

FERNANDO COLCHERO - THE TIBURON ISLAND DESERT BIGHORN SHEEP: A CONSERVATION AND SUSTAINABLE DEVELOPMENT PROGRAM IN MEXICO

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Abstract: The desert bighorn sheep (*Ovis canadensis mexicana*) is one of the most valuable faunal resources in Mexico. This species historically cohabited with the Seri Indian community in Sonora. The Seri own 90,000 hectares in mainland coastal Sonora and Tiburon Island where one of the largest desert bighorn sheep populations is found. This population was introduced to the island 24 years ago as strategic transplant stock to recover their natural ranges, such as in Chihuahua, Coahuila and Nuevo Leon, from which the bighorns disappeared during the second half of the 20th century. In 1996, we started working on Tiburon Island with the Seri community to establish a program for conservation and sustainable harvest. The sheep population of the island has grown to an estimated 650 sheep. The island is also inhabited by an endemic subspecies of mule deer. We are quantifying the use of the succulent vegetation in the flats and in the mountains, examining the diet overlap between both ungulates, learning about the sheep's movements around the island, and evaluating its carrying capacity. The Island has already served to establish nine other bighorn sheep populations since 1995 in mainland Sonora, and this year is when the reintroduction to Chihuahua and Coahuila will take place.

Last year, the Tiburon Island program was finally able to support itself due to the auction sale of two ram hunting permits. This allowed the community to start public works in the Seri Indian settlement, and to continue with the research projects. The Tiburon Island population is not only important from a social perspective, but is also a unique research and conservation model, paying for itself based upon a solid research and management program.

First, I would like to thank the Desert Bighorn Council Ewes as well as the conference organizers for helping me with a grant to attend this conference. Without that, I wouldn't be able to be here.

Before describing the management plan we are using on Tiburon Island, I would like to tell you about myself. My name is Fernando Colchero, and I am doing my bachelor's thesis on Tiburon Island. I'm a student at the Ecology Institute of the National Autonomous University of Mexico. We have been working on the island with Ray Lee, the

Mexican government, and also with a grant from the university.

In discussing the biological situation in Mexico, perhaps some of you know Mexico has been classified as a megadiverse country. That means we have one of the highest species richness in the world. Mexico has between 10 and 15 percent of the species in the world. One explanation suggests we have two biogeographic regions in our area: the neo arctic and neo tropical regions. We also have complex topography features which result in a variety of different biomes and weather conditions.

Like almost every third world country, and maybe all the countries in the world, we are facing a loss in biodiversity caused by desertification, agricultural development, exotic species introductions, illegal hunting, and habitat loss caused by human growth expansion. The national parks and the reserves are not very efficient in species conservation. We think it's because they don't try to relate the work in the reserves to the local people living in the areas. We think we have about five thousand threatened or endangered plant and animal species.

I'm not going to talk to you about the whole legal history of how the government has faced this problem, but in 1994, the government created the SEMARNAP, under the general direction of the National Resource Secretary and the National Ecology Institute. The general guidance comes from some conservation biology researchers at the university and the rural productive diversification program. The national program includes both wildlife conservation and economical problems with the rural sector of our country.

The strategy for reaching the rural sector included creating the UMA, a system to manage the wildlife conservation units. This allows the people to say to the government "I have some natural resources I want to develop. I tell you which are the resources and how I want to manage them, and you give me the permission to do it."

Management of big game animals has been easier than with other kinds of species, but now the people are starting to be more interested in managing their own resources to have some economic profit.

Tiburon Island was declared as a UMA in 1996. Tiburon Island is off the coast of Sonora in the Gulf of California. It has two mountain ranges, the Sierra Kun-Kaak and the Sierra Menor, which run from north to south.

Before talking to you about the sheep, I will tell you about the history of the island. The Seri people

were the original settlers. They've had problems with the government, and some wars with the government, to maintain the island as their own.

