

DOES THE MAYA FOREST NEED MORE ROADS?

Authors: Dalia Amor Conde¹, Victor Hugo Ramos², Irene Burgués³, Bayron Castellanos², Leonardo Fleck³, Carlos Albacete⁴, Piedad Espinoza⁴, Carlos Manterola⁵ and Gerardo Paiz⁶

An assortment of road projects has been proposed in the border region of Mexico, Guatemala and Belize, which is part of the Maya Forest, the largest contiguous tropical forest in the Americas north of the Amazon. The proposals are apparently aimed at spurring economic growth and reducing the high levels of poverty found in this area. But more and better roads usually bring more people and expand farms. Decision-makers are therefore confronted with a seeming conflict between conservation and development goals. Would new roads be bad or good for the Maya Forest region?

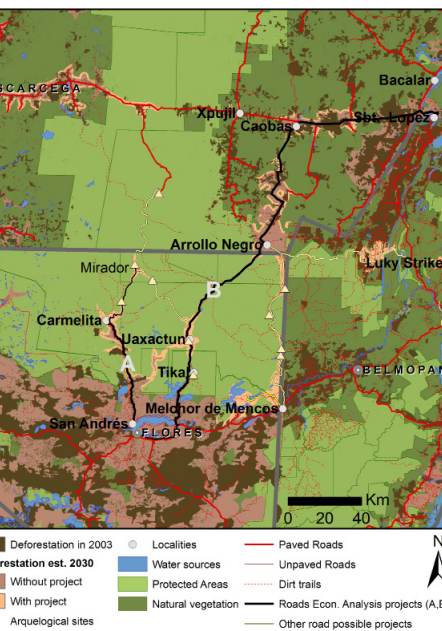
To help answer that question, we analyzed the economic and environmental impacts of proposed road construction and improvement investments. Economic returns to Guatemala and Mexico were calculated for two projects that would join the two countries through currently roadless forest of the Maya Biosphere Reserve. Deforestation, habitat fragmentation and forest fire were projected for a larger set of projects. We used two separate models to predict these impacts, one focused on just Guatemala's Maya Biosphere Reserve, and the other looking at a larger, three-country area.

Our projections indicate that if all the projects in this list are carried out, as much as 311,000 hectares (769,000 acres) of forest would be lost over the next 30 years. This deforestation would release around 225 million tons of carbon dioxide. The global cost of those emissions in present value terms would be on the order of US\$ 136 million. A lower-bound estimate for deforestation in the Maya Biosphere Reserve alone is 37,500 hectares, obtained with a more conservative modeling approach.

By the year 2015, the roads would split six blocks of jaguar habitat into 16 smaller areas, with a total habitat loss of 11 percent (151,428 ha) for the species. Forest "interior," which is free from ecological edge effects would be reduced by 47 percent. Fragmentation and easier access to the Maya Forest would increase its vulnerability to fire and hurricanes, and to human pressures such as land-grabbing within protected areas, illegal logging and trafficking in wildlife. Further, the road projects would present barriers to the movement of species within and among protected areas, which would seriously undermine the objectives of the biological corridors promoted by the Mesoamerican Biological Corridor effort.

From an ecological perspective, we can safely say roads would be bad. But if their economic benefits were sufficiently large, policymakers might conclude that the environmental sacrifice is justified. The following numbers don't support that view.

Economic analysis was conducted for two of the largest projects: Caobas-Arroyo Negro-Tikal; and San Andrés-Carmelita-Mirador.



Location Map (Dalia Amor Conde)

The Caobas-Arroyo Negro-Tikal road would generate losses of approximately \$40 million for Guatemala and \$14 million for Mexico, in present value terms. The San Andrés-Carmelita-Mirador project also showed a negative result, with \$21 million in losses for Guatemala. Costs and benefits were projected over a 30-year time horizon and discounted using a 12 percent economic interest rate.

These figures do not take into account environmental costs. Deforestation is estimated at around 53,570 ha for the first road and 36,128 ha for the second. The resulting losses of forest carbon add up to a global cost of \$24 million for the Cao-bas-Arroyo Negro-Tikal road and another \$15 million for San Andrés-Carmelita-Mirador. Due to a lack of information, we did not attempt to quantify any other economic losses associated with road-induced environmental impacts.

These results suggest that, in fact, there is no conflict between conservation and development goals in the cases we studied. Neither goal would be achieved with these investments since they would cause an economic net loss and provoke considerable impacts on the Maya Forest's ecosystems. The limited public funds available should be directed to projects with better prospects of satisfying criteria for economic efficiency, environmental sustainability and social equity.

In those cases where road projects are already under construction in the Maya Forest, measures are needed to minimize and offset deforestation and to maintain connectivity between natural habitats. These goals can be reached in part through investments in better protection of parks and reserves. In the specific case of the widening of the Escárcega-Xpujil road, there is an urgent need for actions to permit wildlife movement in the Calakmul and Balam-Kú reserves, and to locate the proposed high-tension electric line adjacent to the road, rather than one kilometer away, within the reserves, as has been proposed. This would avoid additional deforestation and fragmentation and would allow for joint mitigation of the road and electric line's impacts, presumably lowering costs.

Our study casts doubt on the appropriateness for the Maya Forest of an economic development model based on large public works, as has been proposed by the Plan Puebla Panama and the Mundo Maya initiatives. Remote areas can be seen as "empty" and therefore appropriate for road corridors and settlement. But using them for those purposes involves an implicit decision to sacrifice conservation values, as well as a considerable risk that the costs of new infrastructure will outweigh its benefits.

To obtain a full copy of these and other CSF studies, please visit:

<http://conservation-strategy.org/en/publications/reports>

NOTES

Authors' affiliations:

1. Nicholas School of the Environment, Duke University
2. Wildlife Conservation Society – Guatemala
3. Conservation Strategy Fund
4. Trópico Verde/Parkswatch
5. Unidos para la Conservación
6. Madreselva

The authors wish to thank the Critical Ecosystems Partnership Fund, Corredor Biológico Mesoamericano, the Mexican Comisión Nacional para el Conocimiento y Uso de la Biodiversidad, and Safari Club International for supporting this research, as well as The Nature Conservancy, Rainforest2Reef and the Wildlife Conservation Society for funding publication of results. The study was the result of Conservation Strategy Fund's capacity-building program in Central America and Unidos para la Conservación's ongoing Selva Maya program

Photos by Victor Hugo Ramos/WCS (previous page) and Regina Esquivel-Obregón (below).

