

DRY SEASON PATTERNS OF LIVESTOCK AND HUMAN DISTRIBUTION  
IN THE OFFICE DU NIGER REGION OF MALI

*Preliminary Report to:*

CIPEA

BP 60, Bamako

MALI

*Prepared by :*  
*Kevin Milligan*

MAY 1983

TABLE OF CONTENTS

1. <i>Introduction</i>	1
2. <i>Methods</i>	2
3. <i>Results</i>	3-4
3.1. <i>The livestock populations</i>	3
3.2. <i>The human populations</i>	3-4
4. <i>References</i>	5

LIST OF TABLES

1. <i>Dry season livestock population totals</i>	6
--	---

LIST OF FIGURES

1. <i>Grid pattern used for dry season aerial survey</i>	7
2. <i>Dry season distribution of cattle</i>	8
3. <i>Dry season distribution of sheep and goats</i>	9
4. <i>Dry season distribution of camels</i>	10
5. <i>Dry season distribution of donkeys</i>	11
6. <i>Distribution of village sizes</i>	12
7. <i>Dry season distribution of Tanasheq</i>	13
8. <i>Dry season distribution of Maure</i>	14
9. <i>Dry season distribution of Pheul</i>	15

## 1. INTRODUCTION

The International Livestock Centre for Africa (ILCA) has been studying livestock production in the Office du Niger region of Mali since 1976. To provide a broader frame for the detailed results that have been produced from this work, ILCA decided to carry out a low altitude aerial survey of the region during the dry and wet seasons of 1983. This preliminary report describes some of the results from the initial dry season survey.

This survey was carried out with the assistance of ODEM, who provided the necessary experienced personnel and some ground support. The results will provide a useful basis for comparison to the adjacent delta area which was surveyed by the same ILCA/ODEM team during the 1980-82 period.

Results of this survey are for the discretionary use of ILCA and ODEM and the author retains the right to make minor alterations to the results in the light of the more detailed computer analyses necessary for final reporting. This preliminary report has a limited distribution to the following individuals:

### ILCA

- Mali
  - Mr. T. Wilson (Team Leader)
  - Mr. P. Hiernaux (Ecologist)
  - Mr. P. Gossey (Agronomist)
  - Ms. M. Diko (Animal Scientist)
  - Capt. J. Meunier (pilot)
- Ethiopia
  - Dr. J. Lambourn (Director of Research)
  - Mr. P. DeLeeuw (Ecologist)

### ODEM

- Dr. N. Diakete (Director General)
- Dr. M. Keita (Veterinarian)

## 2. METHODS

The basic methodology used for the aerial survey follows that successfully used by ILCA in Nigeria, Mali, Niger and Ethiopia and as described in reports from these countries (Milligan 1979, 1982a 1982b, 1983)

The area was first divided into a 10 X 10 km grid pattern based upon the UTM projection. Unfortunately the two adjacent IGN maps that cover the Office du Niger region do not have the same UTM projection, and the projection finally adopted was that based upon "Origine Lo = 0° - Mo = 9° Ouest du Meridien International". The central zone of this Office du Niger region, dissected by the "Canal du Sahel" and generally inundated to rice cultivation, was covered at a greater sample intensity by dividing each of the UTM projections into four equal 5 X 5 km grids (see figure 1).

The aircraft flew at an average altitude of 804 feet above ground level down the centre of each of these grids. The sample intensity was thus 8.04% for the outer region and 16.08% for the inner regions.

The survey team was :

- |   |   |
|---|---|
| - Capt. J. Meunier (ILCA),<br>BP60, Bamako Mali.                              | - Pilot   |
| - Dr. K. Milligan (ILCA)<br>PM 2248, Kaduna, Nigeria                          | - Co-ordinator and recording<br>ecological conditions |
| - Mr. Abdalla Ben Alkaouri (private)<br>Topo-Azawad, BP 1148,<br>Bamako, Mali | - Observer, animals and people                        |
| - Mr Gaousson Sidibe (ODEM)<br>Severe, Mali                                   | - Observer, animals and people.                       |

The following parameters were recorded during the survey:

Human Populations: the number of camps and individual camp sizes of: Tamasheq, Maures and Pheul. Villages (principally Bambara) were excluded from the survey but incorporated into the inventory from the published IGN maps

Livestock Populations: the size of each individual herd of cattle, sheep and goats, camels or donkeys. The definition of a "herd" was taken as the grazing unit as seen from the plane and would not necessarily correspond to household or ownership units.

Land Use

- the proportion of land cultivated, divided into cereal rice cropping.
- the numbers of wells or other major water sources and levels of inundation. This data base was further complimented by reference to the published IGN maps,

Land Cover

- the grass cover
- the tree density per hectare

This report provides some preliminary results for the human and livestock populations only. The other recorded parameters will be analysed in the final report.

### 3. RESULTS

#### 3.1 The Livestock Populations

##### 3.1.1 Abundance

Table 1 provides estimates of the total livestock population of the Office du Niger region during the dry season. From an overall density of about 12 UBT per km<sup>2</sup>, about 75% is accounted for by cattle, despite the fact that there are almost twice as many sheep and goats as cattle.

Cattle density within the central irrigated area is 2.4 times greater than in the surrounding areas, resulting in an inner stocking of only 5.4 hectares per head. This difference is equally due to both more herds and a larger herd size.

The sheep and goat density was also greatest in the centrally irrigated area, being 1.8 times that of the surrounding areas. However, this difference was entirely due to a greater number of herds, as average herd size was actually smaller in the irrigated areas.

Only a few camels and donkeys were seen, representing less than 1% of the cattle, sheep and goat population. However, the donkey population has almost certainly been underestimated due to their tendency to be concentrated within the village and town areas.

