

**COMMUNITY USE OF THE CIÉNEGA DE SANTA CLARA BY THE EJIDOS
OWNING IT: EJIDO LA FLOR DEL DESIERTO, EJIDO MESA RICA, AND
EJIDO LUIS ENCINAS JOHNSON**

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ENVIRONMENTAL DEFENSE

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I. - BACKGROUND

THE EJIDO AS A LAND TENURE REGIME.

The “ejido” is a type of common property regime in Mexico in which rural lands are allotted to communal groups. The origin of the ejido dates prior to the Spanish Conquest; it was one of many land tenure regimes of indigenous groups (Thompson and Wilson, 1994). Although this regime was overtaken by Latifundia during México’s colonial and post-independence periods, it was re-born after the Mexican Revolution, as this social movement was instigated by the demands of Mexican peasants for the land to be owned by those who work it.

The Ejido regime was officially created with the Agrarian Law (1915) and ratified in Mexico’s Constitution of 1917 (Article 27th). Ejido lands are divided into common areas, which are not allocated to individuals, and parceled plots, which are held individually by each ejidatario. The amount of land held in individual parcels varies among ejidos. An ejidatario is a person with recognized agrarian rights to an ejido and any attached entitlements; these rights are inherited.

THE CIÉNEGA DE SANTA CLARA

The Ciénega de Santa Clara is a 5,800 hectares (14,332 acres) cattail marsh located within the Municipality of San Luis Río Colorado, Sonora. It lies within the boundaries of 3 ejidos: La Flor del Desierto (1.5%), Mesa Rica (10%), and Luis Encinas Johnson (37.5%). The remaining 51% of the Ciénega is in federal land. Any portion of the Ciénega held within ejido land is common property of each ejido; thus, there are no individual claims to this wetland.

COMMUNITIES OF THE CIÉNEGA DE SANTA CLARA

A. EJIDO LA FLOR DEL DESIERTO (EJIDO LA FLOR)

Ejido La Flor is located in the State of Sonora, within the Municipality of San Luis Río Colorado (Latitude: 32°02'22", Longitude: 114°48'50"). It was created by presidential decree the 3rd of March, 1980. Ejido La Flor had 31 ejidatarios at the time when the presidential decree was issued. This ejido has an allotment of 19,220 hectares of land (approx. 47,500 acres; DOF, 1980), and has no water rights allotted. Ejido La Flor owns about 89 hectares (220 acres) of the total extension of the Ciénega (1.5%).

B. EJIDO MESA RICA 1 AND 2 (EJIDO MESA RICA)

Ejido Mesa Rica is also located within the State of Sonora, within the Municipality of San Luis Río Colorado (Latitude: 32°08'12", Longitude: 114°55'38"). It was created in 1974 and ratified the 29th of November, 1994 by the Government of Sonora (TSF, 1994); ratified later by presidential decree the 15th of April, 2004. Ejido Mesa Rica has an allotment of 24,000 hectares of land (59,300 acres; DOF, 1974). The decree was endowed with 3.33 ha of primary irrigation water rights per ejidatario. Ejido Mesa Rica owns about 593 hectares (1,465 acres) of the Ciénega (10%).

Currently, 105 ejidatarios live in the towns of the ejido, plus other families with no agrarian rights. This is the only ejido that has SEMARNAT's authorization to allow hunters into its portion of the Ciénega. The ejido receives \$1,000 dollars per year from a registered hunting outfitter in Mexicali for the right to bring hunters into the Ciénega.

C. EJIDO LUIS ENCINAS JOHNSON (EJIDO JOHNSON)

Ejido Johnson is located in the State of Sonora, within the Municipality of San Luis Río Colorado (Latitude: 32°03'36", Longitude: 114°58'00"). It was created by presidential decree the 24th of March, 1980 and ratified in April 23, 1980. The Ejido has an allotment of 6,092 hectares of land (15,050 acres; DOF, 1980). The decree also endowed Ejido

Johnson with 291 hectares of primary irrigation water rights (2,910,000 m³, 2,359 acre-feet) which are derived from Mexico's entitlement of Colorado River flows.

Almost 87% of the ejido land is held as common property (4,770 hectares, 11,786 acres; RAN, 1995). Individual parcels hold rights over 655 hectares of land (1,618 acres) and as well as the ejido's water rights (DOF, 1980). Nearly 2,180 ha (5,387 acres) of the Ciénega de Santa Clara are located within the common lands of Ejido Johnson (37.5%). Ejido Johnson had 95 ejidatarios at the time the presidential decree was issued. Today, only 44 persons retain their agrarian rights and there are 71 families living in the ejido village.

II.-JUSTIFICATION & PURPOSE.

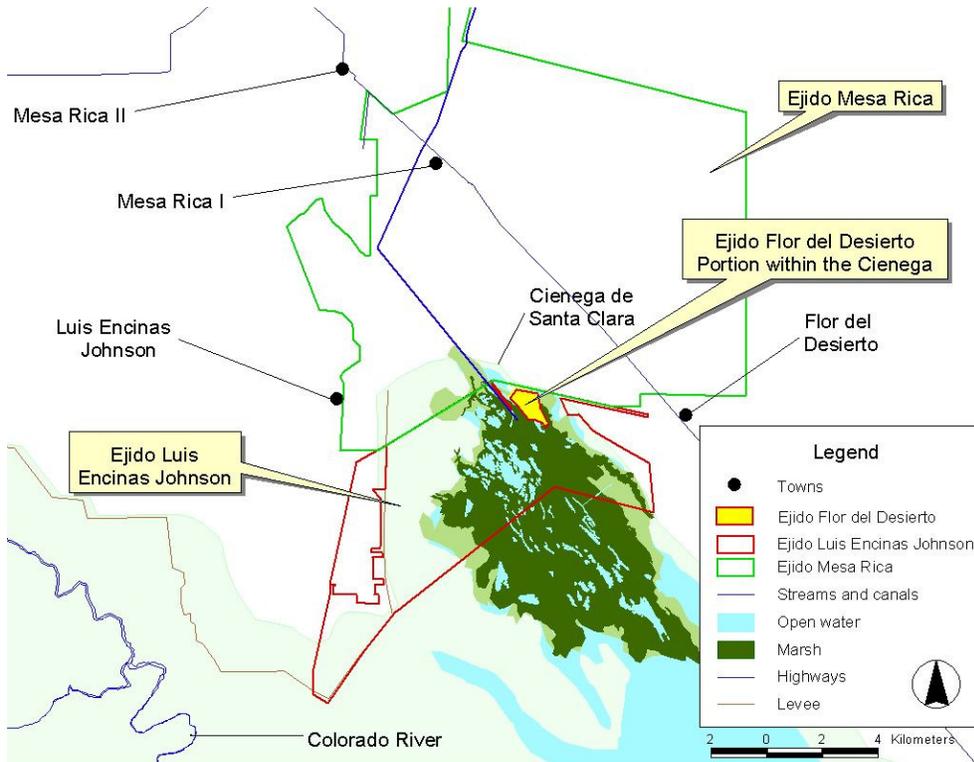
The Ciénega de Santa Clara is part of the core zone of one of UNESCO's Biosphere Reserve. It is also part of a Ramsar Site, which recognizes the Ciénega as a wetland of international importance. In this wetland, as in many wetlands located in the arid zones all over the world, water is the scarcest resource (Kingsfort et al., 1971 in Ramsar, 2005). Even though it has the highest level of international recognition (Ramsar) and national protected status (core zone of a Biosphere Reserve), the Ciénega de Santa Clara is still a threatened wetland as its water source is not guaranteed.

The Ciénega is completely dependant upon the drainage water from the Wellton-Mohawk Irrigation District in the United States. Increasing demands for water in Southwestern U.S. give water managers excuse for diverting the Ciénega's main source of water into a desalination plant in Yuma, AZ to increase the supply of water in the region.

Diverting this water from the Ciénega will have devastating effects on the ecosystem (Garcia et al. 1999). Water managers have not taken into account the manner in which local communities will be affected if they lose this wetland; until now, there was little or no information available regarding how intermingled are the livelihoods of these communities to the Ciénega and its associated flora and fauna.

Thus, the purpose of this study is to depict the several ways in which the local communities use the Ciénega de Santa Clara, analyzing the relationship between the people living in the 3 ejidos that own the Ciénega and the natural resources that this wetland provides them.

III. MAP OF THE COMMUNITIES OF THE CIÉNEGA DE SANTA CLARA (FIGURE 1).



Prepared by: Osvel Hinojosa-Huerta

IV. METHODS.

This study consists of 3 parts: a survey carried out with heads of households of the three local communities, a semi-structured interview with personnel from La Ruta de Sonora, and a survey to visitors to the Ciénega de Santa Clara.

A. SURVEY IN EJIDOS OWNING THE CIÉNEGA DE SANTA CLARA.

The information regarding the use of the Ciénega by the local communities was gathered through an initial survey of people living in the four towns of the three ejidos: Ejido La Flor del Desierto, Ejido Mesa Rica and Ejido Luis Encinas Johnson. We included all households located in the towns of the 3 ejidos as our target population for this analysis. In the case of Ejido La Flor, as only 3 persons actually live there, we also contacted ejidatarios that are not living in the town. The survey was done in August-October 2004.

Each semi-structured interview with ejidatarios was aimed at obtaining information on three areas: family and personal information; their use of the Ciénega and its resources, whether they fish, hunt or gather plant materials; and environmental perceptions regarding the Ciénega. The survey was anonymous to encourage people's true opinions and completely voluntary. None of the people contacted refused to participate in this survey.

