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5. CHANGING PATTERNS OF PREHISTORIC LANDUSE IN THE AGRO PONTINO

Hans Kamermans, Susan Loving and Albertus Voorrips

Introduction

The Agro Pontino archaeological survey project is sponsored by the Albert Egges van Giffen Instituut voor Praeen Protohistorie (I.P.P.) of the University of Amsterdam in cooperation with the Dutch Institute in Rome, the Istituto Italiano di Paleontologia Umana and the Museo Preistorico Etnografico Luigi Pigorini, both in Rome (Voorrips et al. 1983).

The Agro Pontinois a coastal plain between Rome and Naples, about 80 km. south of Rome. It is 60 km. long and 15 km. wide and is surrounded by the Monti Lepini, the Monti Ausoni, the Tyrrhenian sea and the low hills south of Rome (Fig. 5.1).

Geologically speaking, the area consists of two parts, a low lying graben, mainly filled with peat, and a sandy dune area along the coast, both dating to the Quaternary. The calcareous mountains along the north of the Agro Pontino, and Monte Circeo, an isolated part of the Appenines, were formed during the Mesozoic.

The soil map of the area (Fig. 5.2) shows that along the coast four marine terraces can be distinguished. Estimated dates are 250,000 B.P. (Tyrrhenian I), 100,000 B.P. (Tyrrhenian II), 70,000 B.P. (Tyrrhenian III), and postglacial (pre-Neolithic) (Fig. 5.3). Each terrace consists of a sandy beach ridge and a clayey lagoon. Some of the beach ridges contain flint pebbles of a sufficient size for the manufacture of stone tools.

The soil map was made by scholars and students from the Laboratory for Physical Geography and Soil science of the University of Amsterdam (Sevink et al. 1984). During the soil survey much archaeological material was encountered, mainly flint artefacts and pottery. In order to continue the research in this area the I.P.P. started an archaeological survey project in 1979. In 1980 palynological studies were begun.

At this time the main research goal is to investigate changing patterns of prehistoric landuse in the Agro Pontino, from the middle Palaeolithic to the Bronze Age, using land evaluation techniquesin conjunction with archaeological, ethnographic and historical data. In this way the potential of land evaluation for prehistoric research will be assessed

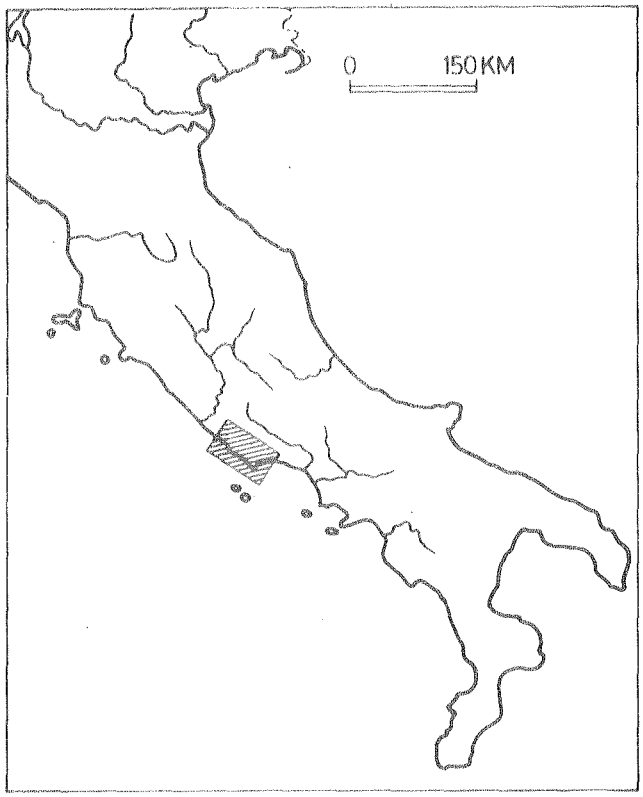

Fig. 5.1. Location of the Agro Pontino (drawing IPP).