A comparison to the ecologically similar inner delta region of Mali (Milligan 1982 a) indicates that the inner irrigated area of the Office du Niger supports less than 1/4 of the cattle density of the inundated plains of the delta, yet an almost identical sheep and goat density.

##### 3.1.2 Distribution

Figure 2 indicates that the greater cattle concentrations were in the inner irrigated areas near Niono, Debougou and Riziam. Results would suggest a split within this concentration, with the Niono population separately identifiable and somewhat smaller. Most of the rest of the inner irrigated lands have few cattle, except to the extreme north near Sokola. The western fringe areas support more cattle than the eastern fringe areas.

The pattern for the sheep and goat population (figure 3) is not the same as that for cattle. The greatest concentrations occurred between Debougou and Sokolo, while around Niono there were only a few.

#### 3.2 The Human Populations

Figure 6 indicates the distribution of villages, as inferred from the IGN maps and supported by aerial observation. Greatest concentrations occur along the Canal du Sahel, though a fairly uniform scatter occurs throughout the inner irrigated lands.

Maps are presented of the distribution of Tamasheq, Maure and Pheul camps in figures 7, 8 and 9 respectively.

The Tamasheq population was entirely within the central irrigated area, and no camps are seen in the fringe areas. The major concentration occurred north-west of Sokolo, though camps also occurred through the Sokolo to Niono region. The Maure camps were mostly in the north-western regions, outside or just entering the irrigated areas, and principally around Sokolo. The Pheul camps were most concentrated within the irrigated lands though were

also common in the western fringe areas.

From these figures it is tempting to suggest that the major cattle concentrations in the region of Niono to Rizan are principally Pheul; the sheep and goat populations between Debougou and Sokolo are principally Tamasheq with some Maures; while the cattle, sheep and goat concentrations near Sokolo would be mainly Tamasheq and Maure with some Pheul. Such suggestions however, do not take into account the perhaps overriding importance of livestock attached to permanent villages, most of which are Bambara.

#### 4. REFERENCES

Milligan K. Bourn D. and Chachu R. (1979) "Dry and wet season patterns of cattle and land use in four regions of the Nigerian Sub-humid Zone" Report to ILCA, Kaduna, Nigeria.

Milligan K. and Keita M. (1982a) "Recensement aerien saisonnier du cheptel et types de paysage du delta central du Niger au Mali" Report to ODEM/ILCA, Severe, Mali.

Milligan K. (1982b) "Recensement aerien des populations humaines et animales et conditions mesologiques d'une region due centre de la zone pastorale du Niger" Report to USAID, Niamey, Niger.

Milligan K. (1983) "An aerial reconnaissance of livestock and human populations in relation to land use and ecological conditons in the Sordu project area of southern Ethiopia" Report to RDP/ILCA, Addis Ababa, Ethiopia.

Table 1.

## DRY SEASON LIVESTOCK POPULATIONS \* IN THE REGION OF THE OFFICE DU NIGER, MALI

	CATTLE	SHEEP/ GOATS	CAMELS	DONKEYS	UBT**
1. Total Population ( $\pm$ %SE)					
a) Total area	76,592	134,521	516	268	78,273
b) Outer area	30,647(15)	62,948(28)	498(96)	187(60)	33,019
c) Inner area	45,945(19)	71,573(12)	19(50)	81(47)	45,254
2. Total Herds ( $\pm$ %SE)					
a) Total area	1,163	1,131	56	74	-
b) Outer area	522(12)	410(23)	37(96)	37(49)	-
c) Inner area	641(16)	721(13)	19(50)	37(39)	-
3. Population Density (Nos/km <sup>2</sup> )					
a) Total area	11.8	20.7	0.08	0.04	12.0
b) Outer area	7.7	15.7	0.12	0.05	8.3
c) Inner area	18.4	28.6	0.01	0.03	18.1
4. Population Stocking (Ha/Hd)					
a) Total area	8.5	4.8	-	-	8.3
b) Outer area	13.1	6.4	-	-	12.1
c) Inner area	5.4	3.5	-	-	5.5
5. Mean Herd Size					
a) Total area	66	119	9	4	-
b) Outer area	59	154	13	5	-
c) Inner area	72	99	1	2	-

\* The Office du Niger region was divided, for the purposes of aerial survey, into an inner zone (2,500 sq kms) and an outer zone (4,000 sq kms) as indicated in figure 1. The outer population was sampled at 8.04%, the inner population at 16.08%.

\*\* Total UBT has been calculated assuming: Cattle 0.75; Sheep and Goats 0.15; Camels 1.0; Donkey 0.5.



Figure 1. Grid pattern used for dry season aerial survey of the Office du Niger region in Mali