The main tool guiding our interviews was a questionnaire with option, closed, and open-ended questions. The questionnaire was pre-tested to refine the language and test the level of non-response to open-ended questions. Two fishermen and a farmer from other ejidos that were not part of our target population helped us improve the final questionnaire. Surveyors were trained to guarantee their understanding of the questions and the information that was required, so they were able to rephrase any question that was not clearly understood during the interviews.

The first portion of the interview dealt with people's opinions regarding the Ciénega de Santa Clara, focusing on their perceptions of how they value this wetland, how they use it, and how they think other people use the resources of this wetland. However, as it is also important to know their actual use of the Ciénega resources, the second portion of the interview asked specifically whether they fish, hunt, or collected plants there.

The questionnaire was composed of 57 questions. It had 9 questions for personal and family information, 4 questions regarding family income, 16 questions on their perceptions of the Ciénega de Santa Clara and how they use it in general terms, and 10 questions if they fish in the Ciénega, 9 questions if they hunt the wetland's wildlife, and 4 questions regarding recreation. A copy of the questionnaire is presented in Appendix A. The database is in the Microsoft access file that accompanies this report.

B. INTERVIEW WITH LA RUTA DE SONORA ECOTOURISM ASSOCIATION.

La Ruta de Sonora is the only tour operator that takes tourists to visit the Ciénega de Santa Clara. The interviews with personnel from La Ruta de Sonora took place in December 2004 and February 2005 to obtain information regarding the benefits that Ejido Johnson receives from the operation of La Ruta's tours into the Ciénega and their perceptions as to how this ejido depends on the Ciénega for subsistence. In this interviews participated Dr. Joaquin Murrieta, who while working at Sonoran Institute is also the precursor of La Ruta, and Ms. Mónica Durand, Marketing Director for La Ruta. The results of this interview are later presented in the Results Chapter. The questions that guided these interviews are in Appendix B.

C. VISITORS' SURVEY IN THE CIÉNEGA.

This report also includes information of a questionnaire applied to people that were visiting the Ciénega in the palapas area during the Holy Weekend in March 2005. The purpose was to gather information on the activities and perceptions regarding the Ciénega, from people that not necessarily live in one of the 3 ejidos surrounding it. It consisted of 37 questions on the way visitors use the Ciénega resources for recreation, fishing, hunting, or to collect plant materials. A copy of this questionnaire can be found in Appendix C.

V. - RESULTS.

A. SURVEY IN EJIDOS OWNING THE CIÉNEGA DE SANTA CLARA.

EJIDO LA FLOR DEL DESIERTO

PERSONAL AND FAMILY INFORMATION

Ejido La Flor has only three households in the town of the ejido, but we included in this analysis another eight families, as the head of these households are ejidatarios with rights over the ejido resources. Seven of the 12 heads of households interviewed have agrarian rights in this ejido, the rest were neighbors with no agrarian rights. The average age of the person interviewed in this ejido was 47 years old and they have attended 8 years of school on average. Most of them were married (58%), having in average 2 family members as dependants.

In Ejido La Flor, eight of the twelve families that are active in the ejido depend on the Ciénega resources to supplement their income (66%). There is one person who complements his household income by providing services to tourists; he receives 20% of his income this way and another 10% of his income by selling the fish he catches in the lagoon. There are other four persons who also fish in the Ciénega to support their families; on average they earn \$2,060 pesos per month (\$184 dollars) by selling the fish. There also three persons who complement their income by working as hunting guides to

visitors in the Ciénega: one of them earns all of his monthly income this way, another earns half of his income, and the last one earns 22% of his income by guiding hunters into the Ciénega.

COMMUNITY PERCEPTIONS REGARDING THE CIÉNEGA DE SANTA CLARA.

Even though there are only three families living in the town of Ejido La Flor del Desierto, ten of the twelve persons interviewed stated that they and/or their family visit the Ciénega and that they enjoy their visit (83%). All of the persons interviewed stated that they would like the Ciénega to be there in the future for their children and next generations to enjoy it. People of Ejido La Flor like several characteristics of this wetland, the most mentioned were its vegetation and wildlife and the landscape and nature in general. What they dislike the most about the Ciénega were mosquitoes and trash.

Figure 2 presents the length of stay in each visit to the Ciénega and Figure 3 presents the frequency of those visits. The two persons interviewed that do not visit the Ciénega stated that it was due to their job or that they just arrived to the ejido.

Figure 2. - Length of stay in the Ciénega of people from Ejido La Flor del Desierto.

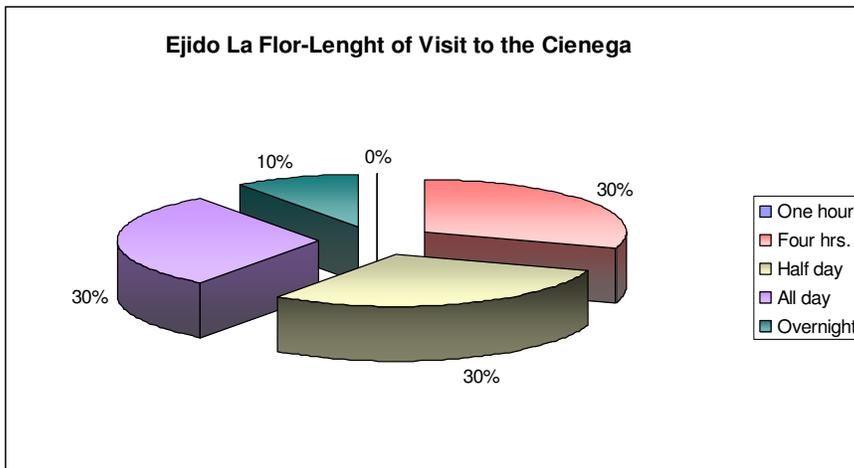


Figure 3. - Frequency of visits to the Ciénega of people from Ejido La Flor del Desierto.

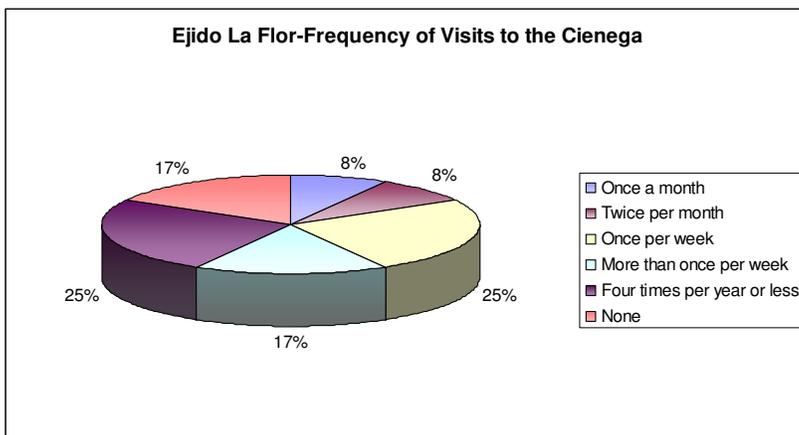


Table 1 presents the number of interviewees that visit the Ciénega classified by their motive. Each person interviewed selected all his/her reasons for visiting the Ciénega and all the activities that he has witnessed other persons doing in there as well. Thus, percentages represent the percent of interviewed families that carry out each activity in the Ciénega.

Table 1. - Reasons for visiting the Ciénega de Santa Clara by visitors from Ejido La Flor del Desierto and what they have seen others do.

Reasons for visiting	Interviewed	Other persons seen by interviewed
Picnic	8 (67%)	5 (42%)
Boat/canoe trip	8 (67%)	7 (58%)
Fish-subsistence	10 (83%)	8 (67%)
Fish-commercial	4 (33%)	6 (50%)
Walk/bird watch	9 (75%)	7 (58%)
Ecotourism-guide	0 (0%)	2 (17%)
Hunting-guide	2 (17%)	6 (50%)
Sport fishing-guide	3 (25%)	5 (42%)
Hunt	6 (50%)	6 (50%)
Other	0 (0%)	0 (0%)

Three persons said that they or their families swim in the Ciénega once a week or once every two weeks, staying each time for about 2 hrs in the water. One person stated that he do drink from the water of the Ciénega.

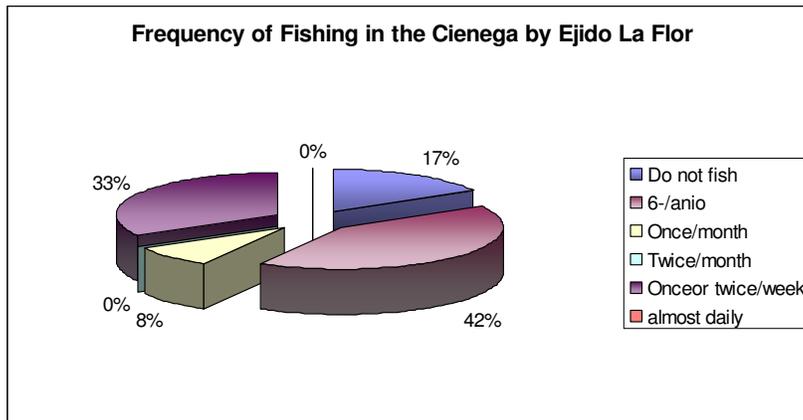
We also asked them how their families and the ejido people would be affected if the Ciénega de Santa Clara was reduced in size, with salinity levels 3 times higher as they are now, and where almost none of the existing fish and vegetation could survive. Each person mentioned several effects and all effects mentioned were counted. The concerns of the people from Ejido La Flor ranged from losing the recreation place of their children, losing fishing and hunting opportunities, losing a portion of the ejido's income, and losing feeding and watering areas for their goats.

