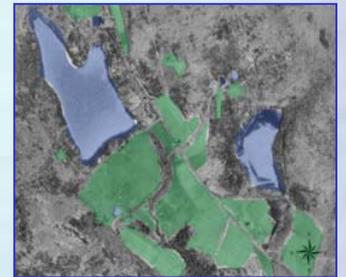
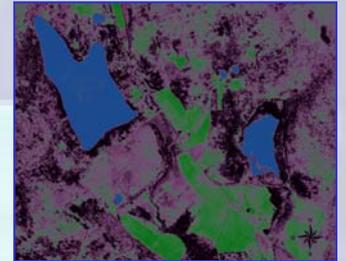


The Conservation of Landscapes in the Upper Susquehanna Watershed



A Workshop with the E. L. Rose Conservancy

John Barney, David Gross & Eve Minson
Department of Natural Resources
Cornell University



Workshop Agenda

- **The Layered Landscape:**

Time: 8:45-10:00

Interaction: Mapping Your Place

- **Introducing landscape ecology**

Time: 10:15-11:00

Interaction: Q & A

- **Integrating landscape ecology in conservation practice**

Time: 11:15-12:15

Interaction: The Conservationshed, Landscape Inventory
and Assessing Priorities

Workshop Goals

- **Interaction**
- **Feedback and discussion**
 - **Conservationshed**
 - **Conservation Inventory & Priorities**
- **Fun learning experience**



Definitions

Conservation / Preservation

Ecology / Bio-diversity / Ecosystem

Landscape / Community / Watershed / Place

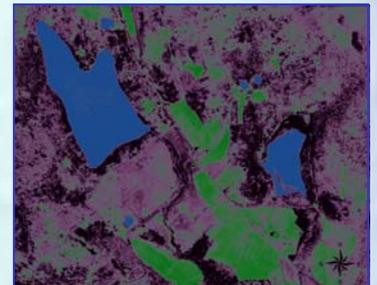
Conservancy / Land Trust

Green-space / Open-space / Park / Preserve / Habitat

Greenway / Corridor / Scenic By-way / Trail

Part I

The Layered Landscape



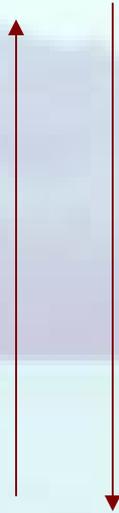
Mapping Your Place

Draw the following features with respect to the place where you live:

- topography of your place
- where does your weather come from
- the watershed you live in
- a large body of water
- 2 creeks or rivers
- a wetland and a forest
- 4 different kinds of native trees
- 4 different kinds of native animals
- 2 places of cultural heritage
- 2 ways we use the land today (1 good and 1 bad for the environment)
- 2 areas illustrating conservation action by local groups
- an important recreational area for you
- 2 major routes or corridors you come (home) to your place
- a landmark or place that tells you are home
- the heart of your community
- create a name for your place
- identify the most important conservation issue for your place

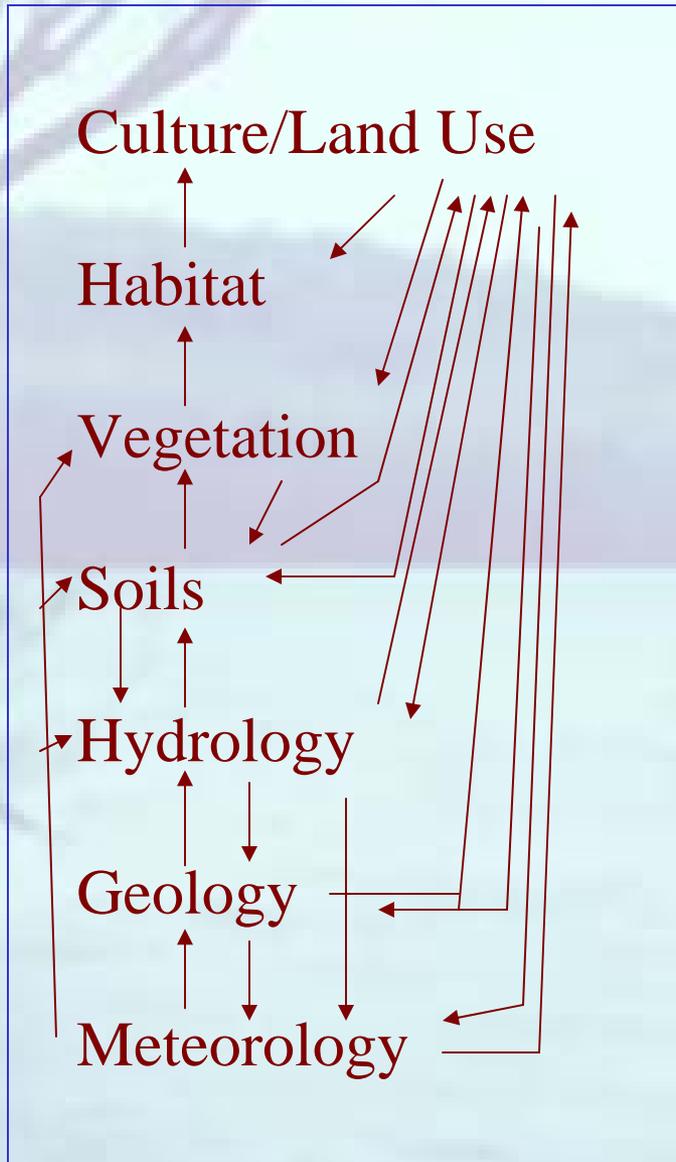
Constructing a Sense of Place

The “**Making**” of the Landscape



Your “**Experience**” of the Landscape

Constructing the Landscape



- Accumulation of physical processes
- Not a linear process
- Different in different places and different times
- Different across scales and over time

Constructing Experience

- **Your processes of dwelling in and moving through the landscape, and your awareness during and recording of those experiences**
- **Nature of your dwelling**
compare farmers to city folk; a naturalist to developer
- **Nature of your transport**
e.g. car, airplane, horse, foot
- **Nature of your awareness (knowledge, training & belief)**
compare Emerson and Thoreau to Gingrich and Watt
- **Nature of your recording**
e.g. memories, maps, photographs, drawings, field notes & stories

Deconstructing Scenic Quality

- Scenic quality comes from the visual experience of landscape
 - physical qualities of landscape
 - a place or way (road or trail) to “view” landscape
- Scenic quality includes cultural landscape elements
- All landscapes have ecological function to humans and non-humans, e.g. wetlands filter and provide water; forests provide cooling, shelter & food, farmland provides food
- Scenic quality is often the product of “landscape diversity”, e.g. moving from closed forest to open farmland, viewing the mosaic of lakes farms and forests, vs. a monotonic or degraded landscape
- Landscape diversity can result in greater ecological diversity

Landscape Diversity & Bio-diversity

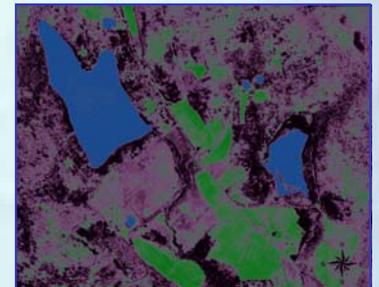
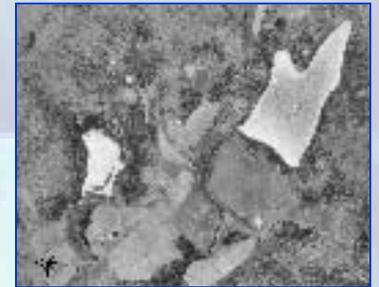
- Different landscapes are the result of different conditions produced by various processes, e.g. the glaciers, clear-cutting and subsequent farming, a beaver dam on a creek, an earthquake
- Different landscapes mean different types of ecological communities, e.g. meadow, upland forest, forested wetland, urban vacant land, etc.
- How do we measure landscape diversity?
How much is enough or not enough for biological diversity?
 - quantify different species
 - quantify different types of ecological communities
 - analyze patterns of ecological places, e.g. size, distribution, and connectivity

(Re)Imaging the Scenic Landscape



Part II

Introducing Landscape Ecology



The New Discipline:

- Developed out of analysis of aerial photos, regional planning and community ecology in the 1950's to meet the need to understand ecological systems and landscape at a regional scale.
- Principles and approaches apply across scales from the single plant to an entire biome.
- Relies heavily on ecological theory (Island Bio-Geography), but can be applied to all systems in the landscape, including humans.
- Approaches the landscape as a layered structure of systems, functions and fluxes.
- GIS has its origins in and is critical to research in the discipline.

Landscape + Ecology

- Ecology - the study of the interactions among organisms and their environment
- Landscape - an expanse of scenery with discernible patterns seen within one view.
- Landscape Ecology - the study of the patterns of structure, function and flux within the landscape.