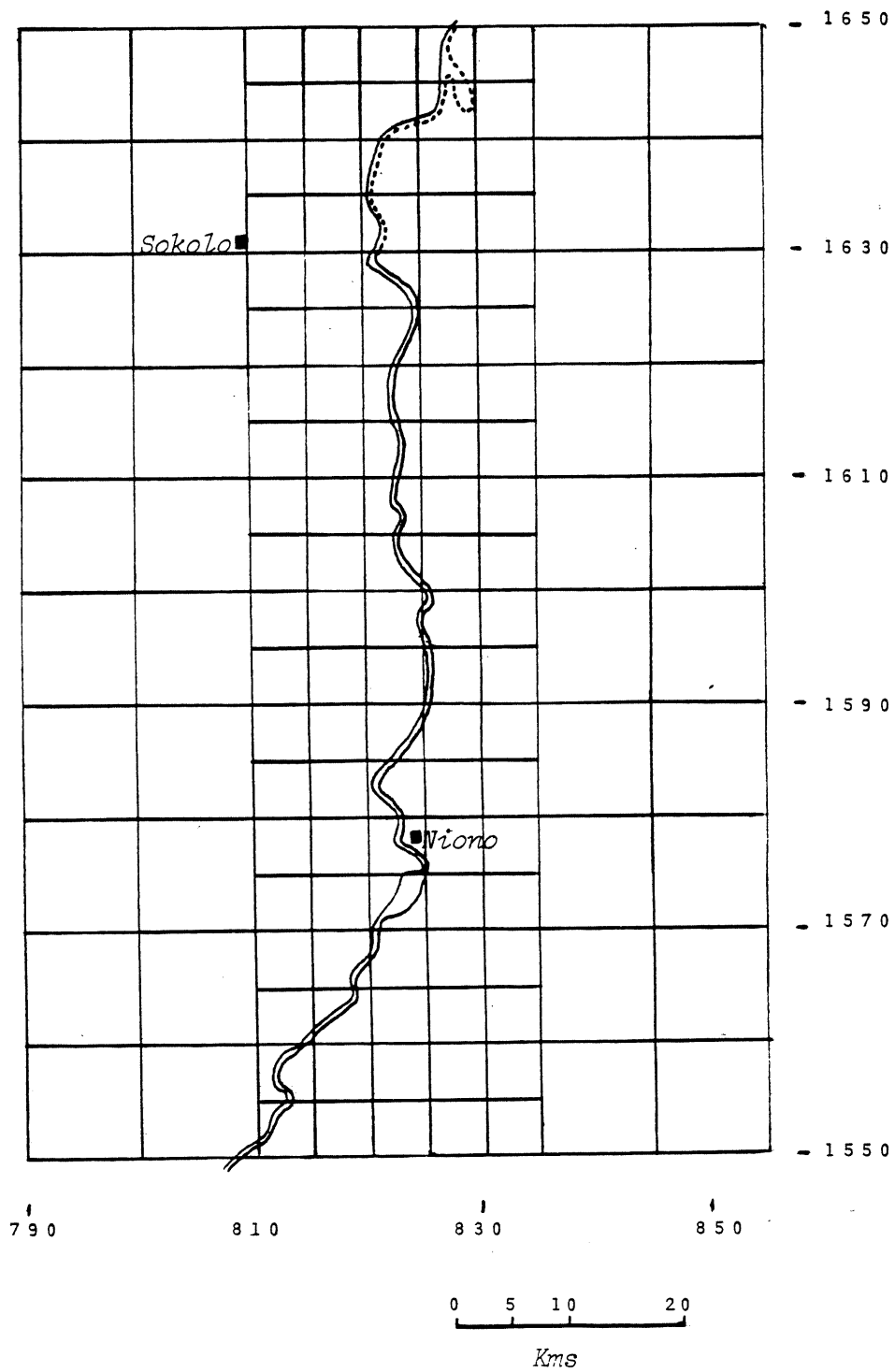


Figure 2. Dry season distribution of cattle in the Office du Niger region in Mali

