DRAFT

Environmental and Cultural Resources Surveys for Cerro Balcón Non-Time-Critical Removal Action at the Municipality of Culebra, Puerto Rico

Prepared for

United States Army District, Jacksonville
United States Army Engineering and Support Center, Huntsville

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1.0 INTRODUCTION

In accordance with requests by the regulators involved with the Technical Planning Process and the approved Work Plan, Ellis Environmental Group LC (EEG) is required to provide a cultural resources and environmental survey of each cay that will be investigated under this contract. The purpose of the surveys is to identify cultural resources, sensitive habitats, and endangered plants and animals that may exist in the work areas.

EEG employed South East Archeological Research (SEARCH) to perform the cultural resources survey at Cerro Balcón. EEG conducted the habitat and endangered species surveys. The results of the cultural resources survey is included in Appendix A. The habitat and endangered species survey is included in Appendix B.

2.0 RESULTS OF SURVEYS

2.1 Cultural Resources Survey

Based on the data in the survey report (Appendix A), there were no significant cultural resources found at Cerro Balcón that would limit the surface removal of Munitions and Explosives of Concern (MEC) from this site. As SEARCH personnel observed, there should be no limitation to EEG operations based on cultural resource issues.

The SEARCH expert provided a cultural resources briefing to EEG personnel during the initial project mobilization. All team members will be on the lookout for any items of potential cultural significance. If items are found, EEG will map each location with the GPS and send the coordinates and pictures to the U.S. Army Corps of Engineers, Jacksonville District (CESAJ) project manager to be forwarded to the Cultural Resources Specialist.

2.2 Environmental Resources Survey

EEG discussed the vegetation removal with the CESAJ and the Puerto Rico Department of Natural Resources (DNER) prior to conducting the removal action. All native trees with diameters greater than 1-inch are to be protected at Cerro Balcón.. All non-native species may be removed.

APPENDIX A
CULTURAL RESOURCES SURVEY

Archaeological Walkover Survey Associated with Unexploded Ordnance Removal, Cerro Balcón, Isla de Culebra, Puerto Rico

Prepared for

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August 2006

Archaeological Walkover Survey Associated with Unexploded Ordnance Removal, Cerro Balcón, Isla de Culebra, Puerto Rico

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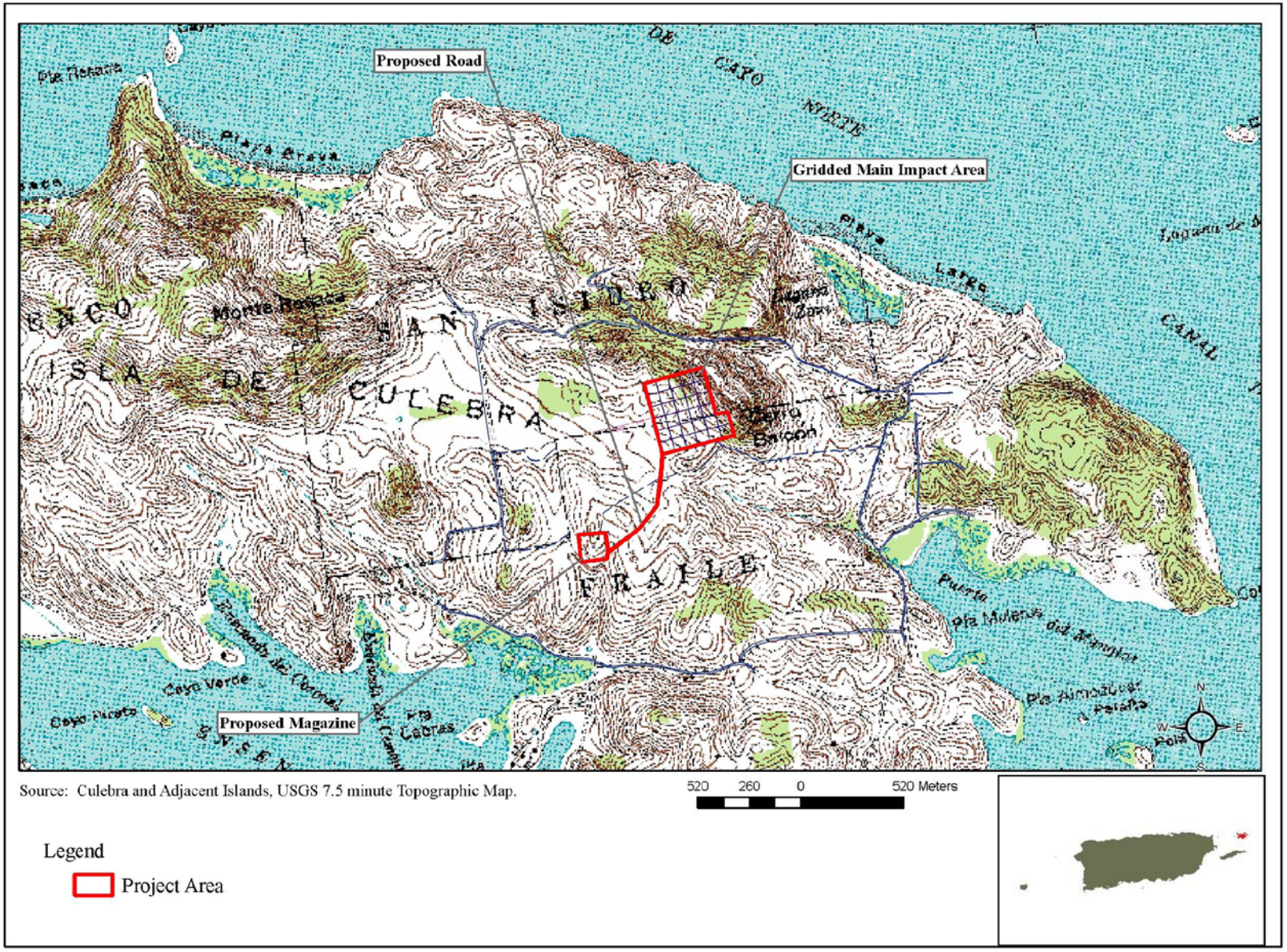
INTRODUCTION

In April 2006, Southeastern Archaeological Research, Inc. (SEARCH) of Jonesville, Florida was engaged by Ellis Environmental Group, LC, to conduct an archaeological impact assessment of the project area for the Culebra Non-Time-Critical Removal of Unexploded Ordnance (UXO) at Cerro Balcón. Dr. William F. Keegan, Curator of Caribbean Archaeology, Florida Museum of Natural History, University of Florida, Gainesville was sub-contracted as the Principal Investigator. Dr. Keegan conducted his investigations between April 19 and 24, 2006. He returned to Culebra on May 16-18, 2006 to conduct a training exercise for the individuals involved in clearing the site of UXO. He also participated in a public meeting on the evening of May 17th.

The project area encompasses 32 acres of a former U.S. military mortar range, from which UXO and associated debris will be removed from the surface. The project area has three subareas: the main impact area (as defined by a collection grid), a proposed magazine at which explosives will be stored, and an unimproved road to be constructed between the magazine and the main impact area. All three areas were surveyed for cultural resources. Due to the presence of UXO on the property, Dr. Keegan's investigations were limited to a walkover survey and no subsurface testing could be undertaken. An Explosive Ordnance Disposal (EOD) specialist, equipped with a magnetometer, preceded Dr. Keegan at all times during the surface survey. Figure 1 is a general map of Culebra, showing the area surveyed.

The purpose of the survey was to determine if any archaeological sites are located within the Cerro Balcón region of Culebra. Determining National Register of Historic Places (NRHP) eligibility of any identified historic property is not possible without subsurface testing. This project involved a review of previous investigations, background research on the region, a pedestrian field survey to locate potential sites, and coordination with the Puerto Rico State Historic Preservation Office (PRSHPO). Research was conducted at the PRSHPO and the Puerto Rico Terrestrial Archaeology Council Division of the Institute of Puerto Rican Culture (IPRC), the Ripley Bullen Caribbean Research Library at the Florida Museum of Natural History, and the SEARCH Corporate library. Hugh Tosteson, B.A. conducted historic research in Puerto Rico and authored the History of Culebra section of this report.

The Principal Investigator for this project is a member of the Register of Professional Archaeologists (RPA) and meets the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (36 CFR Part 61). The project was conducted to comply with Section 106 of the National Historic Preservation Act of 1966 (PL 89-665) as amended and its implementing regulation 36 CFR Part 800 (Protection of Historic Properties), the Archaeological and Historic Preservation Act of 1979 (PL 9291) as amended, the National Environmental Policy Act of 1969, and Puerto Rico Commonwealth State Preservation Laws and Regulations.



Source: Culebra and Adjacent Islands, USGS 7.5 minute Topographic Map.

520 260 0 520 Meters

Legend

Project Area

Figure 1. Areas Surveyed for UXO Removal, Cerro Balcon, Isla de Culebra, Puerto Rico.

PROJECT AREA

The project area is located on the western side of Cerro Balcón, one the highest elevations on Culebra Island, Commonwealth of Puerto Rico (Figure 2). It is in an "interior" setting located 2 km from Bahía de Oleaje, 1.2 km from Playa Larga on the north coast, and 2 km from both Puerto del Manglar and Ensenada Honda to the southeast and south.

Figure 2. View from proposed magazine location toward Cerro Balcón (facing northeast).

The project area can be described as a small valley surrounded by high hills. The valley slopes, first steeply and then gently to the west. It appears that the valley acts like a water catchment, with rainwater directed down slope into the bottom of the valley. Indeed, at the bottom of the valley, just outside the project boundary, there is a "farm pond" used today to water cattle. Based on the characteristics of the pond margin that could be observed, it appears to be a natural pond that likely existed during prehistoric times. In addition, there is evidence for sheet erosion on the western side of the project area, and several large gulleys indicate that a substantial amount of water flows periodically through this area.

The area appears to have been cleared in the past, and there is evidence for its use as a pasture. The vegetation today is dominated by dense stands of guinea grass and acacia thornbush. In the northwestern part of the project area the guinea grass is replaced by deciduous, dry tropical scrub woodland. Tree heights rarely exceed three meters. Surface visibility varied by vegetation type. In areas of guinea grass there was almost zero visibility, but under the acacias and woodland areas the surface visibility was good.

Soils within the project area are Descalabrado clay loam (20-40% slopes, eroded) (USDA 1977). This soil type is well drained and moderately permeable, but usually shallow overlying volcanic bedrock. It occurs on mountain side slopes and ridgetops in semiarid volcanic uplands in areas susceptible to erosion. Low rainfall usually accompanies this soil type and rapid runoff of that rainfall is common.

PREVIOUS SITES AND SURVEYS

The majority of archaeological studies on Culebra have been compliance based. The earliest archaeological investigation of Culebra was conducted by Juan José Ortíz Aguilú in 1975. The report (Ortíz Aguilú 1979) is on file at the PRSHPO. Between 1978 and 1980, Juan González Colón (1979-1980) prepared an inventory of Puerto Rican archaeological sites for the ICRP and included the sites reported by Ortíz Aguilú. Additional research was conducted by R. A. Thomas (1985) of MAAR Associates, Inc., Herminio Rodríguez (1992), and by Juan Rivera and Norma Medina (1996). Miguel Rodríguez prepared a summary of these investigations in July 1997 as part of a Facilities Plan for the Municipality of Culebra. Rodríguez compiled a total of 15 pre-Columbian sites, two petroglyphs, and two historic sites from these surveys. Only one major excavation has been conducted on Culebra, completed at the Lower Camp site by José Oliver (1992, 1995) and Garrow and Associates for the National Park Service.

