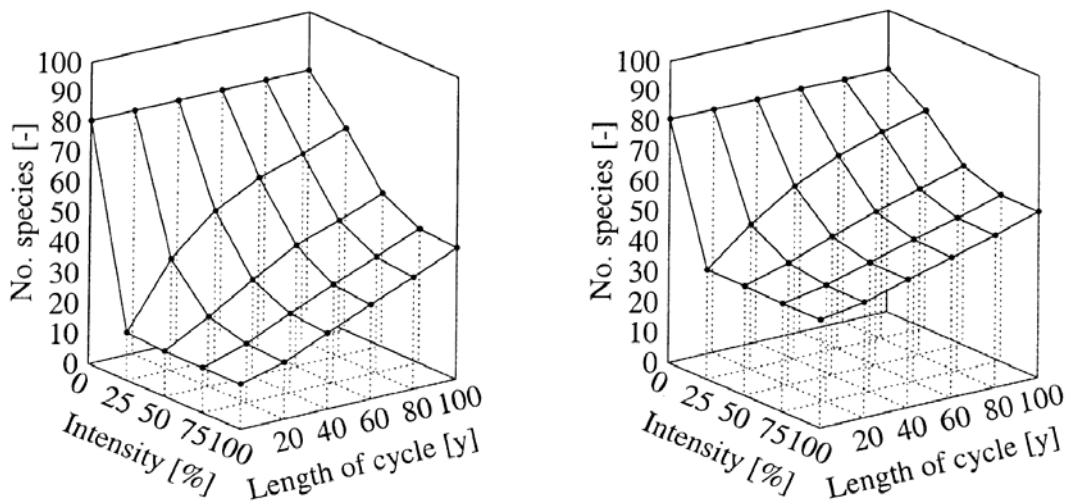


## Simulating bird species diversity in disturbed tropical rain forests

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We used an aggregated modelling approach to simulate the impacts of anthropogenic disturbances on the long-term dynamics of faunal diversity in tropical rain forests. The here presented study focus on bird communities even though the approach is more general. We developed a model called BioDiv [1] which simulates the establishment of hypothetical bird species in a forest. Spatio-temporal dynamics of a tropical rain forest in Malaysia was simulated with a matrix model which was parameterised using the well-tested rain forest model Formix3 [2].

We analysed the establishment of bird species in a secondary forest succession and the impacts of 60 different logging scenarios on the diversity of the bird community. Of the three logging parameters (cycle length, method, intensity), logging intensity had the most severe impact on the bird community (Fig. 1). Already low logging intensities result in high species losses. In the worst case the number of bird species was reduced to 23% of the species richness found in a primary forest.



**Figure 1:** Effects of tree logging on the numbers of established bird species. The two logging methods (left: conventional, right: reduced-impact) differed in damage to the residual stand and in the minimum age of logged patches. The simulated time period was 300 years. Length of cycle: time period between two logging events; intensity: fraction of harvestable trees which are harvested in each logging event.

### References

- [1] Köhler P, Reinhard K; Huth A (2002) Simulating anthropogenic impacts to bird communities in tropical rain forest. *Biological Conservation* 108: 35-47.
- [2] Huth A, Ditzer T (2000) Simulation of the growth of a Dipterocarp lowland rain forest with FORMIX3. *Ecological Modelling* 134: 1-25.