A Brief Examination of the Archaeology of the Maquipucuna Area in Northwestern Ecuador

By
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Introduction

This brief report chronicles a very limited examination of some of the archaeological resources of the Maquipucuna Reserve in the state of Pichinchi some 30 kilometers northwest of Quito, Ecuador. This project was done at the behest of Rodrigo Ontenada and Rebecca Justicia as a small part of a much larger project of developing ecotourism for Maquipucuna. I thank both of them for their support and friendship. I also thank Leah Ostrander, an archaeology student from Wisconsin, for her invaluable held as a volunteer at Maquipucuna for almost half of this project. She also provided a few of the photographs for this project. I also thank Zack Williams, my son, for help on some of the survey. He and David Ontenada found the first pottery at two of the small sites found in this project. I thank Marco, Alphonzo, and Markeño on the staff of Maquipucuna for their help as guides on various occasions. I thank José Valverde for permission to visit the Palmitopamba site.

There has been very little previous archaeological research in this area. The most complete account is that of Ron Lippe (1998). This book-length account of the archaeology of the western Pichincha is an invaluable guide to modern archaeology in the area. My small contribution here is a tiny footnote to his multi-year program.

This work was conducted between August 6 and August 11, 2000. The first day was spent in an area northwest of the main part of Maquipucuna proper near the village of Palmitopamba, and also on the nearby farm known as Orongo. Orongo was also revisited briefly on the final day of field work, August 11. The remainder of the time was spent on Maquipucuna proper, or immediately adjacent to it. I also had the opportunity to visit, as a tourist, the preserved archaeological sites of Cochasqui on August 5 and Ciudad del Sol on August 11, both in the area north of Maquipucuna.

The major goal for this project, as initially conceived, was to map the presumed Inca fortress at Palmitopamba (Lippe 1998:166, following 191, 329). It was not at all clear how long this would take, but it was assumed that it would take at least two or three days. This mapping work was completed with the use of a GPS unit in a single morning, however, and thus the door was opened for other projects to be considered in the time frame available to me (roughly 1 week). The major additional goals undertaken included surveying for small archaeological sites on the lands already owned by Maquipucuna, and mapping the existing trail system using the GPS unit. I will present the data on all these little projects in sequence in the remainder of this report, and conclude with some comments on the specifics of the GPS aspects of the project.

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Palmitopamba

The brief examination of this site took place on the morning of August 6th. The relevant map of the site is presented in Figure 1. The trail followed from the southern edge of the present town was marked on the figure by the GPS unit. It goes to the south-southeast as it climbs the high ridge upon which the fortress is located. A small, currently unoccupied, structure along the way is labeled “House” on the drawing. Some 200 meters uphill to the southeast of this house the hill rises sharply, and a small set of presumably intentionally placed rocks is located (Figure 2). These are marked on the map, and define the northwestern corner of the site as currently understood. These represent the only large rocks seen at the site, although, most of the hill was heavily vegetated on my visit, and there could be others I missed.
The entire site area is marked on the map by a set of straight lines that are subdivided into three parts. The small northeastern triangular area and the large southwestern area are covered with a growth of trees and shrubs that appears to be natural vegetative regeneration of unknown age. The central section of the site is planted regularly by José Valverde in millet. At the time of my visit the grass was head high in most places (and loaded with chiggers!). My estimate of the total size of the fortress, sides included, is just over 2 hectares measured on a plane. The steepness of the sides, however, would increase the actual land surface by a small amount however.

Access to the summit in this planted center section of the site is steep, and traverses at least three separate narrow terraces (each marked with a “T” on the map). The summit and the terraces are formed on the map by two sets of lines—the black line showing the area walked with the GPS unit, and a grey line that marks the presumed actual location of the edge of the summit. The difference is due to the simple fact that I did not walk all the way out to the exact edge of the summit for safety sake. The summit is actually in staggered sections, with the northeastern portion being the highest. The total length of the summit is a little over 200 meters, and the width varies from only 15 to 20 meters. Thus, the summit is a long narrow high ridge that runs from northeast to southwest. I was most surprised by the narrowness of the summit, and the small total area of only about .4 hectare. How many people could have been housed here and for how long is unknown. I saw no evidence of rock structures on the summit, and I observed no artifacts at all. Admittedly the ground cover was thick, however, and I could have easily missed something important. The view in every direction from the summit is wide and stunning. The drop on the southeastern side from the summit is shear and drops over 200 meters to a small stream.
The three terraces recorded on the map are also very small. The middle one is the largest, and measures about 40 meters by 5 meters. The ones just below and above this one are smaller in length, and about the same width. There may be other terraces based upon inspection of Ron Lippi’s photo of the hill (Lippi 1998:after 191), but these were not visible on the ground at the time of my visit.