There are four archaeological sites in the vicinity of Cerro Balcón on the north side of the island and three sites on the nearby south coast (Rodríguez 1997) (Table 1). These seven sites are depicted on Figure 3; none are located within the current project area. The Playa Tórtolo site (CU300013) and the Cerro Tortolo site (CU300014) are both possible village sites and may have been associated. Cerro Tórtola, the inland site, is located on a high mesa between the hills of Vigía and Tórtolo and is directly south of Playa Tórtola. Both sites are Ostionoid in their cultural classification with the pottery styles of Monserrate, Santa Elena, and Esperanza recorded for Playa Tórtola. The two other sites on the northern side of Cerro Balcón do not have site numbers or associated site forms. The Casa Rosa site is located south of Playa Larga and Laguna Zoní. It consists of a shell deposit of *Strombus gigas* and *Cittarium pica* and the remains of a 20th century house (glass, ceramics, and metal). The site closest to the project area is Cerro Balcón I. It is a

Table 1. Recorded Archaeological Sites in Vicinity of Cerro Balcón (from Rodríguez 1997)

Site Name	CAT Site Form #	Location	Period	site type
Playa Tórtola	CU300013	beach west of Playa Larga	Ostionoid (Monserrate, Santa Elena & Esperanza)	village?
Cerro Tórtolo	CU030014	plateau between El Vigía & Tórtolo hills (south of Playa Tórtola)	Ostionoid	village? (associated w/ CU0300013?)
Casa Rosa	no site form	south of Playa Larga/Laguna Zoní	prehistoric/historic	shell concentration & historic house remains
Cerro Balcón I	no site form	between Cerro Balcón and Cerro Vigía	Santa Elena	small, dense site w/ shell, fish bones & ceramics
Lower Camp	CU030008	north side of Ensenada Honda bay	Cuevas	village
Bahia Mosquito	CU0300012	Mid shoreline of Bahia Mosquito bay	Prehistoric	Shell concentration w/ undiagnostic ceramics
Punta Carenero	CU0300010	South of Punta Carenero	Cuevas, Monserrate, Santa Elena, & Esperanza	Village

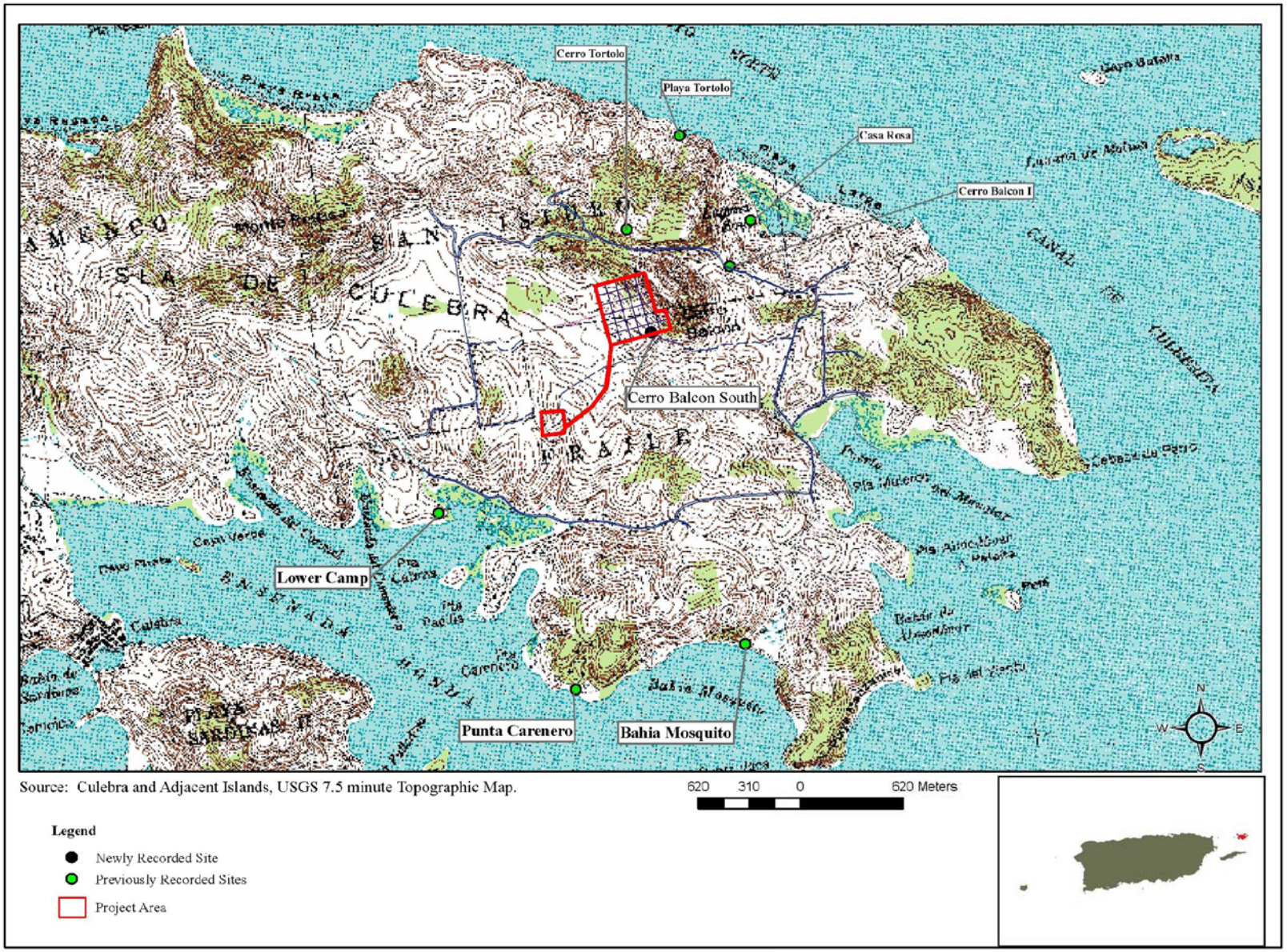


Figure 3. Archaeological Sites Recorded in the Vicinity of Cerro Balcon, Culebra, Puerto Rico.

small but dense inland site located between the hills of Balcón and Vigía. The pottery is Santa Elena style, and there are well-preserved deposits of marine shells and fish bones. The final three sites are each coastal settlements on the southeast shore of the island.

These sites indicate that the area surrounding the project area was extensively used during pre-Columbian times, at least during the Post-Saladoid. Of special interest is the Cerro Balcón I site, which is located just north of the project area over an intervening hill, and in an interior setting. It should be noted that the definition of interior is relative, and often difficult to justify especially on small and narrow islands. However, sites located away from the coast suggest that they were specifically placed to exploit inland resources. Given the fact that these islands have a depauperate terrestrial fauna, it is likely that other resources such as trees for canoes, freshwater sources, or agricultural land were the motivations for settlements in these locations.

PREHISTORIC CONTEXT

The culture history of Puerto Rico and the rest of the Caribbean is based largely on the taxonomic system of Irving Rouse (1992). Substantial revisions to Rouse's framework recently have been proposed (Keegan 2006; Rodríguez Ramos 2005). The current situation in Caribbean archaeology is best described as confusing. Some authors hold steadfast to Rouse's framework, while others are actively seeking an alternative depiction of what happened in the past. The following endeavors to navigate these troubled waters.

The first inhabitants of Puerto Rico arrived around 4000 B.C. (see Keegan 1994 for overview). It is proposed that they arrived on the island from the west after crossing the Yucatan Passage from Belize (Wilson et al. 1998). These people are characterized by a flaked-stone technology, and it has been assumed that they lacked both agriculture and pottery. It has been suggested that they lived in small mobile bands with a hunter-gatherer economy (Rouse 1992). The truth is that there have been very few excavations of Lithic Age sites, and that we know very little about these earliest inhabitants of the Caribbean (Veloz Maggiolo 1991).

Ground-stone tools first appear at sites throughout the Greater Antilles (except Jamaica) and the northern Lesser Antilles around 2500 B.C. The presence of ground-stone tools has been interpreted as reflecting the arrival of a new group of immigrants from northeastern South America (Rouse 1992). Called Archaic, these people are assumed to have had a hunter-gatherer economy and also lack a pottery technology (see Keegan 1994). It is further assumed that they either melded with, or replaced, the indigenous Lithic peoples (Rouse 1992). Richard Callaghan (2006) has challenged this interpretation. The main issue is that there are no Archaic sites in the southern Lesser Antilles so there is no evidence that people migrated through the islands to reach the Greater Antilles. Using evidence from seafaring simulations and the distribution of Archaic sites, Callaghan concluded that there is no evidence for an Archaic migration. Instead, the adoption of ground-stone tools seems to reflect the development of a new technology (or transfer of this technology from groups in Central America) in response to changing economic circumstances. Moreover, there is mounting evidence that Archaic

peoples practiced at least some form of plant management and cultivation (Newsom and Wing 2004), and that pottery, albeit in limited quantities, was used by these people prior to the arrival of the so-called "Ceramic Age" immigrants (Keegan 2006; Rodríguez Ramos 2005; cf. Rouse 1992).

Beginning about 500 B.C. there was a new migration of peoples into the Caribbean islands. This time period has been designated the Ceramic Age because these people manufactured elaborately decorated ceramics and also practiced root-crop horticulture (Keegan 2000; Rouse 1992). It is worth remembering, however, that ceramics were already being made and used in the islands prior to the arrival of these peoples. It commonly is assumed that the Ceramic Age/Saladoid Period peoples migrated east along the Orinoco River valley until they reached northeastern Venezuela and the Guianas. From there they progressed in a stepping-stone pattern through the Lesser Antilles to Puerto Rico. However, current evidence indicates that most of the Lesser Antilles were by-passed during the initial migration into the islands because the earliest sites occur in Puerto Rico and the Northern Lesser Antilles (Keegan 2004). Although Rouse (1992) maintains that the Saladoid originated in eastern South America, an equally viable alternative is that they originated in western Venezuela or the Isthmo-Colombian area (Rodríguez Ramos 2005, Rodríguez Ramos and Pagán 2005). This issue currently is under scrutiny.

The Ceramic Age culture history is based on changes in pottery styles over time. The terminology is complex and confusing (see Curet 2004; Rouse 1992), but is presented here in simplified form. The classification is based on a hierarchical system in which local styles are recognized, these are then grouped by similarities into subseries (denoted by the suffix –an), and then further lumped into traditions or series reflected by the suffix –oid.

The oldest styles for Puerto Rico are named Haciende Grande and La Hueca. These date to the first centuries B.C., and their relationship has been the subject of much debate (Rodríguez Ramos 2005). The Hacienda Grande style appears to have transitioned into the Cuevas style around A.D. 400. All of these styles are classified as belonging to the Saladoid Series, named for the Saladero site on the Orinoco River in Venezuela.

Between A.D. 600 and 800 there was a dramatic change in the ways that pottery was manufactured and decorated. Elaborate decorations and a highly formalized grammar (Roe 1989) disappear, and the pottery is characterized by simple hemispherical or hammock shaped vessels and simple decorations. It has been assumed that this new Ostionoid series reflects the devolution of Saladoid traditions (Rouse 1992); however, the more careful assessment of all of the evidence suggests that these new styles were strongly influence by Archaic pottery traditions (Keegan 2006; Keegan and Rodríguez Ramos 2005). Whatever their origin, three new styles have been distinguished. The earliest is named Monserrate, and it was followed by the Ostiones style in western Puerto Rico and the Santa Elena style in eastern Puerto Rico. There are several issues concerning these designations. First, the distribution of Ostiones and Santa Elena is not strictly divisible based on cardinal directions. In other words, you cannot simply draw a

north-south line through the middle of Puerto Rico and capture the distribution of these styles. Second, although Rouse (1992) dates the earliest appearance of the Monserrate style to A.D. 600 and Siegel (1992) dates it to A.D. 700, recent research on St. John, U.S. Virgin Islands, strongly suggests that Monserrate began about A.D. 800 (Lundberg and Wild 2006). The question that remains to be addressed is what these styles mean in terms of cultural relationships. These early Ostionoid styles were replaced or augmented by Capá (western Puerto Rico) and Esperanza styles (eastern Puerto Rico) about A.D. 1200 (Chican Ostionoid in Rouse's terminology). These later styles are associated with the ethnohistoric Taínos.

