

ABSTRACT: the TRUNPA-project

In most parts of Central Europe the industrialisation caused fragmented overdeveloped landscapes which nowadays extremely complicate the plant species' migration and hardly constrain a species and gene flow between ecosystems. Thus a proactive reaction of the vegetation on threats of climatic change is disabled⁽¹⁾. As basic of all preservation concept consistency has to be returned to the landscapes .

Sheep evolved as an adapted livestock of the eastern Mediterranean. Afterwards human's wool-breeding has improved sheep's ability of seed dispersion by epizoochory^(2,3). Also the sheep endozoochory offers an additional option of a considerable seed transport. This was also observed for goats and tree seeds⁽⁴⁾. A recently analysed genetic variation of identical plant species along long-distanced drover roads is underlining this diversity-hypothesis⁽⁵⁾. Due to their wool the sheep are considered as most efficient seed transporting livestock.

Climate change will speed up the change of most of ecosystems. All phytocoenosis are effected by species' emigration and immigration. But extensive rangeland use increases the magnitude of habitats, and transhumant sheep are widening the Gaussian distribution of species abundance by both slowing down species emigration through seed's return and an increasing the quantity of neophytes⁽⁶⁾. Thus the an ecosystem biodiversity gets effectively augmented emending stability and productivity to the changing environmental conditions and lowering probability of a neophyt's dominance^(7,8,9). Species' redundancy raises the reliability of ecosystem services^(10,11,12,13).

In Europe it is strived for Green Corridors connecting Natura2000 sites enabling gene flow and species migration. This offers a plant species preserving landscape and husbandry design. Returning to landscapes their ecological continuity has to be an essential element of all modern designed preservation concepts. This includes a socio-economical background, which makes possible an human arranged enhancement of seed migration: Transhumant Rangeland Use and Networking of Protected Areas (TRUNPA).

TRUNPA-project aims to facilitate an Europe-wide reintroduction of sheep transhumance. There have to be investigated the following contents:

- 1. botanic reaction of climate change,*
- 2. genetics and epigenetics of plant species,*
- 3. landscape-architecture of a transhumant network,*
- 4. socio-economic issues of transhumant sheep husbandry,*
- 5. livestock sciences.*

The approach has to be holistic. Social as well as botanical variances and tresholds have got to be identified and the social, practical, environmental and political options of a realisation have to analysed. As examples of landscaping serve the transhumant network of drover roads in the ancient Spain⁽¹⁴⁾ as well as the "BfN" proposal of "Green Corridors" through Germany⁽¹⁵⁾.

Literature:

1. Wilfried Thuiller, Sandra Lavorel, Miguel B. Araújo, Martin T. Sykes, I. Colin Prentice. 2005. Climate change threats to plant diversity in Europe. *National Academy of Sciences of the USA* 102, 23:8245-8250.
2. Malo-JE, Jiménez-B, Suarez-F. 2000. Herbivore dunging and endozoochorous seed deposition in a Mediterranean dehesa. *J. Range Manage.* 53(3):322-328.
3. Manzano-P, Malo-JE. 2006. Extreme long-distance seed dispersal via sheep. *Front Ecol Environ:* 4(5): 244–248.
4. Frascuito Luque. 08-2001. herder with 62 years of professional experience from Güejar Sierra, Granada, Spain (oral communication)
5. Prof. Dr. Peter Poschlod. 11-2009. Institut für Botanik, Universität Regensburg (unpublished article).
6. Antonio Gongora Martínez. 09-2002. herder with 49 years of professional experience from San José, Almería, Spain (oral communication) Clarence L. Lehman, David Tilman. *Biodiversity, Stability, and Productivity in Competitive Communities.* vol. 156, no. 5 the american naturalist november 2000
7. Peter B. Reich, Jean Knops², David Tilman², Joseph Craine³, David Ellsworth[§], Mark Tjoelker, Tali Lee, David Wedink, Shahid Naeem², Dan Bahaiddin, George Hendrey[§], Shibu Jose, Keith Wrage, Jenny Goth & Wendy Bengston. 2001. Plant diversity enhances ecosystem responses to elevated CO₂ and nitrogen deposition. *Nature* VOL 410.
8. David Tilman & John A. Downing. 1994. Biodiversity and stability in grasslands. *Nature* Vol. 367. 363 – 365.
9. Elisa Thébault and Michel Loreau. 2005. Trophic Interactions and the relationship between species diversity and ecosystem stability. *The American Naturalist* 166,4: E95-E114.
10. Shahid Naeem. 1998. Species redundancy and ecosystem reliability. *Conservation Biology* 12,1:39-45.
11. Shahid Naeem, 2001. How changes in biodiversity may affect the provision of ecosystem services. In V.C. Hollowell, ed. *Managing Human-Dominated Ecosystems: Proceedings of the Symposium at the Missouri Botanical Garden, St. Louis, Missouri, 26-29 March 1998.* Missouri Botanical Garden Press, St. Louis Missouri, pp. 3-33.
12. G. David Tilman, Donald N. DuVick, Stephen B. Brush, R. James Cook, Gretchen C. Daily, Geoffrey M. Heal, Shahid Naeem and David Notter. 1999. *Benefits of Biodiversity: Task Force Report No. 133, Council for Agricultural Science and Technology.* 4
13. Shahid Naeem, F.S. Chapin III, Robert Costanza, Paul R. Ehrlich, Frank B. Golley, David U. Hooper, J.H. Lawton, Robert V. O'Neill, Harold A. Mooney, Osvaldo E. Sala, Amy J. Symstad, David Tilman. 1999. *Biodiversity and ecosystem functioning: maintaining natural life support processes. Issues in Ecology, Number 4, Fall 1999.*
14. Cosme. 2008. *Andando por España. La Mesta. Mapa de las cañadas.* Available at: <http://www.nuevoportal.com/andando/mesta.html#LAS%20CA%C3%91ADAS%20TRAS>
15. BfN (Bundesministerium für Naturschutz), 2008a. *Naturschutzgebiete Deutschlands > 5.000 ha.* Available at: http://www.bfn.de/0308_nsg.html