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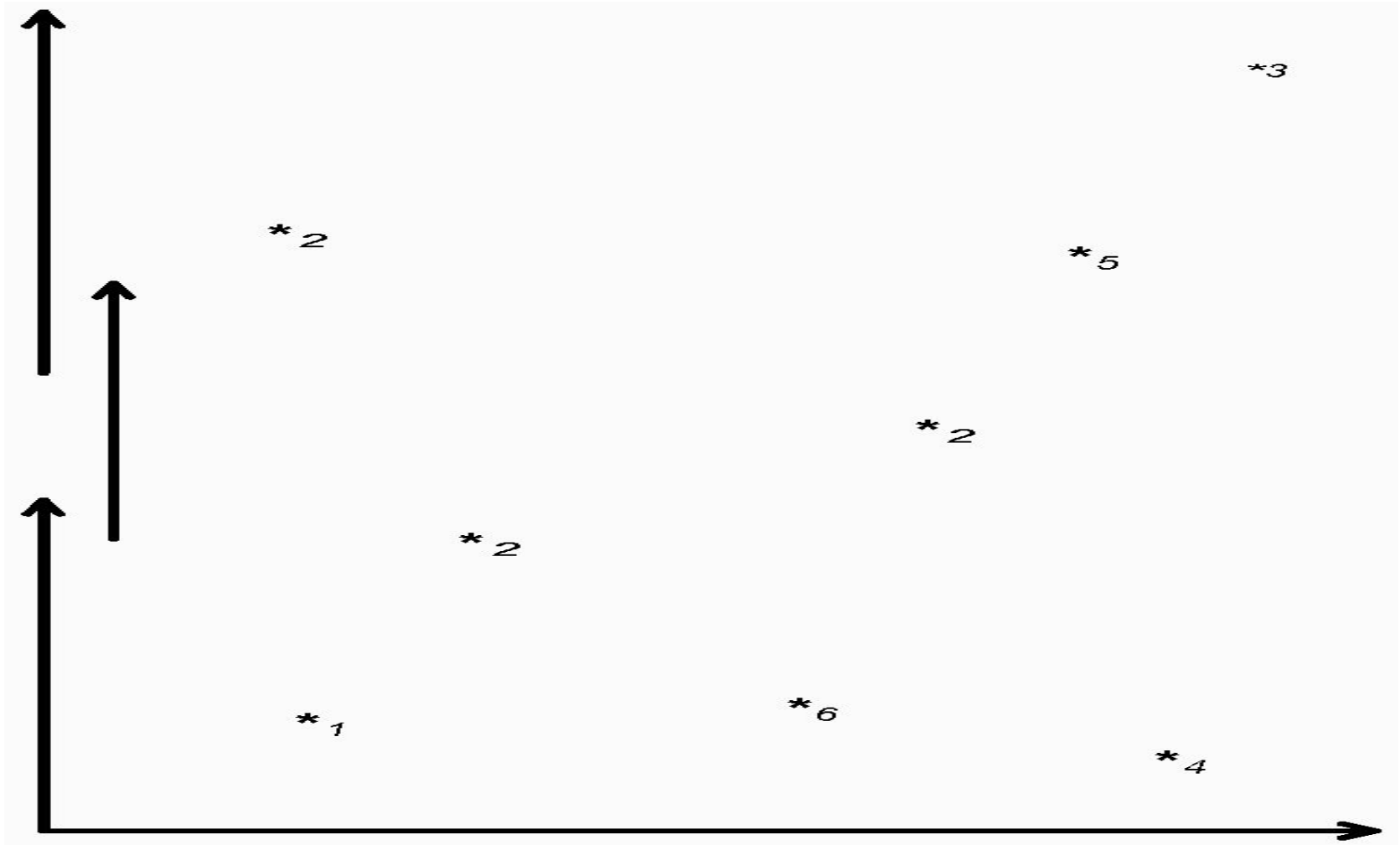


