

# Ecoplex Form, Structure and Function: Ecological Renovation Targets

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One concept that must be developed and appreciated in ecological renovation of community sites is how we delineate space. Where are the edges of a management unit? We must clearly understand the impacts of defining and visualizing biotic islands, corridors, and ecological connections.

The things that we manage all have very discrete physical limits within an ecosystem. These limits can be the edges or boundaries used in management. They do not lend themselves well to the intent nor letter of ecosystem definitions. The modified concept used here is "ecoplex." Ecoplex means "interwoven houses" and sets distinct spacial limits on ecological units for management.

## Interconnections

Ecoplex represents the interconnected ecological grid of biological units and their interactions among themselves, and with their environment. The urban ecoplex is a diverse tapestry of biotic threads, individuals, clumps, and patterns. The ecoplex is laid across hard, dense, ecologically sterile and managerially barren development used to facilitate the concentration and delivery of goods and services to a populations of humans.

In renovating ecological functions on community sites, the identification and delineation of ecological management units are required. There has been a tendency for managers to speak in extremely loose and general ways about ecosystems while concentrating upon discrete, limited patches of soils and plant materials. Both semantically and conceptually, this can lead to over-focusing on a park, a street, or a planting pit as individual systems, ignoring how they fit into the overall community ecoplex.

## By Any Other Name

The Western term "ecosystem" has been used to define a infinitely nested set of interactions and organisms. The term ecosystem has been used for everything from planet-wide scales to an individual tree's canopy. The delineation of borders or management boundaries is ecologically difficult under this concept. Political boundaries remain a primary way of setting management limitations. The setting of ecological unit management boundaries by political lines is problematic. Alternatively, a Russian concept of setting ecosystem walls is more appropriate for a urban and community natural resource manager. An ecological management unit must have a set size for planning, manipulation, renovation, and evaluation.

An ecoplex is a human-defined, area-limited, relatively structured, homogenous area of dynamic matter and energy interchanges between and among biological and non-biological components. In ecological renovation, we work with one portion of an ecoplex, multiple overlapping systems, or a complete community ecoplex. Genesis and maintenance of an ecoplex is dependent upon climate, landforms (watersheds), soils, organisms available to reach and colonize an area, and homogenous



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interactions of components across space and time. The key development indices of an ecoplex include an energy (trophic) distribution grid, biological diversity, and effective and efficient material cycling. Ecological fuel to power the ecoplex and its renovation comes from sunlight and from decaying organic matter.

### Ecoplex Features

An ecoplex has many identifiable characteristics when functioning properly. These features of an ecoplex should be recognized and incorporated into resource and process inventory, renovation procedures, and management evaluations. The primary features of an ecoplex can be summarized as:

- A. discrete structure (energy pathway, soil functions, water cycling, biological units, and atmosphere resources)
- B. identifiable functions (exchange of energy, exchange of materials, disturbance regimes, and successional patterns)
- C. interconnectedness (a loose federation of interactions — not a supra-organism with chaotic behavior (small changes lead to new equilibriums and new interactions))
- D. complexity (strong biological integration which allows multiple outcomes from many different inputs, from a diversity of organisms, and from system behavior that is chaotic)
- E. changes over time (highly dynamic not static)
- F. spacial limits drawn at many levels (individuals, relatives, family groups (not taxonomy), populations, species, communities, genetics at biological limits (plasticity — extreme site responses))

Expected long-term outcomes arising from ecoplex renovation activities are:

1. Viable native populations;
2. Biotic / abiotic interactions approaching normal distribution;
3. Facilitation of evolutionary and ecological processes;
4. Long periods (multi-generational) of time; and,
5. Accommodation of human use and occupancy.

### Further Information

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