Key Concepts

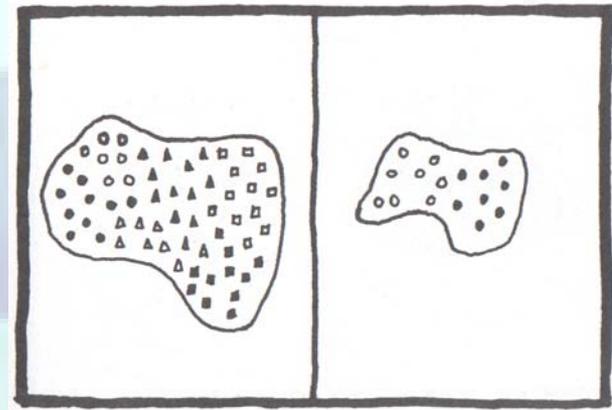
- **Patch** -- ecologically distinct place in the landscape, e.g. island in the ocean, lake in the forest
- **Corridor** -- ecological linkage between patches, e.g. hedgerows and creeks
- **Edge** -- the outer portion of a patch or corridor, which differs significantly from the interior
- **Matrix** -- the basic or majority ecology of a landscape, e.g. farm fields in Iowa, forest in Maine, tundra in Siberia
- **Mosaic** -- the structural pattern of a landscape, i.e. the networks of patches and corridors through matrix

Patches: Size & Origins

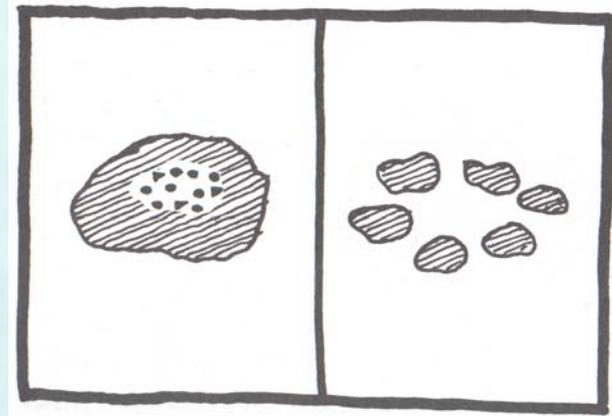
- Origins: remnants, induction, disturbance, resources

- Size matters:

