

BIOL/ENST/NORT 3313: ECOLOGICAL STRUCTURE IN NORTHERN ENVIRONMENTS

TOPIC 5: NORTHERN FOOD WEBS

Functional responses

Merging dynamics with foraging behaviour

The world is green hypothesis (HSS)

The exploitation ecosystems hypothesis (EEH/OFAN)

Exploitation ecosystems in arctic environments

Simple or complex food webs?

Spill-over predation

Tests of exploitation ecosystems

Interactions in food webs

The dissenters

Why are food chains short?

Interaction strength

Something to think about:

Cyclical population dynamics appear to be limited to northern herbivores and some of their predators. Why should this be so? What predictions does the exploitation ecosystems hypothesis make about populations in the southern hemisphere?

Required reading:

Schindler, D. E. et al. 2010. Population diversity and the portfolio effect in an exploited species. Nature 465:609-612. <http://dx.doi.org/10.1038/nature09060>

Workshop 5:

Final preparations: draft class term research proposal.

Outline the research program by drawing a flow chart or design matrix. Write an outline of the proposal and allocate tasks for the first draft. At the end of class, select one of the following terms describing your self-assessment on this task (exceptional, outstanding, very strong, strong, moderate, insufficient). Do the same for the class as a whole. Submit both 'scores' to your GA before leaving. Answer the following questions:

Do we understand and agree on the problem?

Does it truly address fundamental issues in the ecological structure of northern ecosystems?

Do we have a clear roadmap on the research program?

Does everyone feel confident in writing a research proposal?

What is the completion date for the first draft?

Some related reading:

Turchin, P. et al. 2000. Are lemmings prey or predators? *Nature* 405:562-565.

<http://www.nature.com/nature/journal/v405/n6786/full/405562a0.html>

Oksanen, T. et al. 2008. Arctic lemmings, *Lemmus* spp. and *Dicrostonyx* spp.: integrating ecological and evolutionary perspectives. *Evolutionary Ecology Research* 10:415-434.

Abstract only available at LU. <http://www.evolutionary-ecology.com/abstracts/v10/2304.html>

Gauthier, G. et al. 2009. Arctic lemmings are not simply food limited – a comment on Oksanen et al. *Evolutionary Ecology Research* 11:483-484.

<http://www.zoology.ubc.ca/~krebs/papers/238.pdf>

Oksanen, T. et al. 2009. On the implications of currently available data on population fluctuations of arctic lemmings – reply to Gauthier et al. *Evolutionary Ecology Research* 11:485-487. <http://pub.epsilon.slu.se/4493/1/JonasDooar2438.pdf>

Schindler, D.E. et al. 2015. The portfolio concept in ecology and evolution. *Frontiers in Ecology and the Environment* 5:257-263. <http://onlinelibrary.wiley.com/doi/10.1890/140275/pdf>

Boonstra, R., H. P. Andreassen, S. Boutin, J. Hušek, R. A. Ims, C. J. Krebs, C. Skarpe and P. Wabakken. 2016. Why do the boreal forest ecosystems of northwestern Europe differ from those of western North America? *Bioscience* 66:722-734.

<http://www.zoology.ubc.ca/~krebs/papers/302.pdf>