



Pink-footed Goose Session

Evaluation of monitoring programmes for the Svalbard population of Pink-Footed Goose

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Motivation for evaluation

- Monitoring informs conservation, but also costs time & money
- To what extent do we sacrifice attainment of conservation objectives with a loss of monitoring data?
- To what extent can we increase our ability to meet conservation objectives with more investment in monitoring?
- What makes for an acceptable tradeoff between maximizing performance and minimizing costs?

Monitoring programs for pink-footed geese

One of the longest running and most consistent monitoring programs for a waterbird population in Europe

Since 2012 served as the backbone in the implementation of the first AEWA adaptive flyway management plan

	1980					1990					2000					2010					2020														
Population counts	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Age counts	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Banding/resighting									X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Lincoln index									X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Crippling rates									X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

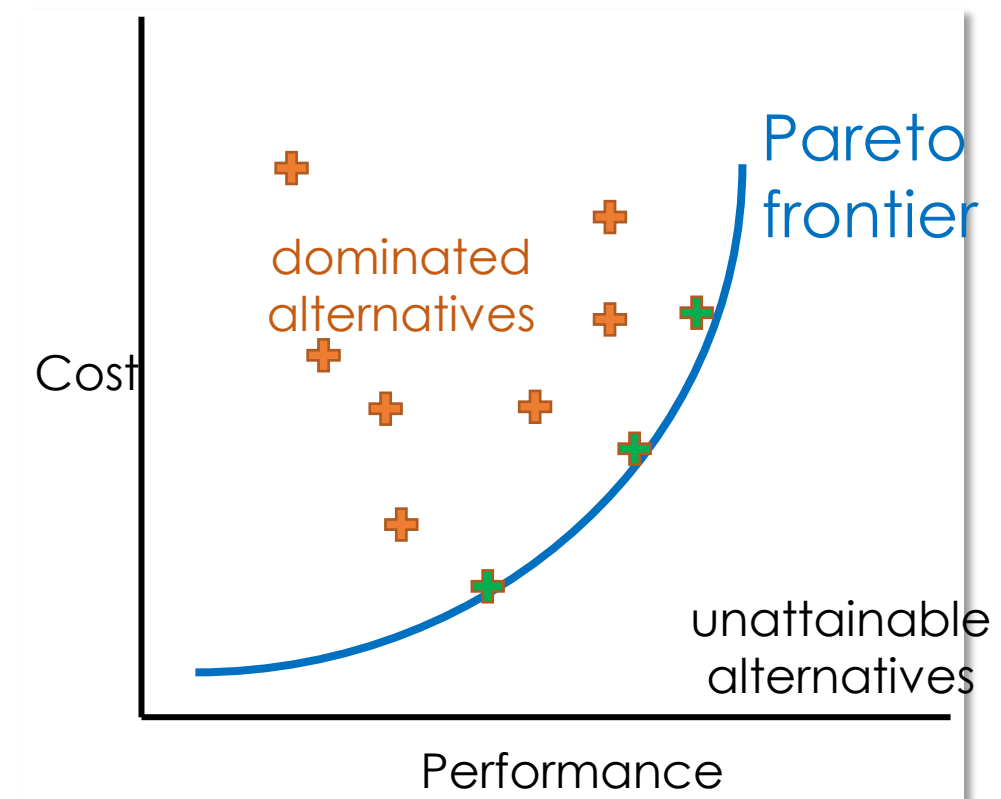


Costly programs

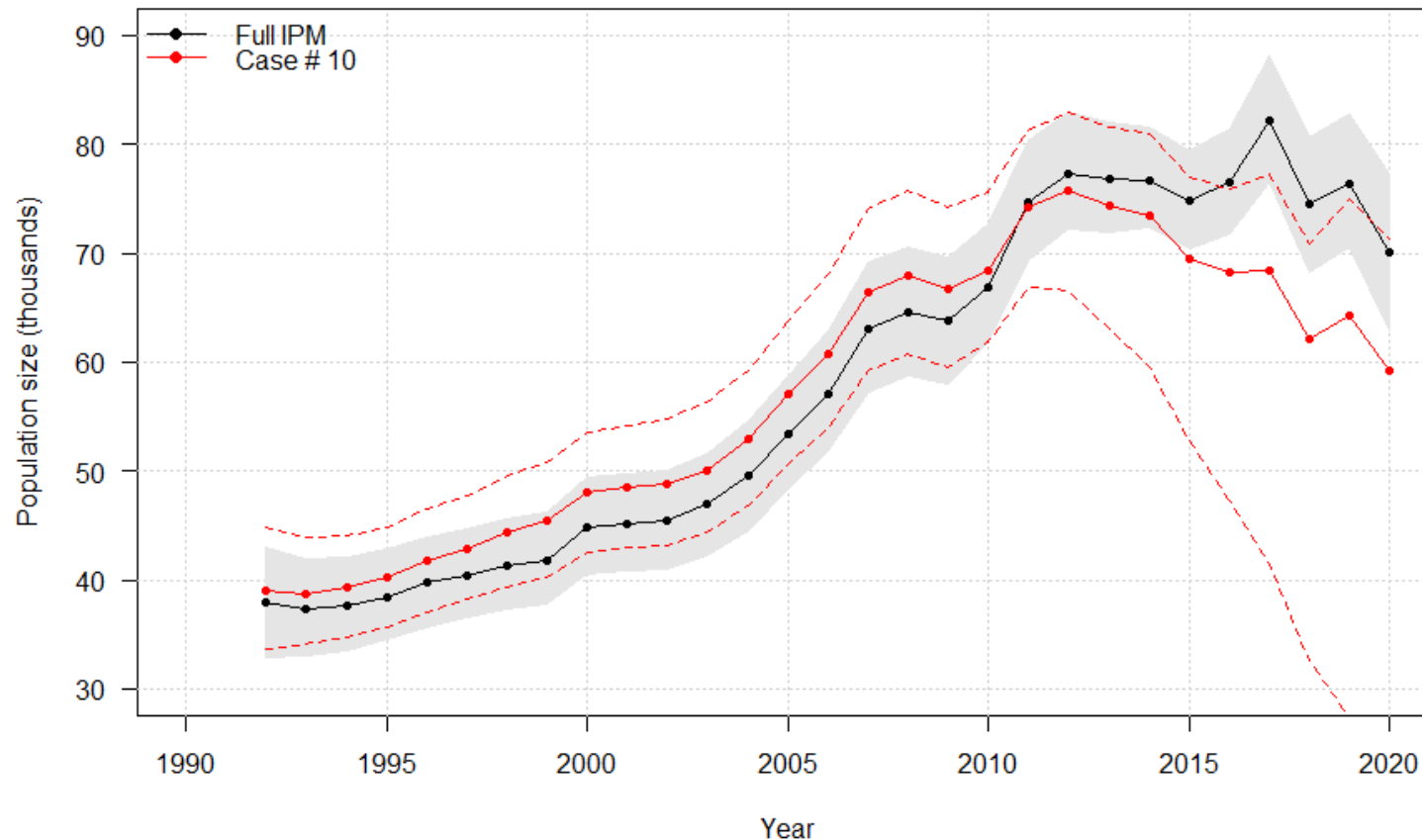
- Four externally funded programs (voluntary contributions not included) used in the annual harvest assessments:
 - May count: €2338/year
 - CMR estimates of May population size and survival: €91,801/year
 - Proportion of young in the autumn: €21,177/year
 - November count: €2145/year
 - Total = €117,460/year
- Costs shared by Aarhus University (95%) and the Norwegian Environment Agency (5%)
- **Aarhus University research funding ending this year**

Value of Information

- Expected *value* with information – Expected *value* without information
- *Value* expressed as:
 - Performance (maximize)
 - ability to maintain the population near the target of 60,000 in spring
 - Costs (minimize)
 - € for monitoring (above and beyond omnibus programs)