An admittedly crude (from a chronological perspective) table of styles and their associated dates is presented in Table 2. It is important to remember that the start and end dates for different styles were fluid, and that these provide only a relative chronology for cultural expressions in different parts of Puerto Rico. Nevertheless, these dates do provide a means for assigning pottery from different sites to general time periods. Similarly, the general location for the styles is an oversimplification.

Table 2. Chronology of Ceramic Styles for Puerto Rico

Ceramic Style	Start	End	Association	General Location
Hacienda Grande	500 B.C.	A.D. 400	Saladoid	Puerto Rico
La Hueca	200 B.C.	A.D. 400	Saladoid	Eastern Puerto Rico
Cuevas	A.D. 400	A.D. 800	Late Saladoid	Puerto Rico
Monserrate	A.D. 700	A.D. 1200	Early Ostionoid	Eastern Puerto Rico
Ostiones	A.D. 700	A.D. 1200	Early Ostionoid	Western Puerto Rico
Santa Elena	A.D. 700	A.D. 1200	Early Ostionoid	Eastern Puerto Rico
Capá	A.D. 1200	A.D. 1520	Ostionoid	Western Puerto Rico
Esperanza	A.D. 1200	A.D. 1520	Ostionoid	Eastern Puerto Rico

A major problem with this classification scheme is that once a new style develops it is assumed that the previous style ceased to be made. Oliver's (1995) work on Culebra clearly demonstrates that this is not the case, and that numerous styles were being manufactured at the same time (see Keegan 2004). The Lower Camp site, located on the north shore of the large bay of Ensenada Honda (see Figure 3), has Late Saladoid deposits dating to the 7th century A.D. (Oliver 1992). What is especially interesting is that the Cuevas style Late Saladoid pottery had already disappeared in Puerto Rico by A.D. 600 and yet the classic Cuevas motifs appear at Lower Camp in a limited and simplified way. Oliver (1995) suggests that in this peripheral location, the artistic style shows conservatism in maintaining the Saladoid style (albeit a devolved form), while simultaneously rejecting the Ostionoid innovations occurring on eastern Puerto Rico. Oliver interprets this as evidence of the isolation, both geographically and culturally, of the Culebra inhabitants. This isolation did not continue throughout the Ostionoid period as can be seen at later Culebra sites. The Punta Carenero site (see Figure 3) at the north entrance to Ensenada Honda is a major site that has a plaza or ball court lined with monoliths indicating an increasingly complex society. The site contains pottery in the Cuevas, Monserrate, Santa Elena and Esperanza styles.

At present there is no evidence of Archaic period peoples living on Culebra. Also, surprisingly, there are no sites dating to the Early Saladoid (either Hacienda Grande or La Hueca) time period, despite the fact that these are both present on the neighboring island of Vieques and at Punta Candelero on the east coast of Puerto Rico (Chanlatte 1981). The known archaeological sites on Culebra date from the Late Saladoid through the end of the Ostionoid period.

HISTORY OF CULEBRA

The island of Culebra does not figure prominently in the early settlement of Puerto Rico by the Spanish, and was considered as one of the many small islands named *Las Once Mil Vírgenes* (literally the Eleven Thousand Virgins, later the Virgin Islands) by Columbus on his second voyage of 1493. Dr. Diego Alvarez Chanca, accompanying Columbus, describes the many islands seen on the passage along the Virgin Islands and Vieques as follows:

> "…we arrived near it at night. Next day in the morning we sailed along the coast: it was a large land although not continuous there since there were more than 40 islets, with high land, most of it denuded of vegetation… it seemed good land for metals [mining]: we did not set ashore, except for a latin caravelle arrived at one of these, where they found certain fishermen houses. The Indians we had [taken from Guadeloupe] told us the [islands] were not inhabited. We continued along the coastline when we gained sight of the Island of *Burenquen* [Puerto Rico]…" (Tió 1966:55-56, in Oliver 1992:61).

By 1532 the island was known as *Pasaje* (Passage), and as *Culebra* (Serpent Island) by the 17th century (Vega 2003: 57). The earliest graphic representation of *Pasaje* island found on a map dated 1545 (Figure 4), where it can be seen to the right of the northeastern point (*Loquillo*, probably in reference to the Luquillo mountain range) of the island of San Juan (the original name for Puerto Rico). According to Vega (2003), the name *Culebra* or Snake Island originates from the serpent-like appearance of the chain of islands and keys stretching from Culebra towards Puerto Rico. Vega cites Cardona (*Islotes de Borinquen: Notas para su historia*, 1985) when also speculating on possible Carib origins for "Culebra" (Vega 2003:57). Juan Lopez de Velazco's report ca. 1571 describes *Pasaje* island as very small, covering an area of about three to four leagues, and located to the east of Puerto Rico, some five to seven leagues from the Luquillo mountain range, adding that later documents note that the name *Pasaje* was a reference to the fact that the island lay on the route between St. Thomas and Puerto Rico (Rodríguez Morales 1990:18).

No other mention is found of Culebra until the early 18th century, when a highly distorted map dated 1718 shows the eastern shore of Puerto Rico (Figure 5; top of the map), the island of Vieques or *Biek* (bottom of the map), and a smaller island, *Isla de la Culebra* (a vertical island to the right of Vieques; detail shown in Figure 6). Vega understands the map indicates that Vieques was more important than Culebra, whose anchorages are not

Figure 4. Puerto Rico (*San Juan*) and Culebra (*Pasaje*), 1545 (Sepúlveda 2004:24, Vol. 1)

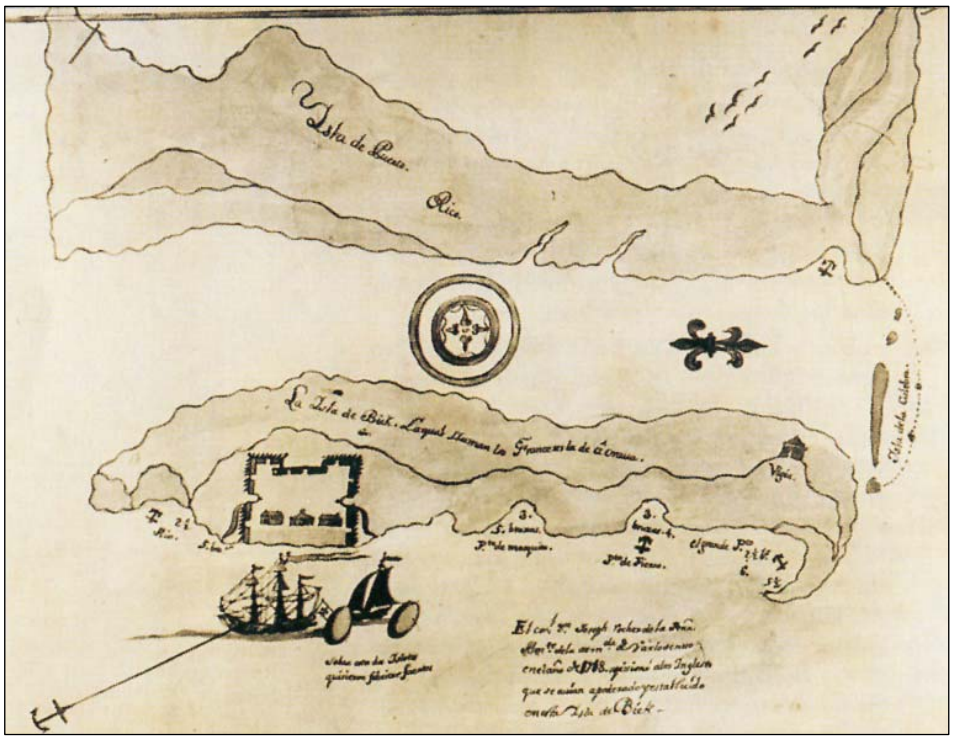


Figure 5. Puerto Rico, Vieques and Culebra, 1718 (Sepúlveda 2004:168, Vol. 1)

depicted at all, adding that the map accompanied a report about expelling British troops from Vieques (Vega 2003:58). The next reference found is Abbad y Lasierra's mention of Culebra in his description of the smaller islands to the East of Puerto Rico:

Figure 6. Detail of Culebra (from 1718 map)

> "…Four leagues from
> Fajardo is Cabo Pinero, in front of which one can see the islands that bear its name, and those of La Cabra, Culebra, and other small ones, with Vieques, that extend about 5 leagues from East to West; it is uninhabited and uncultivated; it has some medium-sized ports used by foreigners from St. Thomas, St. John, St. Martin, St. Croix and other nearby islands who come to cut wood and trade contraband with the inhabitants from Fajardo, Humacao and other towns in Puerto Rico…" (Abbad y Lasierra 1979:110)

Although Culebra was visited by the inhabitants of neighboring islands to avail themselves of the wood provided by its trees for use as lumber, fire wood and charcoal, the Spanish didn't settle the island at first. Until around 1800, the island was reputed to have been "…the lurking place of pirates, whence a little key in this splendid bay derives its name" [1], and that legends abound on the island concerning the occupation of Culebra by refugees escaping from slavery on Puerto Rico (Rodríguez Morales 1990:18-19; Thomas 1985:I-12).

The earliest reference found relating to the various interests that led to the 19th century exploration and settlement of Culebra was a Royal Order given on October 27, 1866, for the Forest Inspector of Puerto Rico to visit and then submit a report on that island. The text indicates a preoccupation that foreigners might be destroying wooded areas on Culebra, and required a study of the geological conditions and the vegetation existing on the island, as well as a feasibility study regarding the economic potential for exploiting the wooded areas, fertile lands and water sources for irrigation. The possibility of distributing lands on Culebra to selected individuals who were to settle there for agricultural purposes seems to have been a motivation for this study (Rodríguez Morales 1990:21-22, 24).

Rodríguez Morales describes one proposal to settle the island with a group of foreign peasants, preferably from Switzerland since according to the proponent Swiss peasants were very industrious people. That proposal was denied by the government, as well as various petitions presented to develop the island for agricultural or industrial purposes during the 1870s, the latter mostly favoring the construction of a naval shipyard on

[1] -- Probably *Cayo Pirata* (Pirate Key) in Ensenada Honda

Culebra, given its close vicinity of St. Thomas, the existence of a natural bay like Ensenada Honda, and the abundant forest resources that could be used for that purpose (Martínez 2002:8-9; Rodríguez Morales 1990:22-23; Thomas 1985:I-12). In 1870, however, the island was temporarily "occupied" by a group led by a resident of British Tortola by the name of Stiven or Stevens, who was appointed by the governor of Vieques to protect the coastal fishing grounds of Culebra (Figure 7). Stevens, who apparently called himself the Governor of Culebra, seemed to have commanded the respect of Puerto Rican fishermen who worked the waters around Culebra. The murder of Stevens in 1876, however, put an end to the non-Spanish "occupation" and had the effect of contributing towards the Spanish Crown's willingness to colonize Culebra. His name is preserved locally in *Piedra Stevens*, a sea rock on the northwest tip of Culebra (Vega 2003:58-59; Thomas 1985:I-12).

