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Pierluigi Giroladini

Between Land and Sea: A GIS Based Settlement Analysis of the Ancient Coastal Lagoon of Piombino (Tuscany, Italy)

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Between Land and Sea: A GIS Based Settlement Analysis of the Ancient Coastal Lagoon of Piombino (Tuscany, Italy)

Landscape archaeology; classical archaeology; Etruscans; Romans.

The main subject of this paper is the settlements of the Piombino Plain (Livorno, Italy), from the first Iron Age to late Antiquity. The study is based on archaeological and topographical data gathered during the last thirty years by a local association of volunteers (Associazione Archeologica Piombinese), with the aim of protecting the archaeological heritage of the whole valley of the River Cornia. Data published by the team of the University of Siena, Chair of Landscape Archaeology, engaged in distinct survey campaigns over the last 10 years, are considered as well.¹

The research was carried out with the aim of clarifying some aspects of the landscape (such as the extent of the ancient lagoon) and of the settlement organization of the area, with special attention to the Orientalizing and Archaic periods, ignored by previous studies. On the other hand, the final outcome of the study was the edition of an archaeological chart, to be used for preservation purposes, thanks to cooperation with the office of the Italian Ministry of Culture in charge of the preservation of the archaeological heritage of Tuscany.

The Plain of Piombino is the lower part of the hydrographic basin of the River Cornia. Marshes fed by the river occupied part of the plain until the 19th century, as stated by a number of historical maps. In modern times, starting in 1828, the area was drained for health and agricultural purposes. Our analysis is mainly based on maps from the end of the 18th and the beginning of the 19th century, the only ones that accurately represent geographical features and geometric characteristics that fit with modern cartography.²

However, the presence of a coastal lagoon or of a bay is recorded in maps from the 15th century on.³ Understanding its presence, shape and features in ancient times is key for a correct reconstruction of the settlement strategies.

In recent years some authors have tried to give a reconstruction of the lagoon in antiquity, focusing only on single elements, such as distribution of the archaeological sites, historical maps or ancient sources.⁴ However, only a multidisciplinary approach could help solve the problem.⁵

Here an attempt to review the key elements:

Ancient sources are not so useful because they do not provide any sure elements for the reconstruction of the ancient topography of the area. The most important source is Rutilius Namatianus (*De Reditu*, I 399–414), who gives a vague description of an area with

1 Cambi 2002; Dallai 2002; Botarelli and Dallai 2003; Botarelli 2004; Botarelli 2006; Cambi 2006; Ponta 2006; Botarelli and Cambi 2007; Cambi 2009.