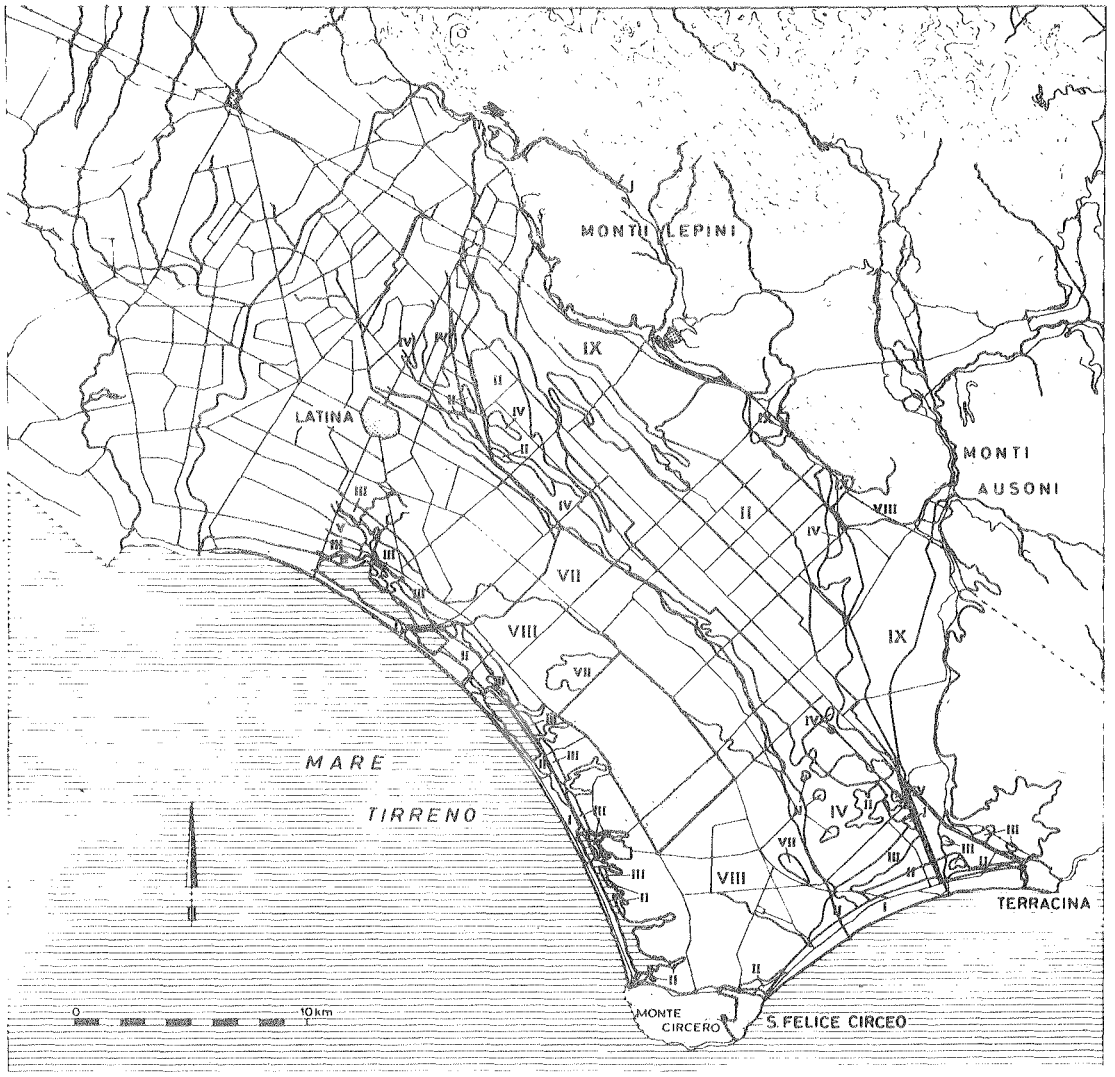

Fig. 5.2. the major sedimentary complexes in the Agro Pontino (after Sevink et al. 1984).

I	beach ridge deposits, Terracina level
II	lagoonal deposits, Terracina level
III	beach ridge and gravelly deposits with lagoonal deposits, Borgo Ermada level
IV	lagoonal deposits, Minturno level
V	beach ridge deposits, Minturno level
VI	lagoonal deposits, latina level
VIII	aeolian deposits
IX	alluvial and colluvial deposits

(drawing IPP)

and something will be learned about the prehistoric socio-economic organization and development in the Agro Pontino.

The land evaluation approach

Land evaluation is a technique developed by physical geographers and is widely used by the FAO (Food and Agriculture Organisation of the United Nations) in third world countries (Brinkman and Smyth 1973; Beek 1978; FAO 1976). The land evaluation approach asks: Given the physical data and given the socio-economic situation what will be the most rational use of land? In other words, land evaluation is the utilization of social and economic parameters in evaluating physical data. Land evaluation entails collecting a basic inventory of land properties or characteristics in order to identify promising land use alternatives in simple socio-economic terms.

Land evaluation starts with basic surveys (Fig. 5.4). On the basis of these surveys a qualitative land classification is made. The basic surveys include the collection of data about, for example, geology, geomorphology, soils, climate and hydrology. These surveys result in maps indicating land characteristics, i.e., slope angle, rainfall, soil texture, available water capacity, biomass of the vegetation etc. These characteristics are then translated into land qualities. For example, the land quality "hazard of soil erosion" is determined by a number of variables: slope angle, slope length, permeability, soil structure, rainfall intensity and so on. The land quality together with a socio-economic analysis are used to derive a quantitative land classification: the land suitability. Areas within a region can then be ranked according to their suitability of use. In this way, the FAO makes the decisions about land use which are necessary for planning at a regional scale.

Of course, the FAO does not know whether or not decisions, based on its analysis will be implemented, or when they are, whether or not they will succeed and for how long. The FAO lacks data on the outcome of its decisions, or, in other terms, the experimental result.

The archaeological record, on the other hand, contains the results of thousands of experiments in land use. The archaeological record is less clear, however, about the socio-economic contexts of those experiments.

