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19 Connections between Pernil Alto and other environmental zones

If starting from Pernil Alto, short forays for hunting game, collecting, and catching freshwater shrimp would have led the involved individuals most probably not further than three hours away from the site (see Figure 156). The “catchment area” of Pernil Alto was thus probably relatively restricted. It included access to the most important zones for the inhabitants, which—aside from the cultivation fields in close proximity to the site—were: the riparian forest of the Rio Grande and the river for the collection of *Prosopis* fruits, fuel, freshwater shrimp, and hunting of rodents, birds, cervids, and camelids in season; the grassland which was connected to the river valley where hunting of rodents, birds, cervids, and grass collection was possible. The most important zones for collecting all necessary materials were located in relatively close proximity to the site, and would not have required overnight stays.

It is not clear if occasional longer forays to the highlands or to the littoral were conducted, or if an exchange with another group is the origin of the materials from these areas. Further research and the evaluation of other contemporaneous sites would be necessary to study these relations. Settlement studies evaluating such exchange systems were conducted for a Neolithic settlement area in Western Germany (Zimmermann 1995) and delivered very detailed and valid results.

However, if the occupants conducted forays, then an approximately four day-long foray to the highland would have been necessary to obtain obsidian from the likely source of Quispisisa (see Figure 156). The littoral was closer and could have been reached within one or two days. Two preceramic sites are on this possible route following the Rio Grande. Las Brujas (Vogt 2007, 2008, 2011) is more or less situated halfway between Pernil Alto and the littoral and—being a rock-shelter—could have played a role as a connecting site with the coast. Santa Ana (Engel 1963b, 1987a) is located directly on the littoral. This estuary area was the origin zone for the sea

shell remains and artifacts found at Pernil Alto. Santa Ana was therefore probably connected to the appearance of this material at Pernil Alto. However, the studies of Las Brujas are ongoing, and the results of the studies of Santa Ana are not in-depth enough to provide a clear estimate of the nature of the connections between those sites and Pernil Alto at this moment.

An integration of Pernil Alto into a settlement system is imaginable in the following way: Agriculture was practiced in an intensified way in the middle valley sections—where Pernil Alto is located—until it formed the basis of the subsistence. Simultaneously, stabilizing connections to the littoral area are traceable with the recovered shell remains. The settlements located on the littoral—like Santa Ana—most probably concentrated on marine resources, given their abundance and that arable land was probably very limited due to the narrow river valley at that point and possible influx of brackish water. Those littoral settlements provided some marine resources for settlements in the hinterland. Due to the specific topography of Southern Peru, relatively large distances lie between middle sections of the rivers with agricultural production and the littoral zone with a concentration on marine resources. Crossing this distance would have taken at least one complete day of walking (see Figure 156). A mixture of different economic systems and mobility patterns can be assumed for the area between the previously mentioned ones. This intermediate area represents a possible area that was passed through or a connection between the previously mentioned larger areas. The sites located within it—as represented by Las Brujas—represent possible stopover sites.

Thus, the various environmental zones were already connected, even though the specific nature of this connection is not definable at the moment. The connections between the littoral zone and the fertile river valleys of the hinterland were more emphasized and stable than those between the river valleys and the highlands.

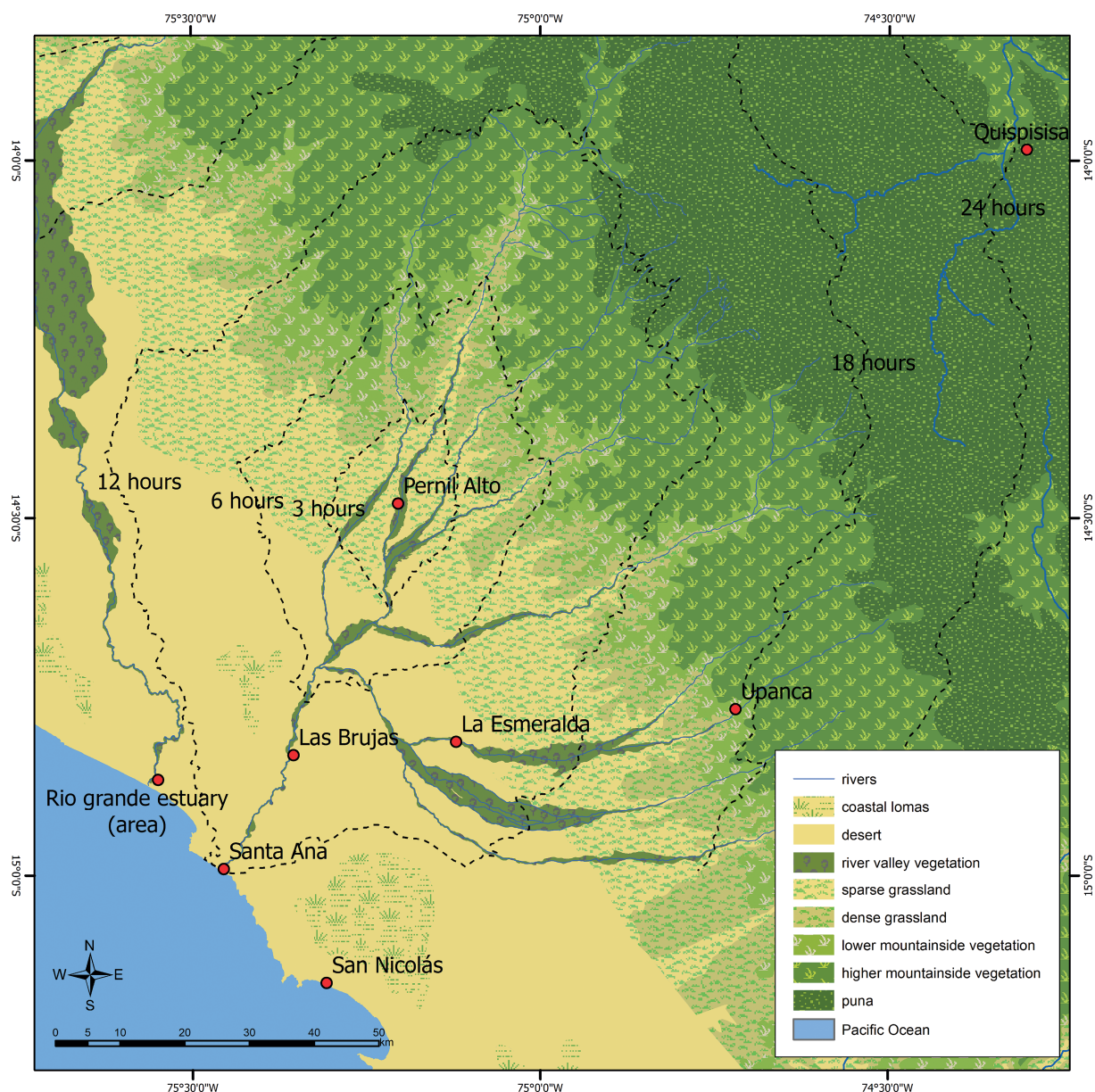


Figure 156: Map showing the location of Pernil Alto in the reconstructed landscape during the occupation of the site. The other known sites of the Rio Grande basin and Quispisisa are mapped. The dotted lines indicate areas reachable within a certain time.³²

³² The map was made based on the function "Path-Catchment" in ArcGIS 10; the factors for the surmounting of landscape gradients are based on Tobler (1961) but modified and generously pro-

vided by Markus Steffen (in prep.), then at the Institute of Pre- and Protohistory at the University of Kiel, Germany. Rivers were weighted with a factor of 3 ×.