THE STATUS AND DISTRIBUTION OF RIVER OTTERS (Lutra longicaudis annectens Major, 1897), IN MEXICO

Juan Pablo Gallo

Abstract

In Mexico, there are three otter species, two of them riverine and one marine. The Sea Otter *Enhydra lutris nereis* (MERRIAM 1904) is, by several authors, considered to be extinct. Some animals are left in Cedros Island and in the Sebastian Vizcaino Bay area in the Pacific Coast of Baja California. The North American River Otter *Lutra canadensis* has two subspecies in Mexico, *Lutra canadensis sonorae* (RHOADS 1898), in Northwestern Mexico and *Lutra canadensis lataxina* (CUVIER 1823), in Northeastern Mexico. The Neotropical Otter, *Lutra longicaudis annectens* (MAJOR 1897), is the most abundant otter in Mexico, and is found in almost all the major rivers as well as in the rivers of the coastal plains, effluents, creeks, lakes, dams, lagoons, ponds, mangrove swamps, coastal lagoons and certain shores of Quintana Roo State. This species is well adapted to a variety of habitats, from the arid regions to the jungles, and from high mountains (1,700 m) to sea level areas.

Otter populations have declined in medium sized rivers affected by industrial and urban pollution; and also by the killing of crustaceans and fish species that make the bulk of their diet. The ancient fishing methods like the poisoning of the rivers are frequent and cause mass killings of fish and crayfish. Other fishing methods include small amounts of TNT, which now, however, is rare and forbidden.

The opening of new land for agriculture is a threatening factor for otters, because the former water level is being reduced by the heavy extraction of water for irrigation or by the damming of effluents. The ancient system of agriculture of slash and burn of the tropical forest is leaving areas around rivers without vegetation cover, causes erosion, increases soil deposition in the river bed and also increases the evaporation rate, thus drastically changing the habitat.

River otters are endargered in Mexico. Although, there are several localities, such as perennial rivers and creeks of the tropical Sierras, which still have the original vegetation and well marked rainy seasons. These are the most stable habitats. These places are proposed for the conservation of river otters.

1. Introduction

Otters in Mexico are poorly known animals for most zoologists, but were very well known by the ancient Aztecs and Mayan people. The VIII. Aztec Emperor (1486-1502) was given the popular name of the river otter in Aztec language, "Ahuizotl", meaning "the spiny one"; this name being synonymous with the cruelty that characterized the Emperor (LANDA 1984). The symbol of this ruler was immortalized by a carved stone with the figure of a river otter. In Mayan language the otter was called "Tzulà", meaning "dog from water". From the conquest of Mexico to the present day otters are known as "Perro de agua" (water dog), or "Nutria de rio" (GALLO 1986).

The ecological interest of this research was to find out the present status and distribution of river otters in Mexico with notes on reproduction, diet and habitat preference in tropical ecosystems. No otter studies have been carried out in Mexico except those of GALLO (1986, 1989) and POLECHLA et al. (1987); new records plus the records available in the literature are presented herein.

2. Methods

For the present study, data was obtained by carrying out interviews with fishermen, peasants, hunters, water pumping stations personnel and dams flow control personnel. These interviews showed the degree of knowledge of these animals, presence, use of local names, food composition, status as well as some aspects of their behaviour.

Several thousand kilometres were travelled by rough roads, horseback and on foot to get to the rivers to search for the presence of otters. Once in a location, the river was walked up and downstream looking for tracks and sprainting sites; food remains were collected. Tracks were followed and their activity described. Dens were photographed and described. Food items were separated following GREER (1955), MELQUIST and HORNOCKER (1983). A reference collection was done.