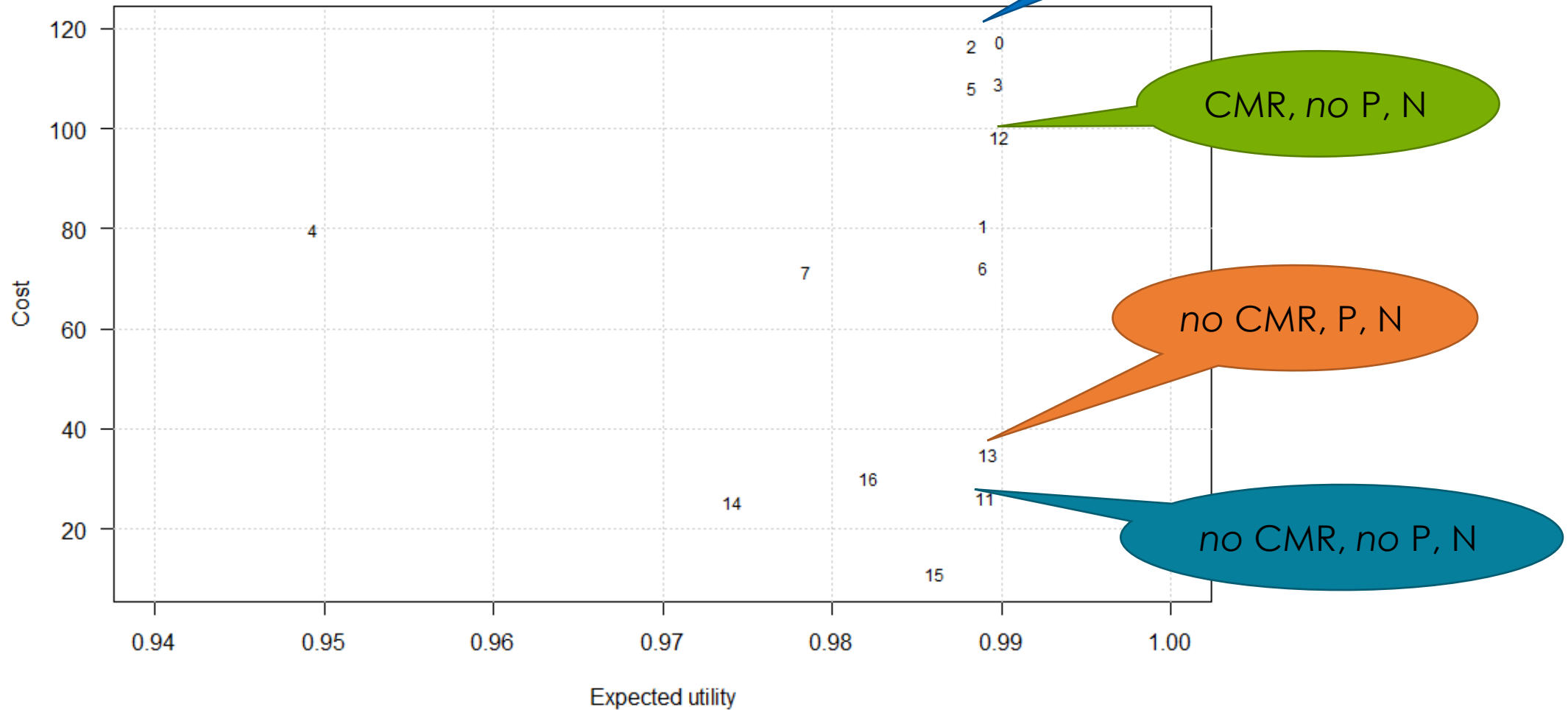


No CMR, no productivity, no November count



Inability to reliably estimate May population size can have a profound impact on expected performance

Pareto efficient alternatives





Conclusions

- May count is important
- No compelling reason to continue CMR for population/harvest management
- Productivity survey could be scaled back and still provide useful information
- November count appears to be relatively important
- Conclusions *very preliminary*

Caveats

- Vol analyses only value monitoring in terms of regulating population size
- Monitoring data have other uses:
 - CMR program helps evaluate crippling losses and can identify new migration routes
 - Population counts
 - Help meet treaty obligations (RAMSAR)
 - Needed for national assessments (agricultural damage)
 - Support ecosystem services (bird-watching by volunteer networks)
 - Engage range states in internationally coordinated management
 - Detecting unforeseen changes in population dynamics (e.g., due to climate change)

**Evaluating Monitoring Programs
for the Svalbard Population of Pink-Footed Goose**

*Progress Report
1 May 2021*

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Abstract: Unlike most goose populations in Europe, an extensive, science-focused monitoring program has been in place for the Svalbard-breeding population of pink-footed geese for three decades. The wealth of available information about population size, survival, productivity, and harvests has facilitated the construction of an integrated population model (IPM), which is now used to guide harvest-management decisions in Norway and Denmark. The monitoring program has been maintained by a network of managers, researchers, volunteers, and contract employees at a current annual cost of €117,461. After 30 years, however, one could ask whether there is a need to continue the monitoring in its current form or whether some monitoring efforts could be reduced without a significant sacrifice of management performance. We are conducting retrospective value-of-information analyses by asking what loss of management performance can be expected if we had stopped using a particular monitoring instrument in the past. Preliminary results suggest that the IPM appears quite robust, in that the posterior estimates of natural survival, differential vulnerability of young, and coefficients describing the relationship between spring thaw days on the breeding grounds and productivity changed little with some loss of monitoring data. Optimal harvest policies also are expected to perform well for the most part under the reduced-data scenarios we examined. It appears that substantial cost savings could be realized with reducing or eliminating the capture-mark-recapture program and productivity surveys, without much loss of the ability to maintain the population around its goal of 60,000 individuals. This is fortuitous, because funding for both of these programs ends in 2021, and will be discontinued unless more funding is forthcoming. Ultimately, any decisions to reduce monitoring efforts for pink-footed geese should consider the limitations of our analyses, which we describe herein. Moreover, we note that there are uses of monitoring data beyond those for managing harvests and population size. While these other uses cannot currently be valued quantitatively, they should nonetheless be considered in any decisions about the future of monitoring efforts for pink-footed geese.

Disclaimer: All results reported in this document are preliminary and therefore subject to change.