

ALTERNATIVES FOR THE USE OF THE NATURAL RESOURCES OF THE
REGION BETWEEN SANTA ELENA AND BOQUILLAS, MEXICO

Final Report

Cooperative Agreement No. CA7029-2-0004

Between

Big Bend National Park
Sul Ross State University

and

Profauna A.C.

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INTRODUCTION

The border region between Coahuila and Chihuahua that adjoins Big Bend National Park includes the *Ejidos* of Santa Elena, San Vicente, Ojo Caliente, Nueva Esperanza, Norias de Boquillas and, a little further to the south, Jaboncillos. Except for Ojo Caliente and Nueva Esperanza, they all have small villages. Of these, only Santa Elena has water and electricity distribution systems.

The primary activity in the area is livestock raising. There has been a long history of natural resource abuse including the exploitation of minerals, harvesting of lechugilla and candelilla, and range abuse due to poor livestock management practices. These have deteriorated the renewable natural resources.

There are also problems and conflicts of a political and social nature, for example disputes over property lines. The trespass of livestock into the National Park is another important problem. This is causing innumerable difficulties that, if allowed to continue, will endanger the relationship between the Park and the *ejidatarios*. This not only causes a conflict between neighbors but also represents an international problem. It ultimately translates into many different detriments including a deterrent to tourism. This, in turn, decreases the possibilities for development of the area.

This problem can not be resolved without sufficient background knowledge. Therefore, the **Asociacion Civil Proteccion de la Fauna Mexicana (Profauna A.C)**, in conjunction with the National Park Service through Big Bend National Park and Sul Ross State University, is involved in an effort to learn more about the people who inhabit the region, their practices and systems of production. At the same time we are looking for primary alternatives that not only will end or decrease the livestock trespass, but also that will help to improve the conditions of life in these *Ejidos*. Such solutions should also provide for the establishment of programs for the conservation of the renewable natural resources of the region.

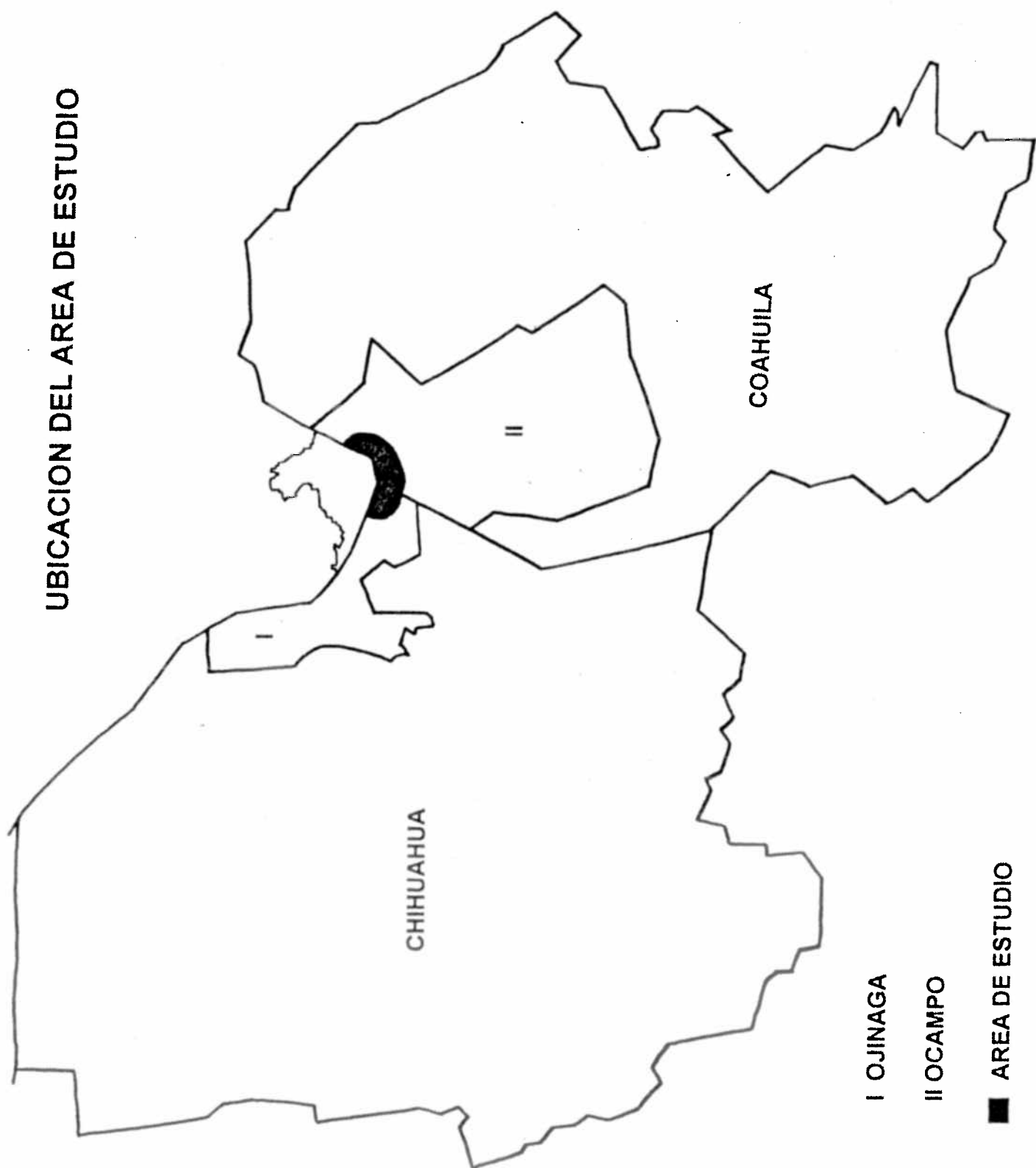
DESCRIPTION OF THE AREA

The study area is found in the extreme northwest of Coahuila and northeast of Chihuahua (Map 1). It is on the borders of both states and to the south of Big Bend National Park in the United States (USA). It encompasses an area of 1,537.7 km². The pattern of land ownership in the area consists of private property mixed with *Ejidos*.

According to the Geographic Census of Coahuila (1981), the zone is on the boundary between two biogeographic subprovinces: (1) the Coahuilan Mountains and Plains and (2) Volcanic Mountains. These subprovinces are of different geologic origin, one being primarily volcanic (igneous) and the other sedimentary

MAP 1

UBICACION DEL AREA DE ESTUDIO



(limestone). It is noteworthy that the region has a mix of mountains of both origins, for example, El Jardin is from limestone and the Maderas del Carmen are volcanic.

There are two high mountain ranges along the edge of the Rio Grande that form two important canyons, Santa Elena and Boquillas. There are isolated mountains to the south of San Vicente and in Piedritas. The rest of the area is composed of plains and gently sloping hills.

The soils of the region are fluvisols with calcareous regosols and haplagic and luvic xerosols. The physical phases that are found are lithic and gravelly. The soils are of medium texture in the top 30 cm.

Various forms of desert shrub dominant the vegetation of the area. These are interspersed with desert grassland-type ranges.

It is interesting to note the distribution and size of the villages in the area. The most important ones are located along the edge of the Rio Grande and along and near the principal road from Muzquiz to Camargo.

MEANS OF TRANSPORTATION

The study area is relatively isolated on the Mexican side. The closest paved road is the state highway that goes from Melchor Muzquiz to Boquillas del Carmen (200 km.). Approximately 120 Km of this road are paved and the rest is dirt in poor condition. There is also a dirt road from the border village of La Linda that goes to the south and connects with the highway from Muzquiz to Boquillas (Map 2).

At Puerto de Lucio, the Muzquiz - Boquillas highway intersects a road over which one could get to some of the other villages along the Rio Grande such as San Vicente in Coahuila as well as eventually to Santa Elena and Lajitas in Chihuahua.

It is important to note that the best way to and from the area is the road, known as *Carretera Riberena*, that goes alongside the Rio Grande through Big Bend National Park. The locals prefer to use this road and leave their vehicles parked on the side of the river.

There are no authorized places in the study area to cross vehicles into the USA. The closest is the border village of La Linda.

POLITICAL DIVISION

The study area is located in the extreme north of the border between the states of Chihuahua and Coahuila. The study area is in the counties of Ojinaga in Chihuahua and Ocampo in Coahuila.

Figure 1. Landscape of the region, showing the type of vegetation (Thorny Desert Shrub).

Figure 2. Dirt roads and trails are the only means of transportation.

LAND TENURE

Within the study area and its area of influence, we find three *ejidos* having a total of 410,492.39 Ha. There are also 22 small privately owned properties with a total of 120,733.50 Ha. This represents 77.27% of the land area belonging to *ejidos* and 22.73% being private property. The *ejidos* and private properties in the study area are tabulated in List 1. All of these can be located on Map 3.

LIST 1

EJIDOS AND PRIVATE PROPERTIES IN THE STUDY AREA

TENANCY	NAME	OWNER	SIZE (HA)
Ejido	San Vicente and Zacatonal		36,333.71
Ejido	Ojo Caliente		3,087.56
Ejido	Boquillas del Carmen		40,572.66
Ejido (NCPE)	La Nueva Esperanza		26,903.16
Ejido	Jaboncillos		94,144.04
Sub Total			131,041.13
Private	El Jardin	Delia Balderrama	6,419.92
Private	Piedra Azul	Ventura Gutierrez P.	2,264.81
Private	Piedra Azul	Ventura Gutierrez P.	14,050.69
Sub Total			22,735.42
Total			153,776.55

LIST 2

EJIDOS AND SMALL PRIVATE PROPERTIES IN THE STUDY AREA AND THE ZONE OF INFLUENCE

MAP #	LOCATION	OWNER	AREA IN HA.
1	Melchor Muzquiz	Ejido	34,840.00
2	San Vicente and Zacatonal	Ejido	36,333.71
3	Ojo Caliente	Ejido	3,087.56
4	Boquillas del Carmen	Ejido	40,572.66
5	Nueva Esperanza (N.C.P.E.)	Ejido	29,903.16
6	Jaboncillos	Ejido	24,144.04
7	La Salada	Ejido	37,326.31
8	Santa Fe del Pino	Ejido	43,435.79
9	Piedritas	Ejido	59,806.59
10	Los Lirios (N.C.P.E.)	Ejido	26,358.26
11	Venustiano Carranza	Ejido	13,005.03
12	Jose Ma. Morelos	Ejido	47,746.24
13	La Union Y El Olan	Ejido	16,933.04
Total for <i>Ejidos</i>			410,492.39

LIST 2 (CONT.)

EJIDOS AND SMALL PRIVATE PROPERTIES IN THE STUDY AREA AND THE ZONE OF INFLUENCE

MAP #	LOCATION	OWNER	AREA IN HA.
14	Cueva (fracc.1)	Emerita Flores De V.	3,359.00
15	El Jardin	Delia Balderrama	6,419.92
16	Piedra Azul	Ventura Gutierrez P.	2,264.81
17	Piedra Azul	Ventura Gutierrez P.	14,050.69
18	Santa Maria	Raul Lopez M.	4,214.23
19	El Mensajero	Jose S. Issac Chaib	7,517.97
20	El Mozon	Natividad Ramirez C.	6,311.56
21	Los Pilares	Natividad Ramirez R.	6,004.88
22	El Reflejo	Tomas Castelo Torres	8,297.21
23	Los Arrayanes	Dora B. Ortegon M.	4,371.04
24	Torreoncito	Mariano Lopez M.	3,200.64
25	Monteros	Eduardo I. Ortegon	3,579.67
26	San Isidro	Desiderio Ortegon M.	3,817.57
27	San Rafaelito	Dora B. Utrega O.	3,790.21
28	Polco Y Toscana	Fco. Villareal	12,051.23
29	Agua Calientes	Raul Lopez Mercado	3,200.64
30	Tuzamapan	Graciela de Munoz	2,764.21
31	Sierra Del Carmen	Ma. Mercado Velasco	4,130.75
32	Santa Rosa	Flora Atayde de C.	3,780.75
33	Disputed Areas	-----	-----
34	El Triangulo	Dora B. Urteaga	1,260.96
Total for Private Properties			104,386.70

CURRENT LAND USE

Current uses of the land in the area were determined using information from the following agencies: *Secretaria de Agricultura y Recursos Hidraulicos (SARH)*, *Secretaria de la Reforma Agraria (SRA)*, *Delegacion Estital de Minería*, *Direccion de Control Agrícola y Ganadero del Estado*, *Secretaria de Productividad Rural del Estado*, *Asociacion Ganadera de Ocampo*, and *Asociacion Ganadera Ejidal de Ocampo*. In addition, the *ejidos* were visited and polls taken of their members. The Annex gives the names and addresses of the most important agencies consulted. This approach resulted in the classification of current land use into four groups: mining, agriculture, livestock raising, and candelilla harvesting.

MINING

There are approximately sixty two mining claims currently in force in the area (see Tables 1 and 2). These are distributed as follows:

7 privately owned	4 active
55 on <i>ejido</i> land	20 active

Figure 3. Rock formations, road between Boquillas and San Vicente.

Figure 4. General view of the Santa Elena Mountains.

Table 1. Mines in the Boquillas Project Area

County	Key	Map	Name of the Mine	Mineral	Size in HA	Actual Situation	Claim Holder	Location
ACUÑA	4681	H13D37	SANTA ANITA	FLUORITA				EJIDO M. MUZQUIZ
	7101	H13D37	LAS CUEVAS 4	FLUORITA	300	ACTIVA	ADRIAN IBARRA J.	EJIDO M. MUZQUIZ
	7054	H13D47	SAN AGUSTIN	Fl. Pb. Sr. Ag. Zn. Mg. Cu. Au	400	ACTIVA	ADRIAN IBARRA J.	PIEDRA AZUL Y EJIDO MUZQUIZ
	6875	H13D47	RIO GRANDE	Pb. Ag. Cu. Fl. Mg. Zn. Au. Sr.	780	ACTIVA	Ma. MACDALENA NORIEGA	PIEDRA AZUL Y EJIDO MUZQUIZ
	6795	H13D47	SAN JOSE	Pb. Ag. Cu. Fl. Mg. Zn. Au.	180	ACTIVA	Ma. ANA GUERRA RDZ.	PIEDRA AZUL Y EJIDO MUZQUIZ
	5802	H13D47	SANTA ANITA 2	FLUORITA	100	LIBRE		PIEDRA AZUL Y EJIDO MUZQUIZ
	5498	H13D47	SANTA ANITA 3	FLUORITA				
	8061	H13D47	EL REGRESO	FLUORITA	25	LIBRE		BOQUILLAS DEL CARMEN
	4785	H13D47	PIEDRA PARADA	Au. Ag. Pb. Cu	300	LIBRE		EJ. SAN VICENTE Y ZAC.
	7122	H13D47	MAXI	FLUORITA	25	LIBRE		P.P. EL JARDIN
OCAMPO	5468	H13D47	XL	ESTRONCIO, FL. BARITA	72	LIBRE		EJ. OJO CALIENTE
	5434	H13D47	LA VERONICA	ESTRONCIO, FL. BARITA	50	LIBRE		EJ. OJO CALIENTE
	6678	H13D47	LA VICTORIA	FLUORITA, ESTRONCIO	100	ACTIVA	ALBERTO RAMON JIMENEZ	EJ. SAN VICENTE Y ZAC.
	8447	H13D47	AMP. EL CENTENARIO	FLUORITA	50	LIBRE		EJ. SAN VICENTE Y ZAC.
	8211	H13D47	EL CENTENARIO	FLUORITA	144	ACTIVA	FELICIANO PACHECO	EJ. SAN VICENTE Y ZAC.
	5514	H13D47	MARGARITAS	FLUORITA	40	SUSP.		EJ. SAN VICENTE Y ZAC.
	5002	H13D47	LAS PANCHAS	FLUORITA	30	ACTIVA	GILBERTO MORALES P.	EJ. OJO CALIENTE
	4842	H13D47	IMA	FLUORITA	100	LIBRE		EJ. SAN VICENTE Y ZAC.
	7055	H13D47	LA MURALLA	Fl. Pb. Ag. Au. Mg. Sr. Cu. Zn	100	ACTIVA	ADRIAN IBARRA J.	EJ. BOQUILLAS
	6714	H13D47	LA VICTORIA 2	FLUORITA Y ESTRONCIO	200	SUSP.	ALBERTO RAMOS J.	EJ. SAN VICENTE Y ZAC.
	8229	H13D47	ARETI	FLUORITA Y ESTRONCIO	136	ACTIVA	DANIEL ARNULFO GARCIA	EJ. SAN VICENTE Y ZAC.
	6204	H13D47	SAN PABLO	FLUORITA	21	ACTIVA	Ma. MUZQUIZ E.	EJ. BOQUILLAS
	4843	H13D47	EL ULTIMO	FLUORITA Y ESTRONCIO	23	ACTIVA	ALFONSO LOPEZ C.	EJ. SAN VICENTE Y ZAC.
	6745	H13D47	EL DIAMANTE	FLUORITA	27	LIBRE		EJ. SAN VICENTE Y ZAC.
	5139	H13D47	BONANZA	FLUORITA	40	LIBRE		EJ. SAN VICENTE Y ZAC.
	7123	H13D47	MAXII	FLUORITA Y ESTRONCIO	50	ACTIVA	ENRIQUE A. Y FAISAL M.	EJ. SAN VICENTE Y ZAC.
	6205	H13D47	SAN PABLO II	FLUORITA	20	ACTIVA	Ma. MUZQUIZ E.	EJ. BOQUILLAS
	8201	H13D47	LA ESTRELLA	FLUORITA	50	LIBRE		P.P. EL JARDIN
	5180	H13D56	LAS CRUCES	FLUORITA	80	LIBRE		EJ. LA NUEVA ESPERANZA
	4488	H13D56	LOS CAVILANES	FLUORITA	58	LIBRE		EJ. LA NUEVA ESPERANZA
	5839	H13D56	TRES HERMANOS	FLUORITA	220	ACTIVA	PEDRO N. GUERRA Y SOCIOS	EJ. LA NUEVA ESPERANZA
	5712	H13D56	LA ESPERANZA	FLUORITA	80	ACTIVA	JOSE L. GONZALEZ M.	EJ. LA NUEVA ESPERANZA
	5724	H13D56	SANTO NIÑO	FLUORITA	36	LIBRE		LIMITES DEL EJ. PIEDRITAS
	5733	H13D56	EL CHERRY	FLUORITA	52	ACTIVA	JOSE S. SANTIAGO	Y NUEVA ESPERANZA
	5711	H13D56	SALMA	FLUORITA	32	ACTIVA	RAUL SERGIO MARTINEZ	EJ. NVA ESPERANZA
	5712	H13D56	LA ESPERANZA	FLUORITA	80	ACTIVA	JOSE L. GONZALEZ	EJ. NVA ESPERANZA
	6028	H13D56	LOURDES	FLUORITA	242	CANCELADA	MA. DE LOURDES VILLAREAL	EJ. NVA ESPERANZA
	4824	H13D56	FRANCIELA	FLUORITA	242	LIBRE		EJ. NVA ESPERANZA
	5040	H13D57	ACUARIO 8	FL. BARITA Y ESTRONCIO	36	LIBRE		EJ. JABONCILLOS
	4978	H13D57	RETIRO	FL. BARITA Y ESTRONCIO	24	LIBRE		EJ. LABONCILLOS

Table 1 (Cont). Mines in the Boquillas Project Area

County	Key	Map	Name of the Mine	Mineral	Size in HA	Actual Situation	Claim Holder	Location
OCAMPO	6114	H13D67	LA VALENCIANA 10	FLUORITA	775	ACTIVA	LA DOMINICA S.A. DE C.V.	EJ. JABONCILLOS
	6790	H13D67	JABONCILLOS	FLUORITA, ESTRONCIO	36	LIBRE		EJ. JABONCILLOS
	6827	H13D67	RESITA	FLUORITA, ESTRONCIO	240	ACTIVA	DAVID ESQUIVEL	EJ. JABONCILLOS
	6704	H13D67	JABALI 1	FLUORITA, ESTRONCIO	92	LIBRE		EJ. JABONCILLOS
	6705	H13D67	JABALI 2	FLUORITA, ESTRONCIO	230	LIBRE		EJ. JABONCILLOS
	5833	H13D67	EL OTOMI	FLUORITA	100	CANCELADA		EJ. JABONCILLOS
	5099	H13D67	ACUARIO 4	FL, BARITA Y ESTRONCI	20	LIBRE		EJ. JABONCILLOS
	6833	H13D67	NUEVO LEON 2	FLUORITA, ESTRONCIO	400	LIBRE		EJ. JABONCILLOS
	5001	H13D67	EL OASIS	FLUORITA, ESTRONCIO	50	ACTIVA	ISIDRO JIMENEZ	EJ. JABONCILLOS
	6150	H13D67	LOS LAMAJALES	FLUORITA, ESTRONCIO	105	LIBRE		EJ. JABONCILLOS
	5021	H13D67	EL OASIS 1	FL, BARITA Y ESTRONCI	48	LIBRE		EJ. JABONCILLOS
	5801	H13D67	ANDROMEDA	FLUORITA, ESTRONCIO	140	CANCELADA	JOSE L. GONZALEZ	EJ. JABONCILLOS
	5793	H13D67	ACTUBRE	FLUORITA	66	ACTIVA	HOMERO VILLAREAL G.	EJ. JABONCILLOS
	6143	H13D67	LOS TOPOS	Fl, Au, Pb, Ag, Zn, C	100	LIBRE		EJ. JABONCILLOS
	6610	H13D67	EL SUSPIRO	FLUORITA, ESTRONCIO	290	LIBRE		EJ. JABONCILLOS
	6504	H13D67	EL GUAYULE	FLUORITA	140	LIBRE		EJ. JABONCILLOS
	7087	H13D67	LOS DOS AMIGOS	FLUORITA	10	ACTIVA	MONICO CASTILLO C.	EJ. JABONCILLOS
	4946	H13D67	AMP. A SAN MANUEL	FLUORITA	24	ACTIVA	JUAN A. ESPINOZA MARTINEZ	EJ. JABONCILLOS
	5182	H13D67	OSIRIS	Fl, Pb, Ag, Zn	90	ACTIVA	ISIDRO JIMENEZ L.	EJ. JABONCILLOS
	5809	H13D67	PEÑON BLANCO 1	FLUORITA, ESTRONCIO	105	CANCELADA		EJ. JABONCILLOS
	5816	H13D67	SANTA MARIA	FLUORITA	112	LIBRE	ALONSO LOPEZ C.	EJ. JABONCILLOS
	6104	H13D67	LA CORONITA	FLUORITA	70	LIBRE		EJ. JABONCILLOS
	5894	H13D67	CAPRICORNIO 1	FLUORITA, ESTRONCIO	48	LIBRE		EJ. JABONCILLOS
	5892	H13D67	CAPRICORNIO 2	FLUORITA, ESTRONCIO	40	LIBRE		EJ. JABONCILLOS