In archaeology the land evaluation approach can be used in a slightly different way. Because the approach relates land use to the socio-economic situation, models for the prehistoric socio-economic situation can be evaluated, compared or, perhaps, tested. An archaeologist first collects the physical data, analogous to the basic surveys, by translating and combining palaeoecological information to yield a qualitative land classification for different time periods. Then, using ethnographic, archaeological and

Unit	Maximum Sea Level, Meters a.s.l.	Tentative Dating	Texture	Drainage	Dominant Soils
Terracina Complex	0	Holocene	coarse	well drained	Calcaric Regosols
			fine/ medium	poorly drained	Eutric Gleysols
Borgo Ermada Complex	6	Tyrrhenian III (Brorup)	coarse	well drained	Chromic Luvisols Orthic Luvisols
			medium	poorly drained	Solodic Planosols Gleyic Luvisols
			fine	poorly drained	Chromic Vertisols
Minturno Complex	16	Tyrrhenian II (Eem)	coarse	well drained	Ferric Luvisols
			medium	imperfectly drained	Solodic Planosols Gleyic Luvisols
			fine	poorly drained	Chromic Vertisols
Latina Complex	25	?	coarse	well drained	Gleyic Luvisols Orthic Luvisols
			medium	imperfectly drained	Solodic Planosols Gleyic Luvisols
			fine	poorly drained	Chromic Vertisols

Fig. 5.3. Major characteristics of the marine complexes in the Agro Pontino (after Sevink et al. 1982).

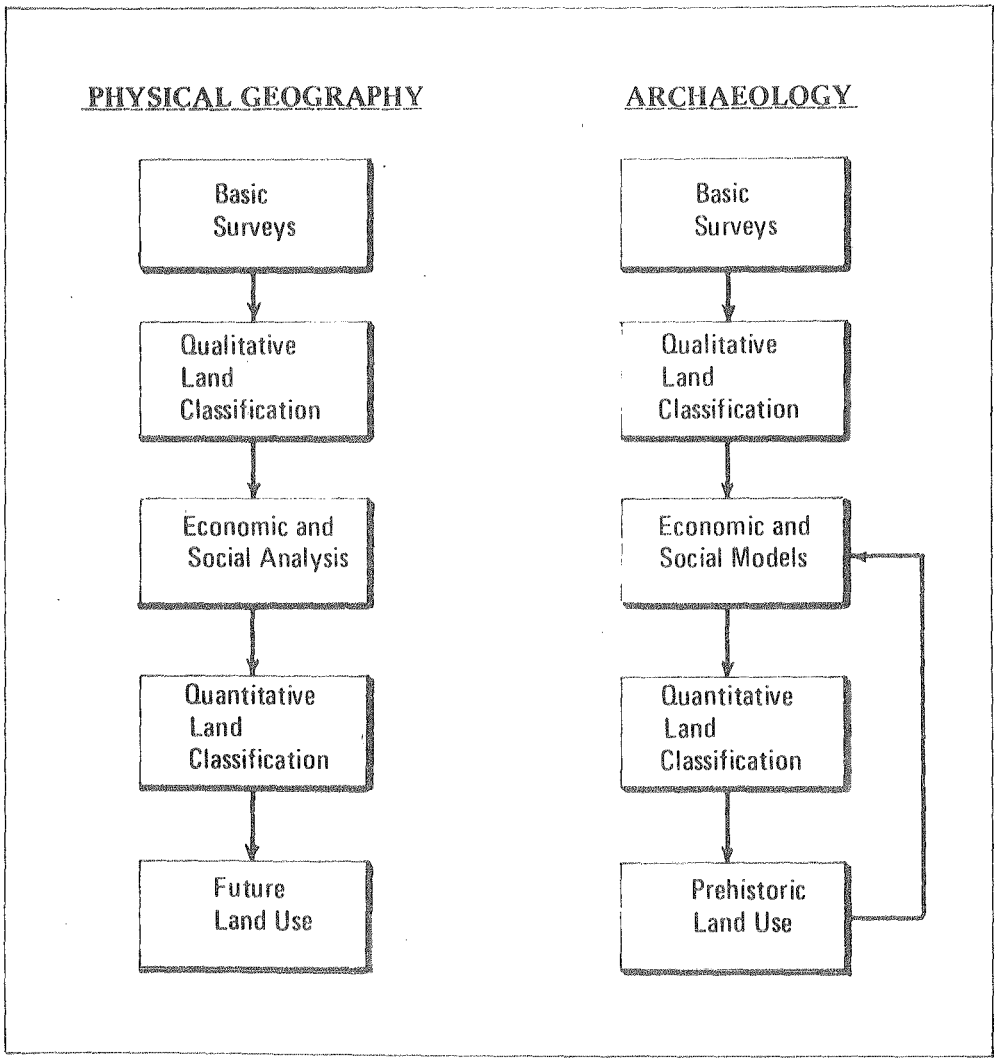

Fig. 5.4. The land evaluation approach in Physical Geography and Archaeology (adapted from FAO 1976).

historical sources, the archaeologist constructs a series of models of prehistoric socio-economic situations. Then, a land suitability assessment is derived by combining the appropriate land classifications with plausible socio-economic models. Finally, the archaeological survey results are examined in order to evaluate the socio-economic models in terms of the land suitability assessment.

