

Environmental problems In Ayuquila

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Degradation of the Ayuquila–Armeria River is a complex problem caused by a variety of human activities that include water storage and diversion, channelization, irrigation, point and nonpoint–source pollution, sedimentation and changes in land use on the riparian area as well as the upper watershed. Of these activities, water storage diversion and point–source pollution discharges have had the most important ecological impacts on riparian ecosystems (Martinez, 2000).

Santana et al (1993) described the principal sources of pollution within the Ayuquila River and watershed as domestic wastewater and garbage from the cities of El Grullo, Autlan and other small towns; sugar cane industrial wastewater; and the residues of fertilizers and pesticides from agriculture. Water pollution effects on the Ayuquila River resources reported by local population include fish and crustaceans die–offs, reduction of species destined for human consumption, income reduction by loss of commercial fish species. Additional impact to natural resources had been the habitat degradation and the risk of extinction of local species. Public health impact to riparian population included gastrointestinal illness, skin and respiratory illnesses and lack of availability of water for domestic use by its color, taste and odor (Santana et al., 1993).

Pollution and habitat loss have degraded fish community integrity and fisheries values in the Ayuquila–Armeria river near Autlan and El Grullo (Navarro–Perez; Lyons and Navarro–Perez, 1990; Santana et al.,1993; Lyons et al.,1995). Whereas historically the river was known for a diverse and excellent fishery (Aguero, 1878), the segment the river from el Corcovado to El Aguacate now had a fish communities dominated by small species of limited value for food or commerce, and fish kills occurred regularly.

Alteration of the streamflow regime of the Ayuquila–Armeria has affected the geomorphic dynamic of the river, causing changes in channel geomorphology and affecting the aquatic habitat for fish and aquatic insects. The lacks of floods has caused changes in the channel capacity, resulting in narrow, deep rivel channel with a gentle slope. The lack of turbulence and transport of gravel and rocks has caused deposition of fine sediments producing a uniform, flat bed load that reduces the diversity of habitat for aquatic organisms. Reduction of the flow also increased the concentration of pollution by the lack of dilution of the organic matter discharge into the river.

References:

Lyons, J. y S. Navarro-Perez. 1990. Fishes of the Sierra de Manantlan, West-Central Mexico. *Southwestern Naturalist* 35(1): 32-46.

Navarro P., S., E., Santana C., J., Lyons y D., Schneider. 1990. La fauna acuática de la Reserva de la Biosfera, Sierra de Manantlan y su zona de influencia. Manuscrito inedito. LNLJ, Ude G. 25 p.

Santana-Castellón E., S. Navarro-Pérez y L.I. Iñiguez D. 1990. Utilización de la Fauna Silvestre por las comunidades rurales de la Reserva de la Biosfera de la Sierra de Manantlán. *Tiempos de Ciencia* 18: 36-43

Santana, E., S. Navarro, L.M. Martinez, A. Aguirre, P. Figueroa, C. Aguilar. 1993. Contaminación, aprovechamiento y conservación de los recursos acuáticos del río Ayuquila, Reserva de la Biosfera Sierra de Manantlan, Jalisco-Colima. *Tiempos de Ciencia* 30:29-38

Lyons, J., S. Navarro-Pérez, P. A. Cochran, E. Santana C., and M. Guzmán-Arroyo. 1995. Index of biotic integrity based on fish assemblages for the conservation of streams and rivers in west-central México. *Conservation Biology* 9:569-584.

Lyons, J., G. González-Hernandez, E. Soto-Galera y M. Guzmán A. 1998. Decline of freshwater fishes and fisheries in selected drainages of West Central México. *Fisheries* 23 (4): 10-18.

Martínez R., L.M., A. Carranza y M. García. 2000. Aquatic ecosystem pollution of the Ayuquila River, Sierra de Manantlán Biosphere Reserve, México. In: M. Munawar, S.G. Lawrence, I.F. Munawar and D.F. Malley (Ed.). *Aquatic Ecosystems of Mexico: Status and Scope*. Ecovision World Monograph Series. Backhuys Publishers, Leiden, The Netherlands. Páginas 165 - 181