Table 2. Mines in the Area of Influence of the Boquillas Project

County	Key	Map	Name of the Mine	Mineral	Size in HA	Actual Situation	Claim Holder	Location
ACUÑA	8831	H13D37	AMP. DOMINICA 6	FLUORITA	100	LIBRE		ZUCUTU. LALITO Y CHUPONES
	4757	H13D37	HALLOWEEN	FLUORITA	58	ACTIVA		
	4080	H13D37	LADRILLO 3	FLUORITA	775	LIBRE	ELICIO PEÑA BOTELLO	P.P. ZUCUTU
	5114	H13D57	VALENCIA 10	FLUORITA				
OCAMPO	4698	H13D47	EL BUSO 5	FLUORITA	140	ACTIVA	GUILLERMO Y ARMANDO FUENTES	
	5177	H13D47	EL JARDIN	FLUORITA	188	ACTIVA	CERARDO MORALES	
	4475	H13D47	UN DIA DE ESTOS	FLUORITA	1995	LIBRE		
	4469	H13D56	SAN GERARDO	FLUORITA	50	LIBRE		
	4728	H13D56	NAVIDEÑO 4	FLUORITA	100	LIBRE	HOMERO IBARRA	Ej LA SALADA
	4399	H13D56	SAN CARLOS	FLUORITA	100	LIBRE		Ej. PIEDRITAS
	5974	H13D56	EL ALAZAN 1	FLUORITA	281	CANCELADA		LA SALADA
	5755	H13D56	LOS TRES VIEJITOS	FL BARITA Cel	100	LIBRE		SANTA FE DEL PINO
	5912	H13D56	LOS DOS VIEJITOS	FL BARITA Y ESTRONCIO	80	ACTIVA	CERARDO GARZA V.	Ej PIEDRITAS
	5983	H13D56	LORENA	FLUORITA	100	LIBRE		Ej PIEDRITAS
	5984	H13D56	LOS GRILLOS	FLUORITA	100	ACTIVA		Ej PIEDRITAS
	5858	H13D56	EL ROSARIO	FLUORITA	470	ACTIVA	KORT BENJAMIN BECK	Ej PIEDRITAS
	7021	H13D56	RISCO	FLUORITA	88	ACTIVA	LUIS GARCIA	Ej PIEDRITAS
	4912	H13D56	BARBA ROJA 1	FLUORITA	72	ACTIVA	Ma. ANGELINA GUERRA	SANTA FE DEL PINO
	5753	H13D56	EL SABINO GORDO	FLUORITA	100	LIBRE	GUILLERMO FUENTES	Ej PIEDRITAS
	5857	H13D56	AMP A SAN ROBERTO	FLUORITA	210	ACTIVA	BRUNO ROSALES G.	Ej PIEDRITAS
	5710	H13D56	SAN ROBERTO	FLUORITA	50	ACTIVA	BRUNO ROSALES G.	Ej PIEDRITAS
	5749	H13D56	LA VIBORA	FL SC. Ba. Mg. FELDESPATO.	30	CANCELADA	GENARO GARZA V.	Ej PIEDRITAS
	7187	H13D56	EL SUBIRAN	FL ESTRONCIO Y BARITA	700	ACTIVA	LA VALENCIANA SADE CV.	Ej PIEDRITAS
	4391	H13D56	PROVIDENCIA	FLUORITA	207	ACTIVA	RICARDO RAMOS M.	Ej PIEDRITAS
	5184	H13D56	SAN FRANCISCO 2	FLUORITA	45	LIBRE		Ej PIEDRITAS
	5911	H13D56	LOS DIFUNTOS	FLUORITA Y ESTRONCIO	80	LIBRE		Ej PIEDRITAS
	4905	H13D56	BARBA ROJA	FLUORITA	88	ACTIVA	GUILLERMO FUENTES C.	Ej PIEDRITAS
	8134	H13D56	ANA EL	FLUORITA Y ESTRONCIO	98	CANCELADA		Ej PIEDRITAS
	5136	H13D56	SANCARLOS	FLUORITA	100	LIBRE		Ej PIEDRITAS
	5030	H13D56	PIEDRITAS	FLUORITA	50	LIBRE		Ej PIEDRITAS
	5598	H13D56	EL NUMERO 15	FLUORITA	100	ACTIVA	HOMERO IBARRA ISIDRO JIMENEZ	Ej PIEDRITAS
	8038	H13D56	LA TOTORA	FLUORITA	130	ACTIVA	REYNALDO GARZA JUAN ORTIZ	Ej PIEDRITAS
	8041	H13D56	SANTA ESTHER	FLUORITA	200	LIBRE	Ej PIEDRITAS	Ej PIEDRITAS
	5734	H13D56	SAN JOSE	FLUORITA	10	ACTIVA	LUIS GARCIA S.	Ej PIEDRITAS
	5841	H13D56	LOS RAMONES	FLUORITA	112	LIBRE		Ej PIEDRITAS
	5883	H13D56	ROSINA	FLUORITA	35	LIBRE		Ej PIEDRITAS
	5915	H13D56	ROSANA	FLUORITA	98	ACTIVA		Ej PIEDRITAS
	4739	H13D56	SAN FRANCISCA	FLUORITA	80	ACTIVA		Ej PIEDRITAS
	4977	H13D57	SAN ISIDRO	Ag. Pb. Zn. Fl	20	LIBRE	ALONSO LOPEZ C.	PEND
	6097	H13D57	LA BONITA	FLUORITA	81	ACTIVA	JOSE ALEJANDRO SUAREZ	Ej PIEDRITAS
	4390	H13D57	LOS ENLAJADOS	FLUORITA	100	LIBRE		P.P. EL REFUGIO

FUENTE: DELEGACION ESTATAL DE MINERIA
SALTILLO, COAHUILA

There are several mining claims on *ejido* lands. However, these do not contribute any benefit to the *ejidatarios*--neither from dividends nor through direct employment. This is because the miners are generally outsiders and the *ejidatarios* have no relationship with them. Furthermore, when the claim holder does not own the land, mining law requires that he pay 2% of the proceeds from production to the land owner. This law is usually disregarded. Also, according to the same law, a mining claim shall be in force for five years. After this time the claim can be renewed. However, if no one files a claim it is declared free.

However, it should be made clear that the mines that were indicated above as being "active" are not necessarily being worked. Legally a mine is considered active as long as the claim is in force. It does not have to be worked.

AGRICULTURE

About the only agriculture practiced in the area is dry farming for personal consumption. The traditional crops are corn and beans for human consumption and sorghum for animal forage (see Tables 3 & 4).

LIVESTOCK

Livestock raising is the primary economic activity in the area and is practiced in an extensive manner. The predominant types of livestock are cattle, goats, horses and donkeys (Tables 5 & 6).

When reviewing the above tables note the difference in the number of animals indicated by the various sources (*Subdelegacion Ganadera SARH, Departamento 03 SARH, Asociacion Ganadera Ejidal, Asociacion Ganadera de la Pequena Propiedades*) and the numbers provided by the *ejidatarios* interviewed. It is difficult to say which data are true.

CANDELILLA

After livestock raising, the collection of candelilla and the production of raw candelilla wax is next most important economic activity in the area (see Tables 7, 8, 9 & 10).

CURRENT CONDITION OF THE NATURAL RESOURCES

MINING

Due primarily to difficulty of access, the region remained primarily a livestock producing area until after the Mexican Revolution. However, during the Revolution some points along the river were important for weapons smuggling. Once the country was pacified, the exploitation of natural resources changed and the mining industry began a great deal progress. Nearness of the US markets resulted in a great deal of interest in the region. Relatively large mining companies were established to mine silver and lead.

AGRICULTURA EN EL AREA DEL PROYECTO BOQUILLAS								
MUNICIPIO	LOCALIDAD	PROPIETARIO	SUP. AGRICOLA	SUP. CULTIVADA	TIPO DE AGRICULTURA	CULTIVOS TRADICIONALES	SUP. SEM. 1992	PRODUCCION 1992 Kg./HA.
OCAMPO	SAN VICENTE	EJIDO	100 HA.	100 HA.	TEMPORAL	MAIZ	3 HA	350
	BOQUILLAS DEL CARMEN	EJIDO	40 HA.	30 HA.	TEMPORAL	FRIJOL	4 HA.	200
						SARGO	4 HA.	4500
						MAIZ	NO SEMBRO	0
	JABONCILLOS	EJIDO	65 HA.	32 HA.	TEMPORAL	FRIJOL	NO SEMBRO	0
						SORGO	NO SEMBRO	0
						MAIZ	NO SEMBRO	0
	OJO CALIENTE NVA. ESPERANZA	EJIDO	-----	-----	-----	FRIJOL	NO SEMBRO	0
						SORGO	NO SEMBRO	0
						-----	-----	-----
FUENTE: S.A.R.H. DISTRITO 03 MONCLOVA, COAHUILA.								
								CUADRO 3

CUADRO 3

Table 3. Agriculture in the Boquillas Project Area

KEY

Municipio - County
 Localidad - Location
 Propietario - Ownership
 Sup. Agricola - Agricultural Land Area
 Sup. Cultivada - Land Area Cultivated
 Tipo de Agricultura - Type of Agriculture
 Cultivos Tradicionales - Traditional Crops
 Sup. Sem. 1992 - Area Planted in 1992
 Produccion 1992 Kg./HA. - 1992 Production in Kilograms per Hectare
 Temporal - Dry Land (not irrigated)
 Maiz - Corn
 Frijol - Beans
 Sorgo - Sorghum
 Sembro - Planted

AGRICULTURA EN EL AREA DE INFLUENCIA PROYECTO BOQUILLAS							
MUNICIPIO	LOCALIDAD	PROPIETARIO	SUP. AGRICOLA	SUP. CULTIVADA	TIPO DE AGRICULTURA	CULTIVOS TRADICIONALES	PRODUCION 1992 Kg./HA.
ACUÑA OCAMPO	M. MUZQUIZ	EJIDO					
	LA SALADA	EJIDO	33 HA.	5 HA.	TEMPORAL	MAIZ	3 HA.
	PIEDRITAS	EJIDO	600 HA.	473 HA.	RIEGO	FRIJOL MAIZ	2 HA. 13 HA.
						FRIJOL	10 HA.
	LA UNION Y EL OLAN	EJIDO	496 HA.	199 HA.	TEMPORAL	ALFALFA	9 HA.
							5000
	ALAMOS DEL MARQUEZ	EJIDO	20 HA.	20 HA.		MAIZ FRIJOL SORGO	9 HA. 11 HA. 6 HA.
	SANTA FE DEL PINO	EJIDO	70 HA.	59 HA.	TEMPORAL	MAIZ	NO SEMBRO
						FRIJOL	NO SEMBRO
	SAN MIGUEL	EJIDO		69 HA.	TEMPORAL	MAIZ FRIJOL MAIZ FRIJOL SORGO	NO SEMBRO NO SEMBRO 6 HA. 11 HA. 13 HA.

FUENTE: SARH. DISTRITO 03 MONCLOVA, COAHUILA.

CUADRO 4

Table 4. Agriculture in the Boquillas Project Area of Influence

KEY

Municipio - County
 Localidad - Location
 Propietario - Ownership
 Sup. Agricola - Agricultural Land Area
 Sup. Cultivada - Land Area Cultivated
 Tipo de Agricultura - Type of Agriculture
 Cultivos Tradicionales - Traditional Crops
 Sup. Sem. 1992 - Area Planted in 1992
 Produccion 1992 Kg./HA. - 1992 Production in Kilograms per Hectare

Temporal - Dry Land (not irrigated)
 Riego - Irrigated
 Maiz - Corn
 Frijol - Beans
 Sorgo - Sorghum
 Alfalfa - Alfalfa
 Sembro - Planted

PREDIOS GANADEROS EN EL AREA DEL PROYECTO BOQUILLAS										
MUNICIPIO	LOCALIDAD	PROPIETARIO	SUP. DE AGOSTADERO	SIST. DE PRODUCCION	GANADO	# DE CABEZAS			RAZA	INFRAESTRUCTURA GANADERA
OCAMPO	SAN VICENTE	EJIDO	19 130 HA.	EXTENSIVO/ VARIOS	VACUNO CAPRINO PORCINO EQUINO	700	227	300	CRUZA	3 ESTANQUES 4 MANANTIALES 3 CORRALES
	BOQUILLAS DEL CARMEN	EJIDO	26 210 HA.	EXTENSIVO/ PASTAS	VACUNO CAPRINO EQUINO	1300	674	250 200	CRUZA	9 ESTANQUES 16 OJOS DE AGUA 7 PILAS DE ABREVADERO 2 CORRALES DE MANEJO COMPLETOS
	JABONCILLOS	EJIDO	33 885 HA.	EXTENSIVO	VACUNO CAPRINO EQUINO	600 1300	750 2055	400 300	CRUZA	5 ESTANQUES 42 Km. DE CERCO 4 ANILLOS
	OJO CALIENTE NVA. ESPERANZA	EJIDO EJIDO	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	1 CORRAL DE MANEJO ND ND

NOTA:

- 1). SUB DELEGACION GANADERA S.A.R.H. SALTILLO, COAHUILA.
 - 2). DISTRITO DE DESARROLLO RURAL 03 S.A.R.H. MONCLOVA, COAHUILA.
 - 3). ASOCIACION GANADERA EJIDAL O DE LA PEQUEÑA PROPIEDAD DE OCAMPO, COAHUILA.
- ND. DATOS NO DISPONIBLES

CUADRO 5

Table 5. Livestock ranches in the Boquillas project area.

KEY

Municipio - County
 Localidad - Location
 Propietario - Ownership
 Sup. de Agostadero - Area of Pasture
 Sist. de Production - Production System
 Ganado - Livestock
 # De Cabezas - Number of Head
 Raza - Breed
 Infraestructura Ganadera - Livestock Infrastructure

Extensivo - Extensive
 Vacuno - Cattle
 Caprino - Goats
 Porcino - Pigs
 Equino - Horses, Donkeys and Mules
 Cruza - Cross
 Estanques - Tanks
 Manantiales - Waterings
 Corrales - Pens
 Ojos de Agua - Springs
 Cerco - Fence
 Corral de Manejo - Working Pens

Table 6. Livestock ranches in the area of influence of the Boquillas project.

PREDIOS GANADEROS EN EL AREA DE INFLUENCIA DEL PROYECTO BOQUILLAS

MUNICIPIO	LOCALIDAD	PROPIETARIO	SUP. DE AGOSTADERO	SIST. DE PRODUCCION	GANADO	# DE CABEZAS			RAZA	INFRAESTRUCTURA GANADERA
						1	2	3		
OCAMPO	LA SALADA	EJIDO	31 787 HA	EXTENSIVO/ CIRIPASTA	VACUNO CAPRINO EQUINO	400	1559 363 105	500 250 70	CRUZA	8 ESTANQUES 1 PILA DE ALMACENAMIENTO 1 PAPALOTE 4 BEBEDEROS 4 CORRALES 3 MANANTIALES 7 ESTANQUES 1 PAPALOTE 1 PRESITA 3 CORRALES DE MANEJO 1 CORRAL DE MANEJO COMPLETO 106 Km DE CERCO 8 DIV DE POTRERO ESTANQUES /ABREVADERO
	LA UNION Y EL OLAN	EJIDO	40 500 HA	EXTENSIVO	VACUNO CAPRINO EQUINO		583 173	400 250 80	CRUZA	
	PIEDRITAS	EJIDO	51 942 HA	EXTENSIVO/ PASTAS	VACUNO CAPRINO EQUINO	300	870 72	300 150 40	CRUZA	
	SANTA ROSA	FLORA ATHAIDE D.		EXTENSIVO						
	EL MAZON	NATIVIDAD RAMIREZ		EXT/PASTAS						
	EL TRIANGULO	DORA B URTEAGA		EXTENSIVO						
	SAN RAFAELITO	DORA B URTEAGA		EXTENSIVO						
	LOS ARRAYENES	DORA ORTEGON M		EXTENSIVO						
	MORTEROS	EDUARDO ORTEGON		EXTENSIVO						
	LOS PILARES	NATIVIDAD RAMIREZ		EXTENSIVO						
	SAN ISIDRO	DESIDERIO ORTEGON		EXTENSIVO						
	SAN FRANCISCO	EJIDO		CIR4PASTAS						
	TORREONCITO	CARLOS LOPEZ M.		PASTAS/ CIRCULAR	VACUNO EQUINO	150 100			CRUZA	
	EL RODEO	ERMINIA JORDAN P.		EXTENSIVO	VACUNO			400	CRUZA	
ACUÑA	SANTA FE DEL PINO	EJIDO	28 962 HA	EXTENSIVO	VACUNO CAPRINO EQUINO		12809 8031 4401	300 150 40	CRUZA	
	SAN MIGUEL	EJIDO	33 131 HA	EXTENSIVO	VACUNO CAPRINO EQUINO		814 120 88	400 300 70	CRUZA	
	ALAMOS DEL MARQUEZ	EJIDO	37 872 HA	EXTENSIVO	VACUNO CAPRINO EQUINO		870 530 177	350 300 40	CRUZA	
	EL MILAGRO	EJIDO	19 980 HA	EXTENSIVO	VACUNO CAPRINO EQUINO		842 80 135	350 200 50	CRUZA	
	LALITO									
	Y CHUPONES	OLEGARIO RAMON L.		EXTENSIVO	VACUNO	110			BEEFMAS	
	ZUCUTU	JESUS N. RAMON		EXTENSIVO	VACUNO	110			BEEFMAS	
	MELCHOR MQZ.	EJIDO		EXTENSIVO	VACUNO	30			CRUZA	
	V. CARRANZA	EJIDO		EXTENSIVO	VACUNO	1300			BRAHMA	
	JOSE Ma. MOREL	EJIDO		EXTENSIVO	VACUNO	2500			CHAROLA	

NOTA: 1 SUB DELEGACION GANADERA SARH. SALTILLO. COAHUILA.
 2 DISTRITO DE DESARROLLO RURAL 03 SARH. MONCLOVA. COAHUILA.
 3 ASOCIACION GANADERA EJIDAL O DE LA PEQUEÑA PROPIEDAD DE OCAMPO. COAHUILA.

CUADRO 6

KEY
 Municipio - County
 Localidad - Location
 Propietario - Ownership
 Sup. de Agostadero - Area of Pasture
 Sist. de Production - Production System
 Ganado - Livestock
 # De Cabezas - Number of Head
 Raza - Breed
 Infraestructura Ganadera - Livestock Infrastructure
 Papalote - Windmills

PREDIOS CANDELILLEROS EN EL AREA DEL PROYECTO BOQUILLAS							
MUNICIPIO	PREDIO	SUP. TOTAL HA.	SUP. APROV. HA.	TOTAL EXIST. TON.	POSIBILIDAD HIERBA	ANUAL TON. CEROTE	BENEFICIARIOS.
OCAMPO	SAN VICENTE	19 230	620	1 116	178.6	4.464	88
	BOQUILLAS DEL CARMEN	26 300	2100	3 780	604.8	15.12	96
	JABONCILLOS	30 710	700	1 260	201.6	5.04	49
	OJO CALIENTE NVA. ESPERANZA	EJIDO EJIDO	--- ---	--- ---	--- ---	--- ---	--- ---

FUENTE: S.A.R.H. AVISO DE ACCION PRELIMINAR
Y ESTUDIO TECNICO JUSTIFICATIVO PARA
EL APROVECHAMIENTO DE FIBRAS Y CERAS

CUADRO 7

Table 7. Candelilla farms in the area of the Boquillas project.

KEY

Municipio - County
Predio - Community
Sup. Total HA. - Total Area in Hectares
Total Exist. Ton. - Total Production
Posibilidad Annual Ton. - Possible Annual Production
Hierba - Herbage
Cerote - Wax
Beneficiarios - Benefactors

PREDIOS CANDELILLEROS EN EL AREA DE INFLUENCIA DEL PROYECTO BOQUILLAS							
MUNICIPIO	PREDIO	SUP. TOTAL HA.	SUP. APROV. HA.	TOTAL EXIST. TON.	POSIBILIDAD ANUAL TON.		BENEFICIARIOS.
ACUÑA					HIERBA	CEROTE	
OCAMPO	M. MUZQUIZ	34 840	600	5 400	864	21.6	162
	ALAMOS DEL MARQUEZ	37 704	200	3 600	576	14.4	61
	LA UNION Y EL OLAN	30 379	4300	7 740	1238.4	30.96	122
	PIEDRITAS	52 552	1250	2 250	360	9	138
	SAN MIGUEL	33 200	3800	6 840	1094.4	27.36	53
	SANTA FE DEL PINO	57 030	2200	3 960	633.6	15.84	200
	LA SALADA	31 127	720	1 296	207.4	5.184	62

FUENTE: S.A.R.H. AVISO DE ACCION PRELIMINAR
Y ESTUDIO TECNICO JUSTIFICATIVO PARA
EL APROVECHAMIENTO DE FIBRAS Y CERAS.

CUADRO 8

Table 8. Candelilla farms in the area of influence of the Boquillas project.

KEY

Municipio - County
Predio - Community
Sup. Total HA. - Total Area in Hectares
Total Exist. Ton. - Total Production
Posibilidad Annual Ton. - Possible Annual Production
Hierba - Herbage
Cerote - Wax
Beneficiarios - Benefactors

PRODUCCION DE CANDELILLA EN EL AREA DEL PROYECTO BOQUILLAS											
MUNICIPIO	EUJIDO	SUP EN PRODUCCION HA	1992		1991		1990		1989		1988
OCAMPO			C. AUT./TON	PRODUC./TON	C. AUT./TON	PRODUC./TON	C. AUT./TON	PRODUC./TON	C. AUT./TON	PRODUC./TON	PRODUC./TON
	SAN VICENTE	124	4		5	58	5	7.1	5	8	
	BOQUILLAS DEL CARMEN	320	10		15	8	10	14.3	7	0	
	JABONCILLOS	140	5		5	23	5	7.4	5	0	
	OJO CALIENTE										
	NVA ESPERANZA										
FUENTE	S.A.R.H. REPORTES DE PRODUCCION ANUAL FIDHECAN SOLICITUD DE CUOTAS DE APROVECHAMIENTO DE HIERBA DE CANDELILLA										

CUADRO 9

Table 9. Production of Candelilla in the Boquillas project area.

PRODUCCION DE CANDELILLA EN EL AREA DE INFLUENCIA DEL PROYECTO BOQUILLAS											
MUNICIPIO	EUJIDO	SUP EN PRODUCCION HA	1992		1991		1990		1989		1988
ACUÑA			C. AUT./TON	PRODUC./TON	C. AUT./TON	PRODUC./TON	C. AUT./TON	PRODUC./TON	C. AUT./TON	PRODUC./TON	PRODUC./TON
OCAMPO	M. MUZQUIZ	800	18		22	10.5	12	10.1	8	0	
	ALAMOS DEL MARQUEZ	400	10		15	1.3	10	13.9	8	5	10
	LA UNION Y EL OLAN	860	30.5		31	21.4	30	33.6	25	13	
	PIEDRITAS	250	9		9	8.4	10	52	8	8	
	SAN MIGUEL	780	20		27	23	24	28.5	25	0	
	SANTA FE DEL PINO	440	10		18	7.3	20	28.9	10	5	
	LA SALADA	144	5		5	1	2	1.9	2	0	
FUENTE	S.A.R.H. REPORTES DE PRODUCCION ANUAL FIDHECAN SOLICITUD DE CUOTAS DE APROVECHAMIENTO DE HIERBA DE CANDELILLA										

CUADRO 10

Table 10. Production of Candelilla in the area of influence of the Boquillas project.

This mining activity is what founded some of the communities such as Boquillas del Carmen and San Vicente. More important it was instrumental in the development of the existing road network in the area. This progress continued until the end of the Second World War when the metallic mineral deposits dwindled and the large mines ceased to function.

Although small, the human settlements have been present since long before the establishment of Big Bend National Park. Subsequently, the mining of non-metallic minerals appeared as an important activity in the area. During this time baryta and fluorspar were mined. However, due to the type of mining and the number of jobs it produced, it did not contribute much to the growth of these settlements or to the establishment of new ones.

A review of the current and expired mining claims in the area clearly demonstrates their importance according to use.

- * 34 Fluorspar
- * 6 Fluorspar - Lead
- * 3 Fluorspar - Gold
- * 6 Fluorspar - Silver
- * 4 Fluorspar - Baryta - Strontium
- * 17 Fluorspar - Strontium
- * 6 Lead - Gold
- * 6 Silver - Gold
- * 2 Strontium - Fluorspar - Baryta

With a change in world prices, mining has practically disappeared in the area as an important economic factor. This has forced the **ejidatarios** to return to livestock raising and the exploitation of renewable natural resources such as candelilla and lechuguilla.

RANGE

The development of natural resources in conjunction with the type of land tenure have brought about the overexploitation of these resources throughout most of the area. The pasturing of goats, cattle and horses show how the resources are used by different residents. The relative number of each type of livestock also indicates economic status. For example, the richer individuals own mostly cattle and horses. These are followed by the middle class who are the goat and horse owners and then the lower economic class is represented by the goat and donkey owners.

There are no true regulations on the pasturing of animals and every one tries to maintain all the animals that he can of each one of the species. This, of course, results in overgrazing and a low level of productivity.

However, on private property we find two situations. One is very much like that described above in that it causes resource denudation. In this case the desire for quick gain overrides any consideration for the sustainability of the resource. The other

situation involves ranchers with well established grazing systems and infrastructure (fences, pipelines, wells, waterings, etc.) on the ranch. These ranchers usually raise pure bred livestock and their pastures are usually in good to excellent condition.

There are several different ways to measure productivity on a grazing operation. If the number of animals per unit of land area is used, we find that more calves are produced in the areas of overgrazing. However, a better measure might be the production of meat per unit area of land.

Comparing the management system used on the Morteros ranch with the one used on the Los Pilares ranch clearly demonstrates the differences in the two approaches. The Morteros ranch has more cows per unit area of land, usually above the recommended carrying capacity. The ranges on this ranch are found in poor to average condition. The livestock are cross bred European livestock. On the Los Pilares ranch they have fewer cows per unit area of land-- normally below the recommended carrying capacity. They raise pure bred livestock and, on occasion, crossbreeds.