Palmitopamba is clearly an important site in the region, and should have much more extensive testing and excavation. I strongly support the idea of preserving this monument.

Orongo

The farm of Orongo was acquired by Maquipucuna to demonstrate multi-crop methods that are both financially viable and better for the land. It also permits some limited profit potential for helping support other worthy goals of the preserve. The area is located northwest of Maquipucuna proper about 10 kilometers, and is thus just east of the community of Palmitopamba. I visited it briefly on two occasions during my trip to Ecuador. The first was on the afternoon of August 6th in the company of Rodrigo Ontenda, Markeño who lives at the station house there, Leah Ostrander, and my family--Anne Shenk, Zack Williams, and Leah Williams. Anne had visited this area the week prior to my arrival, and she had seen an area at Orongo with much native pottery in a small field just over 200 meters uphill (south) from the Station House. I was taken to this spot and observed a concentration of fairly large pottery sherds (Figure 3). This had reportedly been first found by Markeño while digging holes for planting the crops (corn?) in this field. He noticed the sherds, and did not put a plant in that hole, but left it open as it was when Anne, and then I later saw it. We gathered up the sherds that were cast about, observed that all were plain, unpainted sherds, and placed them back in the hole, which was ca. 40 centimeters across and no more than 20 centimeters deep. Apparently a few had been removed on earlier visits, but we removed none on my visit and reburied the sherds by hand, after marking the location just into the field and very near a small fence (ca. 3 meters west of the fence). The area just east of the fence was on the crest of the narrow ridge, and had some huge banana trees growing there. At the time of my visit, I could not map the location with the GPS because it was already full of the Palmitopamba data, and I did not have a laptop along on the trip. I did return to the Orongo site on the morning of August 11th with the GPS unit and was able to map the spot in relation to the Station House, the water source, and a number of other outbuildings at the compound (Figure 4). The Universal Transverse Mercator (UTM) mapping coordinates of the site are 19042 North and 760428 East.

On my first visit to the site we spent about 10 minutes looking in the plowed and planted field in the vicinity of the pottery concentration to see if other artifacts were present on the surface nearby. None were noted. This raises the question of where this is really an occupation site, or merely the location of a single large vessel (perhaps for water) that might have been broken here at some time in the past. In any event, the feature/area should probably be investigated further in the future.

Also, I walked uphill for about 200 more meters on August 6th, but saw no other artifacts. My survey, was minimal at best, however, as time was limited, and a more detailed survey of the entire Orongo area is clearly warranted in the future.
Figure 3. Orongo Plain Sherds
Maquipucuna Proper

The majority of my time in Ecuador was spent in and around the developed center of the Maquipucuna Reserve, near the tourist lodge. As stated before, my two goals in this area were to map the trail systems near the lodge with the GPS unit, and to discover and record any new archaeological sites that might present themselves in the process. I succeeded in both goals. The first figure I present (Figure 5) is a GPS map of the Lodge area, showing the Lodge itself, the two office building, the Bridge into the compound, and the two buildings at the Research Center, as well as the locations of the main Garden and Parking. The trail connecting the Research area and the Lodge is also shown in accurate location. On the northern side of the Bridge, the main road to the west is shown as far as the driveway to the Guest House. The sizes of the buildings are only approximately to scale, but their locations are accurate.

The first sites I wish to discuss are represented on Figure 6, which shows the area to the northeast of the Maquipucuna Lodge area. On the morning of August 8th, I was taken to this area by Alphonzo. A steep road, recently bulldozed and widened ascends the hill immediately northeast of the bridge into the lodge area, on the northern side of the Umachaca River. The new steep road leaves the main road to the east from the Bridge on the north side on the main road and goes first up to the east. It quickly cuts back to the west and begins ascending the hill. A few meters after the next cut back to the east, a clear ditch is visible on the left, or high side of the road. This is a remnant of the Calunco, or ancient trail, that climbed the hill in this location. This is marked on Figure 6. After another cutback to the northwest, the road ends in a small flattish knoll that was recently heavily bulldozed and flattened further artificially. There were several plain potsherds found scattered around this small knoll, and this is marked on Figure 6 as the Site defined by a small circle made with the GPS unit. No sherds were collected from the surface, and they were only thinly scattered. This was likely the location of a small house at some time in the past.