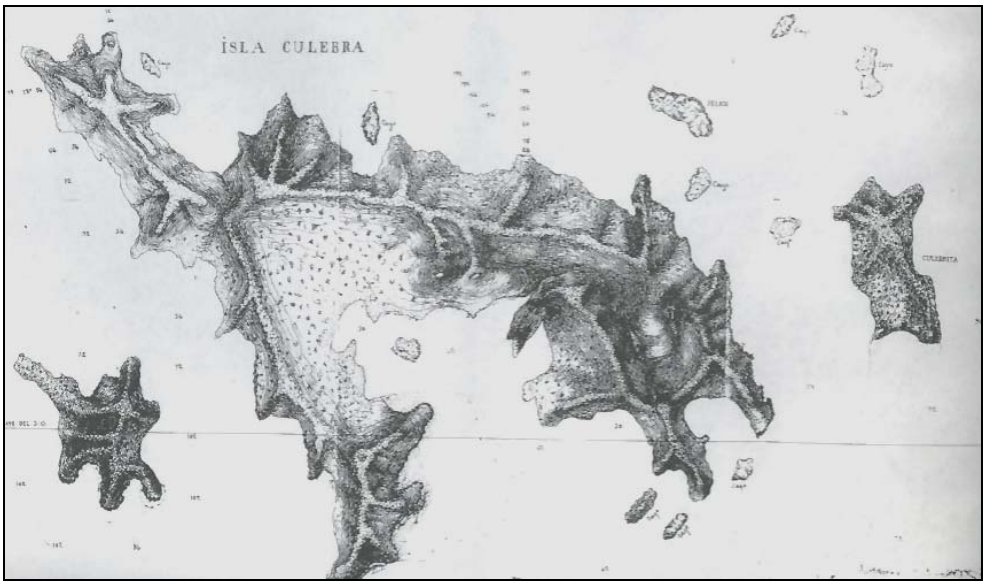


Figure 7. Culebra, ca. 1870 (Sepúlveda 2004:86, Vol. 2)

In 1871 Inspector General of Public Works, Evaristo Churruca Brunet, visited the island at the request of the Spanish Crown. In his report, Churruca stated that Culebra had no inhabitants and that he only noted "one or two negroes [sic] going to the island from St. Thomas to cut timber and make charcoal" (Thomas 1985:I-13). Churruca also pointed out the island's natural beauty, extensive wooded forests and unique inner bay, capable of sheltering vessels of any size, and recommended that the island not be sold or leased to any private industrial or commercial enterprise, but that its lands be divided into lots and given to farmers to raise fruit crops, livestock, as well as establishing a town on the inner bay (Martínez 2002:9).

By 1875, the governor of Puerto Rico expressed preoccupation with the island's state of abandon, since it made the island available to anyone interested, such as pirates and corsairs, the inhabitants of adjacent islands and foreign powers interested in seizing more territory. That same year, the Puerto Rico Forest Engineer, Cesar de Guillerma, visited and inspected the island of Culebra, reporting that his task had been delayed due to the

density of the wooded areas on the island. According to de Guillerma, Culebra measured 12 km from east to west and 7.5 km from north to south, with a natural bay named Ensenada Honda as main port, as well as mentioning another well-sheltered port called *El Manglar*. Finally, he observed that many trees of value were being cut down to be used to prepare charcoal, and the areas they had previously occupied were being invaded by "useless" ferns and grass (Rodríguez Morales 1990:23-25).

By 1877 the more commonly held idea was that workers from Puerto Rico would settle the island. At the time, the Vieques municipal government proposed to ship its idled population to Culebra, which should be declared and developed as a free port for shipping between the Antilles and Central America and competing with St. Thomas as a port of call for ships plying those routes, since its natural bays were superior to those on St. Thomas. Another proposition was to grant land claims with incentives such as tax exemption for those who decided to settle on the island. Lots would be no larger than 10 hectares, and be granted for a year, after which time they would revert to the government if they had not been cultivated or developed. It also was proposed that some lands should be left in their natural state, so that the original vegetation of the island would not disappear (Rodríguez Morales 1990:25-26).

Plans for settling Culebra were developed in the following years, and by 1879 the governor of Puerto Rico announced the Spanish Crown's intention to colonize the island, known at the time as San Ildefonso de la Culebra. Petitioners would be screened according to their conduct, knowledge of agriculture and economic means. Free land, tax exemptions and materials were offered, with the obligation that they should reside on the island indefinitely. An urban lot in town also was offered, as well as land in the countryside. With such incentives, petitions were received from every corner of Puerto Rico (Martínez 2002:10).

Settlement

Although the sources consulted differ on the dates (see Vega 2003:59; Martínez 2002:10-12; Oliver 1992:64-65; Rodríguez Morales 1990:28-29; and Thomas 1985:I-13), it was during 1880-1881 that the two key elements in the settlement of Culebra appeared: the settlement commission and Cayetano Escudero. The following summarizes their actions and significance.

The Settlement Commission

A special settlement commission was named to determine the land areas to be reserved for establishing a town, designate a specific area for the same, define the layout of the streets and select the proper site for the local cemetery, as well as a site for a naval station, a jail and a quarantine station (*lazareto*). These last projects were not decided at the moment, and the commission recommended that the arable lands be divided into 20, 40 and 60-hectare lots (equivalent to 50, 100 and 150 *cuerdas*). The commission selected the esplanade of a short peninsula facing southwards to the inner bay, known as Ensenada Honda, and established that any person to whom land was ceded on the island would be

obliged to clear a lot and build a house on it. In addition, the name San Ildefonso was approved for the future town community, and the island's former name was shortened to "Isla de la Culebra" (Vega 2003:59; Martínez 2002:10-12; Oliver 1992:64-65; Rodríguez Morales 1990:28-29; and Thomas 1985:I-13).

Cayetano Escudero

Also during these two years (1880-81), Cayetano Escudero was named to lead the initial settlement of the island and founding of the town. Although variously represented as a retired army colonel and/or a representative of the mayor of Vieques and/or the mayor of Vieques himself in different sources, Escudero undertook the following sequence of actions: first, submitted a "Plan for the Colonization of Culebra"; second, landed on the island leading a contingent of ten men (possibly a military garrison from Vieques) to initiate the settlement; third, selected a strategically-located hill fronting the bay to build a fort made of wood, stone and cement; and fourth, initiated the construction of the new town of San Ildefonso. Initially, a wharf was built in the area, and plans for the new town established that the main streets would be 14 m wide, and the side streets 12 m wide. The initial group led by Escudero began building the town, and two years later there was an ample building made of wood and zinc, standing on brick supports, a short distance from the wood and stone wharf. Various public buildings for public services were also built, such as a vessel registry office (*despacho de embarcaciones*), post office, livestock register and the civil registry (Vega 2003:59; Martínez 2002:10-12; Oliver 1992:64-65; Rodríguez Morales 1990:28-29; and Thomas 1985:I-13; Figure 8).

Figure 8. Lot Plan for San Ildefonso Town, 1881, detail (Sepúlveda 2004:166, Vol. 3)

It was during this time period that Escudero was officially appointed Special Delegate (*Delegado Especial*) for Culebra, an indefinite title, although he was clearly empowered with leading the settlement. Vega clarifies this by stating that under Spanish rule the municipal government of Culebra was led by a delegate governor (*gobernador delegado*), probably a reference to Escudero's title (Vega 2003:62).

Initially, the settlement's local water source was a single small creek with two or three springs that produced usable water for domestic purposes, and drinking water had to be brought in barrels from Vieques. A public cistern was built by 1886, when Culebra had 86 inhabitants and 2,236 *cuerdas* (2079.48 acres) of land under cultivation, as well as three small stores in town. Construction of a Catholic chapel was completed in 1889, although it remained closed since the local residents were so few and poor they could not support a priest (Martínez 2002:12; Rodríguez Morales 1990:28-29).

Between mid-1887 and 1888, the plan to subdivide lands on Culebra was finally carried out, creating 96 lots distributed into public lands, private lots, mangrove areas, military reserves, lagoons and maritime zones. So many applications were received that it was decided to divide the lots, most of which measured about 62.5 *cuerdas* (58.125 acres), into smaller lots measuring about 31.25 *cuerdas* (29.06 acres) each. Lots were awarded to various settlers through that year, and in the following years other lots were awarded or sold, while others reverted to the state since their owners did not settle there or cultivate the lands. Some lots, mostly the smaller islands surrounding Culebra as well as some coastal, beach and lagoon areas, remained in government hands: Culebrita, which was already the site of a lighthouse built in 1874[2]; Lot 86, which was assigned to the War Department (*Ramo de Guerrra*); Lot 87, where San Ildefonso was established; and lots 90, 91 and 92, which were preserved as forest areas. However, some of the larger islands surrounding Culebra had already been provisionally awarded to some of the first settlers on the island: Cayo Norte was settled by Manuel Morales, although it was later awarded to Leopoldo Padron, and Cayo Luis Peña had been given in 1881 to Cayetano Escudero. Some people began acquiring more lots, such as Antonio Lugo, who by the end of the 19th century owned about 1,300 *cuerdas* (1209 acres) of land. Other owners also had accumulated lands by that time: Pedro Marques Morales with 386 *cuerdas* (358.98 acres), Miguel Ramírez with 300 (279), Eleuterio Feliciano Álvarez with 156 (145.08) and George Clark, from St Croix, with 97 (90.21) (Rodríguez Morales 1990:29-31; Thomas 1985:I-13).

Although no original map was found illustrating the land lots created on Culebra during the 1880s (except for San Ildefonso; see Figure 8), one of the sources consulted included a ca. 1905-1913 military map (Figure 9) that purportedly shows the lots as established in 1887-88. A comparison with a detail section of the 1887 lot plan for Culebra found in Vega (2003:73) shows an exact correlation between both lot plans.

[2] -- Now listed on the National Register of Historic Places.

Figure 9. Culebra, 1905-1913, reflecting 1887-88 lots (Thomas 1985:I-16, Fig. I-8)

By the mid-1890s the town of San Ildefonso comprised 45 houses (probably *bohios* or thatched houses), a church, a public cistern, a House of Delegates and a wharf. The entire island had a population of 519 inhabitants living in 84 houses, both in San Ildefonso and spread out in small communities throughout the rural wards. Culebra's subsistence economy was a combination of farming, fishing, turtle hunting, logging and ranching. Export products included wood, root crops, plantains, beans, garlic, corn, tomatoes, oranges, coconut, cotton, melons, charcoal, salted fish, turtle shells and oil, cattle, pigs, goats, etc. (Vega 2003:59, 63; Rodríguez Morales 1990:32). Culebra became a minor but thriving population center, with a higher quantity of livestock suggesting an increasing economic activity: by 1897 there were 201 horses, 4 donkeys, 1,353 cows, 150 sheep, 325 goats, and 180 pigs on the island (Thomas 1985:I-13). By 1898, led by Leopoldo Padron, the residents of Culebra agreed to form a guerrilla militia to oppose any invasion effort, specifically by the United States.[3] That same year, Culebra was divided into the Pueblo, Flamencos, San Isidro, Playa Sardina and Frailes wards (Martínez 2002:12; Rodríguez Morales 1990:28-29).

[3] - The historic interest of the United States in the Caribbean, both strategic and economic, had increased throughout the 19th century, and was viewed with enough trepidation by Spanish authorities towards the last quarter of the 19th century to establish contingency plans in case of war with the U.S. For additional background, see NRHP thematic nomination *Spanish-American War in Puerto Rico* (Barnes, Marull & Tosteson, 2000), on file at the PRSHPO.

As a result of the Spanish-American War, in December of 1898 the Treaty of Paris ceded all Spanish possessions in the Caribbean, as well as the Philippines, to the United States of America, including the islands of Culebra, Vieques and Puerto Rico. This cession included the transfer to the United States of "all buildings, docks, barracks, fortifications, establishments, public roads and other realty which are public domain". On Culebra these included 35 hectares of mangroves, 466 hectares of forest reserve, four hectares of War Bureau land, 28 hectares at Flamenco and Duck lagoons, and 134 hectares in the maritime zone. Privately titled land remained in the hands of its legitimate owners, while those occupied lots without clear title remain in litigation to this day (Thomas 1985: I-13, I-17).