At first glance it seems that the Morteros ranch obtains more gain and possibly exports more calves. However, the cattle are in poor condition, their fertility is low and so are calf weights. Although rain fluctuates with the time, productivity decreases constantly--even in years with good rains when livestock condition is improved somewhat.

However, the Los Pilares ranch usually has enough forage that, although the cattle that might suffer in the dry season, they will not die like on the other ranch. Furthermore, the sale weights of their calves are higher.

The largest **ejido** in the area uses the same approach as the Los Morteros ranch but worsened by continuous grazing by cattle, horses and goats. Goats are different from the point of view of management. There are greater number of owners each with a small number of animals. Also, specialized infrastructure, such as sheep fences, is lacking. This forces the owners use herding and close the goats at the night in a coral which, in turn causes exaggerated overgrazing around the coral. One argument in favor of these practices is excessive depredation from coyotes, bears and mountain lions.

WILDLIFE

The wildlife in the area is typical of the Chihuahuan desert. However, due to destruction of the habitat and overutilization of resources such as candelilla, populations have decreases. In fact, some of the original species, such as **Berrendo** and the wolf, have disappeared.

Two methods were used to get an idea of the species present and their population situation in the area. The most important was the survey (Annex 1). Although we are not completely confident in

the the results they are generally acceptable.

The results of the survey are shown in the Table 11. These data lead us to believe that although many of the original species are present, their numbers are dramatically low. Even some populations have disappeared from relatively large areas.

The relationship between the residents of the area and the wildlife is worth analyzing.

The first remarkable thing is that the people view this natural resource only from the standpoint of personal consumption. They do not consider killing an animal to eat as hunting. On the other hand, hunting to them is when they serve as a guide with a group of hunters, generally Northamericans.

The polls clearly show that the residents have no regard the laws and rules of hunting. This perception is that the wildlife is a resource free for the taking. Failing to kill or take a wild animal to eat it at home is considered a waste. It is possible that this attitude is related to how the residents perceive the wildlife from Big Bend National Park.

The polls also identified the runaway pig or European wild boar as causing great damage to crops. If this is true, the extreme precautions should be taken to keep them from entering the National Park. The same can be said for the animals that the people call "borregos cimarrones" (runaway rams). However, it could not be determined whether this was barbedo sheep or some other introduced species.

With respect to other species that existed in the area, the **berrendo** is recognized by most of the people. The young people have seen them in Texas and the old people remember that the animals existed until the late forties.

It is also interesting to know is that any resident interviewed, independent of his or her age, does not remember having seen a wolf. Due to the supposed long term predation of livestock, these are controlled almost continuously and by using any available method. These controls plus the traditional use of snares, keep the population of medium and small carnivores low. This is especially true of the wildcat, the gray fox and the **cacomixtle**.

In the case of rare and endangered species, the beaver (**Castor canadensis**) is worth mentioning. Considered in danger of extinction in Mexico, it is relatively abundant along the Rio Grande. However, it was not mentioned on any of the polls.

The perception of the wildlife is different in the different **ejidos**. For example, in Santa Elena, San Vicente and Boquillas the people are unable to recognize species like the Golden Eagle, Perigin Falcon and others. On the other hand, in Jaboncillos some boys and young men recognize these species and have some idea of their conservation.

KEY

Localidad - Locality
 Especie - Species
 Sitio en que se han observado -
 place where they have been seen
 Otras Especies - Other Species
 Jabali de Collar - Javalena
 Guajolote - Turkey
 Venado Bura - Mule Deer
 Oso - Bear
 Coyote - Coyote
 Venado Cola Blanca - White Tail Deer

ESPECIES DE FAUNA REPORTADAS EN CUESTIONARIOS			OTRAS ESPECIES
LOCALIDAD	ESPECIE	SITIO EN QUE SE HAN OBSERVADO	
BOQUILLAS DEL CARMEN	JABALI DE COLLAR	JARDIN, PARTE ALTA, CAÑON, *	COMADREJA
	GUAJOLOTE	ARROYOS, BAJOS, E.U.A.	ARDILLA
	VENADO BURA	CAÑON, DE MUZQUIZ HACIA BOQUILLAS	VIBORA DE CASCABEL
	OSO	PORTE ALTA, SIERRA, JARDIN, E.U.A.	PUMA
	COYOTE	JARDIN, SIERRA.	ZORRA GRIS
	VENADO COLA BLANCA	EN LOS ALREDEDORES DEL EJIDO	LIEBRE
SAN VICENTE	JABALI DE COLLAR	PORTE ALTA, JARDIN, SIERRA, E.U.A.	TEJON
	GUAJOLOTE	ORILLA DEL RIO, LOS PUERTOS, EN	CODORNICES
	VENADO BURA	LOS ARROYOS, TERRENOS DEL MORO,	PALOMAS
	COYOTE	BIG BEND.	GATO MONTES
	VENADO COLA BLANCA	EJIDO, RIO.	AGUILILLAS
	JABALI DE COLLAR	SIERRA, LOMAS, CAMINO EJIDO.	CORRE CAMINOS
JABONCILLOS	GUAJOLOTE	LOMAS, PARCELAS.	GATO MONTES
	VENADO BURA	NO SE ESPECIFICA	ZORRILLO
	COYOTE	LABORES, PRESA, AREA TEMPORALERA	COMADREJA
	VENADO COLA BLANCA	CERCA DEL EJIDO.	ZORRA
	JABALI DE COLLAR	MADERAS, SIERRA LA PEÑA RUMBO LA	LIEBRE
	GUAJOLOTE	LINDA, SIERRA.	CONejo
	VENADO BURA	EN LA SIERRA, EN LA SIERRITA.	LAGARTIJAS
	OSO	EN LA SIERRA, SIERRA DEL CARMEN,	MAPACHE
	COYOTE	ORILLAS DE LA SIERRA, SIERRA JARDIN.	TLALCOYOTE
	VENADO COLA BLANCA	EN LOS ALREDEDORES DEL EJIDO.	VIBORAS
* EL INFORMADOR REPORTA QUE PROBABLEMENTE SEA JABALI EUROPEO.			ZORRA
			GATO MONTES
			COMADREJA
			ZORRILLO
			PUERCO ESPIN
			CONejo
			LIEBRE
			TEJONES
			TLALCOYOTE
			PUMA
			VIBORA

CUADRO 11

Table 11. Species of animals reported on the questionnaire

Figure 5. General view of an area that is used as rangeland.

Figure 6. Dunes of Boquillas at the foot of the Sierra del Jardin.

THE EJIDOS

The Mexican Revolution was a social movement brought about by the political and economic conditions at the time. Farmers played a decisive role as soldiers in winning this conflict. Ever since, they have been considered the most marginal and poorest social sector in the country which has made a compact to pay the debt that is owed them.

The governors of the country, who were called "revolutionaries", planned strategies that would raise the farmer's level of life. It was decided to give them a portion of the land. In keeping with the prehispanic idea of communal lands, groups of people were conveyed title to land in common. The legal term for the for the communities that have received and hold lands in this way is "*Ejido*".

The *ejidatarios* (members of the *Ejido*) could use the land and reap its benefits. However, they did not own it. They could pass their rights to their heirs but not the title to the land itself. However, with the recent modifications to Article 27 of the Constitution that have been enacted pertaining to land tenure, the *ejidatarios* are now considered the legitimate owners of the land and can dispose of it as they best see fit.

To create an *ejido* it is necessary to petition the government. This solicitation is submitted for the authorization of the President of the Republic. If approved Presidential Resolution is issued and published in the Official Federation Diary. The community then takes possession of property.

The *ejidos* that are found in the study area were founded between 1937 and 1969. Three of these (San Vicente, Boquillas and Jaboncillos) have had additions that were made between 1955 and 1965. Jaboncillos was increased a second second time in 1962.

Table 12 is presents a summary of the *ejidos* of the area, their additions and dates of decree. Also, the table shows the original number of *ejidatarios*.

The number of *ejidatarios* may vary with time. Some may abandoned the land and loose their rights. By the same token, others may integrate into the community. This is provided the assembly (the organization of internal government consisting of all of the *ejidatarios*) accepts them.

Table 13 presents a comparison of the number of *ejidatarios* when the ejido was formed and the number that the presidents of the commissions declare there are currently. It is noteworthy that in San Vicente and Jaboncillos the number of *ejidatarios* has decreased since the last addition was decreed. In Boquillas del Carmen, taking into account the two population centers (Boquillas and Norias), the number has increased.

Some have possibly migrated to the cities of Muzquiz, Villa de

Ocampo, Ojinaga and Chihuahua. Also, many have gone to the United States either illegally or as residents.

Table 12. *Ejidos* of the study area.

<i>Ejido</i>	Presidential Resolution	Possession	Members	Area in Hectares
San Vicente	20 May 1955	15 Apr 1956	32	4230 Pasture
Increase	11 Nov 1963	15 Aug 1978	54	15000 Pasture
Boquillas	21 Aug 1957	12 Sep 1958	62	6300 Pasture
Increase	4 Mar 1965	23 Sep 1965	34	20000
Jaboncillos	14 May 1937	7 Aug 1937	26	5616 216 dry land 540 Pasture
1st Increase	20 May 1955	16 Apr 1956	23	5094 Pasture
2nd Increase	29 Oct 1962	10 Mar 1967	25	20000
Ojo Caliente	19 Aug 1986	10 Apr 1987	26	5714 20 dry land 5694 Pasture
Nueva Esperanza	22 Aug 1968	22 Nov 1969	84	39580 Culti- vatalbe
Santa Elena	ND	ND	34	26300 340 dry land 24000 Pasture

Table 13. Number of *Ejidatarios*.

<i>Ejido</i>	Date of Last Increase	No. of <i>Ejidatarios</i>	No. of <i>Ejidatarios</i> in 1993	Diff.
San Vicente	15 Aug 1978	86	40	-46.51
Jaboncillos	29 Oct 1962	74	68	-8.10
Boquillas	23 Sep 1986	96	136	+41.66
Ojo Caliente	19 Aug 1986	26	ND	
Nueva Esperanza	22 Aug 1986	86	ND	
Santa Elena	ND	ND	34	

Figure 7. Village of Santa Elena.

Figure 8. View of the village of Norias de Boquillas.

TRANSPORTATION

Due to the remoteness and limited economic importance of the area and its small villages, transportation infrastructure is limited. Public transportation consists of a bus that goes from Muzquiz to Boquillas once a week. People that need to travel and do not have a private vehicle rely on others to carry them in their pick-up trucks which are the most common vehicles. Almost all of these are legally imported from the United States. The most recent model pick-ups are found in Santa Elena. Table 14 shows the number of private vehicles that are in each village. The greatest number are in Santa Elena and Jaboncillos.

Table 14. Number of Private Vehicles per *Ejido*.

<i>Ejido</i>	Small Trucks	Trucks
San Vicente	11	1
Jaboncillos	20	ND
Boquillas	20	ND
Ojo Caliente	ND	ND
Nueva Esperanza	ND	ND
Santa Elena	40	8

The principal use given these in Santa Elena, Jaboncillos, Norias and San Vicente is for hauling and caring for livestock and for transportation to Muzquiz and Ojinaga. In Boquillas they are utilized principally for transporting the people that cross the Rio Grande to tour areas that are away from the edge of the river. The people that sell gasoline obtain it in Muzquiz and Ojinaga. However, for the general private use they buy it in Big Bend National Park.

ELECTRICITY, WATER AND SEWER

Table 15 presents a summary of the services found in the *ejidos*. Only in Santa Elena is the population provided with electrical energy. They have solar cells in Jaboncillos. These were installed in all of the houses but not all are serviceable. The other *ejidos* are equipped with electric generators that are used for limited times.

Santa Elena has a water distribution system. In the other *ejidos* the water for human consumption is obtained from wells and springs. In Santa Elena the majority of the houses have septic tanks and bathrooms equipped with all of the services. The rest of the population do not have sewage systems. Some are equipped with latrines that are private or communal and defecation in the open is still frequent.

Figure 9. Street in Santa Elena with some of the more common vehicles.

Figure 10. Well in the yard of a house in Norias de Boquillas.

Table 15. Basic Services Existing in the Study Area.

Ejido Residents		No. of Houses	No. of Sources of Water	Schools	Stores
San Vicente	100	30	2 Deep Wells	1 Prim.	3
Jaboncillos	200	70	2 Deep Wells	1 Prim.	2
Boquillas	350	110	50 Shallow Wells	1 Prim.	1 J.D.N. 5
Ojo Caliente	ND	ND	ND	ND	ND
Nueva Esperanza	ND	ND	ND	ND	ND
Santa Elena	238	58	9 Water Pumps	1 Prim.	1 J.D.N. 6

MEDICAL SERVICES

Boquillas has the only clinic in the area. The residents of the region have to go to Muzquiz, Ojinaga, or to the United States to receive medical attention. The residents of Boquillas feel that the customs house could accommodate a doctor's office. Actually, there is a doctor providing social service in Boquillas. However, additional information about his work could not be obtained. Also it is important to mention that there are medical teams formed by volunteers from the United States that visit the villages along the border with the park. Also, teams from the Secretary of Health come to the villages during the regular vaccination campaigns.

SOLID WASTES

The area presents a peculiar problem with respect to solid waste. Seeing that there is no garbage collection service and education in this area does not exist, The result a severe solid waste problem. The problem is principally with plastics and food wrappings. The accumulation of such wastes is particularly noticeable in certain places such as dry creek beds, gullies, and pits (ditches). However, such wastes are found dispersed throughout all of the populated areas. It is particularly alarming that, primarily in Boquillas, the Rio Grande is one of the favorite sites for dumping garbage. The only garbage that is disposed of appropriately is aluminum cans. Everyone gathers and keeps the marked cans that they sell to the concessionaires in the park for for five cents per dollar of deposit. A few people collect also the cans over a longer period of time and keep them to sell later.

HOUSING

The houses are mostly of the style that we find in the rural areas of the state and the Chihuahuan Desert region of Mexico. The most common construction material is adobe with a smooth covering of mud plastering. The roofs are wood or common reed grass and have a covering of earth. The floors also are of packed earth. The doors and windows generally are of wood. Some modern new construction and some remodeled houses are made from cement block and brick. Others are recovered with a mixed paste of

Figure 11. Latrine used by various homes, Norias de Boquillas.

Figure 12. Health Clinic in Boquillas del Carmen.

cement and sand. There are some rock houses in Santa Elena with cement or tile floors.

The houses are not contiguous. They are separated by a space of vacant land. Most have a space to the front and others in a part of the back. Generally, there are few trees in the yards of the houses. Most of the houses consist of two or three rooms, one of which is the kitchen. Some have buildings that are isolated from the main part of the house that serve as kitchens or, in some cases, as bedrooms. As is normal in the Mexican countryside, the principal gathering area is the kitchen. They do not have a special living room like urban houses.

Most of the houses have gas stoves in the kitchens. However, almost all also have a wood stove that is used as an alternate or for the preparation of certain foods. They buy gas for the stoves in Muzquiz or Ojinaga. Some houses are equipped with refrigerators, washers, and other electrical appliances. In addition to the stove, one finds places for keeping utensils and food in the kitchen. There are also tables and chairs for preparing food and eating. The bedroom furniture consists mostly of beds, tables and clothes hampers.

In some villages, such as Boquillas and Jaboncillos, the houses are close together. However, they are more isolated in San Vicente. In all of the cases there are homes that are found outside the principal nucleus of the settlement. There are abandoned houses in all of the villages. Data about the houses was taken during the study. The results are presented in Table 16.

According to our study, the number of inhabitants per house varies from one to nine. To make this more clear, the results are summarized in Table 17.

The first group (one to three) is almost always composed of older adults. They may either live alone or with a child. This child is often a grand child who was left with them by the parents who have gone away to find work.

We find that the four to six group are young adults with minor children usually around 15 years old. Most of the young married have three to four children. The seven to nine group are families with older children. The elders of these households may be from forty to sixty years old and have a married child and his or her family living with them.

The group with more than nine persons per house is small. However, these are the families with many teen-age or small children. Some of these are family groups where the adult children have not left home and the grandparents, parents and grand children are all living together.

Some families, especially in Boquillas and Norias, have houses in both villages. They will temporarily move back and forth according to their most important activities at the time.

Table 16. Services in the Houses Expressed in %

Houses	Norias de San				Santa
	Jaboncillos	Boquillas	Vicente	Boquillas	Elena

No. of Occupants					
With 2 Rooms	0	9.90	9.90	21.42	0
More than 2 Rooms	100	90.90	90.90	78.57	100
Kitchens					
Gas Stove	46.67	45.45	45.45	50	76.47
Wood Stove	60	81.81	100	78.57	42.85
Refrigerator	13.33	0	9.90	21.42	76.47
Construction Material					
Adobe	93.33	100	100	92.86	88.23
Block	6.66	0	0	0	11.76
Brick	0	0	0	0	0
Flooring					
Earth	6.66	0	ND	0	0
Cement	93.33	100	9.90	100	94.11
Tile	0	0	0	0	5.88
Sanitary Service					
Communal Latrine	6.66	27.27	9.90	0	0
Private Latrine	20	0	9.90	57.14	5.88
Flushing Toilets	0	0	0	0	94.11
Houses in the Community					
Occupied	93.34	54.55	90.01	85.72	76.48
Abandoned	6.66	45.45	9.90	14.28	23.52
=====					

Table 17. Number of occupants per house (in %)

No. of Occupants per House	Norias de San				Santa
	Jaboncillos	Boquillas	Vicente	Boquillas	Elena

1	0	18.18	0	0	1.8
2	6.66	9.09	0	28.57	14.80
3	26.66	0	33.33	7.14	23.7
4	20	0	33.33	7.14	14.80
5	13.33	0	16.66	21.42	22.2
6	20	27.27	6.66	14.28	9.2
7	13.33	18.18	0	14.28	5.5
8	0	18.18	0	0	1.8
9	0	9.09	0	0	0
10	0	0	0	0	0
=====					

Figure 13. Adobe construction typical of the area.

Figure 14. House and yard in Norias de Boquillas.

Figure 15. House constructed with block in Boquillas del Carmen.

Figure 16. House with a covering of rock in Santa Elena.

Figure 17. Plastered front typical of the area.

Figure 18. Garden of a house.

SCHOOLS

As shown in Table 15, all the villages have primary schools. Only Boquillas and Santa Elena have preschool. Except for San Vicente which has only one, there are 2 teachers in each school. These schools are operated with one teacher attending several grades. Each teacher will attend some 20 children and the groups are divided between teachers according to the number of students. Table 18 shows the number of children in each school by grade.

The children receive instruction from first to sixth grade in sessions of five hours per day. Practically all of the children of school age attend school in Santa Elena, Norias, San Vicente, and Jaboncillos. However, some of the children in Boquillas do not attend school. Others may attend irregularly. It should be noted that the age of the student often does not correspond with his or her grade in school. There are students who are almost 15 years old that are receiving first grade instruction.

The teachers are not originally from the *ejido*. However, they live in the community during the school year. This is with the exception of the teacher in San Vicente who lives in the community throughout the year and is raising her family there. All are trained teachers and (except in San Vicente) consider their situation as something temporary. They all aspire to work in larger communities or closer to the major cities.

Generally, the schools are in good condition. They are equipped with sufficient furnishings and materials to complete the work. The school at Jaboncillos is set apart by its cleanliness, order and rule. It has boys and girls rest rooms, and garden areas with fences of roses. Also, the school in Boquillas has been restored and improved with bathrooms being constructed. The San Vicente school is in poor condition with one of the lecture halls to the point of tumbling down.

In order to learn more about the children and their school activities, permission was sought to conduct a class room program in Environmental Education. The attendance and participation of the children in Jaboncillos and Norias was continuous. Their scholastic level is good. They all read and write fluently. Their design works are very creative and their discipline very good. The only difference is that the children in Norias are very timid with strangers. The group in San Vicente has a lower scholastic level and their discipline is very poor. However, they actively participated in the dynamics. The attendance in Boquillas was very low. However, the children that attended the session were very interested in the subjects that were explained. In a second visit to this school five months later, the majority of the children attended, demonstrated enthusiasm, and successfully participated in the activities.

Very few children continue their secondary education. In order to do so they have to go live in Muzquiz, Ocampo, Manuel Benavides or Ojinaga. Teachers and parents in Jaboncillos, Norias de

Boquillas, and Boquillas del Carmen are discussing the implementation of secondary education. The lack of interested students makes this difficult.

Although the teachers are always restless to work some where else, all of them are well integrated into the communities. Apart from attending to their work with efficiency, they participate in other activities, help organize social events, improve the appearance of the school and conduct social work. They are advocates before the authorities for different causes. This includes the inspector of the zone that is located on Ocampo.

Due to their participation in the daily life of the villages, the teachers have an unquestionable moral authority that helps improve the communities. They maintain a constant relationship with the people, especially the student's parents.

Table 18. Students & Teachers per school.

Ejido	# of Teachers	Grades	# of Students
Norias de Boquillas	2	1	9
		2	9
		3	9
		4	7
		5	4
		6	6
Santa Elena	2	1	12
		2	7
		3	9
		4, 5 & 6	19
Boquillas del Carmen	2	1	10
		2	7
		3	5
		4	8
		5	6
		6	6
San Vicente	1	1 to 5	17
Jaboncillos	2	1 to 6	40

COMMERCE

Stores where food can be purchased are found in all the villages. There are three types of such stores: The CONASUPO stores sell such basic foods as beans, corn flour, ground corn, wheat flour, crackers, toilet paper, canned foods (chile, vegetables, tuna, sardines, etc.) canned juices and some sweets/candies.

There are also private establishments that sell the same products. The difference in them and the CONASUPO is that they

Figure 19. School in Norias de Boquillas.

Figure 20. School in Boquillas del Carmen.

Figure 21. Group of students in Jaboncillos.

Figure 22. Interior of a school classroom in Santa Elena.

sell fresh fruit and vegetables as well as bottled soft drinks and small wares. There are also very small establishments with very limited sales of bottled soft drinks, sweets/candies, and cigarettes. There are also those that customarily sell gasoline. Santa Elena also has a meat market and a clothing store.

The people, especially from Boquillas, Santa Elena, San Vicente, and Jaboncillos, buy part of their food in Big Bend National Park. This is primarily due to the diversity of articles that that can attain there--especially ice, meat, prepared foods, and household articles. Although it will vary, they probably spend half of their income in Ojinaga, Muzquiz, the USA and the Park. There is another type of commerce that is mobile. These merchants travel through the villages in small trucks and sell diverse merchandise such as meat, fruit, vegetables and sweets. There are others that sell furniture and household articles. They usually pass through each village weekly or bi-weekly. Their prices are very high but their merchandise is very novel to the villagers. During the course of this work, five such merchants were identified that are from Muzquiz and Ojinaga.

INCOMES

As stated above, livestock raising is the principal source of income in the region with tourism and commerce being on a minor scale. These activities are the base of the local economy and the residents can be placed into four economic groups according to how their incomes relate to the minimum wage.

1. The highest income group (more than 7 times the minimum wage) is mostly made up of stockmen/merchants. Also included are the dealers with private livestock for sale and that buy kid goats and yearling calves in the *ejido* and surrounding area. These individuals have one or more vehicles that they use in their business.

2. The next group (5 to 6 times the minimum wage) consists of those that raise goats and have a few cattle. Also belonging to this group are the businessmen such as the owner of the bar, the owners of the stores like the CONASUPO and the persons that transport tourists across the river.

3. The group that is most represented is made up of those persons that make from 2 to 4 times the minimum wage. Goat raising with a few cattle is their principal economic activity. Occasionally they may sell various articles (rocks, minerals, artifacts and used articles) attractive to the tourists. They may also harvest candelilla or work for other *ejidatarios* with more income.

4. This is the group that earns the minimum wage or less. They are primarily older people who are not economically active. They may receive help from their families and some are pensioners of the candelilla fund. The rest of the group is made up of those persons that live under conditions of extreme poverty. This group of extremely poor are also at the fore front of rejection and

social abuse. Fortunately, they are a minority.

INEGI (1993) published data on the magnitude and evolution of the poor in Mexico between 1984 and 1992. Using this approach, the groups can be ranked according to their relative level of well being.

In order to get a better idea of what these incomes mean, INEGI (1993) considered 3 levels of well being. These were based on the ability to acquire a basic basket of food that would meet minimum nutritional requirements. The monetary value of this basic food basket is considered as marking the line of extreme poverty. Relating incomes to the monetary value of this basic food basket can serve to determine the diverse levels of the population.