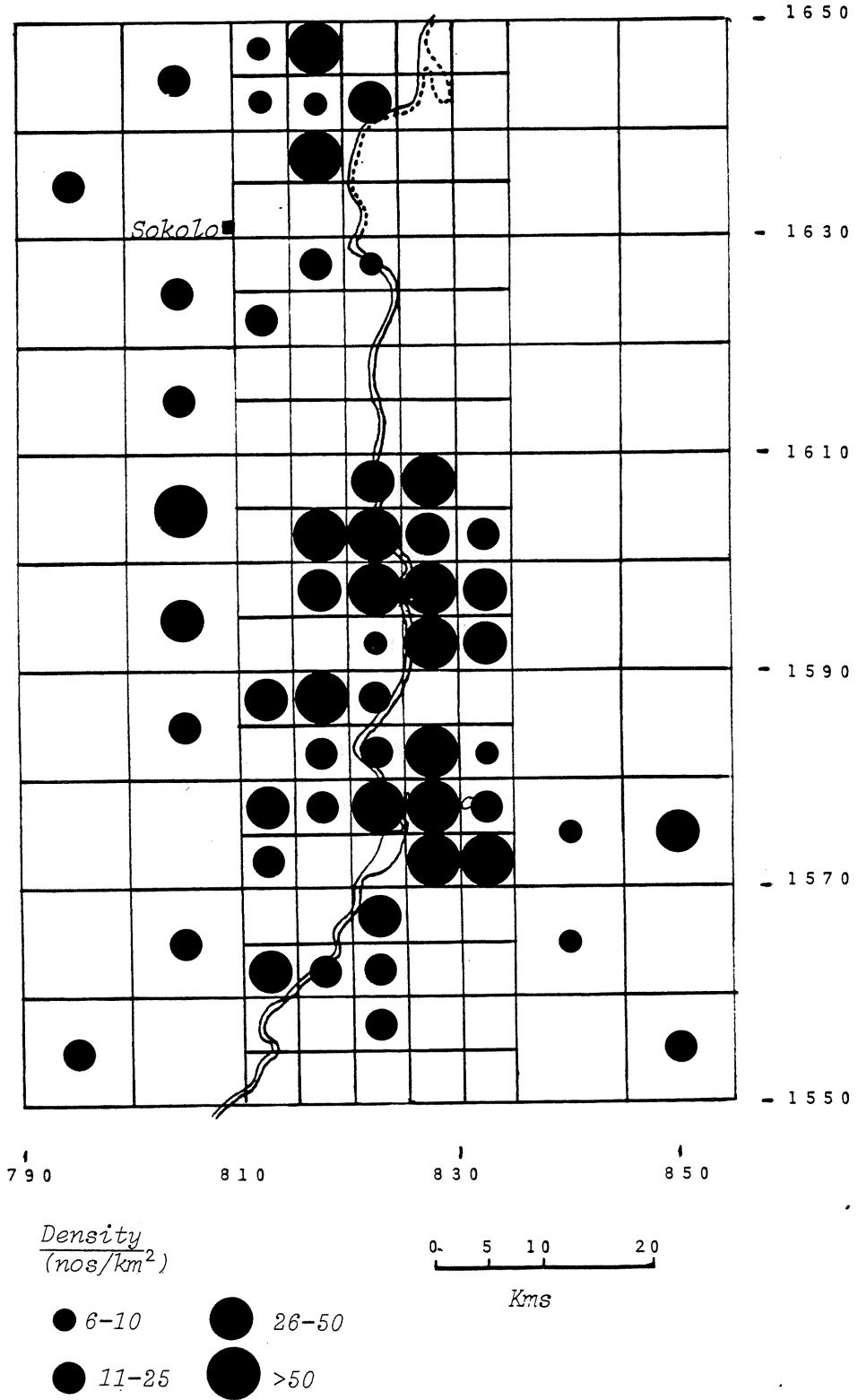


Figure 3. Dry season distribution of sheep and goats in the Office du Niger region of Mali

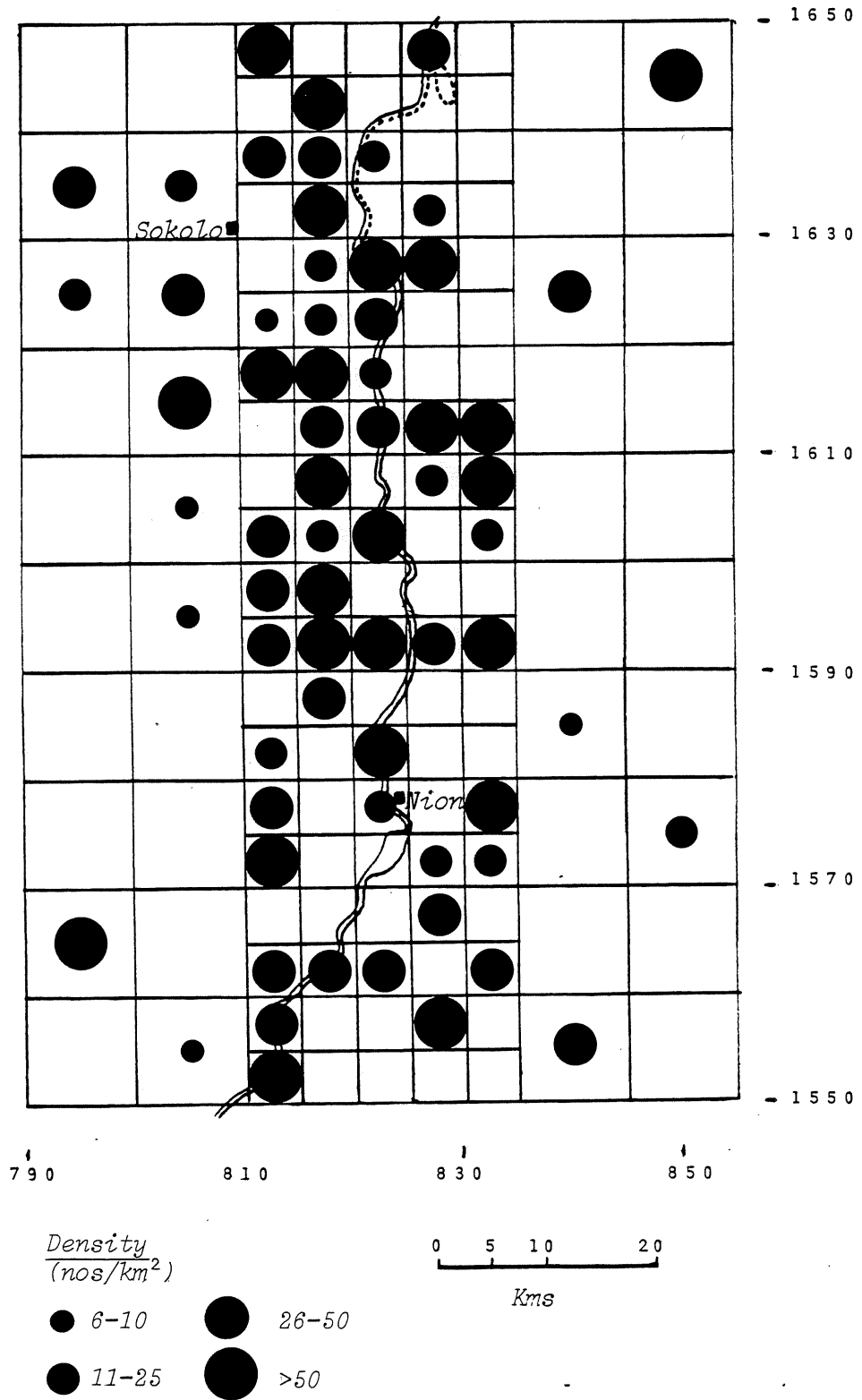


Figure 4. Dry season distribution of camels in the Office du Niger region in Mali

