Ecotone and Edge Effect

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Ecotone is the zone of vegetation separating two different types of communities. It is also known as transition zone (Fig 5.1). Examples - an area connecting the forests and grasslands, or a stream running between the meadows. The vegetation of this zone is highly specialized. The region can be narrow or wide. The vegetation is influenced by the environmental conditions. The region between a pond and the surrounding upland is an example of narrow ecotone. It possesses a sufficiently high number of species, i.e. greatest species diversity at a time. The number of species is higher in this region as compared to neighboring areas. This area contains species from both the communities adjacent to each other. Increased variety of plants present at a particular boundary is called edge effect.

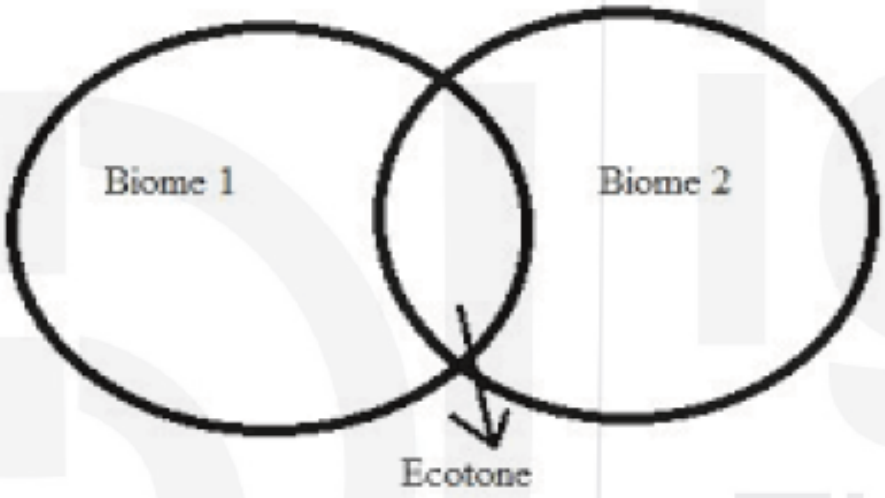


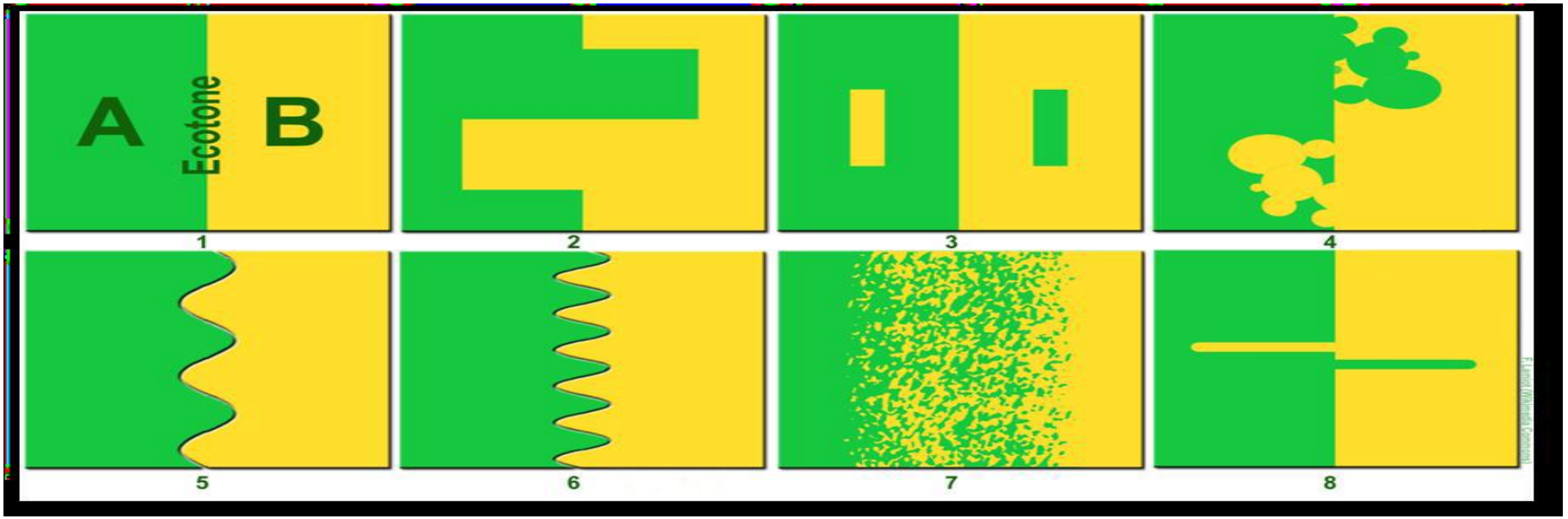
Fig. 5.1: Diagrammatic representation of ecotone.

Formation of ecotone

When physical environment changes, example from forest to clean land, a clear and sharp interface is created between two communities. Moreover, gradual blended interface forms when unique local species and species common to both interacting community found together for example in Mountain ranges. Most Wetlands are ecotones (eg. woodlands of Western Europe).

Type of ecotone

a. Halocline (gradient salinity)
b. Thermocline (gradient in temperature)
c. Pycnocline (water density gradient)
d. Chemocline (chemical gradient)



Features

1. A sharp vegetation transition for example change in grass colours indicates an ecotone.
2. Physiognomy: a key indicator of ecotone where the plant species differ in physical appearance.
3. Change in species is indicators of ecotone where we observe some specific organisms at one side of the ecotone boundary while some other specific organism on the other side.
4. **Spatial mass effect**: New plant establishment or migration obscures an ecotone as they cannot form self sustaining population in different ecotone. But if survives between two communities, then species richness is exhibited by the ecotone.
5. An ecotone can reveal the space sharing efficiency of two communities and the types of biomes by observing the exotic species abundance in ecotone.
6. Best model to study diverse ecosystem.
7. Shift in dominance represented by ecotone.
8. Ecotone act as an ecological niche for the species colonizing at the junction called **edge effect**.
9. **Ecoclines:** A physical transition zone between biological systems termed as ecoline relates to ecotone. It depicts the physiochemical environmental changes microclimatically or chemically signalling an ecotone *via* signals such as gradient of hydrothermal, salinity or pH respectively.

Edge Effect

In ecology, ecotone exhibit changes in population constituting community structure allowing for greater biodiversity at the boundaries of the merged habitats and this is called as **edge effects**. When two habitats are separated by wise edge effects called ecotone than they develop their own type of vegetation and environmental conditions.

Types of Edge effects

1. **Narrow Edge effect**: Abrupt ending of one habitat from where another habitat begins is a narrow edge effect.
2. **Wide Edge effect:** Significant distance between two habitats is exhibited as Wide edge effect or ecotone.
3. **Induced Edge effect:** The structural changes are induced over time either by the human interference or natural disturbances (eg. fire) and leads to induced edge effect.
4. **Inherent Edge effect:** The border between two habitats are separated and stabilized by natural features are called as Inherent edge effect.
5. **Perforated Edge effect:** The distance between two habitats has gaps in them which help in assisting other habitats.
6. **Convoluted Edge effect:** A nonlinear division of two habitats leads to convoluted edge effect.

Edge effects on Succession

When vegetation spreads the succession is affected by edge effects. Different species colonizes to central portions or to the edge leading to differential species distribution. With the change in orientation the edge also changes, thus, participating in different vegetation patterns.