In 1975, the Mexican government declared Tiburon Island as property of the Seri people and have since allowed the Seri people to manage the natural resources of the island.

In 1996, the government declared the island as a national reserve, and that's why right now there's nobody living on the island. There is just a military camp in front of the mainland. In 1975, 20 bighorn sheep were introduced into the island. Two rams and two ewes died during the process, so the initial population was 16 animals. We have calculated, with Ray Lee's help, that right now we have about 650 animals.

In 1997, we developed a management plan to work with the bighorn sheep with an idea of trying to work further with other species. The main goal was to develop a management plan to conserve the Mexican sub-species in Mexico as a resource. From which the rural people would generate economic profit.

The particular objectives are: First, we want to maintain a healthy sheep population on the island. We have some research programs designed to help us to do that.

Second, we want to maintain a balanced ecological relationship between the big-horn sheep population and the native animals. We don't consider the bighorn sheep population as an exotic one, although no fossil records of bighorn sheep on the island have been found. The habitat is just the same as on the mainland. It's surrounded by desert with a very good vegetation cover.

Third, we want to establish and maintain a harvest program. We have already established a harvest program to support the research financially and to allow the community begin sustainable development based on the sheep resource.

Finally, we want to put new populations in the historical ranges of the bighorn sheep. Right now we don't have any bighorn sheep in the Chihuahua, Coahuila, or Sonoran parts of the Occidental range in Mexico.

The helicopter surveys we do are not research projects, but they give us enough data to transplant bighorn sheep into the other areas. We're starting to do demographic analysis of the population with the data that we have collected from the helicopter surveys.

We are going to start a habitat use research project. We want to know exactly how the sheep are moving on the island and what are the reasons for that kind of movement.

We must also consider a genetic analysis of the population. As I told you, the initial population was 16 animals. We now have 650 animals, so maybe we need to plan some management strategies to avoid in-breeding problems.

We are also doing infectious diseases analysis. We may use this information to determine if there is some disease in compatibility between the bighorn sheep on the island and those outside of the island.

We also want to know what the real impact of the bighorn sheep on the island is on mule deer and other wildlife species and plant species.

We don't know the exact mule deer population size, but we feel that the population is declining. We don't know if it's because of the bighorn sheep or because of other factors.

We also have coyotes on the island although we have not yet made a survey of them. We think the coyote population is increasing because of bighorn sheep and mule deer. We want to do a fecal analysis of coyote scats to know if they're really hunting lambs of bighorn sheep or what their prey species are.

Our management strategies are tied to the hunting harvest. We had two hunters for the last season on the island. The price of the permits were very, very high, so that allows us to continue with the research work. For the next season, we have two other hunters with permits for hunting. They have already auctioned the permits.

About 150 animals have been captured on the island and translocated to the Sonora mainland. Right now, we want to try to translocate sheep to Chihuahua and Coahuila, rather than to the Sonora mainland. There are too many from the island on the Sonora mainland already.

As an additional activity, we are qualifying a team selected from the Seri community to work as field technicians to collect data and to understand some basics of the biology of the animal, the basics of population ecology, and the use of GPS and optical equipment to collect data.

As far as financial support, we started with CEMEX, one of the largest industries in Mexico who helped us during 1996 and 1997. That allowed us to collect enough data to propose a hunting harvest plan for the island. Since 1998, we have been working with the money collected from the auction of the two permits.

I want to talk a little bit about this because the money goes to the Fele Commission. That is a bank account for the Seri and they can move the money as a community. I think they have to have about 300 signatures before moving the money from the Fele Commission, so no one is allowed to move the money himself and keep some of it.

Advances we have made so far include helicopter surveys since 1996. We have three years of data which helped us to do the demographics. We have the hunting harvest rates. We have transplantation. We have samples from the DNA taken from the captures to do the DNA analysis and we have pathological samples. We have a team already working on the island and we are developing

another team to work on the mainland, because the Seri also own a big part of the mainland.