In order to use the land evaluation approach in archaeology, an area is required that can provide palaeoecological data, that has well-developed soils (land evaluation leans heavily on differences in soil types), that is a more or less closed area (a physiographic unit) and that has been surveyed for its archaeological material.

Application of the land evaluation approach to the Agro Pontino

The Agro Pontino is an area which fulfills the requirements of the land evaluation approach.

The land surface of the Agro Pontino, like much of lowland central Italy, was not affected by glaciation, and unlike the intermontane regions, is relatively free of colluvium. Thus, its soils are very well developed. It is a physiographic unit, closed on three sides with only four entrances: two along the coast, one from the north and the other from the south, one between the Colli Albani and the Monti Lepini, and one between the Monti Lepini and the Monti Ausini. The geological, geomorphological and pedological history of the area has been very well studied by the Italian geologists (Blanc, Segre and Tongiorgi 1953; Segre 1957; 1969) and the Dutch physical geographers (Sevink 1977; Remmelzwaal 1978; Sevink et al. 1982; 1984).

Excellent conditions exist for collecting palaeoecological data: the peat in the slowly sinking graben is a mine for palaeobotanical samples and the caves in the surrounding Appenines and Monte Circeo have yielded well-preserved palaeo-zoological samples. The excavations in the Apennines and at Monte Cireo that started in the thirties yielded sufficient zoological material to give a rough idea about the fauna from the last ice age onwards (Blanc and Segre 1953; Piperno 1976/1977).

The I.P.P. has collected samples for palynological analysis from the graben and from fossil lagoons in the area. One of the core samples, which has a continuous record dating from approximately 16,000 to 4,500 B.P., has given a general indication of the area's vegetational history since the late glacial (Eisner et al. in press).

Last, but not least, there is an abundance of archaeological material scattered all over the Pontino plain. Archaeological research from the thirties onwards by Blanc (1937; 1939), Taschini (1968; 1970; 1972; 1979) Bietti (1969), Zei (1953; 1954/1955; 1970; 1973), Mussi & Zampetti