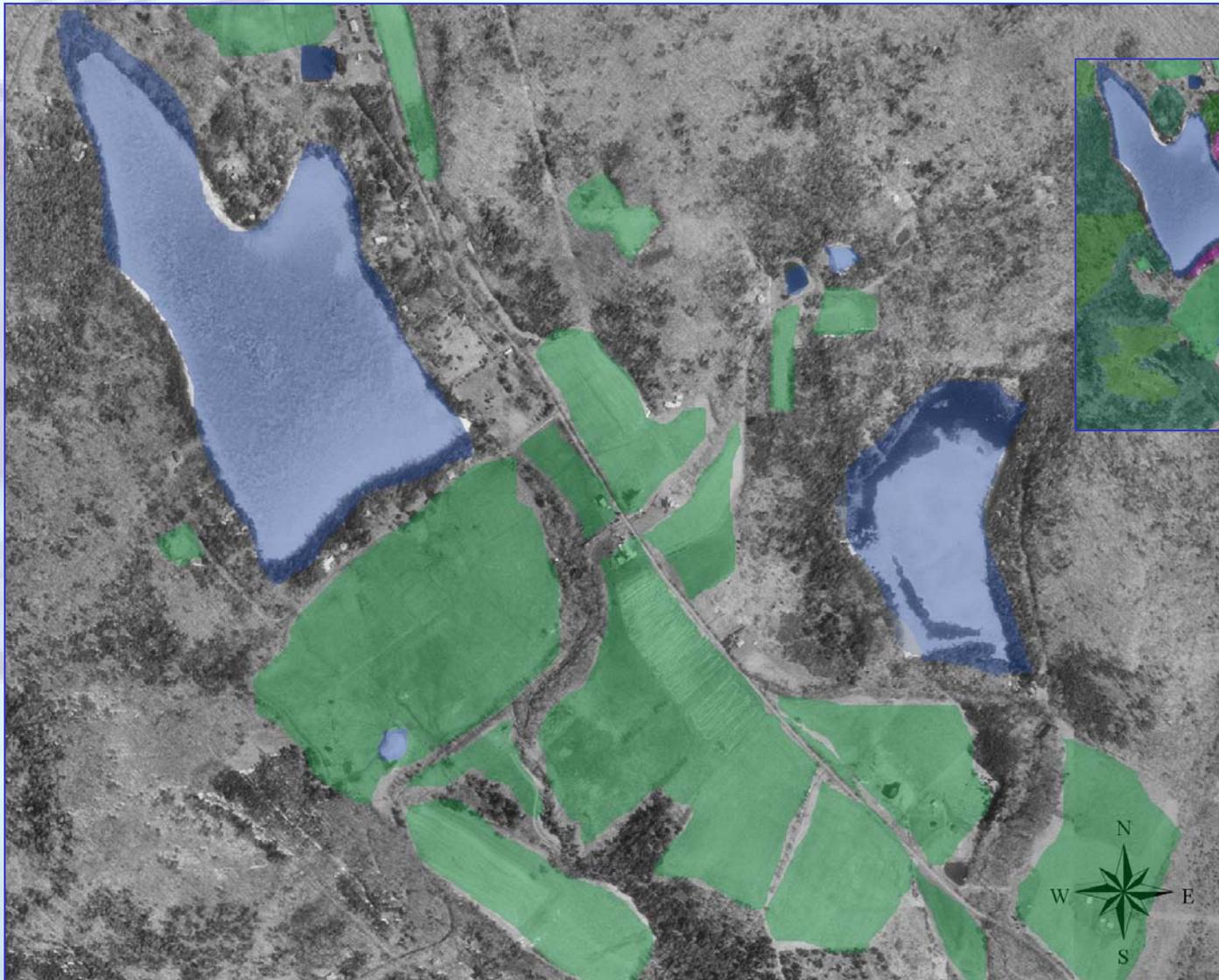
-- habitat diversity



-- core & edge



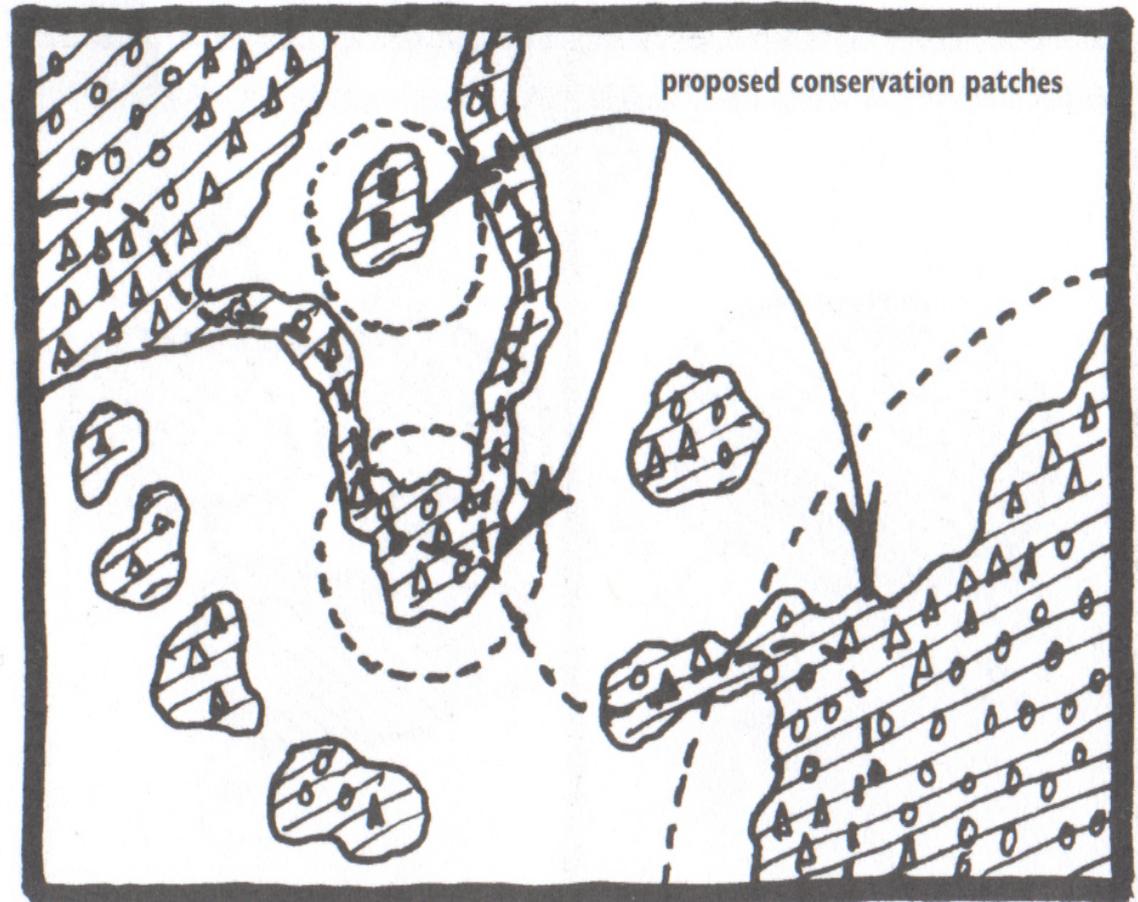
Patches in the Landscape



- Lakes
- Ponds
- Wetlands
- Farms
- Native Forest
- Subdivision

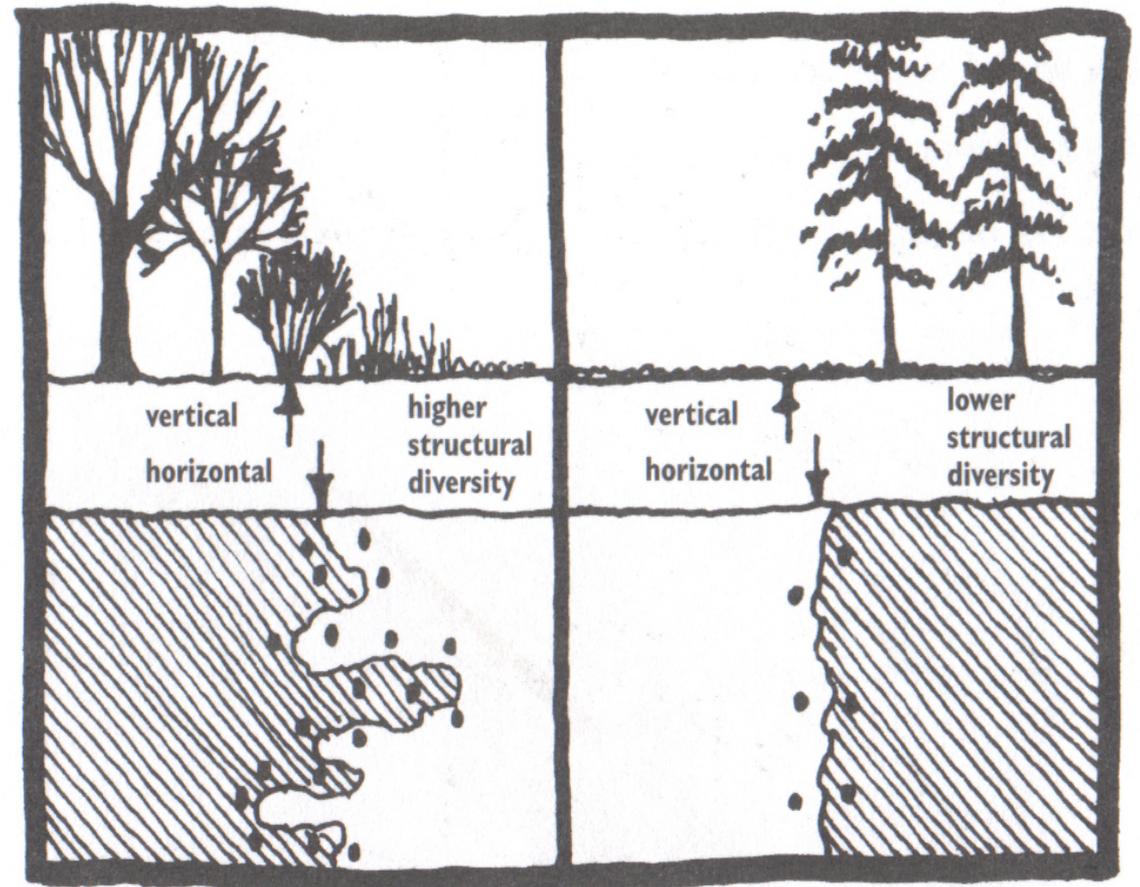
Patches: Conservation

- Large Patches
- High Bio-diversity
- Rare communities
- Remnants
- Critical Places



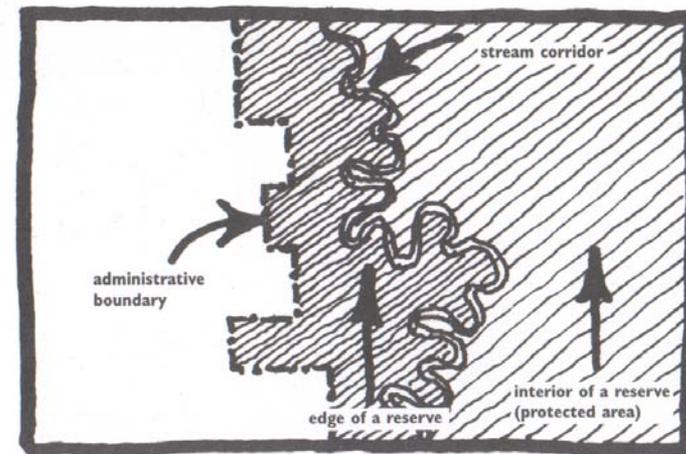
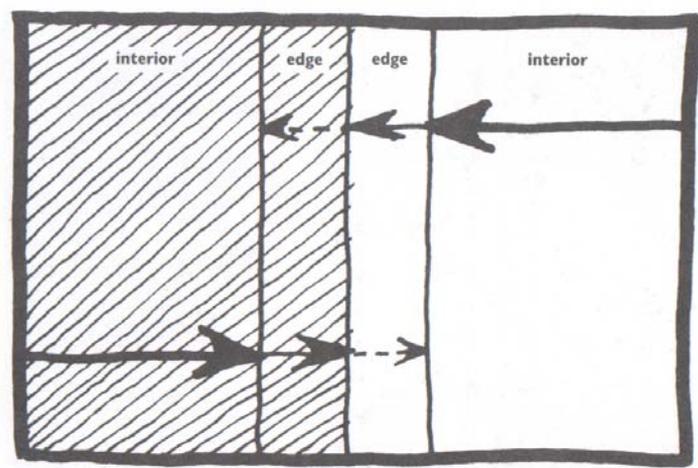
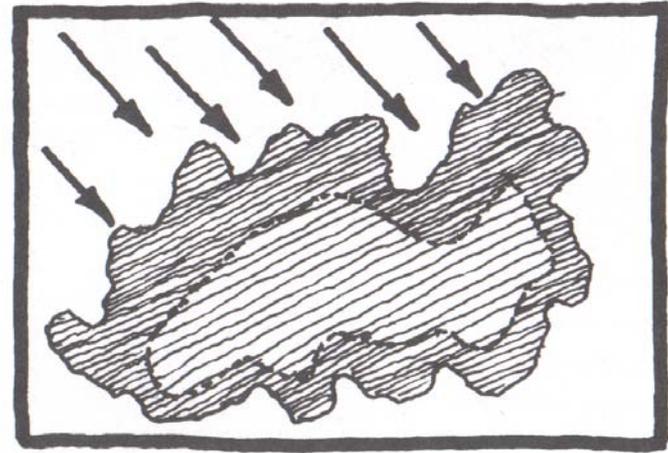
Edges: Genesis & Structure

- key transition zone & habitat
- mediates two distinct habitats or disturbed & non-disturbed areas
- formed by natural & human processes
- important buffer zone & filter

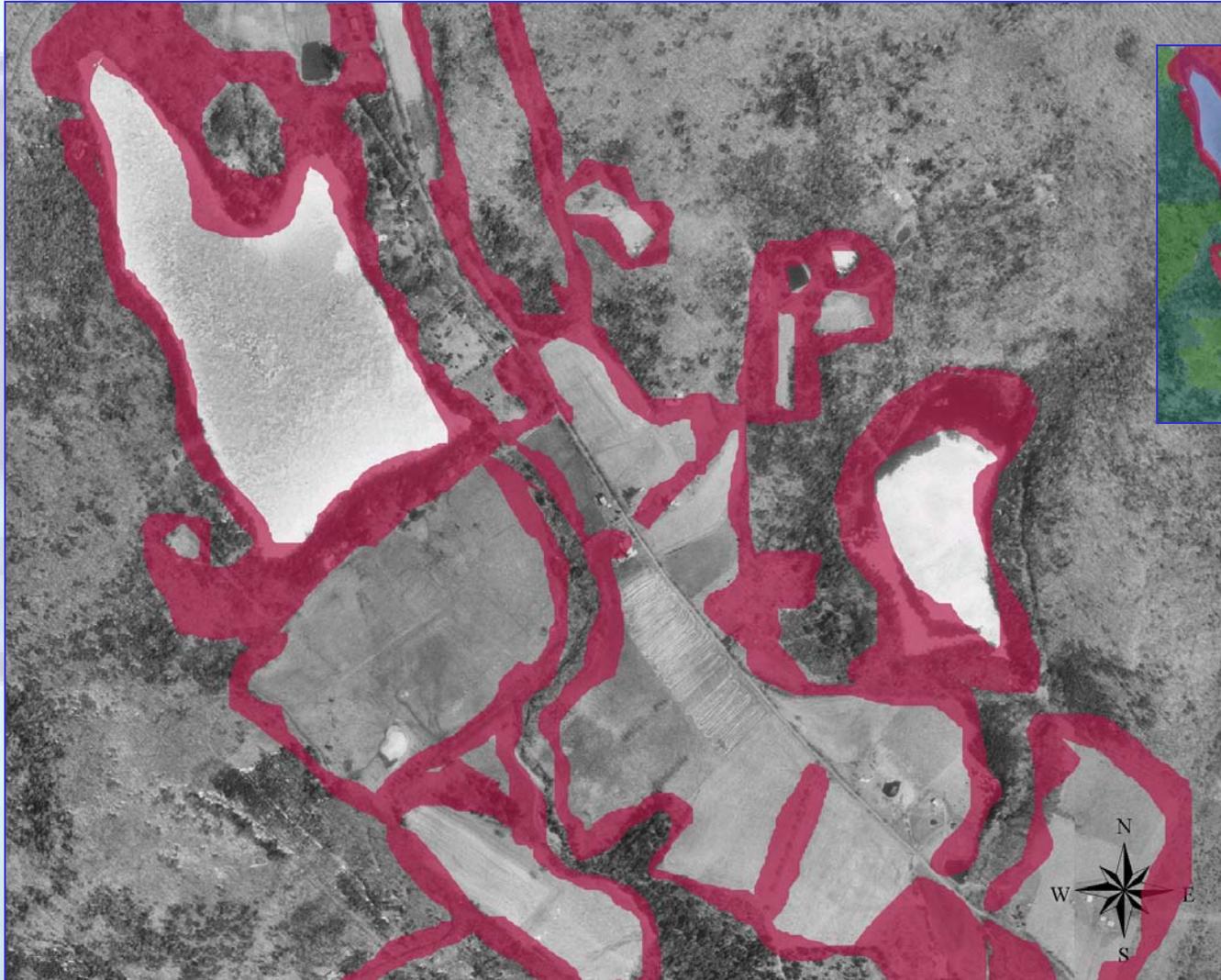


Edges: Formation

- Different processes form different kinds of edges
- Edges are a function of the patch communities