Also, three persons mentioned that there is another place they could use as substitute of this marsh, where they could carry out the activities they currently do at the Ciénega. The potential substitute sites they mentioned were: the town of El Golfo de Santa Clara or the wetlands of Laguna del Indio.

FISHING IN THE CIÉNEGA DE SANTA CLARA

Most of the people interviewed in the town of Ejido La Flor use the resources that this wetland provides. Ten of the twelve heads of household interviewed said they go fishing into the lagoon (83%); most of them do it once every two months (42%) or once or twice per week (33%; see figure 4). The species they fish are: large-mouth bass, tilapia, catfish, carp, and mullet.

Figure 4. Fishing frequency by people of Ejido La Flor in the lagoons of the Ciénega de Santa Clara.



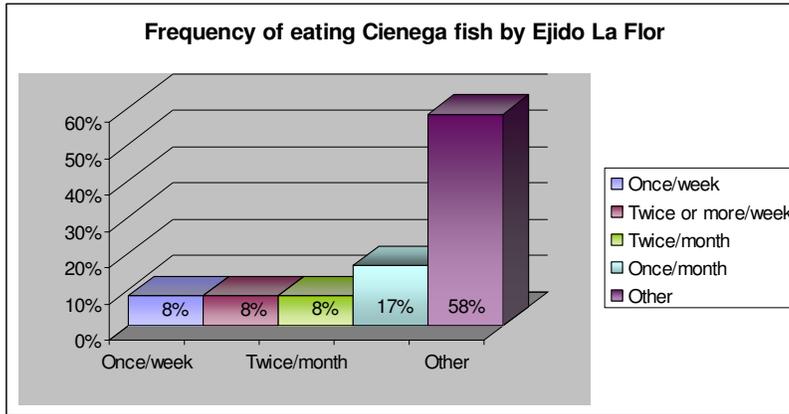
Each head of household was asked to order the reasons why they fish in the Ciénega, being number one the most important reason and number 5 the least important. In this way, each reason had its own percentage of people that marked it as their most important one; others selected this same reason as the second most important one, others more might have selected it as third, fourth, or fifth in importance.

We weighted each level of importance (1-5) by 10, 7, 5, 3 or 1, accordingly, to get an overall community level of importance for each of the reasons, as a way to identify Ejido La Flor’s order of reasons for fishing in the Ciénega.

Therefore, for people living in Ejido La Flor, their number one reason was to get food for themselves. Their second main reason was to provide their families with food. Their third reason was for sport, and fishing for selling was their least important reason. Thus, fishing in the Ciénega by people from Ejido La Flor is done primarily for subsistence.

Figure 5 shows how frequently does people of this ejido eat fish caught in the Ciénega de Santa Clara (either because they caught it or they bought it from someone who fishes in this wetland). All of the interviewees stated that they have never become sick after eating fish from the Ciénega.

Figure 5. Ejido La Flor’s eating frequency of fish from the Ciénega (by household).



For those who stated that they fish in the Ciénega, the minimum amount of fish they usually catch each time is two kilos; while the maximum amount a person has caught in a single fishing trip was 50 kilos. For those who fish and sell their product, the minimum selling price was \$6 pesos/kilo (\$0.54 dollars/lb) and the maximum selling price was \$30 pesos/kilo (\$ 2.72 dollars/lb), depending on the fish species and the season. Table 2 shows the number of households that earn an income from selling the fish they caught at the Ciénega; each income category represents monthly earnings.

Table 2 Income from Ejido La Flor’s households from selling fish caught at the Ciénega de Santa Clara.

Fishing Income in MX pesos (\$ US dollars)	Number of Households (%)
Less than \$250 MXP (\$22 USD)	0 (0%)
\$251-\$500 MXP (\$22-\$45 USD)	0 (0%)
\$501-\$1,000 MXP (\$46-\$90 USD)	1 (8%)
\$1,001-\$2,500 MXP (\$91-\$227 USD)	3 (25%)
\$2,500-\$5,000 MXP (\$227-\$454 USD)	1 (8%)
More than \$5,000 MXP (\$454 USD)	0 (0%)

HUNTING IN THE CIÉNEGA DE SANTA CLARA

Hunting is forbidden in most of the Ciénega de Santa Clara by the regulations of the Upper Gulf of California and Colorado River Delta Biosphere Reserve. Hunting permits are limited to only those areas of the Ciénega that are denominated as buffer zone of the

Reserve, and are also limited to special hunting permits granted by SEMARNAT to each Ejido. Ejido La Flor does not have a permit for operating a hunting enterprise in the Ciénega. Thus, any hunting done in the area since the Reserve was established (1993) is illegal.

From the 12 heads of household interviewed in Ejido La Flor, half of them stated that they have hunted in the Ciénega at least once, and 4 of them stated that they hunted some time during the last 2 years (33%). The main species they hunt are waterfowl and rabbit. Two persons hunt twice per month, one person hunts once every two months, and four others hunt less than 4 times a year.

Among their reasons for hunting in the Ciénega, the most important one was as means of getting food for themselves. The second reason in importance was to bring food for their families, and their third reason was for sport. None of them hunted with the purpose of selling the product. However, four persons from Ejido La Flor have taken hunters from outside the ejido into the Ciénega; outside hunters hunt mainly waterfowl. One person from this ejido earns between \$500 and \$1,000 pesos (\$46-\$90 US dollars) per month during hunting season by serving as hunting guide, while another stated that he earned between \$1,000-\$2,500 pesos (\$90-\$227 US dollars) per month during hunting season.

PLANT GATHERING IN THE CIÉNEGA DE SANTA CLARA

Six of the 12 persons interviewed stated that they have collected plant materials from the Ciénega. Most of them collected cattail leaves (*Typha domingensis*) as materials to make roofs of shaded areas (ramadas) and cattail stems to sell to people in Mexicali who use them to make fireworks; two of them cut common reed (*Phragmites australis*) also for building the roof of shaded areas (palapas).

EJIDO MESA RICA

PERSONAL AND FAMILY INFORMATION

According to INEGI's Population Census, in the year 2000 there were 244 households in the towns of Mesa Rica 1 and Mesa Rica 2 together. In this study we surveyed 107 heads of households in the former (43%) and 87 in the latter (36%). Fifty two persons interviewed were ejidatarios (27%) and 142 were people with no agrarian rights over the ejido resources (73%), but that have permission from the ejido to live in the towns. The age of the heads of households in this ejido ranged between 20 and 95 years old, their average age was 46 years old, and they have attended 4 years of school on average. Most of the interviewees were married (83%), having in average 3 family members as dependants.

In Ejido Mesa Rica, 14 persons depend on the Ciénega resources to supplement their income (7%); five of them depend completely on this income to sustain their families. There are two persons who complement their household income by providing services to tourists; they earn 10% of their income this way. There are 13 persons who fish in the Ciénega to support their families; they earn \$200-2,500 pesos per month (\$18-222 dollars) from selling the fish. Five of these fishermen earn all their income in this activity, one of them earns 40% of his income, and another person earns 10% of his income fishing here. There are also two persons who complement their income by working as hunting guides to visitors in the Ciénega.

COMMUNITY PERCEPTIONS REGARDING THE CIÉNEGA DE SANTA CLARA

One hundred and twenty eight heads of households interviewed in Ejido Mesa Rica stated that they do visit the Ciénega (66%) and 136 persons stated that they enjoy this wetland (70%). Most of the persons interviewed said that they would like the Ciénega to be there in the future for the enjoyment of their children and next generations (97%). What people of Ejido Mesa Rica like the most about the Ciénega are: the fish (35%), its vegetation and

wildlife (12%), the landscape and the environment in general (11%), the birds (10%), the boat trips (10%), and the water in the lagoon (10%). What they dislike the most about the Ciénega are trash (32%) and mosquitoes (11%). Eighteen percent stated that there is nothing they dislike about the Ciénega.

Figure 6 presents the length of stay in each visit to the Ciénega and Figure 7 presents the frequency of those visits. The persons interviewed that do not visit the Ciénega stated that it was due to their job or that they do not have a car.

Figure 6. - Length of stay in the Ciénega for visitors from people of Ejido Mesa Rica.

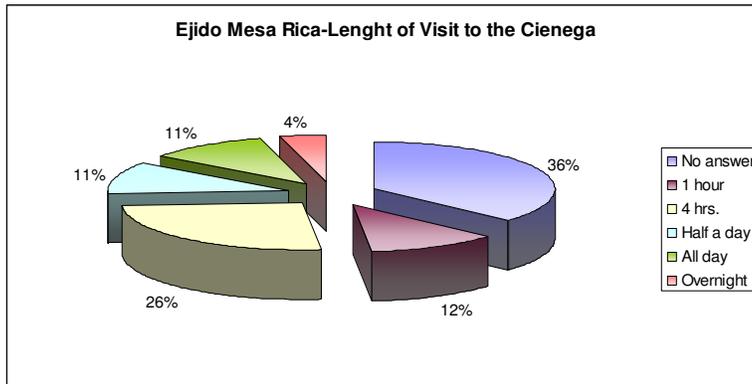
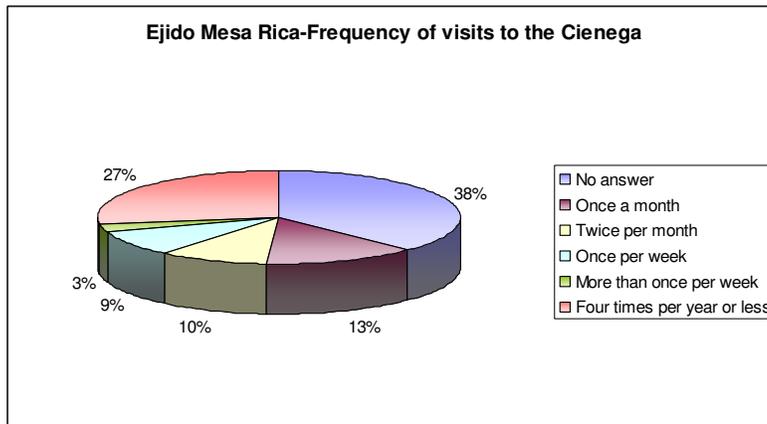


Figure 7. - Frequency of visits to the Ciénega from people of Ejido Mesa Rica.