3. Results

3.1 Otter species present in Mexico

The sea otter *Enhydra lutris nereis* (MERRIAM 1904),

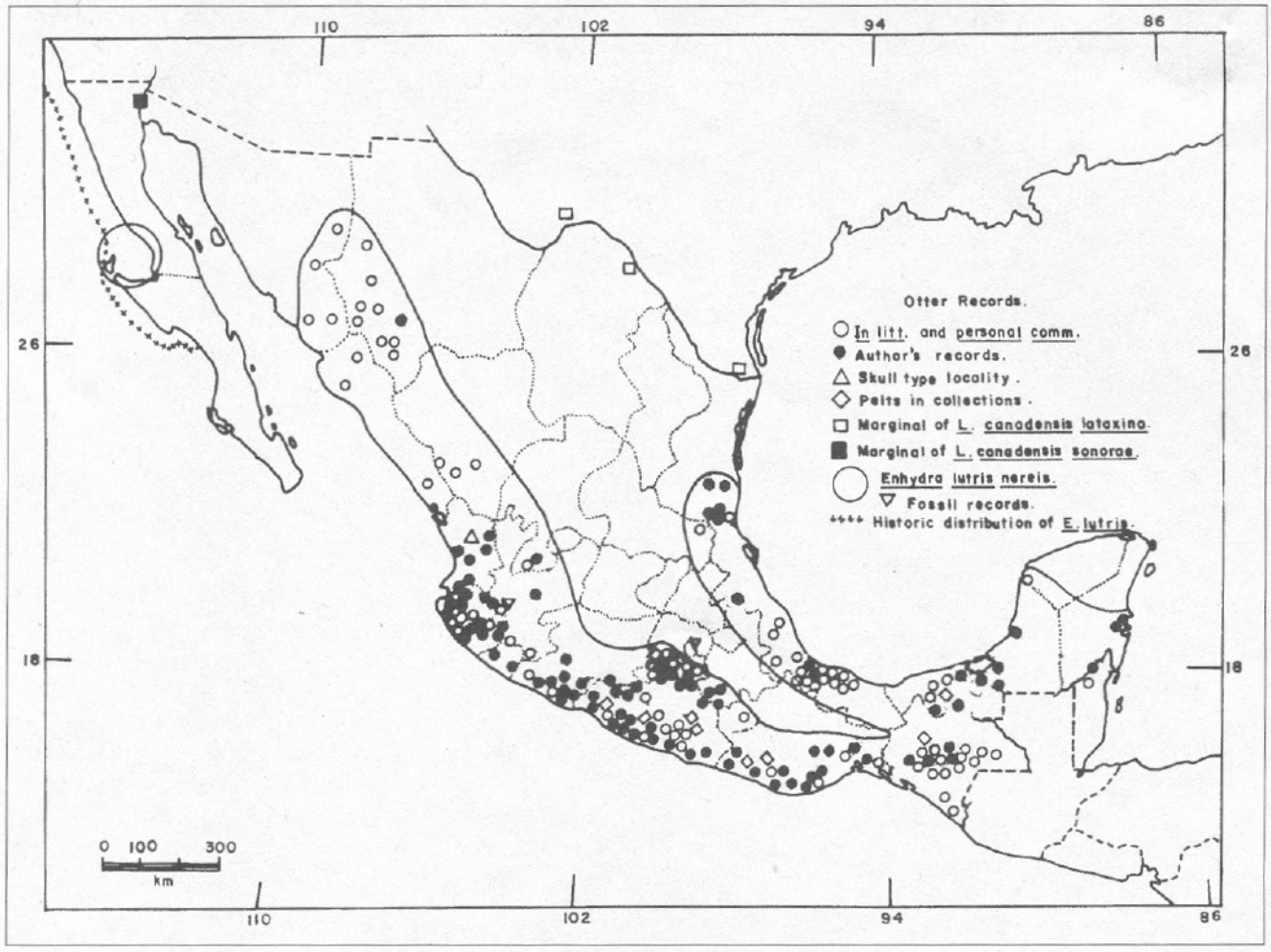

Figure 1: Distribution of *Lutra longicaudis annectens* in Mexico (modified from GALLO 1989).

is considered by several authors as an extinct species (DIGUET 1912; KENYON 1969; DUPLAIX-HALL 1972). The overexploitation by fur traders early this century (1918), and subsequently, the heavy competition with abalone fishermen put this species in such a fragile situation. Only several animals are left in Cedros Island and in the Sebastian Vizcaino Bay area (Figure 1). In 1979, a skull of a young otter was shown to me in Pueblo Nuevo (Baja California State) by abalone and lobster fishermen, they said "the old man from the sea eats what we fish". This sea otter was killed in 1977 with an oar.

The North American River Otter *Lutra canadensis* has two subspecies in Mexico, *Lutra canadensis sonorael* (RHOADS 1898), in Northwestern Mexico and *Lutra canadensis lataxina* (CUVIER 1823), in Northeastern Mexico. From this subspecies I have a new record from the Mexican side of the Bravo River (Figure 1).

