

How do we define a population?

Required reading: Preface pgs xix-xxii in Vandermeer, JH and Goldberg, DE. 2013.
[Population Ecology: First Principles \(2nd Edition\)](#).



Photo credit: www.npr.org: Gurinder Osan/AP



Photo credit: wwf.worldwildlife.org



Photo credit: peupleloup

What is a population?

population

A group of interbreeding individuals that exist together in time and space.

Levin, S. 2013. [*Princeton Guide to Ecology – Population Genetics and Ecology.*](#)

A *population* is a group of individuals of the same species that have a high probability of interacting with each other. A simple

Hastings, A. 1996. Population Biology: Concepts and Models.

Why does it matter?

A **population** is simply a collection of individuals, but the idea of a population is considerably more complex

What size limits should be placed on a fishery?

- Size distribution
- Reproduction and survivorship as a function of size

When is it best to take action on the emergence of an agricultural pest species?

- the distribution of individuals in various life stages





COSEWIC
Committee on the
Status of Endangered
Wildlife in Canada

biodivcanada.ca:

[Technical thematic report No. 10 – Northern caribou population trends in Canada](#)

COSEWIC advises the Canadian government on species to be listed on the List of Wildlife Species at Risk protected by the *Species at Risk Act* (SARA)

For those species listed it is illegal to:

- kill, harm, harass, capture or take an individual;
- possess, collect, buy, sell or trade an individual or any part of an individual; and
- damage or destroy the residence of one or more individuals.



Figure 3. Ranges and recent trends of northern caribou populations in Canada.

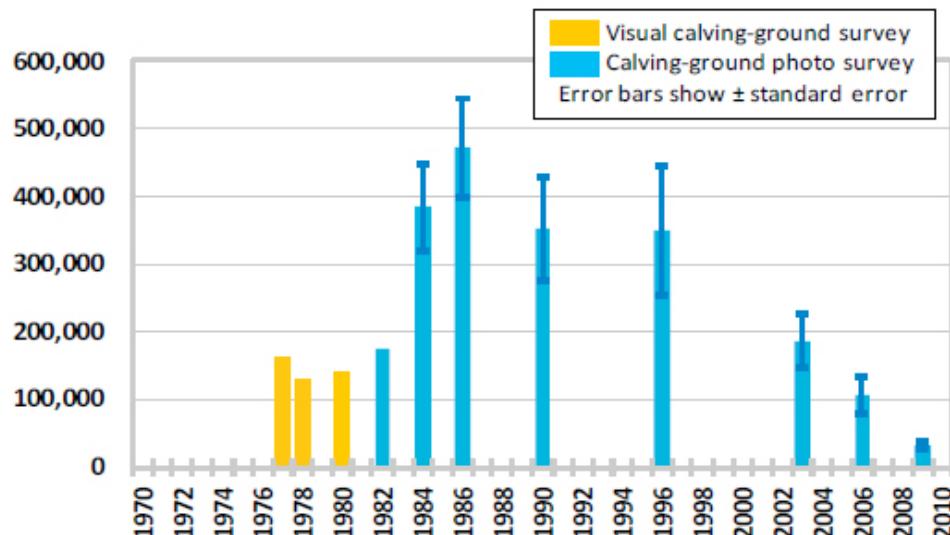


Figure 7. Caribou Herd population estimates.

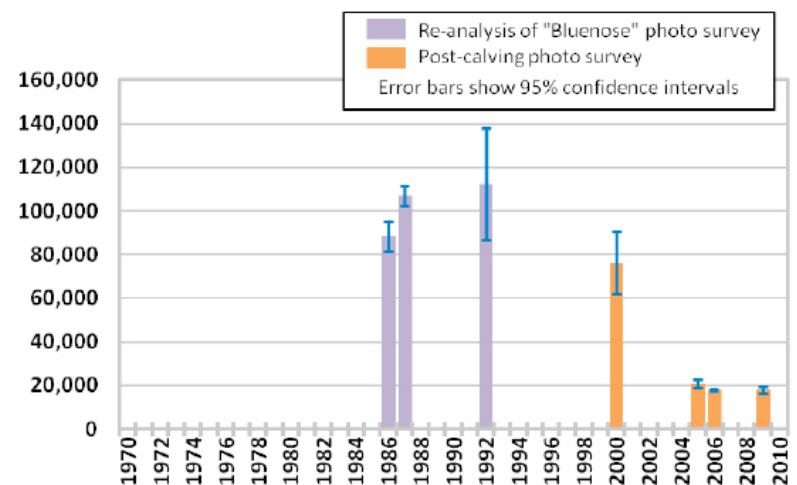


Figure 10. Bluenose-West Caribou Herd population estimates.

