

Wilderness and Large Natural Habitat Areas in Europe

THE ROLE OF CONNECTIVITY

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Ask the right questions

THE ROLE OF CONNECTIVITY

- ▶ Where do ecological processes need to be maintained or strengthened?
- ▶ What conditions need to be met to ensure that linkages function effectively?



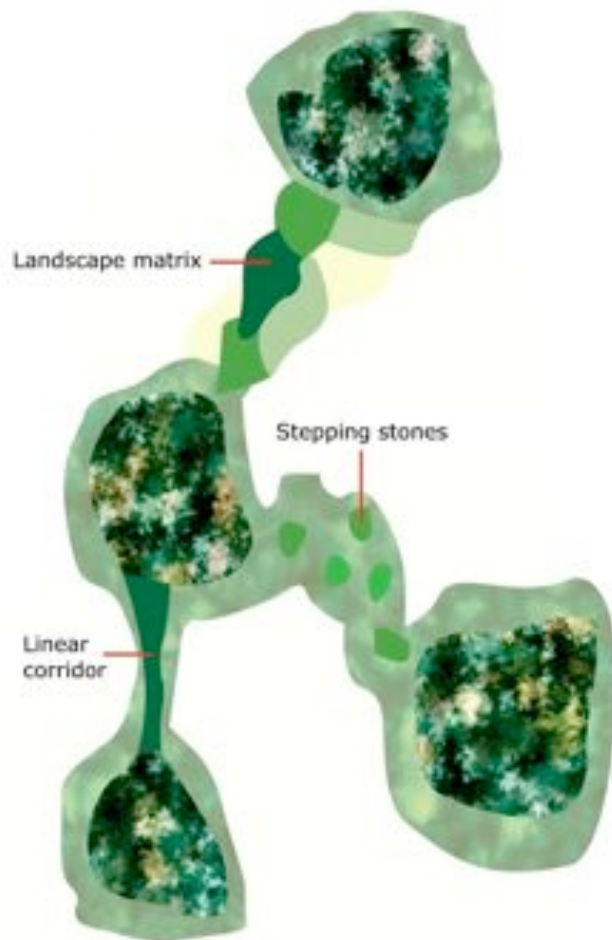
WHY CONNECTIVITY?

Linking isolated patches of habitat can in principle increase the viability of local species populations by:

- ▶ Allowing access to a larger area of habitat
- ▶ Allowing seasonal migration
- ▶ Permitting genetic exchange with other populations
- ▶ Allowing local populations to move away from a degrading habitat
- ▶ Securing the integrity of vital environmental processes that are vital for certain species



TYPES OF LINKAGE



- ▶ Connectivity enables four main kinds of movement:
 - local movement
 - dispersal
 - nomadism
 - seasonal migration
- ▶ Movement through linkages can take place at all scales, from local through regional to continental
- ▶ Landscape linkages can take three different forms:
 - a linear corridor
 - stepping stones
 - a permeable landscape matrix

UNDERSTANDING CONNECTIVITY

Determining the way in which linkages function raises many difficulties, including:

- ▶ Would individuals cross the barrier even without the linkage?
- ▶ Does the presence of the species in the linkage indicate movement between habitat patches?
- ▶ Has monitoring extended over a long enough time?
- ▶ Can other hypotheses explain movement between habitat patches?
- ▶ Does the linkage have negative effects?
- ▶ Is the linkage the most cost-effective way of achieving the conservation objective?





EXAMPLE

Wolves in the Canadian Rockies

- ▶ In the Canadian Rocky Mountains, the landscape confines the movements of wolves to low-lying valley bottoms
- ▶ The Bow Valley permits the movement of wolf packs between Canada and the US
- ▶ However, the natural valley habitat became fragmented by urban centres, tourist facilities and roads, forcing wolves to use other routes which are more circuitous and less suitable
- ▶ In the Banff area, the route with the greatest potential for use by wolves is the Cascade Corridor
- ▶ To restore the 6 km-long corridor, Parks Canada agreed to reduce human activities in the corridor