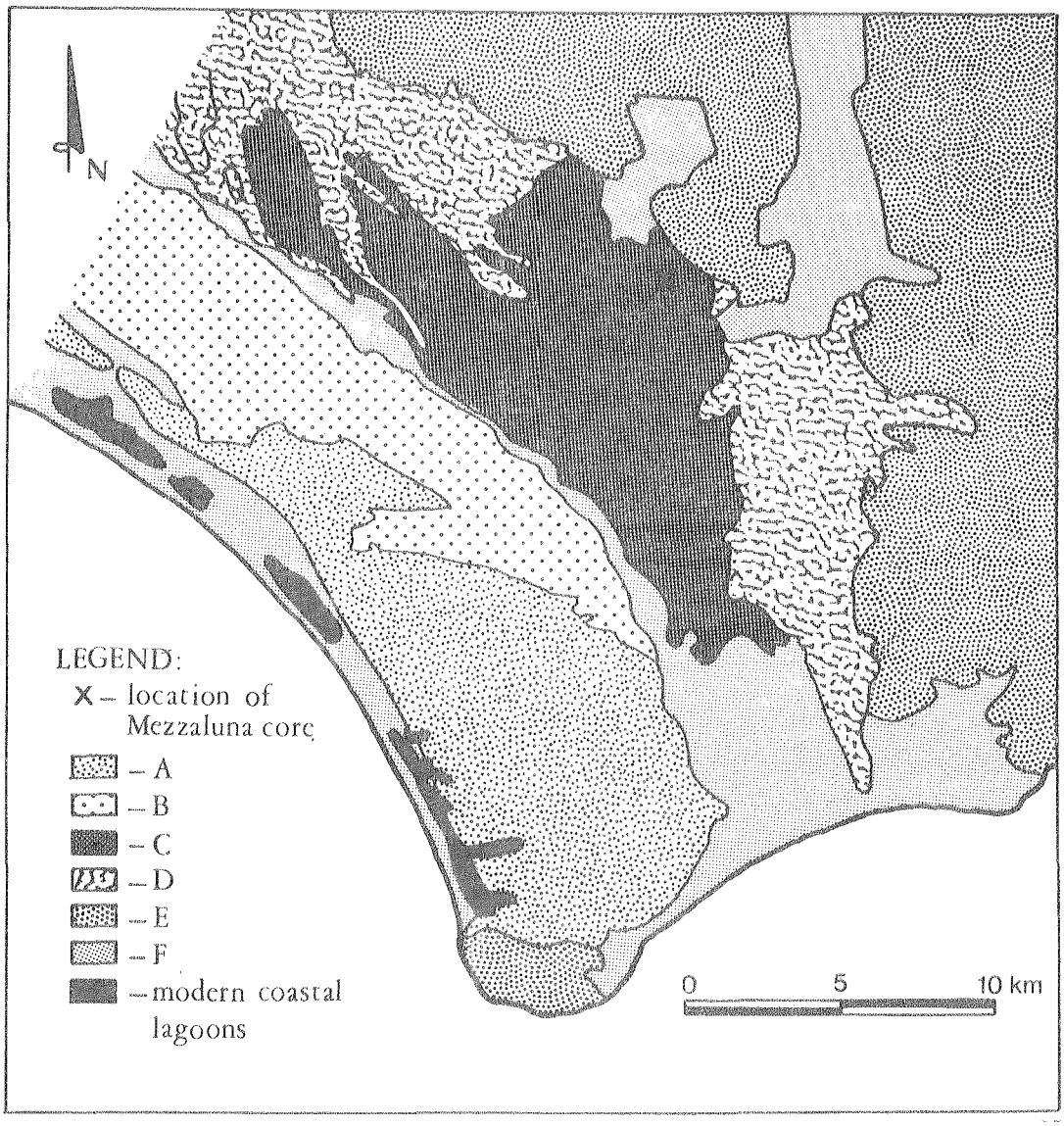

Fig. 5.5. Map of Agro Pontino region showing distribution of dominant soil types and areal divisions for synoecological groups used in palaeoenvironmental reconstructions of pollen zones C1 and D2 (Eisner et al. 1984).

a. dominant soil types
   A - Chromic Luvisols formed in sandy beach ridge and aeolian deposits
   B - Planosols formed in fossil lagoons
   C - Histosols and Gleysols formed in the graben area
   D - Luvisols and Ombisols formed in colluvium
   E - Lithisols and Rendzinas formed on mountain slopes
   F - Areas with multiple soil types
   (not included in palaeoenvironental reconstructions)

b. Pollen zone C1 (16,000 B.P.)
   A - Poaceae, Pinus and Chenopodiaceae
   B - Steppe vegetation
   C - Fe vegetation
   D - Sparse oak woods
   E - Pinus, Betula and Abies

c. Pollen zone D2 (6000-5000 B.P.)
   A - Dune vegetation
   B - Dry, open vegetation
   C - Dryopteris
   D - Quercus ilex forest, macchia garrigue, and Vitis sp.
   E - mixed oak forest belt

(1978) and from the I.P.P. survey allows general maps of the locations of archaeological material from the middle Palaeolithic up to Roman times to be constructed.

To date the Agro Pontino survey has found about 260 locations with archaeological material. Which of these locations can be called sites has yet to be defined and therefore in this paper locations are termed findspots.

Last year a typological study of the flints, most of which are made from beach pebbles, was made in order to date the findspots (Kamermans 1984). Overall, about 10% of the material consists of tools, 90% is debitage. The pottery is very badly preserved, and so far, with the exception of the Roman pottery, has been of limited use for dating. Nevertheless, preliminary chronological sorting of the sherds has been done. On the basis of these analyses, it was possible to assign the findspots, in a preliminary way, to different time periods.

Using data from the southern part of the Agro Pontino, where the survey is more complete, the land evaluation approach can be illustrated. In the two examples below, results are given but not the step-by-step details involved.

Land Use during the late Palaeolithic

Fig. 5.5 shows a general vegetational reconstruction of the area during the latter part of the last glacial, approximately 16,000 B.P. It is a result of the combination of the soil map and the palynological research. During this time period the climate was dry and cool. A represents dune vegetation with pine. B is Artemesia (wormwood) steppe. C represents marsh vegetation. D is sparse oak woods. This, combined with the physiographic circumstances, is the physical data which would be used to define land qualities for areas in the region. Now a socio-economic model for this time period, based on ethnographic, archaeological and historical knowledge, is chosen. Let us say the Agro Pontino was used by upper Palaeolithic groups to hunt large seasonally-migrant herbivores. The more suitable areas are those concentrated along the migration paths of large herbivores and those near fresh water in vegetation zones where the animals graze. Where these areas coincide with those containing raw materials for tool-making the suitability assessment would be even higher.

Looking at the preliminary survey results (Fig. 5.6), this seems to be a reasonable socio-economic model. Late Palaeolithic findspots are distributed along fresh water channels, near flint resources and at the entrances to the Agro Pontino. Of course, this is just an illustration, and in practice detailed suitability assessments of the region using a number of socio-economic models would be made.