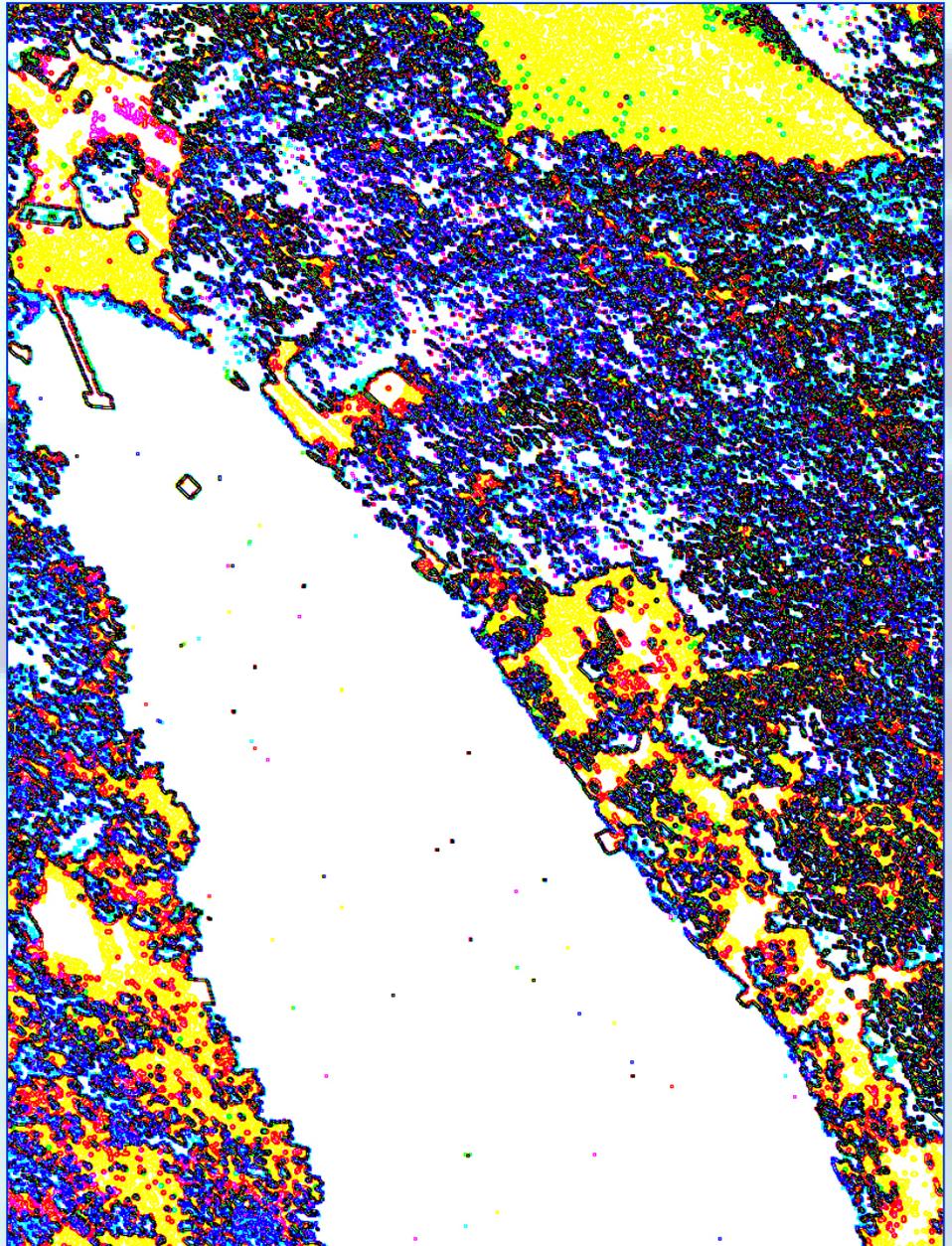


Edges in the Landscape



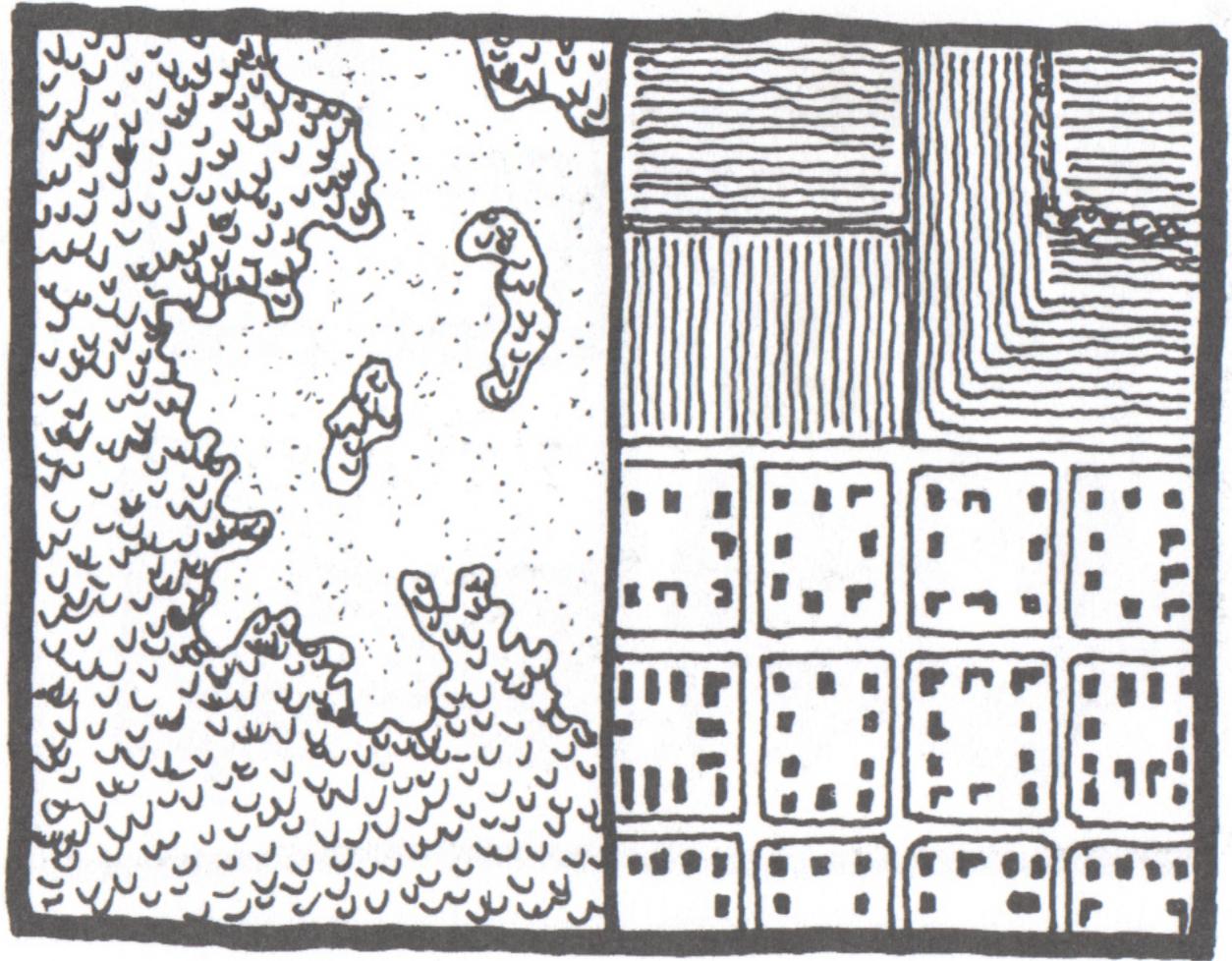
- Buffers
- Transitional Areas

Lake Edge



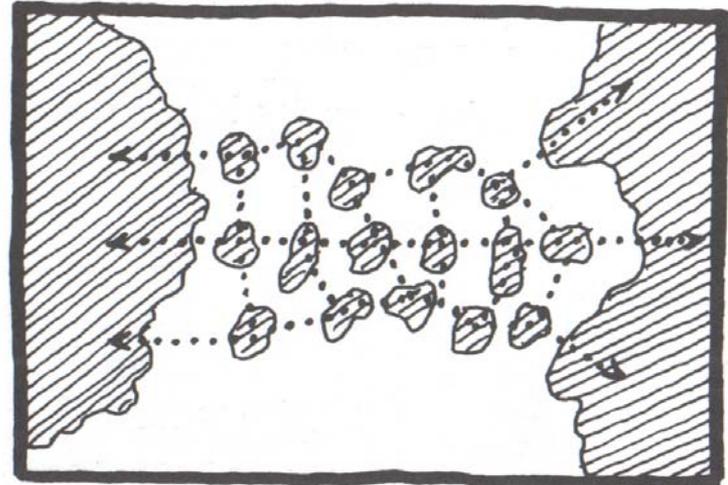
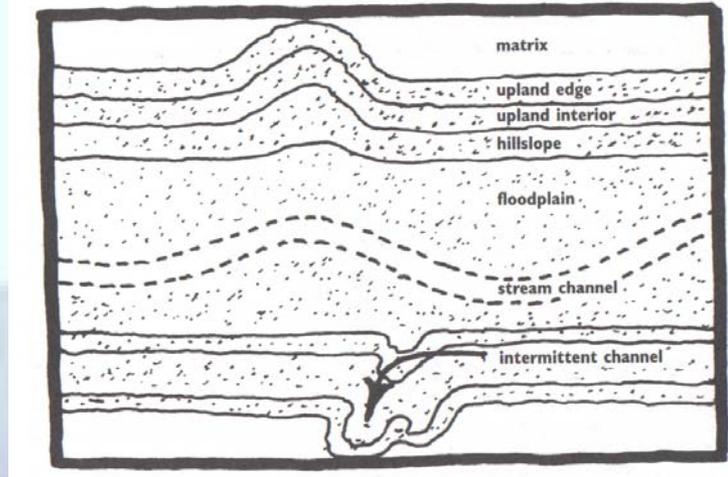
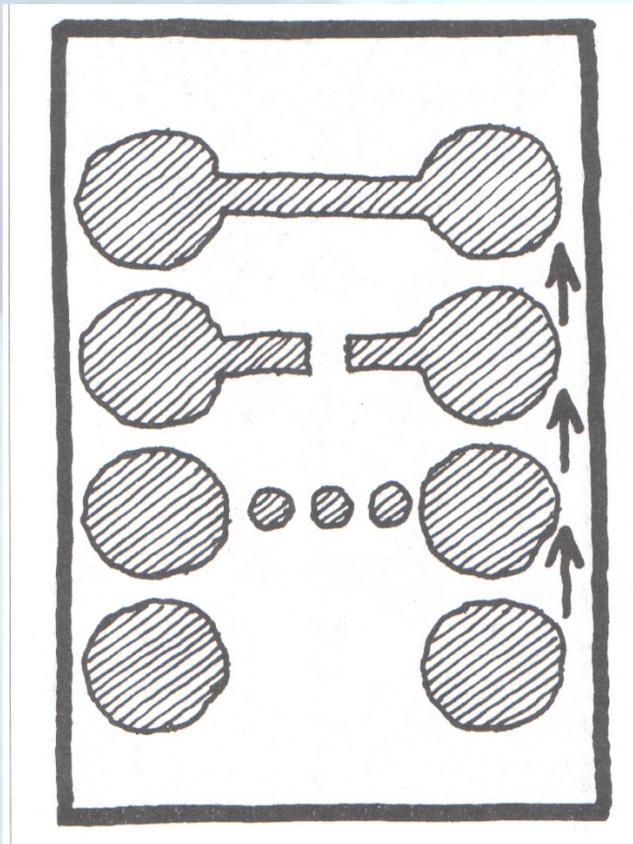
Edges: Conservation