As to the relationship between the bighorn sheep and the other species, we have one student from the national university who worked for two years collecting fecal samples from bighorn sheep, mule deer and jackrabbit on the island, to compare the diets and to compare the areas where they are living or sharing.

This is one of the first wildlife management based efforts to do sustainable development in Mexico. This effort is one of the most important projects of sustainable development and conservation in a country where we have 56 percent poverty. For me, it's the kind of project that we must implement to have conservation programs and to allow the people to work with those conservation programs.

QUESTIONS, ANSWERS AND COMMENTS - FERNANDO COLCHERO PRESENTATION

ERIC ROMINGER, NEW MEXICO: I was wondering, Fernando, what percent of that island do you feel is being used by bighorn sheep at this time, at that population level of 600?

COLCHERO: From a map of the Sierra, we know they are moving between 200 meters and 600 meters of altitude, so measuring, we think they're using about 40 percent of the whole territory in the island.

DALE TOWEILL, IDAHO: Are sheep moving between the two Sierras?

COLCHERO: We think they may be. We have seen some tracks and we have seen sheep walking. We have seen tracks in areas that we have reason to believe relates to the Sierras. We have seen tracks in the south part of the Sierra Menor, that's the Eastern Sierra. It seems that the oldest rams go there during the breeding seasons, so we feel it's one population, not just small populations on the island. But we have to do the habitat project, and some telemetry would be very useful.

WALT VAN DYKE, OREGON: How much hunting do the native people, the Seri people, do of deer and bighorn and is it regulated at all?

COLCHERO: We don't actually know. They can do whatever they want, because they are the owners. But right now, they realize that it's better to maintain the populations to have a hunting harvest and to have more money. I don't know what the numbers were, but there was a lot of hunting. It's traditional use to hunt mule deer, and they use traditional techniques to do it. Right now they are realizing maybe it's not such a good idea to do that.

PHIL HEDRICK, ARIZONA: So you said there were 20 animals originally? Was it four males and 16 females?

COLCHERO: That's it, but only 16 sheep successfully relocated.

HEDRICK: And that's the only group that was put on the island, is that true, or were there more transplants?

COLCHERO: No. That's the only transplanting.

HEDRICK: Those came from?

COLCHERO: The mainland.

BILL WISHART, ALBERTA: Have you calculated that rate of increase?

COLCHERO: No. We are doing that. But what we have seen right now is that the population has maintained the numbers during the last three years of surveys. So maybe we are getting to the capacity of the island. We don't know, actually.

WISHART: It's probably very close to 26 or 25 percent. It would be about 20 percent, if you level it off.

COLCHERO: We don't know the rate yet.

WISHART: It's a classic. It's critical.

JERRY CHURCH, NEBRASKA: I was wondering if there is domestic livestock on the island?

COLCHERO: No, there is not. All the species are wildlife species.

CHURCH: Is there any discussion about eliminating sheep from the island, given it's now a bioreserve?

COLCHERO: The bighorn sheep? No, not at all. I think it's the biggest population we have in Mexico. It would be a mistake to remove the animals.

RACHELLE HUDDLESTON-LORTON, NEW MEXICO: I was wondering, are there any predators on the island?

COLCHERO: We just have coyotes. We don't have bobcat or lions.

KRISTIN LEGG, MONTANA: I was wondering, the hunting permits that were sold, are they given out to foreigners?

COLCHERO: Yes. All the sales have been done through FNAWS at its Reno convention for people from here. They pay more than the Mexican people. We are planning to do a lottery for Mexican hunters, because they also want to hunt there.

LEGG: When the foreigners come, then, are there guides from the island?

COLCHERO: Yes. The team that we worked with on the island to collect data, also work with us during the hunting as guides. They know the island better than anybody, so they have to reinforce their knowledge about the animals and about organizing hunting. They are very proud people, and they are learning, too.