The reasons for visiting this wetland of the people in Ejido Mesa Rica are summarized in Table 3. Each interviewee selected all his reasons for visiting the Ciénega and all the activities that he has witnessed other persons doing in there as well; percentages represent the portion of interviewed persons that carry out each activity in the Ciénega.

Table 3. - Reasons for visiting the Ciénega de Santa Clara by visitors from Ejido Mesa Rica and what they have seen others do.

Reasons for visiting	Interviewed	Other persons seen by interviewed
Picnic	95 (49%)	110 (56.7%)
Boat/canoe trip	95 (49%)	107 (55%)
Fish-subsistence	94 (48%)	113 (58%)
Fish-commercial	15 (7.7%)	104 (54%)
Walk/bird watch	88 (45%)	91 (47%)
Ecotourism-guide	2 (1%)	58 (30%)
Hunting-guide	3 (1.5%)	31 (16%)
Sport fishing-guide	3 (1.5%)	31 (16%)
Hunt	7 (3.6%)	11 (5.7%)
Other	6 (3%)	2 (1%)

Fifty five heads of household said that they or their families swim in the Ciénega (29%), staying between half an hour and two hours in the water. Two persons stated that they do drink water of the Ciénega.

We asked them how their families would be affected if the Ciénega de Santa Clara was reduced, with salinity levels 3 times higher as they are now, and where almost none of the existing fish and vegetation could survive. Each person stated several impacts and all of the impacts mentioned were counted.

Fifty one persons said that they would not be personally affected for changes in the Ciénega (28%). However, 40 persons mentioned that their families will have to stop eating fish (21%) and other 25 persons said they would not be able to fish anymore

(13%). Thirty seven persons mentioned that it will affect them by damaging the place where they take their families out for recreational purposes (19%). Fifteen persons mentioned it will affect their income and three percent mentioned that they would not be able to hunt (8%).

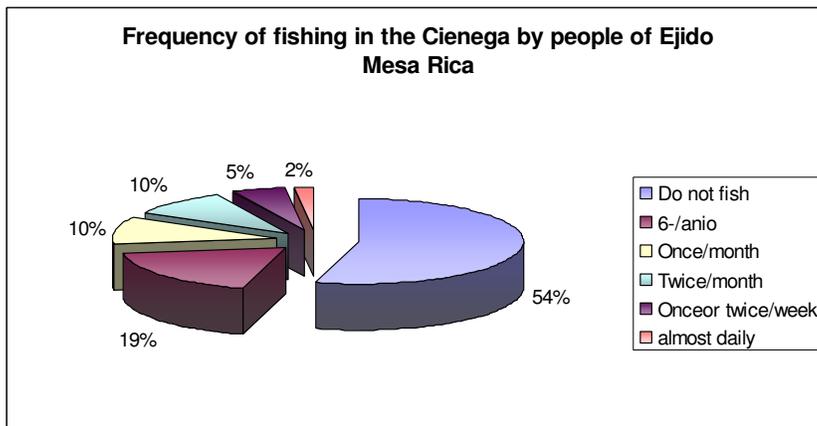
This same question was asked regarding their perception as to how it will affect the Ejido. Forty three persons think that people of the ejido rely on the Ciénega for fishing (22%) and 13 persons mentioned that ejido people will not be able to keep feeding their families with what they fish (7%). Forty four persons were concerned regarding the loss of income for the ejido, the fishermen, and the guides who work for tourists. Nineteen of the mentions were regarding loss of hunting opportunities (10%) and 11 persons mentioned the loss of recreational opportunities (6%).

Thirty persons mentioned that there is another place they could use as substitute for this marsh (15%), where they could carry out the activities they currently do at the Ciénega. The potential substitute sites mentioned the most were: the town of El Golfo de Santa Clara (16 mentions, 53%), the end of the Wellton-Mohawk Canal, where it empties into the Ciénega (8 mentions, 27%), and the Colorado River at San Felipe Bridge (2 mentions, 7%). Nevertheless, the Wellton-Mohawk Canal is not really a substitute to the Ciénega, because if water stops coming to the Ciénega it would include this end of the Wellton-Mohawk Canal.

FISHING IN THE CIÉNEGA DE SANTA CLARA

Some of the people living in the town of Ejido Mesa Rica use the resources that this wetland provides. Nearly half of the heads of household interviewed said they go fishing into the lagoon (46%); of those who fish there, most of them do it once per month (see figure 8). The species they fish are: large-mouth bass, tilapia, catfish, carp, and mullet.

Figure 8. Fishing frequency by people of Ejido Mesa Rica in the lagoons of the Ciénega de Santa Clara.

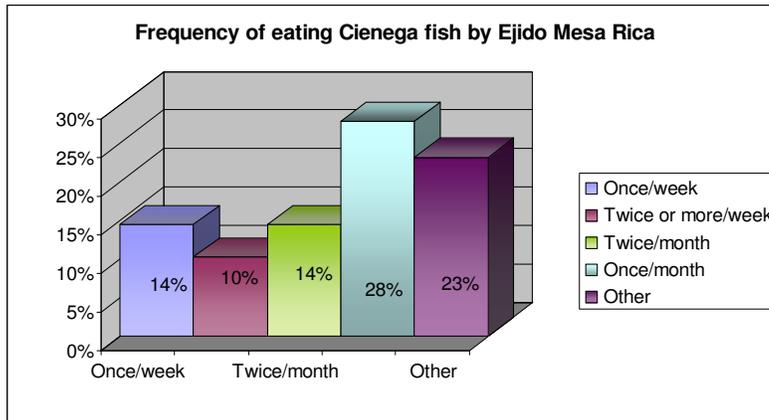


Each person was asked to order the reasons why they fish in the Ciénega, being number one the most important reason and number 5 the least important. We weighted each level of importance (1-5) by 10, 7, 5, 3 or 1, accordingly, to get an overall level of importance for each of the reasons, as a way to rank the reasons of Ejido Mesa Rica for fishing in the Ciénega.

For people living in both towns of Ejido Mesa Rica, their number one reason was get food for themselves. Their second main reason was to provide their families with food. Their third reason was for sport, while fishing for selling it was their least mentioned reason. Thus, it can be said that nearly half of the households in both towns of Ejido Mesa Rica that go to the Ciénega do so for subsistence fishing.

Figure 9 shows how frequently does people of Ejido Mesa Rica use to eat fish caught in the Ciénega de Santa Clara (either because they caught it or they bought it from someone who fishes in this wetland). All of the interviewees stated that they have never become sick after eating fish from the Ciénega.

Figure 9. Ejido Mesa Rica’s eating frequency of fish from the Ciénega (by household).



For those who stated that they fish in the Ciénega, the minimum amount of fish they usually catch each time is two kilos; while the maximum amount a person has caught in a single fishing trip was 100 kilos. For those who fish and sell their product, the minimum selling price was \$8 pesos/kilo (\$0.72 dollars/lb) and the maximum selling price was \$30 pesos/kilo (\$2.72 dollars/lb). Table 4 shows the number of households that earn an income from selling the fish they caught at the Ciénega; each income category represents monthly earnings.

Table 4 Income from Ejido Mesa Rica’s households from selling fish caught at the Ciénega de Santa Clara.

Fishing Income in MX pesos (\$ US dollars)	Number of Households (%)
Less than \$250 MXP (\$22 USD)	4 (2%)
\$251-\$500 MXP (\$22-\$45 USD)	5 (3%)
\$501-\$1,000 MXP (\$46-\$90 USD)	4 (2%)
\$1,001-\$2,500 MXP (\$91-\$227 USD)	3 (2%)
\$2,500-\$5,000 MXP (\$227-\$454 USD)	5 (3%)
More than \$5,000 MXP (\$454 USD)	2 (1%)

HUNTING IN THE CIÉNEGA DE SANTA CLARA

Ejido Mesa Rica is the first ejido within the Reserve to get SEMARNAT’s permission for operating a hunting enterprise in the Ciénega de Santa Clara. From the 194 heads of household interviewed in Ejido Mesa Rica, 19 persons stated that they have hunted in the

Ciénega at least once (10%), 8 of them stated that they did some time during the last 2 years (4%). They have mainly hunted waterfowl. Four persons hunt once per week.

Among their reasons for hunting in the Ciénega, the most important one was to provide food for their families. The second reason in importance was to eat it themselves, and their third reason was for sport. Only one person hunts with the purpose of selling the product. Seven persons have taken hunters from outside the ejido into the Ciénega; outside hunters only hunt waterfowl. Three persons from Ejido Mesa Rica earn between \$250-\$500 pesos (\$22-\$46 US dollars) per month when taking hunters into the Ciénega. One of them earn between \$1,000-\$2,500 pesos (\$90-227 US dollars) per month during hunting season. Another one earns between \$2,500-\$5,000 pesos per month (\$227-\$454 US dollars). The last person who works as hunting guide earns more than \$5,000 pesos (\$454 US dollars) per month.