- Creation, & restoration of edges along human uses
- Creation of & conservation of buffers along critical habitat areas



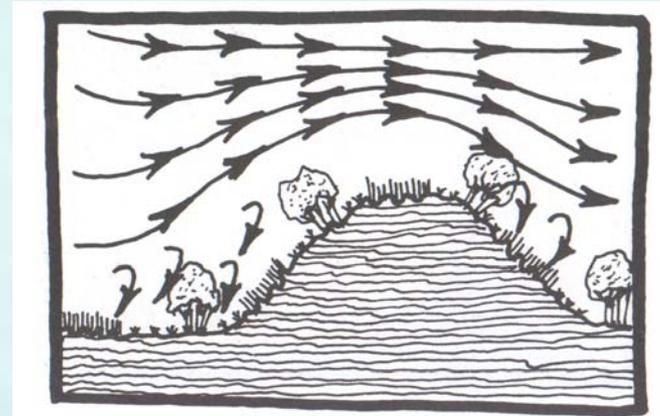
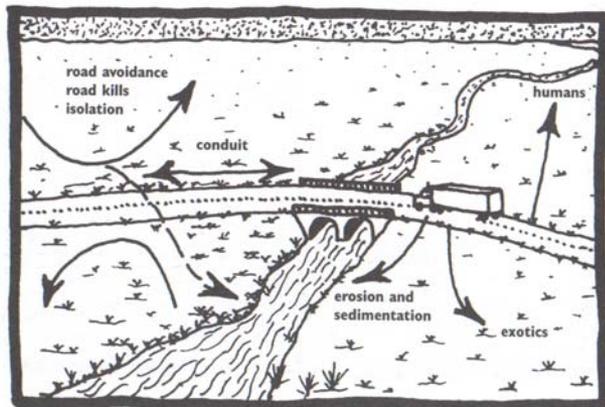
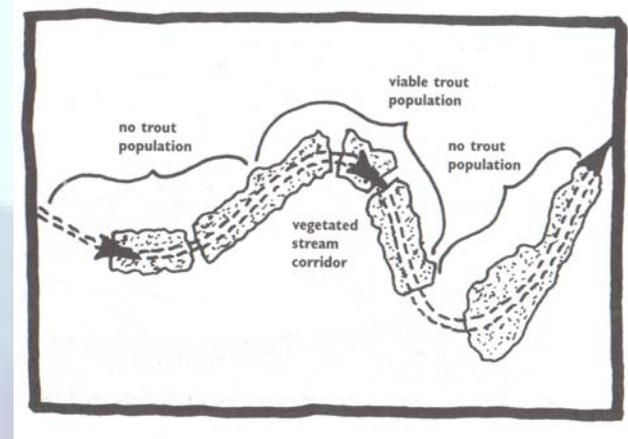
Corridors: Genesis and form

- Linear spaces shaped by flows created by bio-physical changes in the landscape.