The Neotropical Otter *Lutra longicaudis annectens* (MAJOR 1897), is the most abundant otter in Mexico. This species is found in almost all the major rivers as well as the rivers of the coastal plains (Figure 1). This species is larger in body size than *L. canadensis* (940-1300 mm to 915-1270 mm), with a record of 1620 mm (26 kg) from Guerrero State.

3.2 Distribution

The distribution of otters in Mexico is difficult to draw, because there are some boundaries between species and subspecies that are still unclear. As an example, the northern limits of *L. l. annectens* with *L. c. lataxina* and *L. c. sonorael*, are believed to be the direction of the river flux, those rivers whose waters flow to the Rio Grande or Bravo River, either, being in the U.S. territory or in Mexican territory, and those rivers flowing to the Colorado river, either, U.S. territory or Mexican territory. Several authors mention that *L. c. lataxina* exists in the U.S. at 25°N in Florida, proposing this to be the southern limit of the species (HARRIS 1968; TOWEILL and TABOR 1984). This, however, is not the case in Texas due to the presence of this subspecies in the Rio Grande River, specifically at Brownsville (HALL 1981), border line with Mexico, but the same authors have omitted the presence of otters in the Rio Grande River affluents on the Mexican side. I have found that *L. l. annectens* is present in the State of Tamaulipas (Gulf of Mexico slope) close to the Bravo River (26°N); this record was obtained from a skin. It was evident that the species was a Neotropical Otter due to the tricuspid shape of the rhinarium instead of the oblique shape presented by North American River Otters. On the other

side, the northern species seems to inhabit the same habitat as the Mexican beaver (*Castor canadensis mexicanus*), but only in the affluents of the Bravo River (BERNAL 1978).

There is only one record of *L. c. sonorael* in Mexico from the Colorado River (LEOPOLD 1959), several other records are from the border localities between Mexico and the U.S. (Gila River, Arizona-New-Mexico with Sonorael line) (HALL 1981). *L.l. annectens* has been found in very northerly habitats (Moctezuma River, 30°N) (ANDERSON 1972), with the characteristic that all rivers where they were found flow to the south. The direction of flow is an important ecological barrier that separates both species and explains the northern reach of the Neotropical Otter on the Pacific slope.

Neotropical Otters in Mexico have a broad distribution (Figure 1), inhabiting both coastal plains (excluding the desert ones), major rivers, affluents, creeks, lakes, dams, lagoons, ponds, mangrove swamps, coastal lagoons, and the shore of Quintana Roo State. They are also found in irrigation ditches or in desertcrossing rivers. The Neotropical Otter is well adapted to a variety of habitats, from those in arid regions to jungle ones, and from high mountain (1,700 m) to sea level areas.

3.3 Status

The Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) treaty listed the Neotropical Otter on Appendix I, as an endagered species (U.S. Fish and Wildlife Service, 1977 in: POLECHLA et al. 1987). Since then knowledge of this species has grown steadily. I have found that otter populations have declined in medium sized rivers affected by industrial wastes, sugar cane mills, mining wastes, intensive irrigation and heavily polluting city wastes. This seems to be due to the killing of crustaceans (crayfish and crabs) as well as the original fish fauna of catfish (*Ictalurus sp.*), mullet (*Astyanax fasciatus*) and trout (*Agonostnomus monticola*). There is some evidence that in those rivers in which cyclid fish like *Tilapia nilotica* and cyprinid fish such as *Cyprinus carpio* have been introduced, river otters could scarcely survive without resorting to waterfowl and stealing chickens from nearby ranches (GALLO 1986, 1989).

The opening of new land for agriculture is a threatening factor for otters, because the former water level is being reduced by the heavy extraction of water for irrigation or by the daming of affluents of some rivers to provide fresh water to an ever increasing urban area. The ancient system of agriculture that consists in burning the tropical forest is leaving areas around rivers without vegetation cover, causing large quantities of suspended solids in the water, increasing soil deposition in the river bed and also increasing the evaporation rate, thus changing the habitat drastically (GALLO 1989).

