

## Project Update: October 2013

The project has shown thus far that the physiology of the neotropical otter can be affected by human activities. This is in those sites where the human activity is more intense, fecal cortisol levels are higher. This result is related to the overexploitation of otter prey during the dry season. In La Antigua River, shrimp and crayfish fishing is developed by an important part of the population, and its effect reflects in our results. It appears that otters are experiencing chronic stress in its habitat, mainly during the dry season. We have not found a



positive relationship between fecal cortisol levels and the degree of transformation of vegetation probably because the otter mainly uses the river which is its way to escape from threatening situations. We did not record a reduction in prey availability but our indirect parameter (number of pools in the river) may not be an accurate measurement.



We quantified the concentrations of organochlorine pesticides (OP) and PCBs bioaccumulated by the Neotropical otter *Lontra longicaudis* and the fish and crustacean species she consumes. We found that HCHs, DDTs and drines were the compound families that have the higher concentration in otter and its prey. HCH compounds have a restricted use in Mexico, and are used as insecticides or acaricides. Lindane belongs to this family, and is one of the most widely used pesticides

worldwide. It is known that lindane reduces the proportion of mating and litter size in mink. This is a sensitive species and it is also a mustelid as the otter is. Therefore it is possible that otter may experience the same problem. The DDTs and drines are compound families prohibited in Mexico but, because of their persistence in the environment, they can still be detected. The concentrations that we found are lower than the lethal limits for foxes, minks and river otters. However, the exposure to dieldrin has an effect on the adrenal glands and hence on the physiological response.

We have not found differences in HCH, drines and DDT concentration between upper, medium and lower zones within the river. This may be related to the fact that grasslands and crops are distributed heterogeneously along the river. Another explanation is that each compound has a different dispersion pattern from its source point.

Finally, we found that the drines and metoxichlor concentrations measured in the otter scats seem to explain fecal cortisol levels, suggesting that those compounds act as endocrine disruptors and potentially affect the physiological response of the otter, but the same could be taking place in other riparian species. It is necessary to make a detailed emphasis on what

may be happening to human populations of the study area, as they feed on fish and crustaceans as otters do.

The second phase of this project is being carried out. This section consists on working with local communities. We are asking them about the use they do of riverine resources, alerting them on the damage generated by OPs and PCBs, telling them about the conservation status of otter populations and offering them alternatives on the use of environment friendly pesticides.