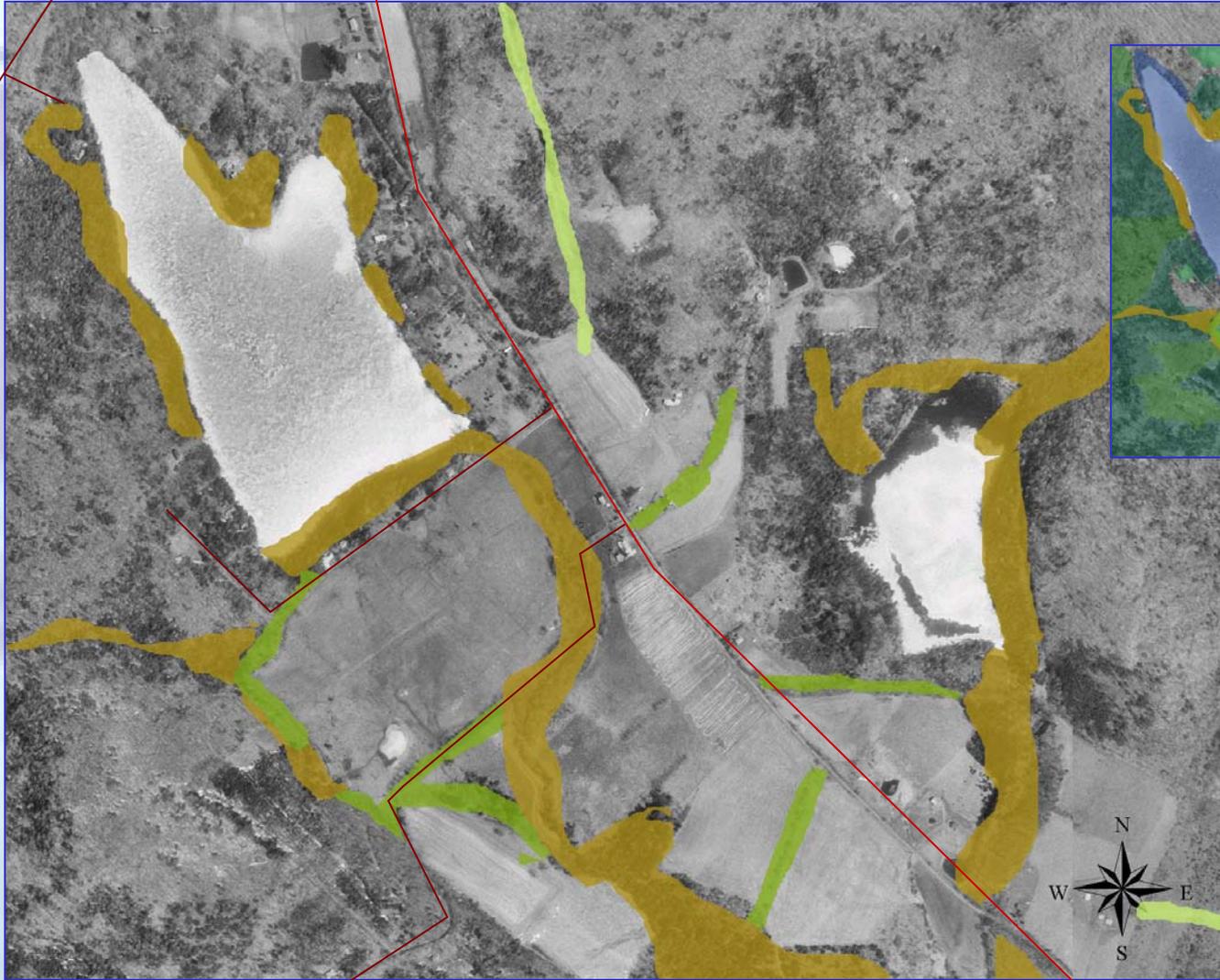


Corridors: Function

- Flows & Movement
- Habitat
- Mitigation & Filtration

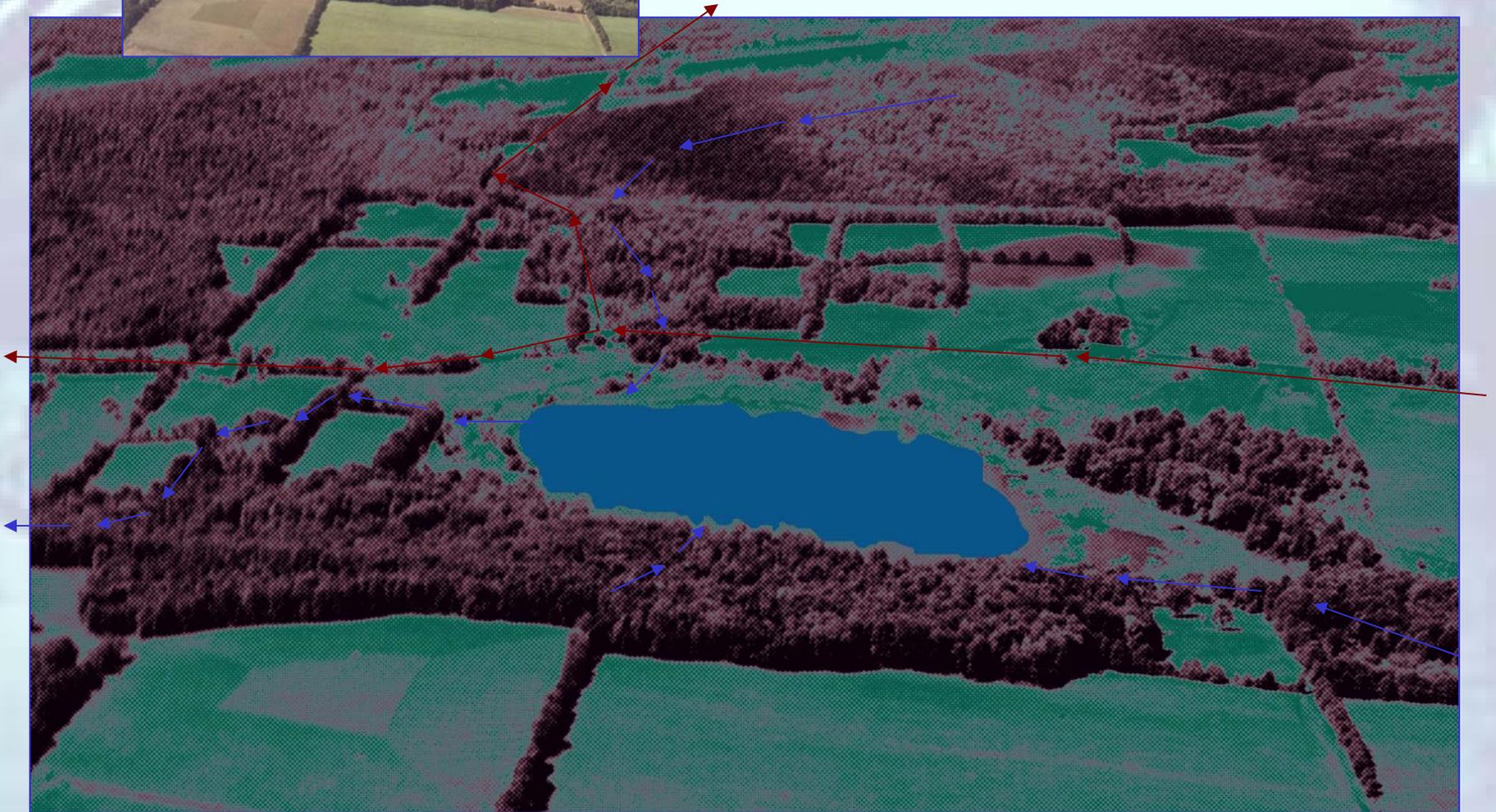


Corridors in the Landscape



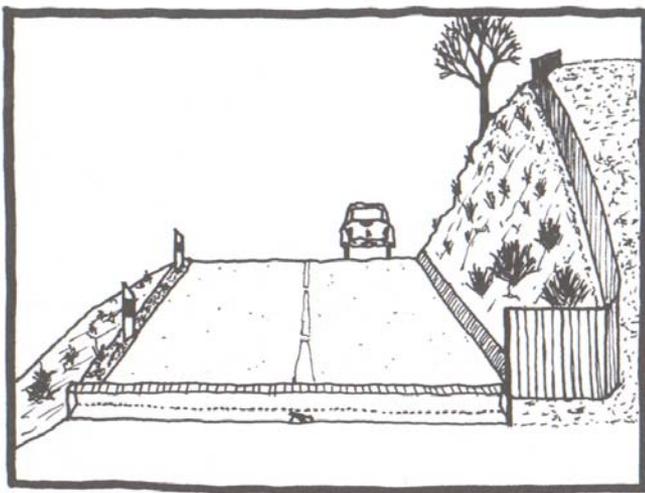
- Hedgerows
- Rockwalls
- Stream Corridors
- Farm Corridor

Hedgerow Stream & Road

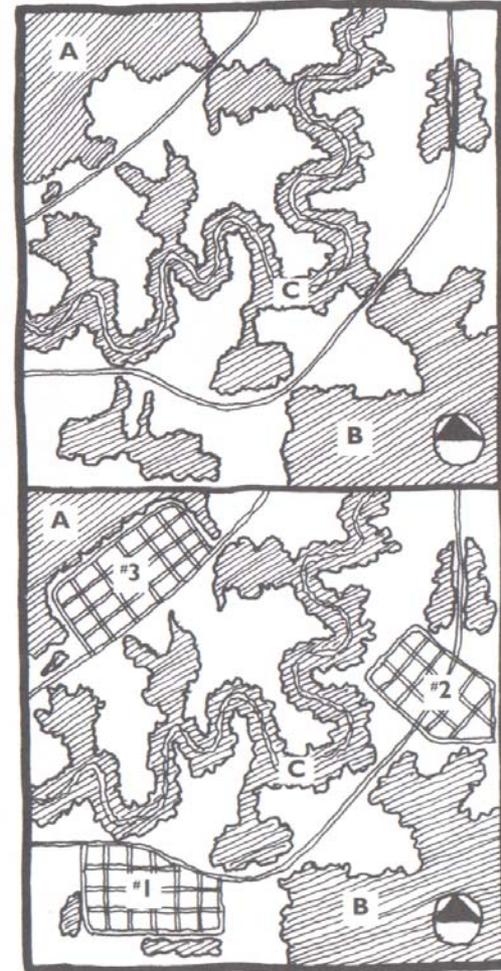


Corridors: Conservation

- Creation & conservation of buffers for streams
- Creation & restoration of connections between patches
- Creation of corridor infrastructure



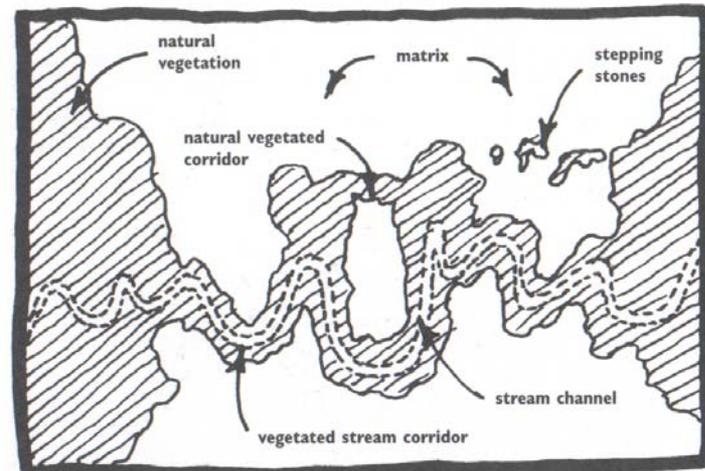
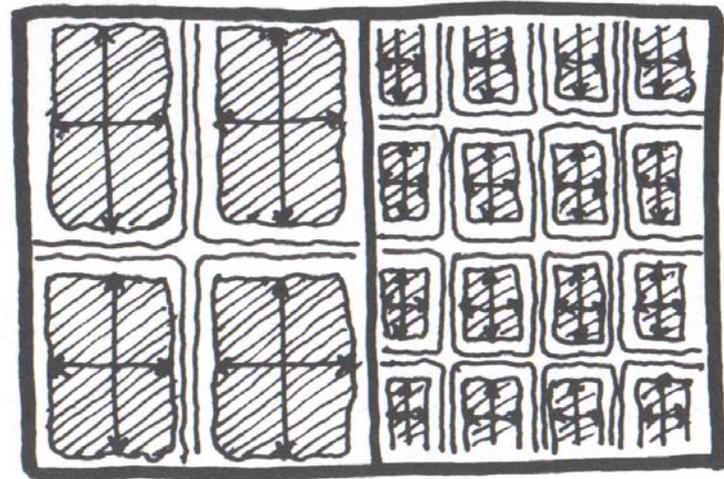
Amphibian Tunnel inserted into road surface.



Housing developments and deer.

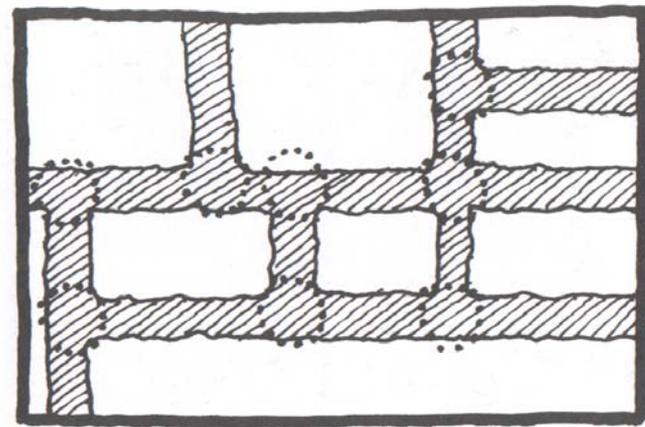
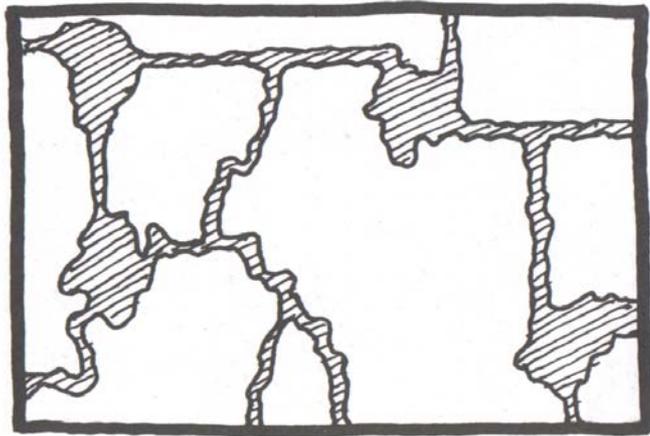
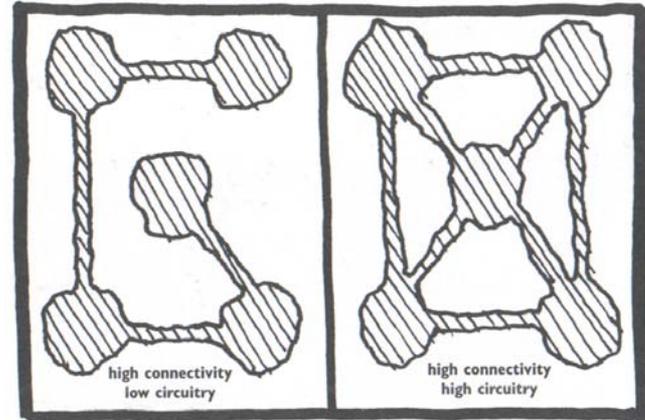
Mosaics: Genesis & Form