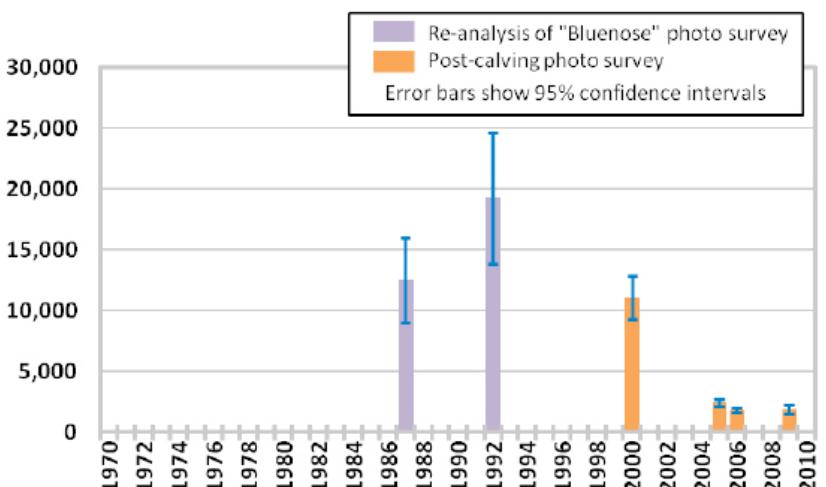
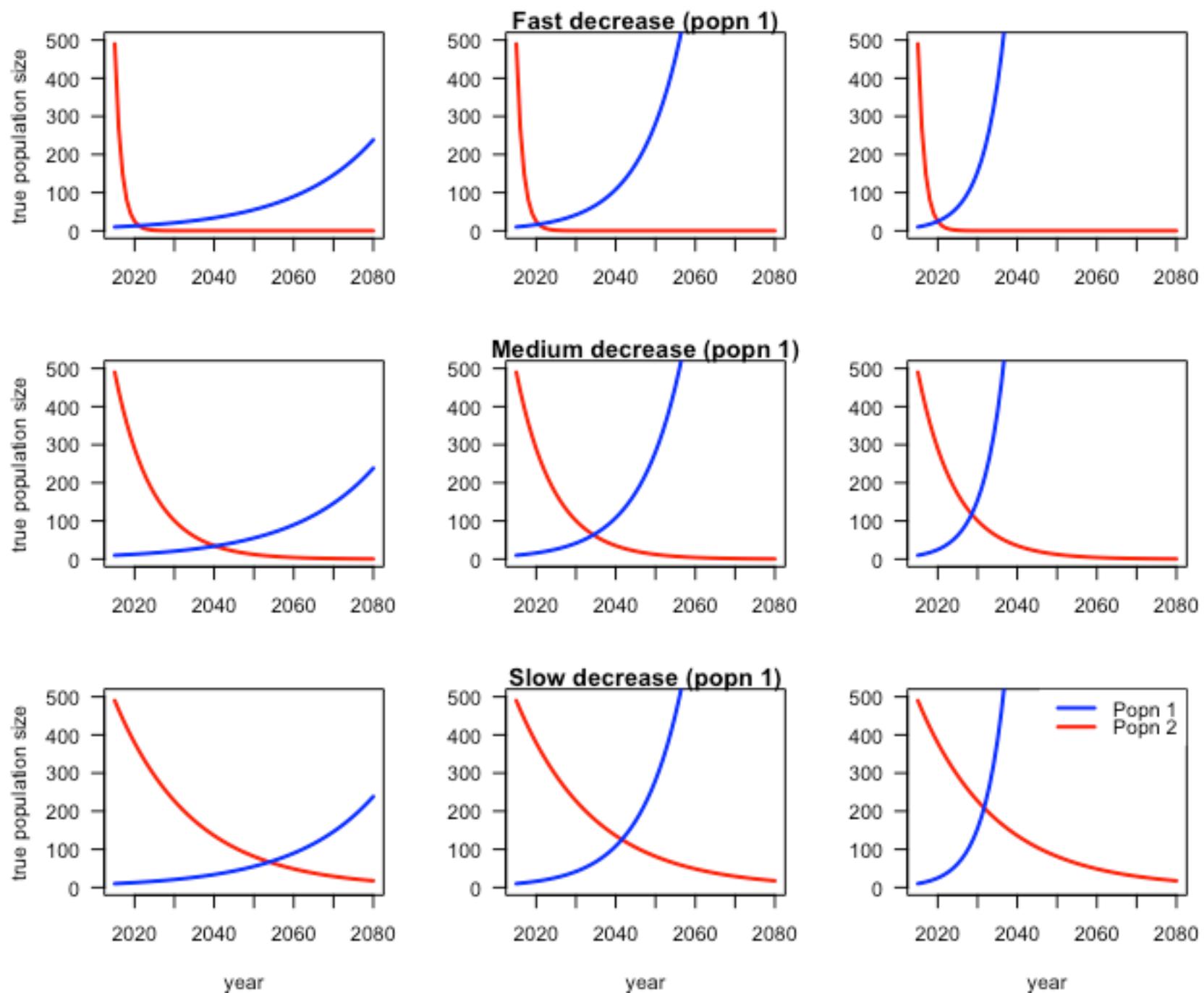