The following population groups are defined relative to the line of extreme poverty:

- Households in extreme poverty: When the total income of the household is less than the value of the basic food basket.
- Intermediate Households: When the household income is more than the value of the food basket but less than 2 times this quantity.
- Households with a level of well being above intermediate: When the income of the household is more than 2 times the value of the food basket.

According to our results and the parameters presented by INEGI, Groups 1 and 2 would be in the category of superior to intermediate. Group 3 would be in intermediate and group 4 would be in the extreme poverty category.

The families that we consider in group 4 (extreme poverty) do not exceed 10% of the total population. This is below the 19.4% that INEGI estimates for the country. In the intermediate category the area is approximately 60% above the national average that was 26.9% in 1992. 30% of the population would fall into the "above the intermediate" category. This is less than the national average which was 53.7% in 1992.

In a similar study that we did in 6 communities in the county of Saltillo, we found that between 10 and 25% of the families were in the situation of extreme poverty. This exceeds the national average. Also, only 15% exceeded the "superior to intermediate" situation. This is not generally true in all *ejidos*. For example, in three of these there are some salaried people that work on private ranches. In the other three communities there are fewer alternatives for employment resulting in less than 10% being in the "superior to intermediate" situation.

At any rate, this gives us a general idea of the relative well being of the population in the study area. Compared with other rural communities they are better off even though the principal productive activities are the same as in the *ejidos* of Saltillo.

Deserving separate mention, the people that are not economically active are not possible to evaluate. First there are the religious ministers. Although they may appear to be in need, they live in conditions better than those of the one group. The second are those that directly or indirectly lend services in Big Bend National Park. It is not possible to precisely estimate their incomes but they live under conditions similar to groups 2 and 3.

Then there is the economically active portion that are children in Boquillas who sell hand crafts and other curios made at home. The relevance of this group is that it can be divided into two: First are the children that belong to the families of groups 3 and 4. They are economically important and contribute to the family well being. Then there are the children of group 2 and some of 3. Their earnings may represent extra savings for the family and be used only to replace worn out clothes, or acquire school supplies and toys.

COMMUNITY RELATIONS

During visits to the different *ejidos*, it could be seen that the people of these villages have extended relations among themselves. Kinsips between the communities are common, especially between Boquillas and Norias. The companionship and friendship between all of the people is also well known. In each community there are groups that have extended relationships, as much men and with women. The most important gathering centers for the young people are outside the stores. There is no special place for the adults who generally gather in groups of four or five people. The women visit in their houses or get together at the school. The children group together at the school as well as in the streets.

The most common organized sport is Volley Ball. There are men's teams in the communities. They compete in local tournaments and go to play at other places such as Big Bend National Park where many events are held. No girls teams were found. When the women get together it is only for making conversation. Apparently it is difficult for them to work as a team. This was noted though they are friends or family. They do not share house work such as making food for special events, needlework, or hand crafts. Each woman does these things separately. Neither do they share manual labor or cooking with other acquaintances. This is most notable in Boquillas.

The children have good relationships between themselves. They play volley ball outside the school which appears to be the most practiced sport. They also play soccer. They are equipped with sufficient balls that are donated through the national park. In addition, they have basket ball nets and balls but they do not like this sport. They also have water polo balls. Some children also have bicycles.

The girls play less since they participate in small activities at

home. They help their mothers prepare food and clean the house. They have traditional toys such as dolls. They are very "home oriented". They also play volley ball but no organized team was observed.

RELIGION

Three religions are practiced in the area. The most common is Baptist. This is followed in numbers of believers by the Catholic and finally the Jehovas Witnesses. There are Baptist churches in all of these villages and all are attended regularly by ministers of this faith. All of the residents practice this religion in San Vicente where the minister has his residence. Except for San Vicente, there is a Catholic church in all of the villages but the priest only visits occasionally. The Jehova's Witnesses only have a church in Santa Elena. The Baptists have a major presence in the communities probably because they provide more for their parishioners than just worship. They distribute clothes, seeds, medical help and food. They attend to all the community independently of the religion that they may belong to. Many Catholics accept their gifts. The Catholic population is growing smaller each day perhaps due to the little attention that their church lends them. Generally, the Catholic religion is maintained by the older people. The large quantity of gifts that the people receive from the church is possibly an important cause of some of them not feeling the need for developing other activities. Since many of their needs are alleviated by the gifts that they receive, they perceive no need for better systems of production. Because of their importance in the community, the minister are responsible for much of the progress that has been had in the area. However, they have also contributed to some of the backwardness.

LAND TENURE CONFLICTS

During the course of this study we conferred with technicians from INEGI (Institute of Statistics, Geography and Information) and with technicians of *Procuraduria Agraria* (Agricultural Procurement) that worked on the *ejido* census and on the delimitation of *ejido* and private properties. There are several cases of invasions and uses of the pasture of land owners without their permission. The *Procuraduria Agraria* mediates complaints and is currently trying to solve the problem. One of these cases is the invasion of lands belonging to *Ejido* Norias de Boquillas by some of the *ejidatarios* from Jaboncillos. This situation is causing friction between both *ejidos*. Another case is *ejido* San Vicente where the center of population is not on *ejido* land. This is not a cause of conflict seeing that the occupied land belongs to the *ejido* Nueva Esperanza which does not have its own population center.

It is very important to clarify the situation of the *ejidos* Ojo Caliente and Nueva Esperanza. In spite of their having a charter and an official list of members, they do not have a population center. During the investigation members of both *ejidos* were

Figure 23. Baptist Church in Santa Elena.

Figure 24. Church in Norias de Boquillas

found in Boquillas. In the case of Ojo Caliente, there is a series of houses in Boquillas where five families live. They have none of their own services or a school. So, in reality, they are a part of the community of Boquillas. However, they pasture their livestock on their own lands. The *ejidatarios* of San Vicente also pasture their livestock on Nueva Esperanza lands without permission of the owners. On countless occasions this has caused small conflicts but without consequence. Some of the *ejidatarios* from Jaboncillos and their neighbors from a place known as Los Frijoles pasture their livestock at Maderas del Carmen without permission of the owners.

AGRICULTURAL USE OF THE AREA

There is agricultural information of two types for the area: (1) Official information obtained for District 3 of the Secretary of Agriculture and Water Resources whose offices are located in the city of Monclova, Coahuila; and (2) information obtained through interviews with the *ejidatarios*. These two information sources do not coincide or agree. This is possibly because the official data takes into account areas that exceed personal consumption. However, there are other important non-traditional crops that may be an alternative of production for some family heads.

The official data is presented in Table 3. These lead one to jump to the conclusion that corn, beans, and sorghum are the only dry land crops widely grown. Also, it is important to note that, at least officially, irrigated agriculture does not exist. This and the erratic rainfall has results in planting not being done every year. This includes corn and beans. For example, the agricultural area of San Vicente was estimated to be 100 hectares in 1992. Of this, only 11 hectares were planted. No planting was done in Boquillas del Carmen or Jaboncillos.

From the data shown in Table 3, the column headed "Agricultural Area" shows the total hectares employed in agriculture. The "Area Cultivated" column corresponds to the total tilled since 1992 and the "Area Planted" column refers to the area planted this year. As can be seen, "Agricultural Area" and "Area Cultivated" is equal only in San Vicente. This is an indication of the low agricultural potential of the area. In spite of this, during the interviews the people said that they planted squash, cantaloupe, watermelon and other crops of minor importance. Worthy of mention is that they have increased the planting of family gardens in Jaboncillos. They plant watermelon, cantaloupe, tomatoes, chilies, onions, and carrots, all of which are for personal consumption.

There is only one example of major production. One *ejidatario* in Boquillas plants a parcel and irrigates it from a spring. This person produces mostly garden stuff and sells the production within the village.

The absence of an agriculture "culture" is notable in the residents of the area. There are two reasons for this: One is

Figure 25. Dryland crop in Jaboncillos.

Figure 26. Family garden.

simply tradition. They are desert dwellers and unfamiliar with the techniques and possibilities for agriculture. Second, and probably most important, is the lack of water. The importance of this this can be noted in Jaboncillos which is the only one of the communities that has water for irrigation. They also have the greatest number of trees and ornamental plants. Boquillas is least favored in this regard seeing that San Vicente has wells for providing water.

The only mechanized agriculture is conducted in San Vicente and Santa Elena. In the case of agriculture for personal consumption and family gardens, their development is owed to the influence of the protestant missionaries. They provide seed of various crops, although not everyone plants the seed received.

In order to provide a general idea of the major crops and family gardens in the area, Table 19 presents the results of interviews and observations made in the villages. The official data do not reflect the results obtained.

Table 19. Types of crops in the study area.

=====		
Basic Family		
Ejido Crops Gardens		

San Vicente	Corn Beans	Corn, Canteloupe Squash, Beans Watermelon, Cane

Boquillas del Carmen	Corn Beans Sorghum	Squash, Canteloupe Watermelon, Garlic, Corn

Jaboncillos	Corn Beans	Watermelon, Squash Canteloupe, Cane, Tomato Chile, Onion, Garlic Carrots

Nueva Esperanza	ND	ND

Ojo Caliente	ND	ND
=====		

LIVESTOCK RAISING

As was pointed out above, the official data regarding the productive activities in the area varies greatly from one source to the other. This is especially true with livestock raising, particularly with respect to the number of head of livestock. As yet, no mention has been made of the number of animals per *ejidatario*.

To find out about livestock per *ejidatario* and other productive activities, such as agriculture and forestry, a series of interviews were conducted in the different *ejidos*. The purpose

Figure 28. Fruit trees in the family garden.

Figure 27. House with garden.

was to find out what percent of the population is engaged in each activity. These data are shown in Table 20.

Table 20. Persons that are engaged in the activities of livestock raising, agriculture, and forestry (in %).

Activity	Santa Elena	San Vicente	Noria de Boquillas	Boquillas	Jaboncillos
Livestock	71.5	84.61	92.85	81.81	93.33
Agriculture	41.05	69.23	53.89	36.36	100
Forestry	51.83	81.81	61.03	100	93.33

As can be seen, livestock raising is the most important activity. Also, it is important to note that many *ejidatarios* engage in multiple activities. Some are agriculturalists, livestock growers, and harvest candelilla. This last activity is, in reality, one in which most engage. Those that answered affirmative are those that are doing it at present.

Before continuing the analysis of the data from the interviews, it is important to outline a brief history of livestock growing in the area. During the 40's (before agrarian reform reached the area) these places were large estates that used an enormous number of employees to harvest candelilla. These were the same workers that organized to petition for the creation of the *ejidos*. However, the market suffered a notable collapse, prices fell, and the activity was no longer profitable. Government supports followed but these only served as an economic palliative for part of the *ejidatarios*. The majority decided to change to a more profitable activity which was livestock raising. This included raising cattle, goats and horses extensively with little infrastructure. The growing of small livestock is limited. It is confined mostly to chickens and, in some cases, pigs. We will analyze the reason for this below.

Table 21 presents the type of livestock grown by the *ejidatarios*. The data is expressed as a percentage of the number of persons that possess some type of livestock.

As can be seen, the majority have more than one type of livestock. Cattle are the most important in all the *ejidos*. All of the people interviewed in San Vicente said they had cattle. There are more goat producers in Jaboncillos than in Santa Elena and San Vicente. It should be noted that the greater the number of cattle producers, the lower the number of goat producers.

With reference to equine species, as many horses as donkeys are found in all of the *ejidos*. Santa Elena is the only village where there are no donkeys. It was in Norias where the most people said they have them. There are no sheep producers in any of the *ejidos*.

Table 21. Percentage of owners per type of livestock.

Livescock	Santa Elena	San Vicente	Noria de Boquillas	Boquillas	Jaboncillos
Cattle	91.6	100	77.77	76.92	64.28
Goats	19.9	36.36	55.5	46.15	85.71
Horses	75	100	55.5	53.84	64.28
Donkeys	0	72.72	77.7	23.07	57.14
Foul	25	27.27	22.2	30.76	14.28
Hogs	0	0	0	0	7.14

Chickens are only found around the houses and, generally, there are very few of them. Only about 20 to 30% of the homes have hen houses. They are less common in Jaboncillos. However, only here do we find people that have pigs.

Other important data that we should take into account is the number of animals per ejidatario. Table 22 presents the highest number and the lowest number that said they had each type of livestock.

Table 22. Major and minor owners by type of livestock.

Type of Livestock	Santa Elena		San Vicente		Noria de Boquillas		Boquillas		Jaboncillos	
	+	-	+	-	+	-	+	-	+	-
Cattle	200	5	76	2	40	1	9	2	50	3
Goats	88	30	25	1	80	2	30	4	200	6
Horses	10	1	30	1	30	3	10	1	16	2
Donkeys	0	0	17	2	10	1	6	2	10	1
Foul	15	5	100	4	25	5	ND	ND	ND	ND
Hogs	0	0	0	0	0	0	0	0	14	0

The largest herds of cattle are in Santa Elena and the smallest in Norias. With reference to goats, the most numerous groups are found in Jaboncillos and the smallest number in San Vicente. The people of Boquillas and San Vicente possess the most horses. There are few horses in Santa Elena and Norias. Donkeys are most abundant in San Vicente but there are practically none in Santa Elena.

Figure 29. Criollo cattle of the region.

Figure 30. Horses at pasture near San Vicente.

Figure 31. Donkeys are common in the area.

Figure 32. A corral with goats and donkeys.

BREEDS OF LIVESTOCK

The cattle are not of any one particular breed although the native cattle are common. There is a Brangus, Hereford, and Charolais breeder in Santa Elena. This stockman has 200 head. He manages his herds separately and claims that this increases his income. Some of the *ejidatarios* have combined their cattle over the years but still have not attempted to improve their herds.

Apparently no one has had a program of livestock improvement in the part of the study area that lies in Coahuila. However, characteristics of Brahman and Hereford can be noted in some of the animals. The goats are mostly of the native type. It is possible that at some time in Norias de Boquillas they carried Nubian goats but now these have been very crossed with the native livestock.

DISEASES

The greatest problem in goats from a health standpoint is brucellosis (*Brucella melitensis*). The most important outbreaks have been in Santa Elena where there are only two breeders of these animals. The livestock were not destroyed and have infected humans, especially the producers' children.

Actually, the brucellosis vaccine has been given to cattle as much as to goats in Santa Elena. Cattle, especially in Santa Elena, were given the triple vaccine *Clostridium chauvoei*, *Septicemia novi* and *Bacterina toxoide*. These vaccines were acquired commercially or through the director of *Ganaderia de SARH*. In some cases, especially Santa Elena, antibiotics are used when castrating or de-horning the animals. Also, it is common to give injectable vitamins to the cows and goats when they are considered to be in poor condition. Another problem that frequently presents itself is the horn fly. In order to control it the animals are bathed (sprayed) every 6 months or year. This is a common practice in all of the *ejidos*. Apparently the animals are free of ticks. Although it was not mentioned, it is possible that there are problems with tuberculosis.

SUPPLEMENTATION

One of the crops of the area is sorghum which is used as forage for animals. So is corn stubble and they are used during critical periods. Those that have few animals bring them in close to their houses where they feed and maintain them during the critical period. Those that have a large number of animals carry the forage to the range. There are springs, waterings, and, in some cases, pipelines that carry water from one place to another on the ranges. During dry times, when the waterings are dry, they carry water to the animals in tanks that they transport in their vehicles. In Santa Elena an *ejidatario* has a pipe that he uses in cases of drought or, as in the case of goats, to entice the animals to the water deposits. The livestock commonly water from the Rio Grande if, at the time, they are grazing near it.

Figure 33. Native and Hereford cross bred cattle.

Figure 34. Native and Charolais cross bred cattle.

The majority of the people supplement with block salt located near the waterings. However, some have abandoned this practice because they consider it of no value. Only one person in Santa Elena buys range cubes in the USA. Another person from Norias furnishes protein block and buys hay and concentrates in the USA for his horses, cattle and donkeys. These animals are in excellent condition.

BREEDING SYSTEMS

Breeding is generally continuous and without a program of genetic improvement. The bull to cow ratio is very variable. Only a few producers keep a ratio of one bull to 20 cows. Those producers that have between 5 and 10 cows may have one or two bulls. Those that have from 2 to 4 cows usually do not have a bull. Their cows are ran with other herds and bred by someone else's bulls. There is usually an agreement for some type of compensation for the owner of the bull. There is no artificial insemination program in the area. The seminals are of better quality in some places such as Santa Elena and San Vicente. The result of the type of breeding used is calves of different ages. This makes it difficult to sell these calves at the major markets. Only three producers from Santa Elena have controlled breeding programs. This is they sell on the export market that requires uniformity in size and age of market livestock.

The producers that have controlled breeding programs get higher calf crops (calves weaned per cow). This is about 80% which is considered to be very high for the area and type of management. These people hire cowboys to help them with the livestock management and supplementation of the animals during critical periods. They also pay better attention to herd health and all of this is reflected in a higher level of production. The other producers have very low calf crops. On the average it is around 40%. The type of management is the cause of this. They do not practice pregnancy testing and may not know their calving percentage. The most common causes of mortality in the calves are environmental factors. There are no apparent problems of predation by coyotes or mountain lions. Nevertheless, there is a problem of cattle theft in the region mostly in Santa Elena where the major producers suffer the most damage.

Controlled breeding is used in the goats. The males are kept apart from the rest of the herd except during the breeding period. It is normal to have one or two males in each herd, depending on the number of in the herd. Abortion is common and 1993 was a dry year with much of the kid crop being lost to the drought. Pregnancy and kidding percentages are unknown. Kids are usually weaned and sold early. Much of the variation in kid crop depends on the quality of the forage on the range. The kid crop was less than 50% in 1993. In this type of livestock the most important cause of mortality in the new born is poor nutrition. Also, some producers consider coyote predation important during parturition. Abortions can be attributed to either poor nutrition or to brucellosis. It would be useful to have serological

Figure 35. Water tank where livestock water.

Figure 36. Cattle on the range at San Vicente.

evidence in order to know the magnitude of the problem that apparently is surrounding Santa Elena. Many of 1993 kids had very low birth weights and some contacted diahera and died.

Horses are not raised for sale. They are needed to work the livestock. However, they generally have more of these than necessary. They keep the majority of those born and sporadically sell them from the herd. In cases of economic necessity they sell some animals to the slaughter house. This is a harmful practice seeing that, in spite of their knowing that horses are less productive and damage the range, they maintain them for sale in case of an emergency. There are less horses and no donkeys in Santa Elena. This is perhaps because all the stockmen have motor vehicles for their work. Major use is given to donkeys in Boquillas as one of the tourist attractions. There are also many donkeys that serve the same purpose in Jaboncillos. Their owners carry them to work in service of the tourists at the edge of the Rio Grande. They are very valuable for this. They are left free for feeding during the night. This is done by using a practice called *maneado* which consists of tying the front feet together which reduces their mobility. The owners of these donkeys generally have more animals than those they bring to work. These are used the same way as horses in that they can be sold during critical times.

LIVESTOCK USES

The region bases its economy in livestock raising. However personal consumption of meat is limited because, basically, they are producing meat for market. During this study we found that the most important milk producers are the goat raisers. However, milk production is very limited. It is only used by the family or they might divide it with some friends. They use it directly or make cheeses. There was only one person found to produce extra milk and make cheeses to sell in the community. Also, there was one family in Boquillas that was found to have milk cows that they maintain near their house. When they are producing milk, they give them green and dry forage. The milk produced is used only for the family. They make cheeses and other products that are also for personal consumption. The meat that they consume comes from the calves that die and can be conveniently butchered. The meat is refrigerated (if a refrigerator is available) or dried and divided between the families. Goat owners may occasionally kill an adult but they prefer to sell the kids. Also, they eat their own chickens and hens on some occasions. It is more common that they buy this meat in the park, from the traveling merchants or from markets when they visit the cities. The people who have chickens use them principally for egg production. This is a principal source of protein even though these animals only produce a part of the year. A few people have other fowl, principally turkeys. Small animals are limited by the lack of resources for feeding them. Since they produce little organic waste and there is no constant, low cost source of grain or forage to maintain them, the people prefer to buy these products instead of producing them. The same situation exists

with pigs as with chickens--there is no economic way of feeding them so almost none of them are consumed.

MARKETING OF LIVESTOCK

There are two basic ways livestock are marketed. The first is the one used by the large producers in the region. They transport and sell their animals at the national market (Ojinaga and Muzquiz) or for export (Ojinaga). These livestock exporters are primarily located in Santa Elena. Market prices were from N \$5.00 per kilogram on the hoof in 1993. These calves average weights were between 80 and 100 kg. Some stockmen prefer to sell them when they weigh 300 kg. The price is the same, there is no difference between the market in Ojinaga and Muzquiz.

The other form of marketing livestock is through a middle man. It is most common and most practiced by the small producers. Curiously, these middle men buy at the same price of N \$5.00 per kg on the hoof. However, it is important to note that there exists a feeling among some of the producers that the middlemen treat them unfairly and they want the opportunity to sell their livestock directly in the market. The principal livestock buyers live in Santa Elena and Jaboncillos. Something similar takes place with the goats. The large producers in the Jaboncillos area sell their kids directly in the market center of Coahuila. Because of the trip and the uncertainty of the market, a better alternative for the small producers is to sell their animals to a middle man. Unfair buying/market rigging practices that exist in the center of Coahuila can cause them losses. There are other buyers that live in Ocampo. Prices of the kids in 1993 were between 50 and 60 N Pesos.

LIVESTOCK REGISTRATION

Both the governments of Coahuila and Chihuahua have a registry for brands and ear marks. The Annex shows the brands of the county of Manuel Benavides, Chihuahua and the brands and marks from the area of interest for this work in Coahuila. This system allows one to take a brand or mark to the state registry and, although the result may not be instantaneous, be able to find out the same day if it belongs to a stockman in the county. The livestock being duly marked is a legal requirement for their sale. The stockmen are obligated to have their own brands seeing that to use a mark that does not belong to them can cause them problems.

However, it is very important to know that this region has a very important problem with cattle theft. The state governments have established diverse strategies in an effort to solve the problem. These include buying-selling operations, especially of livestock for export and the slaughter houses of the cities. Below the supervision of the State Livestock Director, there have been great advances in the detection of livestock buyers that operate illegally in the last two years in Chihuahua. In Coahuila the state government, through the Director of Livestock Registration,

Figure 37. The brand can be seen on this animal.

Figure 38. Some of the cattle have ear marks.

implemented a program in which an attempt would be made to register all of the livestock selling operations in Ocampo county. This area of the state has a major problem due to its extensiveness and low human population density.

To register a brand, the stockmen, whether private owner or **ejidatario**, must submit an annual report to the appropriate office. Failure to do so results in cancellation of their ear marks and brands. Livestock can not be legally sold without these. Unfortunately, due to very little vigilance being exercised, only a few stockmen submitted their reports. Also, due to no physical inspections, these reports can be easily altered.

Another strategy was to cancel all the marks and require a new registration of marks and brands. The new registry is considered the official one and permits must be renewed each five years. It is felt that this method can decrease the illegal sales and represents a first step against livestock theft in the region.

In the interviews conducted it was established that the majority of the **ejidatarios** know the problem and that especially those who have the most animals suffer the greatest losses through this means. Everyone denied knowing the cattle thieves and said that they believed they were not a part of their community.

Table 23 shows the number of **ejidatarios** (according to the data gathered in the interview with the **comisariado ejidal**) and the number of brands registered for the **ejido**. It is notable that they all do not have registered brands or ear marks. There are two possibilities. They may use brands or marks that are registered to an association. Or, the buyers do not look for brands because they do not care about the legality of the animal. What the **ejidatarios** say about their authorized registries is not in accord with official information.

Table 23. Registered brands in the *Ejidos*

<i>Ejido</i>	No. of <i>Ejidatarios</i>	No. of Registered Brands	% of <i>Ejidatarios</i> with Registered Brands
San Vicente	40	10	25
Jaboncillos	74	28	8
Boquillas	136	23	17
Ojo Caliente	26	2	8
Nueva Esperanza	86	1	1
Pierritas	138	19	14
Melchor Muzquiz	16	3	2

RANGE MANAGEMENT

Improvements in range management practices are needed in order for the stockmen to produce more meat per unit of land area with less deterioration of the range. Current range management practices used by the villagers must be understood before alternatives for improvement can be suggested. Although title to the land is held in common, it is fortunate that the stockmen have divided the pasture among themselves. Each stockman pastures his livestock only on his allotted parcel. Since there is no fencing between the pastures, they must have some means of controlling the livestock. This is accomplished by their frequently seeing their livestock and keeping them where they belong. The frequency of these visits varies greatly. The large stock growers hire cowboys from their communities to permanently stay with the livestock and take care of them most of the time. This practice limits the animals movements and keeps them where they should be. It also decreases mortality because it permits timely detection of health problems. However, it does not completely solve the problem of livestock theft.