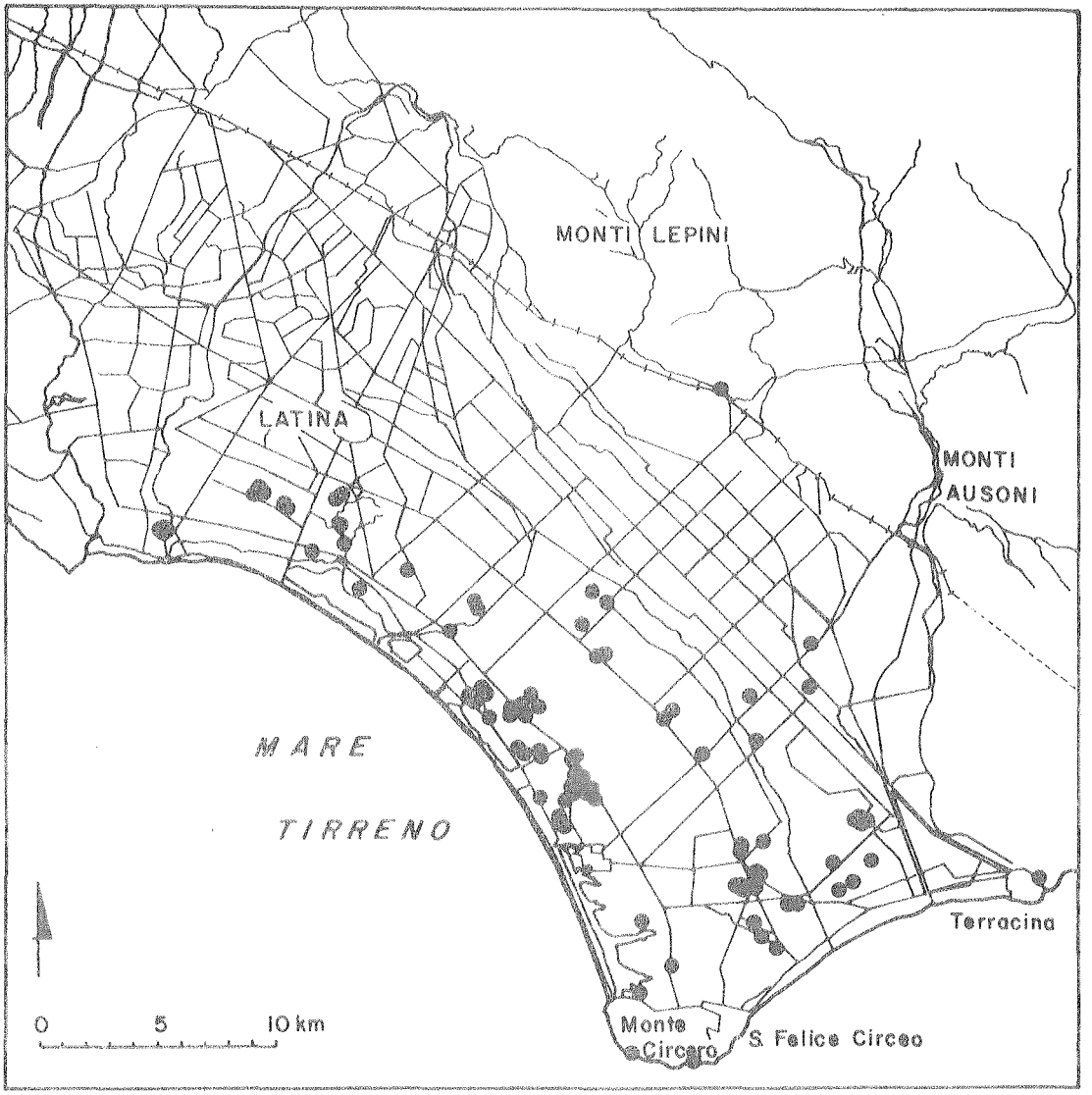

Fig. 5.6. Distribution of late Palaeolithic findspots (drawing IPP).

Land Use during the Neolithic

As the vegetational reconstruction shows (Fig. 5.5), by 6000-5000 B.P. the climate was already of a Mediterranean type. A again represents a dune vegetation with pine and the addition of tamarix. Here the soils are primarily chromic luvisols. B consists mainly of planosols supporting an open, dry vegetation with many herbs. C is a Dryopteris (marsh fern) marsh where the soils are histosols and gleysols. D is a combination of oak forest and macchia-garrigue on luvisols and gleysols. For this example, two different socio-economic models are selected: agriculture and pastoralism. Under a pastoralist model, let us say that because of lowland summer droughts, the Agro Pontino was used for winter pasture. Areas A and D would be quite suitable, but area B would be the most suitable and area C the least suitable. Under an agriculturalist model, the fertile and light soils which are relatively insensitive to summer drought - the chromic luvisols of area A - would be most suitable. Other areas would be far less suitable.

Fig. 5.7 shows that findspots with Neolithic material tend to cluster on the chromic luvisols near Borgo Ermada. In other areas, the findspots are fewer and more dispersed. The data collected so far might suggest that a socio-economic model incorporating several subsistence strategies might be appropriate for the Neolithic period.

Discussion

Figs. 5.6 and 5.7 show the first, very preliminary survey results which are based on less than 1% areal coverage. About 10% of the surveyable area will be covered in three more field seasons. In order to date the open-air sites more precisely, detailed study of archaeological materials from west central Italy in general, and from the Agro Pontino in particular, will be continued.

Pertinent to the application of the land evaluation approach are several natural and cultural impediments to reconstucting the palaeo-landscape. The post-glacial sea transgression has truncated a portion of the physiographic unit; colluviation at the foot of the Apennines has increased since Neolithic times; and aeolian sands, probably deposited during the late glacial, have covered the southwestern part of the survey area. Cultural impediments include a series of intermittent reclamation projects beginning in pre-Roman times; the most recent and the most extensive one began in the 1930s.

