



## STRATEGIES RELATED TO THE PROTECTION OF SITES WITH MEXICAN LIVEBEARING FISHES IN IMMINENT RISK OF EXTINCTION

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### ABSTRACT

As most countries, Mexico suffers from most of the environmental problems associated with unsustainable human development, such as resources overexploitation, pollution, and loss of biodiversity. It is not an exaggeration to state that aquatic ecosystems are possibly the most affected by human activity; thus rivers, lakes, lagoons, and seas receive a great quantity of contaminants from large cities, from industrial parks, and from livestock and agricultural activity. This had led to a situation where 26 freshwater fish species have been lost for Mexico, 15 extinct, five extinct in the wild and six that are now regionally extinct. Three of these correspond to livebearing species. With this in mind, a project was undertaken to identify Mexican freshwater fish species with imminent risk of extinction, based on the work of Ricketts *et al.* 2005 (here results for livebearing species are presented): criteria for choosing sites were as follows: (1) the site had to contain at least one endangered freshwater fish species, (2) the site had to be the sole area where the species currently occurs, and (3) the site had to have a definable boundary. All the information obtained was then processed using *Miradi*™ 3.3.2 (2011) planning software, by means of which a conceptual model was developed. The model integrates all the information including direct threats affecting sites that were drawn from the literature, using the classification of Salafsky *et al.* (2008). Based on this information result chains were then constructed in relation to each target, and from these, priority actions were identified. Results of the analyses produced a list of 15 livebearing species in imminent risk of extinction (10 Goodeidae and 5 Poeciliidae), that are distributed in 12 different sites along Mexico; 6 sites are considered as having no management or formal protection, three which are water parks, and three which have some type of protection. As a result of the conceptual model produced, four main threats were identified for the sites where species in imminent risk of extinction are distributed: (a) recreational activities, (b) water management/use, (c) water pollution and (d) invasive species. Based on these main threats 10 general conservation actions are proposed: (1) Raise awareness, (2) Establish legal protection, (3) Build public support, (3) Promote ecotourism, (4) Build capacity among civil servants, (5) Combat corruption (6) Develop visitor impact management strategies (7) Apply environmental flow criteria, (8) Ban invasives from critical sites, and (9) Eradicate invasives.