2 See Fedeli 1983; Pellegrini 1984.

3 Fedeli 1983; Isola 2006; Isola 2009.

4 Bardi 2002; Camilli 2005; Isola 2006; Isola 2009.

5 Giroladini 2012.

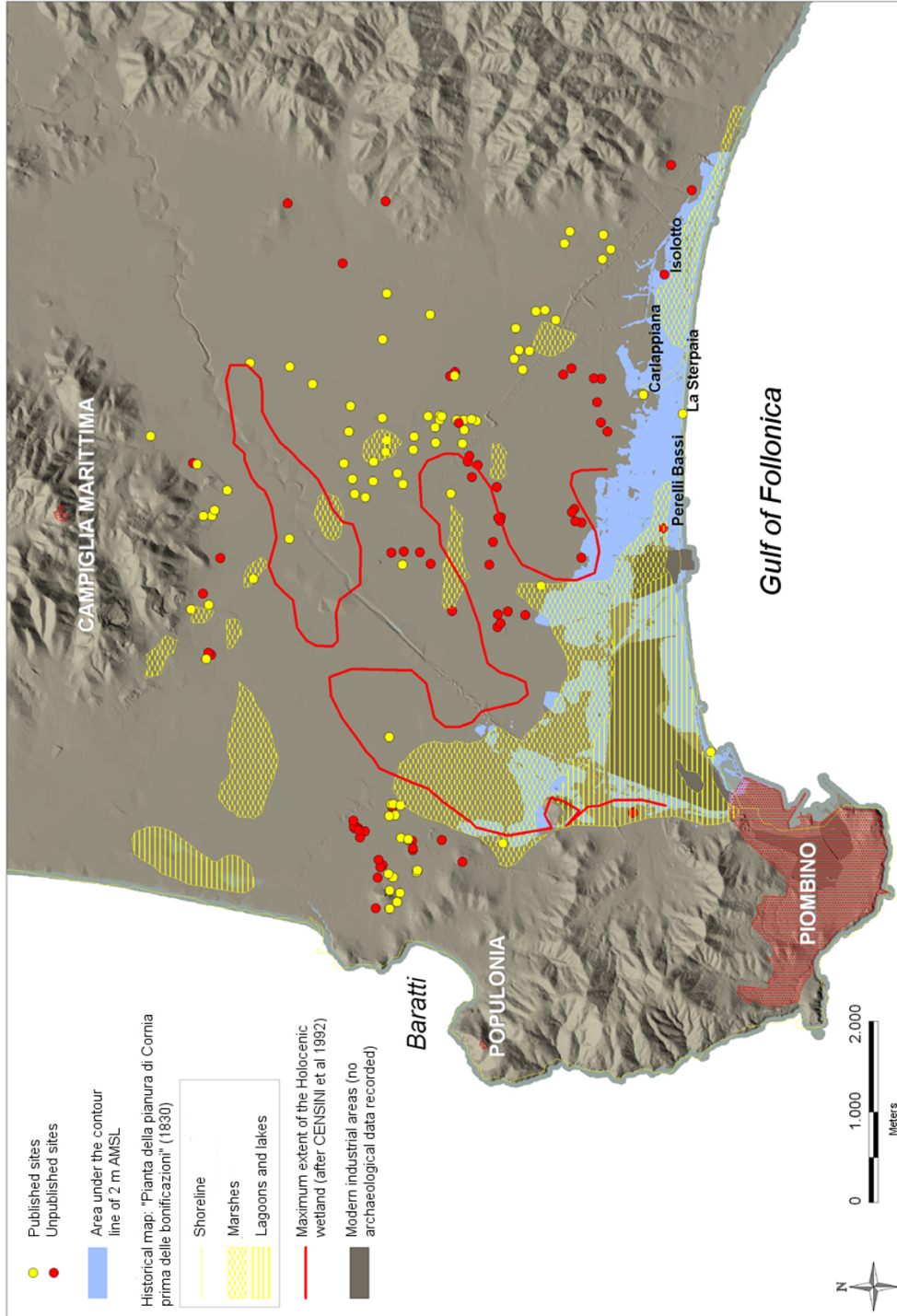


Fig. 1 | Research area; sites with toponyms are under the 2m AMSL.

a number of 'piscaria' during his stop at Falesia (modern "Portovecchio," in the southern part of the Promontory of Piombino) and in another passage talks about a gulf near Populonia that draws inland (*Proxima securum reserat Populonia litus/qua naturalem ducit in arva sinum*). According to Andrea Camilli⁶ this could be the description of the wide lagoon south of the ancient town. A passage by Livy (XXX 39.1) about the Roman fleet taking shelter near Populonia during a storm, is even more unclear:

Claudium consulem profectum tandem ab urbe inter portus Cosanum Loretanumque atrox vis tempestatis adorta in metum ingentem adduxit. Populonium inde cum pervenisset stetitsetque ibi dum reliquum tempestatis exsaeviret, Ilvam insulam et ab Ilva Corsicam, a Corsica in Sardiniam traiecit.

According to Camilli,⁷ the quotation shows evidence of the existence of a mooring area wider than the Baratti bay (traditionally considered the main harbor of Populonia, too little for gathering the entire Roman fleet), but no topographic description is provided by the Roman historian, so is not possible to have any idea of the mooring post of the battleships.