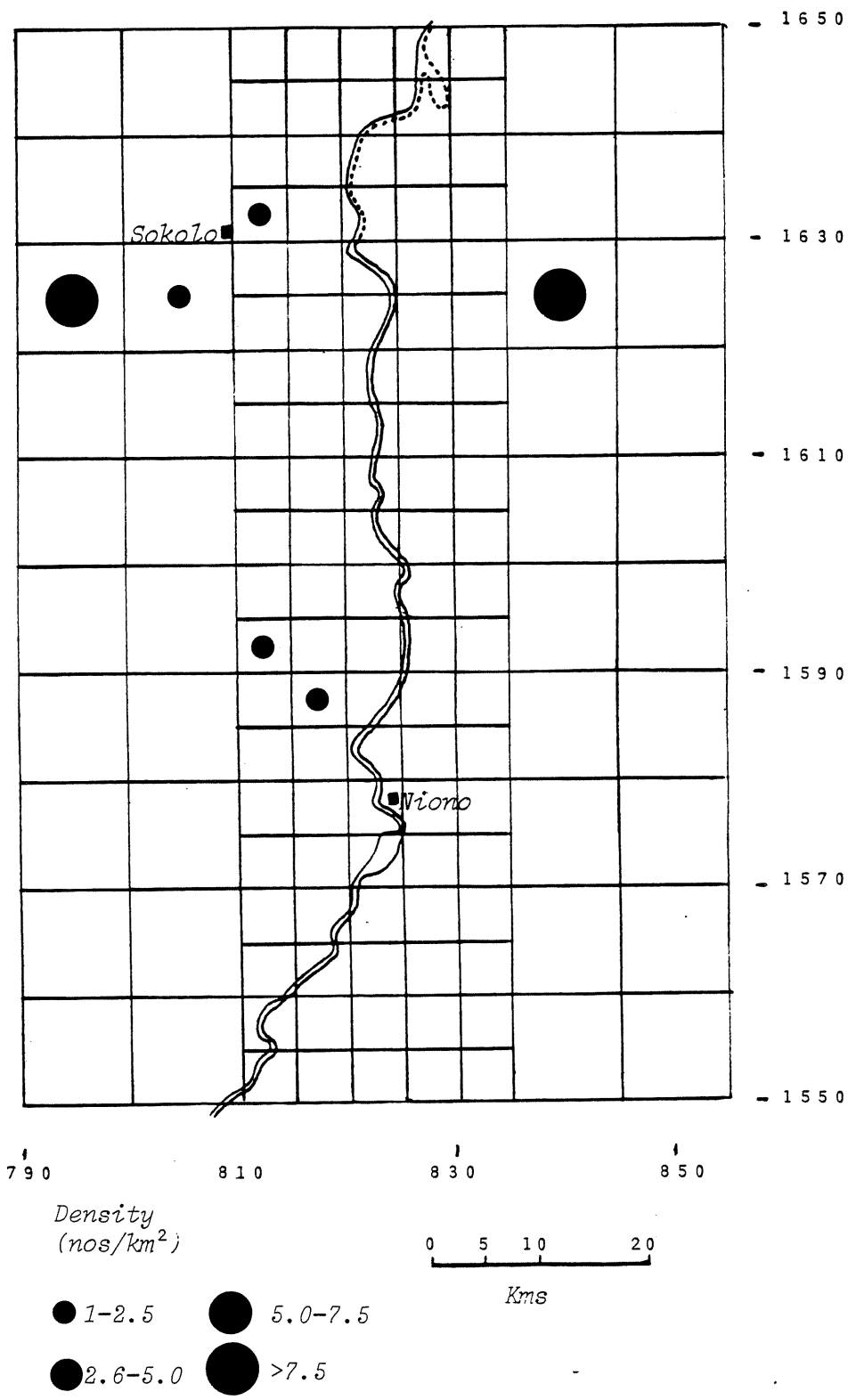


Figure 5. Dry season distribution of donkeys in the Office du Niger region in Mali