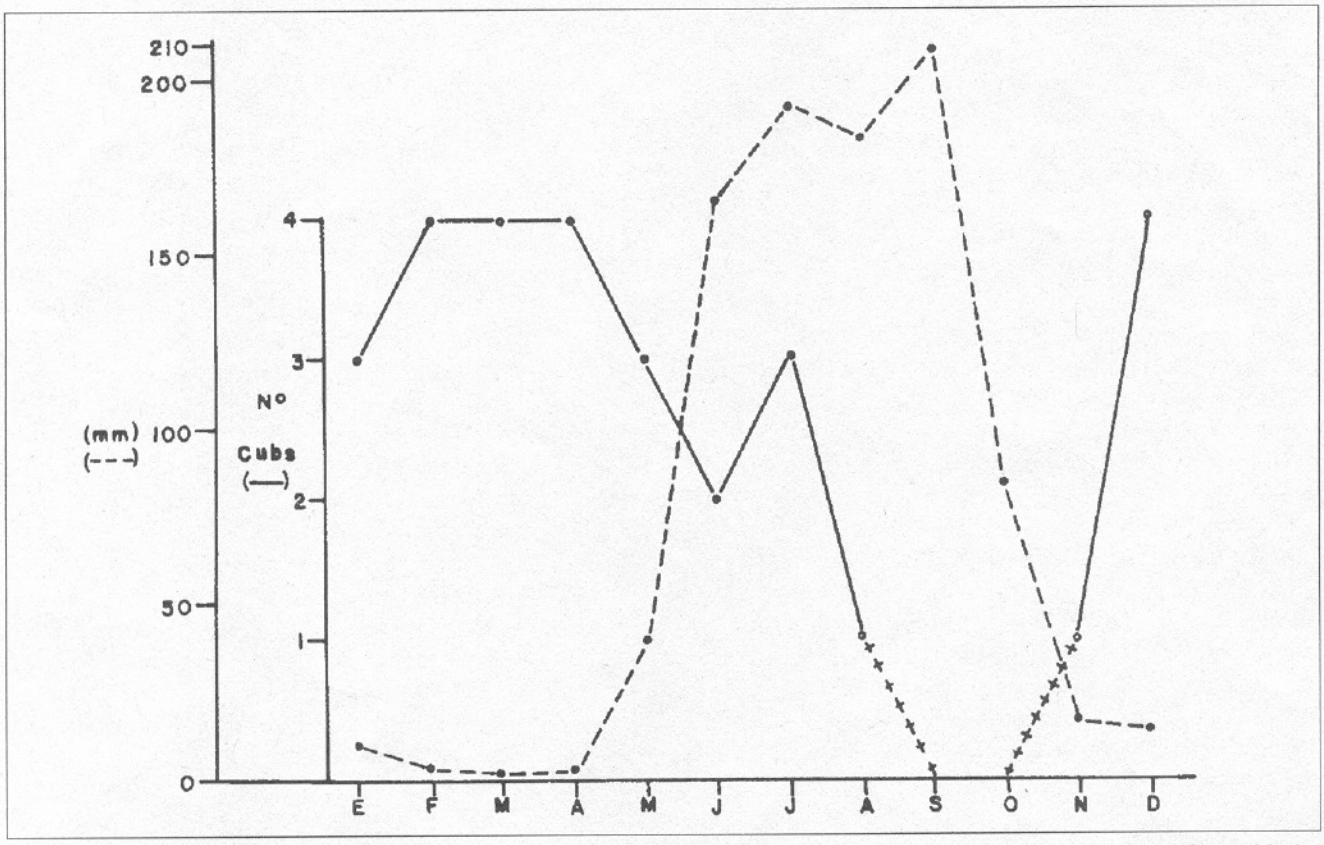

Figure 2: Relationship between the rainy season with the number of cubs of *Lutra longicandis* observed in the Sierra Madre del Sur. Mean rainfall is 84.25 mm, (800 to 1600 yearly). Climate type is AW (GALLO 1989).