As military governor of Puerto Rico, General George W. Davis ordered a general census to determine the state of the island's population, economic potential and social problems such as illiteracy, public health and housing, amongst others. The results of the census show that by 1899 there were a total of 704 people living on Culebra, 206 of which lived in town, which at that time had a schoolhouse with two classrooms, and 498 of whom were spread throughout the countryside on 54 farms. In addition, Culebra was reported as having a total surface of 2,677 *cuerdas* (2,489.61 acres), with 263 *cuerdas* (244.59 acres) devoted to agriculture and 863 *cuerdas* (802.59 acres) as forest. By the beginning of the 20th century, the town's main streets were: Maria Cristina, Alfonso XII and Cayetano Escudero (Vega 2003:59, 63; Martínez 2002:13; Rodríguez Morales 1990:32, 35; Thomas 1985:I-13).

The Navy in Culebra: Transfer of San Ildefonso

Early in 1900, a group of Navy officers visited San Ildefonso, and left the impression that the Department of the Navy wished to establish some sort of naval or military post on those lands that had belonged to the Spanish Crown before the change in sovereignty (Martínez 2002:13). This seems to have been part of a U.S. government evaluation of sites for the construction of a large naval base at some location in the Caribbean, including Guantánamo, Fajardo, San Juan and Culebra. The latter, at least, was to be developed as a coaling station for steam warships (Vega 2003:60). With the approval of the Foraker Act, which was signed by President William McKinley in April of 1901, all buildings, docks, quarters, forts, public roadways and any and all real estate and property that had been the Spanish Crown's were now part of the public domain (Martínez 2002:13). In December of that same year, the U.S. Navy proposed plans to include all the keys surrounding Culebra under their jurisdiction (Rodríguez Morales 1990:35).

On December 17, 1901, President Theodore Roosevelt signed an Executive Order placing all public lands on Culebra under the jurisdiction of the Navy Department. This land consisted "…of Lots 85, 87, 88, 89, 90, 91, and 92; all lands of the War Bureau, and any other public land that exists or could hereafter be declared public land." All persons occupying those lands were required to obtain permission to continue residence. It is obvious from this directive that non-owners were then occupying some of the public lands. It must be remembered that Lot 87 was occupied by the town of San Ildefonso itself, covering an area of about 18 hectares (Thomas 1985:I-17; see description of 1887

lot plan, above). Vega adds that this executive order was signed into law by President Roosevelt in 1903 (Vega 2003:60).

This definitive interest on the part of the Navy seems to be contradicted by Rear Admiral Francis J. Higginson, Commander in Chief of the United States Naval Force in the Atlantic, who in 1902 was of the opinion that the bay at Ensenada Honda did not have the requisite qualities for a naval base. However, he did recommend that the entrance channel to the bay be enlarged, and that the island itself be planted in alfalfa for raising cattle, adding that the island would be a good naval prison, with prisoners being responsible for building roads and fortifications. In addition, in a letter dated July 10, 1902, Lt. L. Handling of the U.S. Marine Corps wrote to the General Commandant of the USMC in Washington, saying they were interested in:

> "…the village of San Ildefonso as a location for permanent barracks on this island…It is centrally located, surrounded by deep water, has a good stone wharf extending into 12 feet of water, is perfectly protected from storm, has sufficient level ground for a good parade and exercise ground, has roads leading into all parts of the island, is so situated that its sanitation could easily be made almost perfect and altogether is far superior to any other location of the island" (Rodríguez Morales 1990:36-37)

At that time, there were about 85 houses and 66 country properties throughout Culebra. In addition, there were several streets in town, 62 houses, two schoolhouses, a schoolmaster's house, a Catholic church, a cemetery, a police station, two public cisterns, a wharf, a "governor's house" (*Casa Blanca*), and a representatives' house (*Casa de Delegados*) that the Navy decided could be used for the commanding officer's quarters, after some alteration and repairs were done to the building. "Camp Roosevelt", as the new barracks were known, was established "…on a bluff near the village", and housed 105 marines, although most of them had to abandon the island in the rainy season because of limited housing facilities (Vega 2003:60; Rodríguez Morales 1990:37; Thomas 1985:I-17).

By December of 1902, the U.S. Naval Command had assumed complete jurisdiction over San Ildefonso. According to one source, that year an American naval cruiser anchored in Ensenada Honda bay, captained by Commander Henry C. Haines, named by the Department of the Navy as the officer in charge of public property on Culebra. Haines disembarked accompanied by two lieutenant engineers and half a dozen marines, and informed Special Delegate Leopoldo Padrón of the Navy's plans to establish a naval base on Culebra, on a wide peninsula with an extensive esplanade where a masonry cistern already existed. The Navy had decided on using the lands where the town of San Ildefonso was established. According to the Navy officers, the island of Puerto Rico had no jurisdiction over the lands occupied by the town. Once the abovementioned Executive Order was signed, the U.S. Navy began to dismantle and drag the houses away to clear the area, after which construction of the naval facilities began. Upon dispossession by

the Navy, the town was dismantled, and most of its residents moved to the area of Playa Sardinas, which already had a few settlers by the end of the 19th century.

Wooden houses of the inhabitants were dismantled and moved from their original place. The sources consulted agree that most residents established themselves on lands corresponding that would become the town of Dewey. Here, house lots were distributed to some, while other residents had to settle in mangrove areas. Other residents displaced from San Ildefonso relocated to lands on or near Punta Padilla, establishing a farming community that was eventually abandoned. In the meantime, two public schools and a Catholic church had been built, and the streets traced at the new settlement. The town of Dewey was named after Admiral George Dewey (1837-1917), who defeated the Spanish navy in the Philippines during the Spanish-American War (Vega 2003:60-61; Martínez 2002:14; Rodríguez Morales 1990:37-38; Thomas 1985:I-17).

The first military works built by the U.S. Navy were two wooden docks mounted on wooden piles one at the San Ildefonso port and another at Punta Colorado, where the coaling station was being constructed. In addition, a channel that would facilitate the movement of shallow-draft vessels between the Ensenada Honda and Playa de Sardina bays was built, using dynamite to demolish the rock down to a depth of six and a half feet. A wooden drawbridge that could be lifted by hand was built over the channel. This would benefit the new town of Dewey, where sloops arrived from San Juan laden with merchandise, entering through the channel and unloading at the end of Escudero Street, next to the drawbridge.

Other military works built at the time during those years were permanent ones to service the troops: a long wooden barracks building roofed with boards and tarpaper able to house 90 soldiers, two brick cisterns with a cement platform to collect rainwater, a wood and zinc building for base administration, a wood and zinc building to house a store and a canteen for the base, a zinc-walled and roofed hangar to house the carpentry shop and foundry, a masonry building for an ice plant and cooling shed (*frigorifico*), a brick and zinc hangar for bathrooms and a laundry, a cement and zinc building for a bakery, a very large wood and zinc hangar to house a stable for the base horses and mules, a wood and zinc building to house a warehouse, another masonry one for the base armory, and an ample wood building roofed with board and tarpaper for a hospital, which was equipped with 20 beds, an operating table and a pharmacy (Vega 2003: 65-66; Martínez 2002:15-16).

Culebra in the 20th Century

The history of Culebra in the 20th century consists primarily of the evolving relationship between the civilian resident population and the initially overwhelming military use of the island. Thus, as early as 1902, the first large-scale naval exercises were conducted in Culebra, consisting of a U.S Marine Corps exercise for “defense of a forward base”. By 1904, Culebra had been designated as a naval station, with the construction of numerous facilities related to this use. At that time, the U.S. Surgeon General proposed removing the native population altogether, so that the U.S. Navy could claim control of the entire

island (Annual Report of the Navy Department, 1907, as cited in Vega 2003:60; Negroni 1992:424; Thomas 1985:I-17).

On the other hand, on March 5, 1905, the Puerto Rico Legislative Assembly passed a law making Culebra a Special Municipal District. On December 7th of that year the Puerto Rico legislature approved Law #73, "to include the island of Culebra amongst Puerto Rico's organized Municipalities and for other purposes" (Martínez 2002:16). These measures were significant for the civil government of Culebra, since under Spanish rule, the municipal government of Culebra was originally led by a *gobernador delegado* (see Cayetano Escudero, above). The enactment of the 1905 laws gave way to the appointment of a mayor (*alcalde*) for a two-year term, which was extended to a four-year term in 1930, while the current practice of elective office for mayor and municipal legislature began in 1960 (Vega 2003:62-63).

In 1909 an Executive Order was issued designating 2,800 acres of former Spanish Crown land on Culebra as a natural wildlife refuge. This refuge included acreage on the main island as well as on Culebrita Island and still exists today, known as the Culebra National Wildlife Refuge, administered by the U.S. Fish and Wildlife Service (Vega 2003:61; Thomas 1985:I-17). It must be pointed out that the sources consulted do not indicate the exact boundaries of these lands, and it is uncertain whether they corresponded to those marked as a Forest Zone (*Zona Forestal*) in the 1905/1913 map (Figure 10).

Although the U.S. Navy had decided in 1911 to concentrate its naval program in Guantánamo, Cuba, and transferred most of its facilities there, Culebra remained an important area for gunnery and landing training. This is evidenced by the fact that in 1914 the world's first large-scale military exercises combining land, sea and air practice were conducted in Culebra, implementing elements of trench warfare that would be used on the battlefields in World War I (Vega 2003:61; Martínez 2002:16; Thomas 1985:I-17). By 1917 Culebra saw the formal establishment of a naval reservation consisting of a camp (Camp Roosevelt) and an airstrip which, although deactivated after World War I, was kept in use for military exercises on Culebra (Negroni 1992:425).

Between 1934 and 1941, most fleet landing exercises took place at Culebra and Vieques, incorporating target ranges for ship to shore bombardment as well aircraft gunnery and bombing practices, established by 1936. These maneuvers allowed the development of new landing craft, including troop transport ships, self-propelled landing craft, and armored amphibious vehicles, all of which would be significant elements throughout World War II (Vega 2003:61-62; Negroni 1992:424; Thomas 1985:I-17). At that time the island was still divided into four wards: Flamenco, San Isidro, Fraile and Playa Sardinas. The ward formerly referred to as Pueblo no longer existed, although the town of Dewey is seen for the first time on a map (Thomas 1985:I-17). In 1937, the U.S. legislature enacted a law empowering the governor of Puerto Rico to acquire or forcibly expropriate some 286 *cuerdas* of land on Culebra, in order to later transfer them to the Navy to build a small emergency airstrip (Martínez 2002:17).

