

Evaluation of habitat fragmentation

by mapping cost-benefit based reachability of resources on regional scale.

Method development - Reachability

Reachability was introduced to evaluate forage and range quality including decreasing availability due to fragmentation.

Reachability incorporates:

- Forage quality & quantity
- Availability
- Edge effects on habitats
- Cost of movement & effective distance in fragmented terrain.

The method can handle more complex classification of movement cost, forage values, fragmentation values and include topography and energetic costs. The method are not species specific and have potential in conservational aspects and infrastructural planning.



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Geographic Information System (GIS)

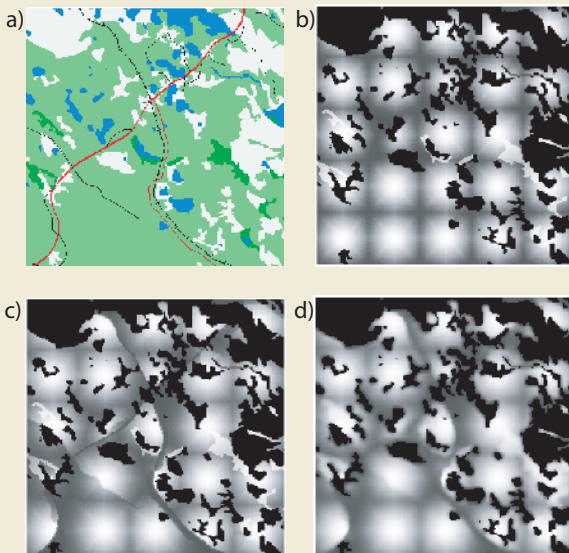
- Cost efficient analysis and prediction tool.
- Potent for complex large scale investigations
- Invaluable tool when studying spatial ecology.
- Essential when calculating reachability values.

GIS is used in the reachability model for:

- Classifying forage and fragmentising values
- Calculating cost of movement & effective distance
- Multiplying effective distance and forage values
- Applying & subtracting edge effects
- Summing up reachability values of compared areas

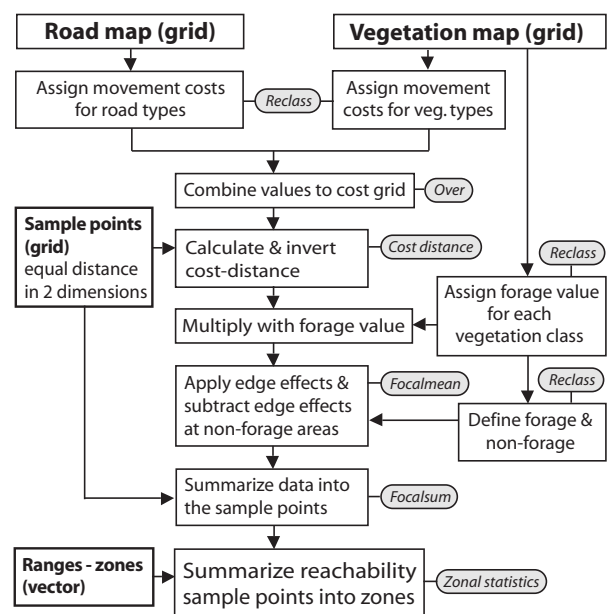
Digital vegetation, road and topography maps are available. Species specific costs of movement can be achieved through usage of GPS-technology.

Method test area



- a) Lakes (blue), forage classes (greens), non-forage (white) and roads of different fragmentising effect.
b) Reachability calculation of forage value without linear structures. (white - high, black - low reachability)
c) Reachability calculation including road net.
d) Reachability calculation including road net and edge effects.

Terrain and waters were given movement costs of one and ten, respectively. Roads vary in fragmentising values, and ground varies in forage value. Sample points are 1 km apart.



Steps in the GIS analysis of the reachability model.
ArcInfo™ - commands indicated with grey rounded boxes.