Analyses of the core samples proceeds very slowly, but it is expected that samples from the most recent lagoon will allow dating of the youngest terrace and subsequent inferences about how much of the archaeological record, chronologically speaking, has been truncated. The inland impact of colluviation and aeolian deposition can be assessed from archaeological settlement data gathered by the survey,

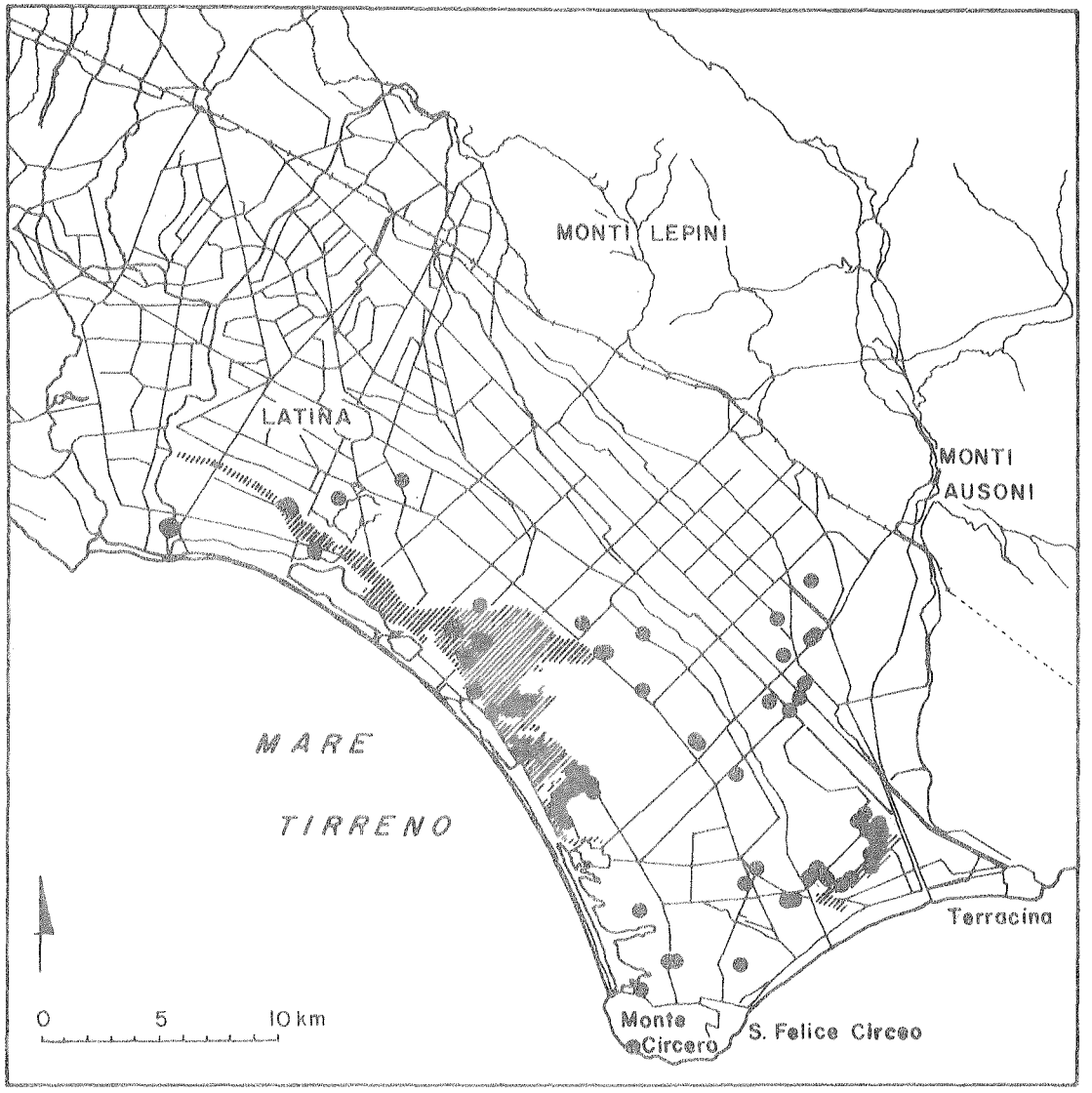

Fig. 5.7. distribution of Neolithic findspots. Shaded area shows distribution of Chromic Luvisols (drawing IPP).

Fig. 5.8. Map of the Agro Pontino by Cornelio Meyer 1678.

but this is of limited use for reconstructing the landscape in the areas affected.

In order to reconstruct the pre-reclamation physiography, air photos in conjunction with the more detailed records of the soil survey are being studied. There are a number of old maps of the area which are being used to reconstruct the socio-geographical history of the area up to the present day. Fig. 5.8 shows such a map made by a Dutch hydrologist, Cornelio Meyer, in the 17th century.

Conclusions

To summarize, land evaluation emphasizes the variable landscape. Landscape is seen as an entity and human activity is considered as something that takes place in and is part of this entity. The landscape was present first; man had to find his place in it and by doing so altered the landscape. By mapping these changes it will be possible to say something about the patterns of prehistoric landuse in the Agro Pontino, and we will be in a better position to focus on the details of human behaviour as represented in the various archaeological sites.

Bibliography

Beek, K.J. 1978. Land Evaluation for Agricultural Development. ILRI Publication 23. Wageningen.

Bietti, A. 1969. Due stazioni di superficie del Paleolitico Superiore nella Pianura Pontina. Bullettino di Paletnologia Italiano 20 (78), 7-39.

