The Future of Tropical Forests

Tropical rainforests are among the most species rich regions of the world. If current deforestation and habitat loss continues, a mass extinction of forest species is predicted in these areas. Smithsonian Tropical Research Institute scientist S. Joseph Wright and Helene Muller-Landau from the University of Minnesota have recently conducted a survey of human population trends and forest cover.

Wright and Muller-Landau use present-day relationships between forest cover and population density and United Nations population projections to predict future forest cover for tropical African, American and Asian countries. United Nations population projections generally predict that human population growth rates will decline and that urbanization will intensify. Wright and Muller-Landau predict future forest cover using both an optimistic scenario based on rural populations alone and a pessimistic scenario based on total (rural plus urban) populations.

Continental trends suggest that deforestation will decrease and a larger area will remain forested in the Americas where population growth is slowing most rapidly and urbanization continues to increase. The outlook is not as optimistic in Asia and Africa. Asian forests are already quite diminished and populations are growing at a higher rate. In Africa, however, population growth overall and particularly in rural areas continues to increase, and net deforestation is expected to continue.

This research suggests that global deforestation will decrease, regeneration of forested areas will increase and a mass extinction of rainforest species can be avoided. Wright and Muller-Landau hope their research will stimulate more sophisticated predictions of future forest cover. In the meantime, further research is needed to establish the threat to individual species and determine which global, regional or local factors may influence these threats. This research will improve the ability to evaluate and manage human influences on forest species.

Halting Biological Hitchhikers

Today, destructive invasive alien species such as gypsy moths and brown tree snakes zip around the globe at the speed of commerce. They often hitch rides with unwitting people, animals or goods. The ultimate goal of a world-wide network of researchers, health care professionals and cargo inspectors is stopping these invasions before they start, on the organism’s native soil. Now there is a revolutionary analytical weapon in their arsenal.

Greg Ruiz of the Smithsonian Environmental Research Center and James Carlton of the Maritime Studies Program of Williams College, have developed an ingenious technique for assessing and prioritizing invasion threats. It focuses on the vector, or transportation mechanism of a given threat, rather than the threat itself.

Ruiz and Carlton share their methods in a chapter of the new book *Invasive Alien Species*, edited by H.A. Mooney, *et al.*, and published by Island Press. The duo state that, “Clearly, the easiest way to prevent new invasions is vector interception or disruption, whereby the capacity of the vector to move species is greatly constrained.”

Their approach focuses on evaluating a vector’s threat profile by specific and universal criteria:

1. Reason for transport. Is it accidental or deliberate?
2. Geographic path over which a species is transported.
3. Mechanism of transport, or the type of vector, such as stagnant water in recycled tires, or packing material.
4. Vector tempo. The size, rate and speed over time that the vector transports organisms.
5. Diversity, density and condition of organisms transferred.
6. Vector strength or the relative number or rate of invasions that result from a given vector in a particular region.

Those battling invasives are faced daily with a massively complex matrix of environmental, social, economic and even political factors that affect the mechanisms which
conspire to spread invasive species. The work of Ruiz and Carlton provides a vector analysis tool. Using this framework to rank and evaluate the risks of invasion, managers can now rationally prioritize and target the most important vectors.

**Current Literature**


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