The owners of only a few animals tend them personally. Some see their animals daily. However, others see their animals on certain occasions during the year--some only when they go to sell them. Many of the villagers have agreements to combine their animals and divide the responsibility for their care. In spite of the attention given to the livestock and the large investment in work, access to water and the lack of forage during dry periods make returns very low. However, the system of sharing the work can be a good alternative, especially for those that have only a few animals.

Since the pastures are not fenced, the animals can move freely and graze on the same sites. This practice is commonly known as the "free pasture system." Herd management is minimized and range deterioration is significant with this approach. The livestock tend to concentrate around the waterings. This causes these sites to be very degraded. Another serious problem with this approach is that many of the animals are temporarily lost. In fact, some are never found. In general the animals are in fair to poor condition, depending on the season. During critical times when feed diminishes, the livestock loose a great deal of weight.

Another important consequence of the lack of fences is that the livestock pass from the *ejidos* into the National Park. This probably occurs at two levels: The first is accidental and sporadic. The second is of greater proportions and consequences. It is the intentional crossing of relatively numerous groups of livestock to the better pastures of the park. The origin and consequences of this problem are discussed in the chapter on Alternatives for Improvement.

In some *ejidos*, especially San Vicente & Boquillas, there are registered brands that belong to a group or association of producers. They maintain their animals together but, in reality,

the herds are personal property. They divide some of the caretaking but do not have a management program or plan for moving the livestock during the year.

The owners of large herds in Santa Elena and Jaboncillos have quite a different management system. They select the sites where they pasture their animals according to range condition and the presence of water. Cowboys are constantly with the animals. The herd is kept on a site until it is exhausted. By then, they have already selected the next place that they are going to move them. This system is known as "deferred rotation" and is commonly done on the higher elevation ranges. This permits them to maintain their livestock isolated from the rest of the *ejido*. Some graze their animals on the pastures of other *ejidatarios* or they trespass on private lands. They do not move the livestock until the feed is exhausted and the movement is only in response to the visual appearance of the site. This practice is apparently less harmful to livestock condition than it is for the range. Over the long run it has resulted in greatly diminished quality of the range. We should agree that it is those who have more livestock that do this and easily exceed the capacity of the site. In addition, the free pastured animals can join these herds due to the lack of fences. All of this translates into more than just a management problem--it is a social problem. No one wants to change his range management practices because he feels that, if he does, then the others can capture the benefit. The horses and donkeys generally move freely with the cattle.

The ranges of each *ejido* are fenced and they each have communal corrals. Some people have separate private corrals. The principal use is for gathering the livestock when they are going to sell them. They are only kept there while waiting for the trucks to arrive. None of the producers have finishing or fattening programs. The corral also serves as a place for dehorning, castrating, and bathing (spraying) the livestock.

The goats are always managed with herders to prevent predation or lost animals. The corrals for the goats are normally outside the village. However, there are some at the houses. Each herdsman has his own corral. However, in some cases, they care for the goats of other stockmen that commonly do not live in the *ejido*. They receive pay for this which is normally a portion of the kids that are taken to the sale. Others have a different system that consists of renting a herd. They pay the owner 20% of the production each year, either in animals or in another form. This system is followed by the poorest herdsman that have not been able to form their own herds. The herdsman use their pastures in a system similar to what we mentioned for cattle. They use the same sites until they are exhausted only moving daily so that the livestock can water. During the rotation they may have one or more routes that change from daily to seasonal depending on the preferences of the herdsman and the size of the herd.

As in the rest of the state of Coahuila where goats are traditional, the effects on the range have been negative. This is

Figure 39. Livestock fences that divide the pastures.

Figure 40. Area of range close to a water tank.

because the size of the herds are due to the capacity of the owners to assemble them. It is common to see herds of 200 goats. With some frequency the herds decrease through mortality brought about by drought. However, as soon as possible, they begin trying to increase the numbers in their herds again. In spite of these decreases, the range is more deteriorated each time. It is unable to recuperate because it is grazed continuously without a period of rest. Although the foot of the mountain is preferred by the herdsmen, there are many herds utilizing the most inaccessible parts as well as the flats. The foot of the mountain and the higher areas are utilized at the same time by goats and the free pastured cattle. This is also in the critical periods which increases the deterioration of these sites.

1993 was a difficult year for all of the goat raisers. In southern Coahuila mortality due to drought reached alarming proportions. In addition to those that were killed or sold during the period, 7,000 dead animals were recorded in Saltillo county alone. Losses were less drastic in the study area because water was not completely lacking. They watered at springs or moved them to the river. However, the number of kids sold was very low.

ALTERNATIVES FOR DEVELOPMENT OF THE REGION

During many visits to official agencies, discussions were had with technicians from different disciplines: agriculturalists, veterinarians, nurses, engineers. They were questioned about the area and their future expectations for it. These responses can be divided into two groups. The first is the group that is optimistic about the possibilities. The other believes that conditions of life in the region can be improved only with great effort. The following is a list of the opinions of both groups. The optimists consider as advantages:

1. The low population density
2. The impressionable mentality of many of the residents of the region
3. The proximity of Big Bend National Park
4. The actual state of the resources that still permits their recuperation.
5. The official environmental programs on the border.
6. The presence of leading teachers in the community that can serve as vehicles for implementing environmental education programs and making improvements in the home (such as production organizations)

The other group considers that the improvement of the region has many limitations. Among their concerns were:

1. The road system that is not only scanty but of poor

quality and in poor condition.

2. The lack of services such as potable water, electricity and telephone.

3. The low acceptance that there is from persons outside the communities.

4. Livestock theft and possibly narcotics trafficking.

5. The low possibility for implementing agricultural programs.

6. The economic crisis that actually affects the mining and livestock industries.

7. The lack of fulfillment of the governments promises.

8. The paternalism exercised through the National Park and the Baptist ministers.

In reality, our perspective of the situation for the study area encompasses the two points of view. Considering the actual situation of the country and the region, we believe that there should be a serious effort made to help as many people as possible with the conservation of resources. In spite of every one of the limitations, this is a reality that should not be forgotten and, in some cases with work and imagination, can be overcome.

Any improvement programs implemented in the region should have a strong component that promises to improve the homes and the population centers. These should rapidly demonstrate the benefits of a change in the way of life and gain the confidence of the people. This would help gain their interest in programs for improving the systems of production--livestock as well candelilla.

The downfall of the majority of the improvement programs in rural communities in Mexico is owed, in general terms, to the following:

1. The planners at the national or state level considering that the needs of all the rural villages are the same.

2. The persons in charge of the projects have little or no contact with the communities where they are implemented.

3. Independent of the results, government programs are considered successful. They are not evaluated nor are they given follow-up in the majority of the cases.

4. Almost always, they correspond to a state or national level program. Therefore, with changes in the government, they change or are discontinued.

5. They preferably address production activities considering that this alone will resolve the social problems.

On the other hand, civil associations and other groups organize projects for farm communities with variable results. Unfortunately, in many of these there is a strong religious or partisan component. This may divide the people along the lines of their political or religious beliefs. It sometimes creates conflicts between the residents. In the case of there being a contrary organization in the community, the antagonism can cause serious divisions to grow, and independent of the results of the project, cause social problems.

Many programs, especially those that have an international component, base their efforts on offering the people large quantities of materials, equipment, objects for personal use and for the home. The thinking is that, in this way, their needs will be alleviated and they will be stimulated to improve their condition of life. Generally, people who are accustomed to receiving this help do not use it efficiently and their way of life, in reality, does not change.

However, there are many examples of communities where private organizations have implemented production or home improvement projects. These programs have the following in common:

1. They are initiated by promoters, often members of the community (or at least live there temporarily) that know the problems
2. They respond to a specific need that has been identified through the promoter or presented by the community itself.
3. The resources that are utilized are reduced or provided from financial sources that have decided to make limited investments. Often these are things (such as credit based on the man's word) that have to be paid back.
4. They are interdisciplinary. They try to resolve production problems and, at the same time, minimize social problems.

In the development of this work, we want to follow as a guide for our proposal the expressed necessities of the people themselves. We want to take into account that, in spite of the similarity in their activities, needs differ from one community to the other. This is reflected in the personal development of each resident and the general situation of the community.

One way to detect the needs of the people is to invite them to participate in meetings and ask them to express themselves. In this case, because of the type of work and in order not to raise false expectations, we decided to do this individually or to stimulate the response of some of the people through actions. Also the teachers assisted as a source of information. Although

they are not native to the community, they communicate a great deal with the people. They helped us by identifying the leaders of the community and by providing personal introductions. Some of them told us of their concerns and the benefits that they wanted for the community.

NUTRITION, HYGIENE, AND HEALTH

The teachers ascertained that the children do not have an adequate level of nutrition. Only in Norias are their heights and weights between the normal levels for Mexican children in a good state of health. Practices, such as family gardens, can be implemented in order to improve the diet. (These are the smallest in Boquillas.) Another way would be to conduct a cooking workshop to teach the women how to prepare foods at low economic cost and of high nutritional value. In looking for some way to insure the availability of such products, classes were held in Santa Elena on the preparation of foods in a base of soy flower. Although the classes were successful, the the product is not readily available.

With reference to family gardens, chickens destroy the gardens when looking for their feed. Also, they do not want to keep chickens in confinement because they do not have a way to feed them. Therefore, they prefer not to have a garden. This is not unique to the region. In other cases the solution has been to isolate the garden so that the chickens do not have easy access to it. This permits them to have chickens and gardens.

Generally the women are good cooks. This skill can be used to implement workshops to teach them how to vary their diet and, at the same time, serve as a social activity.

Only one of the teachers (the one from Santa Elena) considers that the children are not adequately clean. This should not be due to the lack of water. It is a cultural problem. This could be solved through sanctions that the teacher implements. However, he does not think this would be good for the friendly relationships that he has with the parents. The situation may be too delicate to deal with directly. Therefore, the solution could be someone besides the teacher implementing a health improvement program. The program would involve discussions of subjects such as parasites, skin diseases, and the transmission of intestinal diseases.

Something that was observed when visiting the homes was that they neither cool nor purify the water that they drink. It would be important to provide them the knowledge of the mechanisms of purification and its sanitary advantages. This is important especially because the level and type of contamination that could be in the wells is unknown. During the time that we worked in the area, there was an advisory that they not fish in the Rio Grande because of the possibility of contacting cholera. For such a program, materials such as the hand sand filter from the Sub-secretary of Ecology published through the Secretary of Urban

Development and Ecology would be especially useful. Taking a look at the services each community has, we see that only Santa Elena has a sanitary service that includes toilets with running water and septic tanks. In the rest of the communities there are latrines. These are either communal or private and even some of the residents defecate outside. This poses some health problems which are complicated because the latrines are very primitive and generally do not meet the minimum requirements of hygiene.

Due to the houses not having adequate water systems (except in Santa Elena), it is not possible to have toilets with running water. The installation of a water supply and distribution system has been finished in Boquillas. However, it currently is not functioning adequately. There are too many leaks and there is only a water supply at certain hours of the day. There are many alternatives for hygienic latrines of low cost. It is recommendable that help and a government program for improving living conditions be implemented to quickly obtain this service.

There are two types of latrines that are recommended for conditions such as those found in the area: The discontinued latrine or dry pit and the elevated latrine (Secretary of Ecology, SEDUE, 1989). These avoid contamination and bad odors. The ideal would be that each family have a latrine.

Another important aspect to take into account is medical services. As already explained, the people do not have continuous medical attention. The teams from the Secretary of Health confine their visits to the vaccination campaigns and the Doctor in Boquillas can not attend all the people. This could be resolved, at least partially, by implementing all of the possible preventative campaigns and soliciting medical teams from the official agencies that would visit the area no less than four times per year. For emergencies, the simplest and most humane thing would be to officialize the help that is offered in parts of the USA.

Through one of the community leaders in Santa Elena we found out that he had implemented a family planning program in previous years. This was after a qualification course that he had received in the city of Chihuahua. Basically, he used oral contraceptives. His program lasted four years and most of the married women participated. The result was that the number of births decreased notably. Unfortunately, this project was not followed-up because the necessary resources for acquiring the contraceptives were eliminated.

This demonstrates that, among the women, the use of contraceptives is accepted. A campaign of family planning should be implemented in all of the communities. This could be done using the same human resources and avoid the dangers to health. Above all this is because very young marriages are common. Also, according to what the women said in the interviews, it is common that the couple have four or five children when they really do not want more.

Figure 41. Children from Norias de Boquillas

Figure 42. A water well. It is necessary to improve the quality of the water.

Figure 43. To improve the woman's working conditions.

ARTS AND HANDICRAFTS

As we have already mentioned, some of the people in Boquillas make and sell simple art work such as woven bracelets. They offer their products to the tourists that come over from Big Bend National Park. The tourists acquire these things more to help the people than for their artistic value. This frankly seems to be a charity.

During our stay in Boquillas, a family learned a new bracelet pattern. We wanted to see if other families would imitate it and in what form it would be sold. The result was that, within a few months, everyone that offered bracelets had this new pattern and its price had diminished.

This leads us to believe that it may be easy to introduce new artistic techniques and elevate the quality and diversity of products. This could be done by implementing a workshop for artisans. But, at the same time, it would be very important to organize the producers into a cooperative (or some similar form). This would prevent their having to sell at low prices in order to be able to compete in this market that is so restricted and where the buyers really do not appreciate the differences in the work. This is because, unfortunately, what they sell right now is of low quality. Also, the custom of competing for the possible clients would cheapen this art work even though it is of greater cost and better quality.

I feel that Boquillas, the only place where these products are actually sold, could be used as a model. It could also be used to look for other alternatives to the children skipping school to sell their products.

Figure 44. Art work and objects for sale in Boquillas del Carmen.

Of course, producing art work should be promoted in the other communities as a source of work especially for the women. This is in view of the fact that many of them have time and the disposition to do work other than domestic.

Covered drums and some cushions, coverings and bordered napkins are the handicrafts most frequently used as ornaments or adornments for the homes. These abilities could be easily stimulated by giving a workshop for needlework. For those that prefer to work individually, new designs, better materials could be provided, seeing that the fabrics are used in accordance with the best tradition. But, this approach might make commercialization difficult in case they wanted to sell their products.

Except for cloth coverings and napkins, manual weaving is not common. However, it would be easy to increase interest in these crafts with patterns and materials that could be commercialized.

We did not observe borders, middle point or cross points because they do not have adequate materials to make these. But, some of the women said that they knew the techniques.

EDUCATION

Fortunately, the teachers in all the communities work with enthusiasm and dedication. However, it would be desirable for them to be provided with more alternatives for their schools besides just completing their primary objectives. The school could be a center of development for the community. It could be the vehicle through which pilot programs, in which the children and their families participate, could be implemented. As all this means significant extra work for the teacher, thinking should be in terms of economic stimulation. It should be realized that it will not be possible to provide all the possible training opportunities for improving the residents work. In truth, the teachers in these communities work more than in any other rural community that we know of. Perhaps the isolation could be an important factor. However, in whatever form, the teacher's abilities are useful.

Implementing a secondary school should be an intermediate term objective. Seeing that there is no electricity, the the installation of a tele-secondary school would be difficult. However, another interesting option is the National Institute of Adult Education with offices in Cuatro Ciénegas. This institute could not only assist with secondary education programs, it could also implement primary education for adults.

No program undertaken for the improvement of the environment and the protection of natural resources could be effective without the help of a program in Environmental Education. During the course of this work, a pilot program was presented in the different schools. The most important thing noted was that the children were always easily interested in these subjects when

Figure 45. Children participating in the environmental education program.

Figure 46. House where beer is sold to visitors.

they were presented in a pleasant form. The teachers are ready to participate in such activities. It would be very easy to involve them by continuously providing multidisciplinary Environmental Education materials.

It is also important to involve all of the people in Environmental Education programs. In principal, it would guide them in the improvement of their own areas, such as adequate garbage disposal, urban reforestation and adequate use of natural resources such as fire wood, wildlife, water, and, above all, the range.

There are small libraries in the schools. They contain books for the teacher, children's lectures, encyclopedias, and periodical publications. It would be desirable to organize the information and make it available to all of the community. At the same time, the total of bibliographical titles should be increased, not only with children's texts, but also with lectures for adults. Materials pertaining to agriculture and livestock as well as manuals for machinery and home repairs should be included. Revisions such as *Geoworld*, *Contents*, and *Unknown Mexico* as well as official publications for public use such as the manuals published by SEDESOL and SARH should be obtained. Also, they should especially contain receipts for cooking and publications pertaining to hand crafts for the women.

The children in Jaboncillos are especially accustomed to reading story books which are the most common materials in the library. The teachers use the outside loan and rotation of materials in order to foster enthusiasm for their lectures. Because of this, almost all of the children read. In addition, other members of the family may use the materials. The children know many stories and some are acquainted with revisions such as *Unknown Mexico*. They have a higher level of knowledge of the local animals and other parts of the world. They must become accustomed to consulting encyclopedias and specialized books on the subject of interest.

IMPROVEMENT IN LIVING CONDITIONS AND BASIC SERVICES

As with construction materials and the type of living, we found that the houses are small in relation to the number of people that inhabit them. This is especially true in Boquillas. A few have dirt floors. Generally, the number with cement or tile floors gives us an idea of the number completed. However, we must consider how many of these are adequate for the number and distribution of occupants. Also, those completed must be sufficiently comfortable considering the extreme climate of the region.

These types of programs require economic resources which apparently are not available. However, programs can be found that will improve the resident's self-construction abilities. Also, programs such as the living improvement program of SEDESOL might be viable.

TOURISM

There is no register for the number of tourists that visit the area. Generally, they only visit Boquillas and Santa Elena. Occasionally there are organized excursions to Maderas del Carmen but only when there are enough interested Northamerican tourists.

A map (or plan) with the activities of the village is offered to visitors in Santa Elena. The information was prepared in Big Bend National Park.

The visitors come totally from the National Park and the number of people that visit Mexico in this sector varies through the year in the same pattern as the visitors to the park. The tourists cross the Rio Grande in a small boat. They go down the main street and eat. Some visit the candelilla rendering boilers. They cross the Rio Grande at Boquillas in a small boat and go the rest of the way to the village on a donkey or in a pick-up truck. They visit the art store and sometimes sing accompanying a local musical group. They go to the bar or restaurant and drink beer. Some visit the rock store and some of them buy bracelets that the children sell. On occasion they visit the hot spring.

Table 24 shows a comparison between the tourists activities and the number of people that provide these services in Boquillas and Santa Elena.

Table 24. Tourism activities in Boquillas and Santa Elena.

Services	Boquillas	Santa Elena
Boats	2	1
Restaurants	1	2
Bars	1	2
Donkeys	10	0
Pick-up Trucks	3	0
Rock Sellers	4	0
Braclet Sellers	38	0

From the occupational point of view, these activities are most important in Boquillas where more people receive benefits from tourism. However, the economic impact would not be easy to measure because the number of tourists is unknown. Suffice it to say that a child that sells 3 bracelets per week is providing his home the equivalent of one day of minimum wage. This is a constant stimulus for them to practice this activity--even if they must miss school.

Although only 15% of the homes in Boquillas benefit from the lending of services, bracelet sales benefits 80% of the families. It is important to note that only the children involved in selling. Their mothers or older sisters make the bracelets and they sell them to a Northamerican. They only serve as peddlers.

Because the visits are so infrequent, tourism should only be considered a complementary activity. The first order should be more stimulation of this activity. A better image of cleanliness and an improvement in the roads and services would help. Most important is the growth of self-esteem in the people. They should not form extensive ties of dependency to this activity. The most efficient way of doing this would be to promote the educational process and provide adequate services. These would also be an attraction for the visitors. Above all, the benefits should reach a larger number of families in decent form.

SMALL INDUSTRIES

From our view, new activities and projects should be developed and implemented based on personal needs.

During this study only one person detected that was interested in beginning a new productive activity. This was the manufacture of dry meat. When he was informed that this requires a certain type of machinery, he indicated an interest in buying. The idea is to add value to the product and create employment for one or more persons.

Also a producer mentioned installing a beehive in his small orchard. But even if it was currently possible, he is not interested in diversifying his activities. This is because he is already horticulturist, raises goats and cattle and makes cheese.

The search of other alternatives, might continue when there are promoters that support the development of the ideas. We do not think it would be desirable to provide the residents with prefabricated projects which they have not been ask about or may not even be interested in. However, it is possible through the education and extension process in the community to communicate other experiences and possibilities for development.

WILDLIFE

The study area is a part of the historical habitat of two important species; **berrendo** and the feral ram. Both are extinct in Coahuila and the latter is also extinct in Chihuahua. Their disappearance was caused by illegal hunting and changes in the habitat, due especially to overgrazing. The same thing is happening to mule deer which is one of the most important species with major cynergetic potential for the region. We had the opportunity to visit sites where they are still found. But unfortunately, these animals are very scarce because their hunting is not over. Most of the residents hunt these species without consideration for fees or season. At the end of September

Figure 47. Rock shop in Boquillas del Carmen.

Figure 48. Plaza with a view of the Rio Grande in Boquillas del Carmen.

1993 we saw some collected specimens. They also hunt coyotes because they the damage caused by predation to be considerable. The most common hunting gun is the 22 rifle. There are skins from wild animals in some of the houses. Among these are beavers and snakes, as well as raptor claws. Also they have snares that are used mainly to trap lions and coyotes when they cause damage and other mammals for interest.

The type of grazing that they do overexploits the range. However, mule deer survive in Coahuila nearly to the mountains. There are whitetail deer. Wild boars are scarce and they are only seen along the Banks of the Rio Grand. Sometimes they are hunted. Predation damage by coyotes, lions, bears and eagles is reported. If possible, the residents kill all of these animals.

The gravest problem with respect to the wildlife is that the residents have not appraised the animals and do not consider them as a natural resource with value. This is in spite of the fact that they eat them and some times serve as guides to hunters. Thereby, an important step will be promote the appraisal of wildlife and teach to the residents its true ecologic and economic value.

There are some very common stories in Mexico with respect to wildlife. For example, birds such as the owl, the paraquete and magpies transform themselves into witches. Also there is the belief that bats smoke and are vampires. Besides these stories they have their own myths that they relate to the children. We heard three of these. One was about a horned lizard that killed a candelilla producer. Another was about a snake that attempted to hang an individual and in the attempt split herself in two. Then there was the one about a female bear that bathed her young with amole (a sauce eaten on special foods). These stories, although imagined, have created ill will, especially toward the horned lizard. Therefore, they are destroyed.

Thinking in terms of educational programs, these beliefs should be take into account the as a part of their culture. However, they should be brought real information and respect for wildlife should be encouraged.

Another alternative for this area is wildlife production with cynergetic end. This region was famous before for the abundance and size of mule deer. Currently the populations are very low but with adequate management could be increased to an exploitable level. The introduction of mule deer and **berrendos** would be recommendable. Maybe in the future, feral rams could be introduced if the analysis proves that it is feasible. With introductions comes the risk that the animals will disappear due to illegal hunting. Therefore, there should be a surveillance program supporting this project.

Apparently no wildlife introductions have been done in this area. But it is possible that introductions could come into the area from other nearby areas. This would be a problem and could cause

problems with the native wildlife. Therefore, any type of introduction should be prohibited. A program of inspection should be implemented, especially from the USA, in order to avoid introductions into the region due to negligence.

The adjacent mountains, especially Maderas del Carmen, are a dispersion center of flora and fauna. They are of great biological value and a corridor from the Sierra del Carmen to the Chisos Mountains. Therefore it is necessary to think in terms of strict conservation programs such as a protected area that would serve like a development zone to support the region. The black bear, which moved to the Chisos, is an example of how much the biological corridor means. On the other hand, other exotic animals can move in it too.

Everyday the conservation of natural resources gains importance--especially in some plants and animals which have been converted to symbols. The area is going to be very important in the future. If Mexican wolves are liberated in Big Bend National Park they could move to Mexico through the biological corridor. It is necessary to recognize the opinion of Mexicans and foresee the consequences of such a reintroduction. On some of the questionnaires the residents commented to us about the traffic in skins that lasted 30 years and made the region and the border town of Lijitas, Texas famous. They told us that sometimes they killed coyotes that were as big as wolves. Perhaps they did.