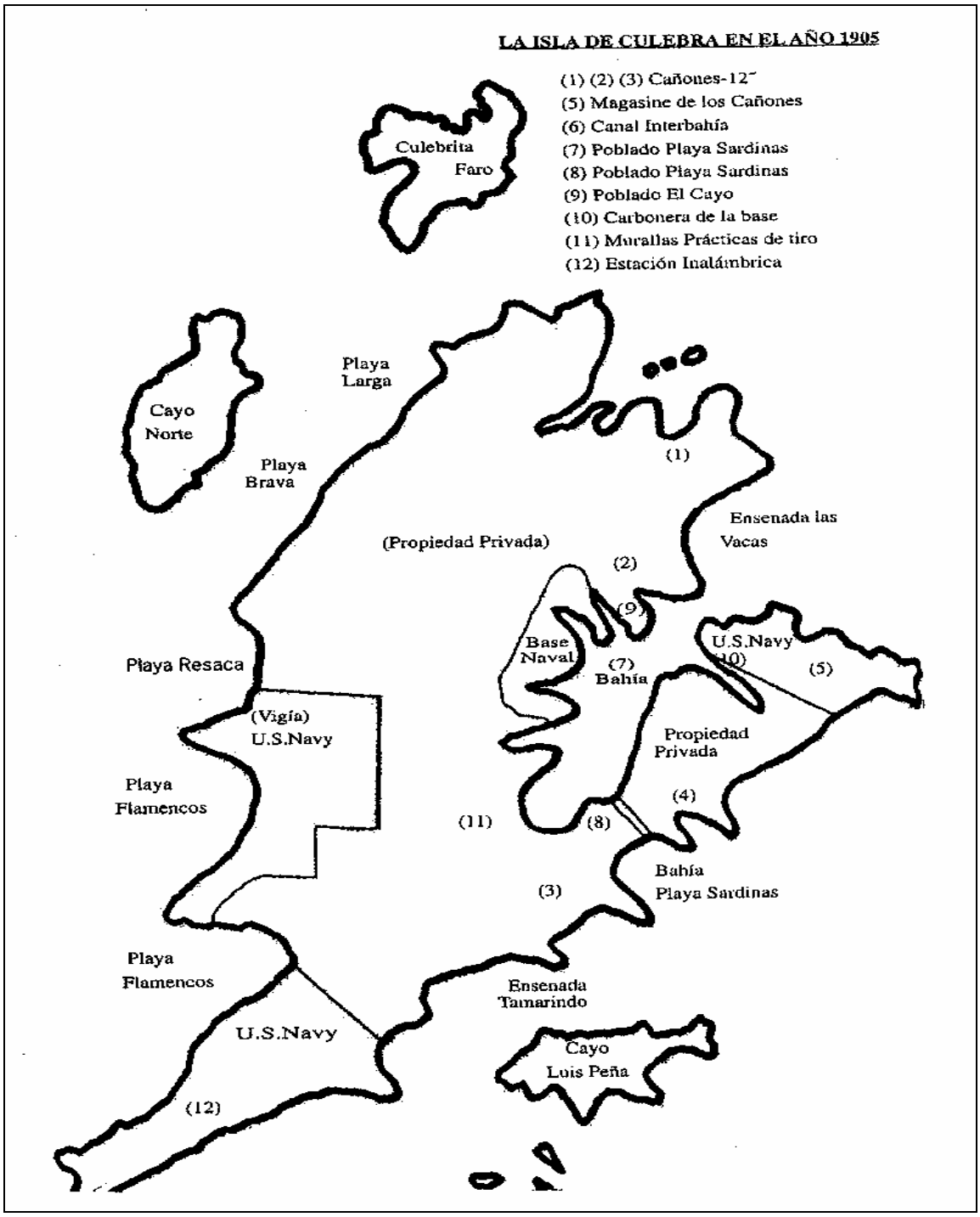


Figure 10. Ownership of Culebra Lands, 1905 (Martínez 2002, figure; from Feliciano 1981)

The World War II period saw a dramatic increase in the construction of large-scale military facilities in Puerto Rico, including: the Roosevelt Roads naval base in Ceiba, which became the command center for the fleet exercises using the Vieques and Culebra naval reservations, as well as large sectors of the surrounding ocean waters; various

airfields on the island, one of which would become the Ramey Air Force base at Aguadilla; a second naval reservation at Isla Grande in San Juan Bay; and the Naval Communications Station at San Juan, later relocated at Sabana Seca, in Toa Baja. Moreover, an Executive Order signed in 1941 formally established what became known as the Culebra Island Naval Defense Maritime Area, allowing the U.S. Navy to appropriate over 2,000 acres of land on Culebra, as well as establishing a three-mile security perimeter surrounding the island, which required requesting Navy permission to enter and leave the island (Martínez 2002:17; Negroni 1992:424-35, 443-45).

In evaluating the impact of the naval practices of the U.S. Navy and Marine Corps on Culebra, Vega (2003) tells us that the island's population in 1894 was 519, expanding to 704 in 1899. Population continued to increase and by 1912 there were 931 rural and 364 urban inhabitants on Culebra (Thomas 1985:I-17). In response to military activities, population fell to 265 by 1920, increasing slightly through the 1930s. This small increase in population was seen as possibly interfering with naval use of the island, and by the late 1950s the U.S. Navy attempted to negotiate the departure of 570 residents of Culebra, in exchange for Navy land on the main island of Puerto Rico (Vega 2003:63).

Martínez (2002) states that a similar initiative was attempted in 1968, offering money to those residents who would leave the island, and which prompted a popular protest that led to the creation of the Committee for the Rescue of Culebra (*Comité para el Rescate de Culebra*) as well as marches to the steps of the state capitol and then the governor's mansion at La Fortaleza (Martínez 2002:18). Martínez cites an article that appeared in the *Armed Forces Journal* May 23, 1970 edition, concerning the causes that gave rise to the animosity that existed between Culebra residents and the Navy, as an agent that fostered a change in attitude by the Navy, which began to attempt gaining the sympathy and goodwill of its neighbors on Culebra (Ibid:18-19). Negroni cites a special report that appeared *Life* magazine's April 10, 1970 issue on the "Culebra problem" as an example of the interest generated by the subject (Negroni 1992:425).

On October 23, 1973 an agreement was signed by the governor of Puerto Rico, the U.S. Secretary of the Interior, and the Committee of Interior and Insular Affairs of the Senate, ratifying a June 16, 1971 resolution that established the principles and regulations relating to the transfer and administration of the surplus federal lands no longer needed by the Navy on Culebra and adjoining islands. The Navy lands were transferred to the government of Puerto Rico (Martínez 2002:20).

The Navy facilities were maintained and used until 1975 when the Navy transferred 702 acres on Culebra to the National Wildlife Refuge (Figure 11). The use of the naval firing range in Culebra was discontinued that year, and transferred to Vieques, where it was recently closed as well. In 1982 an additional 776 acres were transferred and, except for a small communications station, the island was vacated by the U.S. Navy (Vega 2003:64; Martínez 2002:21-22; Thomas 1985:I-17).

On June 22, 1975, the Puerto Rico legislative assembly approved Senate Project No. 1380 "To establish the public policy concerning the conservation, development and use

of the lands of Culebra, to create the Conservation and Development Authority of Culebra, adjunct to the Department of Natural Resources, to establish its powers, duties, rights, obligations and to assign funds." The purpose of this law was to address the ecological and natural resource problems on Culebra, including its cays, islands and surrounding waters and to ensure that the continuous development of Culebra would protect and conserve the extraordinary natural environment that is part of Puerto Rico's heritage. To these ends, it would take over the possession and management of lands and infrastructure in the public domain (transferred by the Navy), with a view to establishing management plans, rules and regulations for the conservation and development of former U.S. government lands on Culebra, as well as to protect sites and objects of natural, cultural or ecological value.

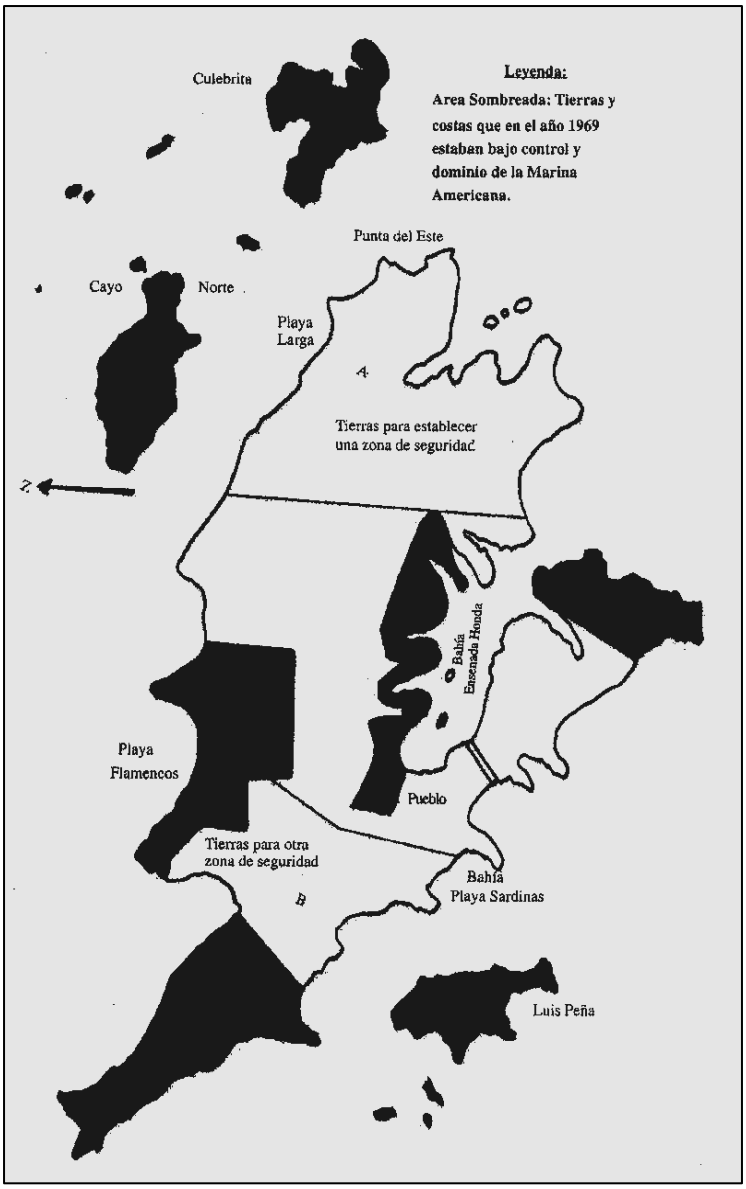


Figure 11. Navy Lands on Culebra, ca. 1969 (Martínez 2002; from Feliciano 1981)

The population of Culebra was reported at 1,515 for 1990, and about 1,868 in 2002. In actuality, the population of Culebra is uncertain, as there are many part-time residents from the Lesser Antilles, and a large floating population of weekend and winter tourists from Puerto Rico, the United States mainland and other parts of the world. Also in 1975, new ferries were inaugurated for the Cataño-San Juan route and the Fajardo-Vieques-Culebra route. These new ferries had passenger seats for 360 passengers, followed by improvements to the Culebra and Fajardo piers in 1976-80. In 1989, a $1.7 million contract was signed by the Ports Authority in order to build a new cargo ferry for the Fajardo-Vieques-Culebra routes (Vega 2003:64).

At present, the municipality's greatest sources of revenue are derived from a scientific instrument manufacturing plant and tourism. Its natural grasses allow the development of small cattle ranches. There are few agricultural products, due to the arid land and lack of water. Fishing, although active, is a subsistence activity" (Martínez 2002:22).

METHODOLOGY

In order to accomplish the project goals, field methods were established that would allow SEARCH to adequately inspect the ground surface of the project area and identify any surface scatters of prehistoric or historic sites. As mentioned above, the present project involved the inspection of 32 acres in the vicinity of Cerro Balcón, including a proposed magazine, the main impact area, and the road connecting the two. The walkover survey consisted of establishing linear transects across the project area and meandering on either side of the transect to avoid places that were impassible due to dense vegetation and other obstacles. The transects were maintained using GPS, and the exact point on the transect was identified at 100 foot intervals (about 30 m). In other words, starting from point zero a meandering path was followed to point one, where the exact transect point was identified. This technique has two advantages. First, it does not require the cutting the vegetation to create a linear path (thus saving time and energy). Second, the meandering survey covers larger areas of ground surface than would a straight transect. This technique has proved very effective during other projects in the West Indies.

The main impact area was surveyed at 100 foot intervals with transects running north to south. Survey transects were keyed to the existing EOD grid. Each square on the EOD grid encompassed 1-acre. Letters were used to name the X-axis and numbers the Y-axis of the grid system. Transects were walked along all of the main grid lines and also between them. The intermediate transects were designated, for example, A+100. During the survey we frequently observed flagging used to identify the grid corners for the previous transect, which indicates substantial coverage of the gridded area. On the eastern side of the grid the land slopes steeply upward. Areas with slopes exceeding 35˚ were not surveyed due to the extremely low probability for sites on such terrain. The ground surface of the proposed road and magazine area was thoroughly inspected for archaeological remains. The proposed road extends from the main road to the magazine across undeveloped land.