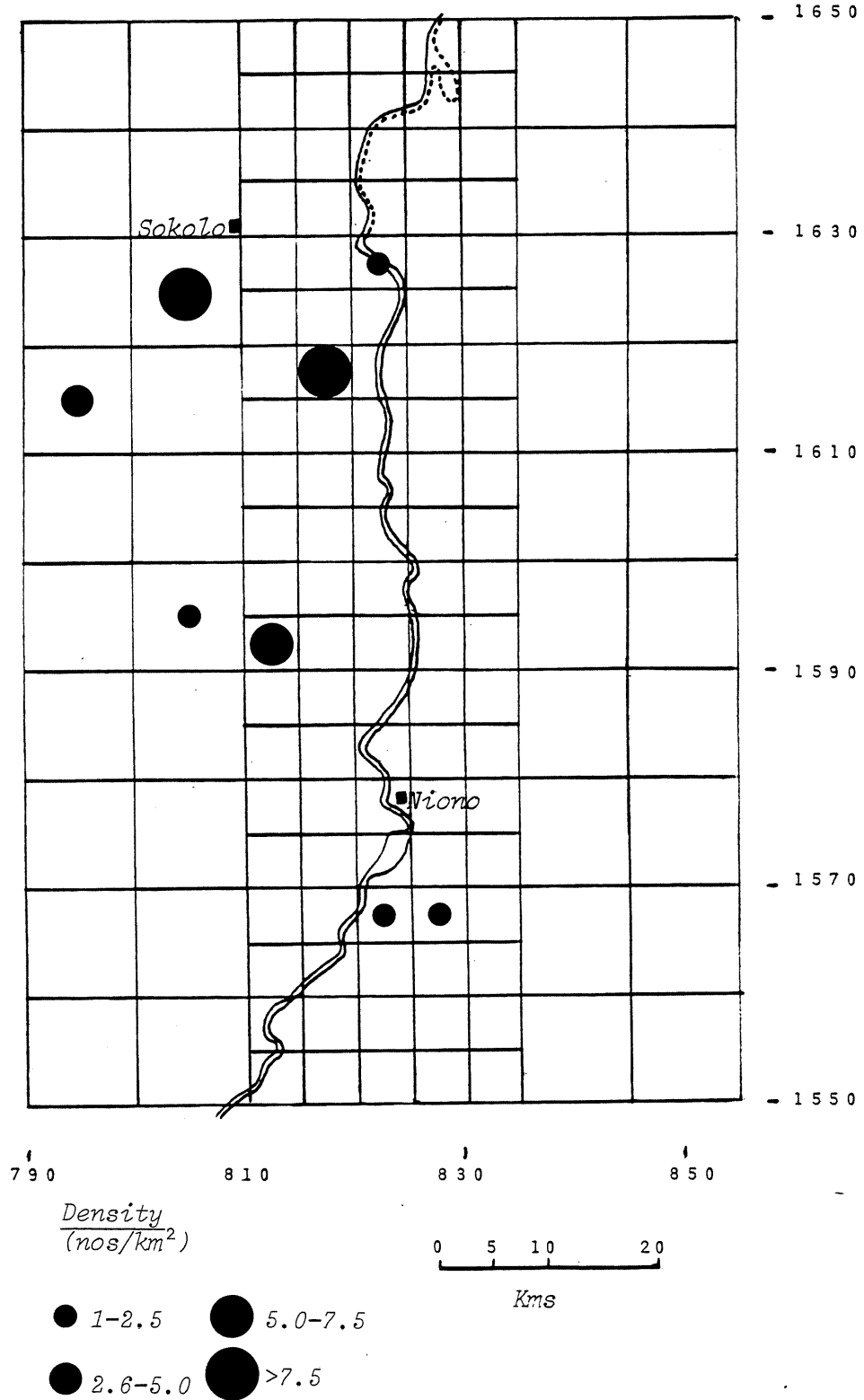


Figure 6 Distribution of Village size in the Office du Niger region of Mali

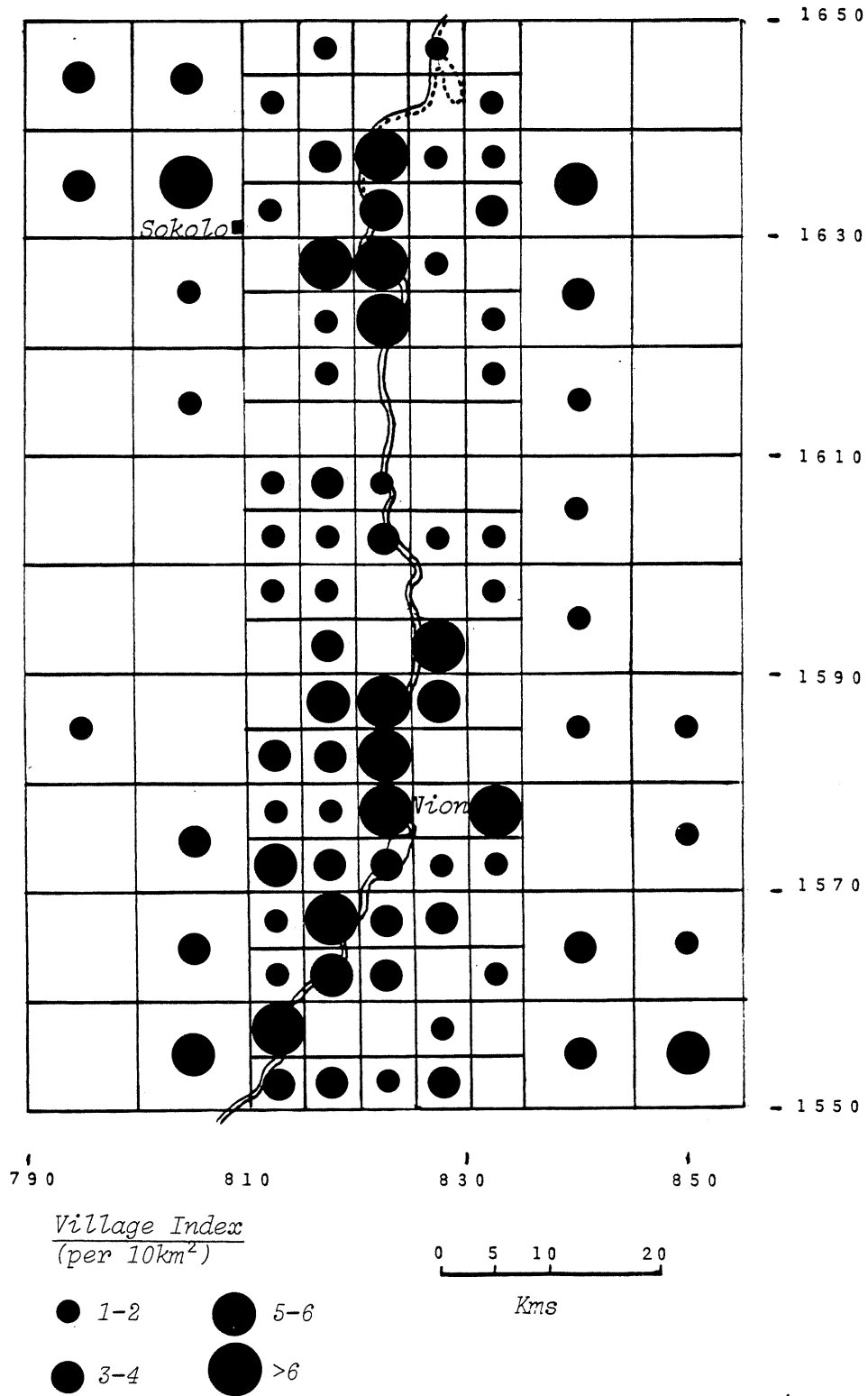


Figure 7 Dry season distribution of Tamasheq in the Office du Niger region of Mali