PLANT GATHERING IN THE CIÉNEGA DE SANTA CLARA

Of the 194 persons interviewed in Ejido Mesa Rica, 28 gather plants or plant materials in the Ciénega (14%). Most of them collected cattails as materials to make roofs of shaded areas (ramadas); others cut common reed and saltcedar (*Tamarix ramosissima*) as well. One person mentioned using saltcedar to build a fence. Another two mentioned cutting mesquite for making fences or as firewood to cook. All of them collected plants less than 4 times a year.

Another reason given for collecting cattail was to sell the stems to makers of fireworks. The higher demand for cattail stems is in September (Mexico's Independence Celebration) and in December; they sell 500 stems for \$120 pesos (\$11 US dollars). Another person stated that she collected creosote (*Larrea tridentata*), mormon tea (*Ephedra* spp.), and common reed mainly for their medicinal properties, and she collects plants every 15 days. Other two persons collected yerba mansa (*Anemopsis californica*), also for medicinal purposes.

EJIDO LUIS ENCINAS JOHNSON

PERSONAL AND FAMILY INFORMATION

Ejido Johnson has 71 households, of which 48 participated in this survey (68%). Twenty one persons interviewed were ejidatarios (44%) and 27 were people with no agrarian rights over the Ejido Johnson's resources but live in the town of the ejido (56%). The age of the heads of households in this ejido ranged between 22 and 79 years old, their average age was 47 years old, and they have attended 4.5 years of school on average. Most of them were married (77%), having in average 3 family members as dependants.

In Ejido Johnson, 19 persons depend on the Ciénega resources to supplement their income (40% of those interviewed); four of them depend completely on this income to sustain their families. There are 15 persons who complement their household income by providing services to tourists; they earn \$100-\$400 pesos per month in this activity (\$9-\$36 dollars per month). There are 6 persons who fish in the Ciénega to support their families; three of these fishermen earn all their income in this activity. There are also three persons who complement their income by hunting in the Ciénega or working as hunting guides to visitors in the Ciénega.

COMMUNITY PERCEPTIONS REGARDING THE CIÉNEGA DE SANTA CLARA.

Almost all the heads of households interviewed in Ejido Johnson stated that they do visit the Ciénega (98%) and that they enjoy this wetland (98%). All of the persons interviewed said that they would like the Ciénega to be there in the future for their children and next generations to enjoy it. The features that people of Ejido Johnson like the most about the Ciénega are: nature and the landscape (22%), bird watching (16%), everything about the Ciénega (13%), the fish (12%), the serenity (10%), the boat trips (9%), and the water in the lagoon (6%). What they dislike the most about the Ciénega are trash (30%), the salt (5%), no trees as shaded areas, the distance from the ejido, the mosquitoes, and that people burn cattail (4% each).

Figure 10 presents the length of stay in each visit to the Ciénega and Figure 11 presents the frequency of those visits. The persons interviewed that do not visit the Ciénega stated that it was due to their job they don't have the time to visit the Ciénega or that they do not have a car.

Figure 10. - Length of stay in the Ciénega for visitors from Ejido Johnson.

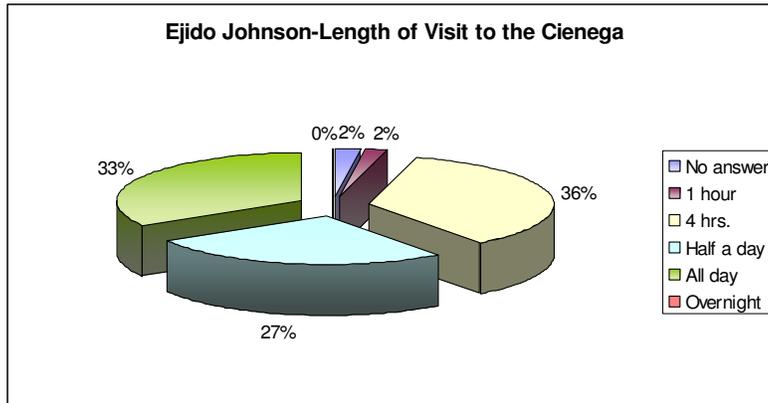
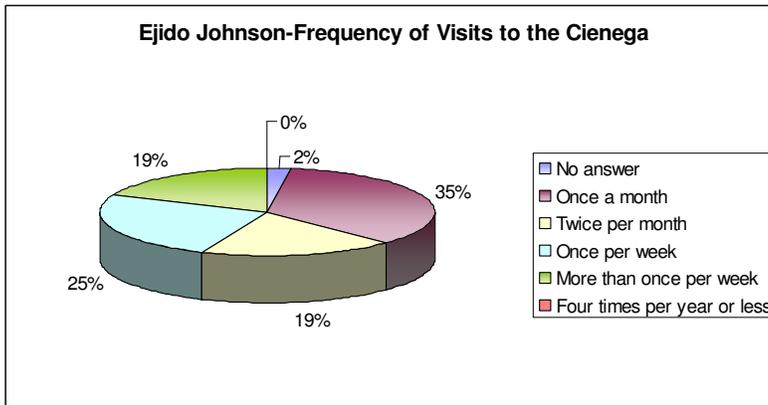


Figure 11. - Frequency of visits to the Ciénega from people of Ejido Johnson.



The reasons for visiting this wetland of the people in the Ejido Johnson are summarized in Table 5. Each person marked all his reasons for visiting the Ciénega and all the

activities that he has witnessed other persons doing in there as well, therefore percentages represent the percent of interviewed persons that carry out each activity in the Ciénega.

Table 5. - Reasons for visiting the Ciénega de Santa Clara by visitors from Ejido Johnson and what they have seen others do.

Reasons for visiting	Interviewed	Other persons seen by interviewed
Picnic	45 (94%)	42 (88%)
Boat/canoe trip	40 (83%)	38 (79%)
Fish-subsistence	25 (52%)	40 (83%)
Fish-commercial	11 (23%)	32 (66%)
Walk/bird watch	33 (69%)	34 (71%)
Ecotourism-guide	10 (21%)	35 (73%)
Hunting-guide	2 (4%)	7 (15%)
Sport fishing-guide	5 (10%)	25 (52%)
Hunt	1 (2%)	2 (4%)
Other	5 (10%)	1 (2%)

Thirty one persons said that they or their families swim in the Ciénega (65%), staying between half an hour and three hours in the water. Two persons stated that they do drink water of the Ciénega.

We also asked them how their families would be affected if the Ciénega de Santa Clara was reduced, with salinity levels 3 times higher as they are now, and where almost none of the existing fish and vegetation could survive. Each person can give several effects and all effects mentioned were counted. Only three percent of the people that answered this question said that they would not be affected personally for changes in the Ciénega.

Twelve percent of the mentions given stated that they rely on the Ciénega to eat fish and feed their families, therefore, changes in the Ciénega ecosystem will mean that they will stop eating fish and 9% said they would not be able to fish anymore. More than half of the perceived effects were regarding losing the place where they take their families out

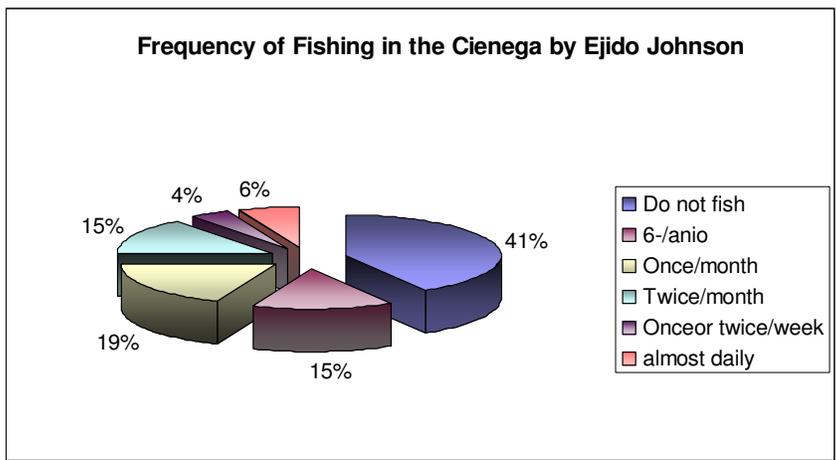
for recreational purposes (57%). Five percent mentioned it will affect their income directly. However, several persons perceived the lost of income for the ejido in general will be important (45%), another 34% of the mentions specified that the ejido will be affected by lost of income from ecotourism activities.

Thirteen persons (27%) mentioned that there is another place they could use as substitute of this marsh, where they could carry out the activities they currently do at the Ciénega. The potential substitute sites mentioned the most were: the town of El Golfo de Santa Clara (9 mentions, 69%), the end of the Wellton-Mohawk Canal, where it empties into the Ciénega (2 mentions, 16%), and the wetland called Laguna del Indio and a place called Las Bombas got both one mention. Nevertheless, the Wellton-Mohawk Canal is not really a substitute to the Ciénega, because if water stops coming to the Ciénega it includes this end of the Wellton-Mohawk Canal.

FISHING IN THE CIÉNEGA DE SANTA CLARA

More than half of the heads of household interviewed said they go fishing into the lagoon (59%); of those who do fish there, most of them do it once or twice per month (see figure 12). The species they fish are: large-mouth bass, tilapia, catfish, carp, and mullet.