No artifacts were collected during the survey and therefore, no laboratory or curation methods were used. The original project plans, field notes and site photographs are housed at the main SEARCH facility in Jonesville, Florida.

RESULTS

Of the 32-acre parcel, 23 acres were surveyed for cultural material remains. Due to refusal of a landowner to grant access to one section of the project area, one 9-acre parcel was not surveyed. This 9-acre block makes up the northwest quadrant of the main impact area. A substantial portion of this unsurveyed parcel is a farm pond with a low probability for archaeological deposits.

The survey for the proposed road and magazine site failed to reveal any evidence for prehistoric activities. The road crosses a very low area that was subject to flash floods before rising to the crest of a low hill, where the magazine will be located. The hill is composed of large rocks and boulders with red, clayey soil that is powdery at the surface but very compact beneath. This area has a low probability of containing prehistoric archaeological materials.

In the main impact area, a total of 13 transects at 100-foot (30 m) intervals were surveyed over varying distances. Transects that would have crossed steep slopes were not walked. Three additional transects crossed the survey area. One was located 20 m east of transect E, at the foot of the steep slope that rises to the east to Cerro Balcón. Another was made during our efforts to locate the center point (between C and D on the grid), and the last during the survey of the new route for the road (between A and C). Nothing was found west of transect D or east of transect E. The western area appears to have flooded periodically in the past, as evidenced by large rocks and deep gulleys. The surface visibility in this area was very good so it is unlikely that surface indicators would have been missed. To the east of E the ground surface slopes sharply upward, and the areas examined showed no evidence for prehistoric activities.

Cerro Balcón South Site

Evidence of one prehistoric archaeological site was found within the access road on the southern edge of the main impact area (Figure 12; see Figure 3). The site was disturbed and made visible because of the previous road. The undisturbed portion of the site is covered by a dense stand of guinea grass resulting in poor surface visibility. Relatively open areas were investigated by brushing back the dead grass by hand and looking for evidence of artifacts on the soil surface. The low frequency of even small stones under the vegetation suggests that any archaeological materials have been buried by soil redeposited by erosion.

Figure 12. View toward Cerro Balcón and Cerro Balcón South Site (facing east). The site is located along the road just east of the truck.

The site was first identified by the presence of small pottery sherds on the road, specifically located where the road turns west onto the level area that leads to the house at the end of the bluff (on transect E). About 12 small sherds (each less than 3 square cm)

were found on the road. Most were red or light brown body sherds with a felsic paste, and one had a quartz paste.

The only other place that sherds were found was in the backdirt of an iguana burrow located 27 m north of the road along transect D. The eight sherds here were also small and appeared to have the same temper type. One tiny, weathered shell fragment also was found. In the soil from the iguana burrow there was one inturned, rounded lip and one sherd with broad-line incising parallel to the lip (which was missing). This decoration could reflect the Esperanza style that post-dates A.D. 1200. All the artifacts noted at this site appear to have been brought to the surface by modern disturbances to the soil.

Three weathered shells, two *Strombus* sp. and one *Cittarium pica* (transect D+100), were recovered near the road, along with one split stone cobble, which was noted because of its different appearance from the other rocks in the area. No animal bones were observed. No samples were collected.

There is a level area south of the road that extends about 27 m before there is a substantial drop-off. Nothing was found on the surface in this area, however, deposits may be buried. Sherds were found on the roadbed up until it turned to the south, which is one possible indication that the site does not extend south of the road.

The evidence available to characterize the site is very limited. In essence, there are two points located 200 feet (60 m) apart at which ceramics have been recovered. A few shells, other sherds along the roadbed, and the split cobble on the road were found between these points. The site is overgrown by extremely dense vegetation and slope wash (erosion) from the surrounding hills likely buried any prehistoric deposits. Without subsurface testing, the extent and nature of this site cannot be determined.

There are additional indications that the site area already has been impacted. Between transects D and E there is a berm of soil that rises about 1 m above the surrounding ground surface. The berm may be from the digging a canal (the area south of this is unusually low), or from grading the road. In addition, there is evidence that a road once ran north from the corner of the present road, and it too has a berm along the eastern side. The full impact of modern disturbances cannot be judged given the density of the vegetation, but surface indicators suggest that they were considerable.

The site was revisited by the Principal Investigator on July 28, 2006. The site had been cleared of most of the vegetation, but surface visibility was still limited by grasses and leaf litter on the surface. However, based on a very light scattering of potsherds in the area where the site originally was identified, the north-south dimension of the site is approximately 60 m. The site was originally visible for 60 m along the east/west road. Thus, the entire site seems to cover a 60 m by 60 m area. The surface clearance of vegetation and UXO has not had a significant impact on the site.

An interpretation of the site is preliminary based on the limited number of artifacts that were recovered. The one incised sherd suggests that the site dates to the Esperanza

period (post A.D. 1200), and that it fits with the expansion of population into the interior that has been observed elsewhere in Puerto Rico at this time (Curet 2005). This small site may reflect farming activities. It is optimally located on level ground with the high hill of Cerro Balcón providing protection from the prevailing winds along with access to the freshwater pond that is 400 m to the northwest. This location is also less susceptible to flooding, which is apparent at lower elevations. The presence of marine mollusks at the site suggests that the inhabitants either procured these themselves from the coast or obtained them from contemporaneous settlements located on the coast.

Historical Component

The history of Culebra indicates that there were a substantial number of individual residences located outside of the town of San Ildefonso. No evidence for the remains of historic structures was observed during this survey. The remains of one structure was identified, evidenced by an aluminum gutter that had been attached to a small, now collapsed shed that once had a tar shingle roof. There were no artifacts associated with the collapsed structure, and it is clearly of modern origin.

CONCLUSIONS AND RECOMMENDATIONS

A walkover archaeological survey was completed at the Cerro Balcón Unexploded Ordnance (UXO) removal project of the former U.S. military mortar range in April 2006. Through a combination of background research, reviews of previous investigations, and surface surveys, the potential for archaeological resources within the project area was calculated and areas were inspected prior to UXO removal. These efforts were made in order to evaluate if any National Register of Historic Places (NRHP) potentially eligible properties exist within the project area. As a result of the survey, one prehistoric archaeological site was identified: the Cerro Balcón South site. Puerto Rico State Historic Preservation Office archaeological site file forms have been completed for this one resource and are provided in Appendix A.

The site measures approximately 60-x-60 m and appears to be buried by redeposited slope erosion. The depth of the site has not been determined since the potential presence of UXO on the project area precludes subsurface testing. The site is located 1150 meters inland from Playa Larga on the north shore of this small island. The site is almost equidistant from both coasts and is truly an inland site. This unusual location is, in itself, interesting and because of this the site warrants further investigation. The NRHP eligibility of the site cannot be determined without further study.

The current undertaking consists of Explosive Ordnance Disposal (EOD) removal of UXO and associated debris. This action does not include any subsurface impacts to the area of the archaeological site and therefore, this undertaking will not adversely affect this historic property. It is proposed that a new road will be built to the magazine area; however, there are no plans to modify the current road, which crosses the archaeological site. Therefore, the new road and magazine construction will have no adverse impact to the archaeological site. For the current UXO removal project, no further work is

recommended on the Cerro Balcón South site. However, in the future, if plans develop which will have a subsurface impact to the site, we recommend that 1) a 100-meter wide area, centered on the site, be cleared below surface of UXO and that this effort be monitored by a professional archaeologist; 2) in the 100-meter wide area cleared of surface and subsurface UXO, an archaeological survey be conducted to determine the horizontal and vertical boundaries of the site; and 3) an archaeological assessment of the site take place to make a final determination as to the potential of the site to be included for listing on the NRHP.

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Full References for Maps and Plans

- Detail of *Islario General* of Alonso de Santa Cruz, 1545, in the *Biblioteca Nacional*, Madrid. Notice islands of S. Juan (Puerto Rico), Beieq (Vieques), Pasaje (Culebra), Virgenes (Virgins Islands), S+ (St. Croix) and Anegada. From Sepúlveda 2004:24, Vol. 1; description from Vega 2003:68, Fig. 13; complete reproduction of map in Oliver 1992:63.

- Historic plan of Puerto Rico, Vieques and Culebra, 1721, AGI Santo Domingo 131. Notice the small, almost insignificant size of Culebra in relation to Vieques, and the fort and anchorages on the south coast of Vieques. This plan was sent by colonel Jose Rocher de la Peña with a report about the removal of British troops from Biek (Vieques) in 1718. From Sepúlveda 2004:168, Vol. 1; description and details from Vega 2003:69, Fig. 14.

- Map of Culebra, ca. 1870. From Sepúlveda 2004:86, Vol. 2

- Lot Plan for San Ildefonso Town, 1881, "*Plano del emplazamiento del pueblo y terrenos del ramo de Guerra en la Isla de la Culebra*". From Sepúlveda 2004:166, Vol. 3; map details from Rodríguez Morales 1990:59, 60.

- "Culebra Land Division Map, 1905, 1913", C.S. Hammond 1905, 1913. From Thomas 1985:I-16, Fig. I-8. Detail description based on comparison with 1887 lot plan detail map in Vega 2003:73.

- "La Isla de Culebra en el año 1905". From Martínez 2002, figure with no number -- copied from Feliciano (*Apuntes y comentarios de la colonización y liberación de la Isla de Culebra*, 1981).

- "Leyenda: Area Sombreada: Tierras y costas que en el año 1969 estaban bajo el control y dominio de la Marina Americana". From Martínez 2002, figure with no number -- copied from Feliciano (Ibid, 1981).

Appendix A.

Completed PRSHPO Site File Form

HOJA DE REGISTRO DE YACIMIENTOS ARQUEOLOGICOS

Nombre del Yacimiento Cerro Balcón South Site **Municipio:** Culebra

Número Oficial: **Barrio:** Fraile

Cuadrángulo USGS: Culebra and Adjacent Islands **Sector:** Cerro Balcón

Coordenadas Lambert NAD83: **X:** 2393468.33 **Y:** -474660.12

GIS TAG (uso oficial):

1. **Formulario Anterior:** SI [ ] NO [X] 2. **Dueño:** U.S. Navy Training Site

3. **Dueño(s) Anterior(es):** U.S. Navy since early 20th century

4. **Actitud en cuanto a Investigación:** UXO removal prior to U.S. Navy leaving Culebra

5. **Condición/Uso del Terreno (especifique vegetación, cultivo, remoción, estructuras, impacto, alteración, y demás):** Acacia, guinea grass: Minor disturbance: roads, possible ditching; no modern structures; upland and inland location

6 **Cuerpos de Agua Cercanos:** pond, 400 meters

Río [ ] Quebrada [ ] Laguna [ ] Embalse/Lago [ ] Manantial [ ] Mar/Océano [ ]

7. **Tipo de Suelo** (según "Soil Survey"): Series: Descalabrado

8. **Dirección hacia la Localización del Yacimiento:** Site is located on the SW side of Cerro Balcón along a plateau at the base of the hill. It is visible in the dirt road for 60 meters up until the dirt road turns suddenly south.

9. **Descripción del Yacimiento:** Histórico [ ] Prehistórico [X] Ambos [ ] Industrial [ ] Institucional [ ] Infraestructura [ ] Militar/Defensivo [ ] Urbano [ ] Residencial [ ] Religioso [ ] Cementerio [ ] Residuario [X] Conchero [ ] Batey/Plaza [ ] Cueva/Abrigo Rocoso [ ] Petroglifo [ ] Pictografía [ ]

Materiales: Cerámica [X] Lítica [X] Hueso [ ] Concha [X] Vidrio [ ] Metal [ ] Otros [ ]

Material Diagnóstico: broad line incised ceramic

Distribución del Material: low density-all surface finds & all found in road or near iguana burrow

Características: quartz or felsic tempered plain pottery, 1 broad line incised sherd, 1 split cobble; few *Strombus* and *Cittarium pica* shells

10. **Asociación(es) Cultural**(es): Possibly Esperanza (Late Ostionoid)

11. **Colección de Superficie** SI [X] NO [ ] Estrategia: Walkover survey along transects

12. **Fotografías** SI [X] NO [ ] Ubicación: Southeastern Archaeological Research, Inc.