LIVESTOCK

Livestock is the most important economic activity in the area. However, it is also the activity that currently has the greatest impact on the habitat. This is for two principal reasons. First is the lack of adequate grazing systems. The carrying capacity of the range in the area is estimated by COTECOCA, the official Mexican agency which determines range coefficients. The coefficients for the area are shown in the Table 25 and compared with other official quantities.

According to the information, only SARH has cattle information and considers that the range lands are over stocked. If goats and horses are taken into account, the quantities would easily be double. As we have already stated, the official data are incomplete. The principal cause is that when information is asked for from the members of the *ejido*, they distrust the use that the government will put to the information. Fearing that supports will be withdrawn or that more taxes will be collected, they give incorrect information. In this case we consider that the numbers from SARH are the most accurate, but there are more cows than they reported. The data that is farthest from reality are the data from the *Asociacion Ganadera Ejidal*. Perhaps this is because they consider that they are protecting their associates by reducing the quantities. Apparently they do not have any record.

But independent of livestock numbers, there are other factors to take into account concerning grazing. The rangelands are not

Table 25. Comparison of carrying capacities and the number of hectares per head according to the reported data.

Ejido	Type of Livestock	Carrying Capacity (Ha/AU)	Animals per Hectare		
			1	2	3
San Vicente	Cattle	30.84	1/27.3	1/84.27	1/63.7
	Goats		-----	1/165.6	1/95.6
	Horses		-----	-----	1/382
Boquillas	Cattle	21.20	-----	1/38.38	1/104.8
	Goats		1/20.16	-----	1/131
	Horses		-----	-----	-----
Jaboncillos	Cattle	28.91	1/56.47	1/45.18	1/84.7
	Horses		1/26.06	1/16.48	1/112.9
	Goats		-----	1/119.7	1/1129

Note: 1. Subdelegacion Ganadera S.A.R.H.
 2. Distrito de Desarrollo Rural 03 S.A.R.H.
 3. Asociacion Ganadera *Ejidal* o de la Pequena Propiedad de Ocampo
 AU = Animal Unit (One cow with calf year long or their equivalent).

divided which results in unequal stocking. Some of them, such as in Santa Elena, are grazed exclusively cattle with only some horses. But, the rest of the *ejidos* are grazed by a combination of cows, goats and donkeys. With no control, this results in some areas being completely degraded. Cattle, donkey and horse movements are in response to the search for feed. This is without the limits of fencing or human control. There are sites where the influence of grazing has caused erosion. This is particularly noticeable near San Vicente and the tract of land from town to the Rio Grande in Boquillas. On many sites the cover of grasses is scarce. On others it is practically non existent. Although we do not know what the vegetation on the site was like before to the Conquest, by comparing it to other areas, it is possible that pasture was abundant.

The original activity of these population centers was not livestock. The towns of Coahuila, (Boquillas and San Vicente) were mining towns and Santa Elena was an agricultural area where cotton was grown. Changes have caused livestock to be the best alternative for the future. Therefore, it is necessary to get this activity into order.

The first step must be to determine the exact number of animals being grazed. To do this, we must first gain the trust of the people. Our experience during this study is that they answer correctly when they are told that the information will not be used to injure them. At the same time, the real area that each uses to grazing their cattle needs to be known. The same is true

for what movements of the cattle are made during the year with both grazing systems used. At the same time, it is necessary to know which sites are used only by cattle and which have multiple use. When these studies are combine with the determination of range coefficients, we can start making recommendations for management.

Also in the first stage, arrangements need to be made with members of the *ejidos* who will allow small plots to be fenced into exclusions. These can demonstrate the potential of the range. This would make the reorganization of the range management practices possible because it could be used for demonstrations of different systems in restricted areas. Also, trips could be organized to ranches that have systems that might be adaptable to the area.

It is not easy o convince members of the *ejido* to decrease their number of animals. They depend on this activity and think their future prosperity depends on the number of animals. One way to convince them might be through payment for production or rent for their ranges for the purpose of conducting demonstrations. They could be employed as cowboys. The other way, but for the short run, would be to provide them alternatives for a fast return. However, this is almost impossible due to the development conditions of the region.

In the initial stage, genetic improvement or changes in cattle type would be important. One way would be to use the official supports through the exchange of crossbred breeding males for pure bred males, both cattle and goats. In the case of goats dairy breeds should be used. Another immediate possibility is a campaign to get rid of the unproductive animals, donkeys and horses. Also, more strict and continuous programs of animal should be implemented--mainly brucellosis and tuberculosis control.

The problem of trespass cattle into Big Bend National Park is due to different causes. The first is the range condition on the Mexican side. Then there is the incomprehension of the residents of a sense of conservation of a National Park in the USA. For these people it is a crime not to use resources in a productive way. "Why can I not utilize that which you do not use?" The third reason that needs special attention is the possibility that the crossed cattle be from illegal activity. This would be easy to find out if the Big Bend staff check the brands.

There is no single solution to the problem of trespass cattle. Solutions must begin at the same time from different points. Perhaps the most important one is the education of the *ejidatario*. This would need to be followed by an extension program with emphasis on range management and genetic improvement of livestock. Then there needs to be surveillance of the cattle movements in the region and the most frequently used crossing points. Also, measures should be taken to stop their use. In summary, the strategy would be based on education and increased

production. And, on the other hand, making passage of the animals difficult. There should be a careful inspection of brands because any sign of illegality would permit immediate legal action from Mexican authorities.

Strictly unilateral measures will only serve to create more distrust and resentment between the neighbors of the National Park. The problem can be resolved only by working together. After talking, mainly with residents of San Vicente, we get the feeling that the international crossing of cattle is truly a rebellious act against the powerful that has everything. We cannot forget that it was their not too distant ancestors who invaded Colorado and accomplished the Mexican Revolution.

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ANNEX

SECRETARIA DE AGRICULTURA Y RECURSOS HIDRAULICOS S.A.R.H.

Carretera central K.m. 7.5
C.P. 25289, Saltillo, Coahuila.
Tel. 91 (84) 300075, 300736
Fax. 300075.

S.A.R.H. Distrito de Acuna.

CAP. LEAL No. 536 CD. Acuna, Coah.
C.P. 26200
Tel. 91 (877) 21164, 21738

SECRETARIA DE LA REFORMA AGRARIA S.R.A.

Hidalgo y M. Perez Trevino
C.P. 25000, Saltillo, Coah.
Tel. 91 (84) 142885.

DELEGACION ESTATAL DE MINERIA

La Salle S.N., Saltillo, Coah.
Tel. 91 (84) 162483.

DIRECCION DE CONTROL AGRICOLA Y GANADERO DEL ESTADO

Direccion de Desarrollo Agropecuario.
Abasolo Nte. No. 537 Piso 1, Saltillo, Coah.
Tel. 91 (84) 124650.

ASOCIACION GANADERA DE OCAMPO.

Dom. Conocido, Ocampo, Coah.

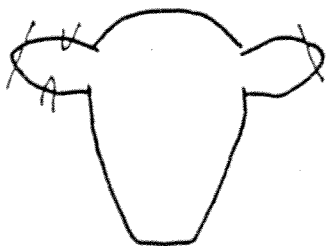
ASOCIACION GANADERA EJIDAL DE OCAMPO

Dom. Conocido, Ocampo, Coah.

REGISTERED BRANDS FOR THE EJIDO

Ejido Nueva Esperanza

NOMBRE: Isaac García Wislar

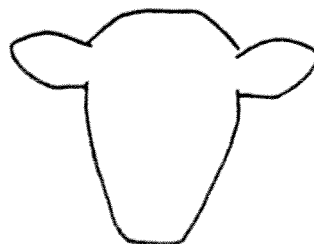


WG

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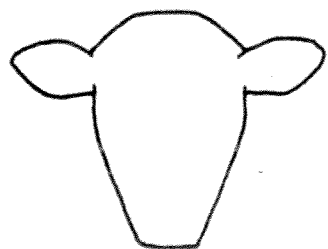
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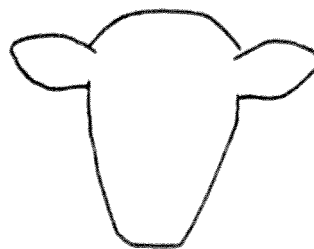
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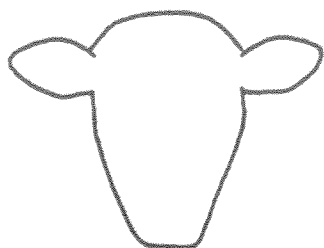
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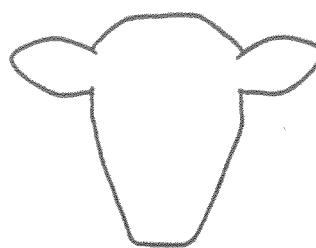
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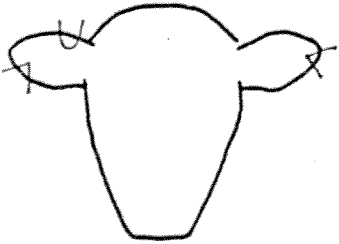
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REGISTERED BRANDS FOR THE EJIDO

Ejido Piedritas

NOMBRE: Oscar Cabello Villarreal

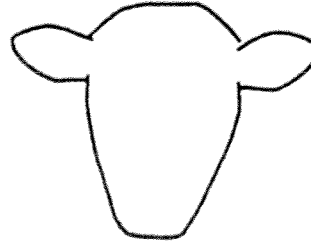


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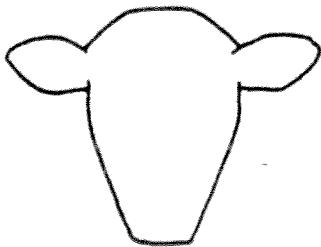
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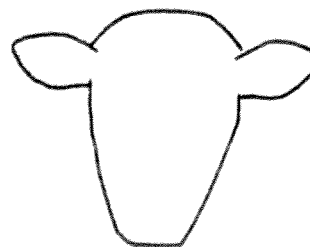
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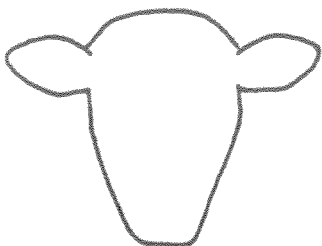
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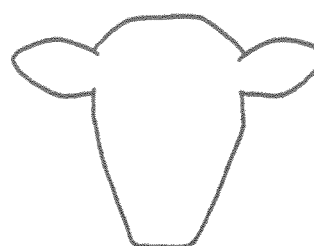
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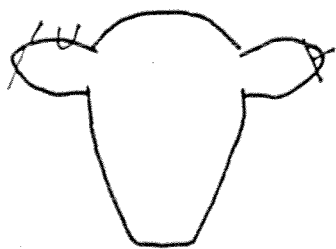
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REGISTERED BRANDS FOR THE EJIDO

Ejido Piedritas

NOMBRE: Gilberto Soto Ortega

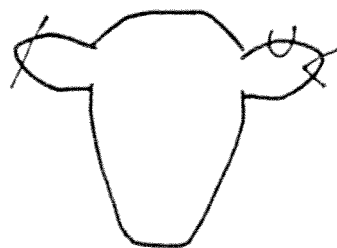


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NOMBRE: Abelardo Rodríguez Ledezma

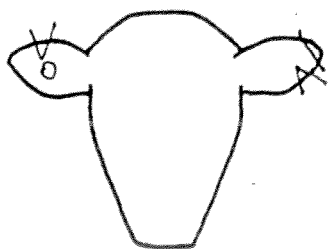


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FIERRO

NOMBRE: Miriam y Claudia Flores Cova

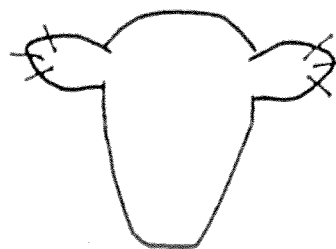


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FIERRO

NOMBRE: Miguel García Villarreal

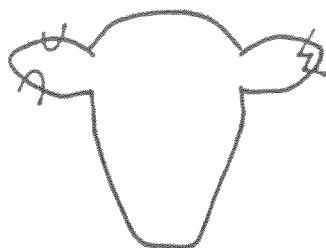


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FIERRO

NOMBRE: Catorina Pruneda Sanchez

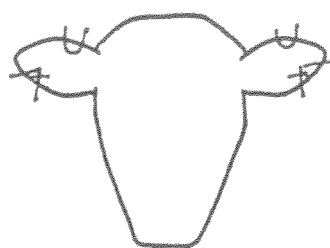


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FIERRO

NOMBRE: Ma. de Jesús Pruneda G.



SEÑAL DE SANGRE

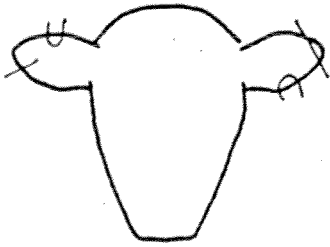


FIERRO

REGISTERED BRANDS FOR THE EJIDO

Ejido Piedritas

NOMBRE: Sector de Producción
Agropecuaria

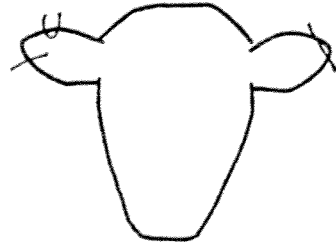


PI

SEÑAL DE SANGRE

FIERRO

NOMBRE: Sector de Producción
Agropecuaria No. 3

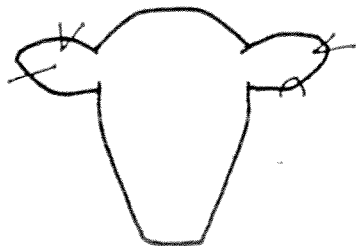


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SEÑAL DE SANGRE

FIERRO

NOMBRE: Longino Corrales Sánchez

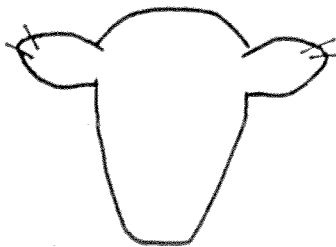


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SEÑAL DE SANGRE

FIERRO

NOMBRE: Antonia Rodríguez Carrasco

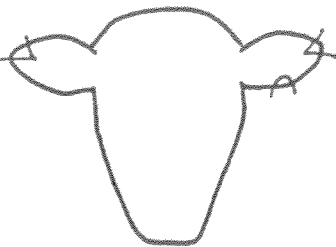


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SEÑAL DE SANGRE

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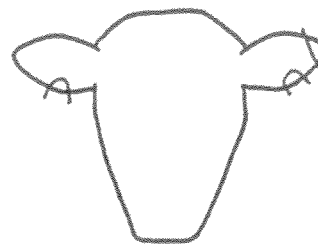
NOMBRE: Enrique Vallejo



SEÑAL DE SANGRE

FIERRO

NOMBRE: Rogelio Sánchez Marez



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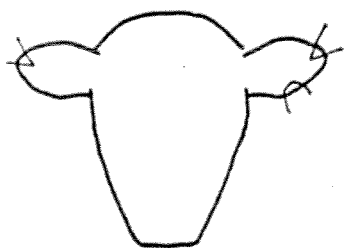
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REGISTERED BRANDS FOR THE EJIDO

Ejido Piedritas

NOMBRE: José Ramón Trujillo

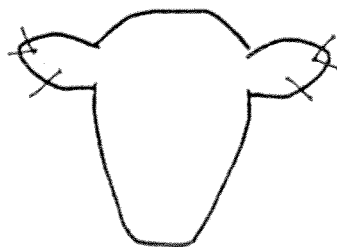


SEÑAL DE SANGRE



FIERRO

NOMBRE: Israel Villa Hinojosa

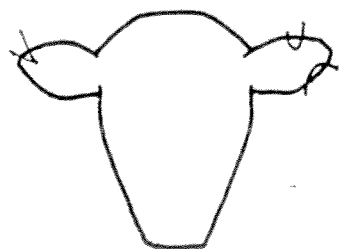


SEÑAL DE SANGRE



FIERRO

NOMBRE: Amado Villarreal Maldonado

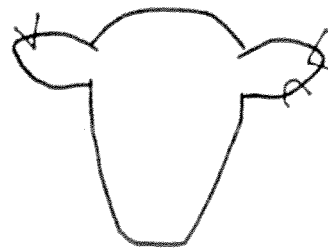


SEÑAL DE SANGRE



FIERRO

NOMBRE: Vicente Cabello Villarreal

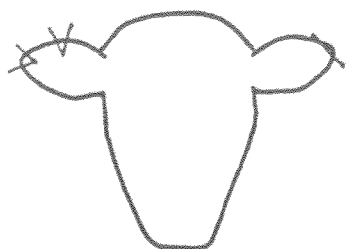


SEÑAL DE SANGRE



FIERRO

NOMBRE: Armando García Baeza

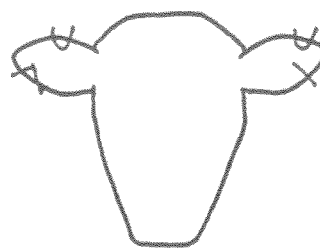


SEÑAL DE SANGRE



FIERRO

NOMBRE: Nora García Villarreal



SEÑAL DE SANGRE

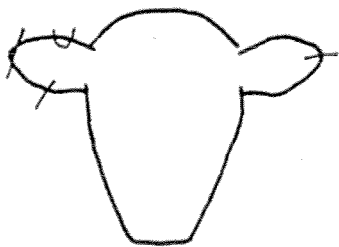


FIERRO

REGISTERED BRANDS FOR THE EJIDO

Ejido Jaboncillos

NOMBRE: José Juan Rubio Atayde

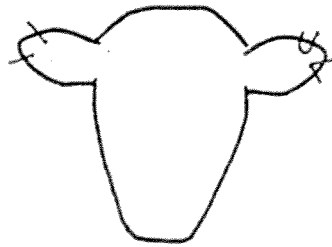


JJ

SEÑAL DE SANGRE

FIERRO

NOMBRE: Sociedad Colectiva de
Jaboncillos

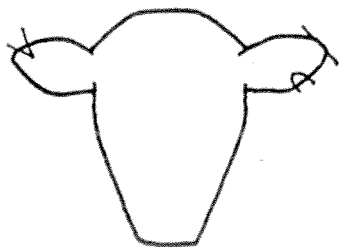


SJ

SEÑAL DE SANGRE

FIERRO

NOMBRE: Francisco Mendoza M.

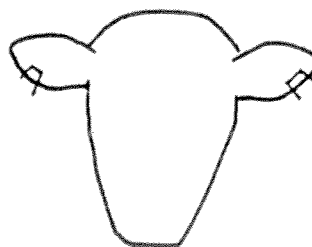


FM

SEÑAL DE SANGRE

FIERRO

NOMBRE: Armando Atayde C.

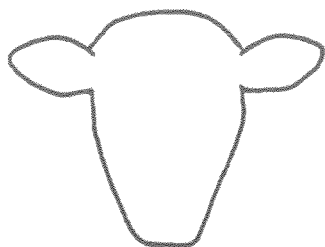


2A

SEÑAL DE SANGRE

FIERRO

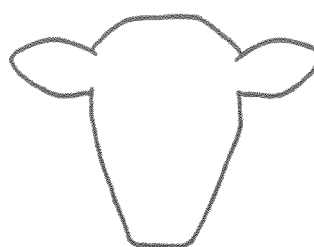
NOMBRE:



SEÑAL DE SANGRE

FIERRO

NOMBRE:



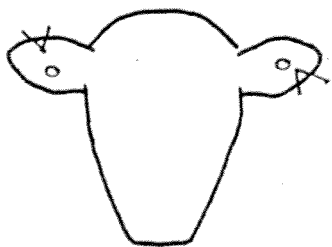
SEÑAL DE SANGRE

FIERRO

REGISTERED BRANDS FOR THE EJIDO

Ejido Joboncillos

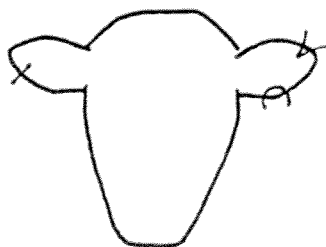
NOMBRE: Sociedad Ganadera Ejidal
Grupo No. 1



SEÑAL DE SANGRE

XL
FIERRO

NOMBRE: Santiago Athayde Falcón

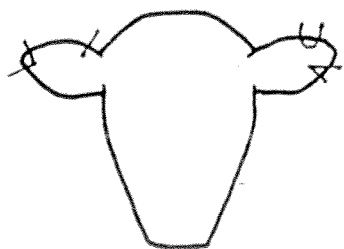


SEÑAL DE SANGRE



FIERRO

NOMBRE: Carlos Magno Martínez Mtz.

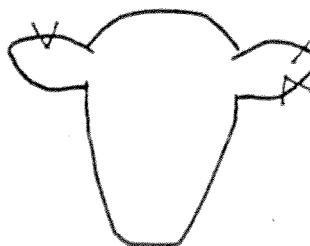


SEÑAL DE SANGRE



FIERRO

NOMBRE: Sociedad Colectiva Ganadera
Ejidal Grupo No. 2

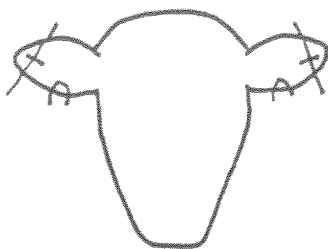


SEÑAL DE SANGRE



FIERRO

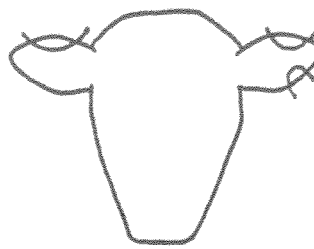
NOMBRE: Martha Balbantin Olguin



SEÑAL DE SANGRE

OS
FIERRO

NOMBRE: Julio Cesar Athayde Mtz.