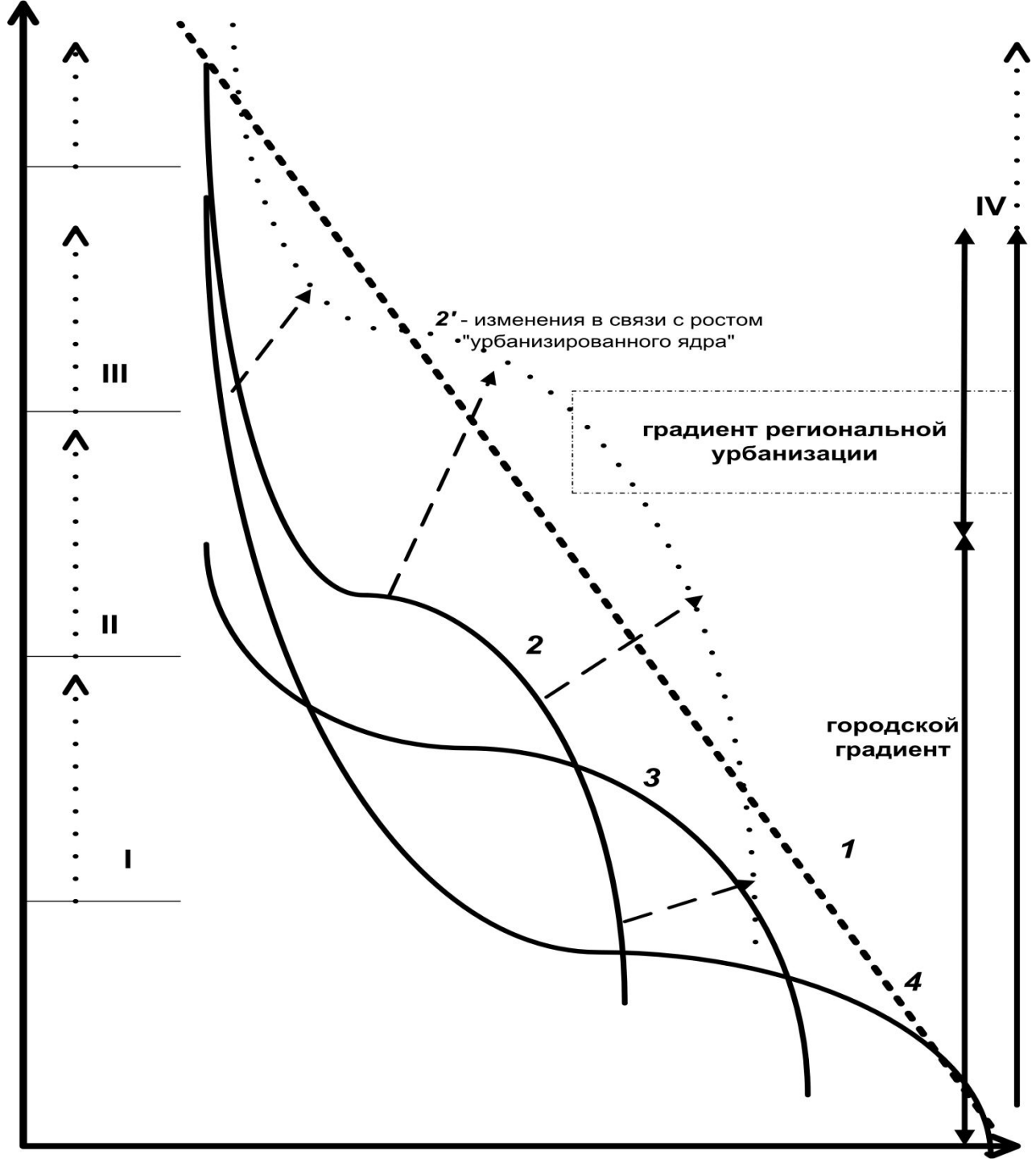




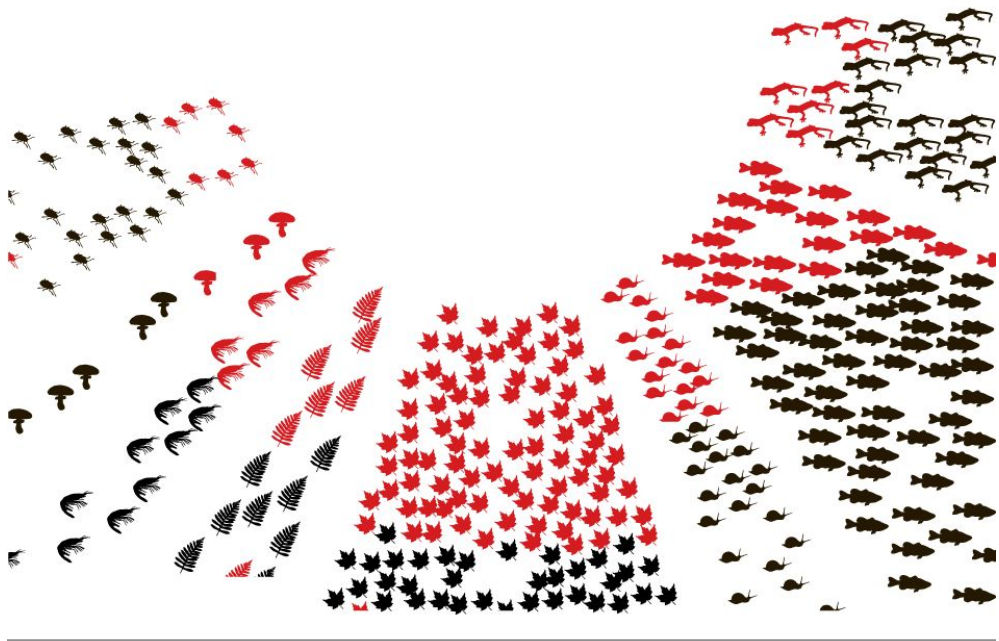
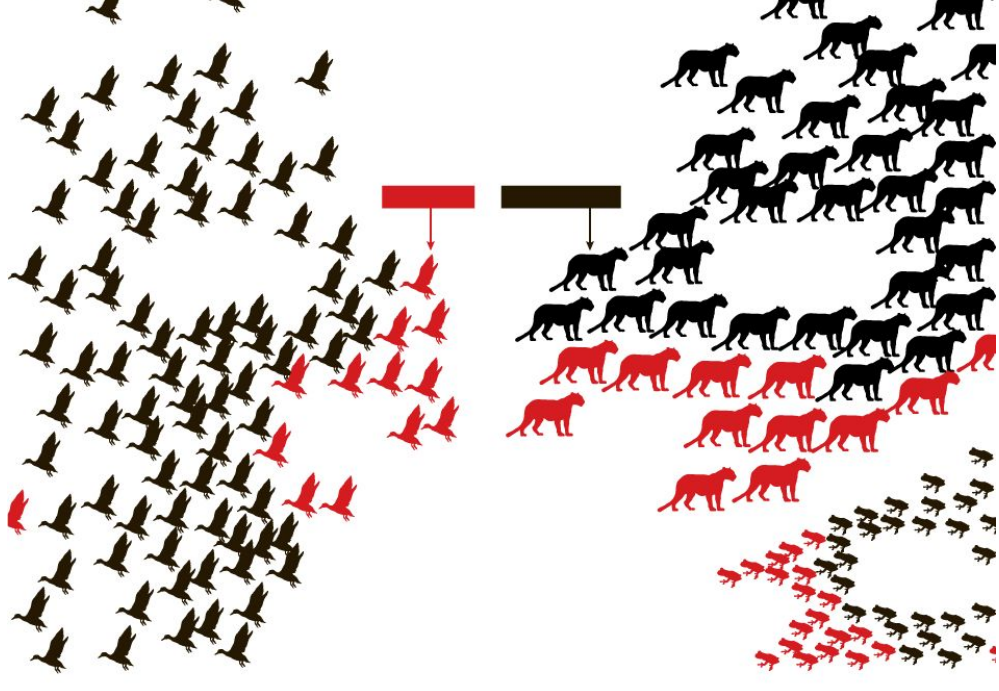
## Место городских местообитаний среди других вариантов “островного ландшафта”.

- 1 – лесные микрофрагменты в зоне лесостепи), 2 – участки старовозрастных еловых (2а), “старых мелколиственных” (2б), и широколиственных лесов (2в) в урбанизированных регионах,  
3 – “острова” природных территорий в структуре урбандошфта ,  
4 – краевые популяции видов, переживших длительный период роста численности и быстрого расширения ареала,  
5а – фрагментация участков южнотаёжных лесов автодорожной сетью







