

Tag Archives: biodiversity

The imperiled fish fauna in the Nicaragua Canal Zone

Posted on April 10, 2017 by Alex Anstett

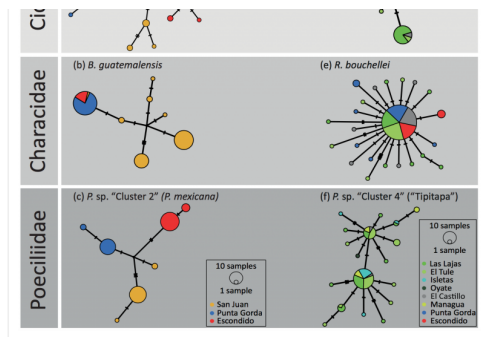
By Nicole Suren, SRC intern

Plans for a new canal through the isthmus of Nicaragua have just been approved by the Nicaraguan government with little to no restrictions on what preexisting waterways can be used as part of this potential new shipping route. The currently proposed route was planned based on economic and technical considerations, but ecological concerns were not factored into the planning, leading to a variety of potential ecological problems due to the construction of the canal. These ecological detriments include overexploitation of the environment, increased water pollution, water flow modification, destruction or degradation of habitat, and the establishment and spread of non-native species. The currently proposed route is of special concern because it not only passes through Lake Nicaragua, a freshwater ecosystem of very high socioeconomic importance, but also because it connects two currently isolated drainage basins, the San Juan drainage basin and the Punta Gorda drainage basin.



- Proposed route (solid line) and alternative routes (dashed lines) of the Nicaragua Canal. The 3 drainage basins involved are San Juan (red), Punta Gorda (blue), and Escondido (yellow). Fish-sampling locations are marked with open diamonds. (Härer et al. 2016)

This study was conducted in order to establish a baseline of biodiversity in the two potentially affected drainage basins, as well as the surrounding basins, so that changes in biodiversity due to the construction of the new canal can be accurately measured and compared against previous levels. The researchers measured biodiversity by taking surveys of the fish in each ecosystem in question with nets, and then sampling two species each from three families of fish that are common in the area. These samples were then used in a DNA analysis, where common sequences of DNA from each species were analyzed for differences. In general, the more similar the DNA sequences, the more closely connected two populations are, and the less similar the DNA sequences, the less closely connected the populations are. Based on the DNA analysis, “populations within the same basin showed almost no genetic differentiation, whereas comparisons across basins exhibited higher differentiation.” This means that populations of fish within the same drainage basin are very similar to each other, while they are quite different from fish in other, unconnected drainage basins. They also found that Punta Gorda and San Juan have 27 species in common, but they also have 24 and 31 species, respectively, that only occur in one basin.



- Diagrams showing connectivity between basins (A-C) and within different locations in the San Juan drainage basin (D-F). The sizes of the circles are proportional to the sample sizes, and the proximity of the circles to each other represent how closely connected they are genetically. (Härer et al. 2016)

Measures of biodiversity are important because they can be a direct indicator of how healthy an ecosystem is. In other words, a diverse ecosystem is a healthy ecosystem. Since the San Juan and Punta Gorda ecosystems contain populations that are so distinct from one another (which is one of the ways biodiversity is defined), the proposed connection between the two is potentially detrimental to the health of those environments because the physical barriers maintaining their diversity would be removed, thereby reducing their diversity and health. Because of these effects, the authors strongly recommend that the precautionary principle be used, and that a more ecologically sound route for the canal be chosen before starting construction.

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The Zoo Debate: Educators or Entertainers?

Posted on **September 24, 2014** by [Laura Vander Meiden](#)

Evidence for the Positive Contributions of Zoos and Aquariums to Aichi Biodiversity Target 1

By [Emily Rose Nelson](#), RJD Intern

The UN Strategic Plan for Biodiversity 2011-2020, adopted by the Convention on Biological Diversity in 2010, is a ten-year model aiming to protect biodiversity and the benefits it provides. The plan is essential in global efforts to halt and, optimistically, reverse the current loss of biodiversity. 20 target goals, known as the Aichi Biodiversity Targets, have been put in place with intent to increase value people put on biodiversity, maintain ecosystem services and support global action for a healthy planet. The first of these targets is as follows, " by 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably." Achieving such an ambitious goal as this will not be possible without work from zoos and aquariums.

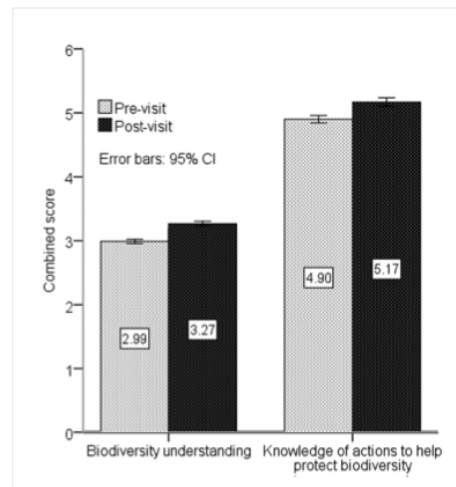


- The United Nations General Assembly has declared this the "Decade on Biodiversity."

themselves for entertainment and weaken messages of environmental education.

Moss and collaborators (2014) set out to evaluate the educational impacts of zoos and aquariums. 5,661 visitors to 26 zoos in 19 different countries all over the world were given the same open-ended surveys before and after their visit. Participants were asked to list up to five things that came to mind when they thought about biodiversity and list two actions they could take to help save animal species. Content analysis was used to provide quantitative data from these responses.

Results of the study showed that understanding of biodiversity and knowledge of actions to help protect biodiversity both significantly increased over the course of zoo and aquarium visits, providing evidence that zoos and aquariums are largely serving their role as educators as well as entertainers. The outcome shown by Moss et. al calls attention to the importance of zoos and aquariums in achieving Aichi Target 1.



- Both dependent variables, biodiversity understanding and knowledge of actions to protect biodiversity, show significant difference between surveys before and after visiting a zoo or aquarium.

However, an increase in knowledge regarding biodiversity is not necessarily an indicator of a related change in behavior to protect biodiversity. Zoos and aquariums face the challenging task of moving people to action. One way in which they are already doing this is providing people with a connection to nature. If one feels attached to something they are more likely to care about its conservation (Falk et al, 2007). Additionally, zoos and aquariums can play a part in pro-conservation action by advocating for policy changes that protect land and wildlife, targeting and providing alternatives to threatening social norms, and serving as a role model for their visitors and other institutions.

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