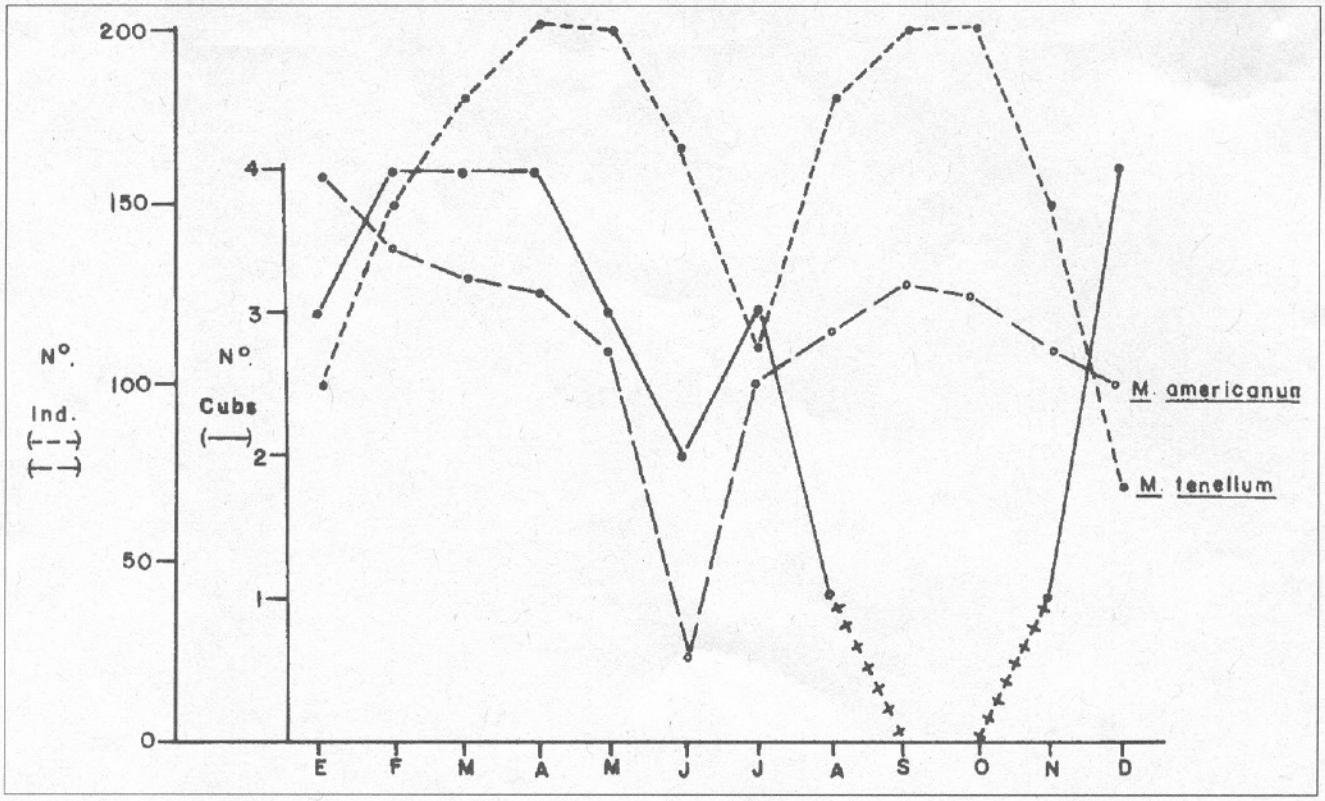

Figure 3: Abundance of *Macrobrachium* species related to the number of cubs of *Lutra longicandis* observed in Sierra Madre del Sur (GALLO 1989).

The ancient fishing methods like the poisoning of the rivers with plants that have *Rotenona* are still frequent. This causes mass killings of fish and crayfish so that they are easily picked up by hand. Other methods include small amounts of TNT, which can blow up the contents of an entire pond including larval stages. Fortunately this practice has been unproductive for the peasants themselves and now is a rare fishing method. The least used but very deadly is the use of small amounts of quicklime that burns the animals alive even in deep ponds. This method is productive but it is very expensive to get quicklime in these isolated regions.

Industrial wastes chiefly contain lead, aluminium and zinc, in quantities more than three times the amount permitted for good quality water. The levels of organochlorine pesticides and their metabolites have not yet been studied in any major river in Mexico, but could certainly become a major pollutant of river ecosystems due to their intensive and extensive use in agriculture. Oils and other chemicals like soda are also spilled in rivers by refining plants and sugar cane mills.