13. **Excavaciones** SI [ ] NO [X] Tipo de Excavación:

14. **Investigaciones Previas:** None at this site, however, Miguel Rodriquez (1997) found Cerro Balcón I Site on north side of hill

15. **Referencias Bibliográficas:** Rodriguez 1997; Ortiz Aguilu 1979; Oliver 1992, 1995; González Colón (1979-1980)

16. **Colecciones Existentes/Ubicación (tanto de material arqueológico como documentos o fotografías históricas):** No artifacts collected. Field notes and photographs curated at Southeastern Archaeological Research in Jonesville, Florida.

17. Peligro de Destrucción: UXO removal from surface only (no subsurface impacts)

18. **Comentarios Adicionales:** Significance of site cannot be determined without subsurface testing (no subsurface testing was allowed due to UXO). Current project to remove surface UXO has no planned subsurface disturbance. However, site is unusual in its inland location (in middle of the inland) and if future impacts are planned to the area, further investigations are warrented for this site.

19. **Investigador:** William Keegan, Ph.D. **Compañía/Agencia:** Southeastern Archaeological Research, Inc.

20. **Titulo de Estudio Arqueológico** (si aplica): "Archaeological Walkover Survey Associated with Unexploded Ordnance Removal, Cerro Balcón, Isla de Culebra, Puerto Rico"

21. **Fecha de Inspección:** 19/4 to 24/4, 2006
22. **Fecha del Formulario:** 18/8/2006

Nota: Inclúyase localización del yacimiento en mapa topográfico USGS y fotografías impresas en color y un CD-ROM con las imágenes en formato TIFF, GIF o JPEG.

APPENDIX B
ENVIRONMENTAL RESOURCES SURVEY

Non-Time-Critical Removal Action
at the Municipality of Culebra, Puerto Rico

Floral & Faunal Survey of Cerro Balcon Project Site April–May 2006

Prepared for

United States Army District, Jacksonville
United States Army Engineering and Support Center, Huntsville

Contract Number: W912DY-05-D-0007
Task Order Number: 0001
Project Number: I02PR006802

Prepared by

Ellis Environmental Group, LC
414 SW 140 Terrace, Newberry, FL 32669 • (352) 332-3888

September 2006

Flora and fauna of the Cerro Balcon project site were surveyed during site assessment efforts from April 19 to May 3, 2006, as specified in the *Final Work Plan, Non-Time Critical Removal Action at the Municipality of Culebra, PR.* The floral and faunal surveys were conducted along random traverses of the removal action grid area along with a survey of cultural resources conducted by archaeologist Dr. Bill Keegan. Surveys were also conducted during siting and clearing operations to create an access road to the planned magazine site. The route to the magazine site was surveyed in the immediate area of the route as its location was established.

The study area is situated near the base of Cerro Balcon and extending up the slope (see **Figure 1**). A total of 35 grids were mapped for surveying, each grid measuring 200 by 200 feet and oriented nearly north-south and east-west (**Figure 2**). A control point was established as a reference at the center of the gridded area. Nine of the grids were inaccessible due to right of entry not being granted.

The six grids that lie to the north and east of the control point are dominated by tree and shrub cover (approximately 75 to 85 percent), with the remainder composed of grasses and other ground cover. The eight grids lying to the south and east of the control point support a predominance of groundcover species covering approximately 80 to 90 percent of the area, with sparse tree and shrub cover. Most of the nine grids lying to the south and west of the control point support approximately 80 to 90 percent shrub and tree cover. Two of the nine grids in this quadrant support a lower density of shrub and tree cover than the other seven. One supports approximately 50 percent tree and shrub cover and 50 percent herbaceous cover. The other grid is dominated by approximately 80 percent herbaceous cover.

The area in which the magazine and access road were established is relatively uniform in composition, with tree and shrub cover as the dominant vegetation. The tree and shrub component of this area represents 80 to 90 percent of the vegetative cover. The relative vegetative cover can be observed from aerial photography presented in **Figure 2**.

Composition of vegetative communities on the island of Culebra has been significantly disturbed by human and natural processes and is reflected in site conditions on and around Cerro Balcon. Invasive exotic species are widespread, and little native flora is present on the site. Much of this effect has been caused by birds and introduced livestock, including cattle and goats, that spread the seeds of invasive plants that they eat, digest, and deposit wherever they range.

The vegetative association or community type attributed to the Cerro Balcon area is dry thorn-scrub forest, which occurs on limestone substrate (**Figure 3**). Most of the vegetation is found in

the shrub layer, with some of the shrub species growing to small trees in size. Few of the trees are taller than 12 feet. The dominant plant is the sweet acacia (*Acacia farnsiana*), an invasive plant that provides the majority of vegetative cover in the area (**Figure 4**). The acacia is present mainly as a shrub that forms a thicket that is nearly impenetrable by humans. Scattered throughout the acacia is mesquite (*Prosopis juliflora*), occurring as small trees growing larger and taller than the acacia.

Native shrub and tree species are present but are few in number. Puerto Rico box (*Buxus portoricensis*), an evergreen species, is the most common native shrub in the site vicinity but is less common than acacia or mesquite (**Figure 5**). Fiddlewood (*Citharexylum fruticosum*), also an evergreen, grows taller than the surrounding vegetation and can be observed protruding from the acacia and mesquite. Also occurring with low frequency is the yellow prickle (*Zanthoxylum monophyllum*), which grows to 10 to 12 feet in height, normally with a single straight trunk identified by protruding short, knobby thorns.

Grasses are the predominant ground cover vegetation in areas that are not totally covered by shrubs. Native and introduced grasses include guinea grass (*Panicum maximum*), *Paspalum* species, and Bermuda grass (*Cynodon dactylon*), among others. Where the shrub cover is dense, ground cover vegetation is limited. Herbaceous plant species include cacti such as jumping cactus (*Opuntia repens*), prickly pear (*O. dillenii*), and Turk's head cactus (*Melocactus intortus*). Also found in the herbaceous layer are wild mallow (*Croton astroites*), wire weed (*Sida acuta*), Britton's wild petunia (*Ruellia Brittonii*), and passion flower (*Passiflora* sp.).

Natural wetlands do not occur within the Cerro Balcon site. A small drainage that runs across an area of the southern portion of the site was identified. The drainage was dry during the survey period and did not appear to support wetland vegetation. A small livestock watering pond that straddles a property boundary outside and west of the Cerro Balcon site was also identified.

The following vegetation species were observed on and near the Cerro Balcon site.

Scientific Name	**Common Name**
Acacia farnsiana	Sweet acacia
Acacia macracantha	Long-spine acacia
Buxus portoricensis	Puerto Rico box
Citharexylum fruticosum	Fiddlewood
Croton discolor	Wild mallow

Cynodon dactylon	Bermuda grass
Melocactus intortus	Turk's head cactus
Opuntia repens	Jumping cactus
Panicum maximum	Guinea grass
Paspalum laxum	Paspalum grass
Passiflora suberosa	Passion flower
Prosopis juliflora	Mesquite
Ruellia Brittonii	Britton's wild petunia
Zanthoxylum monophyllum	Yellow prickle

Few faunal species were observed during the investigation. Reptiles were the most commonly observed fauna inhabiting the site and included anoles (*Anolis* sp.), Puerto Rico racers (*Alsophis portoricensis*), geckos (*Sphaerodactylus* sp.), and iguanas (*Iguana delicatissima*).

Avian species observed on or in the site vicinity included cattle egret (*Bubulcus ibis*), frigatebird (*Fregata magnificens*), turkey vulture (*Cathartes aura*), guineafowl (*Numida memeagris*), common ground dove (*Columbina passerina*), yellow-billed cuckoo (*Coccyzus americanus*), smooth-billed ani (*Crotophaga ani*), gray kingbird (*Tyrannus dominicensis*), Northern mockingbird (*Mimus polyglottos*), and bananaquit (*Coereba flaveola*).

No native large mammals occur on Culebra. The only mammals observed on or near the site were goats, white-tailed deer (*Odocoileus virginianus*), and black rats (*Rattus rattus*). The greater bulldog bat (*Noctilo leporinus*) also likely occurs and feeds in the area.

Protected species listed by the United States Fish and Wildlife Service and the Puerto Rico Department of Natural and Environmental Resources are found in the Environmental Protection Plan found in Section 11 of the *Final Work Plan*. No protected species were observed during surveys of the Cerro Balcon site or the magazine route.

Figure 1. Cerro Balcon study area

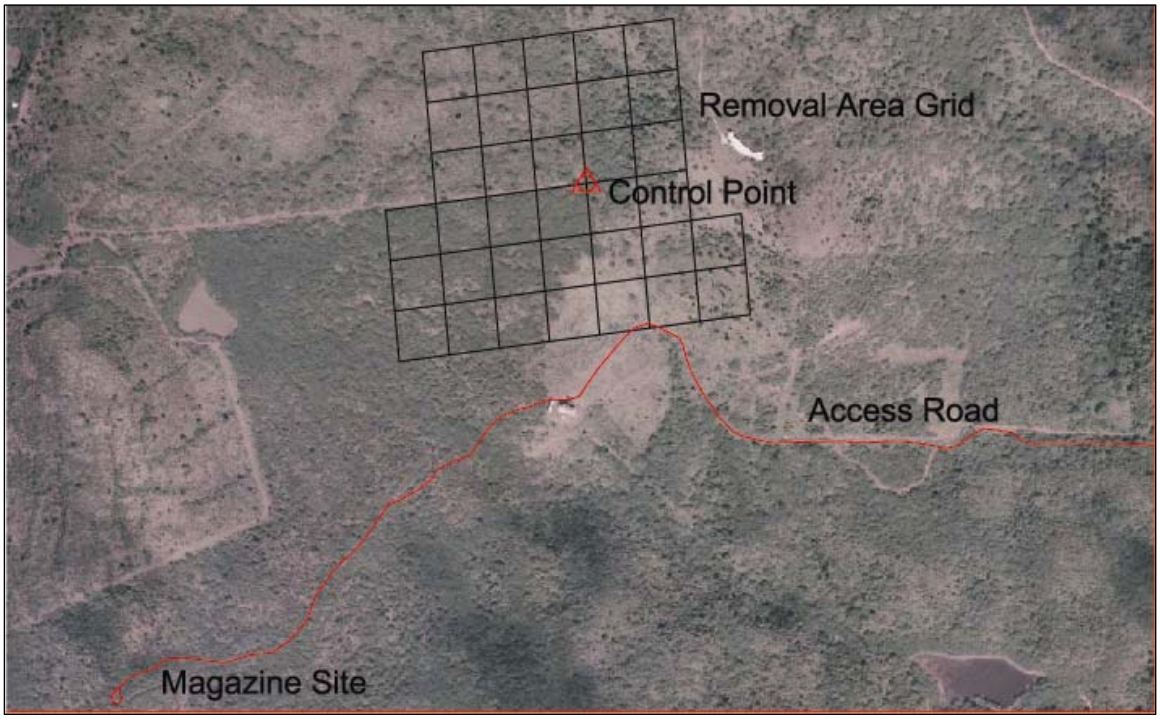

Figure 2. Cerro Balcon removal action site

Figure 3. Scrub thorn forest

Figure 4. Sweet acacia *(Acacia farnsiana)*

Figure 5. Puerto Rico box *(Buxus portoricensis)*