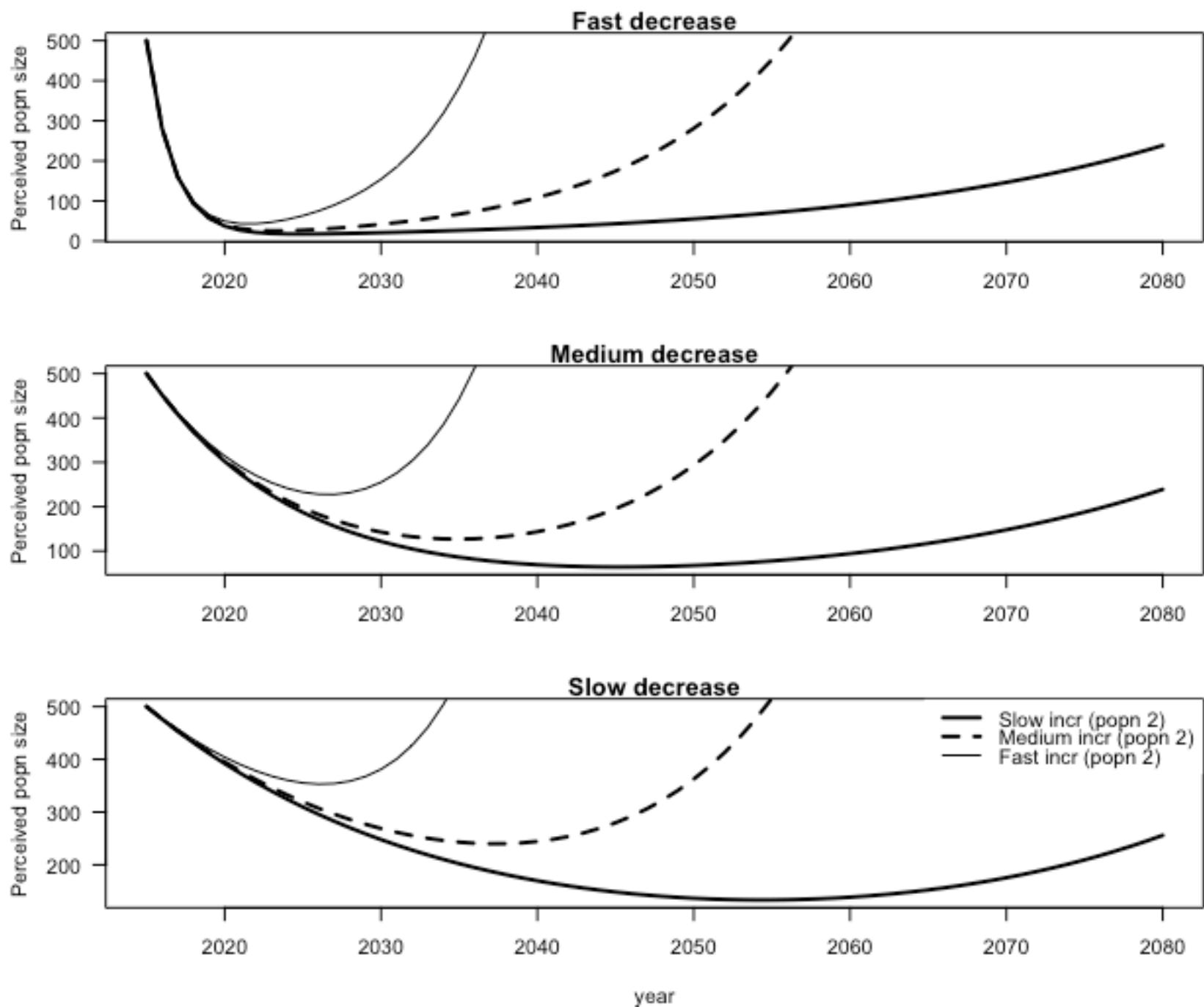
Figure 11. Cape Bathurst Caribou Herd population estimates.