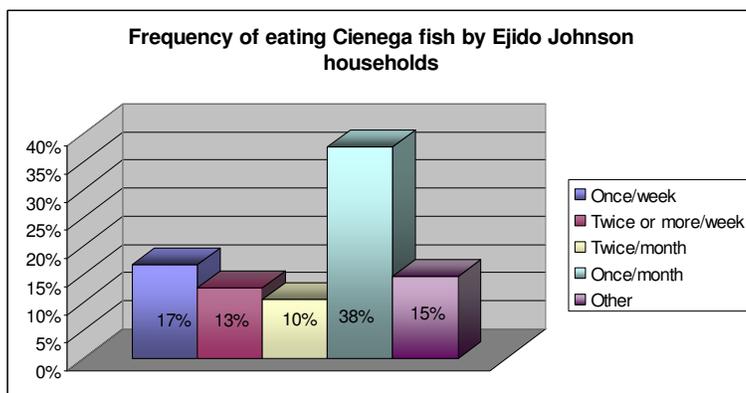
Figure 12. Fishing frequency by people of Ejido Johnson in the lagoons of the Ciénega de Santa Clara.



Each person was asked to order the reasons why they fish in the Ciénega, being number one the most important reason and number 5 the least important. For people living in Ejido Johnson, their number one reason for fishing was to get food for themselves. Their second main reason was to provide their families with food. Their third reason was for sport, and fishing for earning money by selling it was their least important reason. Thus, it can also be said that nearly half of the households of Ejido Johnson fish in the Ciénega primarily as means for subsistence.

Figure 13 shows how frequently does people of this ejido eat fish caught in the Ciénega de Santa Clara (either because they caught it or they bought it from someone who fishes in this wetland). All of the interviewees stated that they have never become sick after eating fish from the Ciénega.

Figure 13. Ejido Johnson’s eating frequency of fish from the Ciénega (by household).



For those who stated that they fish in the Ciénega, the minimum amount of fish they usually catch each time is two kilos; while the maximum amount a person has caught in a single fishing trip was 100 kilos. For those who fish and sell their product, the minimum selling price was \$5 pesos/kilo (\$0.20 dollars/lb) and the maximum selling price was \$10 pesos/kilo (\$ 0.41 dollars/lb). Table 6 shows the number of households that earn an income from selling the fish they caught at the Ciénega; each income category represents monthly earnings.

Table 6.- Income from Ejido Johnson’s households from selling fish caught at the Ciénega de Santa Clara.

Fishing Income in MX pesos (\$ US dollars)	Number of Households (%)
Less than \$250 MXP (\$22 USD)	4 (8%)
\$251-\$500 MXP (\$22-\$45 USD)	3 (6%)
\$501-\$1,000 MXP (\$46-\$90 USD)	1 (2%)
\$1,001-\$2,500 MXP (\$91-\$227 USD)	0 (0%)
\$2,500-\$5,000 MXP (\$227-\$454 USD)	0 (0%)
More than \$5,000 MXP (\$454 USD)	4 (8%)

HUNTING IN THE CIÉNEGA DE SANTA CLARA

Hunting is forbidden in most of the Ciénega de Santa Clara. Ejido Johnson received its registry for hunting permits but the permit quotas are still being negotiated between SEMARNAT and the Ejido. Thus, any hunting done in the area since the Reserve was established in 1993 was done without any permit for wildlife hunting.

From the 48 heads of household interviewed in Ejido Johnson, 9 persons stated that they have hunted in the Ciénega at least once (19%), 8 of them stated that they did some time during the last 2 years (17%). They have mainly hunted waterfowl and rabbit. Two persons hunt twice per month, one person hunts once every two months, and four others hunt less than 4 times a year.

Among their reasons for hunting in the Ciénega, the most important one was to provide food for their families. The second reason in importance was to eat it themselves, and their third reason was for sport. None of them hunted with the purpose of selling the product. However, five persons have taken hunters from outside the ejido into the Ciénega; outside hunters hunt waterfowl and rabbits. Four of them earn less than \$250 pesos (\$22 US dollars) per month when taking hunters into the Ciénega. Two of them earn between \$500 and \$1,000 pesos (\$46-\$90 US dollars) per month during hunting season.

PLANT GATHERING IN THE CIÉNEGA DE SANTA CLARA

Seven of the 48 persons interviewed stated that they have collected plant materials from the Ciénega. Most of them collected cattails as materials to make roofs of shaded areas (ramadas); two of them cut common reed and saltcedar as well for the same purposes. Most of them collected cattail twice per year.

B. INTERVIEW WITH LA RUTA DE SONORA ECOTOURISM ASSOCIATION.

La Ruta de Sonora is an organization that promotes “responsible and ethical tourism for the Arizona-Sonora borderlands region that provides opportunities for local residents to generate new sources of income from business ventures and services” (La Ruta de Sonora, 2005). The concept of an ecotourism organization in the region was initially conceived in 1996, when it was jointly defined by Dr. Joaquin Murrieta, Director for People, Culture, and Conservation, Sonoran Desert Program at the Sonoran Institute, and Juan Butrón, member and community leader of the Ejido Luis Encinas Johnson.

While Dr. Murrieta began exploring the feasibility of ecotourism as an alternative source of income for communities in Northern Sonora and the Colorado River delta, Juan Butrón, a community leader involved in the definition of the Management Plan for the Biosphere Reserve, became interested in developing an ecotourism enterprise that could help in the protection of the Ciénega by educating visitors, while at the same time, help his community to develop an alternative source of income. La Ruta de Sonora acknowledges the key role that Juan Butrón had in its conception.

La Ruta de Sonora Ecotourism Association is the only tour operator that offers trips to the Ciénega de Santa Clara. La Ruta works together with Ejido Johnson to bring visitors to the Ciénega, as part of their Colorado River Delta Tour. Besides investing in the promotion of this wetland as an ecotourism destination, La Ruta has also provided the Ejido with most of the canoes and electric motors the Ejido uses to take visitors to the lagoon.

La Ruta's 3-days/2-nights tour includes a canoe trip in the wetland and a meal prepared by members of Ejido Johnson. Most of La Ruta customers are retired persons with interest in the conservation of the Sonoran Desert ecosystem. The first season that La Ruta offered this tour was October 1999-May 2000, with 9 tours that season. Since then, there have been more than 45 tours to the delta. La Ruta pays Ejido Johnson \$20 dollars per person on the tour. The ejido uses this money to pay salaries of ecotourism guides, training, and common needs of the ejido, like improvements to the school or the ecotourism house.

The amount of money that La Ruta de Sonora pays to Ejido Johnson is about a third of what la Ruta de Sonora expends in San Luis Río Colorado or El Golfo de Santa Clara. This is because the Ejido does not have suitable facilities for visitors to stay at the Ciénega or in the Ejido. Thus, while in the 5 years of tours has meant more than \$6,000 dollars of income to Ejido Johnson, la Ruta has spend more than \$18,000 dollars for food and lodging in the town of El Golfo de Santa Clara and more than \$23,000 dollars for the same services in San Luis Río Colorado, during the same period of time.

The impacts of losing this wetland as it is now will be in both ecological and economic terms. Dr. Murrieta and Ms. Durand agree that people of Ejido Johnson depend on the resources that the Ciénega provides. Dr. Murrieta estimated that between 5-20% of the income of Ejido Johnson's people comes from the economic activities they carry out in this wetland. Their livelihoods are also attached to the Ciénega, as Dr. Murrieta stated "if the Ciénega were to disappear, people of Ejido Johnson will lose their identity, perhaps not so much in the economic sense, but in a moral sense as well."

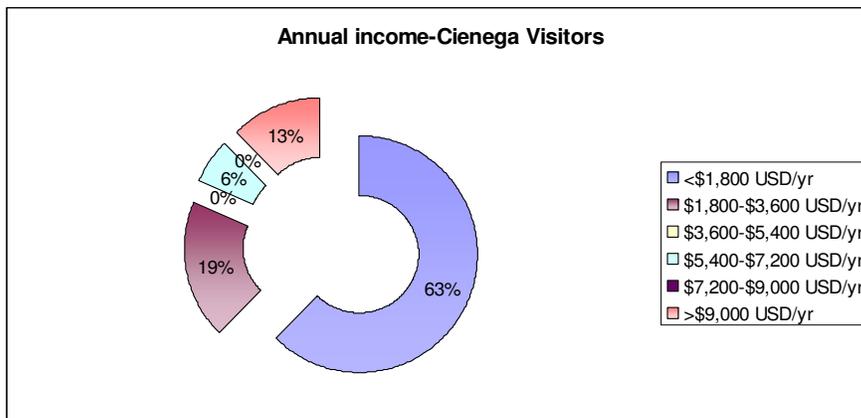
Regarding water quality concerns, Dr. Murrieta and Ms. Durand agree that the general opinion is that the water of the Ciénega is safe for swimming and eating the fish, and there is no perceived risk among the community or La Ruta staff regarding the safety of the water for recreational purposes.

C. VISITORS' SURVEY IN THE CIÉNEGA DE SANTA CLARA.

The Ciénega de Santa Clara attracts local families as a recreational area, especially during the Holy Week. Unfortunately, the Ejido does not keep record of the number of visitors they have allowed into the Ciénega. La Ruta de Sonora was able to provide the information for the tours they have done, estimating that more than 300 persons have visited the Ciénega while on their Colorado River delta tour.

