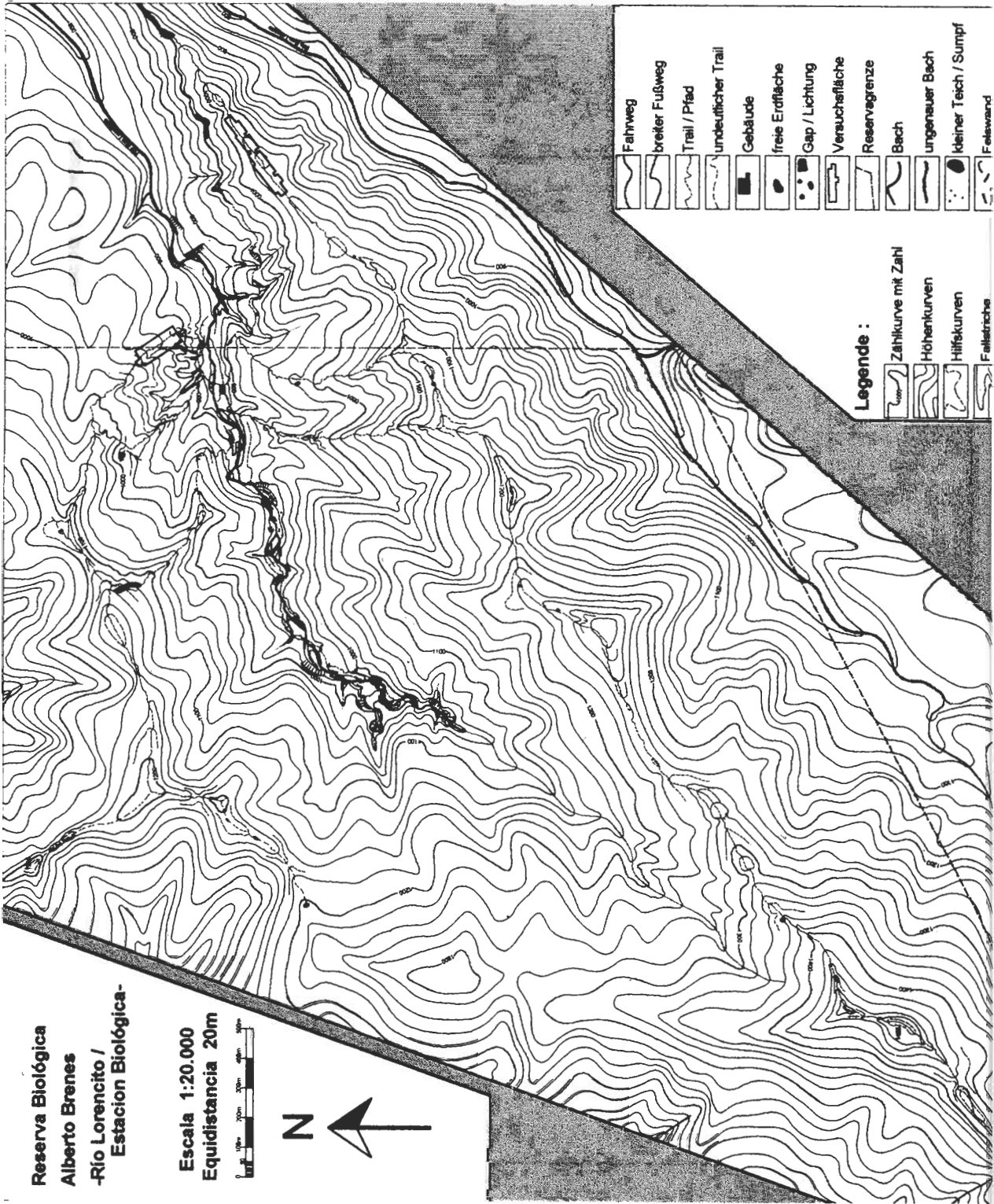
-Río Lorencito /  
Estacion Biologica-

Escala 1:10.000  
Equidistancia 20m



Reserva Biológica  
Alberto Brenes  
-Rio Lorencito /  
Estacion Biológica-

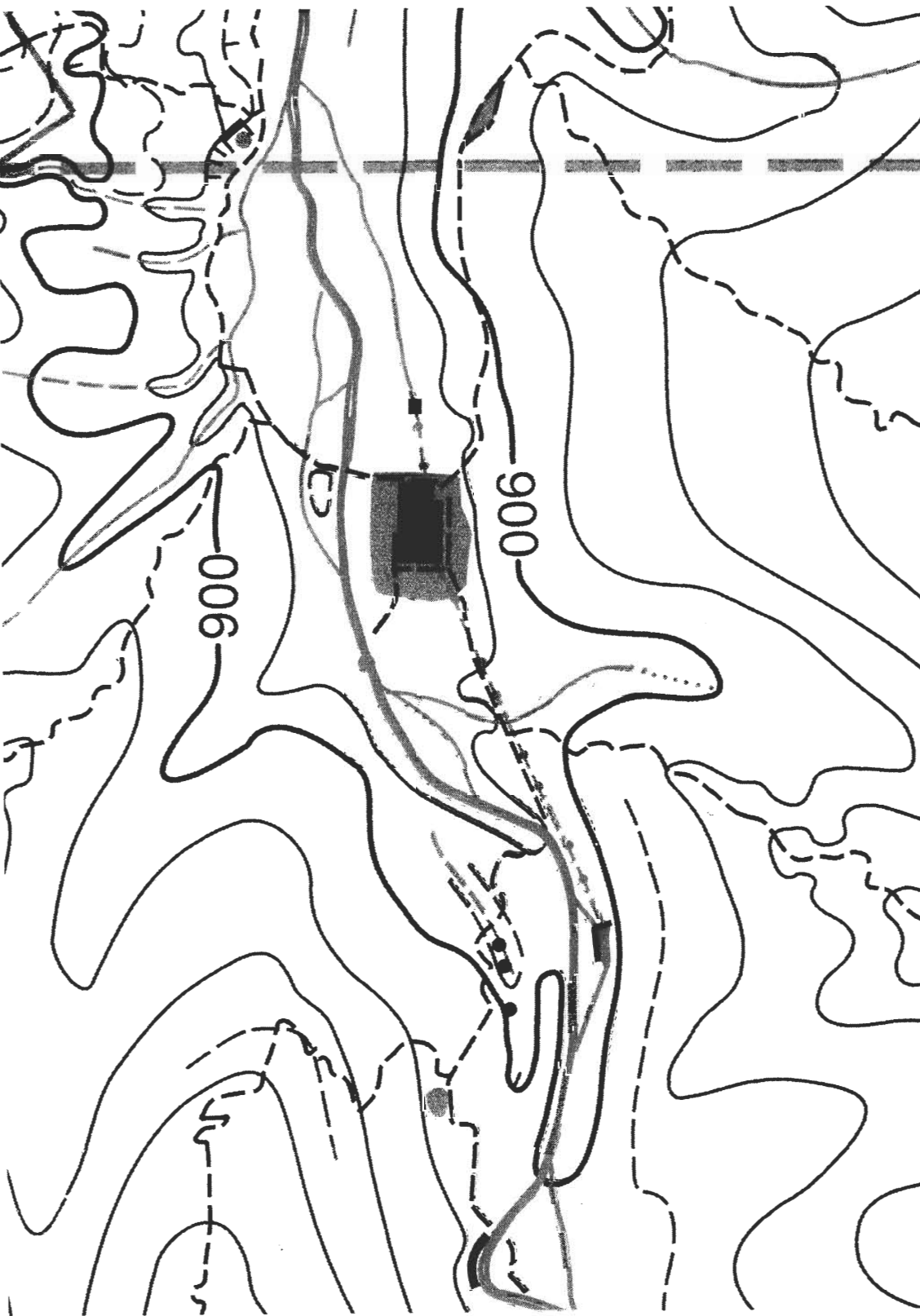
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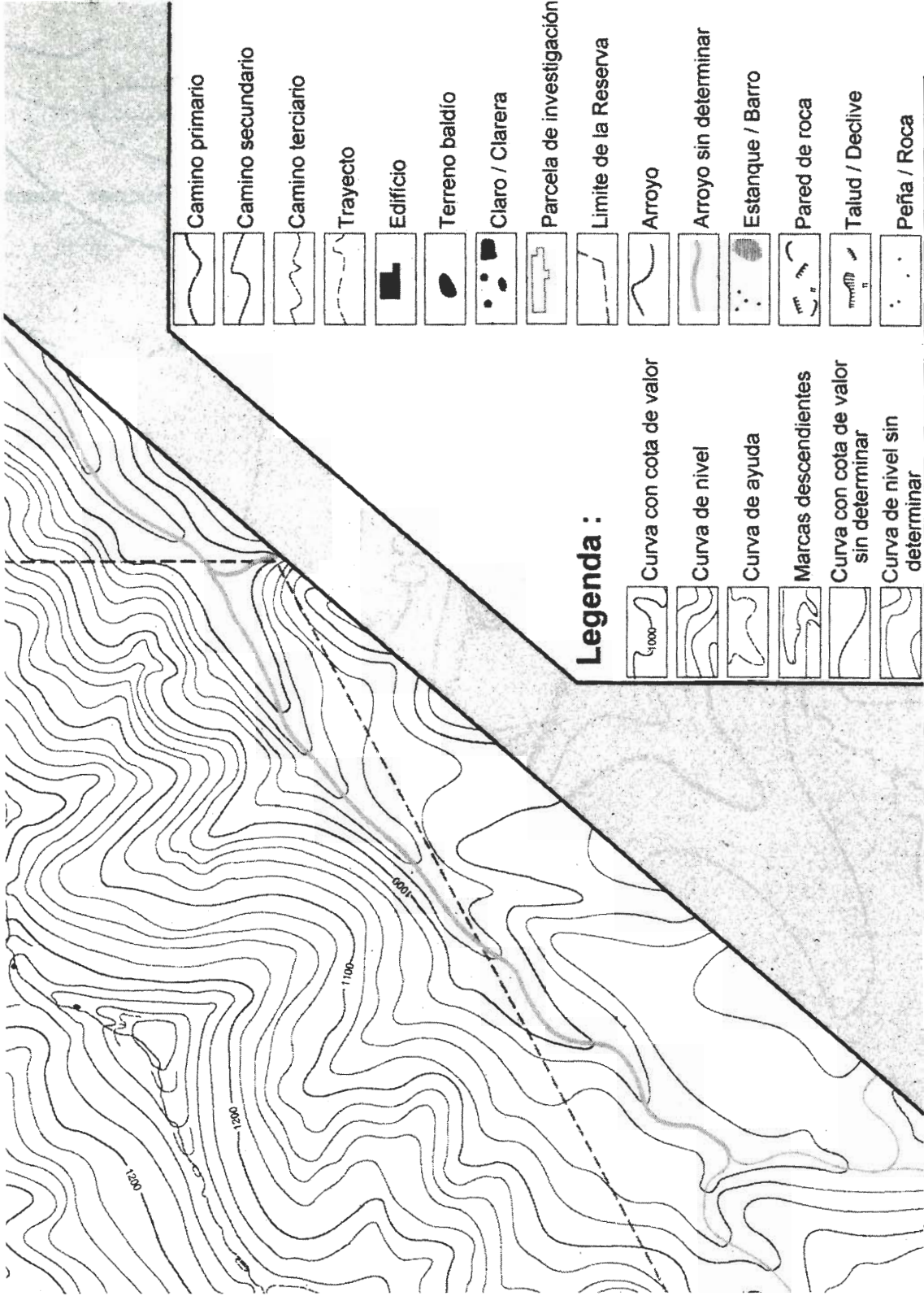


- Fahrweg
- breiter Fußweg
- Trail / Pfad
- undeutlicher Trail
- Gebäude
- freie Erdfäche
- Gap / Lichtung
- Versauerfläche
- Reservegrenze
- Bach
- ungenauer Bach
- kleiner Teich / Sumpf
- Felswand

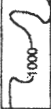

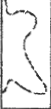



Legende :


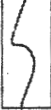

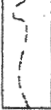


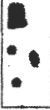




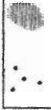
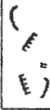
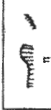
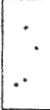
- Zählkurve mit Zahl
- Höhenkurven
- Hilfskurven
- Falllinie





**Legenda :**

-  Curva con cota de valor
-  Curva de nivel
-  Curva de ayuda
-  Marcas descendientes
-  Curva con cota de valor sin determinar
-  Curva de nivel sin determinar

-  Camino primario
-  Camino secundario
-  Camino terciario
-  Trayecto
-  Edificio
-  Terreno baldío
-  Claro / Clarera
-  Parcela de investigación
-  Limite de la Reserva
-  Arroyo
-  Arroyo sin determinar
-  Estanque / Barro
-  Pared de roca
-  Talud / Declive
-  Peña / Roca