3.4 Reproduction

Neotropical Otters do not show a clear reproductive season, they are capable of reproducing at any time of the year. This is true for the populations inhabiting major rivers and perennial medium sized rivers of the coastal plains of the Gulf of Mexico slope, where food is abundant all year round. Otters that inhabit the mountains of the Pacific slope have a well marked reproductive season that takes place in winter, due to the concentration of prey species like crayfish, crabs and fish in large river ponds, were they also reproduce and feed. In the Sierra Madre del Sur the dry season lasts for six months, from November to May, and in this time the cubs learn to swim, acquire their own food and grow to adult size. It seems that this strategy avoids the storms of the rainy seasons in which the rivers become torrents growing from 2 to 5 meters in depth. If the cubs were born in this season, many of them would drown. The abundance of food items is diminished during the rainy season due to the migration and re-distribution of some of the prey species (GALLO 1989) (Figures 2 and 3).

The presence of crayfish in the rivers during the dry season determines in some extent the distribution of NeotropicalOtters. The distribution of river otters in Mexico have the same distribution as *Macrobrachium* species (GALLO 1989) (see Figure 4), it only changes in Quintana Roo State, where river otters do not follow the distribution of crayfish.

3.5 Feeding habits

The diet seems to change according to the kind of river the otter inhabits, feeding mostly on crustaceans in the heavily forested tropical rivers, on fish in the arid zones and on crustaceans, fish and waterfowl in major rivers. In the Sierra Madre del Sur and localities of Tabasco State and Tamaulipas State, I have found that