THE BOW VALLEY REGIONAL CORRIDOR



THE CASCADE CORRIDOR

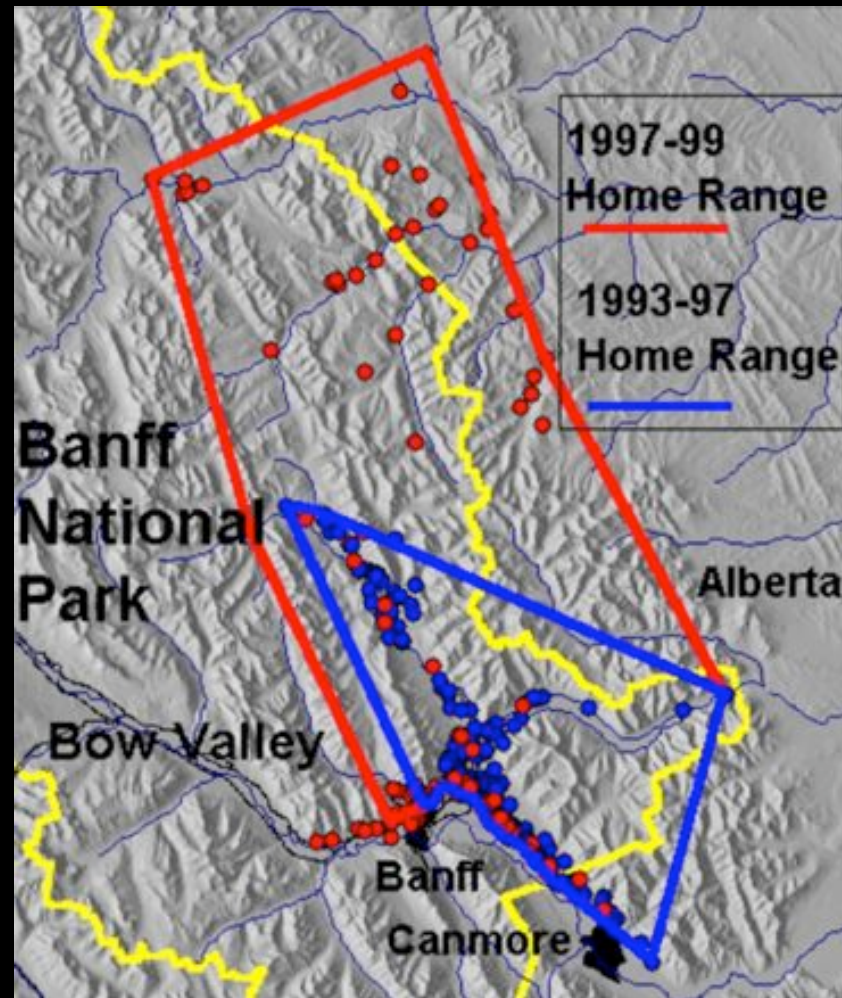


THE CASCADE CORRIDOR

Actions and Results

- ▶ In 1997, Parks Canada removed barns, a buffalo paddock and horse corrals and closed the airstrip except for emergency use
- ▶ Following these actions, the Cascade Corridor was used by wolves more than expected in the period 1997–1999 compared with the period 1993–1997
- ▶ Variations in snow depth, the abundance of elk and shifting wolf packs do not seem to explain the increased use of the corridor
- ▶ Conclusion: the restoration actions increased the attraction of the corridor for wolves, both as a linkage and as additional habitat

EXPANDED HOME RANGE



CONCLUSIONS

The Value of Connectivity in Practice

- ▶ There is a substantial and growing body of evidence from conservation practice indicating that linkages can have a positive conservation effect on the viability of fragmented species populations
- ▶ In most cases, it is not feasible to demonstrate scientifically that a linkage enhances the long-term viability of a species population
- ▶ However, in most of the examples studied, protecting, enhancing or restoring a linkage was clearly the most cost-effective conservation option, and in many cases the only option available to achieve the conservation objective



CONCLUSIONS

The Value of Connectivity in Practice

- ▶ Due to the complexity of factors that affect the way each linkage functions, the results achieved with a specific linkage cannot be easily generalised
- ▶ Improved understanding of movement in the landscape can help prevent fragmentation that would seriously reduce the viability of species populations
- ▶ Results to date support the more extensive application of well-designed linkages, particularly for species populations that are threatened, wide-ranging and fragmented



CONCLUSIONS

Connectivity and Wilderness Areas

- ▶ Most wilderness areas in Europe are relatively small and fragmented
- ▶ Strengthening connectivity can be important for wide-ranging species and large-scale environmental processes
- ▶ Strengthening connectivity can help recreate large functioning ecosystems
- ▶ Strengthening connectivity can increase the socio-economic and cultural benefits that are generated by wilderness

We can help them!

LINKAGES IN PRACTICE