- The “patchwork” or “grain” of the landscape
- Created by changes in the landscape over time and space.
- Patterns are critical to understanding
- Understandings will differ with scale



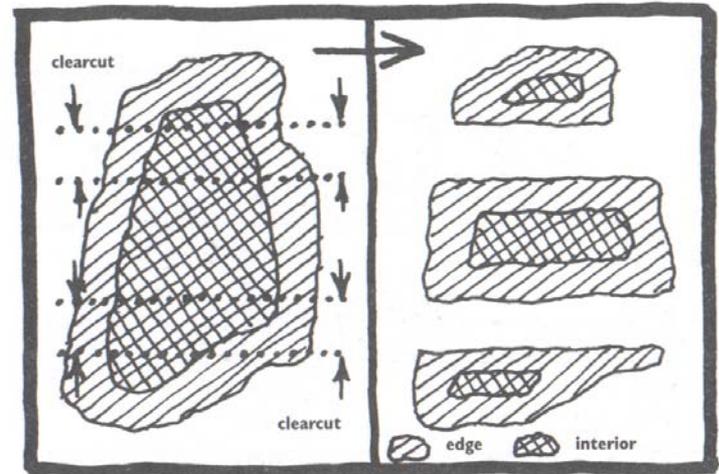
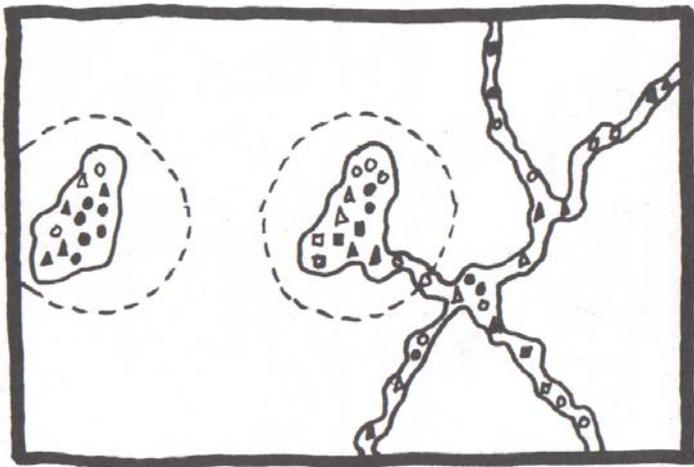
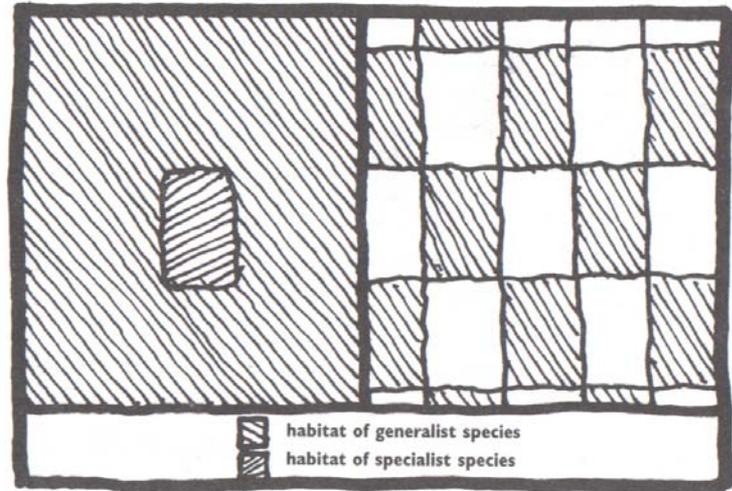
Mosaics: Matrix, Nodes & Networks

- Matrix as basic system
- Patches become nodes
- Corridors become networks

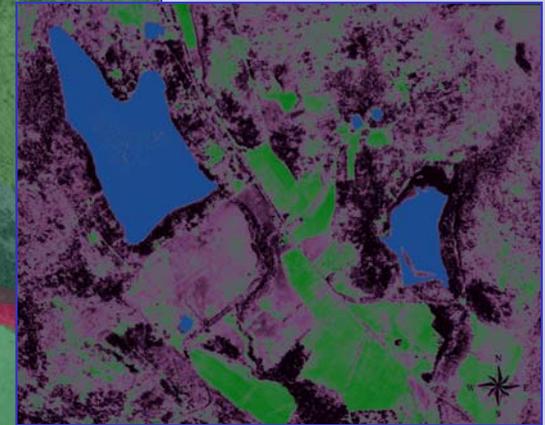
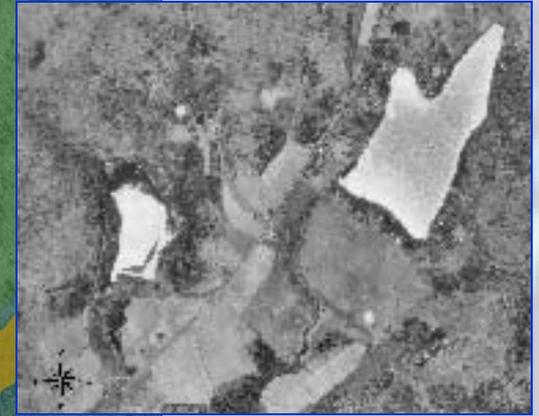
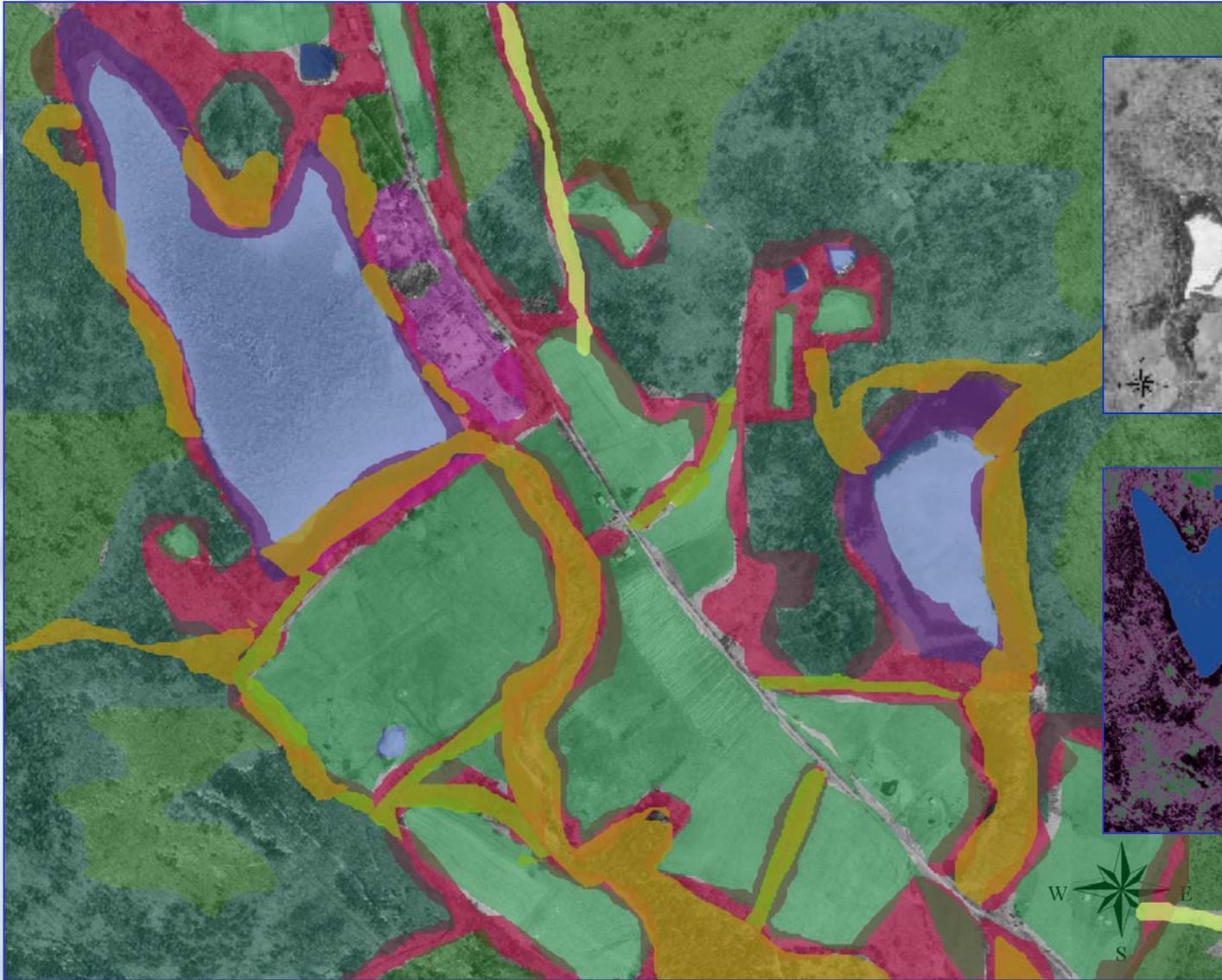


