FOR 527
Ecological Flows Across Landscapes
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Discussion leaders: Aaron Roth, Eva Strand, Toby Gass

Key Points

1. A primary impetus for our interest in ecological flow is the fact that humans have altered flows significantly.
2. Ecological flow includes movement of thermal energy, biomass, nutrients, and water, and is influential at all landscape scales. Understanding the role of landscape boundaries at different scales is key to understanding ecological flow.
3. We often perceive landscape boundaries for their structural distinctiveness rather than their functional role. A challenge in landscape ecology is to see the flows and components from outside the human perspective.
4. Boundaries can be created by disturbance processes as well as by spatial variation in abiotic variables such as topographic position, precipitation or soil types. Conduits and filters are conceptual aids to understanding the variety of movements across boundaries.

Questions for Discussion as well as some Just for Thought

Flow
- For what temporal and spatial scales are the concepts of ecological flow appropriate? How might these change over time? What are some examples of ecological flow processes through time?
- In physics and chemistry, flow is caused by a driving force that creates a gradient; water, for example, flows downstream because gravity pulls it from a higher elevation to a lower elevation. Is this true for ecological flow across landscapes?

Boundaries
- How have humans altered ecological flow and boundaries? How are human caused boundaries different from natural boundaries? How are landscape boundaries created and how do they disappear?
- What is the relative importance of understanding boundary structure, such as verticality and length, and boundary function, such as barriers or filters?
- Foreman and Moore draw parallels between cell membranes and landscape boundaries. Are boundary theories from other disciplines applicable to landscape flow?
- Foreman and Cadenasso both define characteristics of boundaries. How do their definitions differ? Compare and contrast corridors and boundaries.

Management
- How important is it to have a theoretical understanding of ecological flow when designating landscapes for conservation or when involved in making management decisions? If one can define a given location as a boundary for one purpose and a patch
for another, can research in landscape ecology be useful for managers or is it too abstract and relativistic for decision-making purposes?

Are there land areas to which it would be difficult to apply the principles of landscape ecology? If so, why? Are they most easily applied in the temperate forest/woodland/farmland areas?

How can we manage landscape components to allow for spatial change in flows over time?

**Theory**

- Is landscape ecology ecology? If so, why? If not, why not?
- To be a subdiscipline of ecology, must landscape ecology principles be applicable to all land areas?
- When landscape ecology includes the structure and function of a system, including organismic, energy, and material flows, what distinguishes a landscape from an ecosystem or a biome? Is a landscape the scaffolding for an ecosystem?
- Do the constructs of patch, boundary, conduit, flow, filter, sink, habitat, etc. adequately represent a landscape? Are there other ways to conceptualize a landscape? Is anything missing?

**Readings**


**Optional readings**