



SUSTAINABLE WATERS

Patuca River, Honduras

As developing countries search for energy sources to support their economic growth, hydropower is increasingly considered an attractive option. But the development of this hydropower potential has created new challenges – and opportunities – for scientists working to conserve the world’s freshwater ecosystems. In Honduras, the decision to build a hydropower dam on the Patuca River has fueled a collaborative effort between The Nature Conservancy and the national electric energy utility to promote the sustainable management of the river for the benefit of both nature and the indigenous communities that rely on this ecosystem.

Sustaining Ancient Traditions

Steeped in history and tradition, the free-flowing Patuca River begins in the mountains of central Honduras and travels eastward, crossing the remote Mosquito Coast before emptying into the Caribbean Sea near the Nicaraguan border. The second longest river in Central America, the Patuca traverses the largest undisturbed rainforest north of the Amazon and supports a multitude of indigenous communities that live along its banks, including the Tawahka, Pech and Miskito Indians.

For centuries, the river has been the lifeblood of the indigenous people, providing a bounty of fresh fish and drinking water, nourishing farmland and serving as the main transportation corridor for the region. The river and its floodplain support a spectacular array of biological diversity, including more than 300 plants used by the Tawahkas for medicinal purposes. The cultural identity of the

people along the Patuca is intimately intertwined with the river system, a valuable reminder of the intricate link between humankind and nature.

But traditions that have sustained generations are now under threat as plans for a hydropower dam are in motion. Led by the Empresa Nacional de Energía Eléctrica (ENEE), a government agency responsible for energy production, transmission and distribution, the Patuca-3 Hydropower Project will harness the energy of the river, creating a reservoir of impounded water that will generate electricity.

A River Runs Through It

To help protect the ecological integrity of the river system, The Nature Conservancy has entered into a unique agreement with ENEE. The Conservancy is providing guidance to ENEE on the design and implementation of a collaborative process involving scientific experts, water managers, and local residents to determine the specific flows required to support downstream ecosystem health and indigenous community needs. The recommendations will then influence the design of the dam and be incorporated into its management. The first step in the process was to learn more about the river system – the linkages between its ecology and hydrology – and the people who depend on it.

In August 2006, Nature Conservancy consultant and aquatic biologist Peter Esselman set out with a group of 11 researchers to learn more about the connections between the river’s flows and the species and natural communities it supports, as well as the relationship between indigenous

communities and the river system. Traveling in a 12-meter (40-foot) dugout canoe, Esselman and his crew motored 250 kilometers (155 miles) during 11 days, stopping at 11 riverside villages and conducting 16 interviews with individuals and small groups of fishermen.

Talking with community members gave Esselman a unique insight into the biological diversity of the river, including the importance of natural flow events to the health of the river's fishery and the culture of the local villages. The people along the river's banks rely on seasonal flows to support an abundance of fish, to nourish agricultural crops and to provide a navigable channel between neighboring communities. A dam, however, could disrupt the natural flows of the river, impacting the long-term survival of the Patuca's aquatic life, including the migration patterns and reproductive cycles of important fish species, as well as the cultural needs and traditions of the indigenous communities.

Developing Flow Recommendations

Using Esselman's findings and hydrological analyses, ENEE conducted an environmental flow workshop for the Patuca River in December 2006 in Tegucigalpa, Honduras. During the first day, speakers – including Esselman and staff from The Nature Conservancy – gave presentations on the ecology of the river, flow regimes and hydrological alterations, and a review of the trip to riverside villages. Later that day and the next, workshop participants composed mostly of agency and academic scientists, broke out into three smaller groups to develop environmental flow recommendations. Conservancy scientists used the Regime Prescription Tool, a specialized computer software program developed jointly by the U.S. Army Corps of Engineers and the Conservancy, to unify the recommendations of the three working groups.

The collective effort – hydrologic analysis, information gathered from the field trip, and the environmental flows workshop – generated a preliminary environmental flows recommendation that is now being augmented by additional research and indigenous community feedback.



A Model of Hydropower Management

The Nature Conservancy's work in Honduras and other developing countries is far from over. In fact, it's just beginning. The continued support of our members is essential if we are to safeguard the ecological health of the Patuca and the cultural traditions of its people.

Fortunately, The Nature Conservancy has been a welcome advisor to the Patuca-3 Hydropower Dam Project. If the ecological flow recommendations are successfully incorporated into the dam's design and management, the Patuca River will serve as a model for the future of sustainable hydropower operations throughout the world.

By honoring the ecological integrity of the river system and its relationship with the local communities, conservationists and hydrological engineers can work together to ensure a sustainable future for both people and the natural world.

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