Mosaics: Fragmentation

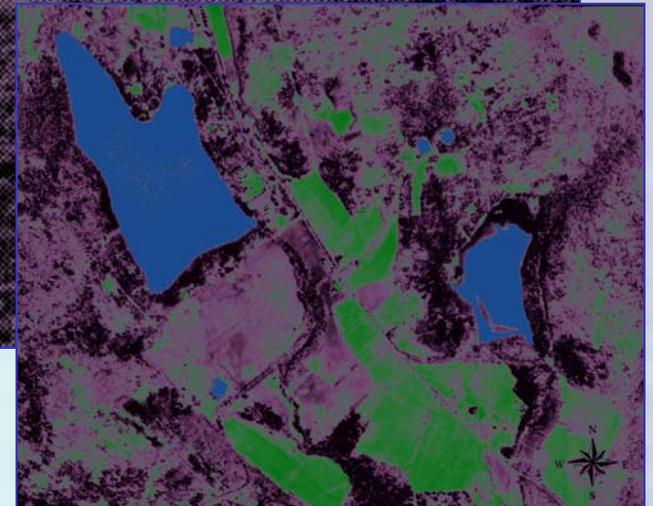
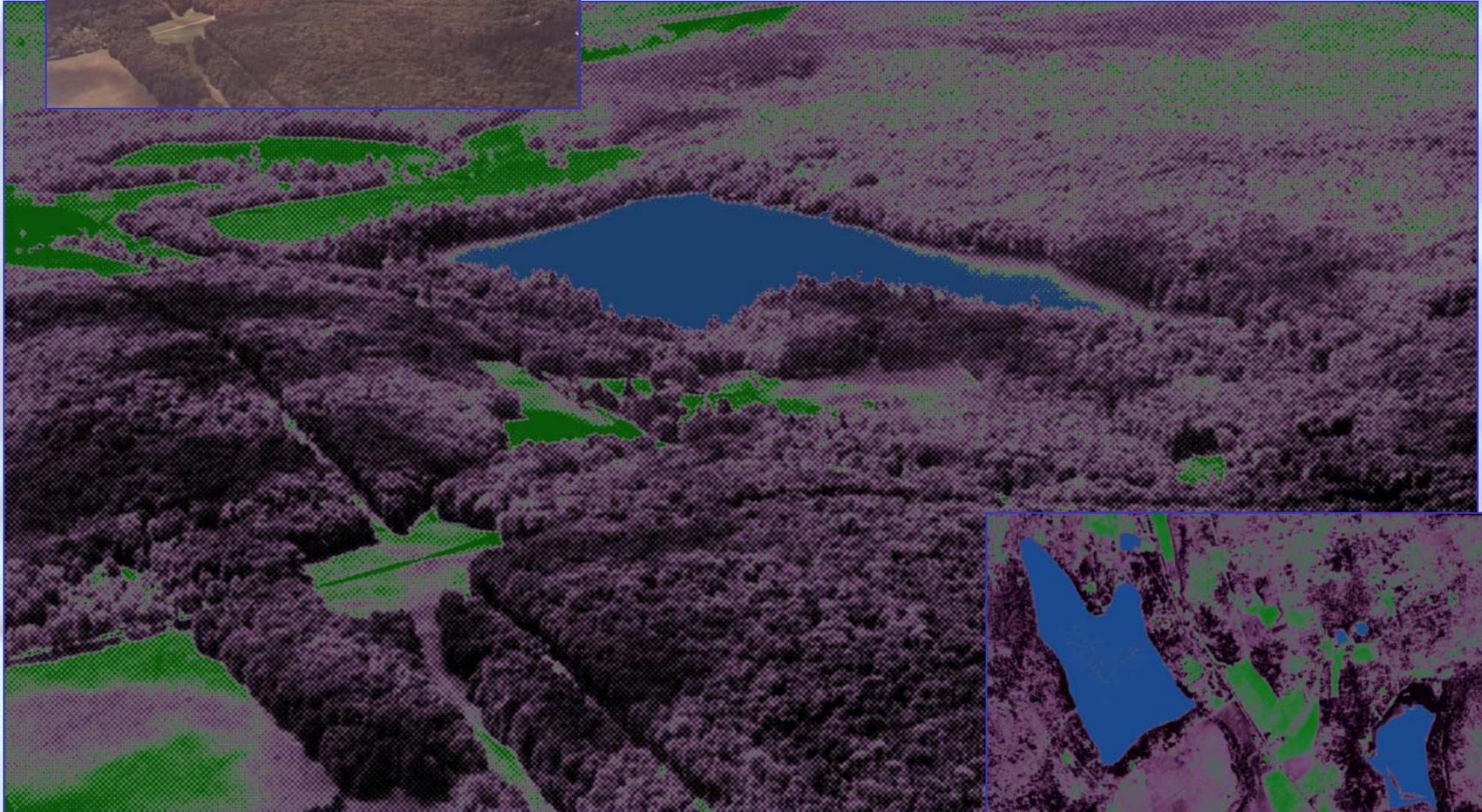
- Process breaking up the landscape into smaller pieces
- Increases in connectivity & patch size decrease effects of fragmentation



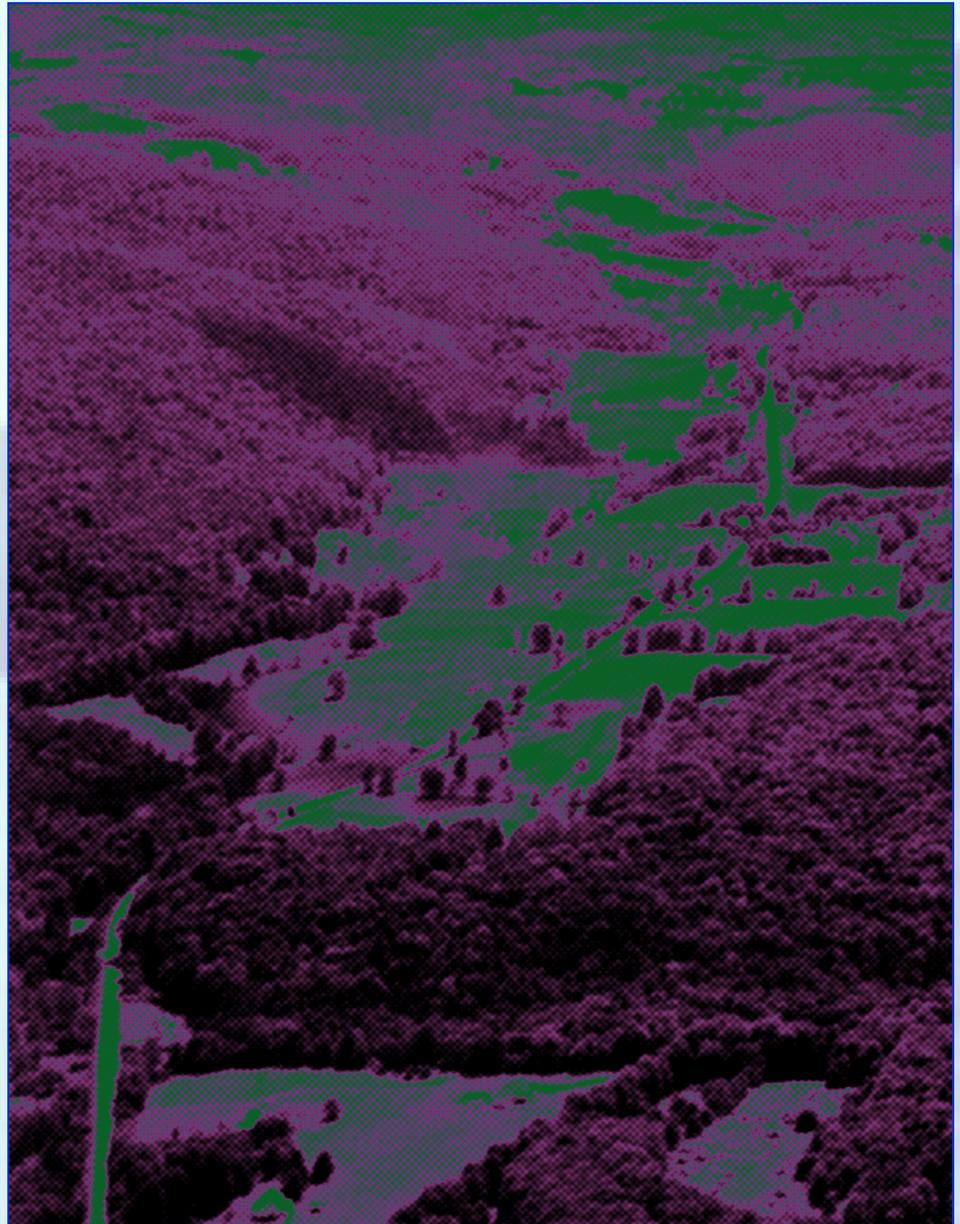
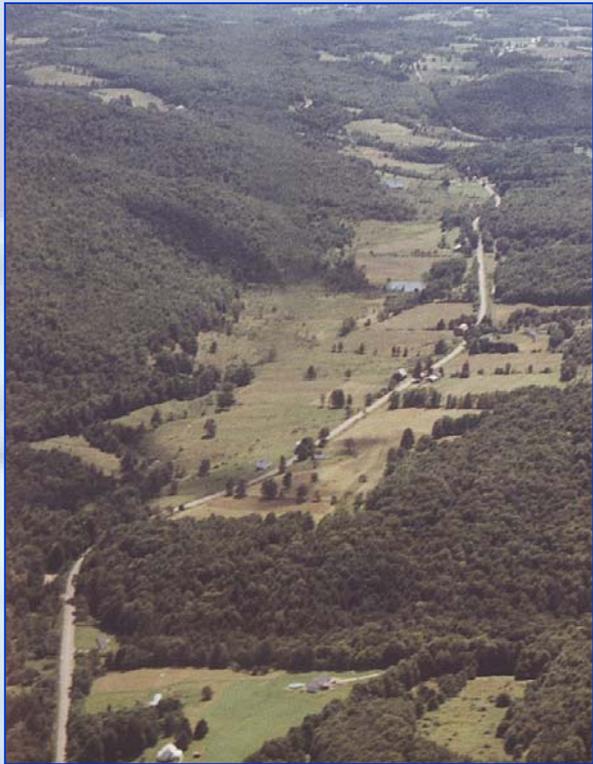
Mosaics in the Landscape



Silver Lake Mosaic



Choconut Valley Mosaic



Mosaics: Conservation

- Conserving coarse grained landscapes containing fine grained patches
- Increase connectivity by conserving creating & restoring corridors
- Increase landscape diversity: i.e. mystery, coherence, legibility & complexity