From this flat area, a trail through several gates and pastures led through relatively flat land to the Ximanex house, where Alphonzo wished to show me where many sherds were located. This house sits on a high peaked hill at the southeastern end of a ridge that runs to the northwest, presumably to the old Culunco. As one ascends the path up the ridge toward the house, an area with many sherds is located eroding from the sides of the path. A brief search of the yard and surrounding fields just north and east of the house showed that the concentration of pottery was mostly to the west of the existing house. This site likely represents another small farm location from antiquity. None of the three area just discussed are on the Maquipucuna Reserve. It was reported by Marco? That there was much pottery located at the current home known as La Playa, which is south, southeast of the area just discussed, and also outside the area of the Maquipucuna Reserve. I did not visit this reported site.

The remainder of the sites located during my brief visit consists of small pottery sherd scatters located on the main part of the Maquipucuna Reserve. These are all shown on Figure 7. This figure also shows the major trail system at the Reserve, with the Lodge located at the junction of the many trail in the northeastern part of this figure. There were 10 separate locations of pottery found and marked on this map. The numbering scheme was obviously arbitrary, with sites 1 through 6 found on August 7 along the Sendero Principal to the south. I was unprepared for the large number of sites located along this trail, and their GPS locations were confirmed over the next several days. Small collections of sherds were made at most of these sites (all collections...
Figure 4.
are curated at the Research Station in the compound).

Sites X and Y were found a couple of days later than the first six. Site Z1 was found by my son, Zack, on a small side trail off of the River trail that leads down to the Umachaca River. It was surprising to find any sherds on this very narrow ridge, and the location seems unlikely to have been the location of a home. Site D, for David, was found by Tall David as part of his environmental testing program and reported to me after the fact.

The main Calunco, located to the southwest of Site 6 on the map, is not accurately mapped by the GPS at the present. Techniques developed after I was in this area, and discussed in the end of this report, might help in accurate mapping of this deeply entrenched and important feature. Further, the location of the mound along the central portion of the southern edge of this feature was not mapped by GPS as part of this project. It is not included on Figure 7, therefore.

Further, no location is indicated on the map for a new mound located on August 11 by Rebeccah Justicia well to the south, near the crest of the mountain.

**Observations**

All of the nine sites other than Z1 were probably the locations of small farm houses. The vast majority of these are along the main trail to the south, and I suspect this trail may have been here for a long time. No sites were located on the many side trails in the river valleys to the east and west. The spacing between sites is apparently somewhat even, particularly along the main trail. Most sites are around 200 meters apart from each other, a number of slightly less distance (mainly to the northeast nearer the Umachaca), and a few of greater distance. Assuming all these are contemporary, however, this clearly represents a small community of some sort.

The recently discovered Bog, located on the new trail, is also accurately marked on Figure 7. This odd location, just northwest of one of the Caluncos, definitely needs to be studied soon. Is it the source of the salt for which the area is presumably known? If so, all of the people in this little community would have been specifically attracted here for this resource.

The pottery from all the sites was plain, with the single exception of a possible red filmed plain sherd from Site 2. Most of the sherds were well smoothed, but a very few were moderately well burnished. They generally were tempered with moderate amounts of medium-sized quartz particles, and most also have a moderate amount of golden-colored mica flecks include.

Only a single piece of flaked stone was found at any of the sites. Lithic tool production, and perhaps even use, seems to be rare in this collection of sites.

The vegetative cover at Maquipucuna clearly makes the locating of small archaeological sites difficult. All those found were located in and along the trails except for site D1, which was found by shovel work incident to other research. A program of shovel testing would be necessary to expand the data on site location away from the existing trails. Further, shovel testing would also be necessary to determine the full sizes of the sites that have now been discovered and reported here.