During the Holy Week of 2005, Juan Butron was able to interview 16 heads of families that visited the Ciénega. He estimated that more than 75 persons were visiting the Ciénega each day during the weekend. The average family had 4 members, the head of the household was on average 40 years old and had 7 years of school. Usually, nationals visiting the Ciénega come from surrounding communities, but some come from Mexicali or San Luis Río Colorado. Thus it is not surprising that most of them have an annual income of less than \$3,600 US dollars (81%). Figure 14 presents the annual income of the visitors interviewed.

Figure 14. Annual income of Cienega visitors surveyed.



All of the visitors interviewed stated that they enjoy going to the Ciénega and would like the Ciénega to remain for future generations (88%). Only two persons mentioned that as

a substitute for the Ciénega, they could visit the coastal town of El Golfo de Santa Clara or the place called Las Bombas. Most of the families that visit the Ciénega stay half a day (37%) or the whole day there (43%).

Regarding the activities visitor's like to do in the Ciénega, most like to do a picnic with the family and take a canoe trip into the Ciénega, or watch birds (88%). Only six of them go there for sport fishing (38%) and eight families (50%) swim in the Ciénega but none of them drink the water.

Seven families have at least a member that fishes in the Ciénega, mainly to provide food for their families (43%), no one interviewed has become sick after eating fish from the Ciénega de Santa Clara.

VI.- CONCLUSIONS

Results of the survey carried out with people living in the three ejidos that own the Ciénega de Santa Clara are statistically representative of families in the ejidos, as it included a high percentage of each ejido's households: Ejido La Flor del Desierto (39%), Ejido Mesa Rica (79%), and Ejido Luis Encinas Johnson (68%).

Local communities appreciate and value the Ciénega de Santa Clara, as out of the 252 heads of household interviewed, only 3 did not show an interest in having the Ciénega for future generations. The ejido, whose people depend the most on the Ciénega to earn an income (by percentage of households), is Ejido La Flor del Desierto (66%), then Ejido Luis Encinas Johnson (40%), and Ejido Mesa Rica (21%). The main activities they carry out in the Ciénega are subsistence fishing, picnics, and canoe trips in the lagoon.

Ejido La Flor del Desierto is almost deserted, however, of those ejidatarios and non-ejidatarios that are still using the Ciénega, 10 families stated that they fish regularly there (83%), and that they eat Ciénega fish at least once per month (43%, 5 families). Also, this community uses other resource of the Ciénega besides fish, they hunt (33%, 4 families)

or they gather plants (50%, 6 families), but less than 6 times a year and mainly cattail stems to sell for making fireworks.

While people from both towns of Ejido Mesa Rica do not rely in the Ciénega resources as much in terms of income, they are the ones who depend the most in the Ciénega to fish for feeding their families (21%, 40 families). Adding together those heads of households who fish for subsistence with other heads of households that fish for selling the product, we get that almost half of this ejido's households depend on the Ciénega fisheries to feed and support their families (46%, 89 heads of families).

In Ejido Mesa Rica, 46 families stated that their families eat fish caught at the Ciénega at least once per week (24%), especially at times where there is no work in the agricultural fields. Also important is that 128 families eat fish caught at the Ciénega at least once per month (66%). In this community, sixty seven of the interviewed families are used to visit the Ciénega at least once per month (35% households). Thirty six families interviewed here stated that the Ciénega is where they go for recreation (19%), and 27 families gather plants in there as well (14%).

In Ejido Luis Encinas Johnson, 5 persons depend on the Ciénega to provide fish for their families (12%); however more than half of Ejido Johnson's families that were interviewed rely on the Ciénega as their most important place for recreational purposes (57%, 26 families). Nearly half of the heads of household interviewed in this ejido stated that they visit the Ciénega at least once per week for various reasons (44%, 20 families).

The operation of the Yuma Desalting Plant will drastically reduce the ecological value of the Ciénega, limiting the ability of this wetland to provide food and shelter for migratory species of birds as well as for Mexican and U.S. threatened and endangered species. However, the impacts of such degradation of the wetland will extend to the social and economic arena as well. Even though their income might not be highly dependant on the Ciénega, their livelihoods are strongly linked to the fate of the Ciénega de Santa Clara as it is the source of food and recreational opportunities for their families.

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3. How often do you visit the Ciénega?
- Once every month
 - Once every two weeks
 - Once every week
 - Other frequency (explain) _____
4. If you do not visit the Ciénega, what are your reasons? _____

5. What do you do at the Ciénega? (mark all that apply)
- Picnic at the palapas
 - Take a boat or a canoe trip in the lagoon
 - Catch fish to feed my family
 - Catch fish to sell the product
 - Walk around the lagoon and see the birds
 - Work as guide in the boat/canoe eco-tours
 - Work as a guide for hunters
 - Work as guide for sport fishermen
 - Hunt yourself
 - Other?
- _____
6. From the same options above, please select now those activities that you have seen other people doing while in the Ciénega _____
7. ¿In general, do you enjoy the Ciénega? Yes No
8. What is it that you like the most about the Ciénega? _____
9. What is it that you dislike the most about the Ciénega? _____
10. Do you think your children and grandchildren should be able to enjoy the Ciénega?
- Yes
 - No (=I am not interested in my children/grandchildren to enjoy it)
 - I do not care one way or the other
11. Is there any other place other than the Ciénega de Santa Clara where you can do all the things you do in the Ciénega? Yes No
12. If yes, what place is this? _____
13. How far from your home is it? _____ km

14. How will it affect you if the Ciénega turns into a smaller lagoon of water 3 times saltier, where no fish could survive, and surrounded by a salt field where little vegetation can grow? _____

15. How will it affect your family if the Ciénega turns into a smaller lagoon of water 3 times saltier, where no fish could survive, and surrounded by a salt field where little vegetation can grow?

16. How will it affect your ejido if the Ciénega turns into a smaller lagoon of water 3 times saltier, where no fish could survive, and surrounded by a salt field where little vegetation can grow?

II.-FISHING

17. Do you fish in the Ciénega? Yes----- No

18. How often do you go fishing to the Ciénega?

- a. Once every month
 - b. Once every two weeks
 - c. Once every week
 - d. Other frequency (explain)
- _____

19. If yes to 17, what are your reasons for fishing in the Cienega? (please, order the options below from most important=1 to least important=5)

- a. _____ to provide food for you
- b. _____ to provide food for your family
- c. _____ for fun (as a sport)
- d. _____ to sell
- e. _____ other

20. What species do you fish? _____

21. How many kilos you get every time you go fishing to the Ciénega?
_____kilos

22. If you sell all or some of the fish you catch in the Cienega, how much do you get per kilo? \$____/k

23. How often do you or your family eat the fish from the Ciénega? (either if you catch it or you get it from someone who fishes in the Ciénega)

- a. once per week
- b. twice per week
- c. once every two weeks
- d. once every month
- e. other frequency

(explain)_____

24. How much do you estimate that you earn per month by selling the fish you catch in the Ciénega?

- a. Less than 250 pesos
- b. 251 - 500 pesos
- c. 501 - 1,000 pesos
- d. 1001 - 2,500 pesos
- e. 2500 - 5,000 pesos

25. ¿Have you ever become sick after eating fish caught in the Ciénega? Yes No

26. If you have become sick for eating fish from the Ciénega, what were your symptoms?

III.- HUNTING

27. Have you ever hunted in the Ciénega? Yes No

28. Have you hunted (or taken hunters) in the Ciénega in the last 2 years? Yes No

29. If yes to 27, ¿what species have you hunted in the Ciénega? _____

30. If yes to 27, what are your reasons for hunting (order the options below from most important=1 to least important=5)

- a. _____ to provide food for you
- b. _____ to provide food for your family
- c. _____ for fun (as a sport)
- d. _____ to sell
- e. _____ other

(explain)_____

31. If yes to 27, how often you go hunting to the Ciénega?

- a. Once every month
- b. Once every two weeks
- c. Once every week
- d. Other frequency (explain)

32. How often do you or your family eat the game you hunt in the Ciénega? (either if you hunt it or you get it from someone who hunts in the Ciénega)

- a. once per week
- b. twice per week
- c. once every two weeks
- d. once every month
- e. other frequency

(explain)_____

33. If you have taken hunters into the Ciénega, how often do you work for them as hunting guide?

- a. once per week
- b. twice per week
- c. once every two weeks
- d. once every month
- e. other frequency

(explain)_____

34. Which are the main game species hunted by those hunters you have taken into the Ciénega? _____

35. How much do you estimate that you earn per month by selling the game you hunt in the Ciénega? Or how much do you earn by guiding hunters into the lagoon?

