

Seminar: Positive Effects of Habitat Fragmentation on Biodiversity

Presenter:

Lenore Fahrig, Professor, Department of Biology, Carleton University

Time of Event:

Tuesday, May 12, 2015 - 12:30

Location:

National Socio-Environmental Synthesis Center (SESYNC)

1 Park Place, Suite 300

Annapolis, MD 21401

Seminar abstract:

Early work suggested positive effects of habitat 'subdivision' or 'patchiness' on persistence of species and communities. This work was subsequently eclipsed by four decades of study and application of patch size and isolation effects. Untenable extrapolation of these patch-scale effects to the landscape scale led to the nearly universal assumption that habitat fragmentation reduces biodiversity. Landscape ecology avoids this extrapolation, by matching the scale of study to the scale of inference; in landscape ecology the landscape, not the patch, is the unit of replication. Here, I review landscape-scale studies of effects of habitat fragmentation per se, i.e., subdivision of habitat while controlling for habitat amount. The majority of fragmentation effects are positive, suggesting that earlier work was on the right track. Explanations for positive fragmentation effects are myriad, including reduced intra- and inter-species competition, stabilization of predator/parasite-prey/host interactions, higher landscape complementation, positive edge effects, and higher landscape connectivity. The results of this review call into question conservation policy that assumes negative fragmentation effects.

Speaker bio:

Lenore Fahrig studies the effects of landscape structure on abundance, distribution, and persistence of organisms. Landscape structure includes the amounts of various kinds of land cover in landscape (e.g., forest, wetland, roads) and the spatial arrangement of these cover types. Landscape structure affects populations through its effects on reproductions, mortality, and movement. Since landscape structure is strongly affected by human activities such as forestry, agriculture, and development, the results of this research are relevant to land-use decisions. A particular focus in her lab is on the effects of roads and traffic on wildlife populations. They use a combination of spatial simulation modelling and field studies on a wide range of different organisms.

Dr. Fahrig's main research questions include:

- What is the minimum amount of habitat required in a landscape for persistence of a population, and what determines that minimum?

- What are the effects of roads on distribution and persistence of populations, which species are most vulnerable to roads, what road patterns are least damaging to wildlife populations, and how can population-level effects of roads be mitigated?
- How can agricultural landscapes be structured to reduce pest populations while maintaining high biodiversity without compromising agricultural output?
- Under what circumstances does the breaking apart (fragmentation) of habitat affect population persistence?
- How does landscape heterogeneity affect population persistence and species richness?
- How does dispersal behaviour of an organism affect its response to landscape structure?
- What is the role of connectivity (the degree to which a landscape permits movement of organisms across it) in population persistence?

Event type:

Seminar

Event Attendance:

Open to the Public

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