SEÑAL DE SANGRE

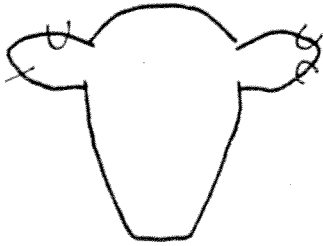


FIERRO

REGISTERED BRANDS FOR THE EJIDO

Ejido Joboncillos

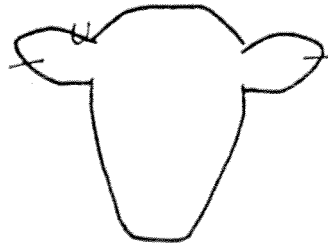
NOMBRE: Guadalupe González



SEÑAL DE SANGRE

FIERRO

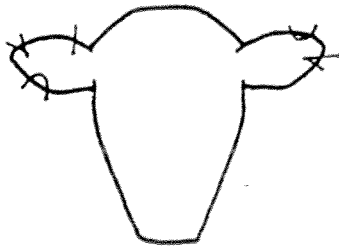
NOMBRE: Julio Peña



SEÑAL DE SANGRE

FIERRO

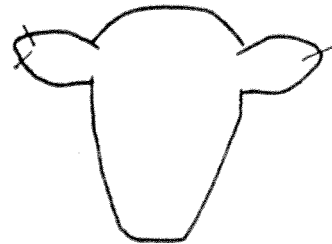
NOMBRE: Emma Estela Rubio Atayde



SEÑAL DE SANGRE

FIERRO

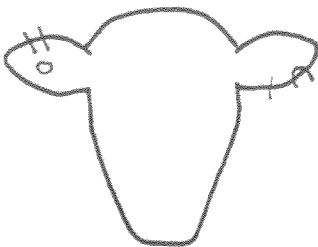
NOMBRE: Raúl Saenz



SEÑAL DE SANGRE

FIERRO

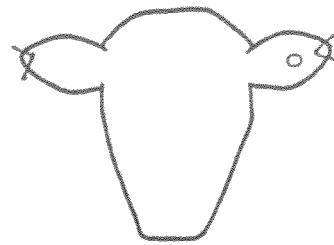
NOMBRE: Etanislao Sanchez Arreola



SEÑAL DE SANGRE

FIERRO

NOMBRE: Javier Sánchez Martínez



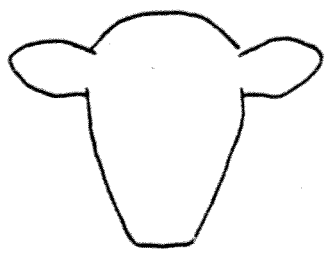
SEÑAL DE SANGRE

FIERRO

REGISTERED BRANDS FOR THE EJIDO

Ejido Jaboncillos

NOMBRE: Romelia Martinez de Martinez



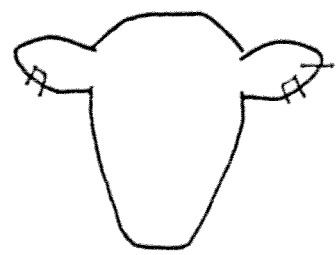
Sin Señal

SEÑAL DE SANGRE

R

FIERRO

NOMBRE: Unión Jaboncillos

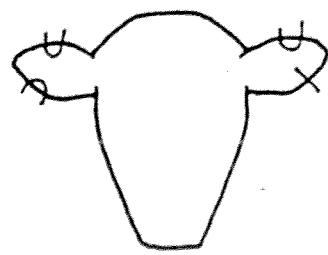


SEÑAL DE SANGRE

UJ

FIERRO

NOMBRE: Tranquilino Oñates de Aviria

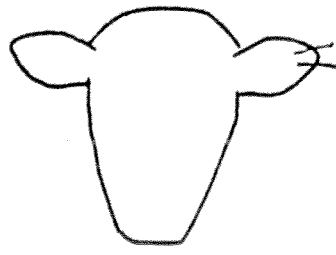


SEÑAL DE SANGRE

TO

FIERRO

NOMBRE: Juan Cabello Flores

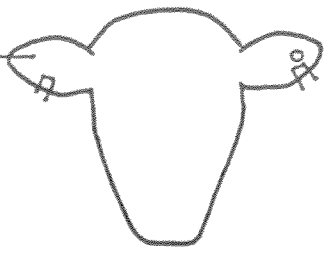


SEÑAL DE SANGRE

JC

FIERRO

NOMBRE: Cruz Rubio Bernal

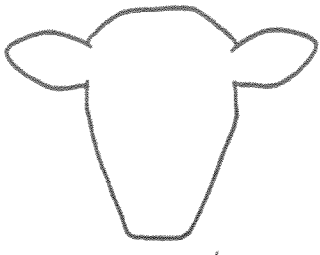


SEÑAL DE SANGRE

CR

FIERRO

NOMBRE: Simón Atayde Sánchez



Sin Señal

SEÑAL DE SANGRE

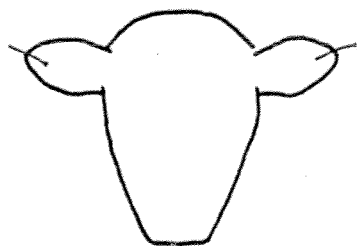
SA

FIERRO

REGISTERED BRANDS FOR THE EJIDO

Ejido Boquillos del Carmen

NOMBRE: Juan José Falcón Luna

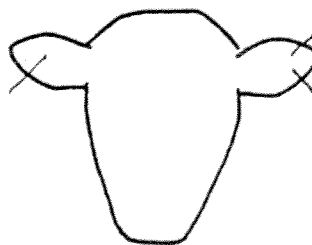


31

SEÑAL DE SANGRE

FIERRO

NOMBRE: Raymundo Rodríguez A.

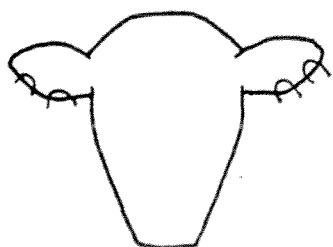


51

SEÑAL DE SANGRE

FIERRO

NOMBRE: Juan Manuel Moran H.

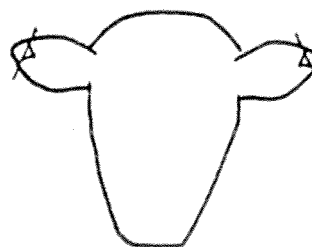


JM

SEÑAL DE SANGRE

FIERRO

NOMBRE: Ricardo Morán Espinoza

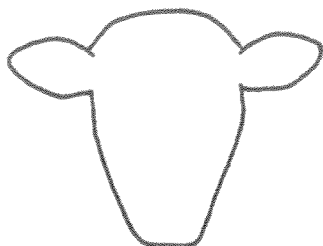


80

SEÑAL DE SANGRE

FIERRO

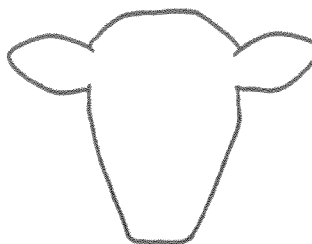
NOMBRE:



SEÑAL DE SANGRE

FIERRO

NOMBRE:



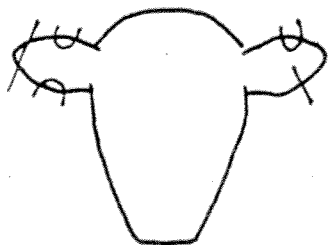
SEÑAL DE SANGRE

FIERRO

REGISTERED BRANDS FOR THE EJIDO

Ejido Boquillas del Carmen

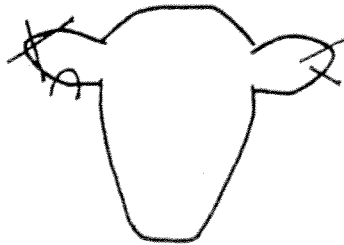
NOMBRE: Adolfo Flores Mata



SEÑAL DE SANGRE

FIERRO

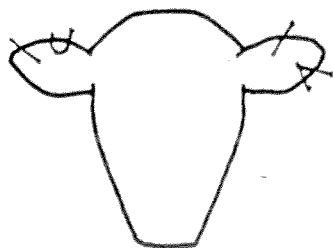
NOMBRE: José Luis Valdez Luna



SEÑAL DE SANGRE

FIERRO

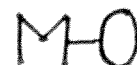
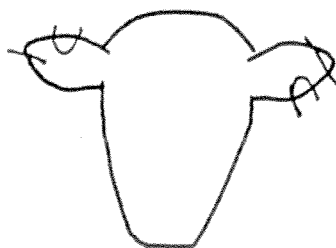
NOMBRE: Nicolás Ureste Vazquez



SEÑAL DE SANGRE

FIERRO

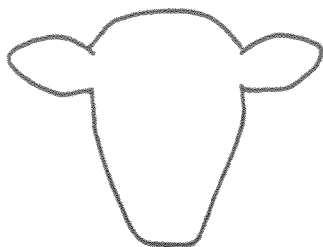
NOMBRE: Manuel Orozco Tapia



SEÑAL DE SANGRE

FIERRO

NOMBRE: José Hernández de León



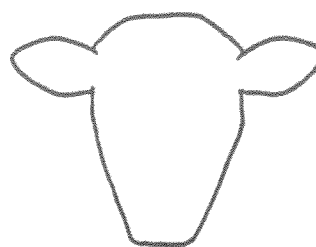
Sin Señal

SEÑAL DE SANGRE



FIERRO

NOMBRE: Jorge Chavez Tapia



Sin Señal

SEÑAL DE SANGRE

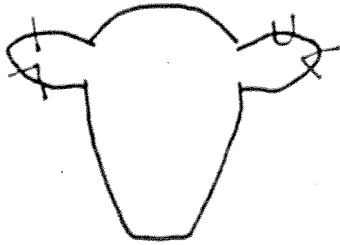


FIERRO

REGISTERED BRANDS FOR THE EJIDO

Ejido Boquillas del Carmen

NOMBRE: Fidencio Topia González

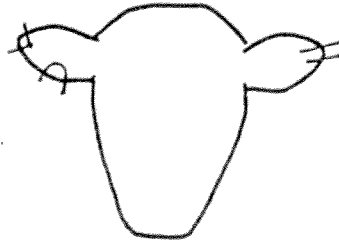


SEÑAL DE SANGRE



FIERRO

NOMBRE: Felipe Martínez Dávila

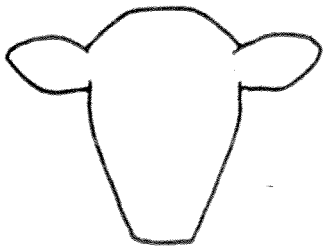


SEÑAL DE SANGRE



FIERRO

NOMBRE: José Falcón Martínez

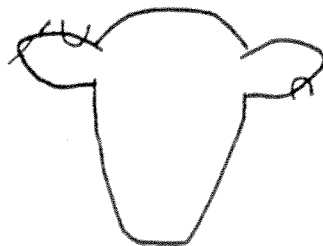


SEÑAL DE SANGRE

07

FIERRO

NOMBRE: Rosalio Gonzalez Díaz

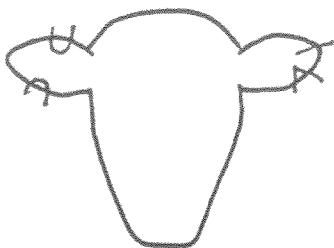


SEÑAL DE SANGRE

RG

FIERRO

NOMBRE: Juan Martínez Zuñiga

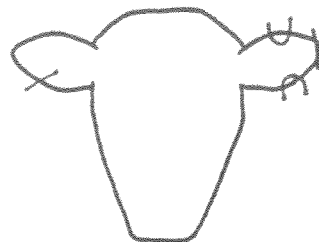


SEÑAL DE SANGRE

1

FIERRO

NOMBRE: Zeferino Díaz González



SEÑAL DE SANGRE

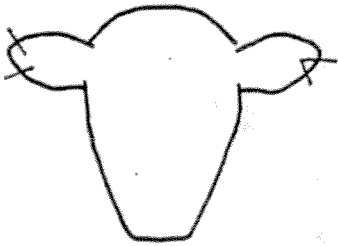
SD

FIERRO

REGISTERED BRANDS FOR THE EJIDO

Ejido Ojo Caliente

NOMBRE: Guadalupe Dávila Hingosa

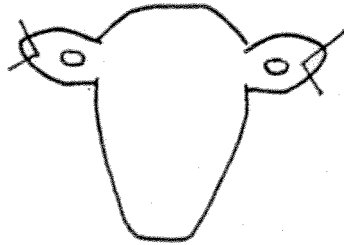


GD

SEÑAL DE SANGRE

FIERRO

NOMBRE: Juan Gonzalez Díaz

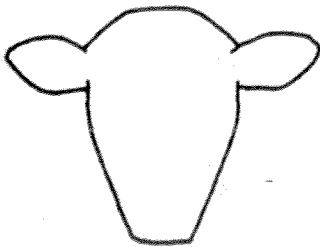


JG

SEÑAL DE SANGRE

FIERRO

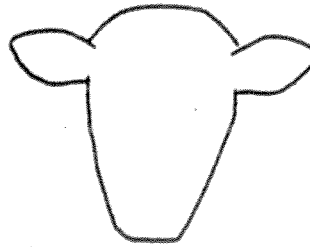
NOMBRE:



SEÑAL DE SANGRE

FIERRO

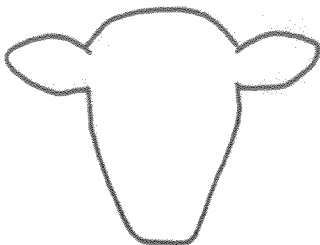
NOMBRE:



SEÑAL DE SANGRE

FIERRO

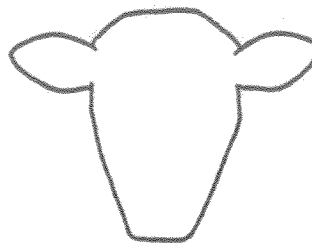
NOMBRE:



SEÑAL DE SANGRE

FIERRO

NOMBRE:



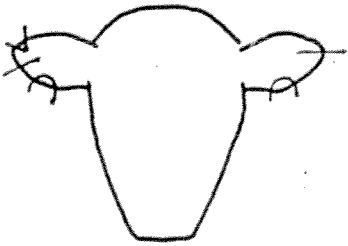
SEÑAL DE SANGRE

FIERRO

REGISTERED BRANDS FOR THE EJIDO

Ejido San Vicente

NOMBRE: Ignacio Brito Morín

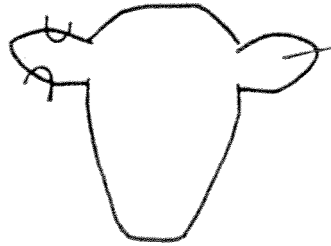


IB

SEÑAL DE SANGRE

FIERRO

NOMBRE: Daniel Jaime de la Rosa M.

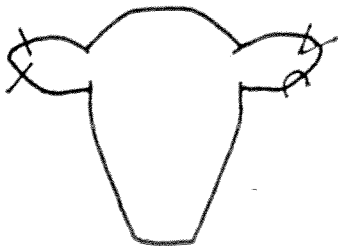


JD

SEÑAL DE SANGRE

FIERRO

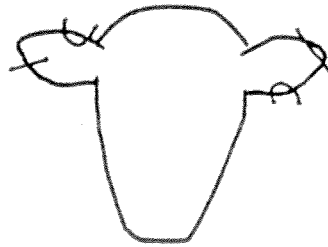
NOMBRE: Amarante Oyervides Morales



SEÑAL DE SANGRE

FIERRO

NOMBRE: Manuel Brito Morín

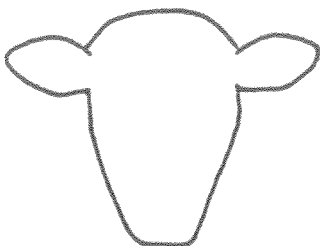


MB

SEÑAL DE SANGRE

FIERRO

NOMBRE: Cresencio Soto Morín

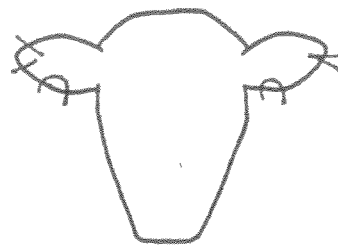


S

SEÑAL DE SANGRE

FIERRO

NOMBRE: Juanita Valdez Salinas



J

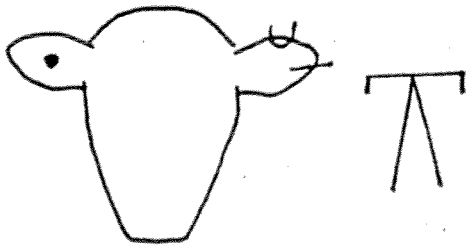
SEÑAL DE SANGRE

FIERRO

REGISTERED BRANDS FOR THE EJIDO

Ejido San Vicente

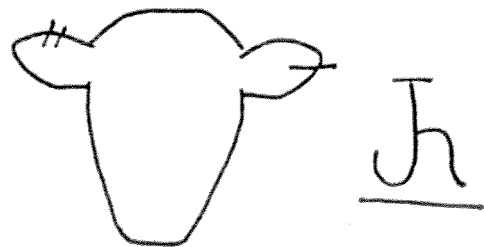
NOMBRE: Vicente Trejo Valdez



SEÑAL DE SANGRE

FIERRO

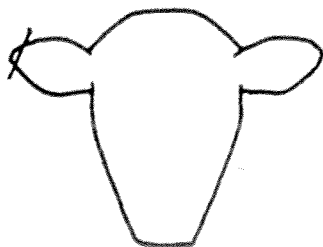
NOMBRE: Jorge Hernandez S.



SEÑAL DE SANGRE

FIERRO

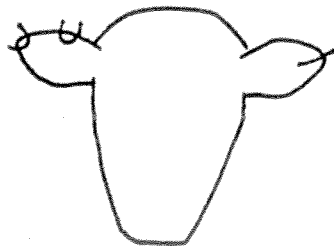
NOMBRE: Jesús Mejía Morín



SEÑAL DE SANGRE

Sin fierro
FIERRO

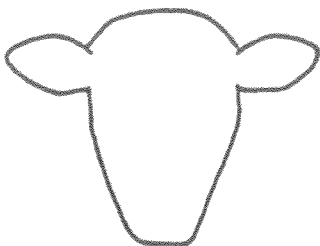
NOMBRE: Juan Lara Ibarra



SEÑAL DE SANGRE

FIERRO

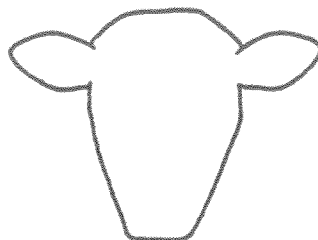
NOMBRE:



SEÑAL DE SANGRE

FIERRO

NOMBRE:



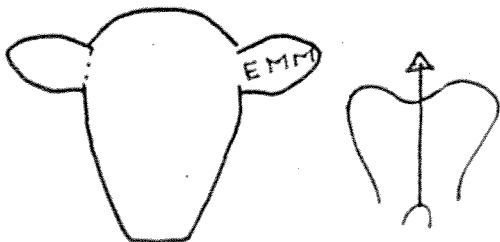
SEÑAL DE SANGRE

FIERRO

REGISTERED BRANDS FOR THE EJIDO

Ejido Melchor Múzquiz

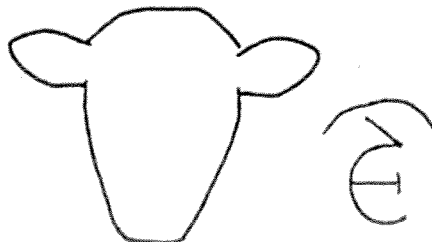
NOMBRE: Nuevo Centro de Población
Ejidal Melchor Múzquiz



SEÑAL DE SANGRE

FIERRO

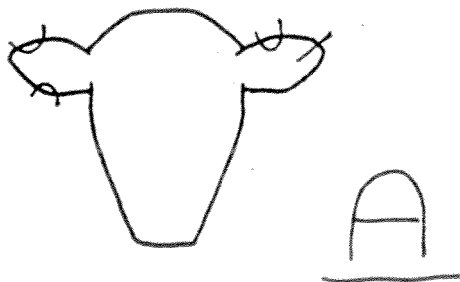
NOMBRE: Elpidio Castillo Flores



SEÑAL DE SANGRE

FIERRO

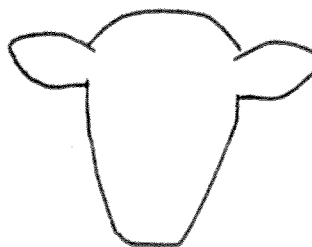
NOMBRE: Alejandro



SEÑAL DE SANGRE

FIERRO

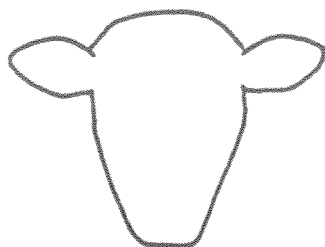
NOMBRE:



SEÑAL DE SANGRE

FIERRO

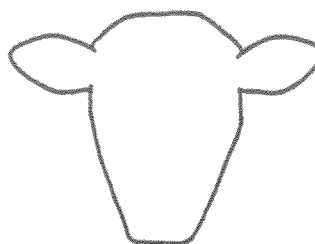
NOMBRE:



SEÑAL DE SANGRE

FIERRO

NOMBRE:



SEÑAL DE SANGRE

FIERRO

QUESTIONNAIRE OVER THE USE OF THE LAND AND NATURAL RESOURCES

DATE
COUNTY
LOCATION
NAME

TYPE OF LAND OWNERSHIP
COLONY
EDIDO
PRIVATE

What activities do you participate in?

- Livestock raising _____ Agriculture _____
- Livestock type extensive _____ intensive _____

- What type of livestock	How many
- Cattle	_____
- Goats	_____
- Sheep	_____
- Horses	_____
- Pigs	_____
- Asses	_____

- Where do you pasture your animals?

- What facilities do you have?

Corrals	made of what?	how many
Holding pens	" " "	" " "
Waterings	" " "	" " "
Fences	" " "	# of Ha.
Others	" " "	

The agriculture is irrigated _____ or dry land

What are the crops

What animals are hunted here?

Have you seen wild boar? _____ Where _____
How many _____ How many times have you seen them _____

Have you seen turkeys _____ Where _____
How many _____ How many times _____

Have you seen deer_____ Which: Mule White Tail
Where_____ How many_____ How many times_____

Have you seen bear_____ Where_____
How many_____ How many times_____
Have you had a problem with the bear_____
What_____
What have you done_____

Have you seen coyotes_____ Where_____
How many_____ How many times_____
Have you had a problem with the bear_____
What problems_____
What have you done with the coyotes_____

What other animals are there here?_____

Do you use candelilla?
Where do you get it
Where is it sold
What is the cost

Do you use lechuguilla
Where do you get it
Where is it sold
What is the cost

Do you use firewood?
Where do you get it

Are there mines on the property?_____

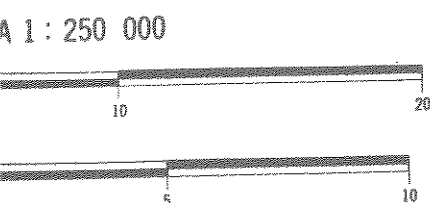
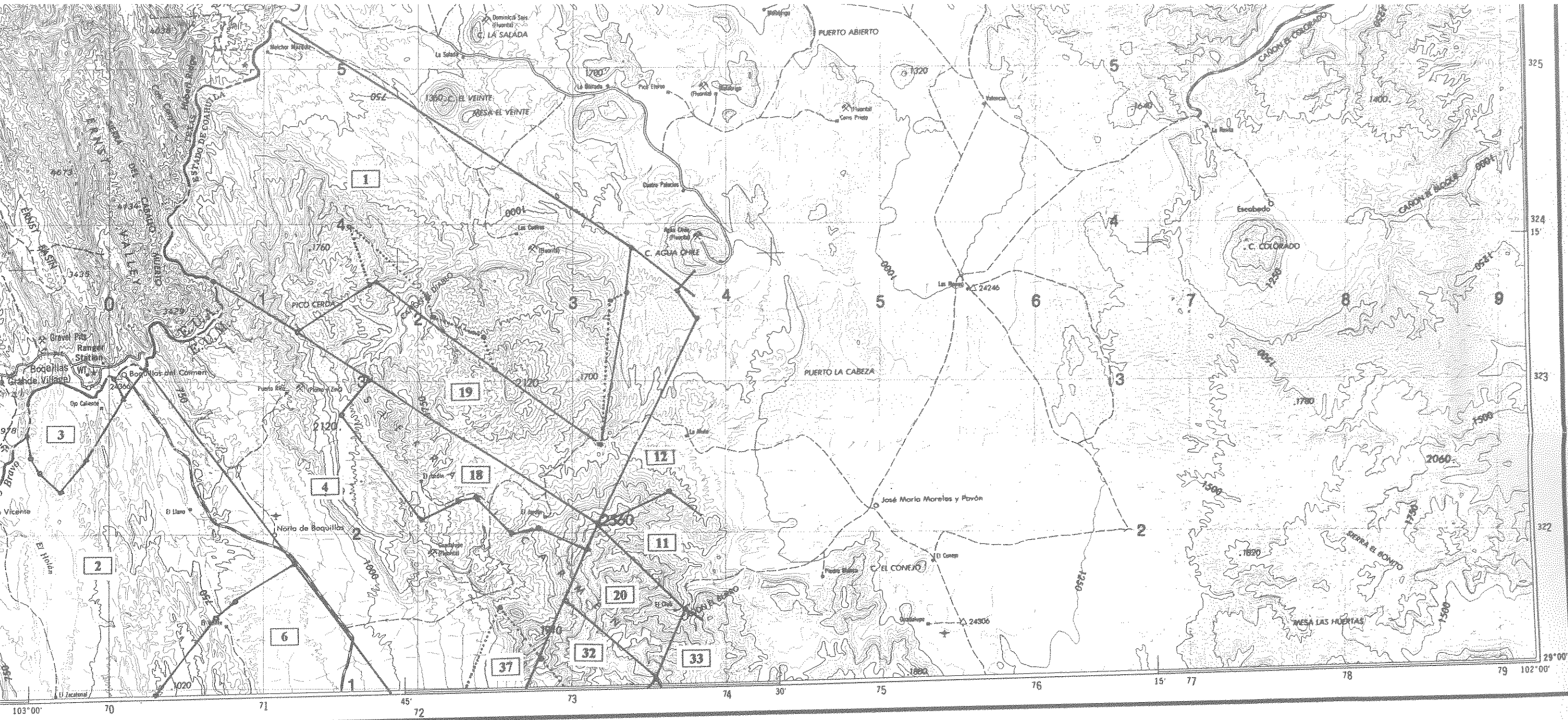
What mineral_____

How many_____

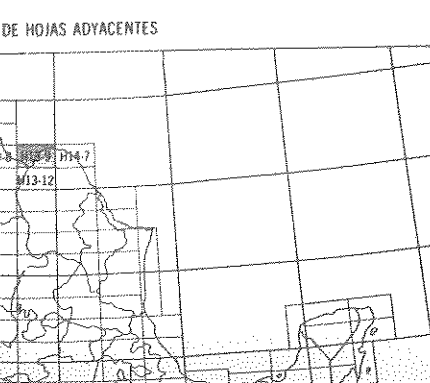
Are they worked_____

Who is the concessionaire_____

Observations _____



LA DE CURVAS DE NIVEL
METROS, SUPLEMENTARIAS 25 METROS
100 PIES, SUPLEMENTARIAS 50 PIES



LA DECLINACION MAGNETICA EN 1970 PARA ESTA HOJA VARIA DE: 10°30' EN EL PUNTO MEDIO DEL BORDE IZQUIERDO A 10°00' EN EL PUNTO MEDIO DEL BORDE DERECHO.