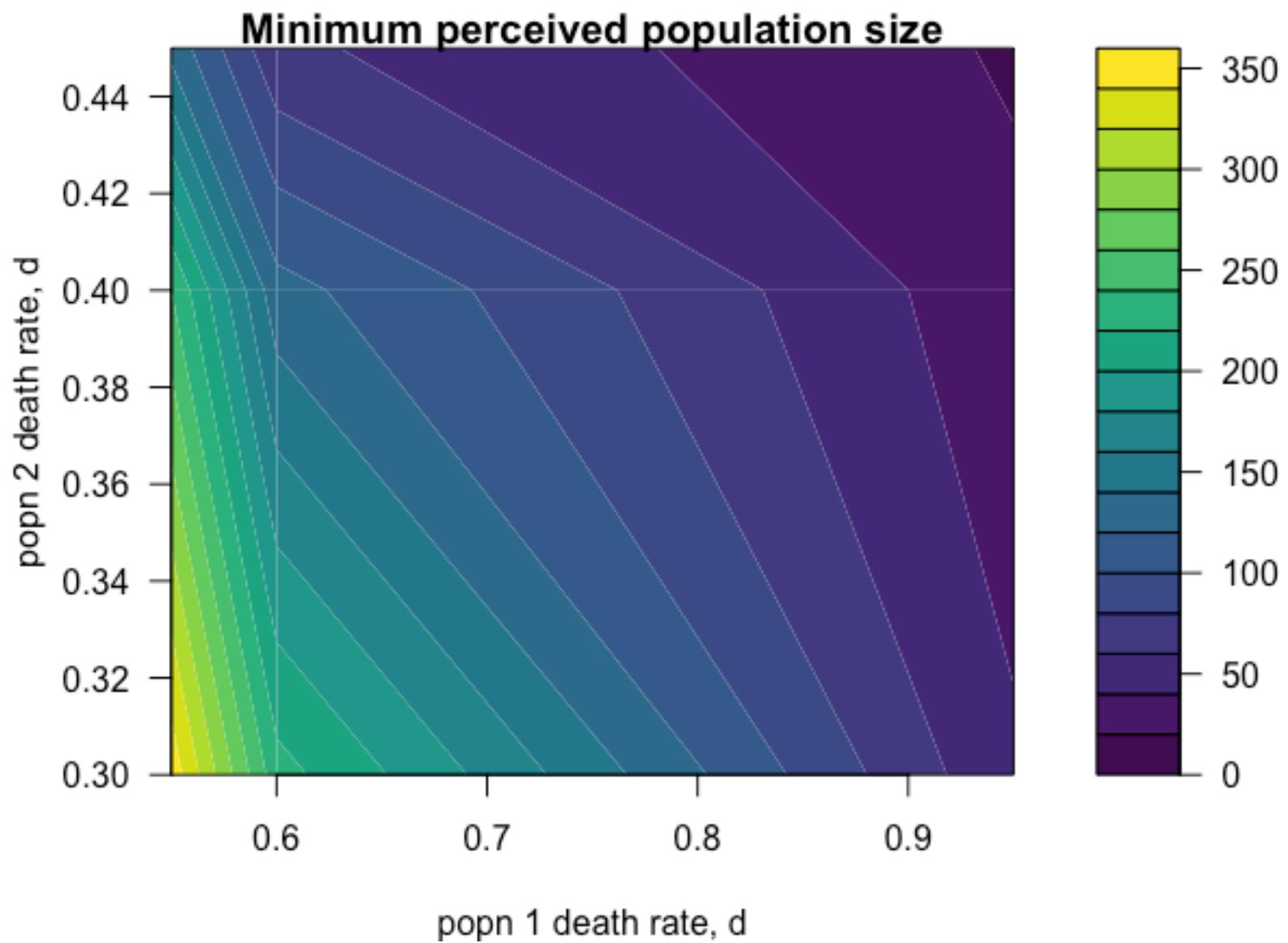
TwoCaribouHerdExample.R

Source on Save Run Source

```
1 # TOY EXAMPLE: TWO POPULATIONS ARE PERCEIVED AS ONE
2 # Loads a color palette
3 library(viridis)
4
5 # Remove all objects - always start with this
6 rm(list=ls())
7
8 # This function assumes geometric growth (i.e. no density dependence)
9 # The function will output a list of times and corresponding
10 # population sizes
11
12 # b: births per individual in a year
13 # d: prob of dying in a year
14 # Nstart: population size at time tstart
15 # tstart: the start time
16 # tend: the end time
17
18 - GeoGrowth = function(Nstart,b,d,tstart,tend){
19   Result = c(tstart,Nstart)
20   N = Nstart
```







**What are some limitations of the
“TwoCaribouHerdExample.R” toy
example?**

**Why, in practice, is it difficult to apply
the definition of population?**

Summary

- A population is a group of interbreeding individuals that overlap in space and time.
- Other definitions are also correct. The key feature of a definition of a population is that individuals “able” to reproduce with each other.
- Of interest is how the population might change
- The definition of a population is important for conservation biology
- The definition of a population can be difficult to apply. For specific studies, additional details on how the definition has been applied may be necessary.