Blanc, A.C. 1937. Nuovi giacimenti paleolitici del Lazio e della Toscana. Studi Etruschi 11, 273-304.

Blanc, A.C. 1939. Un giacimento aurignaziano medio nella Grotta del Fossellone al Monte Circéo. Atti Soc. Ital. Prog. Sci. 27 (6), 215-221.

Blanc, A.C. and Segre, A.G. 1953. Excursion au Mont Circé. IVe congrès international du Association Internationale pour l'étude du Quaternaire. Roma.

Blanc, A.C., Segre, A.G. and Tongiorgi, E. 1953. Le quaternaire de l'Agro Pontino. Supplement au Excursion au Mont Circé. IVe congrès international du Association Internationale pour l'étude du Quaternaire. Roma.

Brinkman, R. and Smyth, A.J. (eds.) 1973. Land Evaluation for Rural Purposes. ILRI Publication 17. Wageningen.

Eisner, W., Kamermans, H. and Wymstra, T.J. in press. The Agro Pontino survey: Results from a first pollen core. Journal of Mediterranean Anthropology and Archaeology. In press.

FAO. 1976. A Framework for Land Evaluation. Wageningen, ILRI Publication 22.

Kamermans, H. 1984. Artefacten onderzoek Agro Pontino Project. Internal report. Rome, Istituto Olandese.

Mussi, M. and Zampetti, D. 1978. Siti preistorici di superficie nel territorio di S. Felice Circeo (Prov. di Latina). Quaternaria 20, 41-48.

Piperno, M. 1976/1977. Analyse du sol Moustérien de la grotte Guattari au Mont Circé. Quaternaria 19, 71-92.

Remmelzwaal, A. 1978. Soil Genesis and Quaternary Landscape Development in the Tyrrhenian Coastal Area of South-Central Italy. Amsterdam.

Segre, A.G. 1957. Contributo allo studio del Quaternario dell' Agro Pontino: Il travertino di Cisterna di Latina. Giacimento del Paleolitico Superiore e del Bronzo. Quaternaria 4, 191-197.

Segre, A.G. 1969. Linee di riva sommerse e morfologia della piattaforma continentale italiana relative alla transgressione marina versiliana. Quaternaria 11, 41-154.

Sevink, J. 1977. Het bodemonderzoek in de fysische geografie. Koninklÿk Nederlands Aardrijkskundig Genootschap Geografisch Tijdschrift 11, 189-194.

Sevink, J., Remmelzwaal A. and Spaargaren O.C. 1984. The Soils of Southern Lazio and Adjacent Campania. Amsterdam.

Sevink, J., Vos, P., Westerhoff, W.E., Stierman, A. and Kamermans, H. 1982. Sequence of marine terraces near Latina (Agro Pontino, Central Italy). Catena 9 , 361-378.

Taschini, M. 1968. La datation au C14 de l'abri Blanc (Mont Circéo). Quelques observations sur le mésolithique en Italie. Quaternaria 10, 137-165.

Taschini, M. 1970. La grotta Breuil al Monte Circé per una impostazione dello studio del Pontiniano. Origini 4, 45-78.

Taschini, M. 1972. Sur le Paléolithique de la plaine Pontine (Latium). Quaternaria 16, 203-223.

Taschini, M. 1979. L'Industrie lithique de Grotta Guattari au

Mont Circé (Latium): Définition culturelle, typologique et chronologique du Pontinien. Quaternaria 21, 179-247.

Voorrips, A., Loving, S.H. and Kamermans, H. 1983. An Archaeological survey of the Agro Pontino (prov. of Latina, Italy). In Keller, D.R. and Rupp, D.W. (eds.) Archaeologial Survey in the Mediterranean Area. (BAR International Series 155) Oxford, British Archaeological Reports, 175-181.

Zei, M. 1953. Esplorazione di grotte nei pressi di Sezzo-Romano. Bulletino di Paletnologia Italiana 8, 102-107.

Zei, M. 1954/1955. Ricerche preistoriche nel Lazio. Agro Pontino. Bullètino di Paletnologia Italiana 9, 64.

Zei, M. 1970. Ricerche nel Lazio meridionale. Rivista di Scienze Preistoriche 25, 323-325.

Zei, M. 1973. Un giacimento epigravettiano nell' Agro Pontino a Molella di Sabaudia (Latina). Rivista di Scienze Preistoriche 28, 107-132.

Summary

The authors review a long term archaeological survey of the Agro Pontino. The aim of the project is to investigate settlement changes from the middle Palaeolithic to the Bronze Age using land evaluation techniques (as used by the FAO) in conjunction with archaeological, ethnographic and historical data. Land use during the late Palaeolithic and the Neolithic is described.

Riassunto

Gli autori passano in rassegna la ricognizione di lunga durata del Agro Pontino. Lo scopo del progetto e di investigare i cambiamenti di insediamento dal paleolitico medio all'età del bronzo utilizzando tecniche di valutazzione del terreno (come quelle del FAO) insieme con i dati archeologici, etnografici e storici. E' descritta l'utilizzazione del suolo durante il paleolitico superiore e il neolitico.