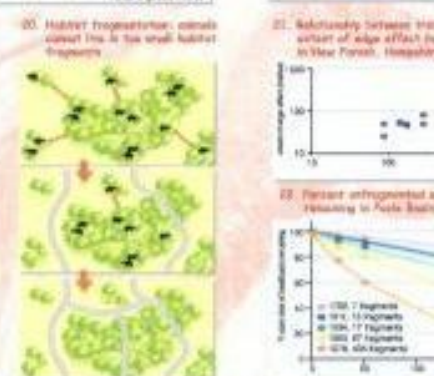
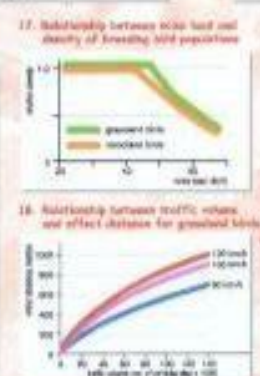
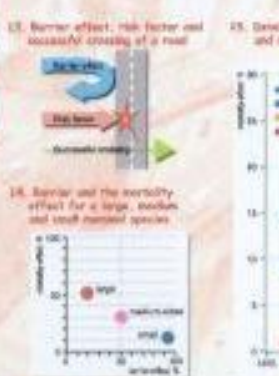
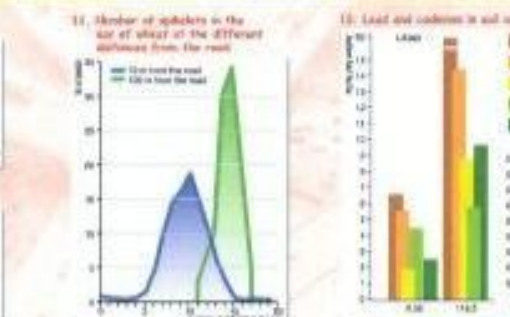
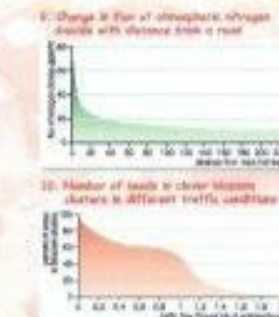
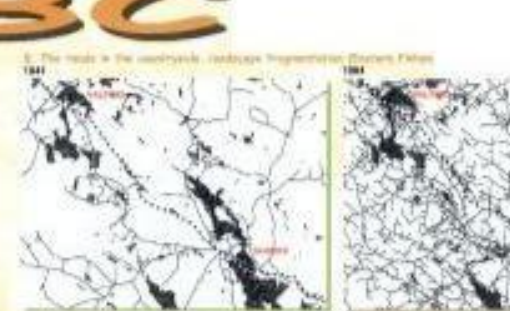
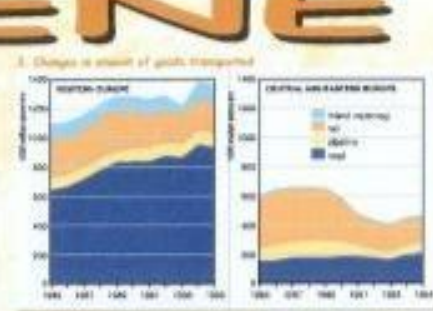
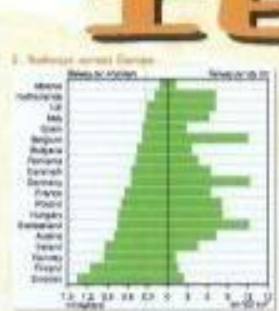
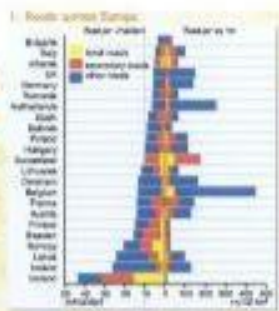


# IENE ABC

FACTS

PROBLEMS

SOLUTIONS



**24. Conditions affecting use of a passage**

Species group	Species	Effect
Amphibians	Water voles, etc.	Large water areas or embankments surrounding the passage.
Reptiles	Large mammals, etc.	Large mammals or embankments surrounding the passage.
Small mammals	Small mammals, etc.	Small mammals or embankments surrounding the passage.
Large mammals	Large mammals, etc.	Large mammals or embankments surrounding the passage.
Carabid beetles	Carabid beetles, etc.	Large mammals or embankments surrounding the passage.
Birds	Large birds, etc.	Large mammals or embankments surrounding the passage.
Ungulates	Large ungulates, etc.	Large mammals or embankments surrounding the passage.

**The IENE principles**

1. IENE is an interdisciplinary approach to road construction and road management.
2. IENE is a multidisciplinary approach to road construction and road management.
3. IENE is a participatory approach to road construction and road management.
4. IENE is a holistic approach to road construction and road management.
5. IENE is a systems approach to road construction and road management.
6. IENE is a long-term approach to road construction and road management.
7. IENE is a flexible approach to road construction and road management.
8. IENE is a transparent approach to road construction and road management.
9. IENE is a collaborative approach to road construction and road management.
10. IENE is a learning approach to road construction and road management.