There are a great many more archaeological data gathering project that need to be conducted at Maquipucuna. Specific initial questions and projects include the following. How many additional small ceramic scatters are located at Maquipucuna? Is the correlation with the Sendero Principal real or accidental? Is the strange nature of the bog the reason for the development of this early community? Can the Caluncos be more accurately and completely mapped though advanced GPS efforts? The two know mound sites need accurate maps made, presumably with true surveying equipment. Both of these sites need shovel testing to determine
Figure 5.
the size of the occupation immediately around them, assuming there is such occupation. A bigger goal for the future will be expansion of the efforts begun here in the heart of Maquipucuna, to document sites in the thousands of hectares owned by the Reserve away from the tourist and research center, both in the upland areas to the south, and in the newly acquired areas to the northwest toward the coast. This is every bit as important as any future excavation efforts that might be planned at any of the known sites on Maquipucuna. Archaeological research at Maquipucuna is still in its infancy, but this brief project has, I hope, helped move it in the right direction. Only time will tell.

**Marianitas**

Although it was not an “archaeological” part of the project, I happened to spend most of the afternoon of August 8th charging batteries in the town of Marianitas near the Maquipucuna Reserve, and used the opportunity to map the core of the town using the GPS unit. This was at the request of Rebeccah Justicia. The mapping consisted of a simple slow walk around the plaza, with a pause in front of each structure to mark the location of its center front. The map is presented here as Figure 8. The path I walked is marked by the solid line. It begins at the school in the southwestern part of the town, proceeds up the northern side of the plaza, circles to the town entrance in the north, goes by the nearby Church, comes back in front of the store, and then goes back to the school area, coming down the southeastern side of the plaza. The mapped locations of the houses and structures are estimated based upon my route. I did not map the few structures that are along the road to Maquipucuna that exits the plaza from its extreme eastern (northeastern) corner. I stopped about 5 meters in front of each structure to mark its location, and the sizes of each house is standardized. The main part of the town is about 160 meters northeast to southwest and 100 meters northwest to southeast, or 1.6 hectares in size.

**GPS and Maquipucuna**

One significant and successful part of my brief project was an attempt to use a Global Positioning System (GPS) unit at Maquipucuna for mapping in light of the important events of May 1, 2000. On that date, Bill Clinton, President of the United States, signed an order turning off what was known as “selective availability” of the GPS system. Selective Availability caused inaccurate positional information to be given to any users other than US military personnel. The removal of this feature, also known as “spoofing”, immediately increased significantly the accuracy and consistency of GPS readings to any and all users of the system.

The primary initial goal of the little project described in this report was the mapping of the Palmitopamba fortress. I had initially considered mapping the fortress with a Total Station style survey unit and associated digital data recording unit. But these expensive items, and the associated additional tripod and mirror pole would have been very difficult at best to transport from my institutional home at the University of Georgia. I was therefore delighted when the removal of selective availability in the midst of my quandary made GPS an attractive possible alternate mapping system. Experiments in Georgia and New Jersey showed great promise, and I decided to go with the GPS mapping option.

The GPS unit used for the work in Ecuador was a Garmin GPS III+, a new feature-laden unit that is very inexpensive in price, and is very widely available as a consumer item. I used no
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Figure 7.
external or separate antenna, although such an additional antenna might be worth considering for future use at Maquipucuna. Certainly a comparison might be warranted with the tiny antenna mounted directly on the standard palm-sized unit. At the end of each data gathering session, the data were down-loaded onto a simple Dell Inspiron 3800 laptop PC. Because there was no readily available electricity during the summer of 2000 at Maquipucuna from which to recharge the laptop on a regular basis, I deferred detailed analysis of the data until I returned to the United States.

The specific function of the Garmin GPS unit that was most valuable for mapping purposes was the function that permitted the creation of Tracks. This function essentially takes a position at the time or distance specified by the user in the configuration of the unit. Incidentally, all position measurements made on this project used the UTM system for grid referencing, and used
1969 South American coordinate system, one of the standard reference systems included in the GPS III+. After a certain time or distance, a dot was placed on the LCD screen of the Garmin unit and, thus, created a series of dots that could be connected to create a map of where the user had traveled. I found that time-based Track mapping was the most valuable for my purposes. For most purposes the time of 1 second was chosen as the interval between position recordings (dots). The unit can hold some 1900 track readings, so this permits continuous recording for about 33 minutes before downloading becomes necessary. A 2-second interval would permit 66 minutes of data to be recorded, and so on. The trade off, then, is between accuracy and amount of data being recorded before data downloads. If the user is walking a reasonably straight line, and the terrain is relatively open, then several seconds between positions is perfectly acceptable. If, however, the user is walking a frequently curving path, or one that is badly overgrown, the 1-second intervals are necessary.