Tabula Peutingeriana is not useful either. It is hard to link the non-naturalistic, round shape of an inland lake close to *Aquae Populoniae* to a coastal lagoon.⁸

Historical maps provide great help in reconstructing the shape of the wetland,⁹ the best ones are the later ones: the map of the Plain of Campiglia, drawn in 1830, is important for locating the area now drained and useful for the analysis of site distribution (an absence of archaeological record in the area of drainage does not necessarily indicate an absence of sites, but could be caused by the presence of thicker layers of ground protecting the archaeological stratification).

Geological data give some basic indications of the extent of the wetland: recent geophysical analysis showed the presence of a water basin during the Holocene, and gave its maximum extent (dating back to 5000–6000 bp), allowing us to locate the Etruscan and Roman lagoon inside this area, and to reject the reconstruction of Carlo Isola, who proposes an extremely wide wetland.¹⁰ According to further studies, the presence of a coastal dune of sand is recorded by the 1st millennium BC.¹¹

A cross analysis of historical and geological sources and of the distribution of archaeological records can give an idea of the approximate extent of the lagoon from the Iron Age to late antiquity, even if an exact reconstruction and evolution of the coastline is not possible at the moment. Some authors¹² connect the presence/absence of recorded sites with the 2m a.s.l. contour line; indeed the number of sites under that level is very low. A new hydrographic, GIS based model, presented by L. Cappuccini at the last Congress of the National Institute of Etruscan Studies could be useful, but needs to be calibrated using the archaeological data. At the current state of research, the distribution of sites does not show evidence of a great evolution of the coastline between the 1st millennium BC and 1st centuries AD. It is possible that, with the emerging of the sandbar between 1000 and 500 BC, the lagoon slowly started to be filled by the sediments of Cornia River, progressively changing into marshes. Historical maps from the beginning of the 19th century may show evidence of the end of this process.

The proposed reconstruction of the landscape is the basis for the interpretation of the archaeological findings: the definition of the wetland area and of the dry land allows us to

6 Camilli 2005.

7 Camilli 2005.

8 Contra Camilli 2005.

9 Fedeli 1983; Isola 2006.

10 Isola 2006.

11 Costantini et al. 1990; Censini et al. 1992; Federici and Mazzanti 1995, 198. See also Gabbani 1983; Alessandro and Pranzini 1986.

12 i.e. Camilli 2005.

determine the space for farming and the space for the exploitation of lagoon resources as in the three case studies below.

So, during the first spread of sites, between the 7th and 6th century BC, is possible to define two different groups of sites, thanks to the topographic position and the kind and number of recovered materials. The small number of recovered sherds, high percentage of raw impasto storage pottery, together with the absence of fine ware, are markers of a group of small sites very close to the hypothetical lagoon area. On the other hand, a greater number of open sites, in the center of the plain, with less storage vases and a certain amount of bucchero ware were probably little farms, providing the main center of Populonia with agricultural products.

After a period of great decrease in the number of sites, caused by great social and political changes in the town of Populonia, the 3rd–1st century BC phase shows evidence of a new spread of settlement. A number of little sites are close to the lagoon; the main farms, that will become villas at the end of the period,¹³ are set in the internal part of the plain.

During the imperial period there is a crisis of settlement. Great land-owners progressively acquire new properties, causing a decrease of little farms and villages.¹⁴ The phenomenon also affects the area close to the lagoon shoreline. Only few sites date back to this period. One of them, at Carlappiana, is very close to the lagoon, and according to Campana¹⁵ and Patera¹⁶ is strictly connected with the *mansio/villa* site of Vignale, probably providing it with products from the lagoon (fish and salt). It is possible the same model could be applied to the other little sites on the lagoon side, now controlled by the main villas.

13 See Botarelli and Cambi 2007.

14 See Botarelli and Cambi 2007.

15 Campana 2003.

16 Patera et al. 2003.

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Pierluigi Giroladini, Soprintendenza per i Beni Archeologici della Toscana, Via della Pergola 65, 50121 Firenze, Italy, pierluigi.giroladini@virgilio.it