**References**

See the IENE website for more information: [www.iene.org](http://www.iene.org)

# Fragmentation

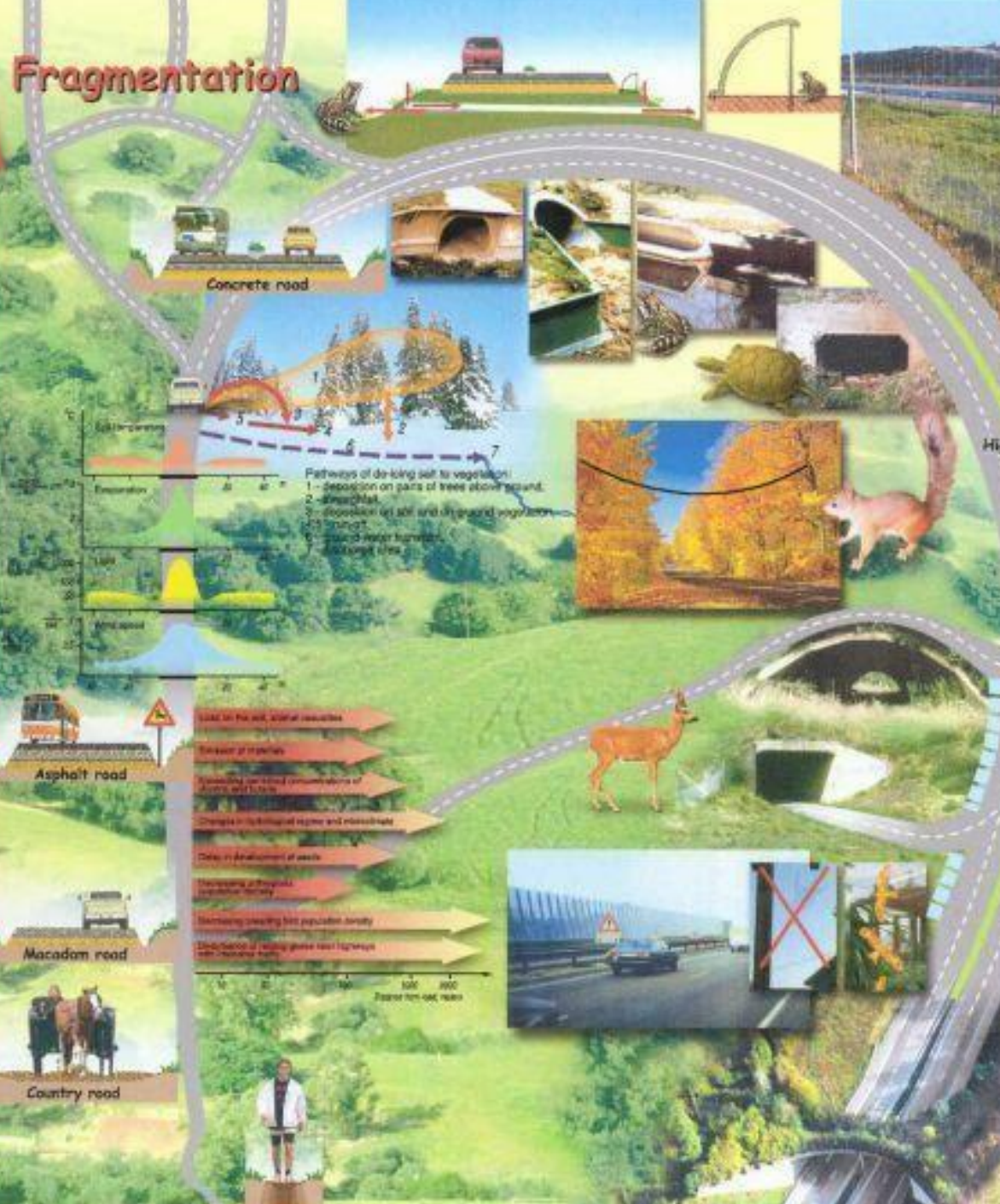
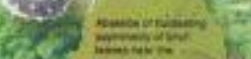
IMPACT ON THE ECOSYSTEMS

High level of fluctuating asymmetry of leafhoppers near the highway

High level of fluctuating asymmetry of leafhoppers near the highway

Fluctuating asymmetry of leafhoppers near the highway

Fluctuating asymmetry of leafhoppers near the highway



Concrete road

Asphalt road

Macadam road

Country road

Highway

De-fragmentation

- Loss of the soil, natural resources
- Exhaustion of minerals
- Increased chemical concentrations of acids, salt, toxic
- Changes in hydrological regime and microclimate
- Delay in development of seeds
- Increasing of physical landscape heterogeneity
- Increasing of the population density
- Disruption of nesting places near highways

Trail

www.iene.