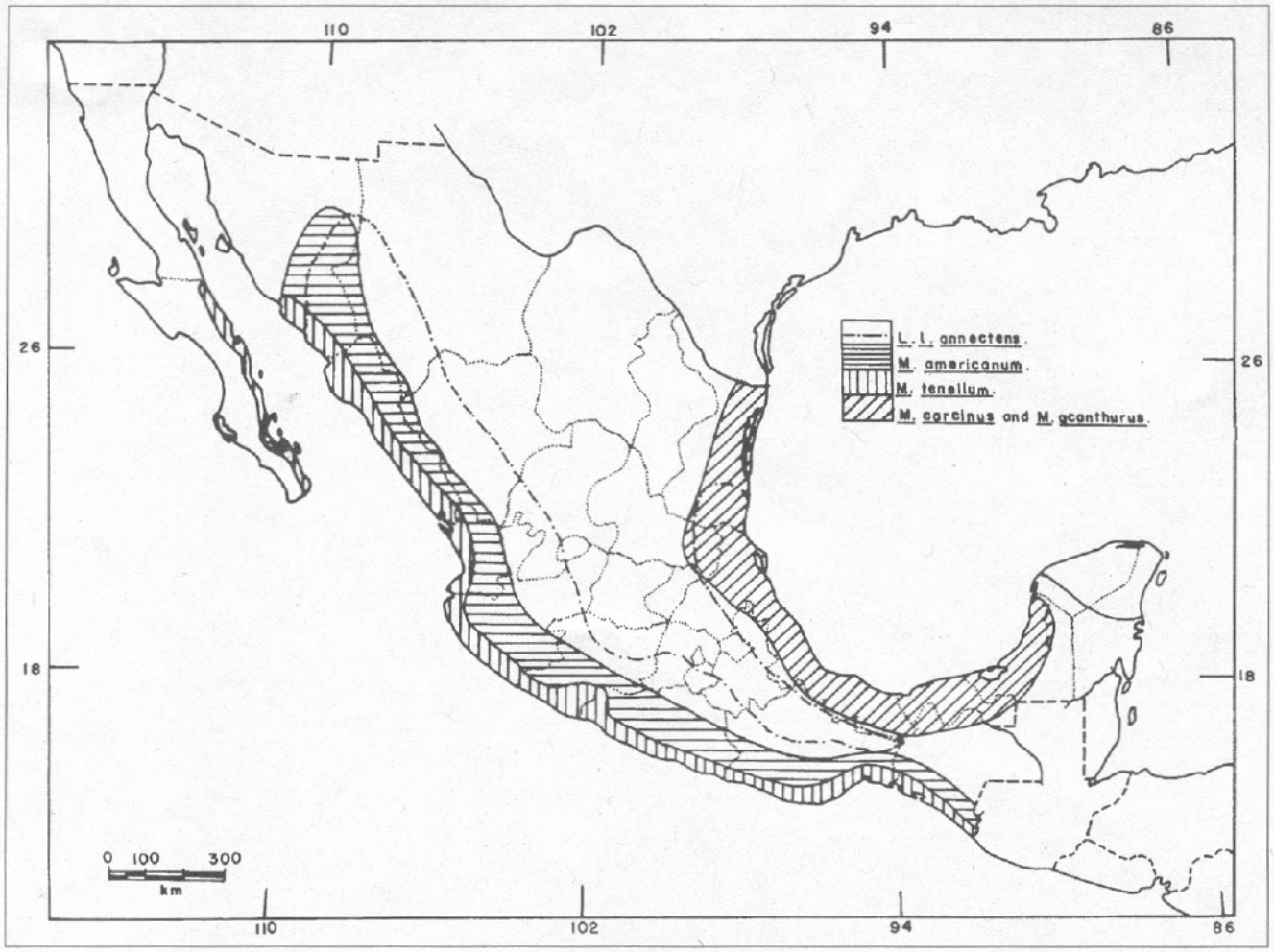

Figure 4: Distribution of *Lutra longicaudis annectens* and crayfish (*Macrobrachium* sp.), (from GALLO 1989).

Neotropical Otters feed on crustaceans and fish: crayfish (*Macrobrachium americanum, M. tenellum, M. acanthurus* and *M. carcinus*), river crabs (*Pseudothelphusa spp.*), river shrimp (*Atya ortmanioides, A. innocous and A. margaritacea*), blue crabs (*Callinectes sapidus*), and crabs of the *genera Uca*; of the fishes, otters take trout (*Agonostomus monticola*), river mullet (*Astyanax fasciatus*), catfish (*Ictalurus sp.*), guavina (*Gobiomorus dormitator* and *Dormitator maculatus*), sucklers (*Awaous transandeanus*), and introduced fish like trout (*Salmo gairdneri*), carp (*Cyprinus carpio*), tilapia (*Tilapia nilotica*), mojarra (*Cichlasoma sp.*) as well as wild duck, cormorants (*Phalacrocorax spp.*), river birds (*Pipilo ocai* and *Sayornis nigricans*), hen (*Gallus domesticus*), mice (*Neotoma sp.*), squirrels (*Spermophilus mexicanus*), raccon (*Procyon lotor*), lizards, iguanas (*Ctenosaura pectinata*), frogs (*Pachymedusa dacnicolor, Smilisca baudini, Rana sp.,* and *Hyla sp.*), toads (*Bufo marinus horribilis*), aquatic serpents like tilcuates (*Drymarchon corais*), and aquatic insects. Major feeding activities are found during afternoon and night, but I have also witnessed feeding activities during the day (GALLO 1986, 1989).

3.6 Conservation

The perennial rivers and creeks of the tropical Sierras with their original vegetation and well marked rainy seasons are the most stable habitats for otters due to their great diversity in food items, den facilities, water quality, reduced to little extraction of water for irrigation, few cattle activities, very small urban areas and little discharge of pollutants (detergents). The exception is the washing of pesticide tanks used in the combat of malaria by the Ministry of Health personnel. This practice is prohibited but there are no regulations or instructions to show users how dangerous this pesticide is. In the Pinela River in the State of Guerrero these kinds of accidents happened with the result of a massive destruction of river life. It can take more than two years for the ecosystem to get established again. River otters have learnt to avoid human presence by becoming shy, since in several towns they are hunted for food or for fur. Raw otter skins can be sold at $ 35,000.00 pesos or U.S. $ 14, representing a substantial income to a peasant family. Several interviewed people said that no otters were left in their rivers, but when I walked along the river, I found tracks, dens and sprainting sites.

Unfortunately, the protected areas in Mexico represent a very small portion of the country. The creation of new national parks and natural reserves is a new process that will be of major importance for otter protection, but this process suffers from the lack of legal initiatives for the protected areas. The federal Hunting Law forbids the hunting or trapping of river otters during any season of the year and in all states of the Republic, with a penalty of $ 1,000,000.00 (pesos) for each animal killed. Unfortunately there are no efficient ways of enforcing the law in thousands of rivers close to towns in which river otters are present.

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Juan Pablo Gallo
273 Applied Sciences Buildg.
University of California
Santa Cruz
CA 95064
USA

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ERRATA

Page 57. In the Introduction, first paragraph at the end says: **"The VIII. Aztec..."**, should say: **"The VIII Aztec..."**. Second paragraph at the end says: **"herein."**, should say: **"here."**

Page 58. Second paragraph, line 2, says: **"canadensis sonoraeI"**, should say: **"canadensis sonorae"**. Fourth paragraph, line 5, says: **"L. c. sonoraeI"**, should say: **"L. c. sonorae"**.