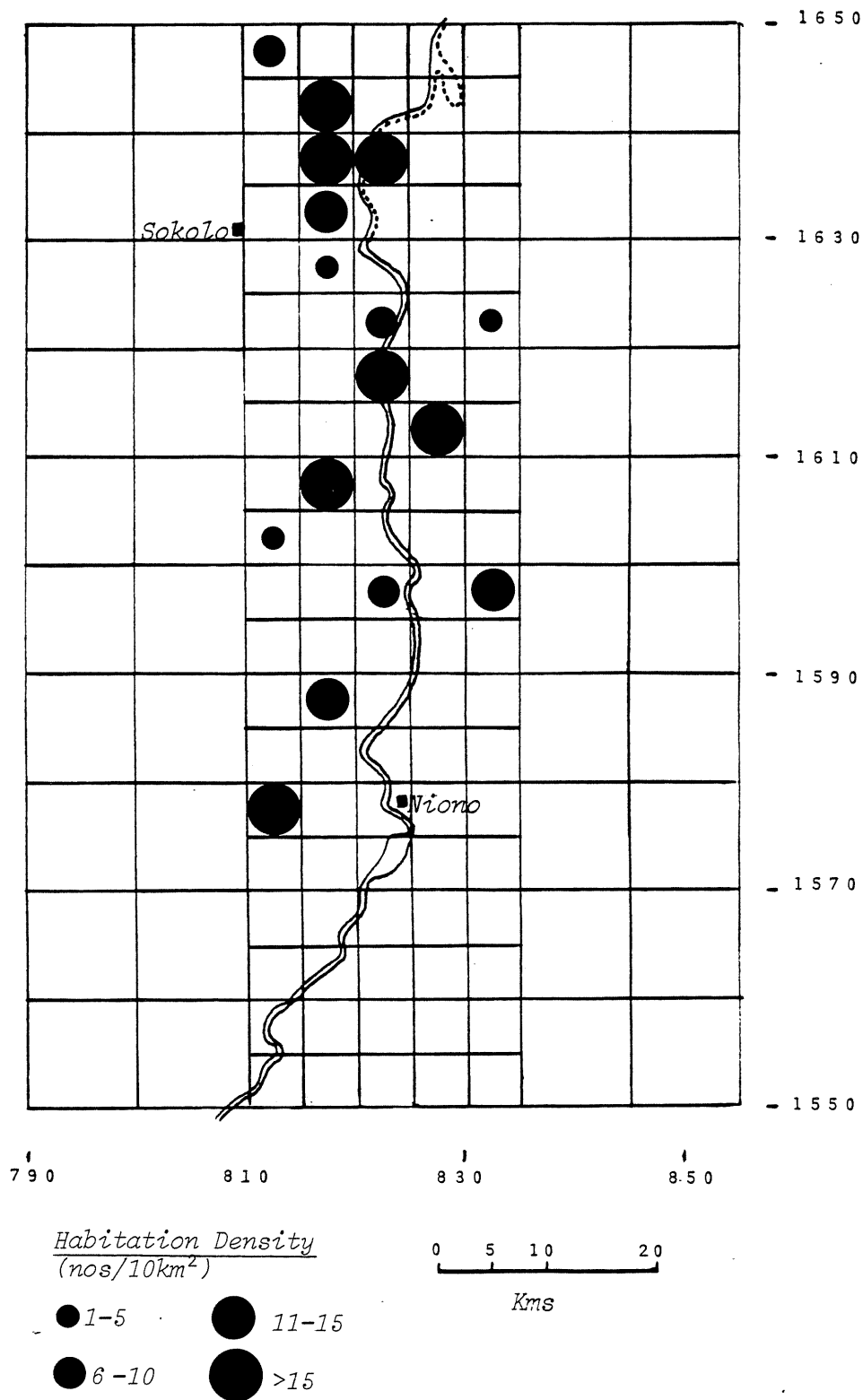


Figure 8 Dry season distribution of Maure in the Office du Niger region in Mali

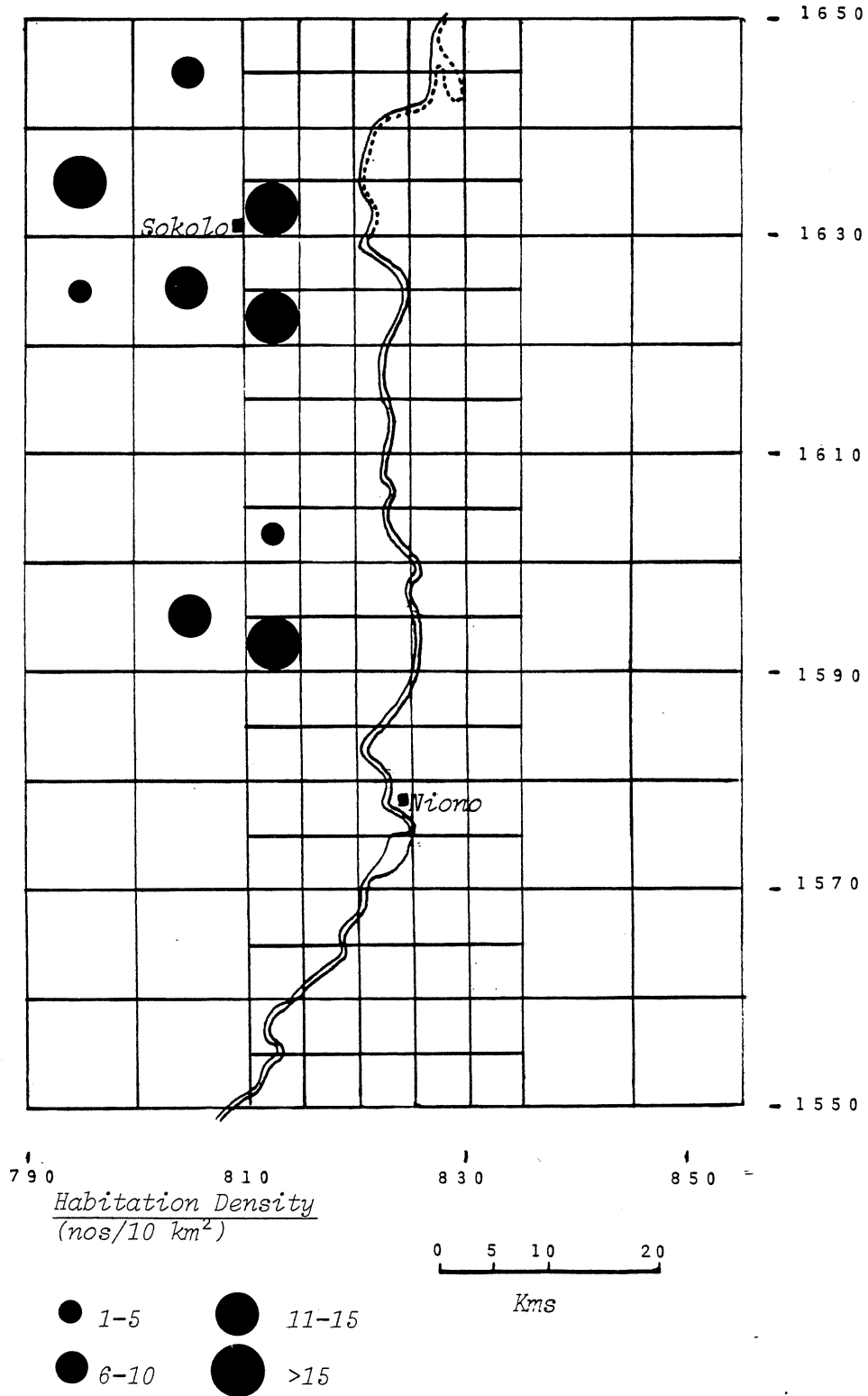
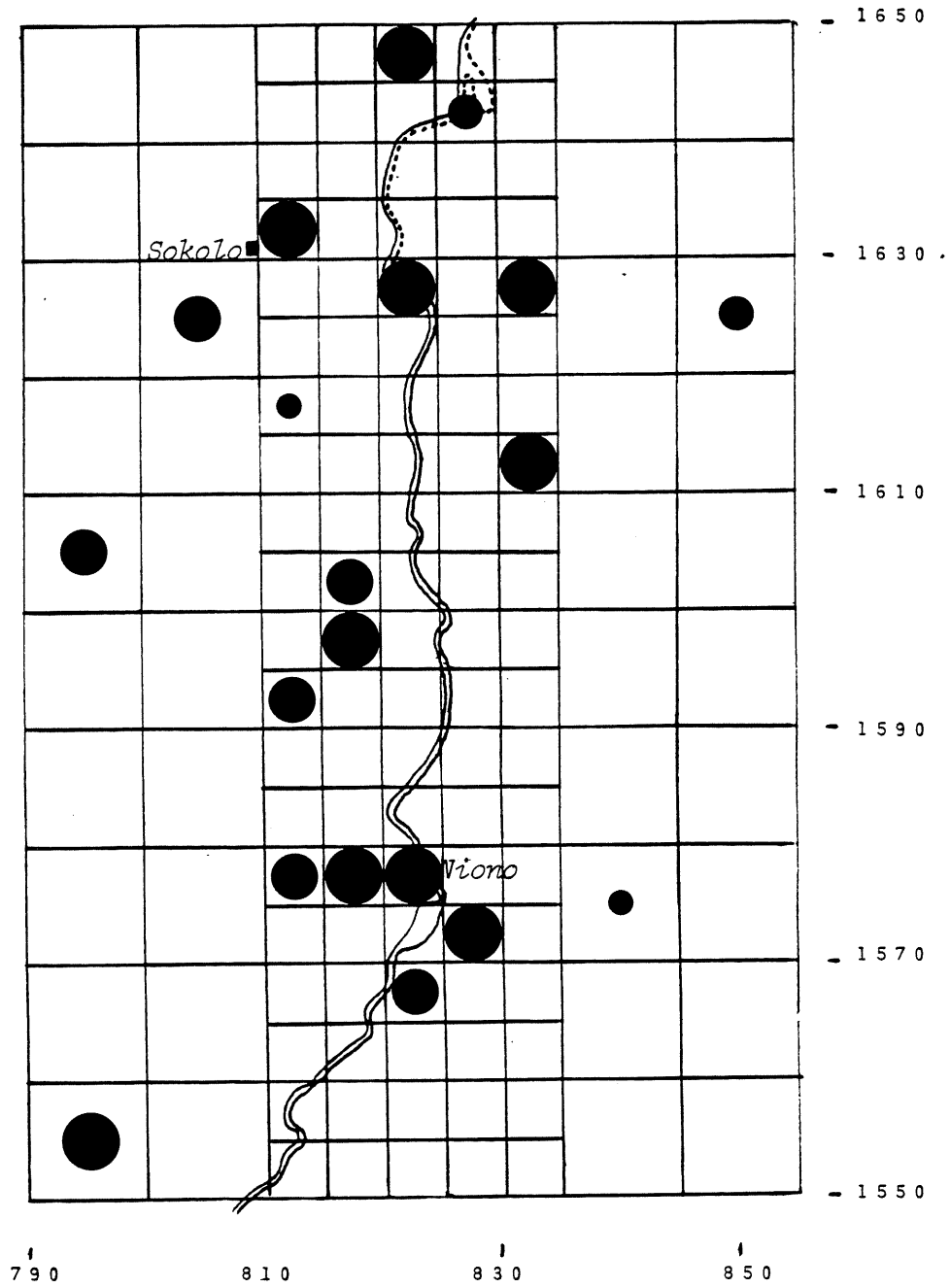




Figure 9 Dry season distribution of Pheul in the Office du Niger region in Mali

LA REGION DE L'OFFICE DU NIGER - MALI



Habitation Density  
(nos/10km<sup>2</sup>)

- 1-5
- 6-10
- 11-15
- >15

