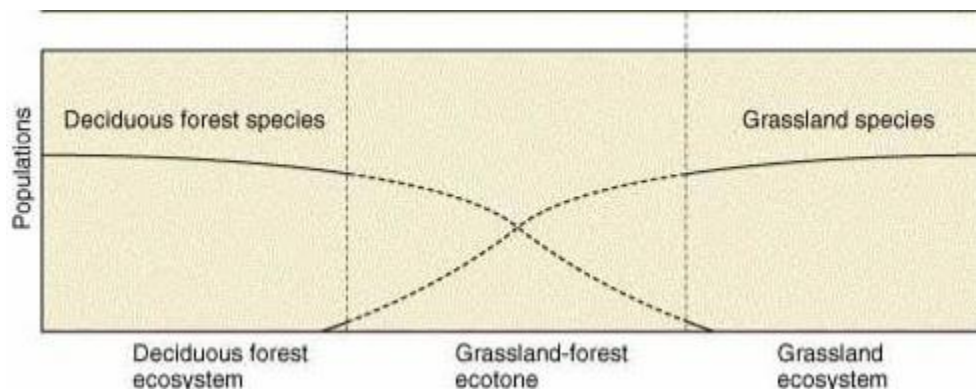


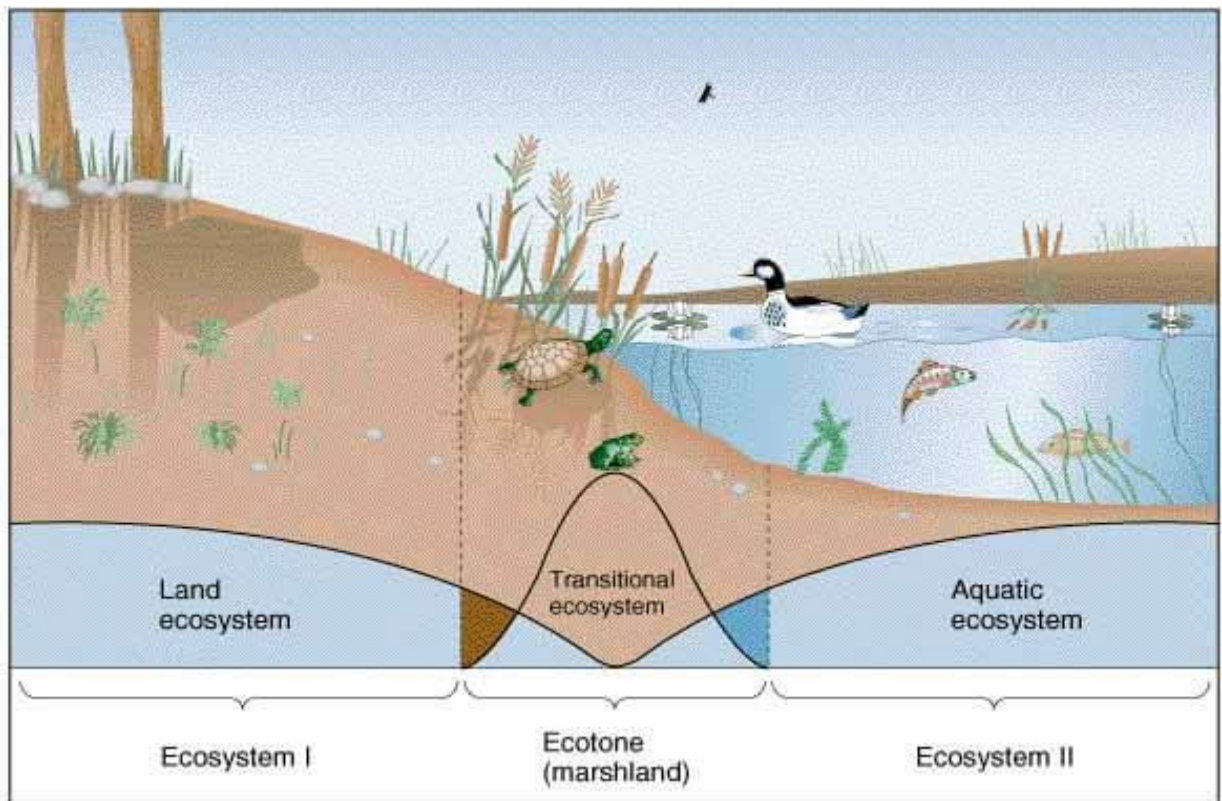
Ecotone and edge effect

An ecotone is a **zone of junction or a transition area** between two biomes (diverse ecosystems). It is the zone where two communities meet and integrate. For e.g. the **mangrove forests** represent an ecotone between marine and terrestrial ecosystem.

Other examples are **grassland** (between forest and desert), **estuary** (between fresh water and salt water) and **riverbank or marshland** (between dry and wet).



Diagrammatic representation of Ecotone



An ideal Ecotone

Characters of an Ecotone

- It may be narrow (between grassland and forest) or wide (between forest and desert).
- It has **conditions intermediate** to the adjacent ecosystems. Hence it is a **zone of tension**.
- Usually, the number and the population density of the species of an outgoing community decreases as we move away from the community or ecosystem.
- A well-developed ecotone contains some organisms which are entirely different from that of the adjoining communities.
- Species variation at Ecotone is generally very high than its adjacent ecosystems.

In ecology, **Edge Effects** are changes in population or community structures that occur at the boundary of two or

more habitats. Areas with small habitat fragments exhibit especially pronounced edge effects that may extend throughout the range. As the edge effects increase, the boundary habitat allows for greater biodiversity.

Types

- Inherent – Natural features stabilize the border location.
- Induced – Transient natural disturbances (e.g., fire or flood) or human related activities, subject borders to successional changes over time.
- Narrow – One habitat abruptly ends and another begins (e.g., an agricultural field.)
- Wide (ecotone) – A large distance separates the borders of two clearly and purely definable habitats based upon their physical conditions and vegetation, and in between there exists a large transition region.
- Convolved – The border is non-linear.
- Perforated – The border has gaps that host different species.

Examples

When edges divide any natural ecosystem and the area outside the boundary is a disturbed or unnatural system, the natural ecosystem can be seriously affected for some distance in from the edge. In 1971, Odum wrote, 'The tendency for increased variety and diversity at community junctions is known as the *edge effect*... It is common knowledge that the density of songbirds is greater on estates, campuses and similar settings...as compared with tracts of uniform forest.'. In a forest where the adjacent land has been cut, creating an open/forest boundary, sunlight and wind penetrate to a much greater extent, drying out the interior of the forest close to the edge and encouraging growth of opportunistic species there. Air temperature, vapor pressure deficit, soil moisture, light intensity and levels of photosynthetically active radiation (PAR) all change at edges.

Amazon rainforest

One study estimated that the amount of Amazon Basin area modified by edge effects exceeded the area that had been cleared. "In studies of

Amazon forest fragments, micro-climate effects were evident up to 100m (330ft.) into the forest interior." The smaller the fragment, the more susceptible it is to fires spreading from nearby cultivated fields. Forest fires are more common close to edges due to increased light availability that leads to increased desiccation and increased understory growth. Increased understory biomass provides fuel that allows pasture fires to spread into the forests. Increased fire frequency since the 1990s is among the edge effects that are slowly transforming Amazonian forests. The changes in temperature, humidity and light levels promote invasion of non-forest species, including invasive species. The overall effect of these fragment processes is that all forest fragments tend to lose native biodiversity depending on fragment size and shape, isolation from other forest areas, and the forest matrix.