Page 59. Second paragraph, line 1, says: **"L. c. sonoraeI"**, should say: **"L. c. sonorae"**. Line 5, says: **"SonoraeI line"**, should say: **"Sonora line"**. Fourth paragraph, line 13, says: **"Agonostnomus monticola"**, should say: **"Agonostomus monticola"**. In the Figure caption, line 1, says: **"Lutra longicandis"**, should say: **"Lutra longicaudis"**.

Page 60. In the Figure caption, line 1, says: **"Lutra longicandis"**, should say: **"Lutra longicaudis"**.

Page 61. Second paragraph, line 19, says: **"U.S. $ 14,"**, should say: **"U.S. $ 14.00,"**.

Page 62. In references, right column, line 3, says: **"(Lutra longicaudias..."**, should say: **(Lutra longicaudis..."**.

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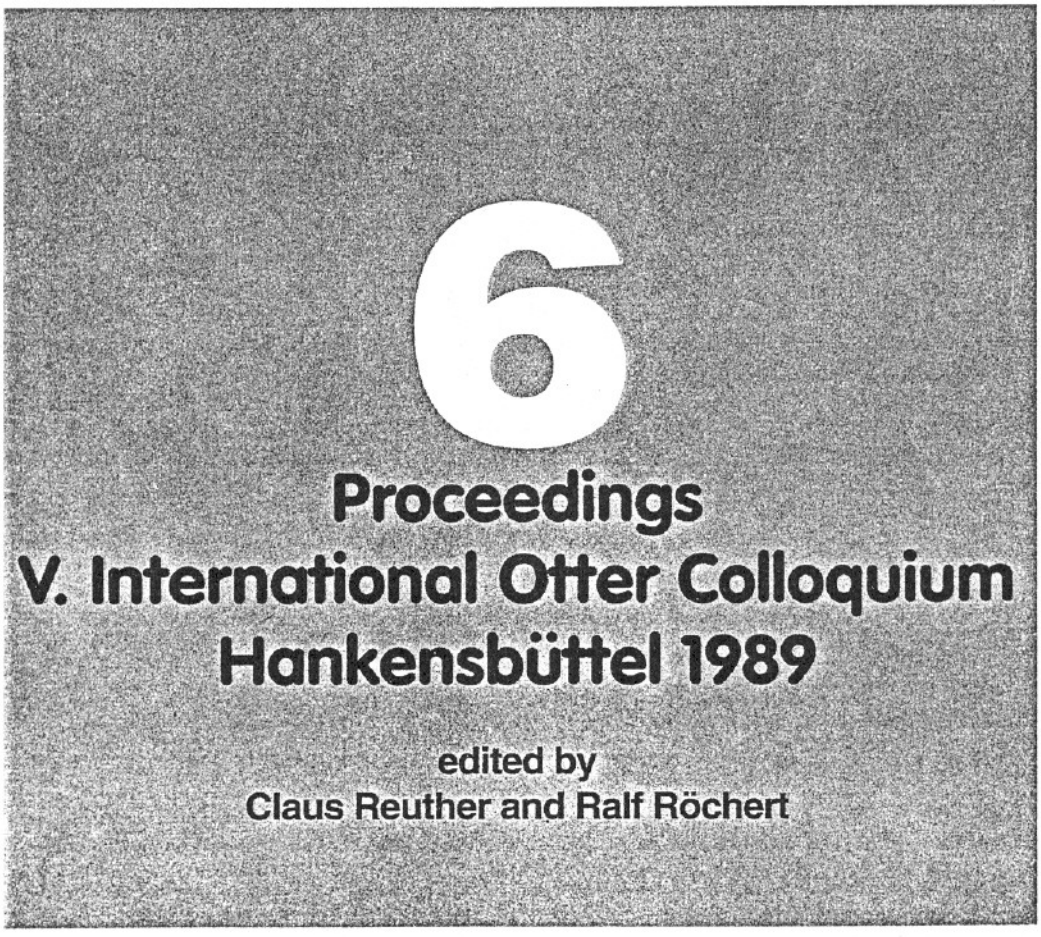

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