- a. Less than 250 pesos
- b. 251 - 500 pesos
- c. 501 - 1,000 pesos
- d. 1001 - 2,500 pesos
- e. 2500 - 5,000 pesos

IV.- PLANT GATHERING

36. Do you gather plants in the Ciénega? Yes No

37. If yes to 36, ¿what plants do you collect in the Ciénega?_____

38. If yes to 36, what are your reasons for gathering plants (please, order the options below from most important=1 to least important=5)

- a. _____ to eat
- b. _____ for fun (as a sport)
- c. _____ to sell
- d. _____ other

(explain)_____

39. If yes to 36, how often you collect plants in the Ciénega? _____

40. Do you eat the plants (or parts of them) that you collect in the Ciénega? Yes No

V.- RECREATION

41. Do you swim in the Ciénega? Yes No

42. How many persons of your family go swimming in the Ciénega? _____ persons

43. How often do you or your family swim in the Ciénega (summer months)?

- a. once per week
- b. twice per week
- c. once every two weeks
- d. once every month
- e. other frequency

(explain)_____

44. How long do you or your family members stay in the water when you go the lagoon?
_____hrs

I. FAMILY

45. Are you ejidatario, posesionario, or just a neighbor in this ejido? _____

46. Do you live in the ejido? Yes No → ¿where? _____

47. How old are you? _____ years

48. What is the highest school grade you finish? _____

49. Are you married? Yes No

50. How many children do you have? _____

51. How many persons depend on your income? _____

52. What percentage of your family income do you get from working in the Ciénega?

- a. % income from eco-tourism _____%
- b. % income from sales of fish you catch in Ciénega? _____%
- c. % income from sales of game you hunt in Ciénega? _____%

53. Do you drink the water of the Ciénega? Yes No

54. If yes, how frequently do you drink the water of the Ciénega? _____

55. Do you provide any of these services to tourists (select all you provide)?

- a. Guide in ecotourism or in sport fishing
- b. Hunting guide
- c. Food preparation
- d. Other? _____

56. How much do you estimate that you earn per month by providing services to tourists?

- a. Less than 250 pesos
- b. 251 - 500 pesos
- c. 501 - 1,000 pesos
- d. 1001 - 2,500 pesos
- e. 2500 - 5,000 pesos

**IX.- APPENDIX B. INTERVIEW WITH LA RUTA DE SONORA ECOTOURISM ASSOCIATION
(QUESTIONNAIRE GUIDING THE INTERVIEW)**

Importance of the Cienega for the Community:

1. Do you think that people at Ejido Johnson depend on the existence of the Cienega for their livelihoods? In what measure?
2. How much do you think it will hurt the community if the Cienega de Santa Clara disappears? Or in what ways will they lose?
3. How much do you think the operation of the Yuma Desalting Plant will affect the livelihood of the Ejido Johnson and of the other ejidos that share the Cienega (La Flor and Mesa Rica)?
4. Do you know if there is any threat to people regarding the current quality of water in the Cienega?

Work of La Ruta in partnership with Ejido Johnson:

1. Since when have La Ruta been working with the Ejido Johnson?
2. How did you get involved as a partner in the eco-tourism venture with Ejido Johnson?
3. How advanced was the Ejido Johnson regarding the eco-tourism service when you began your work with them?
4. How many tours have you led to the Cienega each year since you began activities?
5. Are the tours to the Cienega exclusive to visit this area? Or do you lead tours that visit several other places in Mexico besides the Cienega?
6. On average, how much money does each person that takes your tour pays?
7. For each person that pays you to visit the Cienega, what percentage of this payment is transferred from La Ruta to the Ejido?
8. How much money have you payed per year to the Ejido since you began your partnership with them?
9. Do you know how does the Ejido applies/spends/invest this income it gets from eco-tourism?

X.- APPENDIX C. VISITOR'S SURVEY IN THE CIÉNEGA DE SANTA CLARA.

Community Use of the Ciénega de Santa Clara
Questionnaire for families living in Ej. Johnson, Ej. Mesa Rica, and Ejido Flor del
Desierto
August-September 2004

The Yuma Desalting Plant constitutes the greatest threat to the Ciénega de Santa Clara. The U.S. Bureau of Reclamation intends to operate the plant using the Ciénega's main source of water. If the plant begins operations, the Ciénega will receive only 33% of the water supply it now gets and this water will be 3 times saltier than what it is now. Thus, instead of the lagoon there is now, there will be no cattail, perhaps saltcedar, and salt crusts surrounding a much smaller lagoon, with water so salty that most of the current fish species will not survive.

The Rocky Mountain Office of Environmental Defense and Pronatura Noroeste are both working to protect the Ciénega de Santa Clara against this threat. To ensure that the impacts of losing the Cienega will have on local communities, we are carrying out a study of how the people use the Ciénega de Santa Clara.

We need you to help us document the various ways in which you and your family use the Ciénega de Santa Clara and how your livelihood could be affected if it disappears. The information you provide to us is critical to help us urge the Mexican Government to protest the operation of the Yuma Desalting Plant based on the impacts that losing this valuable ecosystem will have in your communities.

Your participation is voluntary, anonymous, and confidential so you can feel comfortable answering our questions. We will answer any further questions you may have and please let us know any time if you need further clarification of any question.

I- USE OF CIÉNEGA

1. When you visited the Ciénega, ¿How much time (on average) did you spend there?
 - a. One hour
 - b. 4 hrs.
 - c. Half a day
 - d. Entire day
 - e. I camped for _____ day (s)

2. How often do you visit the Ciénega?
 - a. Once every month
 - b. Once every two weeks
 - c. Once every week
 - d. Other frequency (explain) _____

3.If you do not visit the Ciénega, what are your reasons? _____

4.What do you do at the Ciénega? (mark all that apply)

- a. Picnic at the palapas
- b. Take a boat or a canoe trip in the lagoon
- c. Catch fish to feed my family
- d. Catch fish to sell the product
- e. Walk around the lagoon and see the birds
- f. Work as a guide in the boat/canoe eco-tours
- g. Work as a guide for hunters
- h. Work as a guide for sport fishermen
- i. Hunt yourself
- j. Other? _____

5.In general, do you enjoy the Ciénega? Yes No

6.What is it that you like the most about the Ciénega?_____

7.What is it that you dislike the most about the Ciénega?_____

8. Do you think your children and grandchildren should be able to enjoy the Ciénega?

- a. Yes
- b. No (=I am not interested in my children/grandchildren to enjoy it)
- c. I do not care one way or the other

9. Is there any place other than the Ciénega de Santa Clara where you can do all the things you do in the Ciénega? Yes No

10. If yes, what place is this?_____

11. How far from your home is it? _____km

12. How will it affect you and your family if the Ciénega turns into a smaller lagoon of water 3 times saltier, where no fish could survive, and surrounded by a salt field where little vegetation can grow? _____

II.-FISHING

13. Do you fish in the Ciénega? Yes----- No

14. How often do you go fishing to the Ciénega?
- Once every month
 - Once every two weeks
 - Once every week
 - Other frequency (explain)

15. If yes to 13, what are your reasons for fishing in the Ciénega? (please, order the options below from most important=1 to least important=5)
- _____ to provide food for you
 - _____ to provide food for your family
 - _____ for fun (as a sport)
 - _____ to sell
 - _____ other
16. How often do you or your family eat the fish from the Ciénega? (either if you catch it or you get it from someone who fishes in the Ciénega)
- once per week
 - twice per week
 - once every two weeks
 - once every month
 - other frequency
(explain)_____
17. ¿Have you ever become sick after eating fish caught in the Ciénega? Yes
No
18. If you have become sick for eating fish from the Ciénega, what were your symptoms?_____

III.- HUNTING

19. Have you ever hunted in the Ciénega? Yes No
20. Have you hunted (or taken hunters) in the Ciénega in the last 2 years? Yes No
21. If yes to 19, what are your reasons for hunting (order the options below from most important=1 to least important=5)
- _____ to provide food for you
 - _____ to provide food for your family
 - _____ for fun (as a sport)
 - _____ to sell
 - _____ other
(explain)_____

22. How often do you or your family eat the game you hunt in the Ciénega? (either if you hunt it or you get it from someone who hunts in the Ciénega)
- a. once per week
 - b. twice per week
 - c. once every two weeks
 - d. once every month
 - e. other frequency
(explain)_____

IV.- PLANT GATHERING

23. Do you gather plants in the Ciénega? Yes No

24. If yes to 36, ¿what plants do you collect in the Ciénega?_____

25. If yes to 31, what are your reasons for gathering plants (please, order the options below from most important=1 to least important=5)

- f. _____ to eat
- g. _____ for fun (as a sport)
- h. _____ to sell
- i. _____ other (explain)_____

V.- RECREATION

26. How many persons of your family go swimming in the Ciénega? _____ persons

27. How often do you or your family swim in the Ciénega (summer months)?

- j. once per week
- k. twice per week
- l. once every two weeks
- m. once every month
- n. other frequency
(explain)_____

28. How long do you or your family members stay in the water when you go the lagoon? _____ hrs

I. FAMILY

29. How old are you? _____ years

30. What is the highest school grade you finish? _____

31. Are you married? Yes No

32. How many children do you have? _____
33. How many persons depend on your income? _____
34. Do you drink the water of the Ciénega? Yes No
35. If yes, how frequently do you drink the water of the Ciénega? _____
36. Do you provide any of these services to tourists (select all you provide)?
- a. Guide in ecotourism or in sport fishing
 - b. Hunting guide
 - c. Food preparation
 - d. Other? _____
37. How much do you estimate that you earn per month by providing services to tourists?
- a. Less than 250 pesos
 - b. 251 - 500 pesos
 - c. 501 - 1,000 pesos
 - d. 1001 - 2,500 pesos
 - e. 2500 - 5,000 pesos

THANK YOU VERY MUCH!

X.- APPENDIX D. FINANCIAL REPORT.**FINAL REPORT TO ENVIRONMENTAL DEFENSE**
Community Use of the Ciénega de Santa Clara
by PRONATURA SONORA

CATEGORY	BUDGET	TOTAL REPORTED	DIFFERENCES
Personnel	2,375.00	2,587.35	-212.35
Vehicle	821.00	480.72	340.28
Per diem	170.00	104.05	65.95
Materials and Supplies	115.00	308.88	-193.88
Telephone and Fax	60.00	60.00	0.00
Sub Total	3,541.00	3,541.00	0.00
Indirect Costs	534.00	534.00	0.00
TOTAL			

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