LA UBICACION DE LAS ESTACIONES HIDROMETRICAS HA SIDO TOMADA DE LOS DATOS PROPORCIONADOS POR LA SECRETARIA DE AGRICULTURA Y RECURSOS HIDRAULICOS, COMISION FEDERAL DE ELECTRICIDAD Y COMISION INTERNACIONAL DE LIMITES Y AGUAS.

COMPILADA DE CARTAS 1:50 000 DE 1978 A 1980

LA INFORMACION CONTENIDA EN LA PARTE DEL MAPA CORRESPONDIENTE AL TERRITORIO DE EUA PROVIENE DE LAS CARTAS HECHAS POR U. S. GEOLOGICAL SURVEY (USGS)

EL TRAZO DEL LIMITE INTERNACIONAL NO DEBE CONSIDERARSE COMO AUTORITARIO

ESFEROIDE _____ CLARKE DE 1866
PROYECCION _____ TRANSVERSA DE MERCATOR
CUADRICULA _____ UTM A CADA 10 000 m.
DATUM HORIZONTAL _____ NORTEAMERICANO DE 1927
REFERENCIA DE COTAS _____ NIVEL MEDIO DEL MAR
PRIMERA EDICION _____ 1980

SPLICAMOS AL USUARIO NOTIFICAR LOS ERRORES U OMISIONES QUE ENCUENTRE EN LA CARTA A:
DIRECCION GENERAL DE GEOGRAFIA / INEGI. HEROE DE NACOZARI No. 2301, PUERTA 8, PRIMER NIVEL.
CD. INDUSTRIAL, C. P. 20290, AGUASCALIENTES, AGS.

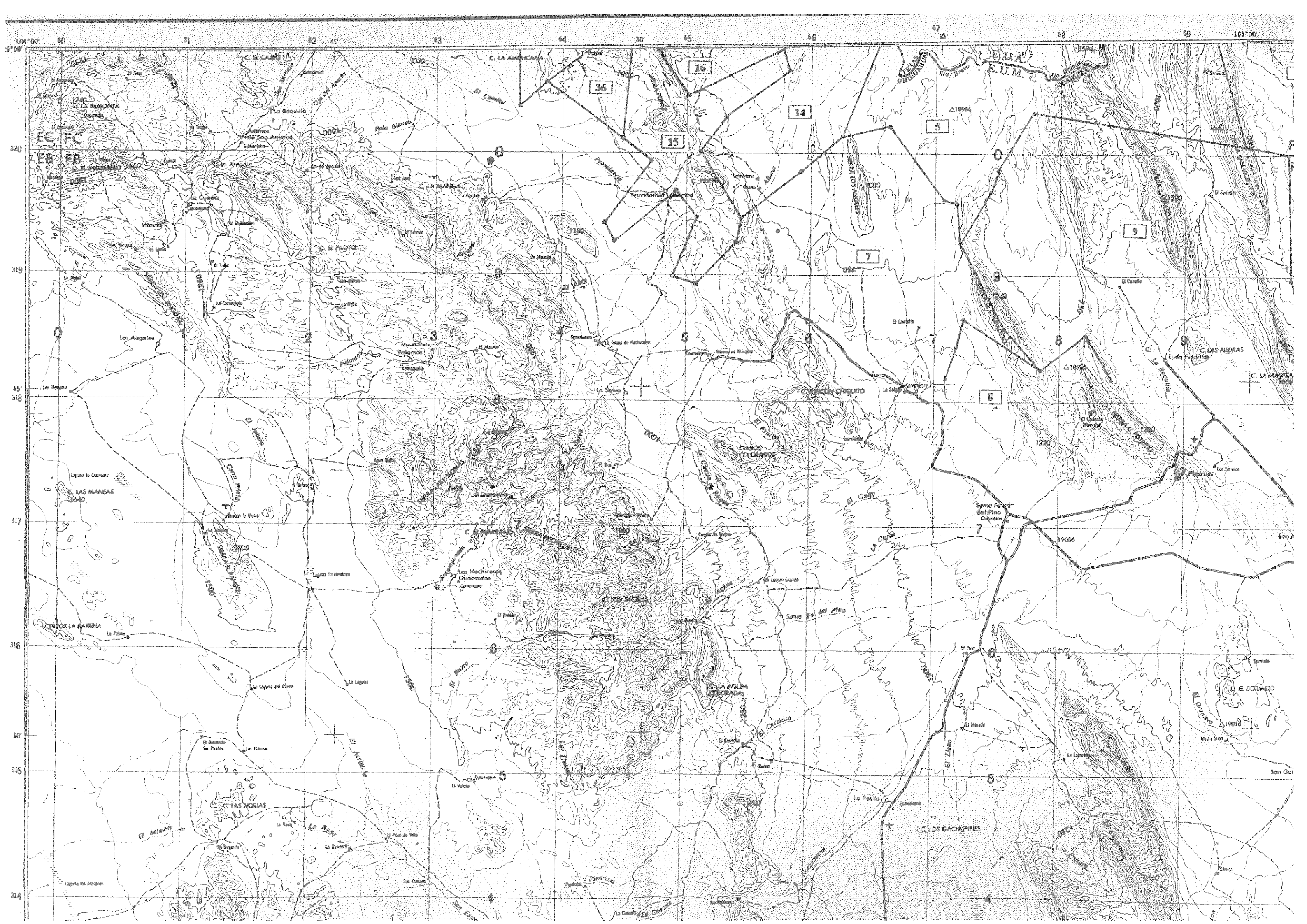
INSTRUCCIONES PARA LOCALIZAR UN PUNTO CON UNA APROXIMACION DE 1 000 m

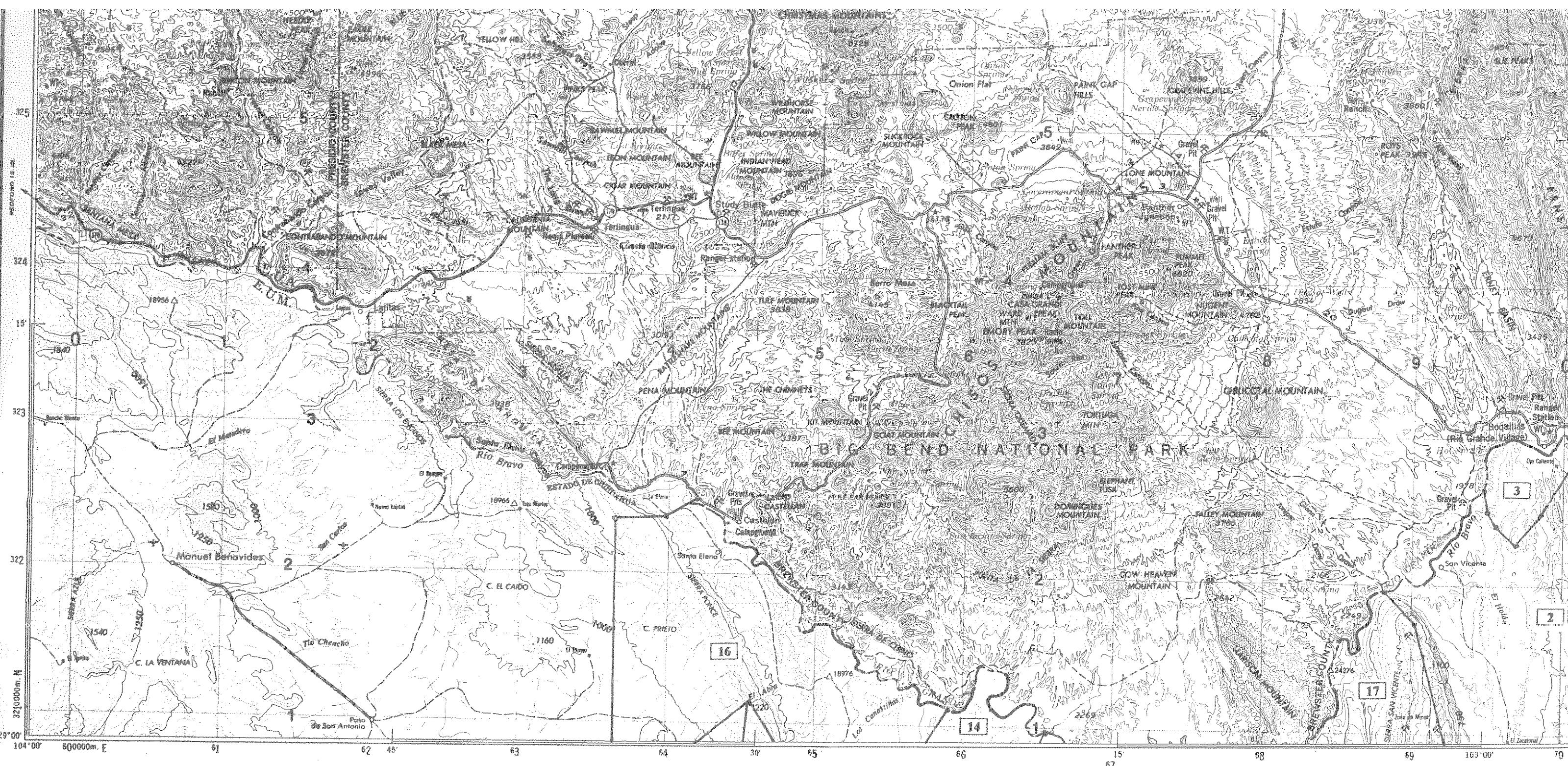
CLAVE DE LA ZONA	PUNTO UTILIZADO COMO EJEMPLO: Escobedo
13R LOCALIZACION DEL CUADRADO DE 100 000 m	GC
 FC GC 330 60 70	7 6 4 1

Ignora los números de tipo menor de cualquier distancia de la cuadrícula, dichos números solo sirven para precisar el valor completo de las

INSTITUTO NACIONAL DE ESTADISTICA GEOGRAFIA E INFORMATICA







ESCALA 1 : 250 000

SÍMBOLOS CONVENCIONALES

POBLACIONES

LUGARES POBLADOS

CON MAS DE 100 000 HABITANTES

DE 40 001 A 100 000

DE 15 001 A 40 000

DE 2 501 A 15 000

CON MENOS DE 2 500

RASGO CULTURAL IMPORTANTE

VIAS TERRESTRES

CHIHUAHUA

PATZCUARO

GUANAJUATO

Emiliano Zapata

Sanayta

Tecolapan

RASGOS CULTURALES

LIMITE INTERNACIONAL

LINEA ELECTRICA

CONDUCTO: SUPERFICIAL, SUBTERRANEO

ACUEDUCTO: SUPERFICIAL, SUBTERRANEO

CANAL, PRESA, BORDO, ESTACION HIDROMETRICA

PUENTE, TUNEL

MINA, POZO, DEPOSITO

BANCO DE MATERIAL, TEMPLO EXTRAURBANO, FARO

LEGEND USA AREA

POPULATED PLACES

OVER 500 000

100 000 TO 500 000

25 000 TO 100 000

5 000 TO 25 000

1 000 TO 5 000

LESS THAN 1 000

ROADS

PRIMARY: ALL-WEATHER, HARD SURFACE

SECONDARY: ALL-WEATHER, HARD SURFACE

LOS ANGELES

OMAHA

GALVESTON

Durango

Grand Coulee

Sun Valley

5 4 3 2 1 0 KILOMETROS

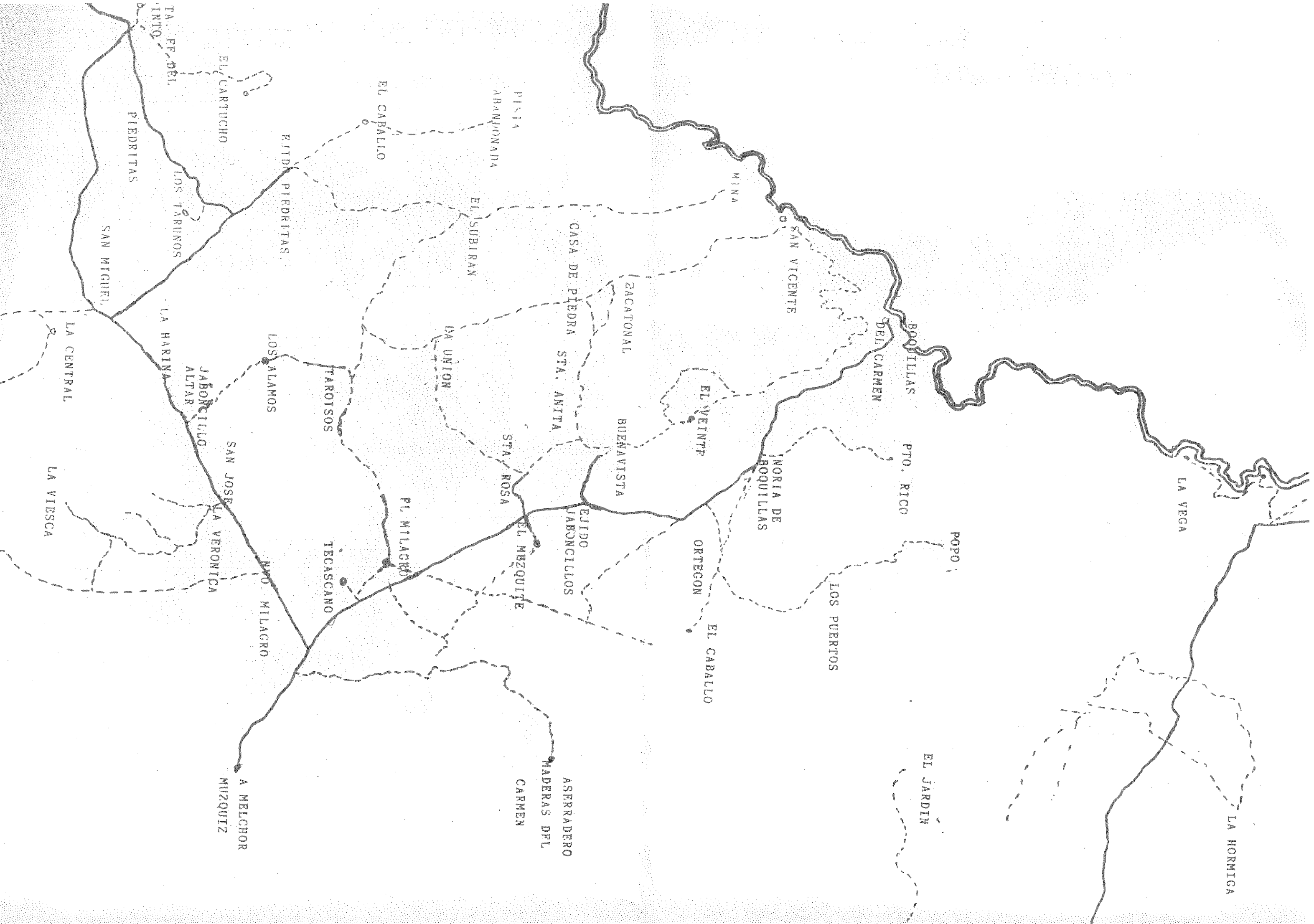
5 4 3 2 1 0 MILLAS

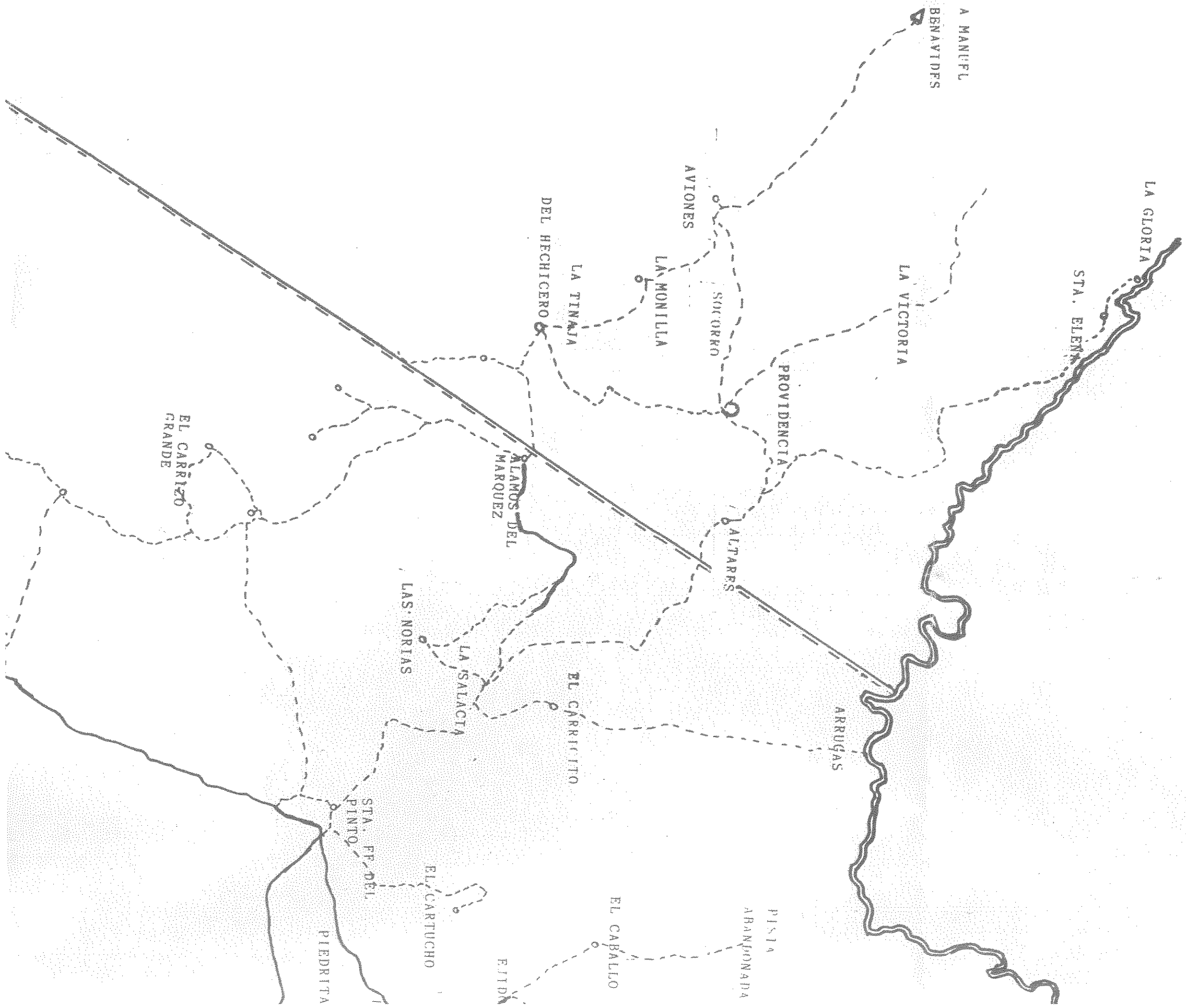
EQUIDISTANCIA DE CURVAS DE NIVEL

PARA EUM: ORDINARIAS 50 METROS, SUPLEMENTARIAS

PARA EUA: ORDINARIAS 100 PIES, SUPLEMENTARIAS

INDICE DE HOJAS ADYACENTES





A MANUEL

BENAVIDES

LA GLORIA

STA. ELENA

LA VICTORIA

PROVIDENCIA

SUCURRO

AVIONES

LA MONILLA

LA TINAJA

DEL HECHICERO

MARQUEZ DEL

ALTARES

ARRUGAS

PISA

ABANIGONADA

EL CABALLO

ELIDA

EL CARTUCHO

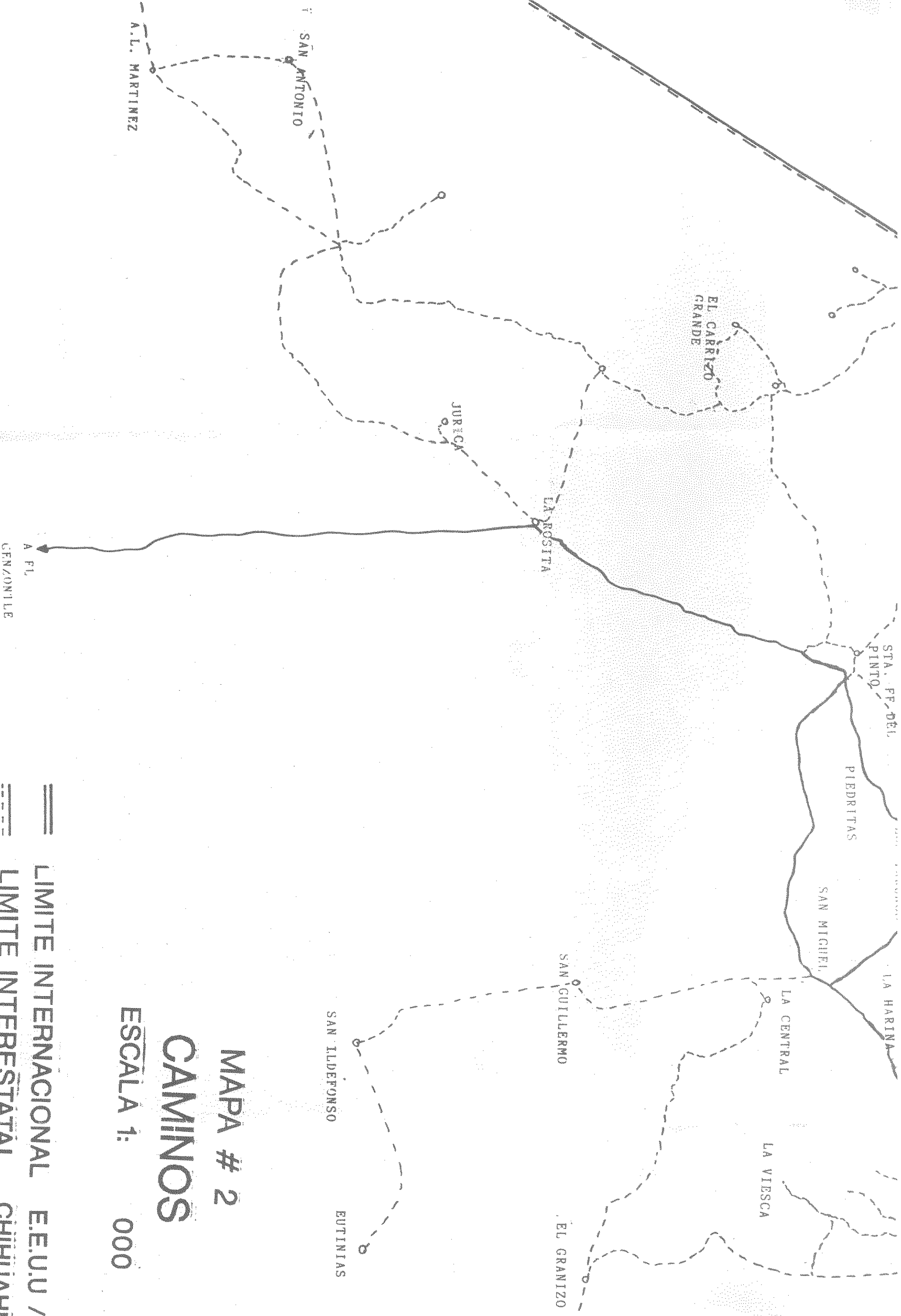
STA. FE DEL
PINTO

PIEDRITA

LA SALACITA

LAS NORIAS

EL CARRIZO
GRANDE



MAPA # 2
CAMINOS

ESCALA 1: 000

- == LIMITE INTERNACIONAL E.E.U.U / MEXICO
- LIMITE INTERESTATAL CHIHUAHUA / COAHUILA
- TERRACERIA
- - - BRECHA