The recording of a position depends upon clear reception of at least three satellite signals. In general, the reception generally was excellent in Ecuador. On occasions I was able to lock in even nine or ten of the satellites. In deep river valleys or gorges, however, the ability to lock three satellites was much more problematical. I was able to come up with a workaround eventually that did permit some limited mapping of trails or locations in such places. The trick is to begin outside such areas in the open, and have the unit fully locked onto at least three satellites before entering such places, and to be sure and use 1-second intervals for the tracking. When the unit fails to receive a signal for a few seconds after descending into these narrow places (and it will), the unit will tell you it is having problems receiving signals, and will ask you if you wish to continue. The positive response to this important question requires a press of the enter key for acknowledgment, and the unit will resume trying to relocate the satellites. Even if it gets only an occasional good reading from the satellites, the unit will continue as long as your are willing to press the Enter key to acknowledge the poor reception from time to time. In this way, some useful, but obviously limited mapping information may still be obtained in deeply entrenched areas. If one waits until one is in a deep ravine before attempting to lock to satellites for the first time, the unit will not work at all. Poor or limited data is better than no data. I routinely carried the unit at about throat level in from of me, so I could see the reception warning as soon as it appeared and then press Enter immediately. There is, of course, a bit of an art to walking steadily, even over rough terrain, while keeping an eye almost constantly on the screen of the GPS unit.

If much data must be recorded on the same date in a region that is deeply entrenched or overgrown, then the carrying of a laptop computer to the field to download the data frequently is essential. Incidentally, the battery life of the Garmin unit is very long, with the four penlight cells it uses, and I do not recommend the use of an external battery pack. The batteries will last for at least a week under normal use. Carrying a single extra set of AA batteries to the field is much easier than using a larger external battery with accompanying cumbersome wires.

Once a set of data was completed in the GPS unit, it was first downloaded on the PC laptop using the proprietary Map Source software that comes as a part of the World Map CD marketed by Garmin as an optional addition to their GPS system. The data on this CD for the Ecuador region, incidentally has too few details to be of much value. Once the Track data were successfully downloaded to Map Source (version 3.03), there were first saved on the hard disk as a .mps file (Map Source native file format). Each data file was then exported from the Map Source program through the “file, export” function as a tab-delimited text file (ascii file). Each of these files were then cleaned up in a word processing program (Word Perfect) to make it ready for importing into the program Surfer (version 7.02). The file consists of UTM north and east coordinates for each
and every data point recorded as a Track point, arranged one point per line of text.

This text file is brought into Surfer and used to create a “post map” (map, postmap) on the screen. This plots the relative location of each and every track position reading as a dot. These files were then each saved from Surfer as a .srf file (native surfer format). While in Surfer, grids were plotted and limited labels were added for each map. Further, wild or obviously inaccurate position points were removed from the datasets before final printouts of each map were made. Also, in the case of the main trails at Maquipucuna proper, many separate files were combined, and redundant points were eliminated before final mapping took place in Surfer. This process was tedious and time-consuming—yet another case where computer processing and analysis took longer than it took to actually gather the data in the field!

Once printed maps were derived from all the datasets and printed from Surfer, another important step was necessary to create the true final maps. All the maps were then placed on a digitizer tablet and a digitizing pen was used to trace/digitize the drawings into the program Didger from Golden Software in Golden Colorado, the same people who make Surfer. This was necessary to create continuous line drawing from the dot maps—truly to play connect the dots. Obviously in areas where the data dots were widely spaced (such as in the deep valleys) a limited element of hand-eye interpretation was involved. The resulting maps were then saved in Didger format, and then exported back to Surfer where they were cleaned one more time and reprinted. The files were then exported for inclusion directly into this report, which was created using WordPerfect 9.

Obviously this entire multistep analytical process is cumbersome, and perhaps even a bit clumsy, but the results, I believe, are worth the effort. In the future, as the uses of GPS data are expanded, perhaps more direct software solutions will become available. The advent of sub-meter accuracy for GPS with the removal of selective availability will, I believe, spur many such software developments over the next year or two. In the short run, however, I strongly believe that Maquipucuna should continue using GPS as an important part of its goals of preserving the vital cloud forests of Ecuador.

References Cited:

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